

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 However, these data will quickly become outdated if without focused attention and ongoing maintenance.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 ArcGISbased 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	
Aircraft Registration	The FAA's Aircraft Registration Database records all civil aircraft in the United States, including detailed records of each aircraft	FAA	Daily	https://
Database	(registration, manufacturer, model), owner information (name and address), and the airworthiness certificates on-file. The			certifica
	complete database can be downloaded as a ZIP folder (including an Excel workbook) for further analysis.			releasat
Airmen Certification	The FAA maintains a database recording all individuals that have an active airmen certificate including detailed records for each	FAA	Monthly (on the first	https://
Database	certificate holder including name, address, medical certificate on-file, and airworthiness certificate(s) and rating(s) acquired. The		day of each month)	airmen
	full database can be downloaded as a CSV or text file for further analysis.			
Airport Data and	The FAA's ADIP is a data repository of airport and aeronautical data. This repository includes airport data collected from the	FAA	FAA 5010 inspection	https://
Information Portal (ADIP)	FAA's 5010 Airport Safety Inspection program, FAA-published approach plates, and presents airport map imagery. Airport 5010		cycle (typically every	
	inspections collect data on airport facilities, services, activities, and obstructions intruding into the airport's critical safety areas.		three years for	
	This data can be downloaded in an Excel format from Airport Data and Information Portal (ADIP) using the advanced facilities		airports without air	
	search query to select the intended airports for review. This data is organized in four categories: Facility, Runway, Remark, and		carrier service and	
	Schedule Data. ⁴		annually for airports	
			with scheduled	
			commercial service)	
Airport Improvement	The FAA's AIP directs federal funding to airports included in the National Plan of Integrated Airport Systems (NPIAS). Historical	FAA	Annually	https://
Program (AIP) Grant	summaries of all grants awarded through the AIP can be downloaded in a PDF or Excel format for further analysis.			
Histories				
Low Altitude	The FAA has introduced the LAANC program to support integrating unmanned aerial vehicles (UAV) activity into the National	FAA	Unknown⁵	https://
Authorization and	Airspace System (NAS). The LAANC facilitates communication between UAV users and aviation stakeholders (including airports)			data_ex
Notification Capability	for identifying sensitive airspace and gaining visibility into the locations and times of UAV activity.			%20can
(LAANC)				
National Based Aircraft	The FAA's National Based Aircraft Inventory Program is a data repository recording all based aircraft at Nonprimary NPIAS	FAA	Annually to maintain	https://
Inventory Program	airports. These airports are required to submit their based aircraft into the program's website to be validated with the FAA's		eligibily for federal	
	Aircraft Registration database. Specific details on the based aircraft at each airport is limited to authorized personnel (i.e., airport		funding	
	managers, sponsors). However, summary reports of the total based aircraft at each airport are made publicly available on the		(responsibility of	
	program's website.		airport sponsors)	
NPIAS	The NPIAS reports all existing and proposed airports that are included in the NAS. Appendix A of the report details all NPIAS	FAA	Biennially	https://
	airports including the roles they currently serve and the amounts and types of airport development eligible for federal funding			current
	under the AIP over the next five years. This appendix can be downloaded in a PDF or Excel format for further analysis.			
Operational Network	The FAA's OpsNet is a database containing official operations data reflective of FAA air traffic operations recorded across the	FAA	Monthly	https://
(OpsNet)	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.			
Traffic Flow Management	The FAA's TFMSC is a database that maintains operations data across all airports in the NAS. The operation counts recorded in	FAA	Monthly	https://a
System Counts (TFMSC)	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.			

Website

://www.faa.gov/licenses_certificates/aircraft_ ication/aircraft_registry/ sable_aircraft_download/ ://www.faa.gov/licenses_certificates/

en_certification/releasable_airmen_download/

://adip.faa.gov/agis/public/#/public

://www.faa.gov/airports/aip/grant_histories/

://www.faa.gov/uas/programs_partnerships/ _exchange/#:~:text=LAANC%20is%20the%20Low%20Altitude,pilots an%20and%20cannot%20fly.

://basedaircraft.com/Default.aspx?ReturnUrl=%2f

://www.faa.gov/airports/planning_capacity/npias/ nt/

://aspm.faa.gov/opsnet/sys/main.asp

://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 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.

DEPARTMENT OF TRANSPORTATION

Minnesota State Aviation System Plan Phase II

Data Source	Summary	Responsible Author/Agency	Source Data Update Cycle ³	
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)	participating airport is inspected on a three-year cycle and evaluated against the FAA's and MnDOT's pavement design and		Three-year cycle	https://
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 Link to https:// airport
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://v
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:// zoning-
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://

We	bsite

://www.dot.state.mn.us/aero/airportdevelopment/pavementmana ent.html

ne page: https://www.dot.state.mn.us/aero/airportdirectory/ to the AirportFinder app: s://www.dot.state.mn.us/aero/airportdirectory/ prtfinder/index.html

//www.dot.state.mn.us/airport-economic-study/

s://www.dot.state.mn.us/aero/planning/ ng-warehouse.html

://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	
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.		Live updates	https://
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://

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

Minnesota State Aviation System Plan Phase II

Website

://www.aviationweather.gov/

s://data.ntsb.gov/carol-main-public/landing-page

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.

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	Events outside of the normal update cycle that the data should be
Outside of Update Cycle	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	Identifies the individual/group within MnDOT Aeronautics recommended
Responsibility	to be responsible for updating the data points
Data Manipulation Plan from Raw	Details how the raw data needs to be manipulated to conform with the
State (if applicable)	parameters of the MnSASP data

Table 6.2. Data Points Assessment Criteria

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 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	<u>MnSASP Report Card</u> : Airport details element <u>Airport Geodata</u> : 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	

Table 6.3. Airport Contact Information



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	10/20/2020
Collection	
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	<u>MnSASP Report Card</u> : Airport details element and map <u>Airport Dashboards</u> : Airport Economic Impact Dashboard (map)
	<u>Airport Geodata</u> : 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	Airport planning staff
Responsibility	
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.

Table 6.4. Airport Coordinates

Source: Kimley-Horn, 2022

.



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	11/01/2020
Collection	
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for	Airport name or FAA ID change
Evaluation Outside of	
Update Cycle	
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	MnSASP Hub Airport Data (The FAA ID is used as the common key for all tables
applicable)	and layers in the MnSASP Hub Airport Data feature layer)
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	None
Raw State (if applicable)	

Table 6.5. Airport Identification

Source: Kimley-Horn, 2022

-



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	10/20/2020
Collection	
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for	Airport relocation
Evaluation Outside of	
Update Cycle	
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	MnSASP Hub Airport Data/MN Airport Background
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	None
Raw State (if applicable)	

Table 6.6. Airport Physical/Mailing Address

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	<u>MnDOT District</u> : 12/16/2020
Collection	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	Jurisdictional boundary changes
Evaluation Outside of	
Update Cycle	
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	MnSASP Hub Airport Data/MN Airport Background
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	None
Raw State (if applicable)	

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	<u>MnSASP Report Card:</u> Airport details element <u>Airport Geodata</u> : 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	Airport planning staff
Responsibility	
Data Manipulation Plan from	None
Raw State (if applicable)	

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	<u>MnSASP Report Card</u> : Airport details element <u>Airport Geodata</u> : 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



Data Accossment	State Classification
Data Assessment	State Classification State Classification
Data Point(s)	
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	<u>System Performance</u> : Dashboard filters, metric/indicator data cards <u>Airport Performance</u> : Dashboard filter, metric/indicator data cards <u>MnSASP Report Card</u> : Airport details element <u>Airport Dashboards</u> : Airport Economic Impact Dashboard <u>Airport Geodata</u> : 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	State classifications are assigned across the system based on three factors, all
Raw State (if applicable)	 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.

Table 6.10. State Classification

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.



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: JetEngineGA Jet Turboprop 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	06/02/21 (2022 MnSASP Airport Inventory)
Collection	
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

Table 6.11. Based Aircraft



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

Table 6.12. Baseline Operations Counts

Data Assessment	Baseline Operations Counts
Data Point(s)	Total Baseline Operations Count
	Baseline Operations Count Year
Data Type	Baseline Operations Count Source 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	None
Evaluation Outside of	
Update Cycle	
Hub Presentation/Use	MnSASP Hub/Airport Performance: Airport Operations [Indicator]
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Airport Activity
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan	See Section 6.4.2.2 for obtaining and manipulating operations counts data
from Raw State (if	available via the FAA's OpsNet database. Note that this data is also plugged into
applicable)	the MnSASP Baseline Operations Estimation Tool.



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

Table 6.13. Drone/UAV Programs



	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
Description	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	06/02/21 (2022 MnSASP Update)
Collection	
Update Cycle	Annually
Trigger Point(s) for	None
Evaluation Outside of	
Update Cycle	
Hub Presentation/Use	System Performance: Emergency Medical [Indicator]
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Airport Activity
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	None
Raw State (if applicable)	

Table 6.14. Emergency Medical Activity



Data Accordment	Table 6.15. FAA Filed Flight Plans
Data Assessment	FAA Filed Flight Plans Flight ID Number
Data Point(s)	Route – Airport to State
	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	09/17/2021
Collection	
Update Cycle	Biennially
Trigger Point(s) for	None
	None
Evaluation Outside of	
Update Cycle	
Hub Presentation/Use	Airport Dashboards: FAA Filed Flight Plan Dashboard
	Airport Dashboards: FAA Filed Flight Plan Dashboard FAA Filed Flight Plan Data/All Flight Plan Details

Table 6.15. FAA Filed Flight Plans



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

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	<u>MnSASP Report Card</u> : Airport details element <u>Airport Geodata</u> : 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

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.

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	10/20/2020
Collection	
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for	Construction of a new ATCT
Evaluation Outside of	
Update Cycle	
Hub Presentation/Use	None
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Facilities and Services
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	None
Raw State (if applicable)	

Table 6.17. Air Traffic Control Tower

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)

DEPARTMENT OF TRANSPORTATION

Minnesota State Aviation System Plan Phase II

Data Assessment	Aircraft Rental
Update Cycle	Annually
Trigger Point(s) for	None
Evaluation Outside of	
Update Cycle	
Hub Presentation/Use	MnSASP Hub/Airport Performance: Available Services [Indicator]
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Facilities and Services
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	The field "Other Services" in ADIP's "Facilities" dataset will be populated with
Raw State (if applicable)	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	09/30/2021
Collection	
Update Cycle	Annually
Trigger Point(s) for	None
Evaluation Outside of	
Update Cycle	
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	MnSASP Hub Airport Data/Facilities and Services
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	The field "BeaconSchedule" in ADIP's "Facilities" dataset will be populated with
Raw State (if applicable)	"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.

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 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	06/02/21
Collection	
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for	Completion of a new or updated ALP and/or master plan
Evaluation Outside of	
Update Cycle	
Hub Presentation/Use	None
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Facilities and Services
applicable)	
MnDOT Aeronautics	ALP Program Manager
Responsibility	
Data Manipulation Plan from	None
Raw State (if applicable)	



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	06/02/21 (2022 MnSASP Update)
Collection	
Update Cycle	Annually
Trigger Point(s) for	None
Evaluation Outside of	
Update Cycle	
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	MnSASP Hub Airport Data/Facilities and Services
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	N/A
Raw State (if applicable)	

Table 6.21. Courtesy Car

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	06/02/21 (2022 MnSASP Update)
Collection	
Update Cycle	Biennially

DEPARTMENT OF TRANSPORTATION

Minnesota State Aviation System Plan Phase II

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

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 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	MnSASP Hub Airport Data/Facilities and Services
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	The field "Fuel Types" in ADIP's "Facilities" dataset indicates all the types of
Raw State (if applicable)	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

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	06/02/21 (2022 MnSASP Update)
Collection	
Update Cycle	Biennially
Trigger Point(s) for	Terminal improvement project (renovation/addition or new construction)
Evaluation Outside of	
Update Cycle	
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	MnSASP Hub Airport Data/Facilities and Services
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	None
Raw State (if applicable)	

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	<u>MnSASP Hub/System Performance</u> : Maintenance and Repair at Airports [Indicator] <u>MnSASP Hub/Airport Performance</u> : 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



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	06/02/21 (2022 MnSASP Update)
Collection	
Update Cycle	Annually
Trigger Point(s) for	None
Evaluation Outside of	
Update Cycle	
Hub Presentation/Use	MnSASP Hub/Airport Performance: Courtesy Car/Rental Car [Metric], Available
	Services [Indicator]
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Facilities and Services
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	None
Raw State (if applicable)	

Table 6.27. Rental Car

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	06/02/21 (2022 MnSASP Update)
Collection	

DEPARTMENT OF TRANSPORTATION

Minnesota State Aviation System Plan Phase II

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

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	06/02/21
Collection	
Update Cycle	None
Trigger Point(s) for	Completion of a new/updated ALP or new runway construction/realignment
Evaluation Outside of	project
Update Cycle	
Hub Presentation/Use	<u>MnSASP Hub/System Performance</u> : Adequate Wind Coverage [Metric] <u>MnSASP Hub/MnSASP Report Card</u> : Wind Coverage [Metric]
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Facilities and Services
applicable)	
MnDOT Aeronautics	Airport Layout Plan Coordinator
Responsibility	
Data Manipulation Plan from	None
Raw State (if applicable)	



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.

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], RunwayLighting [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

Table 6.30. Primary Runway



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	09/30/2021
Collection	
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	Each record in ADIP's downloadable runway dataset includes data for each
Raw State (if applicable)	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 .

Table 6.31. Runway Approach Type

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	09/30/2021
Collection	
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for	Runway extension, relocation, or realignment project
Evaluation Outside of	
Update Cycle	
Hub Presentation/Use	None
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Runway/Taxiway Data
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	Each record in ADIP's downloadable runway dataset includes data for each
Raw State (if applicable)	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.

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



through names c - Rur - Bas	a points are included in a downloadable "Runways" dataset available the ADIP advanced search query. Refer to the key below for the field containing the data points: way ID: Runway Id e End ID: Runway Id (all characters before the "/") iprocal End ID: Runway Id (all characters after the "/") 021
names c - Run - Bas	containing the data points: way ID: Runway Id e End ID: Runway Id (all characters before the "/") iprocal End ID: Runway Id (all characters after the "/")
- Rur - Bas	way ID: Runway Id e End ID: Runway Id (all characters before the "/") iprocal End ID: Runway Id (all characters after the "/")
- Bas	e End ID: Runway Id (all characters before the "/") iprocal End ID: Runway Id (all characters after the "/")
	iprocal End ID: Runway Id (all characters after the "/")
- Rec	021
Date of Initial Data 09/30/2	021
Collection	
Update Cycle As requi	red based on trigger point for evaluation
Trigger Point(s) for Complete	tion of an ALP update or any type of reorientation
Evaluation Outside of	
Update Cycle	
Adequat [Metric] <u>MnSASP</u> Lighting [Metric] <u>MnSASP</u>	Hub/System Performance: Adequate Approaches to Airports [Metric], te Navigational Systems [Metric], Airport Surfaces Clear of Obstructions Hub/Airport Performance: Primary Runway Width [Metric], Runway [Metric], Primary Runway Approaches [Metric], Navigation Systems , Airport Surfaces [Metric] Hub/MnSASP Report Card: Runway Approach [Metric], Navigation [Metric], Airport Obstructions [Metric]
, , , , ,	Hub Airport Data/Runway/Taxiway Data
applicable)	elenning staff
	olanning staff
Responsibility	
	cord in ADIP's downloadable runway dataset includes data for each
	at all airports selected in the advanced search. However, this dataset vides the FAA site number (#) as the airport identifier for each runway
	For joining the FAA IDs to each runway record for updating the
	y/Taxiway Data" table in the Hub, refer to the instructions included in

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	09/30/2021
Collection	
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for	Applicable runway improvement project
Evaluation Outside of	
Update Cycle	
Hub Presentation/Use	MnSASP Hub/Airport Performance: Primary Runway Width [Metric]
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Runway/Taxiway Data
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	Each record in ADIP's downloadable runway dataset includes data for each
Raw State (if applicable)	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 .

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	09/30/2021
Collection	
Update Cycle	Annual
Trigger Point(s) for	Runway improvement project
Evaluation Outside of	
Update Cycle	
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	MnSASP Hub Airport Data/Runway/Taxiway Data
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
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.

Table 6.36. Runway Lighting

	Runway Lighting
Data Point(s) Edge	e Light Intensity
Base	e End VGSI
Base	e End ALS
Base	e End REIL
Base	e End Centerline Lights
Base	e End Touchdown Lights
Reci	procal End VGSI
Reci	procal End ALS
Reci	procal End REIL
Reci	procal End Centerline Lights
Reci	procal End Touchdown Lights
Data Type Tabl	ılar data
Pescription Run	way 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	e slope indicator (VGSI), approach lighting system (ALS), runway end
ider	tifier lights (REILs), centerline lights, and touchdown lights.
ource(s) FAA	ADIP: https://adip.faa.gov/agis/public/#/public
ource(s) Details The	data points are included in a downloadable "Runways" dataset available
thro	ugh the ADIP advanced search query. Refer to the key below for the field
nam	es 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	09/30/2021
Collection	
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for	Installation of runway lighting projects
Evaluation Outside of	
Update Cycle	
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	MnSASP Hub Airport Data/Runway/Taxiway Data
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	Each record in ADIP's downloadable runway dataset includes data for each
Raw State (if applicable)	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.

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	Development of a new or modification of an existing runway approach
Evaluation Outside of	
Update Cycle	
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	MnSASP Hub Airport Data/Runway/Taxiway Data
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	Runway visibility minimums can be pulled by reviewing FAA-published
Raw State (if applicable)	approach plates available in ADIP. See Section 6.4.2.6 for instructions on
	pulling the visibility minimums from approach plates.

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	09/30/2021
Collection	
Update Cycle	Annually
Trigger Point(s) for	Completion of a runway obstruction removal project or comprehensive
Evaluation Outside of	obstruction evaluation study
Update Cycle	
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	MnSASP Hub Airport Data/Runway/Taxiway Data
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	As a part of airport 5010 inspections, runways are evaluated for close-in
Raw State (if applicable)	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.

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	06/02/21 (2022 MnSASP Update)
Collection	
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for	Taxiway improvement project
Evaluation Outside of	
Update Cycle	
Presentation/Use	MnSASP Hub/Airport Performance: Parallel Taxiway [Metric], Taxiway Width [Metric]
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Runway/Taxiway Data
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	None
Raw State (if applicable)	

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.



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
D · · T	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	06/02/21 (2022 MnSASP Update)
Collection	
Update Cycle	Annually
Trigger Point(s) for	New hangar construction
Evaluation Outside of	
Update Cycle	
Hub Presentation/Use	MnSASP Hub/Airport Performance: Transient Aircraft Storage [Metric]
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Aircraft Storage
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	None
Raw State (if applicable)	

Table 6.40. Hangars

Source: Kimley-Horn, 2022



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	06/02/21 (2022 MnSASP Update)
Collection	
Update Cycle	Annually
Trigger Point(s) for	Addition of new tiedown spaces, apron improvement project, or a hangar
Evaluation Outside of	construction project
Update Cycle	
Hub Presentation/Use	MnSASP Hub/Airport Performance: Aircraft Parking [Metric]
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Aircraft Storage
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan	None
from Raw State (if	
applicable)	

Table 6.41. Tiedowns

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.



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	06/02/21 (2022 MnSASP Update)
Collection	
Update Cycle	Biennially
Trigger Point(s) for	- Clear zones should be confirmed to be depicted on ALP during ALP
Evaluation Outside of	approval
Update Cycle	- 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	MnSASP Hub Airport Data/Planning and Special Studies
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan	N/A
from Raw State (if	
applicable)	

Table 6.42. Clear Zone Information (Tabular Data)

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	10/28/2021 (2019 Statewide Airport Economic Impact Study)
Collection	
Update Cycle	Completion of a new Statewide Airport Economic Impact Study (anticipated
	every five to seven years)
Trigger Point(s) for	None
Evaluation Outside of	
Update Cycle	
Hub Presentation/Use	MnSASP Hub/System Performance: Economic Impact [Indicator]
	MnSASP Hub / Airport Dashboards: Airport Economic Impact Dashboard
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Planning and Special Studies
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan	None
from Raw State (if	
applicable)	

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	MnSASP Hub Airport Data/Planning and Special Studies
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan	See Section 6.4.2.7 for guidance on pulling and organizing the AIP data and
from Raw State (if	organizing the dataset to conform with the MnSASP data.
applicable)	

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	06/02/21 (2022 MnSASP Update)
Collection	
Update Cycle	Biennially
Trigger Point(s) for	ALP and/or master plan updates
Evaluation Outside of	
Update Cycle	
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	Airport planning staff
Responsibility	
Data Manipulation Plan	None
from Raw State (if	
applicable)	

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	06/02/21 (2022 MnSASP Update)
Collection	
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for	Completion of a local obstruction study or ALP with AGIS survey
Evaluation Outside of	
Update Cycle	
Hub Presentation/Use	None
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Planning and Special Studies
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan	None
from Raw State (if	
applicable)	

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	06/02/21 (2022 MnSASP Update)
Collection	
Update Cycle	Bienially
Trigger Point(s) for	Adoption of new minimum standards
Evaluation Outside of	
Update Cycle	



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

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



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	MnDOT Aeronautics Airport Pavement Management System: 12/01/2021
Collection	(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	Completed airport pavement inspection
Evaluation Outside of	
Update Cycle	
Hub Presentation/Use	MnSASP Hub/System Performance: PCI [Metric]
	MnSASP Hub / Airport Geodata: Airfield Pavement Dashboard
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Planning and Special Studies
applicable)	
MnDOT Aeronautics	MnDOT APMS Coordinator
Responsibility	
Data Manipulation Plan	None
from Raw State (if	
applicable)	

Table 6.50. Pavement Condition Report

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	None
Evaluation Outside of	
Update Cycle	
Hub Presentation/Use	None
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Planning and Special Studies
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan	See Section 6.4.2.7 for manipulating the Excel output generated by ACE for
from Raw State (if	calculating the total state and local funding by system airport.
applicable)	

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.

Data Assessment	Weather Station Type
Data Point(s)	Туре
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	Installation or decommissioning of an AWOS/ASOS
Outside of Update Cycle	

Table 6.52. Weather Station Type



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	MnSASP Hub Airport Data/Aviation Weather Stations
applicable)	
MnDOT Aeronautics	Airport development staff
Responsibility	
Data Manipulation Plan from	None. Additional information regarding the MnSASP Weather Station Visual
Raw State (if applicable)	Assessment is available in Appendix C. Minnesota NAVAIDs of the 2022
	MnSASP Technical Report.

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	Installation or decommissioning of an AWOS/ASOS
Outside of Update Cycle	
Hub Presentation/Use	MnSASP Hub/Airport Geodata: Weather Stations & NAVAIDs Dashboard
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Aviation Weather Stations
applicable)	
MnDOT Aeronautics	Airport development staff
Responsibility	
Data Manipulation Plan from	Refer to Section 6.4.1.1 for converting the coordinates in DMS format to
Raw State (if applicable)	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	Installation or decommissioning of an AWOS/ASOS
Outside of Update Cycle	
Hub Presentation/Use	MnSASP Hub/Airport Performance: Weather Reporting [Metric]
	MnSASP Hub / Airport Geodata: Weather Stations & NAVAIDs Dashboard
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Aviation Weather Stations
applicable)	
MnDOT Aeronautics	Airport development staff
Responsibility	
Data Manipulation Plan from	None
Raw State (if applicable)	

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	Installation or decommissioning of an AWOS/ASOS
Outside of Update Cycle	

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	MnSASP Hub Airport Data/Aviation Weather Stations
applicable)	
MnDOT Aeronautics	Airport development staff
Responsibility	
Data Manipulation Plan from	The visual assessment was a manual process that utilized Google Earth satellite
Raw State (if applicable)	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.

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.

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").

Table 6.56. Airfield Pavement

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	Airfield pavement improvement project
Outside of Update Cycle	
Hub Presentation/Use	MnSASP Hub/System Performance: PCI [Metric]
	MnSASP Hub/Airport Geodata: Airfield Pavement Dashboard
MnSASP Hub Layer/Table (if	MnSASP Hub Airport Data/Airfield Pavement
applicable)	
MnDOT Aeronautics	MnDOT Aeronautics Pavement Management staff
Responsibility	
Data Manipulation Plan from	The APMS uses PAVER to map all airfield pavement at study airports and store
Raw State (if applicable)	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)

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. Instrumen	t Landing System
-----------------------	------------------

Data Assessment	Instrument Landing System
Data Point(s)	Туре
	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	Installation of a new NAVAID or decommissioning of existing equipment
Outside of Update Cycle	
Hub Presentation/Use	MnSASP Hub/Airport Geodata: Weather Stations & NAVAIDs Dashboard
MnSASP Hub Layer/Table (if	NAVAIDs/Instrument Landing System (ILS)
applicable)	
MnDOT Aeronautics	Navigation systems engineering team
Responsibility	
Data Manipulation Plan from	Coordinate data (latitude, longitude) is usually recorded in DMS format, which
Raw State (if applicable)	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.

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

Data Assessment	VOR/DME/TACAN/VORTAC Location Points
Data Point(s)	Туре
	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.

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

Data Assessment	VOR/DME/TACAN/VORTAC Service Buffers
Data Point(s)	Database
	Туре
	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	Installation of a new NAVAID or decommissioning of existing equipment
Outside of Update Cycle	
Hub Presentation/Use	MnSASP Hub/Airport Geodata: Weather Stations & NAVAIDs Dashboard
MnSASP Hub Layer/Table (if	NAVAIDs/VOR/DME/TACAN/VORTAC Service Buffers
applicable)	
MnDOT Aeronautics	Navigation systems engineering team
Responsibility	
Data Manipulation Plan from	The coordinate data (Latitude, Longitude) is usually recorded in DMS format,
Raw State (if applicable)	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.

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.

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 ordinancesAirport 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)

Table 6.60. Zoning

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

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 standards²³) 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	n 12/15/2021
Update Cycle	As required based on trigger point for evaluation

Table 6.61. Clear Zones (Spatial Layers)

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

DEPARTMENT OF TRANSPORTATION

Minnesota State Aviation System Plan Phase II

Data Assessment	Clear Zones
Trigger Point(s) for Evaluation	- Completion of a ALP or master plan
Outside of Update Cycle	- 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	Airport Safety Areas/Clear Zones (Existing)
applicable)	Airport Safety Areas Clear Zones (Ultimate)
MnDOT Aeronautics	Airport planning staff ²⁴
Responsibility	
Data Manipulation Plan from	Clear zones need to be remapped in GIS in conjunction with a triggering
Raw State (if applicable)	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 150/5300-13A²⁶) 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	Change to applicable dimensions
Outside of Update Cycle	
Hub Presentation/Use	MnSASP Hub/Airport Geodata: Airport Safety Areas Dashboard
MnSASP Hub Layer/Table (if	Airport Safety Areas
applicable)	
MnDOT Aeronautics	Airport planning staff ²⁷
Responsibility	
Data Manipulation Plan from	Part 77 surfaces need to be remapped in GIS in conjunction with a triggering
Raw State (if applicable)	event. ²⁸ See Section 6.4.1.7 for a summary of the initial mapping tasks
	completed during the 2022 MnSASP.

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	Changes to applicable RPZ dimensions
Outside of Update Cycle	
Hub Presentation/Use	MnSASP Hub/Airport Geodata: Airport Safety Areas Dashboard
MnSASP Hub Layer/Table (if	Airport Safety Areas
applicable)	
MnDOT Aeronautics	Airport planning staff ³⁰
Responsibility	
Data Manipulation Plan from	RPZs need to be remapped in GIS in conjunction with a triggering event. $^{\rm 31}$ See
Raw State (if applicable)	Section 6.4.1.7 for a summary of the initial mapping tasks completed during
	the 2022 MnSASP.

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.

Data Assessment	Aviation Fatalities
a Point(s)	Aviation Fatalities
аТуре	Tabular data
cription	This data point reflects the total number of annual aviation-re
	Minnesota.

Table 6.64. Aviation Fatalities

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)

Data Point(s) Data Type

Description

elated fatalities in

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.

DEPARTMENT OF TRANSPORTATION

Data Assessment	Aviation Fatalities
Update Cycle	Annually
Trigger Point(s) for	Aviation-related fatality in Minnesota
Evaluation Outside of	
Update Cycle	
Hub Presentation/Use	MnSASP Hub/System Performance: Aviation Fatalities [Indicator] ³²
MnSASP Hub Layer/Table (if	MnSASP Indicator Data
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	Using the search parameters defined in the source details (see Section 6.4.1.8
Raw State (if applicable)	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	MnSASP Indicator Data
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	Using the search parameters defined in the source details (see Section 6.4.1.8
Raw State (if applicable)	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.

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	08/18/2021
Collection	
Update Cycle	Annually
Trigger Point(s) for	None
Evaluation Outside of	
Update Cycle	

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	Total MN Certified Pilots: MnSASP Indicator Data
applicable)	Certified Pilots within 30nm: MnSASP Hub Airport Data/Airport Activity
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan	See Section 6.4.2.2 for instructions on completing the proximity analysis
from Raw State (if	necessary for populating these data points.
applicable)	

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

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 analysisESRI 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	Calculating the total population that fulfill the criteria for the data point
Raw State (if applicable)	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

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	None
Outside of Update Cycle	
Hub Presentation/Use	MnSASP Hub/System Performance: Registered Aircraft [Indicator] ⁴²
MnSASP Hub Layer/Table (if	MnSASP Indicator Data
applicable)	
MnDOT Aeronautics	Airport planning staff
Responsibility	
Data Manipulation Plan from	See Section 6.4.2.10 for complete instructions on pulling the data from the
Raw State (if applicable)	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	10/11/2021 (runway incursions in 2020)				
Collection					
Update Cycle	Annually				
Trigger Point(s) for	Runway incursion at a towered airport in Minesota				
Evaluation Outside of					
Update Cycle					
Hub Presentation/Use	MnSASP Hub/System Performance: Runway Incursions [Indicator] ⁴³				
MnSASP Hub Layer/Table (if	MnSASP Indicator Data				
applicable)					
MnDOT Aeronautics	Airport planning staff				
Responsibility					
Data Manipulation Plan from	See Section 6.4.1.9 for complete instructions on populating this data point.				
Raw State (if applicable)					

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	Addition or removal of MRO service availability at any system airport				
Outside of Update Cycle					
Hub Presentation/Use	MnSASP Hub/System Performance: Maintenance and Repair at Airports				
	[Indicator] ⁴⁴				
MnSASP Hub Layer/Table (if	MnSASP Indicator Data				
applicable)					
MnDOT Aeronautics	Airport planning staff				
Responsibility					
Data Manipulation Plan from	The workflow for updating this data point is configured into an ArcGIS				
Raw State (if applicable)	Notebook (System Indicators - Proximity Analyses). Refer to the MnSASP Hub				
	User's Guide for guidance on running the ArcGIS Notebook.				

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 \div 60) (+/-) (Seconds \div 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.

State Classifications	Criteria
Key Commercial	Part 139 Certificate
Service	
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

Table 6.72. MnSASP State Classification Assignment Criteria

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.



•	DIP							Quick Link	s ••••
dvance	ed Facility Search					O Back to Sea	rch 🛛 🕅 Display on Map	Downloads P	Results •
Displaying	100 of 134 Matches								
Loc Id	Facility Name *	City	FAA Site #	Part 139	NPIAS Service Level	NPIAS Hub Type	Asset Role	State	
SN	ARLAKE	MINNEAPOUS	10821.02*A	N	Reliever	N/A	Regional	MINNESOTA	
νT	A/T/ON MUN/STEVE KURTZ FLD	AITON	10505.*A	N	General Aviation	N/A	Local	MINNESOTA	
LEL.	ALBERT LEA MUNI	ALBERT LEA	10509.*A	N	General Aviation	N/A	Local	MINNESOTA	13
ANE.	ANOKA COUNTY-BLAINE (JANES FLD)	MINNEAPOLIS	10827.2"A	N	Relever	N/A	National	MINNESOTA	13
LQP	APPLETON MUNI	APPLETON	10518."A	N				MINNESOTA	B
NUM	AUSTIN MUNI	AUSTIN	10524.°A	N	General Aviation	N/A	Local	MINNESOTA	5
NS .	BACKUS MUNI	BACKUS	10525."A	N				MINNESOTA	5
94	BAGLEY MUNI	BAGLEY	10527.*A	N				MINNESOTA	1
8DE	BAUDETTE INTL	BAUDETTE	10535."A	N	General Aviation	N/A	Local	MINNESOFA	0
5.II	BEMIDI RONL	BEMIDI	10546.°A	Υ.	Primary	Non-Hub		MINNESOTA	5
888	BENSON MUNI	BENSON	10551,1*A	N	General Aviation	N/A	Basic	MINNESOTA	D
19	BIG FALLS MUNI	BIG FALLS	10560."A	N				MINNESOTA	
oz	BIGFORK MUNI	BIGFORK	10562.*A	N				MINNESOTA	
au	BLUE EARTH MUNI	BLUE EARTH	10569.1A	N	General Aviation	N/A	Local	MINNESOTA	8
νD	BOWSTRING	BOWSTRING	10573."A	N				MINNESOTA	2
RD	BRAINERD LAKES RGNL	BRAINERD	10576.°A	v	Primary	Non-Hub		MINNESOTA	
01	BROOTEN MUNI/JOHN O BOHMER FLD	BROOTEN	10592.*A	N				MINNESOTA	
OFE	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	
on	CHANDLER FLD	ALEXANDRIA	10512.*A	N	General Aviation	N/A.	Local	MINNESOTA.	2
15	CLARISSA MUNI	CLARISSA	10618.6°A	N				MINNESOTA	
200	CLOQUET CARLTON COUNTY	CLOQUET	10623.*A	N	General Aviation	N/A	Local	MINNESOTA	5
QM	COOK MUNI	соок	10535.*A	N	General Aviation	N/A	Basic	MINNESOTA	
CKN.	CROOKSTON MUNI/KIRKWOOD FLD	CROOKSTON	10642.*A	N	General Aviation	N/A	Local	MINNESOTA	2
MIC	CRYSTAL	MINNEAPOLIS	10821.*A	N	Reliever	N/A	Regional	MINNESCITA	

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

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).

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

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

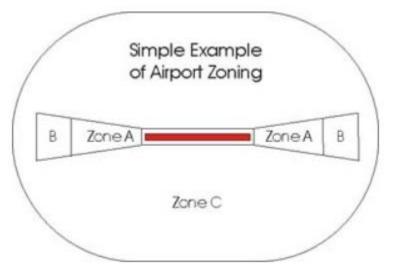
Source: FAA Aeronautical Information Manual (Chapter 1, Section 1), 2022

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.







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.

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

Table 6.74. Clear Zone Dimensional Standards

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.

DEPARTMENT OF TRANSPORTATION

Minnesota State Aviation System Plan Phase II

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.



Q SIMPLE SEARCH Q ADVANCED SEARCH		HELP NTSBHOME CAROL QUERY 🛞
Search for: Investigations O Recommendations		
Common Investigation Fields	Aviation Investigation Fields	Safety Recommendation Fields
Aviation data available from 1983; surface modes from 2010	Data available from 1983 and later	All data available
Event date: from Event date: to 01/01/2015 to 01/01/2020	Aircraft registration number	Safety recommendation number
City	Aircraft category 👻	Recommendation text
State Minnesota X *	FAR part *	Addressee name
Country		
Mode		
Aviation × -		
NTSB number		
Original publish date: from to Original publish date: to		
Highest injury level Fatal X ×		
		Q Go to Advanced Search CReset Q Search

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

*	New Search Help
Begin Results View	<u>Contact Support</u> <u>ASRS Database Items(pdf)</u>
How To Search:	
Step 1: Click ⁽³⁾ to add search items. Note: Make sure yo	our Pop-up Blocker is off.
Step 2: In "Current Search Items" section, select "Click	Here" in a statement and choose items from lookup window.
Date & Report Number	Place
Report Number (ACN) was [number]	Location was [identifier]
Environment	Person
G Flight Conditions were [conditions]	Reporter Organization was [type]
Lighting was [conditions]	Reporter Function was [position]
Weather was [element]	Event Assessment
Aircraft	Detector was [equipment/human]
Federal Aviation Regs (FAR) Part was [regulation]	Primary Problem was [most prominent factor]
Flight Plan was [type]	Contributing Factors were [problem areas]
Flight Phase was [phase]	Human Factors (since 6/09) were [factor]
Make/Model was [aircraft type]	Result was [consequence]
Mission was [operation]	
Text: Narrati	ive / Synopsis
C Text cor	ntains [words]
Current Search Items:	
Date of Incident was between <u>January-2015</u> and <u>Ja</u>	nuary-2021
and State was MN	
and Event Type was <u>Runway</u>	
	Back Run Search
A	SRS v2.9

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

DEPARTMENT OF TRANSPORTATION

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.

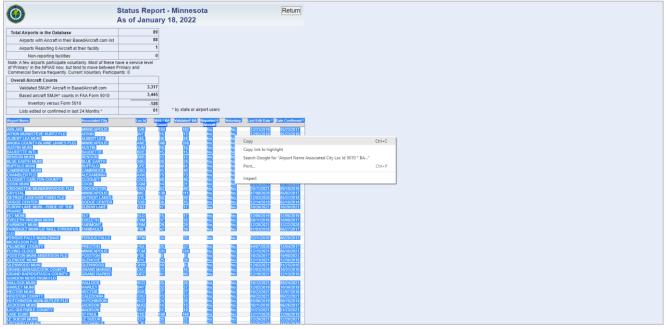


Figure 6-5. Copy Based Aircraft Counts by Airport

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

Federal Aviation Administration		Back to main FAA website
Main Page Airport Ops Tower Ops TRACON Ops Total Terminal Ops Center Acft Ha	Handled Facility Info Delays Other Reports	FAA Operations & Performance Data
	The Operations Network (OPSNET) > Airport Operations	
	Write Write <th< th=""><td></td></th<>	
Competitional of Transportation Prederal Josefon Administration Prederal Josefon Administration Prederal Josefon Discovery Prederal Josefon Discovery Prederal Josefon Discovery Prederal Prederation		

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.

- 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.

DEPARTMENT OF

TRANSPORTATION

SU	M	Ţ	: × v	<i>f</i> ∞ =IFERROR(T	RIM(LEFT(D2,FIND(" -",D2))),D2)	
		А	В	С	D	E
1	#	-	Arrival Date 🔻	Departure Date 💌	Arrival Airport ID - Name	Arrival Airport ID
2		1	Jan-19	Jan-19	04Y - Hawley	D2)
3		2	Jan-19	Jan-19	06C - Chicago/Schaumburg	06C
4		3	Jan-19	Jan-19	06C - Chicago/Schaumburg	06C
5		4	Jan-19	Jan-19	0D8 - Gettysburg	0D8
6		5	Jan-19	Jan-19	0M5 - Waverly	0M5
7		6	Jan-19	Jan-19	14G - Fremont	14G
8		7	Jan-19	Jan-19	14Y - Long Prairie	14Y
9		8	Jan-19	Jan-19	14Y - Long Prairie	14Y
10		9	Jan-19	Jan-19	16D - Perham	16D
11		10	Jan-19	Jan-19	1D2 - Plymouth	1D2
12		11	Jan-19	Jan-19	1D7 - Webster	1D7

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



• 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.

=IFERROR(IF	(COUNTIF(Airports!\$C\$3:\$C\$20042,\$E2)>0	,"US",VLOOKUP(\$E2,'airport-codes_csv'!\$	A\$3:\$G\$57423,'airport-codes_csv'!\$F\$1,FA	LSE)), "Unknown")
с	D	VLOOKUP(lookup_value, table_array, co	l index num, (range lookup))	G
ture Date 💌	Arrival Airport ID - Name			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
	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
1 40		400	lue	

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

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(VI	LOOKUP(\$E2,Airports!\$C\$3:\$G\$20042,Airp	orts!\$G\$1,FALSE),RIGHT	VLOOKUP(\$E2,'airport-codes_csv'!\$A\$3:\$G\$57423,'a	airport-c	odes_csv'!\$G\$1,FALSE),2])
с	D	E	VLOOKUP(lookup_value, table_array, col_index_num, [ran	ige_looku	p]) G
rture Date 💌	Arrival Airport ID - Name 💌	Arrival Airport ID	Arrival Airport Country	-	Arrival Airport State
	04Y - Hawley	04Y	US		\$G\$57423,'airport-codes_csv!\$G\$1,FALSE)
Jan-19	06C - Chicago/Schaumburg	06C	US		IL .
	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.

=IFERROR(I	FERROR(VLOOKUP(E2,Airports!\$C\$3:\$AK\$;	20042,Airports!\$X\$1,FALSE	,VLOOKUP(E2,'airport-codes_csv'!\$A\$3:\$N\$57	7423,'airport-codes_csv'!\$M\$1,FALSE]),"U	Jnknown")
с	D	E	VLOOKUP(lookup_value, table_array, col_index_nu	um, [range lookup]) G	Н
ure 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	106C	US	IL.	41.98934167
	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	9 14G - Fremont	14G	US	OH	41.33308333
Jan-19	14Y - Long Prairie	14Y	US	MN	45.89759444
Jan-19	9 14Y - Long Prairie	14Y	US	MN	45.89759444
Jan-19	16D - Perham	16D	US	MN	46.61097222
	0 1D2 - Plymouth	1D2	US	MI	42.34780556
Jan-19	1D7 - Webster	1D7	US	SD	45.29311111
	1G0 - Bowling Green	1G0	US	OH	41.391
law di	100 Baudian Casan	100	lue	011	44.204

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

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

DEPARTMENT OF

TRANSPORTATION

- 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".
- 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).



AutoSave 💽 🛛	圏 🛛 り・			runwa	ıy-data.xlsə	- Excel			2	Search											
ile Home	e insert Pag	ge Layout F	ormulas	Data Review	View	Develope	r Help	BLUEBE	AM Acr	obat Po	wer Pivot	PDF-X	Change for A	croPlot Pro							
🖳 🔏 Cut	Calibri		1 ~ A^ A		at at	Mana Taut		General				Normal	Ba	vd.			= i	$ \Sigma $	AutoSum ~	ZY D	4
Copy	·			_							-				~			1 🗸 🖓 F	ill ~		
→ Ste		⊻ - ⊞ -	🔗 ~ 🗛 ~	===	•= 🗄	Merge & Ce	nter ~	\$ - % !		Conditiona Formatting	I Format as	Good	N	eutral	~	Insert	Delete Forma	at 🖉 🦉	Clear ~	Sort & Find & Filter ~ Select ~	
Clipboard		Font		2	Alignmen		5	Numb	er Fa	ronnatting	Tuble -	Styl					Cells	1	Editi		Ide
Clipboard	181	Font			Alignmen		121	NUMD	er isi			Styl	es				Cells		Editi	ng	Ide
2 -	3 X 🗸	fx =SUBST	FITUTE(B2,"*	","~*")																	
А	вс	D	E	F G	н	1	J	к	L	м	N	0	P	Q	R	s	т	U	v	w	x
Site ID_new	Site Id 👻 State	▼ Runwa ▼ I	Length 👻 W	idth 👻 Surface 👻	Surface	PCN -	Edge Li	Length 👻	Length - N	NBC Si 👻 V	VBC D(- W	BC T\ - \	WBC Ta 👻 Ba	ise Er 👻 Base	Tr - B	ase IL 🔻	Base Ri 🔻	Base M	Base M	Base La 👻 B	Base La 👻
10504.11~*A	10504.11* MN	15/33	3103	60 ASPH-F			LOW						15		154		N	NPI	F	047-15-51.1	170151.4
10505.~*A	10505.*A MN	16/34	4000	75 ASPH-F			MED	3RD PART	*****	12			16		164		N	NPI	G	046-33-21.1	167601.4
10505.~*A	10505.*A MN	08/26	3123	140 TURF-G				3RD PART					08		87		N			046-32-43.1	167563.4
10509.~*A	10509.*A MN	05/23	2898	75 ASPH-G				NGS	*****				05		47		N	NPI	G	043-40-44.1	157244.6
10509.~*A	10509.*A MN	17/35	5000	100 ASPH-G			MED	3RD PART	*****	19	29		17		168		N	NPI	G	043-41-15.1	157275.8
10512.~*A	10512.*A MN	04/22	4098	75 ASPH-F			MED	3RD PART	******	35	60		04		49		N	NPI	G	045-51-45.1	165105.3
10512.~*A	10512.*A MN	13/31	5099	100 ASPH-G			MED	3RD PART	******	35	60		13		139		N	PIR	G	045-52-17.1	165137.8
10518.~*A	10518.*A MN	04/22	2770	157 TURF-G				FAA OE/A					04		45		N	NSTD	F	045-13-32.1	162812.2
10518.~*A	10518.*A MN	13/31	3500	75 ASPH-F			MED						13		135		N	NPI	F	045-13-49.1	162829.0
10524.~*A	10524.*A MN	17/35	5800	100 CONC-G		48 /R/C/V	HIGH	3RD PART	******	100	135		17		172		N	PIR	G	043-40-13.1	157213.8
10525.~*A	10525.*A MN	15/33	3585	135 TURF-P			NSTD	ADO	*****				15		161		N		G	046-49-54.1	168594.5
10527.~*A	10527.*A MN	14/32	3800	75 ASPH-F			MED						14				N	NPI	F	047-31-42.1	171102.0
10535.~*A	10535.*A MN	12/30	5498	100 ASPH-G			HIGH	3RD PART		30			12		121		N	PIR	G	048-43-56.1	175436.2
10535.~*A	10535.*A MN	13W/31W	6000	120 WATER				3RD PART	******				13	w	127					048-44-12.1	175452.8
10546.~*A	10546.*A MN	07/25	5700	150 ASPH-E	GRVD	11 /F/B/Y	MED	3RD PART	*****	75	200		07		74			NPI	G	047-30-26.1	171026.0
10546.~*A	10546.*A MN	13/31	7004	150 ASPH-E	GRVD	11 /F/B/Y	HIGH	3RD PART	******	75	200		13		134			PIR	G	047-31-06.1	171066.4
10551.1~*A	10551.1*A MN	14/32	4000	75 ASPH-F			MED			40	50		14		144		Y	NPI	F	045-20-10.1	163210.0
10560.~*A	10560.*A MN	03/21	2850	100 TURF-G				STATE	*****				03							048-11-55.1	173515.
L0560.~*A	10560.*A MN	11/29	2602	200 TURF-G			NSTD	STATE	*****				11				N			048-12-02.1	173522.0
10562.~*A	10562.*A MN	15/33	3998	75 ASPH-G			MED	3RD PART	******				15		151		N	NPI	G	047-47-19.1	172039.
10569.~*A	10569.*A MN	03/21	2245	200 TURF-G				3RD PART	******				03		35		N			043-35-42.1	156942.3
L0569.~*A	10569.*A MN	16/34	3400	75 CONC-G			MED	3RD PART	#############	12			16		161		N	NPI	G	043-35-53.1	156953.9
10573.~*A	10573.*A MN	07/25	2565	150 TURF-G				ADO	*****				07		81		N			047-33-27.1	171207.
10576.~*A	10576.*A MN	H1	60	60 CONC-G	GRVD		PERI						H					BSC	G		
10576.~*A	10576.*A MN	05/23	6512	150 CONC-G	GRVD	49 /R/B/V	HIGH	3RD PART	*****	75	125	220	05		54			PIR	G	046-23-40.1	167020.0
10576.~*A	10576.*A MN	16/34	7100	150 CONC-E	GRVD	49 /R/B/V	HIGH	3RD PART	******	75	125	220	16		163			PIR	G	046-25-02.1	167102.0
10592.~*A	10592.*A MN	15/33	3500	60 ASPH-F			MED						15				N	BSC	G	045-30-04.1	163804.3
L0605.~*A	10605.*A MN	18/36	3200	75 ASPH-F			MED	3RD PART	******				18		181		N	NPI	G	045-09-47.1	162587.
.0610.~*A	10610.*A MN	13/31	3499	77 ASPH-G			MED			10			13		135		N	NPI	F	043-35-59.1	156959.:
0612.2~*A	10612.2*A MN	16/34	4001	75 ASPH-G			MED	3RD PART	*****	12			16		163		N	NPI	G	045-33-45.1	164025.8
10615.2 ^{~*} A	10615.2*A MN	12/30	4648	75 ASPH-F			MED	3RD PART	******				12		121		N	NPI	G	044-43-58.1	161038.1
0618.6 ^{~*} A	10618.6*A MN	10/28	2600	200 TURF-G									10				N			046-06-49.1	166009.8
10623.~*A	10623.*A MN	07/25	3100	75 ASPH-F			MED	3RD PART	******				07		73		N	NPI	G	046-42-03.1	168123.8
10623.~*A	23.*A MN	18/36	4002	75 ASPH-F			MED	3RD PART	******	8	12		18		179		N	NPI	G	046-42-20.1	168140.3

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



- 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.



AutoSave		9- (?-				runway-data.xlsx -	Excel			<u>م</u>	Search											
File H	lome Insert	Page La	yout	Formulas	Data Rev	iew View	Developer	Help	BLUEBEA	M Acro	bat Po	wer Pivot	PDF-XCh	ange for Ad	croPlot Pro							
	Cut	Calibri		11 - A^ A	===		rap Text	Ge	neral				Normal	Bac	4	-	**	2 🖽	∑ Auto	Sum ~		0
	Copy ~				-						<u> </u>	-				-			🐺 Fill 🗸			~
aste	Format Painter	BI∐	~ 🖽 ~	· 🙆 - 🗛 -	· ===	1 II II 🖽 🖽 M	erge & Cent	ter ~ \$	- %)	* 8 -88	Conditional Formatting	Format as	Good	Ne	utral	÷	Insert Delet	e Format	🖉 Clea		iort & Fin ilter ~ Sele	
Clipb			Font		6	Alignment		5	Numbe		. enning	19616	Styles				Cell			Editin		
Cipo	Juaru is		FURL			Augriment		191	Numbe	1 191			signes				Cen			Eulun	·	
12	• : ×	√ fx	=VLO	OKUP(B2,'[air	rport-data.xls	x]Airports'I\$A\$2	\$D\$135,4,F	ALSE)														
A	В	с	D	E	F	G H	1	J	к	L	м	N	0	Р	Q	R	s	т	U	v	w	
	Site ID_ne	Site Id 💌	State	* Runwa *	Length 👻 W	idth 💌 Surface	Surface *	PCN 💌	Edge Li	r Length 👻	Length 💌	WBC SI 💌	WBC D 💌 W	/BC T\ 👻 V			Base Tr 💌	Base IL 💌	Base Ri 💌	Base M	 Base N 	M.~
D00	10504.11.A	10504.11*A	MN	15/33	3103	60 ASPH-F			LOW						i		154		N	NPI	F	
AIT	10505A	10505.*A	MN	16/34	4000	75 ASPH-F			MED	3RD PART		12			1		164		N	NPI	G	
AIT	10505A	10505.*A	MN	08/26	3123	140 TURF-G				3RD PART					0		87		N			
AEL	10509A	10509.*A	MN	05/23	2898	75 ASPH-G				NGS	******				0		47		N	NPI	G	
AEL	10509A	10509.*A	MN	17/35	5000	100 ASPH-G			MED	3RD PART		19	29		1		168		N	NPI	G	
AXN	10512A	10512.*A	MN	04/22	4098	75 ASPH-F			MED	3RD PART		35	60		0		49		N	NPI	G	
AXN	10512A	10512.*A	MN	13/31	5099	100 ASPH-G			MED	3RD PART		35	60		1		139		N	PIR	G	
AQP	10518A	10518.*A	MN	04/22	2770	157 TURF-G				FAA OE/A	******				C		45		N	NSTD	F	
AQP	10518A	10518.*A	MN	13/31	3500	75 ASPH-F			MED						1		135		N	NPI	F	
AUM	10524A	10524.*A	MN	17/35	5800	100 CONC-G		48 /R/C/V		3RD PART	*****	100	135		1		172		N	PIR	G	
7Y3	10525A	10525.*A	MN	15/33	3585	135 TURF-P			NSTD	ADO	******				1		161		N		G	
7Y4	10527A	10527.*A	MN	14/32	3800	75 ASPH-F			MED						1				N	NPI	F	
BDE	10535A	10535.*A	MN	12/30	5498	100 ASPH-G			HIGH	3RD PART		30			1		121		N	PIR	G	
BDE	10535A	10535.*A	MN	13W/31W	6000	120 WATER				3RD PART						3W	127					
BJI	10546A	10546.*A	MN	07/25	5700	150 ASPH-E	GRVD	11 /F/B/Y		3RD PART		75	200		0		74			NPI	G	
BJI	10546A	10546.*A	MN	13/31	7004	150 ASPH-E	GRVD	11 /F/B/Y		3RD PART	*****	75	200		1		134			PIR	G	
888	10551.1.A	10551.1*A	MN	14/32	4000	75 ASPH-F			MED			40	50		1		144		Y	NPI	F	
7Y9	10560A	10560.*A	MN	03/21	2850	100 TURF-G				STATE	*****				0							
7Y9	10560A	10560.*A	MN	11/29	2602	200 TURF-G			NSTD	STATE	******				1				N			
FOZ	10562A	10562.*A	MN	15/33	3998	75 ASPH-G			MED	3RD PART					1		151		N	NPI	G	
SBU	10569A	10569.*A	MN	03/21	2245	200 TURF-G				3RD PART					0		35		N			
SBU	10569A	10569.*A	MN	16/34	3400	75 CONC-G			MED	3RD PART		12			1		161		N	NPI	G	
9Y0	10573A	10573.*A	MN	07/25	2565	150 TURF-G				ADO	******				0		81		N			
BRD	10576A	10576.*A	MN	H1	60	60 CONC-G		to to to b	PERI				105		0	1				BSC	G	
BRD	10576A	10576.*A	MN	05/23	6512	150 CONC-G		49 /R/B/V		3RD PART		75	125	220	1		54			PIR	G	
BRD	10576A	10576.*A	MN	16/34	7100	150 CONC-E	GRVD	49 /R/B/V		3RD PART	uwnumun	75	125	220	1		163			PIR	G	
6D1	10592A	10592.*A	MN	15/33	3500	60 ASPH-F			MED						1				N	BSC	G	
CFE	10605A	10605.*A	MN	18/36	3200	75 ASPH-F			MED	3RD PART	*******				1		181		N	NPI	G	
CHU	10610A	10610.*A	MN	13/31	3499	77 ASPH-G			MED	200.04		10			1		135		N	NPI	F	
CBG	10612.2.A	10612.2*A	MN	16/34	4001	75 ASPH-G			MED	3RD PART		12			1		163		N	NPI	G	
CNB	10615.2.A	10615.2*A	MN	12/30	4648	75 ASPH-F			MED	3RD PART	HARANNAN				1		121		N	NPI	G	
8Y5	10618.6.A	10618.6*A	MN	10/28	2600	200 TURF-G			1450	200.0457					1				N	NIDI	6	
COQ	10623A	10623.*A	MN	07/25 18/36	3100 4002	75 ASPH-F 75 ASPH-F			MED MED	3RD PART	*******	8	12			7 8	73		N N	NPI	G	
coq	10623A	10623.*A																				

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."
- 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.



C	2 👻	: × 🗸	<i>f</i> _x A33-15/33									
1		Remark I denti code		Run way ID								
1	A	в	С	F	G	н	1	J	K	L	M	N
1	Site Id 🛛 👻	State Id 🛛 💌	Remark Element Nam 🔻	Remark -								
2	10504.11*A	MN	A33-15/33	CRACKING	AND SUR	FACE EROS	ION.					
3	10504.11*A	MN	A40-15/33	SEVERAL L	IGHTS LEA	NING.						
4	10504.11*A	MN	A58-15	RWY 15 H	AS 7 FT BR	USH 37 FT F	ROM THE F	RWY END	AND 94 FT L.			
5	10504.11*A	MN	E111	NON COM	IPLIANCE F	AR 157.						
6	10504.11*A	MN	A58-33	RWY 33 H	AS 7 FT BRI	USH 32 FT F	ROM THE F	RWY END	AND 100 FT F	۲.		
7	10504.11*A	MN	A70	FUEL AVA	IL 24 HOUF	WITH CRE	DIT CARD.					
8	10504.11*A	MN	A110-1	ULTRALIG	HTS ON &	INVOF ARP	т.					
9	10504.11*A	MN	A110-2	FOR CD CT	C FARGO	APCH AT 70	1-235-889	4.				
10	10504.11*A	MN	A16	ARPT MGF	CELL PHO	NE 218-415	5-0191					
11	10505 *A	MANI	A12	AIDDODT (NC DAV #21	0 000 106		010 051 ASA	n		

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



- 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**)

		•	•
В	С	D	E E G H I I K I M N
State Id	Remark Element Nam 👻	v	Convert Text to Columns Wizard - Step 3 of 3 ? X
MN	A33-15/33		This screen lets you select each column and set the Data Format.
MN	A40-15/33		Column data format
MN	A58-15		● <u>G</u> eneral
MN	E111		General' converts numeric values to numbers, date values to dates, and all remaining values to text.
MN	A58-33		O Date: MDY V Advanced
MN	A70		O Do not import column (skip)
MN	A110-1		
MN	A110-2		Destination: =SDS1
MN	A16		
MN	A13		Data preview
MN	A110-5		Data Dicence
MN	A110-4		General General
MN	A30A-16		Remark Element Name
MN	A42-08		A33 15/33 A40 15/33
MN	A70		A58 15 DR 218-839-6488 FC
MN	A81-APT		♥ VASI RY 16/34; MIF
MN	A30-08/26		>
MN	A110-2		APPR AREA TO RY
MN	A110-1		Cancel < <u>B</u> ack Next > Einish
MN	A58-35		24 FT TREE 68 FT FROM RWY END 354 FT L.
MN	A17		FOR SVC AFT HRS CALL 507-826-3451.
MN	A15		EMAIL ADDRESS: JIMHANSON@DESKMEDIA.COM (ALL LOWER CASE)

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

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

Source: Kimley-Horn, 2022

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

DEPARTMENT OF

TRANSPORTATION

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.



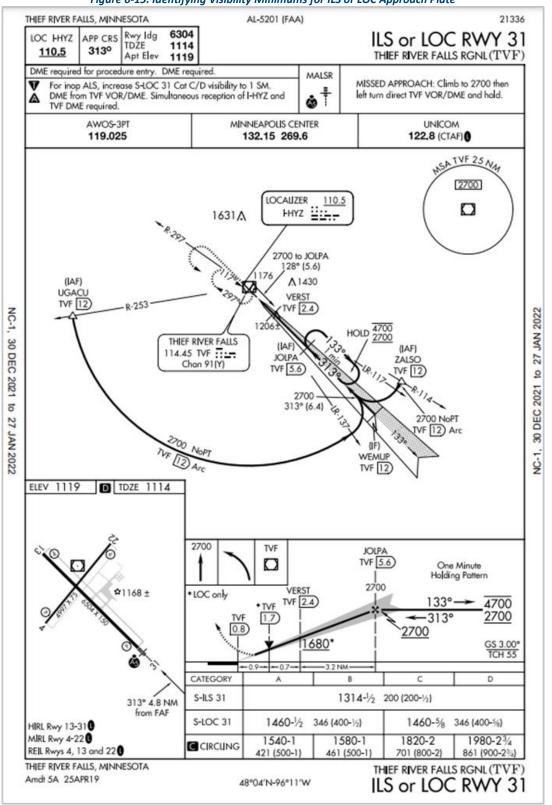


Figure 6-15. Identifying Visibility Minimums for ILS or LOC Approach Plate

Source: FAA ADIP, 2022



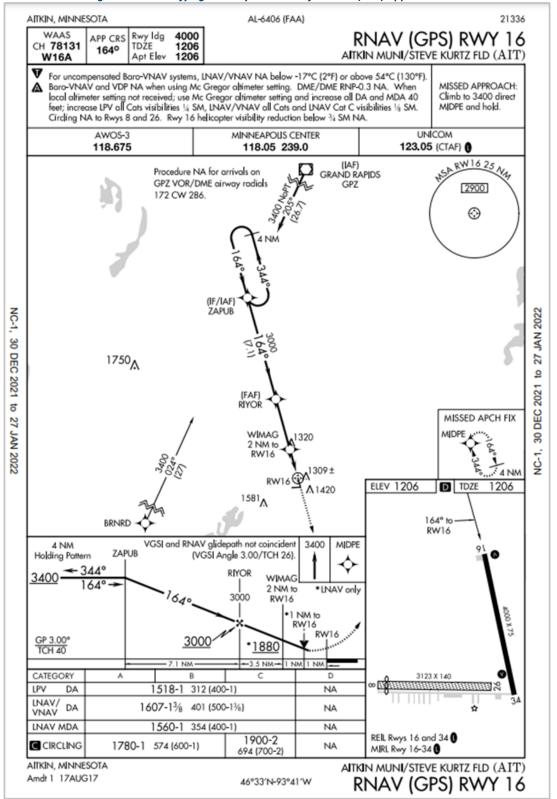


Figure 6-16. Identifying Visibility Minimums for RNAV (GPS) Approach Plate

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.

Report Filters	
* Start Date:	2017 ~
* End Date:	2020 ~
* Service Level (or State Project):	All Service Levels
Hub:	Select a Hub Type ~
State:	MN Y
Submit Export to	Excel
	Sources: EAA AID 2022

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

Sources: FAA AIP, 2022

- 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.

J2		+ = 2	< 🗸	fx =NU	MBERVALU	JE(12)								
	А	В	С	D	E	F	G	Н		I.		J	К	L
1	Fiscal Y	Service	State	Locatio	Airport I	Hub Typ	Grant S	Work De	AIP Fed	eral Funds	AIP F	unds	CARES	Supplem
2	2017	GA	MN	AEL	Elbow Lake	-	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
4	2017	GA	MN	SBU	Elbow Lak	-	Blue Earth	Construct	\$324,625		\$	324,625.00	\$0	\$0
5	2017	GA	MN	COQ	Elbow Lake	-	Cloquet Ca	Rehabilitat	\$112,763		\$	112,763.00	\$0	\$0
6	2017	GA	MN	CQM	Elbow Lak	-	Cook Mun	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 Lake	-	Detroit Lak	Construct	\$4,471,792	2	\$	4,471,792.00	\$0	\$0
9	2017	GA	MN	TOB	Elbow Lake	-	Dodge Ce	Reconstru	\$257,960		\$	257,960.00	\$0	\$0
10	2017	GA	MN	ELO	Elbow Lake	-	Ely Munici	Reconstru	\$90,900		\$	90,900.00	\$0	\$0
11	2017	GA	MN	EVM	Elbow Lak	-	Eveleth-Vir	Construct	\$712,111		\$	712,111.00	\$0	\$0
12	2017	GA	MN	FKA	Elbow Lake	-	Fillmore Co	Conduct A	\$486,041		\$	486,041.00	\$0	\$0
13	2017	GA	MN	FSE	Elbow Lake	-	Fosston M	Rehabilitat	\$254,925		\$	254,925.00	\$0	\$0
14	2017	GA	MN	CKC	Elbow Lake	-	Grand Mar	Conduct E	\$67,500		\$	67,500.00	\$0	\$0
	2017	GA	MN	GPZ	Elbow Lake	-		Construct			\$	241,110.00	\$0	\$0
40	2017	GA	MN	HCO	Elbow Lake	-	Hallock Mi	Construct	\$201 901		\$	201,901.00	\$0	\$0

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



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

	A	B	С	D	E	F	G	Н	I			J	K	L
1	Fiscal Y	Service	State	Locati	or Airport I H	lub T	yr Grant So	Work De	AIP Feder	ral Func	ls AlF	P Funds-New	CARES	Suppleme
2	2017	GA	MN	AEL	Elbow Lake-		Albert Lea	Construct	\$766,342		\$	766,342.00	\$0	\$0
3	2017	GA	MN	BDE	6		-		·	2		954,308.00	\$0	\$0
4	2017	GA	MN	SBU	Create PivotTab	le				?	×	324,625.00	\$0	\$0
5	2017	GA	MN	COQ	Choose the data t	hat you	want to analyze -					112,763.00	\$0	\$0
6	2017	GA	MN	CQM	Select a tab	, Io or ron	, ,					25,110.00		\$0
7	2017	GA	MN	CKN			-					330,463.00	\$0	\$0
	2017	GA	MN	DTL	<u>T</u> able/F	Range:	Sheet1!\$A\$1:\$L\$	419			1	4,471,792.00		\$0
	2017	GA	MN	TOB	○ Use an exte	rnal data	source					257,960.00		\$0
10	2017	GA	MN	ELO	Choo	se Conn	ection					90,900.00		\$0
11	2017	GA	MN	EVM		tion nam						712,111.00		\$0
12	2017	GA	MN	FKA								486,041.00		\$0
13	2017	GA	MN	FSE	 Use this work 	rkbook's	Data Model					254,925.00	\$0	\$0
14	2017	GA	MN	CKC	Choose where you	u want th	e PivotTable repo	ort to be place	d		_	67,500.00		\$0
15	2017	GA	MN	GPZ	New Works	heet						241,110.00		\$0
	2017	GA	MN	HCO	Existing Wo	rksheet						201,901.00		\$0
	2017	GA	MN	04Y								707,223.00		\$0
18	2017	GA	MN	MJQ	Locatio	n:					Î	135,720.00	\$0	\$0
	2017	GA	MN	DXX	Choose whether y	ou want	to analyze multip	le tables				164,822.00		\$0
20	2017	GA	MN	12Y	Add this dat	ta to the	Data Model					144,345.00		\$0
21	2017	GA	MN	LXL								201,737.00		\$0
	2017	GA	MN	3N8					ок	Cancel		49,526.00		\$0
23	2017	GA	MN	MKT	LIDOW LON-		mankato n	Neconstru	ψ 1,013,4 31		-	1,813,437.00	\$0	\$0
	2017	GA	MN	JKJ	Elbow Lake-		Moorhead				\$	482,168.00		\$ 0
25	2017	GA	MN	MZH	Elbow Lake-		Moose Lak				\$	219,015.00	\$0	\$0
26	2017	GA	MN	MOX	Elbow Lake-		Morris Mu	Conduct A	\$450,000		\$	450,000.00	\$0	\$0
27	2017	GA	MN	ULM	Elbow Lake-		New Ulm M	Update Air	\$264,600		\$	264,600.00	\$0	\$0

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

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.

		В	С	D	E	F	G	Н	1	J	PivotTable Fields	- ×
1	Drop Report Filter	Fields Here										
2											Choose fields to add to repo	rt: 🛞 🔻
3	Average of AIP Funds										Search	م
4	Location Identifier	Total									L Hub Type	
5	*MNS	759533.5									Grant Sequence Number	
6	04Y	707223									AIP Federal Funds	
7	10D	821234.6									AIP Funds	
8	12D	92871.33333									CARES Act Local Matchin Supplemental_Discretion	
9	12Y	173985.5										w w
10	14Y	530737.3333									Drag fields between areas b	elow:
11	1D6	107783.8									T Filters	Columns
12	21D	2453064									1 mon	- columb
13	3N8	331743										
14	55Y	184884.25									= Rows	Σ Values
15	ACQ	302840									Location Identifier	Average of AIP Funds
16	ADC	133970.25									esection identifier	recage of Air Funds
17	AEL	519251										
1	Sheet3 Sheet1 (+	440040.05				: •				•	Defer Layout Update	Update

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

Source: Kimley-Horn, 2022

Source: Kimley-Horn, 2022

6.4.2.8. State and Local Funding

The Excel output⁴⁷ 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.

Region			Ident	Munici	pality	Payme	nt Date	Federal	State	Local
E										
6D1			BROOTEN							
> Broc	oten Airp	ort<	05/28/1958		\$0.00	\$9,	545.01	\$0.00		
GRADIN	G, PAVII	NG, DRAINAGE	12/18/1978		\$0.00	\$162,	641.62	\$41,513.84		
LAND			12/14/1978		\$0.00	\$122,	00.000	\$36,882.44		
PAVEME	NT CRA	CK REPAIR	10/19/1991		\$0.00	\$9,	966.67	\$4,983.33		
Sample of	data exp	oort/								
Region	ldent	Municipality			Payn Date	nent	Federal	State	Loca	I
Е	6D1	BROOTEN	> Brooten Airport	<	05/2	28/1958	\$0.00	\$9,545.01		\$0.00
E	6D1	BROOTEN	GRADING, PAVING, DRAINAGE		12/1	8/1978	\$0.00	\$162,641.62	\$41,	513.84
E	6D1	BROOTEN	LAND		12/1	4/1978	\$0.00	\$122,000.00	\$36,	882.44
E	6D1	BROOTEN	PAVEMENT CRACK REPAIR		10/1	9/1991	\$0.00	\$9,966.67	\$4,	983.33

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

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

EPARTMENT OF

TRANSPORTATION

• 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	2. ACE Data	Manipulation –	Column P
-------------	-------------	----------------	----------

f _x	=LEN(F5)=3									
									Р	<u>م</u>
									Test for a	Airport Name
-	Municipality	Payment Date	Federal ~	State	r Local		· •	* *	Is 3-characters long? (airport identifier)	Row is otherwise t
	Region	Ident	Municipality	Payment Date	Federal	State Local		3	Is 3-characters long? (airport identifier)	Row is otherwise t
ader	E							4	FALSE	TRUE
catego	6D1	BROOTEN						5	=LEN(F5)=3	TRUE
w	> Brooten Airport<	05/28/195	B \$0.00	\$9,545.01	\$0.0	0		e	FALSE	FALSE
w	GRADING, PAVING, DRAINAGE	12/18/197	B \$0.00	\$162,641.62	\$41,513.8	4		7	FALSE	FALSE
w	LAND	12/14/197	B \$0.00	\$122,000.00	\$36,882.4	4		8	FALSE	FALSE
w	PAVEMENT CRACK REPAIR	10/19/199	1 \$0.00	\$9,966.67	\$4,983.3	3		9	FALSE	FALSE
w	UST REMOVAL-2 TANKS	04/05/199	3 \$0.00	\$1,400.00	\$966.7	7		10	FALSE	FALSE
w	UST REMOVAL-2 TANKS	04/05/199	3 \$0.00	\$533.55	\$0.0	0		11	FALSE	FALSE
w	CRACK REPAIR	12/15/199	5 \$0.00	\$11,546.00	\$5,773.0	0		12	FALSE	FALSE
w	Design Engineering for Rwy Rehab	07/14/200	3 \$0.00	\$4,005.40	\$1,001.3	5		13	FALSE	FALSE
w	Runway Rehabilitation	10/31/200	3 \$0.00	\$115,337.18	\$28,834.3	0		14	FALSE	FALSE
w	Runway Rehabilitation	05/27/200	4 \$0.00	\$4,459.18	\$1,114.7	9		15	FALSE	FALSE

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

=AND(ISBLANK(H5), ISBLANK(I5), ISB	LANK(J5))												
												Q	R
											Test for	Airport Name	
 Municipality 	 Payment Date 	*	Federal ~	State	Local	-	* *	-	~	-	ls 3-characters long? (airport identifier)	Row is otherwise blank	 Is new ai
Region	Ident		Municipality	Payment Date	Federal		State Local			3	Is 3-characters long? (airport identifier)	Row is otherwise blank	ls new ai
E					-					4	FALSE	TRUE	FAL
0 6D1	BROOTEN		(Ī	I					5	TRUE)	TRU
> Brooten Airport<		05/28/1958	\$0.00	\$9,545.01		\$0.00				6	FALSE	FALSE	FAL
GRADING, PAVING, DRAINAGE		12/18/1978	\$0.00	\$162,641.62		\$41,513.84				7	FALSE	FALSE	FAL
LAND		12/14/1978	\$0.00	\$122,000.00		\$36,882.44				8	FALSE	FALSE	FAL
PAVEMENT CRACK REPAIR		10/19/1991	\$0.00	\$9,966.67		\$4,983.33				9	FALSE	FALSE	FAL
UST REMOVAL-2 TANKS		04/05/1993	\$0.00	\$1,400.00		\$966.77				10	FALSE	FALSE	FAL
UST REMOVAL-2 TANKS		04/05/1993	\$0.00	\$533.55		\$0.00				11	FALSE	FALSE	FAL
CRACK REPAIR		12/15/1995	\$0.00	\$11,546.00		\$5,773.00				12	FALSE	FALSE	FAL
Design Engineering for Rwy Rehab		07/14/2003	\$0.00	\$4,005.40		\$1,001.35				13	FALSE	FALSE	FAL
Runway Rehabilitation		10/31/2003	\$0.00	\$115,337.18		\$28,834.30				14	FALSE	FALSE	FAL
Runway Rehabilitation		05/27/2004	\$0.00	\$4,459.18		\$1,114.79				15	FALSE	FALSE	FAL

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

=AND(P5,Q5)				_	_	_	_	-			_
F	G	н	1	J	<u>к</u>	L M	N	0	р	Ω	R
						_		_		Airport Name	
 Municipality 	 Payment Date 	 Federal 	 State 	- Local		~	* *			Row is otherwise blank	
Region	Ident	Municipality	Payment Date	Federal	State L	ocal		3	Is 3-characters long? (airport identifier)	Row is otherwise blank	Is new airport
E								4	FALSE	TRUE	FALSE
go 6D1	BROOTEN							5	TRUE	TRUE	=AND(P5,Q5)
> Brooten Airport<	05/	28/1958 \$0	.00 \$9,545.0)1	\$0.00			6	FALSE	FALSE	FALSE
GRADING, PAVING, DRAINAGE	12/	18/1978 \$0	.00 \$162,641.6	32 \$4	1,513.84			7	FALSE	FALSE	FALSE
LAND	12/	14/1978 \$0	.00 \$122,000.0	0 \$3	6,882.44			8	FALSE	FALSE	FALSE
PAVEMENT CRACK REPAIR	10/	19/1991 \$0	.00 \$9,966.6	57 \$	4,983.33			9	FALSE	FALSE	FALSE
UST REMOVAL-2 TANKS	04/	05/1993 \$0	.00 \$1,400.0	0	\$966.77			10	FALSE	FALSE	FALSE
UST REMOVAL-2 TANKS	04/	05/1993 \$0	.00 \$533.5	5	\$0.00			11	FALSE	FALSE	FALSE
CRACK REPAIR	12/	15/1995 \$0	.00 \$11,546.0	0 5	5,773.00			12	FALSE	FALSE	FALSE
Design Engineering for Rwy Rehab	07/	14/2003 S0	.00 \$4,005.4	10 9	1,001.35			13	FALSE	FALSE	FALSE
Runway Rehabilitation	10/	31/2003 S0	.00 \$115.337.1	8 S2	8.834.30			14	FALSE	FALSE	FALSE
Runway Rehabilitation	05/	27/2004 \$0	.00 \$4,459.1	8 \$	1,114.79			15	FALSE	FALSE	FALSE

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.

=AND(NOT(ISBLANK(F5)), NOT(ISBL	ANK(G5)), ISBLANK	(H5), ISBLAN	IK(15), ISBLAN	IK(J5))											
															S
<u> </u>	ĺ	i i i										Test for	Airport Name		Other Header
Municipality	 Payment Date 	- F	Federal ~	State	~ Local	*	-	-	-	-	-	Is 3-characters long? (airport identifier)	Row is otherwise blank	Is new airport ~	First 2 filed, o
Region	Ident	1	Municipality	Payment Date	Federal		State Lo	cal			3	Is 3-characters long? (airport identifier)	Row is otherwise blank	Is new airport	
E				_			_				4	FALSE	TRUE	FALSE	FALSE
6D1	BROOTEN	ī		i	-i		Ī				5	TRUE	TRUE	TRUE)
> Brooten Airport<		05/28/1958	\$0.00	\$9,545.0	1	\$0.00	-				6	FALSE	FALSE	FALSE	FALSE
GRADING, PAVING, DRAINAGE		12/18/1978	\$0.00	\$162,641.6	2	\$41,513.84					7	FALSE	FALSE	FALSE	FALSE
LAND		12/14/1978	\$0.00	\$122,000.0	0	\$36,882.44					8	FALSE	FALSE	FALSE	FALSE
PAVEMENT CRACK REPAIR		10/19/1991	\$0.00	\$9,966.6	7	\$4,983.33					9	FALSE	FALSE	FALSE	FALSE
UST REMOVAL-2 TANKS		04/05/1993	\$0.00	\$1,400.0	0	\$966.77					10	FALSE	FALSE	FALSE	FALSE
UST REMOVAL-2 TANKS		04/05/1993	\$0.00	\$533.5		\$0.00					11	FALSE	FALSE	FALSE	FALSE
CRACK REPAIR		12/15/1995	\$0.00	\$11,546.0	0	\$5,773.00					12	FALSE	FALSE	FALSE	FALSE
Design Engineering for Rwy Rehab		07/14/2003	\$0.00	\$4,005.4	0	\$1,001.35					13	FALSE	FALSE	FALSE	FALSE
Runway Rehabilitation		10/31/2003	\$0.00	\$115,337.1	8	\$28,834.30					14	FALSE	FALSE	FALSE	FALSE
Dunning Databilitation		05/07/0004	60.00	P4 450 4	0	P4 444 70					40	EALCE	EALCE.	EALCE	EALCE

Figure 6-25. ACE Data Manipulation – Column S

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.

=OR(R5,S5)									
								т	
				Test for A	irport Name		Other Header		Subtotal
* * *	~	~	-	s 3-characters long? (airport identifier) 🔄	Row is otherwise blank ~	Is new airport ~	First 2 filled, or ~	Is new header ~	Suspected Total Row
State Local			3	s 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

Figure 6-26. ACE Data Manipulation – Column T

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	e 6-2	7. ACE	Data N	1anipulation – C	olumi	n U	
ta	Review	View	Developer	Help	BLUEBEAM	Power Pivot	PDF-XChange for AcroPlot Pro	Team		
	l ab						La la la la			

a KMB favs Insert Page Layo	ut Formulas Data	Review View	/ Developer	Help BLUEBEA	M Po	wer Pivot	PDF	-XChan	ge for AcroPlot Pro Team					ළ S	Share
·	A^ A ≡ ≡ ≡ ≫ + ▲ + ≡ ≡ ≡ ⊡ ⊡		enter ~ \$ ~	o∠ e «.0 .00 C	ionditional ormatting ~				Normal Bad Calculation Check Cell	Good Explanatory		elete Format	∑ AutoSum	Z V Sort & Find &	Create
Font Font	Fa Alig	nment	rs I	Number 🗇					Styles			Cells	E	diting	Bluel
• : X	✓ fx =AND(ISBLA	NK <mark>(F5),</mark> ISBLANI	K <mark>(G5),</mark> NOT(OR(A	ND(ISBLANK(H5), ISI	3LANK(15)	, ISBLAN	K(J5)))))								
F														U	
										Airport Name		Other Header		Subtotal	Empty
 Municipality 				.ocal		*	* *		Is 3-characters long? (airport identifier)	 Row is otherwise blank 		First 2 filled, of	Is new header	Suspected Total Row	 Is totally
Region	Ident	Municipality F	Payment Date F	ederal	State Lo	ocal		3	Is 3-characters long? (airport identifier)	Row is otherwise blank	Is new airport		Is new header	Suspected Total Row	is totally
E								4	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FA
0 <mark>6</mark> 01	BROOTEN	I I.	1		4			5	TRUE	TRUE	TRUE	TRUE	TRUE	J5)))))	FA
> Brooten Airport <	05/28/1958		\$9,545.01	\$0.00				6	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FA
GRADING, PAVING, DRAINAGE	12/18/1978		\$162,641.62	\$41,513.84				7	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FA
LAND	12/14/1978		\$122,000.00	\$36,882.44				8	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FA
PAVEMENT CRACK REPAIR	10/19/1991		\$9,966.67	\$4,983.33				9	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FA
UST REMOVAL-2 TANKS	04/05/1993		\$1,400.00	\$966.77				10		FALSE	FALSE	FALSE	FALSE	FALSE	FA
UST REMOVAL-2 TANKS	04/05/1993		\$533.55	\$0.00				11		FALSE	FALSE	FALSE	FALSE	FALSE	FA
CRACK REPAIR	12/15/1995		\$11,546.00	\$5,773.00				12		FALSE	FALSE	FALSE	FALSE	FALSE	FA
Design Engineering for Rwy Rehab	07/14/2003		\$4,005.40	\$1,001.35				13		FALSE	FALSE	FALSE	FALSE	FALSE	FA
Runway Rehabilitation	10/31/2003		\$115,337.18	\$28,834.30				14		FALSE	FALSE	FALSE	FALSE	FALSE	FA
Runway Rehabilitation	05/27/2004	\$0.00	\$4,459,18	\$1,114,79				15	FALSE	FALSE	FALSE	FALSE	EALSE	FALSE	EA

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.

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



			i ige		ACL DUI		ipulation							
e KMB favs Insert Page Layout	Formulas Data	Review Vie	v Developer	Help BLUEBEA	M Power Pivot	t PDF-XC	hange for AcroPlot P	ro Team					ß	Share 🛛 🖓 Comm
y \sim nat Painter $\begin{vmatrix} ARIAL & 10 & A \end{vmatrix}$ $A = A$	A [×] = = = ≫ · • = = = ⊡		enter ~ \$ ~	0/ 9 (40.00 C	ionditional Format a		Normal Calculation	Bad Check Cell	Good Explanatory	Insert De	elete Format	∑ AutoSum ↓ Fill ~ ♦ Clear ~	* AZY O Sort & Find & Filter * Select *	Create PDF Change Settings Batch PDF
d Font	TS A	lignment	15	Number 🕞			Styles			c	ells	E	diting	Bluebeam
• : × •	∕ f x =AND(ISE G	ILANK <mark>(F5)</mark> , ISBLAN	IK <mark>(G5)</mark> , ISBLANK I	:(H5), ISBLANK <mark>(I5)</mark> , ISB J	(<i>M</i>	I N C	D	P	Q	R	s	j τ	U	v
		_				_	_		Airport Name		Other Header		Subtotal	Empty R
	Payment Date			Local		× ×	Is 3-characters long				First 2 filled, o			Is totally blank is list
Region	Ident	Municipality	Payment Date	Federal	State Local		3 Is 3-characters long		Row is otherwise blank	Is new airport		Is new header	Suspected Total Row	is totally blank S
								LSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
go 6D1	BROOTEN							RUE	TRUE	TRUE	TRUE	TRUE	FALSE	ISBLANK(J5))
> Brooten Airport<	05/28/19		\$9,545.01	\$0.00				ALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
GRADING, PAVING, DRAINAGE	12/18/19		\$162,641.62	\$41,513.84				LSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
LAND PAVEMENT CRACK REPAIR	12/14/19		\$122,000.00	\$36,882.44				ALSE ALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
UST REMOVAL-2 TANKS			\$9,966.67	\$4,983.33				ALSE	FALSE	FALSE	FALSE	FALSE	FALSE	
UST REMOVAL-2 TANKS UST REMOVAL-2 TANKS	04/05/19		\$1,400.00 \$533.55	\$966.77 \$0.00				ALSE ALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
CRACK REPAIR	12/15/19		\$533.55	\$5,773.00				ALSE ALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Design Engineering for Rwy Rehab	07/14/20		\$4,005.40	\$1,001.35				ALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Runway Rehabilitation	10/31/20		\$115,337.18	\$1,001.35 \$28,834.30				ALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Runway Rehabilitation	05/27/20		\$4,459.18	\$1,114.79				ALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE

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	

tte Copy - B I U -	- III - A'			(1) Wrop Text		meat - % 9	1 SI - 21	Conditional Formatting	Format as Table -	Normal 2 Normal Neutral Calculation		od planatory		Delete Format		Find &	Create PDF Change Settings
Clipboard 15	Font	15	Ali	proment	14	Number	- 6	Sector Contraction	111701-11	Styles				Cells	Editing		Bluebeam
BTOTAL	* I X	1 5	=LEN(F4)=3		_		_	_	_			_	_			_	
F	1	a:	H	1 1	1 2	ř.	1 K I I	1 # 1	N 0	1 .	1	1 16	L. K	1 7	1	1 ×	Name of Concession, Name
											or Airport Name		Other Header		Subtotal	Empty	Region Header Sc
lunicipality	- Payment Date	+ + +	ederal	- State	Local			+ +		is 3-characters long? (airport identifier)	- Row is otherwise blank	Is new airport -		- Is new header	Suspected Total Row	- is totally blank	
Region	Ident		lunicipality	Payment Date	Federal		State Loca	411		I is 3-characters long? (airport identifier)	Row is otherwise black	is new airport		is new header	Suspected Total Row	is totally blank	Single character
										FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	+LEN(F4)+1
	BROOTEN									TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE
Brooten Airport K		05/28/1958	50.0	\$9,545.01		\$0.00			1	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
RADING, PAVING, DRAINAGE		12/18/1978	\$0.0	\$162,641.62		\$41,513.84				FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
AND		12/14/1978	\$0.0			\$36,882.44				FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
AVEMENT CRACK REPAIR		10/19/1991	\$0.0			\$4,983.33			1	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
ST REMOVAL-2 TANKS		04/05/1993	50.0	51,400.00		\$966.77			10	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
ST REMOVAL-2 TANKS		04/05/1993	\$0.0			\$0.00			1	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
RACK REPAIR		12/15/1995	50.0	\$11,546.00		\$5,773.00			13	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
esign Engineering for Rwy Rehab		07/14/2003	\$0.0	\$4,005.40		\$1,001.35			13	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
unway Rehabilitation unway Rehabilitation		10/31/2003	\$0.0	\$115,337.18		\$28,834.30			14	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
		05/27/2004	\$0.0	54.459.18		\$1,114.79				FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE

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.

File Home KMB favs Insert Pa	age Layout Form	nulas Data	Review	View Develop	oer Help	BLUEBEAM	Power Pivot PDF-XCha	ange for AcroPlot P	'ro Team					
Paste → SFormat Painter ARIAL		= = = »> = = = = :			eneral 5 → % 🤊 58		Attional Format as atting v Table v	Normal Calculation	Bad Check C		Good Explanatory	~	Delete Forma	t ∑ AutoSum
Clipboard 😼 Font	5	A	lignment	151	Number	5		Styles					Cells	1
			l row", k spacer row", ion header",											
J E F		TRUE, "No	ormal row")	Constant Provident Asso	2		alas if too 31 floring boot and			£1 (I)		ιυ	l V	w
1	6	TRUE, "No	ormal row") al_test1, value_if				value_if_true3], [logical_test4, value					U Subtotal	V Empty	W Region Header Space
1 2 • Municipality	C • Payment Date	TRUE, "No	ormal row") al_test1, value_if	Local			Is 3-characters long? (airport identifier -	Row is otherwise blank	Is new airport -		Is new heade	Suspected Total Row	Is totally blank	Is region?
1 2 * Municipality 3 Region	C Payment Date Ident	TRUE, "No	ormal row") al_test1, value_if State				 Is 3-characters long? (airport identifier 3 Is 3-characters long? (airport identifier) 	Row is otherwise blank - Row is otherwise blank	Is new airport - I Is new airport	First 2 filled.	Is new heade - Is new header	Suspected Total Row - Suspected Total Row	Is totally blank - Is totally blank	Is region? Single character
1 2 4 Municipality 3 Region 4 Region header E	Ident	TRUE, "No	ormal row") al_test1, value_if	Local			Is 3-characters long? (airport identifier = 3 Is 3-characters long? (airport identifier) 4 FALSE	Row is otherwise blank Row is otherwise blank TRUE	Is new airport - I Is new airport FALSE	First 2 filled.	Is new heade Is new header FALSE	Suspected Total Row Suspected Total Row FALSE	Is totally blank - Is totally blank FALSE	Is region? Single character TRUE
1 2 * Municipality 3 Region		TRUE, "No IFS(logical Federal • Municipality	ormal row") al_test1, value_if	Local	State Local		 Is 3-characters long? (airport identifier 3 Is 3-characters long? (airport identifier) 	Row is otherwise blank - Row is otherwise blank	Is new airport - I Is new airport	First 2 filled.	Is new heade - Is new header FALSE TRUE FALSE	Suspected Total Row Suspected Total Row FALSE FALSE FALSE	Is totally blank Is totally blank FALSE FALSE FALSE	Is region? Single character TRUE FALSE FALSE
	Ident BROOTEN 05/28/1 12/18/1	TRUE, "No IFS(logica • Federal • Municipality 1958 \$0.00 1978 \$0.00	al_test1, value_if State Payment Date \$9,545.01 \$162,641.82	Local Federal \$0.0 \$41,513.8	State Local		Is 3-characters long? (airport identified * 3 Is 3-characters long? (airport identifier) 4 FALSE 5 TRUE 8 FALSE 7 FALSE 7 FALSE	Row is otherwise blank Row is otherwise blank TRUE TRUE FALSE FALSE	Is new airport - I Is new airport FALSE TRUE FALSE FALSE	First 2 filled. FALSE TRUE FALSE FALSE	Is new heade - Is new header FALSE TRUE FALSE FALSE	Suspected Total Row Suspected Total Row FALSE FALSE FALSE FALSE	Is totally blank FALSE FALSE FALSE FALSE FALSE	Is region? Single character TRUE FALSE FALSE FALSE FALSE
	Ident BROOTEN 05/28/1 12/18/1 12/14/1	TRUE, "No IFS(logica • Federal • Municipality 1958 \$0.00 1978 \$0.00	al_test1, value_if state Payment Date \$9,545.01 \$162,841.62 \$122,00.00	Local [Federal 30.0 \$41,513.8 \$38,882.4	State Local		Is 3-characters long? (airport identifiee' - 3 Is 3-characters long? (airport identifier) 4 FALSE 5 TRUE 6 FALSE 7 FALSE 8 FALSE 8 FALSE	Row is otherwise blank Row is otherwise blank TRUE FALSE FALSE FALSE	Is new airport	First 2 filled. FALSE TRUE FALSE FALSE FALSE	Is new heade FALSE TRUE FALSE FALSE FALSE FALSE	Suspected Total Row Suspected Total Row FALSE FALSE FALSE FALSE FALSE FALSE	Is totally blank Is totally blank FALSE FALSE FALSE FALSE FALSE	Is region? Single character TRUE FALSE FALSE FALSE FALSE FALSE
Aunologality Rejon Rejo	Ident BROOTEN 05/28/1 12/14/1 12/14/1 10/19/1	TRUE, "No IFS(logica • Federal • Municipality 1958 \$0.00 1978 \$0.00 1978 \$0.00	al_test1, value_if State - Payment Date \$9,545.01 \$162,641.62 \$122,000.00 \$9,968.67	Local 50.0 Federal 51.0 \$41,513,8 \$38,882,4 \$4,983,3	V V V State Local		Is 3-characters long? (airport identifiel - 3 Is 3-characters long? (airport identifier) 4 FALSE 5 TRUE 6 FALSE 7 FALSE 8 FALSE 9 FALSE 9 FALSE	Row is otherwise blank Row is otherwise blank TRUE FALSE FALSE FALSE FALSE FALSE	Is new airport - I Is new airport FALSE TRUE FALSE FALSE FALSE FALSE	First 2 filled, FALSE TRUE FALSE FALSE FALSE FALSE FALSE	Is new heade - Is new header FALSE TRUE FALSE FALSE FALSE FALSE	Suspected Total Row FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Is totally blank Is totally blank FALSE FALSE FALSE FALSE FALSE	Is region? Single character TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
	Ident BROOTEN 05/28/1 12/18/1 12/14/1 10/19/1 04/05/1	TRUE, "No IFS(logica - Federal - Municipality 1958 \$0.00 1978 \$0.00 1978 \$0.00 1978 \$0.00 1978 \$0.00	al_test1, value_if state - Payment Date \$9,545.01 \$162,841.62 \$122,000.00 \$9,988.87 \$1,400.00	Local Federal 30.0 341,513.0 336,882.4 34,983.3 3986.7	V V V State Local	1	Is 3-characters long? (airport identifief - 3 is 3-characters long? (airport identifief) 3 is 3-characters long? (airport identifief) 5 TRUE 6 FALSE 7 FALSE 8 FALSE 9 FALSE 9 FALSE 9 FALSE 9 FALSE	Row is otherwise blank Row is otherwise blank TRUE FALSE FALSE FALSE FALSE FALSE FALSE	Is new airport Is new airport FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	First 2 filled, FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Is new heade Is new header FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Suspected Total Row Suspected Total Row FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Is totally blank Is totally blank FALSE FALSE FALSE FALSE FALSE FALSE	Is region? Single character TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
Image Municipatity Region Region Arror of castery E Marco in statery E Marco in statery E Nomel rev E Nomel rev E Nomel rev EXPERIMENT CRACK REPAR Nomel rev UST REBUNAL2 TANKS	Ident BROOTEN 12/18/1 12/14/1 10/19/1 04/05/1 04/05/1	TRUE, "No IFS(logici • Federal • Municipality 1958 \$0.00 1978 \$0.00 1978 \$0.00 1991 \$0.00 1993 \$0.00	ormal row") al_test1, value_if State - Payment Date \$9,545.01 \$162,641.62 \$122,000.00 \$9,696.67 \$1,400.00 \$333.55	Local Federal \$41,513.0 \$36,882.4 \$4,983.3 \$986.7 \$0.0	v v v State Local		Is 3-characters long? (airport identifief - ' 3 Is 3-characters long? (airport identifief) 5 FALSE 6 FALSE 7 FALSE 8 FALSE 9 FALSE 9 FALSE 9 FALSE 1 FALSE 1 FALSE 1 FALSE	Row is otherwise blank Row is otherwise blank TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Is new airport - I Is new airport FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	First 2 filled. FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	 Is new header Is new header FALSE 	Suspected Total Row Suspected Total Row FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Is totally blank FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Is region? Single character TRUE FALSE
Image Municipality Region Address Region Address Region Address Region Address Nomed rev Image Nomed rev Address	Ident BROOTEN 05/28/1 12/14/1 10/19/ 04/05/1 12/15/1 12/15/1	TRUE, "No IFS(logical Pederal - Municipality 1958 - 30.00 1978 - 30.00 1978 - 30.00 1979 - 30.00 1991 - 30.00 1993 - 30.00 1993 - 30.00	al_test1, value_if al_test1, value_if State - Payment Date \$9,545.01 \$162,241.62 \$122,000.00 \$3,965.67 \$1,400.00 \$333.65 \$11,546.00	Local Federal 30.0 \$41.513.8 338.882.4 54.983.3 \$986.7 \$0.0 \$5,773.0	V V V State Local		Is 3-characters long? (alroor identifie(-) Is 5-characters long? (alroor identifie() Is 5-characters long? (alroor identifie() Is 6-characters long? (alroor identifie() Is 6-characters long? (alroor identifie() Is 6-characters long? (alroor identifie() Is 7-characters long Is 7-characters	Row is otherwise blank Row is otherwise blank TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Is new airport - I Is new airport FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	First 2 filled. FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	 Is new header Is new header FALSE 	Suspected Total Row Suspected Total Row FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Is totally blank Is totally blank FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Is region? Single character TRUE FALSE
Index Construction Index Constructio	Ident BROOTEN 05/28/1 12/18/1 12/14/1 04/05/1 04/05/1 12/15/1 07/14/2	TRUE, "No IFS(logical Pederal - Municipality 1958 \$0.00 1978 \$0.00 1983 \$0.00 1983 \$0.00 1983 \$0.00 1983 \$0.00	al_test1, value_if State Payment Date \$9,545.01 \$162,841.82 \$122,000.00 \$39,545.01 \$162,841.82 \$17,400.00 \$33,55 \$11,546.00 \$4,000.40	Local \$0.0 Federal \$0.0 \$41,513.8 \$308,082.4 \$4,983.3 \$9667. \$0.0 \$5,773.0 \$1,001.3	V V V		I 3-bharacters ton? (Signor Identifiee) IS 5-bharacters ton? (Signor Identifiee) IS 5-bharacters ton? (Signor Identifiee) IS 7 FAUSE 7 9 FAUSE 9 FAUSE 1 FAUSE 1 FAUSE 2 FAUSE 3 FAUSE	Row is otherwise blank Row is otherwise blank TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Is new airport - I Is new airport FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	First 2 filled. FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Is new header FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Suspected Total Row Suspected Total Row FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Is totally blank FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Is region?
Image Municipality Region Address Region Address Region Address Region Address Nomed rev Image Nomed rev Address	Ident BROOTEN 05/28/1 12/14/1 10/19/ 04/05/1 12/15/1 12/15/1	TRUE, "No F5(logic. Federal - Municipality 1958 \$0.00 1978 \$0.00 1978 \$0.00 1978 \$0.00 1983 \$0.00 1983 \$0.00 1983 \$0.00 1983 \$0.00 1985 \$0	al_test1, value_if al_test1, value_if State - Payment Date \$9,545.01 \$162,241.62 \$122,000.00 \$3,965.67 \$1,400.00 \$333.65 \$11,546.00	Local Federal 30.0 \$41.513.8 338.882.4 54.983.3 \$986.7 \$0.0 \$5,773.0			Is 3-characters long? (alroor identifie(-) Is 5-characters long? (alroor identifie() Is 5-characters long? (alroor identifie() Is 6-characters long? (alroor identifie() Is 6-characters long? (alroor identifie() Is 6-characters long? (alroor identifie() Is 7-characters long Is 7-characters	Row is otherwise blank Row is otherwise blank TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Is new airport - I Is new airport FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	First 2 filled. FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	 Is new header Is new header FALSE 	Suspected Total Row Suspected Total Row FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Is totally blank Is totally blank FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE	Is region? Single character TRUE FALSE

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.

2		* I X	✓ f _* =IF(\$W3096, F3096, 83035)	1													
					La service de la											(and the second s	and the second
	D			0			3	K U W	n 0		Test for Arport Name	10001-000	Other Header		Subtotal	Empty	Report Head
Ident [1	Municipality Pa	evment Date [+]	Federal + 1	State + Local					dentifier . Rov is otherwise blank	list new strends		is new header		is totally blank	 Is region?
100	WINSTED	Normal row	Relocate Natural Gas Pipeline	01/24/2019	\$10,955.00	3008.00	\$408.15	and him is	3065	FALSE	FAL DE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Normal ray	Raiocata Natural Gas Pipelina	04/08/2019	\$13,626.00	\$757.00	\$757.00		3008	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
10D	WINSTED	Narrad ray	Relocate Natural Gas Pipeline	06/25/2015	\$7,299.00	\$405.45	\$454.55		3067	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Normal row	Relocate Natural Gas Pipeline	06/25/2019	\$5,765.00	\$320.30	\$320.70		3068	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Normal row	Relocate Natural Gas Pipeline	10/15/2019	\$247,577.00	\$13,754,29	\$13,754.51		3009	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
00	WINSTED	Normal row	Relocate Natural Gas Pipeline	12/11/2019	\$19,429.00	\$1,079.43	\$1.080.07		3070	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
00	WINSTED	Normal row	Relocate Natural Gas Pipeline	03/05/2020	\$244,157.00	\$13,564,25	313.554.51		5071	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Normal row	Relocate Natural Gas Pipeline	05/17/2020	\$11,747.00	\$152.61	\$652.65		3072	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
00	WINSTED	Normal row	Relocate Natural Gas Pipeline	04/01/2020	\$3,494.00	\$154.11	\$154.13		5073	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Normal rox	Relocate Natural Gos Pipeline	05/04/2020	\$2,394.00	\$133.00	\$135.00		3074	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Normal row	Relocate Natural Das Pipeline	06/17/2020	\$244,157.00	\$13.504.29	\$13,554.51		3075	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
0D	WINSTED	Normal row	Relocate Natural Gas Pipeline	08/20/2020	\$245,895.00	\$13.827.54	\$13.627.28		3076	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Normal row	Relocate Natural Gas Pipeline	09/20/2020	\$5,381.00	\$107.58	\$188.83		3077	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Normal row	Reconstruct Turt Runway 09/27	01/00/1900	\$5,952.00	\$5,155.18	\$0.00		3078	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
10D	WINSTED	Normal row	Reconstruct Turf Runsey 09/27	12/11/2019	\$197,128.00	\$10,951,62	\$10,962.70		3079	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Normal row	Reconstruct Turl Runeary 05/27	05/03/2020		\$3,151.00	\$3,152.07		3080	FALSE FALSE	FALSE	FALSE	FALSE FALSE	FALSE FALSE	FALSE	FALSE	FALSE FALSE
100	WINSTED WINSTED	Normal row	Reconstruct Turi Runkey 29/27	03/18/2020	\$3.072.00	\$170.82	\$166.73		3081	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Normal row	Reconstruct Turl Runway 09/27 Reconstruct Turl Runway 09/27	04/07/2020	\$7,104.00	\$394.71 \$1,299.52	\$396.54 \$1,299.54		3082 3083		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED WINSTED	Normal row	Reconstruct Turl Runway 09/27 Reconstruct Turl Runway 09/27	06/20/2020	\$23,391.00				3083	FALSE FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Normal row Normal row	Reconstruct Turl Runway 05/27 Reconstruct Turl Runway 05/27	08/25/2020	\$438.955.00	\$11,443.20 \$24,275.22	\$11,443.31 \$24,274.34		3084	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Normal row	Reconstruct furt Runway Ob 21 Reconstruct Turt Runway Ob 21	12/09/2020	\$578,367.00	\$32,165.99	\$32,188.45		3086	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
SD C	WINSTED	Normal row	Reconstruct furt Runkay 09/21	12/08/2020	\$275,295,00	\$15,294,15	\$25,075,45		3067	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Narral ray	Fuel System Reseit	01/00/1900	50.00	\$17.553.11	35 350.00		3068	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Normal rise	Entrance Road Receive	11/25/2015	\$0.00	\$7.556.00	\$2.518.75		3069	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Normal row	Parking Lot and Engrance Road Rehat: Construct Ti	01/00/1800	\$10.078.00	\$0.00	\$0.00		3090	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Northal row	Parking Lot and Engrance Road Rahab: Construct Ti	12/08/2020	\$244,154.00	\$5.00	\$0.00		3091	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
00	WINSTED	Name for	New Fuel Tark - Relocated	01/00/1900	\$0.00	\$5,295,11	\$1,755.37		3082	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
100	WINSTED	Normal row	CARES ACT AMENDMENT FOR WINSTED	05/31/2021	\$12.077.00	\$0.00	\$0.00		3093	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
10D	WINETED	Blank spacer r							3094	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FAL 15
500	WINSTED	Total row			\$4,725,315,13	\$2501,890,13	\$423,890,77		2096	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
100	WINSTED	Ragion header	N I						3090	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
AIT	A/TRON	Arport or cate		TKIN .					3097	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE TRUE FALSE
	A/TKIN	Normal row	CLEARING	10/06/1947	\$0.00	\$497.00	\$0.00		3056	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
	a martine a																

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.

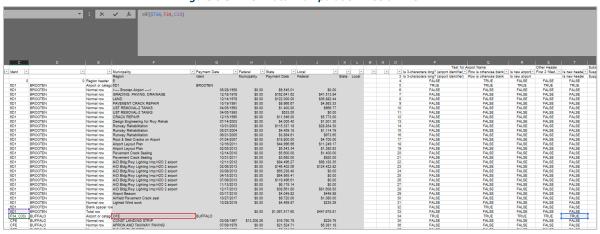


Figure 6-32. ACE Data Manipulation – Column C

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.



												in conum							
SUBTOT	AL			• I ×	✓ f ===================================														
				- C - C -															
											_								
					Constant and the		100 C	is a second second		1 1 1		Text for	Arport Name		Other Header		Subtotal	Empty	Region Header Spa
- 3	sanl-1	ident		9 9 9	Municipality			State - Local		u u u	4	- Is 3-characters long? (airport identified		 Is nex airport. 	 First 2 filled. 				ta region? -
					Region	(dent	Municipality	Payment Date Federal	State	Local		3 is 3-characters long? (airport identifier)		Is new airport		Is new header	Suspected Total Row	is totally blank	Single character
			0	0 Region header	E							4 FALSE	TRUE	FALSE	FALSE.	FALSE	FALSE	FALSE	TRUE
	1 9	601	BROOTEN	Airport or categ		BROCTEN						5 TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE
		601	BROOTEN	Normal row	> Brooten AirportK	05/28/1958	\$0.00		\$0.00			6 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
		601	BROOTEN	Normal row	GRADING, PAVING, DRAINAGE	12/18/1978	\$0.00	\$102,041.02	\$41,513.84			7 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
	-	601	BROOTEN	Normal ros	LAND	12/14/1978	\$0.00		\$30,882.44			8 FALSE 9 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
		601 601	BROOTEN BROOTEN	Normal row Normal row	PAVEMENT CRACK REPAIR UIST REMOVAL 2 TANKS	10/19/1991 04/05/1993	\$0.00		\$4,963.33 \$600.77			9 PALSE 10 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
-		501	BROOTEN	Normal row	UST REMOVAL-2 TANKS	04/05/1993	\$0.00		\$0.00			10 PALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
		501	BROOTEN	Normal Inv	CRACK REPAIR	12/15/1905	\$0.00		\$773.00			12 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	PALSE
	-	601	BROOTEN	Normal tow	Design Engineering for Rev Rehab	07/14/2003	\$0.00		\$1.001.35			13 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
		601	BROOTEN	Normal ipu	Rumay Rehabilitation	10/31/2003	\$0.00		\$25,834.30			14 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
		601	BROOTEN	Normal row	Runway Rehabilitation	05/27/2004	\$0.00		\$1,114,75			16 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
1 3		601	BROOTEN	Normal row	Runway Rehabilitation	05/21/2005	50.00		\$973.05			10 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
1 1		601	BROOTEN	Normal row	Rout & Seal Cracks on Almont	07/24/2007	\$0.00		\$4,700.00			17 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
	-	601	BROOTEN	Normal row	Airport Lavout Plan	12/16/2011	\$0.00		\$11,249.17			18 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
		801	BROOTEN	Normal row	Amort Layout Plan	02/05/2013	\$0.00		\$7,305.83			19 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
	1	801	BROOTEN	Normal row	Payantent Crack Saeing	12/14/2010	\$0.00	\$5,000.00	\$1,400.00			20 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
1 1		801	BROOTEN	Normal new	Paventent Crack Sealing	10/31/2011	\$0.00		\$920.00			21 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
1		60 t	BROOTEN	Normal row	A/D Bidg Rwy Lighting Imp;H2O 2 airport	12/11/2012	\$0.00		\$98,183.35			22 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
1		501	BROOTEN	Normal row	AID Bidg Rwy Lighting Imp;H20 2 sirport	02/08/2013	\$0.00		\$124,422,82			23 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
		801	BROOTEN	Normal row	A/D Bidg Rwy Lighting Imp;H2O 2 sirport	03/08/2013	\$0.00		\$0.00			24 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
		601	BROOTEN	Normal row	A/D Bidg Rwy Lighting Imp;H2O 2 alread	04/18/2013	\$0.00		\$0,00			25 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
	_	601	BROOTEN	Normal row	A/O Bidg Rwy Lighting Imp.HDO 2 airport	07/09/2013	\$0.00		\$0.00			20 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
		6D1	BROOTEN	Normal ros	A/D Bidg Rwy Lighting Imp;H2O 2 airport	11/13/2013	\$0.00		\$0.00			27 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
	- 1	601 601	BROOTEN	Normal ide	A/D Bidg Rwy Lighting Imp;H2O 2 airport	12/17/2013 03/17/2015	\$0.00	\$38,501.80 \$4,049.82	\$81,008.93 \$449.95			20 FALSE 29 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
- 3		501	BROOTEN	Normal row	Arport Beacon Arfield Pavement Crock seal	03/17/2015	\$0.00		\$449.90			29 FALSE 30 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
		801	BROOTEN	Normal row Normal row	Artield Pavenient Crack Seal	10/28/2019	\$0.00		\$1,080.00			30 PALSE 31 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
		601		Blank spacer ro		10/20/2018	\$0.00	er. 1/2.02	1000.00			32 FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
		601	BROOTEN	Total row			\$0.00	\$1.067.517.80	\$447.076.81			33 FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
		CFE	+(F(\$T34, G34, D33)	Airport or cateo	CFF.	BUFFALO		**************************************				34 TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE
1 3		CFE	BUFFALO	Normal row	CONST LANDING STRIP	03/02/1907	\$13,208,20	\$10,790,79	\$225.70			10 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
1 3		CFE	BUFFALO	Normal row	APRON AND TAXIWAY PAVING	07/09/1979	\$0.00	\$21,524.71	\$5,381.18			30 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
		CFE	BLIFFALO		F & I FUEL PUMPS	01/12/1978	\$0.00		3533.64			37 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE

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.

SUBTO	TAL			•	× 🗸 j	=ISNUMBER(MATCH(C12, Table	2[FAA ID], 0))										
1															E	1	
																Y	z
1															Spa	cer Is MN Airport?	Sanity Checks
2	Regi~	dent	~		* *	Municipality	 Payment Date 		Federal		Local	*	~	 ~	~	Is MN Airport?	Is Date > 1910
3						Region	Ident		Municipality	Payment Date	Federal		State Local		3	Is MN Airport?	TRUE I
4	E		0		0 Region header	E									4	FALSE	TRUE I
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
	E	6D1	BROOTEN		Normal row	GRADING, PAVING, DRAINAGE		12/18/1978	\$0.00	\$162,641.62	S4	41,513.84			7	TRUE	TRUE
8	E	6D1	BROOTEN		Normal row	LAND		12/14/1978	\$0.00	\$122,000.00	\$3	36,882.44			8	TRUE	TRUE
)	E	6D1	BROOTEN		Normal row	PAVEMENT CRACK REPAIR		10/19/1991	\$0.00	\$9,966.67		\$4,983.33			9	TRUE	TRUE
0	E	6D1	BROOTEN		Normal row	UST REMOVAL-2 TANKS		04/05/1993	\$0.00	\$1,400.00		\$966.77			10	TRUE	TRUE
1	E	6D1	BROOTEN		Normal row	UST REMOVAL-2 TANKS		04/05/1993	\$0.00	\$533.55		\$0.00			11	TRUE	TRUE
2	E	6D1	BROOTEN		Normal row	CRACK REPAIR		12/15/1995	\$0.00	\$11,546.00		5,773.00			12	Table2[FAA ID], 0))) TRUE
2	E	6D1	BROOTEN		Normal row	Design Engineering for Rwy Rehab		07/14/2003	\$0.00			\$1,001.35			13	TRUE	TRUE
4	E	6D1	BROOTEN		Normal row	Runway Rehabilitation		10/31/2003	\$0.00			28.834.30			14	TRUE	TRUE
5	E	6D1	BROOTEN		Normal row	Runway Rehabilitation		05/27/2004	\$0.00	\$4,459,18		51,114,79			15	TRUE	TRUE
15	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).



					gure 0-55. Relevant ACL Data				
	A E	С	D	E	F	G	Н	I	J
1	Row Numt Reg	▼ Ider ▼	· · · · · · · · · · · · · · · · · · ·			Payment Da 💌	Federal 💌	State 💌	Local 🔹
2	6 E	6D1	BROOTEN	Normal row	> Brooten Airport<	05/28/1958	\$0.00	\$9,545.01	\$0.00
3	7 E	6D1	BROOTEN	Normal row	GRADING, PAVING, DRAINAGE	12/18/1978	\$0.00	\$162,641.62	\$41,513.84
4	8 E	6D1	BROOTEN	Normal row	LAND	12/14/1978	\$0.00	\$122,000.00	\$36,882.44
5	9 E	6D1	BROOTEN	Normal row	PAVEMENT CRACK REPAIR	10/19/1991	\$0.00	\$9,966.67	\$4,983.33
6	10 E	6D1	BROOTEN	Normal row	UST REMOVAL-2 TANKS	04/05/1993	\$0.00	\$1,400.00	\$966.77
7	11 E	6D1	BROOTEN	Normal row	UST REMOVAL-2 TANKS	04/05/1993	\$0.00	\$533.55	\$0.00
8	12 E	6D1	BROOTEN		CRACK REPAIR	12/15/1995	\$0.00	\$11,546.00	\$5,773.00
9	13 E	6D1	BROOTEN	Normal row	Design Engineering for Rwy Rehab	07/14/2003	\$0.00	\$4,005.40	\$1,001.35
10	14 E	6D1	BROOTEN	Normal row	Runway Rehabilitation	10/31/2003	\$0.00	\$115,337.18	\$28,834.30
11	15 E	6D1	BROOTEN	Normal row	Runway Rehabilitation	05/27/2004	\$0.00	\$4,459.18	\$1,114.79
12	16 E	6D1	BROOTEN	Normal row	Runway Rehabilitation	06/21/2005	\$0.00	\$3,894.61	\$973.65
13	17 E	6D1	BROOTEN	Normal row	Rout & Seal Cracks on Airport	07/24/2007	\$0.00	\$18,800.00	\$4,700.00
14	18 E	6D1	BROOTEN		Airport Layout Plan	12/16/2011	\$0.00	\$44,996.66	\$11,249.17
15	19 E	6D1	BROOTEN	Normal row	Airport Layout Plan	02/05/2013	\$0.00	\$5,543.34	\$1,385.83
16	20 E	6D1	BROOTEN		Pavement Crack Sealing	12/14/2010	\$0.00	\$5,600.00	\$1,400.00
17	21 E	6D1	BROOTEN	Normal row	Pavement Crack Sealing	10/31/2011	\$0.00	\$3,680.00	\$920.00
18	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
19	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
20	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
21	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
22	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
23	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
~	00 -	004	PROOTEN	AL 1	ADDU D TITLE T HOOP I'V	40/47/0040	eo oo	600 FOX 00	

Figure 6-35. Relevant ACE Data

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
riguic	0.00.	ACL	Dutu		I GOIC	Andry Sis

								PivotTable Fields	•
L	М	Ν	0	Р	Q	R		Channel Galida ta add ta annan	
								Choose fields to add to repor	t 🖉
	Average of State Funds							Search	
04Y	8334.204298	4925.572807						Search	
05Y	11079.71486	3991.294286						MnDOT Region	
06Y	19837.02885	5249.224231							
07Y	18888.65667	1874.286667						FAA ID	
10D	4647.130833	3924.914537						Airport	
12D	11025.49363	6769.008901						Project Name	
12Y	13402.60436	10215.24574						Payment Date	
13Y	11829.181	2911.646						Federal Funds	
14Y	8072.603182	8200.850152							
16D	23116.19233	8413.665342							
18Y	10528.66815	3240.961852						Drag fields between areas be	elow:
1D6	5527.057761	4778.997313							
21D	50306.26959	32163.41247						▼ Filters	Columns
23D	14725.435	1161.666667							Σ Values
25D	87079.51806	32702.50484							
3G2	28364.40923	6881.400769							
3N8	3604.310303	2360.916061						Rows	Σ Values
43Y	27681.70875	4613.21375							
47Y	14034.97593	5346.108519						FAA ID 🔻	Average of State Funds
18Y	15536.88413	6980.234348							Average of Local Funds
52Y	5691.863	1552.257							
55V	0231 486122	4678 01051					-	Defer Layout Update	

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.

- 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.

AutoSave 💽	ም 🗄 እ - ሪ					PILOT_BASIC.	csv 👻				,	h				
File Hom	e Insert Pa	ge Layout	Formulas	Data	Review	v View	Develop	er Help	BLUEE	BEAM A	Acrobat	Power Piv	ot PD	F-XChang	e for AcroPlo	t Pro
Cut	Calibri		~ 11 ~ A	• A* =		≫~~ ab	Wrap Text		General				Nor	mal	Bad	
Paste Copy	· •															
	at Painter B I	⊻ - ⊞	~ <u>^</u> ~	<u>A</u> ~ =	==	←= →= ↔	Merge & C	enter 🗸	\$~%	9 €00.0	Format		le ~	a	Neutral	
Clipboard	5	Font		5		Alignmen	t	5	Num	ber	5	2		Styles		
D1 *	· : × ✓	<i>f</i> ∞ STI	REET 1													
A	ВС	D	E	F	G	н	1	J	к	L	м	N	0	Р	Q	R
	FIRST N - LAST N	STREET -	STREET	CITY 💌	STATE 🔄	ZIP CO 🔻	COUNT -	REGIOI -	MED CI 🔻	MED D. 👻	MED E	BASIC	BASIC	D CMEC I	DATE	
	KEITH ELM AAKRE	857 WAR		GRANITE		56241-170		GL	2							
	BURT WALACKERN	IA 2168 HILL	s	SHAKOPE	IMN	55379-957	USA	GL	2	62019	62020	20200714	20200708			
89 A0005334	BRIAN ALLADAIR	2580 SCH	A	MAPLEWO	MN	55119-586	USA	GL	1	52021	112021					
14 A0006072	CLAYTON ADAMS	4045 MC/	A	ROSEMOL	MN	55068-327	USA	GL	1	42021	102021	20200401	20200401			
38 A0009952	BRIAN DO ADDIS	211 W KR	4	WEST ST F	MN	55118-380	USA	GL	3	72020	72022					
44 A0010228	DAVID FRI ADELMA	N 19492 BIS	50	FARMING	MN	55024-952	USA	GL	3	122019	122021					
70 A0010783	SAMUEL S ADKINS	16624 JA	с	LAKEVILLE	MN	55044-463	USA	GL								
34 A0012603	DENNIS MAHERN	1528 NOF	R	RED WING	MN	55066-353	USA	GL	3	72016	72018	20200719	20180718			
48 A0012874	FRANK HE AHLMAN	N 3900 WEL	Ц	FARIBAUL	MN	55021-781	USA	GL	2		122016	20201218	20180918			
50 A0012915	GEORGE E AHLSTEN	N 7542 710	ТІ	WHEATON	MN	56296-550	USA	GL	3		52017	20200906	20170511			
	RODNEY CAHLSTEP		И.	EDEN PRA	MN	55346-230	USA	GL	1		102021					
	NORMAN AHRENS				MN	56583-960		GL	2			20200701	20180601			
	THOMAS JALBAIN	19670 BE		PRIOR LAI		55372-345		GL	1		32020					
	GREGORY ALBJERG			LAKEVILLE		55044-354		GL	3		82022					
	JOSEPH PEALLEN	11027 M/		COON RA		55448-434		GL	3			20200602	20180606			
	STUART K(ALLEN	357 OAK		GONVICK		56644-417		GL	2		62022					
	DANIEL JC AMEN	6143 ARC		EDINA	MN	55436-184		GL	3			20210202	20210202			
	JOHN WIL AMIES	13915 250		ZIMMERN		55398-921		GL	3		12022					
	DARYL ARI AMUND			BLUE EAR		56013-132		GL	2		62022					
	JEFFREY SCAMUND			ELBOW LA		56531-951		GL GL	2		102020					
	BRADLEY FANDERS BRIAN WAANDERS			BEMIDJI OWATON		56601-288 55060-513		GL	3	52020	52022					
	BRUCE ME ANDERS			DULUTH		55812-212		GL								
	CHARLES LANDERS			ALEXAND		56308-939		GL	3	22016	22019	20200518	20180402			
	DAVID JOI ANDERS			FRIDLEY	MN	55432-571		GL	3				20180402			
	DAVID PA ANDERS			PARK RAP		56470-635		GL	1		82020	20210001	20210010			
	DARRELL LANDERS			FRAZEE	MN	56544-898		GL	3			20170507	20170424			
	GARY WALANDERS				MN	55303-618		GL	3		42023					
	HARLAN RANDERS				MN	55321-452		GL	3		72021					
	JANICE M/ ANDERS			MINNEAP		55409-171		GL	1		122021					
232 A0036933		O 10625 PO		WOODBU		55129-581		GL	1		82021					
279 A0038575	MICHAEL	O 995 MEDI		WAYZATA		55391-967	USA	GL	3	102020	102022					
292 A0039135	PAUL LEOI ANDERS	O PO BOX 1	11	CANBY	MN	56220-001	USA	GL	2	52021	52022					
303 A0039312	RALPH WAANDERS	O 5210 VILL	4	EDINA	MN	55436-215	USA	GL	2	82020	82021					
								1	1							

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

Source: Kimley-Horn, 2022

DEPARTMENT OF TRANSPORTATION Minnesota State Aviation System Plan Phase II

- 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.

New item			×
 Location information is in multiple fields. 			^
Location type	Field		/100
Address or Place	STREET 1	~	an e
Address2	STREET 2	~	an (
Address3	Location type not used	~	an S
City	CITY	~	an S
County	Location type not used		an 4
State	STATE		an 4
ZIP	Location type not used		an 4
ZIP4	Location type not used		an 4
Country			an 4
Back	COUNTRY	Cancel Nex	t an 4

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."



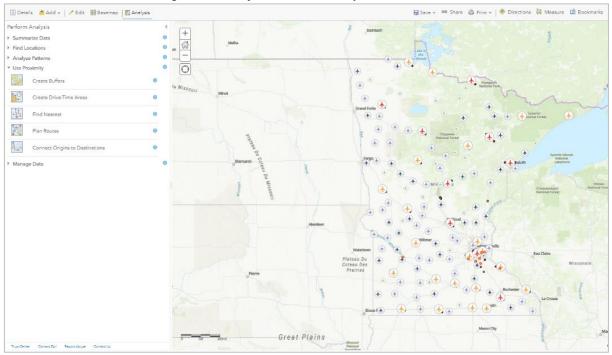


Figure 6-39. Certified Pilots Feature Layer Item Details

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

New item	×	te
File		
MN Pflots_011022_text.csv		
Tide		loc
MN Certified Pilots_011022		
Folder		
C MnSASP Hub - Draft	~	an d
Tags		
MnDOT × MnDOT Aeronautics × Airports × MN × Minnesota × Minnesota GO × Official MnDOT ×		
	~	an S
Add tags		
Summary		an S
Feature layer plotting all FAA-certified pilots located in Minnesota. Used in the MnSASP Hub for the "Certified Pilots within 30 nm" indicator		
Characters left: 1906	-	
		an 4
		an i
		an 4
		an i
Back	Save	an A

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.



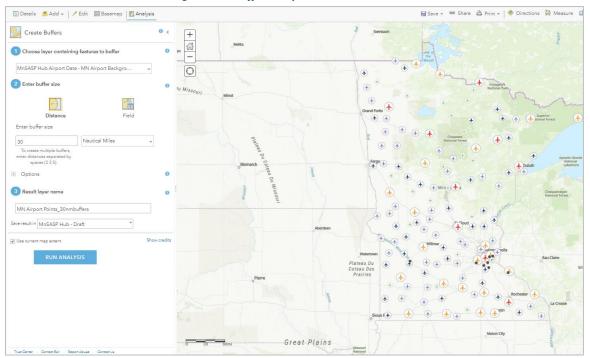


Figure 6-41. Buffer Analysis Parameter Selection

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."



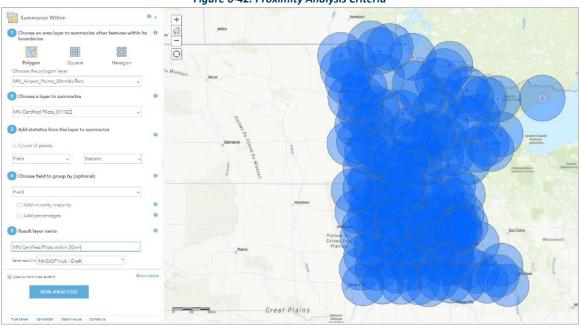


Figure 6-42. Proximity Analysis Criteria

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

- 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.

	riguie o io			
AutoSave 💽 🗄 りゃ 🔍 🗢	Book1 - Exce	el	♀ Search	
File Home Insert Page Layout	Formulas Data Review View	Developer Help BLUEBEAM	Acrobat Power Pivot PDF-XChang	je for AcroPlot Pro
	Existing onnections All ~ Definitions	Organization Stocks Geography	↓ ↓ </td <td>Text to Columns Fill Duplicates Validation ~</td>	Text to Columns Fill Duplicates Validation ~
Get & Transform Data	Queries & Connections	Data Types	Sort & Filter	Data To
	DE,FRACT OWNER,AIR WORTH DATE, OTHER N		M N O P	ij) Spitt a single column of text into multiple columns. For example, you can separate a column of full names into separate first and last name columns. You can choose how to split it up:
1 N-NUMBER, SERIAL NUMBER, MFR MDL CO	DE,ENG MFR MDL,YEAR MFR,TYPE REGISTRAN	IT,NAME,STREET,STREET2,CITY,STATE,Z	IP CODE, REGION, COUNTY, COUNTRY, LAST	A fixed width or split at each comma, IF
2 100 ,5334 ,7100510,17003,194	40,1,BENE MARY D ,PO BOX	329 , ,KETCH	IUM ,OK,743490329 ,2,097,US,202001	0! period, or other character. 1!
3 10001,A28 ,9601202,67007,19	28,1,STOOS ROBERT A ,PO B	OX 1056 , ,LA	KELAND ,FL,338021056 ,7,105,US,2019	O Tell me more
4 10004,T18208245 ,2072738, ,	,7,ETOS AIR LLC ,PO BOX 28	8 , ,NEW LOI	NDON ,TX,756820288 ,2,401,US,201810	11,,
5 10006,BG-72 ,1152020,17026,1	1955,1,COUTCHES ROBERT HERCULES DBA	,550 AIRWAY BLVD ,	,LIVERMORE ,CA,94551953	3,4,001,US,20201125,19980826,1U
		5804 HILLTOP ST ,	,PAPILLION ,NE,681332403 ,3,055,U	S,20190102,20190102,1N ,4,1,V,50
7 10009,79-032 ,8930105,41525,1	1979,3,HENDRICKSON FLYING SERVICE INC	,21532 QUITNO RD ,	.ROCHELLE .IL.610689413 .	
	1979, 5, HEINDRICKSON FERING SERVICE INC	,21352 QUITNO KD ,	,KUCHELLE ,IL,010089413 ,	C,141,US,20190311,20100211,31 ,6,:
8 1000A,3255 ,3801213,00000,15	978,1,LEWIS STEVEN G ,139 N		,ROCHELLE ,IL,610689413 ,	

Figure 6-43. Text to Columns function

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

DEPARTMENT OF

TRANSPORTATION

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

	Α	В	С	D	E	F	G		н	1		J		K		L	М	N	0
1	N-NUM 👻	SERIAL 🔻	MFR MI 👻	ENG MI 🔻	YEAR M 💌	TYPE RE 🔻	NAME	▼ STF	REET 💌	STREET	Γ	CITY	-	STATE	- T Z	ZIP COL 👻	REGION -	COUNT 🝷	COUNT
14	1000N	310H0104	2074220	17027	1963	3	ANDERS	₽↓	Sort A	to Z						5.62E+08	С	173	US
15	1000P	28-1000	7102808	41514	1963	4	LENSING		S <u>o</u> rt Z t							5.63E+08	С	145	US
14	1005K	3732	8190104	17003	1946	1	KING RI	(^{▲↓}	3 <u>ο</u> π 2 τ	A 0.						5.6E+08	С	99	US
65	1008C	24-1100	5870219	41522	1981	7	BAT FLY	Sor <u>t</u> by Color								5.6E+08	С	43	US
17	100BA	U12	1154002	52142	1968	3	BEMIDJ	9	heet <u>V</u> ie	ew					>	5.66E+08	С	7	US
68	100EF	S9801-013	05612K4	99999	2002	1	BRODER								-	5.51E+08	С	163	US
24	100HY	2100	2210406			1	MORELL	٦ź	Clear F	ilter Fror	n "S	IAIE"				5.5E+08	С	3	US
30	100JG	3213019	7103218	41530	1988	3	CLUB CH	l F	ilter by	Color					>	5.54E+08	С	53	US
49	100KL	758 (1483)	2808002	52034	1955	7	ROBERT	1	ext <u>F</u> ilte	ers					>	5.51E+08	С	37	US
54	100KZ	65	5170805	29001	1999	4	OK MED		c 1						2	5.54E+08	С	53	US
74	100MD	340A0535	2076405	17040	1978	1	HOPPE		Search					\$		5.6E+08	С	13	US
25	100QT	LI689	1152913	52045	1976	3	SOUTHV	~	K					^	•	5.63E+08	С	83	US
49	1010Q	27370	21101PK	41508	1970	1	BURKLU									5.54E+08	С	53	US
82	10122	802A-0495	390308	52290	2013	3	AERO SE		N							5.62E+08	С	151	US
95	1012J	1	7040242	41502	1983	7	OLD SCH	-								5.54E+08	С	53	US
98	1012T	401-0719	390204	52016		3	JOHNSC									5.67E+08	С	89	US
20	10135	401-0724	390204	52016	1989	4	SLATER	•		1N						5.68E+08	С	135	US
97	1017K	CH2-0805-	05624X9	55564	2007	1	NAPIWO		🗆 N	10						5.51E+08	С	123	US
27	1018T	24-4884	7102406			1	LEON J H	-	🗆 N	1P				~	,	5.67E+08	С	69	US
27	101EG	LF-33	1152513			3	BEMIDJI								1	5.66E+08	С	7	US
41	101FL	15071541	2071822	17020	1970	1	ELSING	¢			0	к		Cancel		5.62E+08	С	105	US
63	101HB	1	056157J	99999	2005	4	MARINO								.:	5.58E+08	С	137	US
89	101KC	18-649	7101802			3	H O AIR	CR 138	85 IVY			ANDO	VER	MN		5.53E+08	С	3	US
007	101TR	ER-125	05626LZ			1	GOEKE F	RA 251	1 DARI			ALEXA	ND	MN		5.63E+08	С	41	US
017	101UL	517	059025M	55562	1999	1	CLAY JO	HI 432	3RD A	-		САМВ	RID	MN		5.5E+08	С	59	US

Figure 6-44. Registered Aircraft – Add State Filter

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.



	A	В	С	D	E	F	G	н	1	J	K		L	M	N		0	Р	Q	R	S	T
1	N-NUM 👻	SERIAL 👻	MFR M	ENG MI	YEAR M 👻	TYPE RE 👻	NAME -	STREET -	STREET -	CITY	STATE	e 🐨 Zi	IP COL 👻 I	REGION	COUN	IT 👻 CO	JUNT -	LAST A	CERT IS 👻	CERTIF	TYPE AI 👻	TYPE E
14	1000N	310H0104	2074220	17027	1963	3	ANDERSO	PO BOX 1	1	CANBY	MN	5	5.62E+08	с		173 U	s	20191207	19970408	1N	5	
15	1000P	28-1000	7102808	41514	1963	4	LENSING	1312 COL	-	BELGRAD	DEMN	5	5.63E+08	С		145 U	5	20191210	20170503	1N	4	
14	1005K	3732	8190104	17003	1946	1	KING RIC	H 19062 600	r i	ROSE CR	EEMN		5.6E+08	с		99 U	5	20200211	19720525		4	
65	1008C	24-1100	5870219	41522	1981	7	BAT FLYIN	1005 VAL	-	BLUE EAF	RTMN		5.6E+08	С		43 U	S	20210702	20121012	1N	4	
217	100BA	U12	1154002	52142	1968	3	BEMIDJI	4125 HAN		BEMIDJI	MN	5	5.66E+08	С		7 U	5	20190228	20190228	1N	5	
268	100EF	S9801-013	05612K4	99999	2002	1	BRODERS	(14930 130	r i	STILLWA	TIMN	5	5.51E+08	С		163 U	S	20181125	20020107	4:	2 4	
324	100HY	2100	2210406			1	MORELL	251 PALO		CIRCLE P	IMN		5.5E+08	С		3 U	5	20190309	20160808		4	
30	100JG	3213019	7103218	41530	1988	3	d						COOL					20191113	20161227	1N	4	
349	100KL	758 (1483)	2808002	52034	1955	7	F1007	101TR	EF	R-125	05	5626	LZ					20200116	19980331	44	4	
354	100KZ	65	5170805	29001	1999	4	d			-	17 05						100	20210531	20180615	1T	5	
374	100MD	340A0535	2076405	17040	1978	1	1017	101UL		5	17 05	5902	JVI	555	062		199	20191217	20191217	1N	5	
125	100QT	⊔689	1152913	52045	1976	3	\$1089	1021G		17	11 05	5638	C4					20190812	20170105	1N	5	
549	1010Q	27370	21101PK	41508	1970	1	B	10210										20201113	20180117	1N	4	
582	10122	802A-0495	390308	52290	2013	3	41129	1023Z	JA	\$509-0	1-105	5639	AU	800	000		201	20181017	20130312	314	4	
595	1012J	1	7040242	41502	1983	7	91145	10340			86	0.00	1000	501	110		201	20190814	20170112	43	2 4	
598	1012T	401-0719	390204	52016		3	1145	1024S		0	80	8084	2000	521	118		201	20210217	20150722	3	4	
520	10135	401-0724	390204	52016	1989	4	\$1178	1026N	1 1	72594	06	2072	2432	415	508		191	20200723	20200723	3	4	
597	1017K	CH2-0805-	05624X9	55564	2007	1												20191028	20191028	4:	2 4	
27	1018T	24-4884	7102406				L <mark>1192</mark>	1027E	7/	AC-457	78 🖂	2110	0102	170	003		194	20190811	20090420		4	
327	101EG	LF-33	1152513			3	81227	102AC	、	44103	11	2076	5020	10	515		198	20210216	20180717		5	
341	101FL	15071541	2071822	17020	1970	1	E1231	TUZAL	,	44105	11	2070	5020	1.	515		134	20201105	19950815	3	4	
363	101HB	1	056157J	99999	2005	4	1303	102FA	T	C-483		1152	2704	170	027		196	20190311	20130412	4	2 4	
389	101KC	18-649	7101802			3	H											20200423	20110922		4	
007	101TR	ER-125	05626LZ			1	d1312	102FV	1	72805	52	2072	2401	415	515		199	20190421	19950123		4	
017	101UL	517	059025M	55562	1,99	1	. c	-					~					20200711	20100712	48A	4	
	60060	6766	0550001		-	1	. c			Sheet	1		(+)					20190211	20190211		4	
129	1023Z	JA509-01-	05639AU	80000	2020	1	P	_			_							20200427	20200427	4	2 4	
145	1024S	586	8682000	52118	2011	7	A Read	iy 637	4 of 281	7933 re	cords	four	nd					20200214	20110723	1N	4	
178	1026M	17259406	2072432	41508	1970	1	s				-	_				_		20190109	19941214	1N	4	
192	1027E	7AC-4578	2110102	17003	1946	1	BUCKLEY	J 2038 BUR		MORA	MN	5	5.51E+08	С		65 U	S	20200219	20080613		4	
237	102AD	4410311	2076020	1515	1983	7	INDY AIR	L 3065 1015		BLAINE	MN	5	5.54E+08	С		53 U	S	20200922	20180214	1N	5	
303	102FA	TC-483	1152704	17027	1963	1	REGISTRA	720 S PLA	ž	MENDOT	[A MN	5	5.51E+08	С		123 U	5	20210429		1N	5	
312	102FV	1728.552	2072401	41515	1998	1	GRUBA SI	H 10271 CO	4	SAINT JC	SMN	5	5.64E+08	С		145 U	S	20200918	20150226	1NU	4	
		Sheet1	+																	: •	1	
Read	V 6374 of	287933 recor	ds found																			
		22.000 10001				_																

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 Aeronautics 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.