Chapter 1. Inventory

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1.1 INTRODUCTION

Minneapolis–Saint Paul International Airport (MSP or the Airport) is a commercial service airport that supports the Minneapolis–Saint Paul metropolitan area. MSP is located south of downtown Minneapolis, Minnesota, and southwest of downtown Saint Paul. The Airport property covers approximately 3,400 acres. The Airport is owned and operated by the Metropolitan Airports Commission (MAC). The MAC also operates six general aviation (GA) airports in the Twin Cities region: Airlake Airport (LVN), Anoka County–Blaine Airport (ANE), Crystal Airport (MIC), Flying Cloud Airport (FCM), Lake Elmo Airport (21D), and Saint Paul Downtown Airport (STP). **Exhibit 1-1** shows the location of MSP and the other airports comprising the MAC system.

As of 2019, the last full year before the pandemic, MSP ranked as the 16th busiest airport in the United States in terms of passengers, with 12.2 million enplaned passengers (passenger boardings). Additionally, it ranked as the 29th largest cargo airport in the United States, handling approximately 229,000 metric tons of air cargo. Also in 2019, approximately 406,000 aircraft operations (takeoffs or landings) occurred at the Airport.

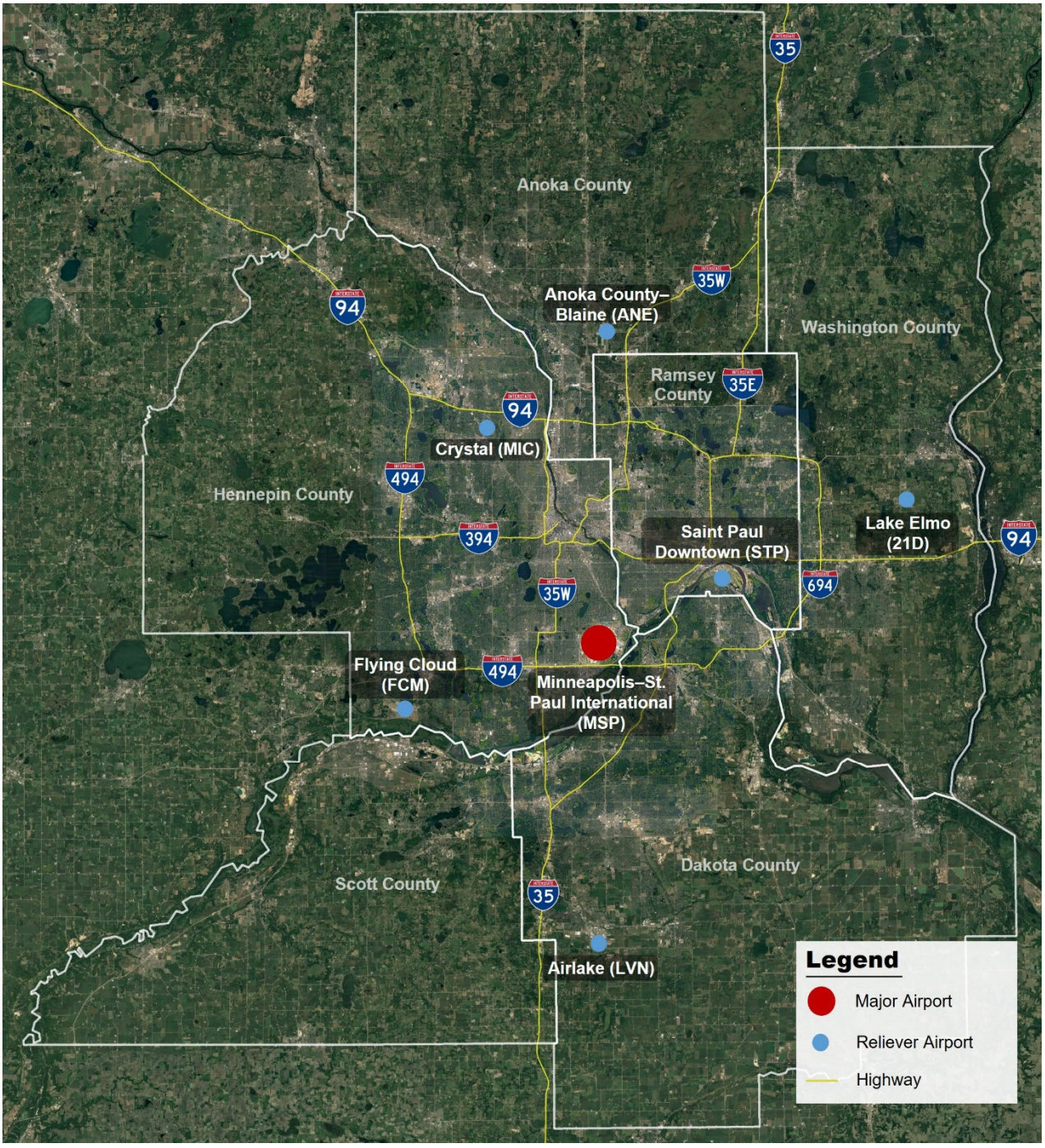
The MAC commenced a revision of the Long-Term Plan (LTP) in 2019. The LTP is an effort to update the findings of the previous 2030 Long-Term Plan (2030 LTP) and adapt them to the changes in the Airport's mission and growth. The 2030 LTP, completed in 2010, recommended the reassignment of airlines between Terminal 1 (T1) and Terminal 2 (T2) to balance passenger demand and improve efficiency and customer service of both facilities through 2030. The 2030 LTP recommended utilizing T1 to accommodate Delta Air Lines (Delta) and its partner airlines while relocating all other airlines to T2. Specific terminal capital programs were recommended based on this terminal reassignment. Chapter 4 discusses the major elements that comprised the 2030 LTP.

The 2040 Long-Term Plan (2040 LTP or the report) provides a blueprint for the long-range infrastructure development necessary to accommodate the growth in commercial aviation demand at MSP through 2040, while prioritizing safety, efficiency, and environmental sustainability. The 2040 LTP addresses the Airport's commercial air passenger terminal, airfield, and landside facility requirements to maintain an acceptable level of service (LOS). The purpose of the 2040 LTP is to update the recommended capital improvements proposed in the MSP 2030 LTP using updated aviation forecasts, industry trends, and stakeholder expectations.

Due to changes brought on by the COVID-19 pandemic, the 2040 LTP was split into two phases. The first phase of development for the 2040 LTP involved conducting a survey of existing Airport infrastructure; assessing the capacity of the current gate and Airport facilities; developing the aircraft and passenger demand forecasts; conducting the passenger facility gap analysis; determining the gating requirements; and identifying the carrier alignment scenarios for each terminal.

The first phase was completed in July 2020, but the forecasts could not account for the potential effects of widespread disruptions in air service due to the COVID-19 pandemic. The MAC paused the 2040 LTP effort in 2020 because of the pandemic.

Exhibit 1-1: Metropolitan Airports Commission – Airport System



SOURCES: Google Earth, 2022 (aerial image); Metropolitan Airports Commission, 2022.

In October 2021, the MAC initiated the second phase of the 2040 LTP. The forecasts were updated to incorporate COVID-19 pandemic impacts on aviation demand. The second phase of the study included:

- Revising the demand forecast to account for changes resulting from the pandemic
- Estimating the long-term (2040) infrastructure needs, with planning activity level (PAL) evaluation points for the short-term and mid-term periods
- Evaluating potential development options
- Selecting a preferred plan
- Outlining a general timeline for implementing expansion projects at the near-, mid-, and long-term points throughout the planning horizon

1.2 NEED FOR LONG-TERM PLAN

The Metropolitan Council (Met Council) is the regional policymaking body, planning agency, and provider of essential services in the Twin Cities metro area. The Met Council adopted guidelines that require regular updates to the LTP to integrate pertinent information regarding the planning, development, and operation of the region's airports for compatibility with the surrounding areas. The primary objectives for the LTP are the following:

- **Objective 1:** Plan for future facilities that will meet forecast PALs in a manner that maintains and enhances customer service, while facilitating a seamless "one-journey" experience.
- **Objective 2:** Produce a development plan that positions the MAC to meet future demand levels, enhances financial strength, leverages environmental stewardship, and infuses sustainable thinking.
- **Objective 3:** Conduct the planning process in a manner that includes meaningful stakeholder engagement processes.

The purpose of the 2040 LTP is to address the three primary objectives. Objective 1 is addressed through the analysis of existing conditions and exploring options for optimizing and expanding Airport facilities, while creating a more convenient experience for passengers traveling through the Airport. As passenger demand grows at MSP, existing Airport facilities may not meet future demand or an acceptable LOS. **Exhibit 1-2** highlights curbside congestion at T2, which is a key concern, among others, that is discussed throughout this report. The 2040 LTP addresses customer LOS while ensuring that future facilities align with forecasted PALs.

Objective 2 is met by creating a plan that enables the MAC to achieve sustainable growth in a financially feasible manner. This plan integrates past and current studies into a framework, ensuring that growth from various infrastructure improvements does not conflict with the overall development and environmental stewardship of the Airport. The plan balances demand projections with financially viable development while retaining a robust environmental sustainability strategy.

Objective 3 is addressed by the framework developed by the Stakeholder Advisory Panel (panel). The framework is structured to receive information about the planning process and communicate public concerns and aspirations to the MAC through a series of public workshops. The panel has developed an engagement process that includes representation of a broad range of stakeholders. The stakeholders involved include airport tenants, passengers, public partners, local communities, regional businesses, and tourism associations.

Exhibit 1-2: T2 Curbside Congestion

SOURCE: HNTB, *Minneapolis–Saint Paul International Airport 2020 Improvements Environmental Assessment / Environmental Assessment Worksheet*, 2013

1.3 AIRPORT HISTORY

In 1915, the original 350 acres of Airport land were purchased for the Twin City Motor Speedway, a 2-mile motor derby racetrack loop. After 2 years of racing, the property was unused for several years, until the Twin City Aero Corporation acquired the property for development of a local airport. By 1920, the Airport was named Speedway Field and was fully developed with a landing field and hangar for airmail. In 1923, Speedway Field was renamed to Wold-Chamberlain Field after Minnesotans Ernest Wold and Cyrus Chamberlain, whose lives were taken in World War I. After the Minneapolis Park Board purchased the airfield in 1928 for $165,000, it was renamed the Minneapolis Municipal Airport, and the original concrete track was demolished for future expansion opportunities. The first passenger service flights began in 1929.

Throughout the 1930s, Airport facilities and services continued to grow and expand. To manage the growing Airport, the Minnesota Legislature established the MAC in 1943. In 1948, the Airport was renamed as the Minneapolis–Saint Paul International Airport / Wold-Chamberlain Field, and in 1958 construction began on the current T1 building. The 600,000-square-foot structure, housing 24 gates on 2 concourses, began operations in 1962. Originally, the terminal was forecast to serve approximately 4 million passengers per year by 1975. However, the estimated passenger

growth drastically exceeded the original forecasts, with the Airport serving more than 4.1 million people by 1967. Passenger growth continued at an exponential rate throughout the 1970s and 1980s. To accommodate the exponential growth, the Minnesota Legislature passed the Metropolitan Airport Planning Act in 1989, which ultimately established the Dual Track Airport Planning Process. Managed by the MAC and the Met Council, the almost 7-year planning process analyzed various options for either providing adequate air service capacity and facilities within the region or building a new airport to meet the demand.

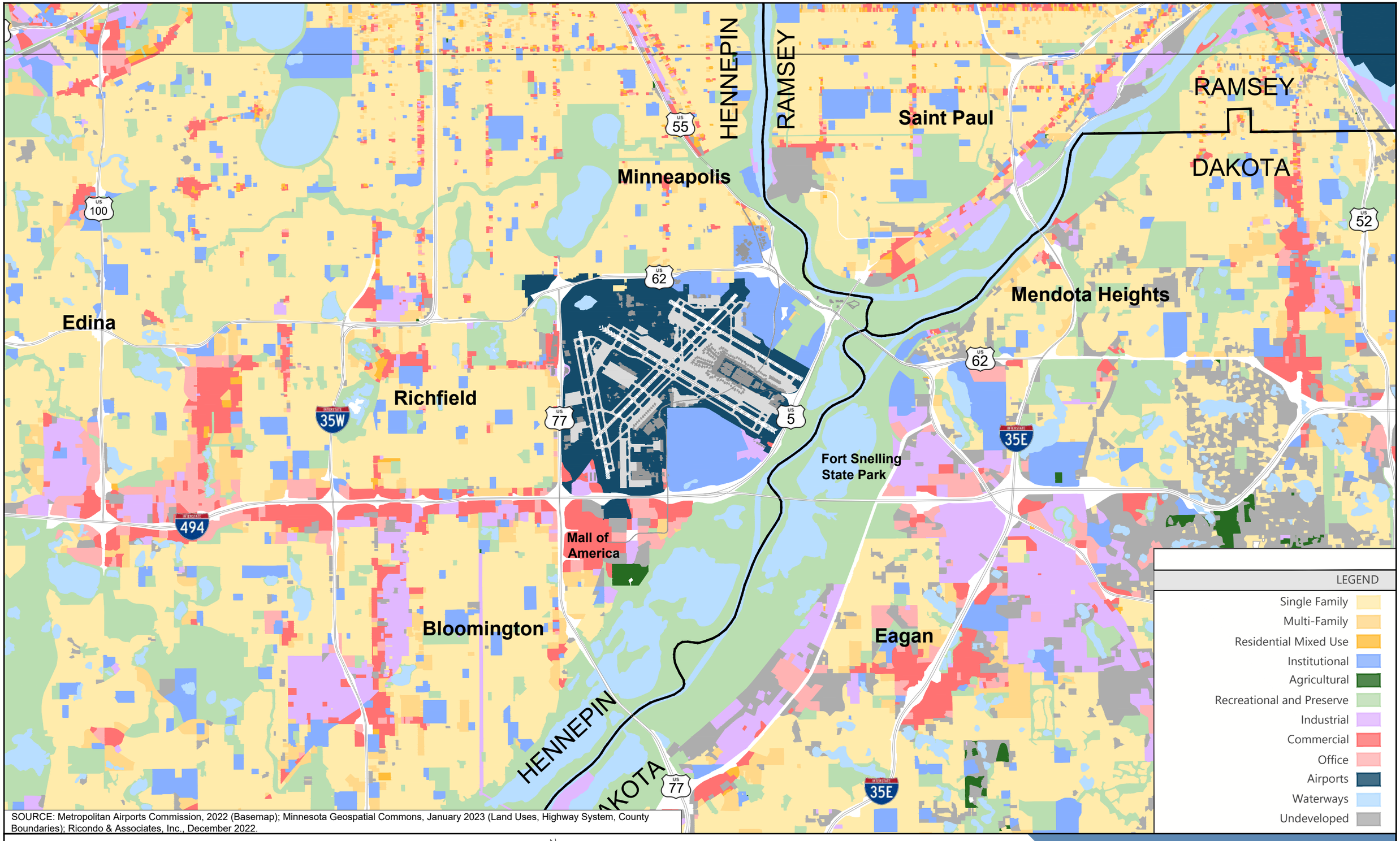
After completion of the analysis and a formal submission of recommendations to the Minnesota Legislature in 1996, legislation was passed by both the House and Senate on April 2, 1996, and signed by Governor Arne Carlson. The MAC ceased further study of a new airport development and implemented the MSP 2010 LTP. The LTP included an expansion of an estimated more than $3.1 billion in Airport developments and improvements for gates, automobile parking, rental car facilities, and a new runway. More specifically, the fourth runway, Runway 17-35, opened in 2005 because of the 2010 LTP.

1.4 AIRPORT SETTING

MSP is in an urban area between Minneapolis and Saint Paul, Minnesota; it is surrounded by the suburban cities of Bloomington, Eagan, Mendota Heights, and Richfield. Minneapolis is located to the northwest, Saint Paul is located to the northeast, Bloomington is located to the southwest, Eagan is located to the southeast, Mendota Heights is located directly east, and Richfield is located directly west of MSP. **Exhibit 1-3** depicts these cities, as well as the associated counties, highway systems, and land use categories surrounding MSP. According to the U.S. Census Bureau, the total population of Minneapolis, St. Paul, Bloomington, Eagan, Mendota Heights, and Richfield was estimated to be approximately 950,000 in 2020. The entire region's population as of 2020 was approximately 3.2 million.

1.4.1 Surrounding Land Use

MSP is in Hennepin County, with Ramsey and Dakota counties directly east; the Airport is nestled among the six cities, although it is not technically part of any municipality. The Airport is in an urbanized area, and the majority of land surrounding MSP is developed by the adjacent municipalities. Highways 62, 77, 5, and Interstate 494 (I-494) follow the perimeter of the airport property. As reviewed on **Exhibit 1-3**, the land surrounding MSP includes residential, industrial, institutional, commercial, agricultural, recreational, and other uses. Land to the west and northwest of the Airport is primarily residential use, and land to the south and east consists primarily of a mix of commercial, industrial, and recreational land use, with pockets of residential use throughout. A band of recreational and reserve areas that include waters and wetlands follow along the southeast perimeter of the Airport boundary. The Mall of America is located adjacent to the southwest corner of MSP. Land uses within the southeast flight patterns for the primary Runways 12L-30R and 12R-30L are predominantly commercial, industrial, recreational, and preserve areas. Land uses within the northeast flight patterns for the primary runways consist largely of residential, recreational, and preserve areas. Land uses within the southern flight pattern for Runway 17-35 consists primarily of commercial, office, Mall of America, recreational, and preserve areas. Land uses within the northern flight pattern for Runway 17-35 consist of residential, recreational, and preserve areas.



SOURCE: Metropolitan Airports Commission, 2022 (Basemap); Minnesota Geospatial Commons, January 2023 (Land Uses, Highway System, County Boundaries); Ricondo & Associates, Inc., December 2022.

MSP

MINNEAPOLIS-SAINT PAUL
INTERNATIONAL AIRPORT
2040 LONG-TERM PLAN

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EXHIBIT 1-3
Land Use

1.4.2 Airspace

The National Airspace System (NAS) is the network of U.S. airspace, which includes navigation facilities, equipment, procedures, airports, and air traffic controllers. The NAS provides for the safe and efficient flow of aircraft in and out of airports across the country. The NAS is divided into classes of airspace (Classes A through G) that differ based on flight rules and interaction with air traffic control (ATC). The classification of airspace above the Airport is Class B, which extends from the surface up to 10,000 feet mean sea level (MSL).

The airspace in the Minneapolis–Saint Paul area falls under the jurisdiction of the following entities: the Minneapolis Air Route Traffic Control Center (ARTCC), Minneapolis Terminal Radar Approach Control (TRACON), and the MSP Air Traffic Control Tower (ATCT).

- **Minneapolis ARTCC** – The airspace over the continental United States is divided into 20 geographically defined ATC jurisdictions based on the ARTCCs, which provide radar service and other ATC services to enroute aircraft (i.e., those aircraft that are not landing or taking off). The Minneapolis ARTCC has jurisdiction of enroute traffic over portions of Minnesota, South Dakota, North Dakota, Wisconsin, Michigan, Nebraska, Kansas, Iowa, and Missouri.

- **Minneapolis TRACON** – The TRACON provides radar approach and departure control as well as other ATC services to aircraft flying in terminal area airspace. Jurisdiction over airspace in the Minneapolis–Saint Paul region is given to the Minneapolis TRACON.

- **MSP ATCT** – The ATCT provides ATC services to aircraft at and in the immediate vicinity of an airport, ensuring the safe and efficient flow of aircraft. Controllers are responsible for separating aircraft in the air or on the ground, in addition to providing weather information and route clearance to pilots. The ATCT at MSP is located between Runways 12R-30L and 12L-30R in the northeast quadrant of the Airport, adjacent to Taxiway J. The ATCT cab has a floor-level elevation of 965 feet MSL.

1.5 INVENTORY OF EXISTING FACILITIES

1.5.1 Overview

This section describes the inventory of existing facilities at MSP, which comprises the airfield, terminal, and landside facilities, including cargo, GA, and support facilities. Airfield facilities in this inventory include those that directly support aircraft operations, such as the runways, taxiways, aprons, remain-overnight (RON) parking, deicing pads, airspace, and navigational aids (NAVAIDs). Terminal facilities include all passenger-related facilities such as check-in, security, holdrooms, baggage handling and screening, international arrivals, and baggage claim. Landside facilities encompass facilities related to roadways, curbsides, parking, and other ground transportation functions.

1.5.2 Landside Inventory

Landside facilities directly serving MSP passengers and visitors include terminal area roadways, terminal curbsides, parking facilities, rental car facilities, and commercial ground transportation areas. These are shown for the Airport campus, T1, and T2 on **Exhibits 1-4**, **1-5**, and **1-6**, respectively.

1.5.2.1 Terminal Area Access and Egress

The Airport is surrounded by a highway network. State highways 5 and 77 (MN-5 and MN-77) lie directly to the east and west of the Airport, respectively. State Highway 62 (MN-62) and I-494 run along the north and south borders of the Airport, respectively. **Exhibit 1-1** illustrates the overall Airport campus layout relative to the regional roadway network.

The primary access and egress to T1 is provided via MN-5 and Glumack Drive. Glumack Drive is a one-way, continuous loop roadway that provides access and egress for the terminal area facilities, including the parking ramps, Ground Transportation Center (GTC), Rental Car Center, and the terminal curbsides. The T1 landside also houses a post office and hotel, which are accessible from Glumack Drive or Northwest Drive. All deliveries to the Airport use Northwest Drive.

T2 is accessed from I-494 and 34th Avenue South, and it egresses via 72nd Street. Humphrey Drive is a one-way, continuous loop roadway around the primary T2 facilities that provides access and egress for the terminal area facilities.

1.5.2.2 Terminal Curbside Facilities

Glumack Drive in front of the T1 passenger terminal is divided into an upper- and lower-level roadway. The upper-level roadway curbside provides drop-off space for originating passengers (departures) and some commercial vehicle operations. The west upper-level roadway supplies 830 linear feet of departures curbside. The west lower-level roadway provides 700 linear feet of pick-up space for terminating passengers (arrivals).

Humphrey Drive in front of T2 provides 1,200 linear feet of curbside, a shared area for drop-off space for originating passengers (departures), and pick-up space for terminating passengers (arrivals).

1.5.2.3 Parking

The Airport provides parking spaces in nine parking ramps distributed between T1 and T2. The parking ramps also include rental car facilities at both terminals. **Table 1-1** summarizes the existing parking supply for each parking facility and its estimated end of life.

T1 has five parking ramps: the Gold Ramp, Green Ramp, Red Ramp, Blue Ramp, and Silver Ramp (shown on **Exhibit 1-6**). The parking facilities are connected to T1 with an underground walkway area and/or the Hub Tram. Valet parking is available, for which vehicles are stored underneath the terminal building. An additional remote parking ramp for T1, the Quick Ride Ramp, is located on Northwest Drive and is served by a shuttle service that picks up and drops off at T1.

T2 has two parking ramps (shown on **Exhibit 1-7**): the Orange Ramp and Purple Ramp. The parking facilities are connected to T2 with an elevated skyway and an at-grade crosswalk.

A cell phone lot, containing approximately 40 stalls, is located on Post Road between the two terminals. Additionally, four off-Airport parking operators provide approximately 6,000 additional stalls with shuttle service to the Airport. Existing off-Airport parking providers include Park ‘N Go, Park ‘N Fly, EZ Air Park, and Shepard Road Airport Parking. Park ‘N Go and Park ‘N Fly are located nearest to the Airport, in the city of Bloomington. Delta currently provides employee

parking in lots accessed from 34th Avenue; Delta employee parking requirements are not included in this report.

Table 1-1: Existing Parking Facilities

Facility	Estimated End of Life	Spaces
T1	--	**16,795**
Valet Garage	--	389
Gold/Brown Ramp (Levels 1–7)	2029	3,721
Green/Pink Ramp (Levels 1, M, 2–7)	2039	3,835
Blue Ramp (Levels 4–9)[1,2]	2075	2,650
Red Ramp (Levels 4-9)[1,2]	2075	2,806
Silver Ramp (Levels 6–11)[3,4]	2095	3,394
Quick Ride Ramp (Levels 1–2)	2075	**1,704**
T2	--	**8,716**
Orange Ramp (Levels 1, M, 2–8)	2085	4,668
Purple Ramp (Levels 2–8)[5]	2075	4,002
Employee Parking Surface Lot	--	46
Total	**--**	**27,215**

NOTES:
1 Does not include Blue and Red Ramps Level 1. This level is occupied by rental car quick turnaround operations.
2 Does not include approximately 1,700 proposed parking stalls on the Blue and Red Ramps Levels 2 and 3. These levels were vacated by rental car companies in 2020.
3 Does not include Silver Ramp Level 1. This level is occupied by the Transit Center and is used for commercial ground transportation operations.
4 Does not include Silver Ramp Levels 2 through 5. These levels are occupied by rental car companies for ready/return operations.
5 Does not include Purple Ramp Level 1. This level is used for commercial ground transportation operations.
SOURCE: Kimley-Horn and Associates, Inc., 2021.

Additional employee parking lots are distributed across the Airport to serve individual operations, including the MAC General Office, MAC Trades, GA, cargo, and the ATCT. Available parking stalls for these discrete operations are not included in this report.

1.5.2.4 Rental Car Facilities

Each terminal has its own set of rental car facilities in proximity. **Table 1-2** summarizes the existing rental car facilities. The customer service building (CSB) at T1 is located on Level 1 of the Silver Ramp. The Silver Ramp also houses the T1 ready/return area on Levels 2 through 5. The rental car facilities in the Silver Ramp are accessed via the Hub Tram and underground walkways. The T1 quick turnaround (QTA) facilities are located on Level 1 of the Red and Blue Ramps.

The T2 customer service operations and ready/return area occupy a portion of Level 1 and the Mezzanine Level of the Purple Ramp. The QTA facility is located on the south side of East 72nd Street near the Purple and Orange Ramps.

Table 1-2: Existing Rental Car Facilities

Facility	T1	T2	Total
Customer Service			
Customer Service Counter Positions	48	29	77
Ready / Return Stalls	2,050	665	2,715
Quick Turnaround			
Fueling Positions	76	24	100
Car Wash Bays	12	8	20
Vehicle Storage (Stacking Positions)	575	685	1,260

SOURCE: Kimley-Horn and Associates, Inc., 2021.

1.5.2.5 Commercial Ground Transportation

Commercial operators at MSP include taxis, limousines, transportation network companies (TNCs), Airport-operated shuttles, private shuttles, buses, and public transit. **Table 1-3** summarizes the existing supply for commercial ground transportation facilities.

Ground transportation functions at T1 occur at the GTC and the Transit Center. The GTC provides direct access to the east upper-level roadway and the east lower-level roadway. This area serves taxis, TNCs, limousines, Quick Ride Ramp shuttles, and various hotel and regional shuttles. The Transit Center, located on Level 1 of the Silver Ramp, serves charter buses, employee shuttles, Metro Transit buses, and off-site rental car and parking shuttles.

T2 has a similar mix of commercial ground transportation operators, which are consolidated on Level 1 of the Purple Ramp. Dedicated parking areas on Post Road provide additional space, approximately 503 stalls, for commercial vehicle staging. The locations for the various ground transportation holding lots are noted on **Exhibit 1-5**.

Table 1-3: Existing Commercial Ground Transportation Facilities

Facility	Number of Positions
T1	**133**
TNCs/Taxis/Limos	97
Shuttles	27
Buses	9
T2	**55**
TNCs/Taxis/Limos	29
Shuttles	21
Buses	5
Total	**188**

NOTE: TNC – Transportation Network Company
SOURCE: Kimley-Horn and Associates, Inc., 2021.

1.5.2.6 Transit and Multimodal

MSP has direct access to downtown Minneapolis and Bloomington via Metro Transit's light rail system and local bus service. T1 is served by a subterrain light rail station underneath the Silver Ramp, as well as local bus service at the Silver Ramp Transit Center. T2 has an at-grade light rail station along the east side of the Orange Ramp. No local bus routes service T2. **Exhibit 1-5** notes the light rail connections and **Exhibits 1-6** and **1-7** highlight the station locations at each terminal.

There are no designated bike lanes on the MSP campus. Northwest Drive is a low-speed roadway, with lower traffic volumes than Glumack Drive; bicyclists can use Northwest Drive to access the T1 Silver Ramp from Post Road. Bicyclists can access T2 using 34th Avenue South or Post Road. There is also a sidewalk on the west side of 34th Avenue South between T2 and I-494.

MINNEAPOLIS

HIGHWAY 62

SAINT PAUL

MISSISSIPPI RIVER

FIGURE 1.4.2-2
TERMINAL 1 LANDSIDE

METRO TRANSIT BLUE LINE LIGHT RAIL CONNECTION TO MINNEAPOLIS

GLUMACK DRIVE

SNELLING LAKE

METRO TRANSIT BLUE LINE LIGHT RAIL CONNECTION BETWEEN TERMINAL 1 AND TERMINAL 2

HIGHWAY 5

LONGFELLOW AVENUE SOUTH

CARGO ROAD

FIGURE 1.4.2-3
TERMINAL 2 LANDSIDE

EAST 70TH STREET

LIMO AND SHUTTLE STAGING

MISCELLANEOUS STORAGE (LEASED)

CELL PHONE LOT

TRANSPORTATION NETWORK COMPANIES

POST ROAD

NORTHWEST DRIVE

RICHFIELD

HIGHWAY 77

34TH AVENUE SOUTH

FORT SNELLING NATIONAL CEMETERY

COMMERCIAL VEHICLE STAGING (TAXIS PRE-HOLDING)

COMMERCIAL VEHICLE STAGING (TAXIS)

MINNESOTA RIVER

AIRPORT LANE

INTERSTATE 494

METRO TRANSIT BLUE LINE LIGHT RAIL CONNECTION TO BLOOMINGTON

SOURCE: Kimley-Horn, 2022.

DRAWING LEGEND

EXISTING BUILDINGS	
EXISTING LANDSIDE - TERMINAL AREA	
EXISTING SURFACE LOT - TERMINAL AREA	
EXISTING LANDSIDE - OTHER	
EXISTING SURFACE LOT - OTHER	
LANDSIDE BOUNDARY	
AIRPORT PROPERTY BOUNDARY	

MSP

MINNEAPOLIS-SAINT PAUL INTERNATIONAL AIRPORT
2040 LONG-TERM PLAN

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EXHIBIT 1-4
EXISTING LANDSIDE CONDITIONS - CAMPUS

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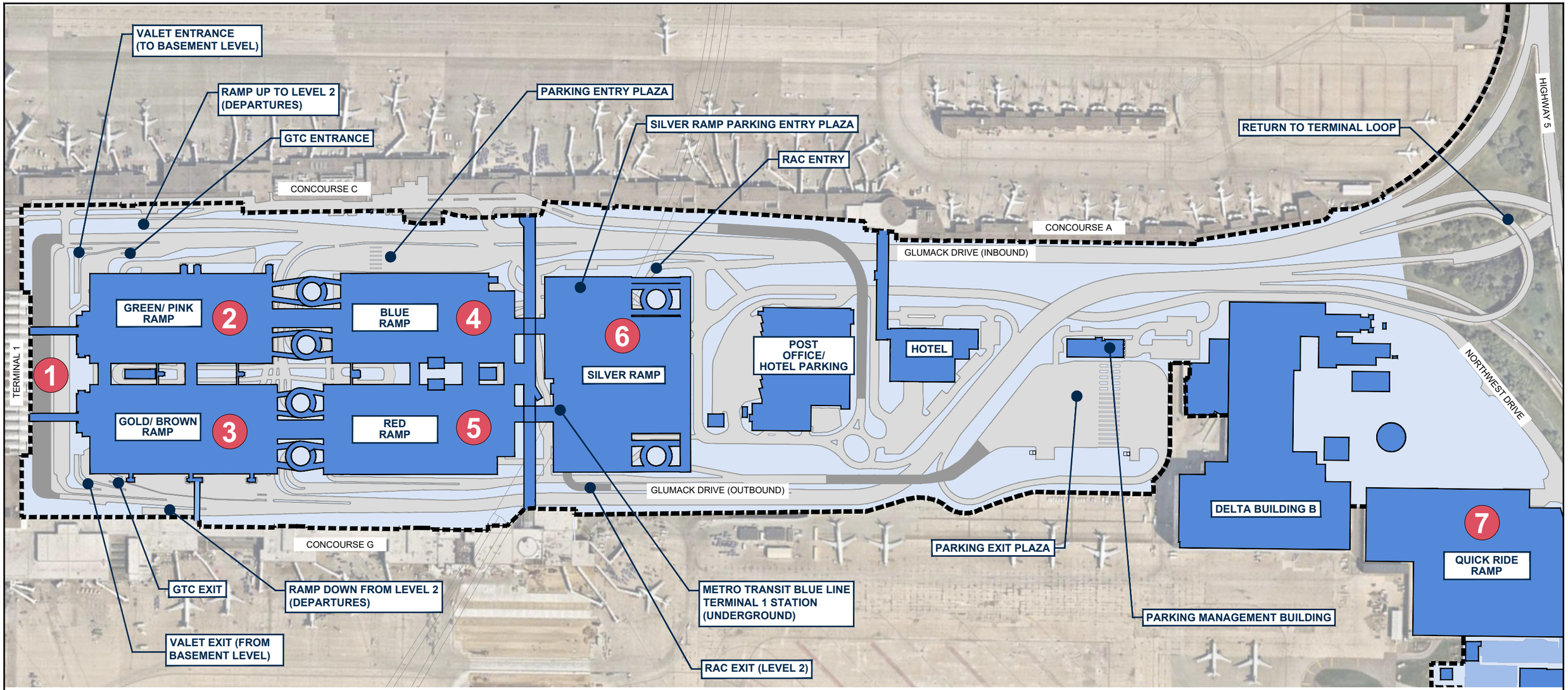

1 Curbside
L1 West: Arrivals (Passenger Pick-Up)
L1 East: GTC
L2 West: Departures (Passenger Drop-Off)
L2 East: Departures (Commercial Vehicles and Delta Curbside Check-In)

2 Pink Ramp
L1: GTC, ePark Elite, Employee Parking
LM: General Parking, Valet Overflow Storage

Green Ramp
L2-L7: General Parking

3 Brown Ramp
L1: GTC, General Parking, Employee Parking

Gold Ramp
L2, L4-L7: General Parking
L3: Hourly Parking

4 Blue Ramp
L1: RAC QTA
L2-L3: Not Used
L4-L9: General Parking

5 Red Ramp
L1: RAC QTA
L2-L3: Not Used
L4-L9: General Parking

6 Silver Ramp
L1: RAC CSB, Transit Center
L2-L5: RAC RR
L6-L11: General Parking

7 Quick Ride Ramp
L1: Delta & Public Parking
L2: Public Parking

Abbreviations:
CSB: Customer Service Building
GTC: Ground Transportation Center
L#: Level Number
M: Mezzanine Level
RAC: Rent-A-Car
RR: Ready-Return
QTA: Quick Turn Around

DRAWING LEGEND

EXISTING BUILDINGS LANDSIDE	
EXISTING LANDSIDE	
EXISTING SURFACE LOT LANDSIDE	
LANDSIDE BOUNDARY	

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MINNEAPOLIS-SAINT PAUL INTERNATIONAL AIRPORT
LONG-TERM PLAN 2040

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EXHIBIT 1-5
EXISTING LANDSIDE CONDITIONS - TERMINAL 1

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GTC ENTRANCE
SHORT TERM PARKING ENTRY PLAZA
GENERAL PARKING ENTRY PLAZA
GTC EXIT
RAC EXIT
TERMINAL 2
HUMPHREY DRIVE
ARFF STATION #1
PURPLE RAMP
1
ORANGE RAMP
2
RAC ENTRANCE
E 72ND STREET
RAC QTA
METRO TRANSIT BLUE LINE TERMINAL 2 STATION
34TH AVENUE S
E 70TH STREET
FORT SNELLING NATIONAL CEMETERY
PARKING EXIT PLAZA

1 Purple Ramp
L1: GTC, RAC RR
LM: RAC RR
L2: Short Term Parking
L3-8: General Parking

2 Orange Ramp
L1: Transit Center
L1-L8: General Parking

Abbreviations:

ARFF: Aircraft Rescue and Firefighting
CSB: Customer Service Building
GTC: Ground Transportation Center
L#: Level Number
M: Mezzanine Level
RAC: Rent-A-Car
RR: Ready-Return
QTA: Quick Turn Around

DRAWING LEGEND

EXISTING BUILDINGS LANDSIDE	
EXISTING LANDSIDE	
EXISTING SURFACE LOT LANDSIDE	
LANDSIDE BOUNDARY	

MSP
MINNEAPOLIS-SAINT PAUL INTERNATIONAL AIRPORT
LONG-TERM PLAN 2040

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EXHIBIT 1-6
EXISTING LANDSIDE CONDITIONS - TERMINAL 2

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1.5.3 Terminal Inventory

The Airport has two commercial passenger terminal complexes: T1 and T2. Together, they provide approximately 3.33 million square feet of terminal facilities and 118 contact aircraft gates.

T1 is located between the Airport's parallel runways in the southern land envelope below Runway 4-22. T1 comprises seven concourses, designated A through G, that contain 102 contact gates[1] and 2 ground-loaded gates;[2] 10 gates are connected by sterile corridors to the T1 International Arrivals Facility, known as the Federal Inspection Station (FIS) facility, on Concourse G. **Table 1-4** summarizes the concourses and gate counts. Passenger movement is enhanced by moving sidewalks throughout the T1 complex and an automated people mover (APM) system along the front face of Concourse C, from Gate C1 to Gate C27.

T2 is located between Runway 17-35 and Runway 12R-30L in the southern land envelope below Runway 4-22. T2 has one concourse, designated H, which contains 16 contact gates[3]. Five of these gates are connected by sterile corridors to the T2 FIS. **Table 1-4** summarizes the gate counts.

The remainder of this section reviews the primary functional spaces existing within T1 and T2. Reference **Appendix A**, Section 1.3, to access exhibits of the existing facilities.

Table 1-4: Gate Inventory

Terminal	Concourse	Gate	Type	Airlines	Maximum ADG
1	A	11	Contact	Delta	ADG II
1	B	8	Contact	Delta	ADG II
1	B	3	Ground Load	Denver Air	ADG II
1	C	26	Contact	Delta	ADG III
1	D	6	Contact	Delta	ADG IV (B757-3W)
1	E	16	Contact	Alaska Airlines, Spirit Airlines, Air Canada, United Airlines, American Airlines	ADG IV (B757-3W)
1	F	16	Contact	Delta	ADG IV (B767)
1	G	20	Contact	Air France, Delta, KLM	ADG V
2	H	14	Contact	Allegiant Air, Condor, Frontier Airlines, Icelandair, JetBlue Airways, Southwest Airlines, Sun Country Airlines	ADG IV
Total		120			

NOTE: ADG – Airplane Design Group
SOURCES: Metropolitan Airports Commission, 2020; Ricondo & Associates, Inc., February 2020.

[1] Contact gates provide access to aircraft from the building via passenger boarding bridges.

[2] Ground-loaded gates provide a path for passengers to exit the building onto the apron and access the aircraft via stairs.

[3] Contact gates provide access to aircraft from the building via passenger boarding bridges.

1.5.3.1 Check-in Facilities Inventory

The T1 check-in inventory includes four banks of baggage acceptance points: two primary check-in banks on Level 2 and two landside check-in banks on Level T. The T2 check-in inventory includes a single bank of baggage acceptance points on Level 1. All baggage acceptance points include an agent position, desk, baggage belt, passenger staging process area, and passenger queue space. **Tables 1-5** and **1-6** present the inventory for the T1 and T2 check-in facilities.

Table 1-5: T1 Check-in Facilities Inventory

Airline	Kiosks	Agent Positions	Bag Drop Kiosks	Automated Bag Drops	Total Bag Induction Points
T1 Ticket Lobby					
Delta / SkyTeam	48	35	--	--	35
Aer Lingus[1]	--	2 (premium only)	--	--	2
Air Canada	4	4	--	--	4
Alaska Airlines[1]	--	2 (premium only)	--	--	2
American Airlines	20	4	6	--	10
Spirit Airlines	--	4	--	--	4
United Airlines	16	6	4	--	10
Common Use[2] (AS, EI, NK, EAS)	24	--	--	8	8
Tram Level (Delta)	5	10[3]	--	--	10
East Departures Facility (Delta)	--	12[4]	--	--	12

NOTES:
AS – Alaska Airlines
EI – Aer Lingus
NK – Spirit Airlines
EAS – Essential Air Service
1 Aer Lingus and Alaska Airlines have counters for premium passengers. Economy passengers will use common-use resources.
2 Common-use facilities service Alaska Airlines (AS), Air Lingus Limited (EI), Spirit (NK), Air Choice One (3B), and Boutique Air (4B).
3 The Tram Level counter totals are based on the existing configuration.
4 The East Departures Facility offerings are based on a plan to expand from 6 to 12 agent positions.
SOURCES: Metropolitan Airports Commission, 2020; Alliiance, 2020; Ricondo & Associates, Inc., February 2022.

Table 1-6: T2 Check-in Facilities Inventory

Airline	Kiosks	Agent Positions[1]	Bag Drop Kiosks	Automated Bag Drops	Total Bag Induction Points[1]
T2 Ticket Lobby					
Sun Country	--	20–28	--	--	20–28
Condor	--	4–6	--	--	4–6
Icelandair	--	4–6	--	--	4–6
Frontier Airlines	3	4–6	--	--	4–6
JetBlue Airways	3	4–6	--	--	4–6
Southwest Airlines	10	14	--	--	14

NOTE:
1 Agent counters at T2 are common-use and can fluctuate usage throughout the day.
SOURCES: Metropolitan Airports Commission, 2020; Ricondo & Associates, Inc., February 2020.

1.5.3.2 Holdrooms Inventory

As presented in **Table 1-7**, 104 holdrooms are in T1. Concourse A and Concourse B holdrooms are configured for domestic Airplane Design Group (ADG) II aircraft. Holdrooms are configured to be directly adjacent to allow for sharing of holdroom space between gates. Concourse C holdrooms are configured for domestic ADG II and ADG III gates. Holdroom areas are spread along the concourse in grouped clusters for shared use, where possible. Concourse D holdrooms are configured for domestic ADG II and ADG III aircraft. The holdrooms are grouped together in a single open area to maximize passenger utilization with neighboring gates. Concourse E holdrooms are configured for domestic ADG III aircraft. Concourse F holdrooms are configured for a range of domestic ADG III to ADG V aircraft. Holdrooms are usually physically separate from each other on Concourse F, except for the end-of-pier clusters on each concourse, with gate clusters F7/F9 and F8/F10 as the exception. Concourse G holdrooms are configured for a range of aircraft, from ADG III to ADG V aircraft. Gates G1 through G10 can also accommodate international arrivals.

The T2 holdrooms are configured for ADG III aircraft. Holdroom areas are spread along the concourse in grouped clusters for shared use and can accommodate up to ADG V aircraft for Gates H3 through H7. Gate H4 is capable of accommodating ADG IV aircraft when sharing the holdroom with Gate H3. Gate H5 is capable of accommodating ADG V aircraft when sharing the holdroom with Gate H4. H6 is capable of accommodating ADG V aircraft when sharing the holdroom with Gate H7. Gates H3 through H7 can also accommodate international arrivals.

Table 1-7: Holdroom Inventory

Concourse	Number of Gates	Total Square Footage of Holdrooms
A	11	8,121
B	9	8,929
C	26	46,806
D	6	12,067
E	16	28,883
F	16	35,011
G	20	40,359
T1 Subtotal	**104**	**180,176**
T2 Subtotal	**14**	**65,777**
Total	**118**	**245,953**

SOURCES: Metropolitan Airports Commission, 2020; Ricondo & Associates, Inc., February 2020.

1.5.3.3 Baggage Claim Inventory

The inbound baggage process comprises two components: the baggage claim devices and circulation area within the non-secure footprint of the facility, and the tug and cart staging area in the security identification display area (SIDA or airside) directly adjacent to the interior baggage claim.

The T1 domestic baggage claim is located on Level 1 of the T1 headhouse. The baggage claim, located on the non-secure side, includes 11 individual devices ranging from 120 linear feet to 180 linear feet of presentation length. Each claim unit is connected to an individual stripping belt in the cart staging area. **Table 1-8** presents the inventory for the T1 domestic baggage claim.

Table 1-8: Domestic Baggage Claim Inventory

Attribute	Unit	T1	T2
Bag Claim Carousels	Devices	11	2
Bag Claim Presentation Frontage	Linear Feet (Per Device)	120 – 1 Device 160 – 1 Device 180 – 9 Devices	200 – 2 Devices

SOURCES: Metropolitan Airports Commission, 2020; Ricondo & Associates, Inc., February 2020.

The T2 domestic baggage claim is located on Level 1 of the T2 headhouse. The baggage claim, located on the non-secure side, includes 2 individual devices with 200 linear feet of presentation length each. Each claim unit is connected to an individual stripping belt in the cart staging area. **Table 1-8** presents the inventory for the T2 domestic baggage claim.

1.5.3.4 Security Checkpoint Inventory

The main Security Screening Checkpoint (SSCP) banks located after check-in are split between two locations in T1: north and south. Each SSCP includes both Automated Screening Lanes (ASLs) and non-ASLs for passenger processing, as well as an employee screening lane. Each location in T1 contains 9 screening lanes for a total of 18 screening lanes in T1.

There are three other checkpoints within the T1 complex. The recheck facility on Concourse G is primarily used for international inbound passenger processing, specifically after the FIS process. The Skyway and hotel passenger SSCPs are located adjacent to the hotel and skyway within the T1 complex. The skyway checkpoint has two lanes, while the hotel has one lane. The sand hotel checkpoints are limited in their operational times and do not have check-in facilities located adjacent to them.

Security screening is split between two locations in T2: Checkpoint 1 and Checkpoint 2. Each SSCP has a bank of non-ASLs for passenger processing. T2 does not have an employee screening lane. Checkpoint 1 contains 6 screening lanes and Checkpoint 2 contains 4 lanes, for a total of 10 screening lanes in T2.

Table 1-9 presents the SSCP inventory for both terminals.

Table 1-9: Security Screening Checkpoint Inventory

Equipment	T1					T2	
	South[1]	North[1]	Recheck[2]	Skyway[3]	Hotel[4]	# 1	# 2
Non-ASL Lanes	2	2	3	2	1	6	4
ASL Lanes	7	7	0	0	0	0	0
Employee Lanes	1	1	0	0	0	0	0
Total Lanes	9	9	3	2	1	6	4
WTMD/AIT	5/5	5/5	2/2	1/1	1/1	3/3	2/2
TDC Podiums	10	10	2	2	1	3	2

NOTES:
ASL – Automated Screening Lane
WTMD – Walk Through Metal Detector
AIT – Advanced Imaging Technology
TDC – Travel Document Checker
1 The T1 inventory is based on operational improvement plans provided by Alliiance.
2 Available for international connecting passengers only.
3 Open 5:30 a.m. to 1:15 p.m. No bag checking facilities are available prior to this checkpoint.
4 Open 4:45 a.m. to 10:00 a.m. No bag checking facilities are available prior to this checkpoint.
SOURCES: Metropolitan Airports Commission, 2020; Alliiance, 2020; Ricondo & Associates, Inc., February 2020.

1.5.3.5 Baggage Screening Facilities Inventory

Baggage screening is split between two locations in T1: T1 west and T1 south. Each baggage screening point has a bank of 5 and 2 CTX 9800 inline screening units, respectively. The units are arranged in an N+1 configuration, which assumes a single-unit redundancy. Bag throughput reflects this configuration. Expansion space is reserved for 2 additional units at T1 south.

Baggage screening is split between two locations in T2: T2 checked baggage inspection system (CBIS) and T2 out of gauge (OOG). Each baggage screening point has two CTX 9800 inline screening units, respectively. The T2 CBIS supports the primary baggage screening, while the T2 OOG supports the international connection baggage screening. The units are arranged in an N+1 configuration, which assumes a single-unit redundancy. Bag throughput reflects this

configuration. Expansion space is reserved for two additional units in the T2 CBIS. **Table 1-10** presents the baggage screening inventory for both terminals.

Table 1-10: Baggage Screening Facilities Inventory

Location	EDS Capacity			Expansion Reserved (Units)	Mainline BHS Capacity			CBRA Workstations	Notes
	EDS Models	Unit Throughput/Hour	Total EDS Throughput (Less N+1)		Number of Mainline Feeds	Bags/Hour /Feed	Total Mainline Feed Capacity		
T1 West CBIS	CTX 9800	674	2,022	-	2	1,800	3,600	14	Design Year: 2012
T1 South CBIS	CTX 9800	674	674	2	1	1,800	1,800	6	Design Year: 2017
T2 CBIS	CTX 9800	674	674	2	1	1,800	1,800	6	Design Year: 2016
T1 OOG and FIS	CT80XL (inline)	185	185	-	1	30	30		

NOTES:
EDS – Explosive Detection System
CBRA – Checked Baggage Resolution Area
BHS – Baggage Handling System
CBIS – Checked Baggage Inspection System
FIS – Federal Inspection Services
OOG – Out-of-Gauge
T1 – Terminal 1
T2 – Terminal 2
SOURCES: Metropolitan Airports Commission, 2020; Ricondo & Associates, Inc., February 2020.

1.5.3.6 Federal Inspection Station Inventory

Both T1 and T2 contain FIS facilities. Each facility includes a primary inspection area with automated passport control (APC) kiosks, international bag claim units, secondary and customs inspection areas, exit control area, space for Customs and Border Protection (CBP) offices and support space, and sterile circulation space for passenger movement from the international gates through the FIS process.

The T1 FIS facility supports 10 international-capable gates at T1, Gates G1 through G10. The FIS facility includes 2 bag claim devices with a total of 290 linear feet of presentation length for each device. **Table 1-11** presents the T1 FIS inventory.

The T2 FIS facility supports 5 international-capable gates at T2, Gates H3 through H7. The FIS facility includes 2 bag claim devices with a total of 200 linear feet of presentation length for each device. The international bag claim area has a set of movable walls that allows for the international claim units to be used for domestic arrival operations during times of international arrivals inactivity. **Table 1-11** presents the T2 FIS inventory.

Table 1-11: Federal Inspection Services Inventory

Attribute	Units	T1	T2
Primary Officer Booths	Positions	14	12
Primary Officer Podiums	Positions	2	--
APC Kiosks	Units	24	10
GE APC Kiosks	Units	8	4
Exit Control Positions	Positions	2	2
Bag Claim Carousels	Devices	2	2
Bag Claim Presentation Frontage	Linear Feet (Per Device)	290	200

NOTES:
APC – Automated Passport Control
GE – Global Entry
SOURCES: Metropolitan Airports Commission, 2020; Ricondo & Associates, Inc., February 2020.

1.5.4 Airfield Inventory

1.5.4.1 Runways

MSP has four runways, including one set of parallel runways. Runway 4-22 is the Airport's longest runway; it measures 11,006 feet long by 150 feet wide and has a 1,550-foot displaced arrival threshold on the Runway 4 approach end and a 1,000-foot displaced arrival threshold on the Runway 22 approach end. Runway 12L-30R measures 8,200 feet long by 150 feet wide and has a 200-foot displaced arrival threshold on the Runway 30R approach end. Runway 12R-30L measures 10,000 feet long by 200 feet wide. Runway 17-35 measures 8,000- feet long by 150 feet wide. **Exhibit 1-7** depicts the existing airfield configuration.

Federal Aviation Administration (FAA) airport design standards in Advisory Circular (AC) 150/5300-13B, *Airport Design (AC 13B), March 2022*, provide design guidelines for a safe and efficient airport system. General conformity to the FAA standards ensures an aircraft in a particular category can safely operate at an airport.

The Runway Design Code (RDC) identifies the existing and future design standards for a runway and is made up of three components: Airplane Design Group (ADG), Aircraft Approach Category (AAC), and approach visibility minimums. The AAC identifies the range of aircraft approach speeds that can be accommodated by the runway. The ADG is a function of the wingspan and tail height dimensions of the critical design aircraft. The approach visibility minimum is defined as the approved minimum horizontal visibility that the specific runway accommodates, expressed as a Runway Visual Range (RVR) value. The RDC provides the information needed to determine which design standards apply for existing and future configurations and are specific to each runway end. **Table 1-12** summarizes the components of an RDC, and **Table 1-13** presents the resulting runway characteristics for each runway.

DRAWING LEGEND

RUNWAY PAVEMENT	
EXISTING TAXIWAY / APRON PAVEMENT	
AIRPORT PROPERTY LINE	
EXISTING BUILDING - ON AIRPORT	
RUNWAY SAFETY AREA (RSA)	RSA
RUNWAY OBSTACLE FREE ZONE (OFZ)	OFZ
PRECISION OBSTACLE FREE ZONE (POFZ)	POFZ
RUNWAY OBJECT FREE AREA (ROFA)	ROFA
RUNWAY PROTECTION ZONE (RPZ)	RPZ
TAXIWAY OBJECT FREE AREA (TOFA)	TOFA
35' BUILDING RESTRICTION LINE (BRL) (1)	BRL
RUNWAY HOLDING POSITION (PATTERN A)	
ILS HOLDING POSITION (PATTERN B)	
INTERMEDIATE HOLDING POSITION (PATTERN C)	
NON-MOVEMENT AREA BOUNDARY	
APPROACH LIGHTING SYSTEM (MALSR)	
APPROACH LIGHTING SYSTEM (ALSF-2)	
NAVAID CRITICAL AREA	
HOT SPOT	
AIRPORT BEACON	

NOTES

1. THE BUILDING RESTRICTION LINE FOLLOWS ANY NAVAID CRITICAL AREA, RPZ AND TOFA WHERE OVERLAPPING.
2. AERIAL IMAGERY: NEARMAP (SEPTEMBER 2022)

SOURCE: HNTB, 2023.

MSP

MINNEAPOLIS-SAINT PAUL INTERNATIONAL AIRPORT
2040 LONG-TERM PLAN

N

0 1,600' 3,200'

FEBRUARY 2023

EXHIBIT 1-7
EXISTING AIRFIELD CONFIGURATION

Table 1-12: Runway Design Code (RDC) Components

Aircraft Approach Category (AAC)		
A	Less than 91 knots	
B	91 knots or more but less than 121 knots	
C	121 knots or more but less than 141 knots	
D	141 knots or more but less than 166 knots	
E	166 knots or more	
Airplane Design Group (ADG)		
	Wingspan	**Tail Height**
I	Less than 49 feet	Less than 20 feet
II	49 feet but less than 79 feet	20 feet but less than 30 feet
III	79 feet but less than 118 feet	30 feet but less than 45 feet
IV	118 feet but less than 171 feet	45 feet but less than 60 feet
V	171 feet but less than 214 feet	60 feet but less than 66 feet
VI	214 feet but less than 262 feet	66 feet but less than 80 feet
Approach Visibility Minimums (Runway Visual Range – RVR)		
VIS	Visual approach	
5,000	Not lower than 1 mile	
4,000	Lower than 1 mile, but not lower than ¾ mile	
2,400	Lower than ¾ mile, but not lower than ½ mile	
1,600	Lower than ½ mile, but not lower than ¼ mile	
1,200	Lower than ¼ mile	

NOTE: VIS - Visibility in feet
SOURCE: US Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, *Airport Design*, March 2022.

As featured in **Table 1-13**, the Approach Reference Code (APRC) and Departure Reference Code (DPRC) identify the operational capabilities of each runway and adjacent taxiways where no special operating procedures or restrictions are necessary. The APRC and DPRC do not consider runway length; they are only a measurement of ideal operational characteristics, as they relate to runway-taxiway separation (APRC and DPRC) and visibility minimums (APRC only). The APRC and DPRC can be used to determine what aircraft operations can occur without operational restrictions. Likewise, aircraft occasionally operating on a runway exceeding the APRC/DPRC, it identifies when operational restrictions should be in place, such as the occasional passage of ADG VI aircraft on a runway designed to ADG V standards. APRC and DPRC are assigned to each runway end and can be different between runway ends on the same runway.

Declared distances effectively reduce the amount of runway available for takeoff, aborted takeoffs, and landings so that adequate space exists for Runway Safety Areas (RSAs) and Runway Object Free Areas (ROFAs) to mitigate the presence of unsuitable land use in the runway protection zone (RPZ) or mitigate the presence of an obstacle in the approach or departure path of an aircraft. RSA, ROFA, and RPZ dimensional standards are reviewed in Chapter 3. **Table 1-13** presents the declared distances for each runway end at MSP, which are defined below by the FAA.

- Takeoff Run Available (TORA) – The runway length declared available and suitable for the ground run of an aircraft taking off.

- Takeoff Distance Available (TODA) – The TORA plus the length of and remaining runway or clearway beyond the far end of the TORA; the full length of TODA may need to be reduced because of obstacles in the departure area.
- Accelerate-Stop Distance Available (ASDA) – The runway plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting takeoff.
- Landing Distance Available (LDA) – The runway length declared available and suitable for landing an aircraft.

Table 1-13: Existing Runway Characteristics

Runway	4-22		12L-30R		12R-30L		17-35	
Length	11,006’		8,200’		10,000’		8,000’	
Width	150’		150’		200’		150’	
Surface	Concrete – Grooved		Concrete – Grooved		Concrete – Grooved		Concrete – Grooved	
Pavement Strength[1]	PCN: 105/R/B/W/T		PCN: 105/R/B/W/T		PCN: 106/R/B/W/T		PCN: 118/R/B/W/T	
	S-100		S-100		S-100		S-100	
	D-200		D-200		D-200		D-200	
	DT-400		DT-400		DT-400		DT-400	
	DDT-850		DDT-850		DDT-850		DDT-850	
Critical Design Aircraft	Airbus A330-900 NEO (Tail Height = 55’-1”, Wingspan = 210’-0”)							
Runway End	4	22	12L	30R	12R	30L	17	35
Lowest Approach Minimums Available	2,400 RVR / 200 HAT	4,000 RVR / 400 HAT	700 RVR / 100 HAT	4,000 RVR / 100 HAT	600 RVR / 100 HAT	1,000 RVR / 100 HAT	5,500 RVR / 600 HAT	600 RVR / 110 HAT
Runway Design Code (RDC)	D-V-2400	D-V-4000	D-V-700	D-V-4000	D-V-600	D-V-1000	D-V-5500	D-V-600
Approach Reference Code (APRC)	D/IV/2400 D/V/2400	D/IV/4000 D/V/4000	D/IV/1200	D/IV/4000 D/V/4000	D/IV/1200	D/IV/1200	D/IV/4000	D/IV/1200
Departure Reference Code (DPRC)	D/IV, D/V	D/IV, D/V	D/IV, D/V	D/IV, D/V	D/IV, D/V	D/IV, D/V	D/IV, D/V	D/IV, D/V
Runway-to-Parallel Taxiway Separation	Taxiway C (400’ – 600’) Taxiway M (400’ – 550’)		Taxiway P (400’) Taxiway R (400’)		Taxiway A (400’) Taxiway W (400’ – 600’)		Taxiway K (400’) Taxiway L (400’)	
Displaced Threshold	1,550’	1,000’	None	200’	None	None	None	None
Landing Distance Available (LDA)	9,456’	10,006’	7,620	8,000’	10,000’	10,000’	8,000’	8,000’
Takeoff Run Available (TORA)	11,006’	11,006’	8,200’	8,200’	10,000’	10,000’	8,000’	8,000’
Takeoff Distance Available (TODA)	11,006’	11,006’	8,200’	8,200’	10,000’	10,000’	8,000’	8,000’
Accelerate-Stop Distance Available (ASDA)	11,006’	11,006’	7,620’	8,200’	10,000’	10,000’	8,000’	8,000’

NOTES: 1 The PCN is a number that expresses the load-carrying capacity of a pavement for unrestricted operations.
PCN – Pavement Classification Number
S – Single Wheel (expressed in thousands of pounds); D – Double Wheel (expressed in thousands of pounds); DT – Double Tandem (expressed in thousands of pounds); DDT – Dual Double Tandem (expressed in thousands of pounds); TORA – Takeoff Run Available (runway length declared available and suitable for the ground run of an aircraft taking off); TODA – Takeoff Distance Available (TORA plus the length of the remaining runway or clearway beyond the far end of the TORA; full length of TODA may need to be reduced because of obstacles in the departure area); ASDA – Accelerate-Stop Distance Available (runway plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting takeoff); LDA – Landing Distance Available (runway length declared available and suitable for landing an aircraft)
SOURCE: HNTB Corporation, November 2022.

1.5.4.1 Taxiways and Taxilanes

The taxiway and taxilane system shown on **Exhibit 1-8** provides aircraft connections between runways and aprons throughout the airfield. Like runway standards, taxiway standards are derived from the size and type of aircraft expected to use the taxiways. The Main Gear Width (MGW) and the Cockpit to Main Gear (CMG) dimensions determine the Taxiway Design Group (TDG) classification. The TDG establishes the standards for taxiway width, taxiway shoulder width, taxiway edge safety margin (TESM), and taxiway fillet design at intersections. The designated ADG of a taxiway determines other dimensional standards, such as the Taxiway Safety Area (TSA), Taxiway Object Free Area (TOFA), and separation standards in relation to other airfield pavements (runways, taxiways, taxilanes, aprons, and Vehicle Service Roads (VSRs)). The dimensional standards are discussed in Chapter 3. **Table 1-14** summarizes the existing taxiways and taxilanes at MSP and their basic characteristics.

Table 1-14: (1 of 5) Taxiway System Summary

Taxiway	Segment	Type	Width	Shoulder Width	ADG	TDG
A	TWY A1 – TWY A4 TWY A4 – TWY A7 TWY A7 – TWY A10	Full Parallel TWY	75’	35’ 30’ 35’	V	5
A1	RWY 12R-30L – TWY A TWY A – TWY B	RWY Entrance Crossover TWY	100’	35’	V	5
A2	RWY 12R-30L – TWY A TWY A – TWY B	RWY Entrance Crossover TWY	100’ 120’	35’ 30’	V	5
A3	RWY 12R-30L – TWY A TWY A – TWY B	High-Speed Exit Crossover TWY	100’ 150’	35’ 30’	V	5
A4	TWY A – TWY B	High-Speed Exit TWY	100’	35’	V	5
A5	RWY 12R-30L – TWY A	Exit TWY	100’	35’	V	5
A7	RWY 12R-30L – TWY A	Exit TWY	100’	35’	V	5
A8	RWY 12R-30L – TWY A	Exit TWY	100’	35’	V	5
A9	RWY 12R-30L – TWY A TWY A – TWY B	RWY Entrance Crossover TWY	100’	35’	V	5
A10	RWY 12R-30L – TWY A TWY A – TWY B	RWY Entrance Crossover TWY	100’	35’	V	5
B	TWY A1 – TWY A3 TWY A3 – DWY D TWY D – TWY M TWY M – TWY A10	Full Parallel TWY	75’ 75’ 100’ 75’	20’ None 35’ 35’	IV(<135’) IV V V	4 5 5 5
B8	TWY A – TWY B	Crossover TWY	75’	35’	V	5
RWY 30L Deicing Pad Taxilane	TWY A3/B – TWY A2/B	Deicing Pad TL	50’	None	IV(<135’)	4

NOTES: TWY – Taxiway; RWY – Runway; ADG – Airplane Design Group; TDG – Taxiway Design Group
SOURCE: HNTB Corporation, November 2022.

Table 1-14: (2 of 5) Taxiway System Summary

Taxiway	Segment	Type	Width	Shoulder Width	ADG	TDG
C	NMAB Parking–TWY D TWY D – RWY 12R-30L TWY 12R-30L – TWY A TWY A – TWY P TWY P – RWY 12L-30R RWY 12L-30R – TWY C10	Apron TWY Partial Parallel TWY Partial Parallel TWY Partial Parallel TWY Partial Parallel TWY Partial Parallel TWY	75’ 100’ 75’ 100’ 75’ 100’	35’	V	5
C1	TWY C – TWY D	Crossover TWY	100’	30’	V	5
C2	RWY 4-22 – TWY C TWY C – TWY D	RWY Exit Crossover TWY	100’	35’	V	5
C5	TWY C – TWY D	Crossover TWY	100’	35’	V	5
C6	RWY 4-22 – TWY C TWY C – TWY D	RWY Exit Crossover TWY	75’ 100’	35’	V	5
C9	RWY 4-22 – TWY C	RWY Entrance TWY	100’	35’	V	5
C10	RWY 4-22 – TWY C	RWY Entrance TWY	100’	35’	V	5
D	TWY K – TWY C1 TWY C1 – TWY W TWY W – TWY A TWY A – TWY P	Partial Parallel TWY	75’ 75’ 100’ 75’	35’ 30’ 35’ 35’	V	5
G	TWY P – RWY 12L-30R RWY 12L-30R – TWY C	RWY Exit TWY Midfield Connector	100’ 75’	35’ 10’	V	5
G1	TWY G - Apron	Apron Access TWY	75’	50’	V	5
G2	TWY G - Apron	Apron Access TWY	75’	35’	V	5
H	TWY B – TWY Q	Midfield Connector	75’	35’	V	5
J	TWY M – TWY Q	Midfield Connector	50’	25’	III(<85.3’)	3
K	TWY K1 – TWY K10	Full Parallel TWY	75’	35’	V	5
K1	RWY 17-35 – TWY K	RWY Entrance TWY	100’	35’	V	5
K2	RWY 17-35 – TWY K	RWY Entrance TWY	100’	35’	V	5
K3	RWY 17-35 – TWY K	RWY Exit TWY	100’	34’	V	5
K6	RWY 17-35 – TWY K	High-Speed Exit TWY	100’	35’	V	5
K8	RWY 17-35 – TWY K TWY K – TWY W	High-Speed Exit TWY Crossover TWY	100’ 75’	35’	V	5
K10	RWY 17-35 – TWY K	RWY Entrance TWY	100’	35’	V	5
L	TWY L3 – TWY L10	Partial Parallel TWY	75’	35’	V	5
L3	RWY 17-35 – TWY L	RWY Exit TWY	100’	35’	V	5
L5	TWY L – NMAB Marking	Apron TWY	100’	35’	V	5
L5 Taxilane	NMAB Marking – Apron	Apron TL	75’	25’	V	5

NOTES: TWY – Taxiway; RWY – Runway; ADG – Airplane Design Group; TDG – Taxiway Design Group
SOURCE: HNTB Corporation, November 2022.

Table 1-14: (3 of 5) Taxiway System Summary

Taxiway	Segment	Type	Width	Shoulder Width	ADG	TDG
L6	RWY 17-35 – TWY L TWY L – NMAB Marking	RWY Exit TWY Apron TWY	100’	35’	V	5
L6 Taxilane	NMAB Marking - Apron	Apron TL	75’	None	V	5
L7	RWY 17-35 – TWY L	RWY Exit TWY	100’	35’	V	5
L9	RWY 17-35 – TWY L	RWY Entrance TWY	100’	35’	V	5
L10	RWY 17-35 – TWY L	RWY Entrance TWY	100’	35’	V	5
M	TWY S – TWY W TWY W – TWY A TWY A – TWY P TWY P – RWY 12R-30L	Partial Parallel TWY Partial Parallel TWY Partial Parallel TWY Exit TWY	75’ 100’ 75’ 100’	35’	V	5
M2	RWY 4-22 – TWY M	RWY Exit TWY	100’	35’	V	5
M6	RWY 4-22 – TWY M	RWY Exit TWY	100’	35’	V	5
N	TWY K – TWY L	RWY Exit TWY	100’	35’	V	5
P	TWY P1 – TWY M TWY M – TWY P10	Full Parallel TWY	75’	35’ 30’	V	5
P1	RWY 12R-30L – TWY P TWY P – NMAB Marking	RWY Entrance TWY Deicing Pad TWY	100’	35’	V III (<97’)	5 3
P2	RWY 12R-30L – TWY P TWY P – TWY Q	RWY Entrance TWY Crossover TWY	100’	34’	V III (<97’)	5 3
P3	RWY 12R-30L – TWY P	High-Speed Exit TWY	75’	35’	V	5
P4	RWY 12R-30L – TWY P	High-Speed Exit TWY	75’	35’	V	5
P8	RWY 12R-30L – TWY P	High-Speed Exit TWY	75’	35’	V	5
P9	RWY 12R-30L – TWY P	RWY Entrance TWY	100’	35’	V	5
P10	RWY 12R-30L – TWY P TWY P – TWY Q	RWY Entrance TWY Crossover TWY	100’	34’	V IV	5
Q Taxilane	NBAB Marking – Concourse A-B TL & RWY 30R Deicing Pad	Apron TL	50’	None	III (<97’)	3
Q	NMAB Marking – TWY P2 TWY P2 – TWY P3 TWY P3 – TWY D TWY D – TWY M TWY M – TWY P10	Apron Access TWY Partial Parallel TWY Partial Parallel TWY Partial Parallel TWY Partial Parallel TWY	50’ 50’ 50’ 100’ 75’	None None None 35’ 35’	III (<97’) III (<97’) IV (<135’) V IV	3 3 4 5 5

NOTES: TWY – Taxiway; RWY – Runway; ADG – Airplane Design Group; TDG – Taxiway Design Group
SOURCE: HNTB Corporation, November 2022.

Table 1-14: (4 of 5) Taxiway System Summary

Taxiway	Segment	Type	Width	Shoulder Width	ADG	TDG
Concourse A-B Taxilane	TL Q – NMAB Marking NMAB Marking–TWY Q	Apron TL	35’	None	III (<81.5’)	2
Concourse E-F Taxilane	TWY D–NMAB Marking NMAB Marking-Gates E7/F7 Gates E7/F7 – Gates E1/F1	Apron TWY Apron TL Apron TL	50’	None	IV (<135’) IV (<135’) III	4 4 3
R	RWY 4-22 – TWY R8 TWY R8 – TWY R10	Midfield Connector Partial Parallel	75	10’ 35’	V	5
R3	TWY R – Apron	Apron Access TWY	60’	35’	V	5
R4	TWY R – Apron	Apron Access TWY	60’	30’	V	5
R5	TWY R – Apron	Apron Access TWY	60’	30’	V	5
R6	TWY R – Apron	Apron Access TWY	80’	30’	V	5
R7	TWY R – Apron	Apron Access TWY	80’	30’	V	5
R8	TWY R – Apron	Apron Access TWY	100’	10’	V	5
R9	RWY 12R-30L – TWY R	RWY Entrance TWY	100’	35’	V	5
R10	RWY 12R-30L – TWY R	RWY Entrance TWY	100’	35’	V	5
S	TWY K – NMAB Marking	Midfield Connector	75’	35’	V	5
S Taxilane	NMAB Marking – TL S4 TL S4 – Apron	Midfield Connector TL Apron Access TL	75’	30’	V III	5 3
S1 Taxilane	TWY D – TL S	Apron TL	100’	35’	IV	5
S2 Taxilane	TL S – Run-Up Pad & Apron	Apron Access TL	75’	35’	V	5
S3 Taxilane	TL S - Apron	Apron TL	75’	30’	III	3
S4 Taxilane	TL S - Apron	Apron TL	75’	30’	IV (<135’)	4
T	TWY D – TWY C TWY C – RWY 4-22 RWY 4-22 – TWY M TWY M–NMAB Marking Infield Cargo Apron NMAB Marking–TWY Y	Crossover TWY RWY Exit TWY RWY Exit TWY Apron TWY Apron TL Apron TWY	100’ 75’ 100’ 100’ 75’ 100’	30’ 35’ 35’ 35’ None 35’	V	5

NOTES: TWY – Taxiway; RWY – Runway; ADG – Airplane Design Group; TDG – Taxiway Design Group
SOURCE: HNTB Corporation, November 2022.

Table 1-14: (5 of 5) Taxiway System Summary

Taxiway	Segment	Type	Width	Shoulder Width	ADG	TDG
W	TWY W1 – TWY D TWY D – TWY M TWY M – TWY K	Full Parallel TWY	75' 100' 75'	35'	V	5
W1	RWY 12R-30L–TWY W	RWY Entrance TWY	100'	35'	V	5
W2	RWY 12R-30L–TWY W	RWY Entrance TWY	100'	34'	V	5
W3	RWY 12R-30L–TWY W	RWY Exit TWY	100'	35'	V	5
W5	RWY 12R-30L–TWY W TWY W–NMAB Marking	RWY Exit TWY Apron Access TWY	75'	35'	V IV (<135')	4
W5 Taxilane	NMAB Marking - Apron	Apron Access TL	75'	10'	IV (<135')	4
W6	TWY W–NMAB Marking	Apron Access TWY	50'	20'	III	3
W6 Taxilane	NMAB Marking - Apron	Apron Access TL	50'	20'	III	3
W7	RWY 12R-30L–TWY W	RWY Exit TWY	100'	35'	V	5
W8	RWY 12R-30L–TWY W	RWY Exit TWY	100'	35'	V	5
W9	RWY 12R-30L–TWY W	RWY Entrance TWY	100'	35'	V	5
W10	RWY 12R-30L–TWY W	RWY Entrance TWY	100'	35'	V	5
Y	RWY 17-35 – TWY K TWY K – TWY W	High-Speed Exit Midfield Connector	100' 75'	35'	V	5
Z	TWY K – TWY W	Midfield Connector	75'	35'	V	5
RWY 4-22	TWY K – TWY P	RWY Operating as TWY	150'	35'	V	5

NOTES: TWY – Taxiway; RWY – Runway; ADG – Airplane Design Group; TDG – Taxiway Design Group
SOURCE: HNTB Corporation, November 2022.

1.5.4.2 Apron Areas

As presented on **Exhibit 1-8**, there are several aircraft apron and parking areas throughout the MSP airfield. The naming in **Exhibit 1-9** and in the following sections is for reference purposes only and not a reflection of the actual designation for these areas.

- **Apron A –** The T1 apron is approximately 5.5 million square feet and is located between Runways 12L-30R and 12R-30L. This apron supports all gates at T1 and is accessible from perimeter Taxiways B, D, and Q. This apron accommodates 102 gate positions and 4 hardstand positions.
- **Apron B –** The T2 apron is approximately 1.1 million square feet and is located between the T2 building and Taxiway D. This apron accommodates 14 gate positions and 2 additional hardstand positions.

- **Apron C1 –**The infield cargo area apron has two aprons separated by Taxiway T. The north ramp is operated by FedEx and is approximately 680,000 square feet. The south ramp is operated by UPS and is approximately 650,000 square feet. Both cargo ramps have associated warehouses with landside access tunneled under Runway 17-35 via Cargo Road.

- **Apron C2 –** The west cargo apron is located west of Taxiway L and is approximately 650,000 square feet. DHL and Amazon share use of the apron and the associated warehouse. Landside access is provided on Cargo Road to Longfellow Avenue.

- **Apron D1 –** The Minnesota Air National Guard (MNANG) apron is located north of Runway 12L-30R and accessible via Taxiway G. Apron D1 is approximately 850,000 square feet and north of Apron D1 is a closed taxilane and apron used by the MNANG museum. Both the D1 Apron and closed taxiway are outside of the MAC property line. Per the MNANG website, the MNANG operates the C-130 Hercules out of the MSP Base and provides airlift of troops, cargo, and medical patients along with expeditionary combat support in communications, security forces, and civil engineering worldwide.

- **Apron D2-** The United States Air Force Reserve, 934th Airlift Wing apron is located north of Runway 12L-30R and accessible via Taxiway R. Apron D2 is approximately 750,000 square feet, of which approximately 310,000 square feet is outside of the MAC property line. The 934th Airlift Wing operates the C-130 Hercules out of the MSP Station and provides worldwide deployment of people, cargo, and services which support the United States Air Force.

- **Apron E –** In the center of the airfield, south of the intersection of Runways 12R-30L and 4-22, is the fixed base operator (FBO) apron. This apron is approximately 820,000 square feet, and it allows for the parking of charter and private aircraft. Generally, the aircraft is ADG III or smaller, but access to the apron is suitable for up to ADG V aircraft, if needed. The apron is surrounded by 7 hangars and a Signature Flight Support (Signature) terminal building. The existing hangars total approximately 263,000 square feet.

- **Apron F1 –** Apron F1 is located off Taxiway S and is approximately 673,000 square feet total. Delta uses the apron area for maintenance and staging of aircraft. There are several Delta hangars and maintenance buildings with access to the apron.

- **Apron F2** - Apron F2 is also located off Taxiway S, to the west of the GRE. The apron is approximately 226,000 square feet. The apron is primarily used as a staging area by Delta for their cargo operations. The apron is accessible via a 107,000 square-foot cargo warehouse facility.

- **Apron F3 -** Apron F3 is located off Taxiway B at the approach end of Runway 30L. The apron is approximately 324,000 square feet and is used by Delta as an aircraft maintenance and staging area. A 115,000 square foot hangar provides access to apron area.

- **Apron G –** Apron G is located on the west side of the airfield off Taxiway L near the Runway 4 approach end. The apron is approximately 700,000 square feet and is used as an aircraft staging and maintenance area by Sun Country. There are three Sun Country hangars totaling approximately 235,000 square feet at the apron.

1.5.4.3 Remain-Overnight Parking (RON)

MSP has two designated Remain-Overnight (RON) parking areas depicted on **Exhibit 1-9**. RON A is located southeast of T1 Concourse G, accessible by Taxiway B, and is used by Delta for narrowbody RON parking. RON A can accommodate a maximum of seven narrowbody aircraft or a combination of widebody aircraft and reduced narrowbody positions. RON A has a jet blast wall protecting Foshay Drive from parked aircraft.

RON B is referred to as the T2 Remote Apron and is located east of Runway 35 with access from Taxilane S. While this location is available for RON operations, the area's primary use is as a deicing pad. When used for RON, the area is suitable for parking narrowbody aircraft in a variety of configurations. Airlines using this area for RON are most likely carriers operating from T2 which do not have a dedicated on-airport maintenance apron or a large number of contact gates, such as Allegiant, Frontier, or Jet Blue. The area also has a service vehicle storage facility attached to the west.

1.5.4.4 Deicing Pads

MSP has six deicing pads located near each runway end as shown on **Exhibit 1-8**. The Runway 17 Deice Pad is located adjacent to Runway 17 between Taxiways Y and Z and can accommodate seven narrowbody aircraft. The maximum size aircraft accommodated varies by spot on the deice pad. The largest aircraft that can be accommodated on the Runway 17 Deice Pad is the B757-300W. The T2 Remote Deice Pad is located to the south as a portion of the T2 Remote Apron and can accommodate six narrowbody aircraft. The largest aircraft accommodated on the northern three positions is the B737-900W and the largest aircraft accommodated on the southern three positions is the B757-300W. The Runway 12R Deice Pad is located northeast of Runway 12R along Taxiway A and can accommodate eight narrowbody aircraft. The largest aircraft accommodated on the northern six positions is the B757-300W and the largest aircraft accommodated on the southern two positions is the EMB-175. The Runway 30L Deice Pad is located adjacent to Runway 30L along Taxiway B and can accommodate five narrowbody aircraft. The largest aircraft accommodated on the deice pad is the B757-300W. The Runway 12L Deice Pad is adjacent to Runway 12L in between Taxiway P and Taxiway Q and can accommodate seven narrowbody aircraft. The maximum size aircraft accommodated varies by spot on the deice pad. The largest aircraft that can be accommodated on the Runway 12L Deice Pad is the B757-300W. The Runway 30R Deice Pad is at the end of T1 Concourse A, adjacent to Runway 30R, and can accommodate two narrowbody EMB-195 aircraft and two regional jet CRJ-900 aircraft.

The deicing pads are sized for narrow body aircraft usage and are used by the various airlines serving MSP. On occasion, widebody aircraft may be deiced at deicing pads, however they block the taxiway behind the aircraft when that occurs. Therefore, most widebody aircraft are deiced at or near their assigned gate position. The following users/carriers deice at gates or on the ramp: Air France, Bemidji Aviation, Delta widebody aircraft, FedEx, KLM, Signature, United, UPS, and west cargo carrier widebody aircraft.

DRAWING LEGEND

RUNWAY PAVEMENT	
EXISTING TAXIWAY / APRON PAVEMENT	
AIRPORT PROPERTY LINE	
EXISTING BUILDING - ON AIRPORT	
APRON PARKING AREA	
REMAIN OVER NIGHT (RON) PARKING AREA	
DEICE PAD	

APRON D2
APRON D1
RWY 12L DEICE PAD
RWY 12R DEICE PAD
RWY 17 DEICE PAD
RUNWAY 12L-30R 8,200' x 150'
APRON A
APRON C1
RUNWAY 4-22 11,006' x 150'
RUNWAY 12R-30L 10,000' x 200'
RUNWAY 17-35 8,000' x 150'
RWY 30R DEICE PAD
RON A
APRON C2
APRON B
RWY 30L DEICE PAD
APRON E
APRON F3
APRON G
T2 REMOTE DEICE PAD
APRON F2
APRON F1
RON B

SOURCES: Nearmap, September 2022 (Aerial Imagery), HNTB, 2022.

NOTES

1. AERIAL IMAGERY: NEARMAP (SEPTEMBER 2022)
2. SEE MSP LONG-TERM PLAN SECTION 1.4 FOR DESCRIPTION OF APRON PARKING AREAS, RON PARKING, AND DEICE PADS DEPICTED ON EXHIBIT

MSP
MINNEAPOLIS-SAINT PAUL INTERNATIONAL AIRPORT
2040 LONG-TERM PLAN

N

0 1,300' 2,600'

JANUARY 2023

EXHIBIT 1-8
AIRCRAFT PARKING, RON, AND DEICE FACILITIES

1.5.4.5 Airfield Lighting

MSP has a variety of lighting systems to assist with operations during periods of low visibility or at night. A summary of lighting features for each runway is presented in **Table 1-15**. Existing lighting installations include the following:

- **Runway Lighting** – All runways are equipped with High Intensity Runway Edge Lights (HIRLs). In-pavement runway centerline lights (RCLs) are installed on all runways, except Runway 4-22.
- **Approach Lighting System (ALS)** – Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) are installed on the Runway 4 and 22 approach ends and are installed in-pavement along the respective 1,550-foot and 1,000-foot displaced thresholds. A Medium Intensity Approach Lighting System with Sequenced Flashing Lights (MALSF) is installed on the Runway 30R approach end. Runways supporting CAT II/III precision approaches have a High Intensity Approach Lighting System with Sequenced Flashers (ALSF-2) and are installed on the Runways 12R, 12L, 30L, and 35 approach ends.
- **Precision Approach Path Indicator (PAPI)** – PAPI is a lighting system that provides visual approach slope information. The system provides a combination of white and red-light projection patterns along the desired path to the touchdown point. All runways are equipped with a four-light PAPI system. All PAPIs, except for Runway 17, are located on the left side of the runway (when viewed from an aircraft on approach land).
- **Runway Status Lights (RWSLs)** – The RWSLs prevent runway incursions by providing a critical visual queue if the runway is in use and therefore unsafe for entry or crossing. There are two types of RWSLs: Takeoff Hold Lights (THLs) which are near the ends of the runway, and Runway Entrance Lights (RELs) which indicate when it is safe to enter or cross a runway. There are no THLs present at MSP. RELs are present at Runway 17-35 at taxiways K1, K2, K3, N (both sides of Runway 17-35), K6, Y, L3, L6, and L7; at Runway 12R-30L at Taxiways A1, A2, A3, A5, A7, D (both sides of Runway 12R-30L), C (both sides of Runway 12R-30L), M (both sides of Runway 12R-30L), A8, A9, A10, W1, W2, W3, W5, W7, W8, W9, and W10; and at Runway 12L-30R at Taxiways P1, P2, G (both sides of Runway 12L-30R), C (both sides of Runway 12L-30R), P9, P10, R9, and R10.
- **Runway End Identifier Lights (REIL)** – REILs consist of two synchronized flashing strobe lights (one on each side of the runway at the threshold), providing a visual reference point to assist pilots in identifying the runway end during approach. Only the approach end of Runway 17 has REILs installed.
- **Airport Beacon** – The airport beacon is located northeast of Runway 12R-30L near the VOR sight. The airport beacon indicates the location of the airport to pilots at night.
- **Taxiway Lighting** – All taxiways have Medium Intensity Taxiway Lights (MITL) to support nighttime and low visibility operations. Select taxiways also feature in-pavement Taxiway Centerline Lighting (TCL). Installation of TCLs are generally tied to being on a Surface Movement Guidance and Control System (SMGCS) routing for low visibility operations (CAT II/III).

- **Runway Guard Lights (RGL)** – RGLs are intended to reduce the likelihood of a runway incursion by indicating to pilots the presence of a runway. RGLs include both aboveground (wigwags) and in-pavement lighting. The yellow lights flash and alternate to enhance situational awareness. At MSP, all runway-taxiway intersections include aboveground RGLs.

Table 1-15: Existing Runway Lighting

	Runway End							
Lighting	4	22	12L	30R	12R	30L	17	35
HIRL	X	X	X	X	X	X	X	X
RCL			X	X	X	X	X	X
MALSR	X	X						
MALSF				X				
ALSF-2			X		X	X		X
PAPI	X	X	X	X	X	X	X	X
REIL							X	
RGL	X	X	X	X	X	X	X	X

NOTES:
HIRL – High-Intensity Runway Light
RCL – Runway Centerline Light
MALSR – Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights
MALSF – Medium-Intensity Approach Lighting System with Sequenced Flashing Lights
ALSF-2 – High-Intensity Approach Lighting System with Sequenced Flashing Lights
PAPI – Precision Approach Path Indicator
REIL – Runway End Identifier Light
RGL – Runway Guard Light
SOURCE: HNTB Corporation, November 2022.

1.5.4.6 Navigational Aids

MSP has a variety of navigational aids (NAVAIDs) to aid aircraft operations at the Airport. NAVAIDs are generally classified as precision, non-precision, or visual, and the category of NAVAIDs present determines the approach type for each runway end.

NAVAIDs, for use by a precision instrument approach procedure, typically include a glideslope antenna (GS), localizer antenna (LOC), and select Global Positioning Systems (GPS). These NAVAID components, when combined, create a horizontally and vertically guided Instrument Landing System (ILS).

Non-precision NAVAIDs include GPS, Airport Surveillance Radar 9 (ASR-9), Very High Frequency (VHF) Omni-Directional Range (VOR) with or without Distance Measuring Equipment (DME), Non-Directional Beacon (NDB), Runway Visual Range (RVR), and Tactical Air Navigation (TACAN). **Table 1.4-5** summarizes the various NAVAIDs available for each runway end.

Table 1-16: Existing Navigational Aids

	Runway End							
NAVAID	4	22	12L	30R	12R	30L	17	35
Glideslope Antenna			X	X	X	X		X
Localizer Antenna	X	X	X	X	X	X	X	X
Runway Visual Range	X	X	X	X	X	X	X	X
Inner Marker Beacons			X		X	X		X
Distance Measuring Equipment			X	X	X	X	X	X

NOTE: NAVAID – Navigational Aid
SOURCE: HNTB Corporation, November 2022.

1.5.4.7 Runway Operating Characteristics

MSP has historically operated with five runway-use configurations. The flows, driven by wind and weather conditions, are North, Straight North, Mixed A, South, and Straight South. **Table 1-17** describes the configurations that are depicted on **Exhibit 1-9**. In total, the modeled flows represent 91.92% of the average annual runway-use configuration. During strong winter storms, where winds tend to originate from the north, Runway 35 is used as the primary arrival runway and Runway 4 is used as the primary departure runway. Departing aircraft generally enter Runway 4 at Taxiway S for this runway-use configuration.

Table 1-17: Runway Operating Configurations

	North	Straight North	Mixed A	South	Straight South
Arrival Runway(s)	30L, 30R, 35[1]	30L, 30R	30L, 30R	12L, 12R	12L, 12R
Departure Runway(s)	30L, 30R	30L, 30R	30L, 30R, 17	12L, 12R, 17	12L, 12R

NOTE:
1 Requires the use of a complex Converging Runway Operation (CRO) with simultaneous arrivals on Runways 30L, 30R, and 35.
SOURCE: Metropolitan Airports Commission, 2022.

1.5.4.8 Runway Wind Coverage

The existing runway configuration's ability to accommodate wind coverage requirements as outlined by the FAA in Advisory Circular 150/5300-13B is presented below. To accommodate the existing AAC D aircraft operations, MSP needs to cover at least 95% of all-weather combined wind coverage for the 20-knot crosswind component. This requirement is met for each runway, as well as the combined airfield wind coverage requirement. **Table 1-18** to **Table 1-22** summarize the wind coverage data for the runways at MSP.

STRAIGHT NORTH FLOW
VMC / MVMC / IMC

MIXED FLOW A
VMC / MVMC / IMC

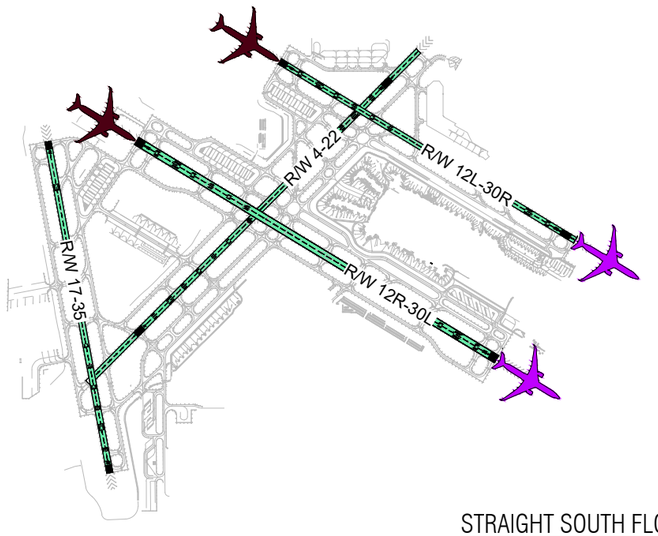
VISUAL METEOROLOGICAL CONDITIONS (VMC)
CEILING HEIGHT $\geq$ 2,500' AND VISIBILITY $\geq$ 5 MILES

MARGINAL VISUAL METEOROLOGICAL CONDITIONS (MVMC)
CEILING HEIGHT $<$ 2,500' AND $\geq$ 800' OR
VISIBILITY $<$ 5 MILES AND $\geq$ 2 MILES

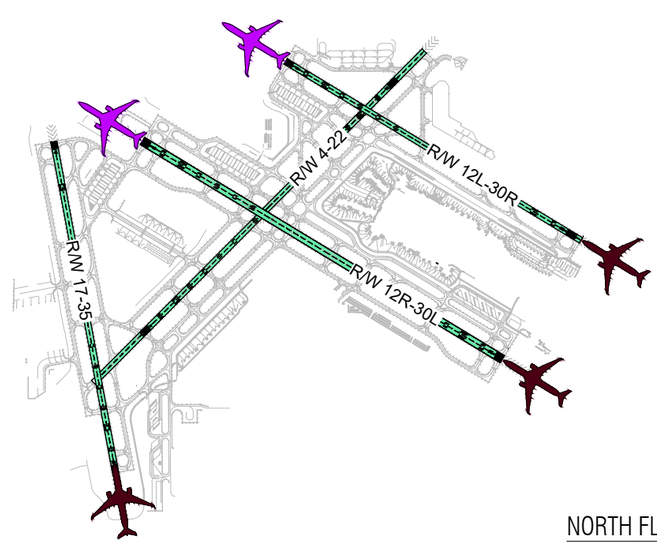
INSTRUMENT METEOROLOGICAL CONDITIONS (IMC)
CEILING HEIGHT $<$ 800' OR VISIBILITY $<$ 2 MILES

SOURCE: FAA, AVIATION SYSTEM PERFORMANCE METRICS, AIRPORT EFFICIENCY MODULE

SOUTH FLOW
VMC / MVMC / IMC



STRAIGHT SOUTH FLOW
VMC / MVMC / IMC



NORTH FLOW
VMC / MVMC

DRAWING LEGEND	
EXISTING RUNWAY PAVEMENT	
EXISTING TAXIWAY / APRON PAVEMENT	

ARRIVAL

DEPARTURE

SOURCES: Nearmap, September 2022 (Aerial Imagery).

MSP

MINNEAPOLIS-SAINT PAUL
INTERNATIONAL AIRPORT
2040 LONG-TERM PLAN

NOT TO SCALE

JANUARY 2023

EXHIBIT 1- 9
RUNWAY OPERATING CONFIGURATIONS

Table 1-18: Runway 4-22 Wind Coverage

Crosswind Component (Knots)	VFR Coverage	IFR Coverage	All Weather Coverage
10.5	81.71%	83.40%	81.97%
13.0	89.28%	90.33%	89.44%
16.0	96.58%	96.73%	96.63%
20.0	99.24%	99.14%	99.24%

NOTES: VFR – Visual Flight Rules; IFR – Instrument Flight Rules
SOURCE: U.S. Department of Transportation, Federal Aviation Administration, Airport Data and Information Portal (ADIP), 2022.

Table 1-19: Runway 12L/R to Runway 30L/R Wind Coverage

Crosswind Component (Knots)	VFR Coverage	IFR Coverage	All Weather Coverage
10.5	91.94%	88.87%	91.60%
13.0	96.15%	94.11%	95.92%
16.0	99.13%	98.15%	99.02%
20.0	99.86%	99.63%	99.83%

NOTES: VFR – Visual Flight Rules; IFR – Instrument Flight Rules
SOURCE: U.S. Department of Transportation, Federal Aviation Administration, Airport Data and Information Portal (ADIP), 2022.

Table 1-20: Runway 17-35 Wind Coverage

Crosswind Component (Knots)	VFR Coverage	IFR Coverage	e
10.5	89.37%	88.02%	
13.0	94.40%	93.42%	94.31%
16.0	98.24%	97.85%	
20.0	99.60%	99.48%	99.59%

NOTES: VFR – Visual Flight Rules; IFR – Instrument Flight Rules
SOURCE: U.S. Department of Transportation, Federal Aviation Administration, Airport Data and Information Portal (ADIP), 2022.

Table 1-21: All Runways Wind Coverage

Crosswind Component (Knots)	VFR Coverage	IFR Coverage	All Weather Coverage
10.5	99.71%	99.65%	99.70%
13.0	99.95%	99.95%	99.95%
16.0	99.99%	99.99%	99.99%
20.0	100%	100%	100%

NOTES: VFR – Visual Flight Rules; IFR – Instrument Flight Rules
SOURCE: U.S. Department of Transportation, Federal Aviation Administration, Airport Data and Information Portal (ADIP), 2022.

Table 1-22: Runway Operating Configurations – Instrument Flight Rules Coverage (20 Knots)

Runway Operating Configuration	Wind Coverage
Straight North	71.02%
Mixed A	98.72%
South	84.42%
Straight South	79.93%

SOURCE: U.S. Department of Transportation, Federal Aviation Administration, Airport Data and Information Portal (ADIP), 2022.

1.5.5 Cargo

Air cargo facilities at MSP are located on the west and south sides of the Airport with on-airport cargo handling and processing generally occurring in four primary locations: 1) FedEx and UPS facilities, 2) the DHL facility (Amazon/DHL) and Sun Country facility, 3) Air Cargo Center, and 4) Main Delta Cargo facility. **Exhibit 1-10**, MSP Air Cargo Facilities Map shows a map of the Airport and location of the cargo facilities.

The existing cargo facilities at MSP shown in **Table 1-23** represent approximately 523,000 square feet of total cargo building area designated for air cargo activities. All the space leased to FedEx and UPS is dedicated to air cargo whereas Delta facilities, the DHL facility housing Amazon and DHL, and the Air Cargo Center also have other aeronautical or non-cargo related activities which are not accounted for in the summary table below. Freighter cargo (primarily FedEx and UPS) represented about 88% of total air cargo in 2020 but has historically only represented about 74% of total air cargo, the remainder being transported in the belly hold of commercial passenger aircraft. The recent shifts in air cargo segments are mainly due to the impact of the COVID-19 pandemic and the reduction in scheduled passenger services at MSP.

Due to the pandemic, the Delta Dash facility has been closed. All volume is being processed through their main cargo facility. As passenger flights return and more belly space becomes available, the Dash facility may reopen.

LEGEND

Cargo Facility

Cargo Apron

SOURCES: Metropolitan Airports Commission, 2022 (Basemap); Nearmap, September 2022 (Aerial Imagery), Ricondo & Associates, Inc., 2022.

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EXHIBIT 1-10

Existing Cargo Facilities

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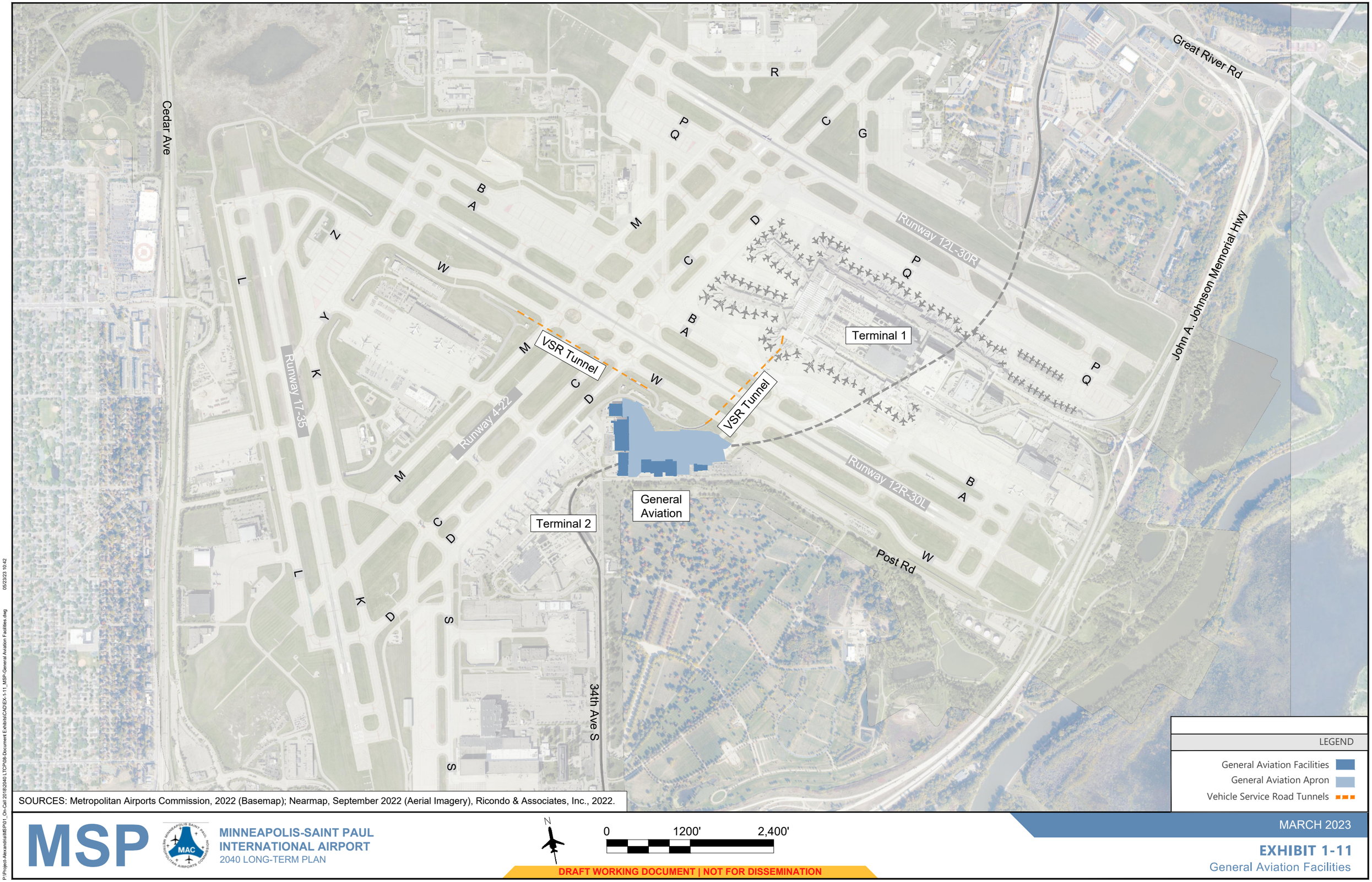
Table 1-23: Existing Air Cargo Facilities

Building	Carrier	Building SQ FT	Apron SQ FT	Landside/Other SQ FT	2020 Metric Tons
FedEx	FedEx	203,000	341,000	522,540	89,793
UPS	UPS	67,000	406,128	558,374	70,566
Delta	Main Delta Cargo	104,036	0	585,698	18,365
	Delta Dash	2,064	0	33,000	
DHL	Amazon (Atlas/Sun Country)	3,009	240,000	54,828	12,216
	DHL	33,284			7,531
	WFS	10,134			Handler Only
Sun Country Headquarters	Sun Country (Belly/Amazon)	6,165		Shared	1,837
Air Cargo Center	Other/WFS	23,953	0	Shared	3,389
	Southwest Airlines	7,458	0	Shared	
	Air General	7,575	0	Shared	
	Vacant (old DHL)	55,000	0	Shared	0
Total Estimate		**522,678**	**987,128**		**203,697**

NOTES:
UPS – United Parcel Service
DHL – Dalsey, Hillblom and Lynn
WFS – Worldwide Flight Services
The Delta Dash facility closed in 2020, but it may reopen.
SOURCE: Landrum & Brown, Inc., Cargo Facts, April 2019 (data provided by carriers).

1.5.6 General Aviation

General aviation (GA) facilities are located on a 37-acre site off East 70th Street. Fixed Base Operator (FBO) services are provided by Signature Flight Support (Signature). In 2002, Signature built a new GA facility, which now provides 18,500 square feet of facilities featuring a lobby, office space, conference rooms, private phone suites, pilot lounge, showers, lockers, a game room, and a quiet room. A 3,700 square-foot garage provides indoor storage for ground equipment. There are also about 185 public automobile parking spaces. The site includes about 267,000 square feet of hangar/storage/shop space and 88,000 square yards of apron. The FBO also provides aircraft maintenance. The General Aviation (GA) apron is shown on **Exhibit 1-11**.



SOURCES: Metropolitan Airports Commission, 2022 (Basemap); Nearmap, September 2022 (Aerial Imagery), Ricondo & Associates, Inc., 2022.

LEGEND

- General Aviation Facilities
- General Aviation Apron
- Vehicle Service Road Tunnels

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EXHIBIT 1-11
General Aviation Facilities

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1.5.7 Support Facilities

Support facilities (which include airline maintenance, airport maintenance, Aircraft Rescue & Fire Fighting (ARFF) facilities), Federal Aviation Administration facilities, and miscellaneous facilities are in various locations of the airport.

Delta (which acquired Northwest) occupies two maintenance complexes and a cargo facility on the south side of the airport. Most of the old Northwest Building B maintenance facility (adjacent to the T1 inbound/outbound roadway) has been demolished. Two hangars, an engine test cell, and associated facilities that remain (approximately 751,000 square feet), are used by Delta for aircraft maintenance, shops, and repairs. Delta's maintenance and cargo facilities are shown on **Exhibit 1-12.**

There are three additional airline maintenance hangars on the western edge of the airfield that provide a total of approximately 247,000 square feet of floor space for hangars, shops, and offices. These hangars are shown on **Exhibit 1-12.**

The main Aircraft Rescue & Fire Fighting (ARFF) facility is located near the center of the airfield on the south side of the runways; a satellite ARFF facility is located on the north side of the airfield between the parallel runways. The ARFF facilities are shown on **Exhibit 1-12**.

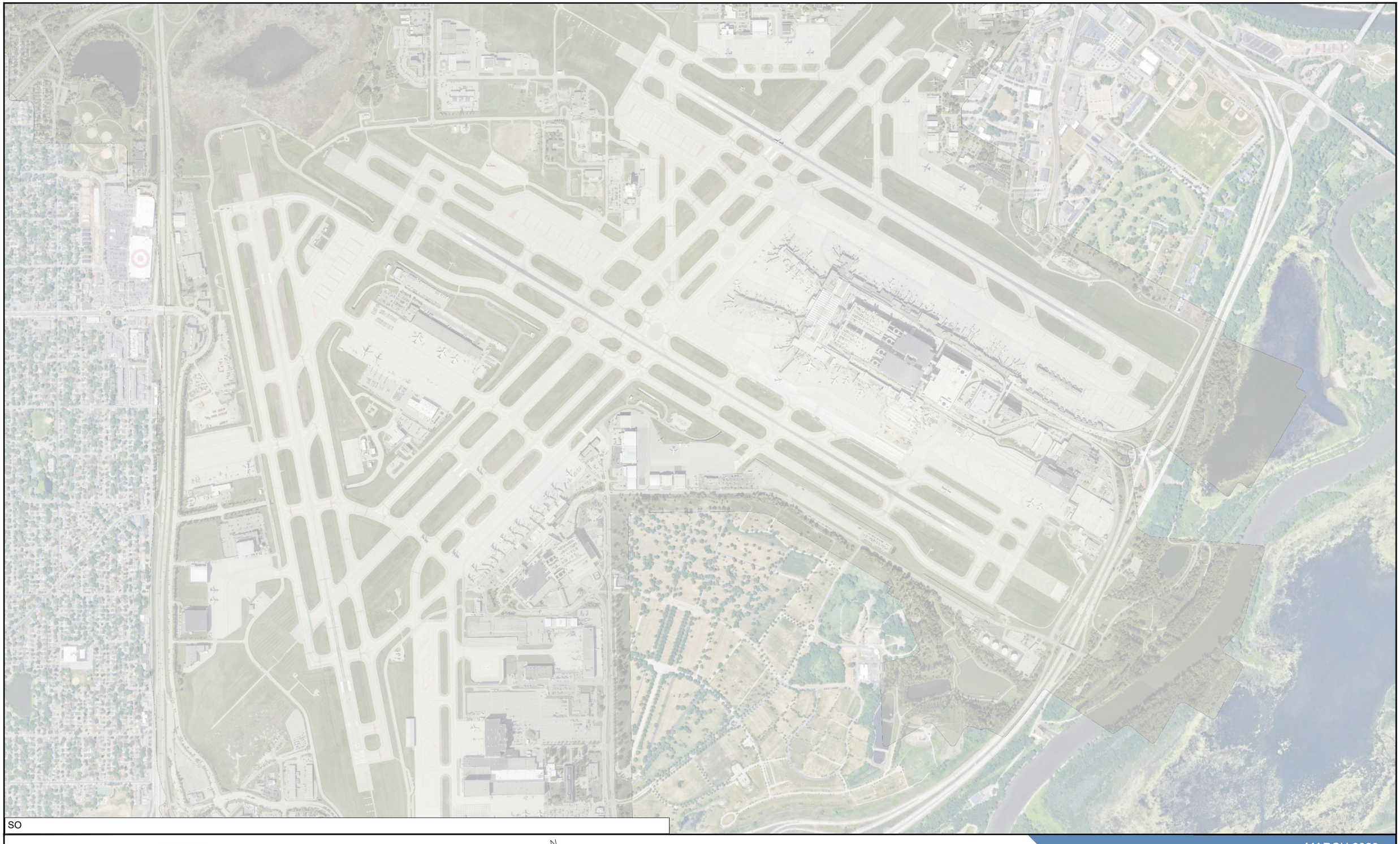

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EXHIBIT 1-12
Support Facilities

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1.6 ENVIRONMENTAL CONSIDERATIONS

This section reviews the environment around the Airport, such as the parks, wetlands and waterways, and historic sites. In addition, proposed projects and improvements are reviewed, as well as the MSP 2020 Improvements Environmental Assessment / Environmental Assessment Worksheet.

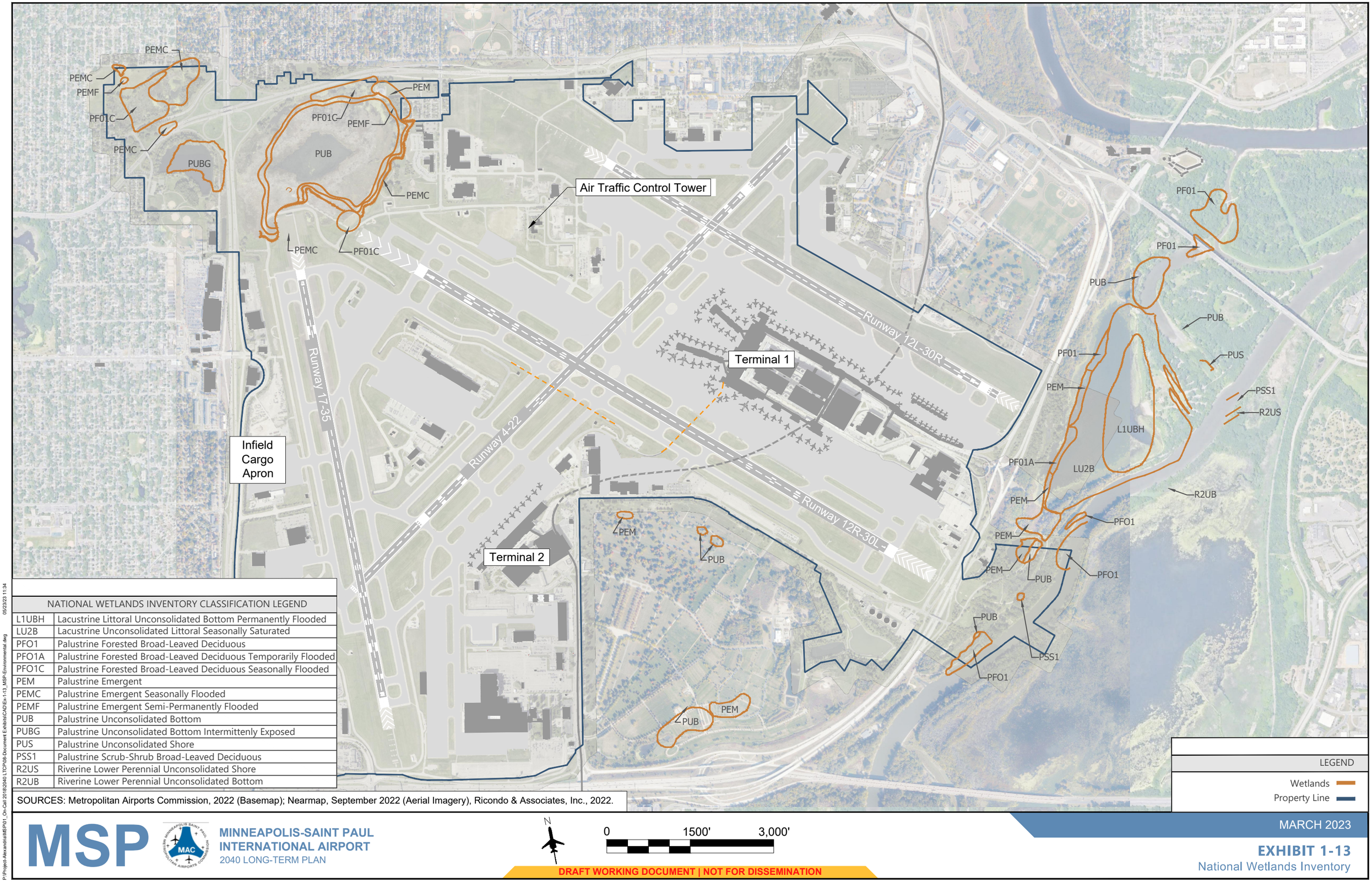
1.6.1 Environment Around the Airport

As previously shown on **Exhibit 1-3**, many state and regional parks are within the vicinity of MSP, including Fort Snelling State Park, located just beyond Runway 30R-30L, as well as Pike Island Park, Washington Park, Wilson Park, Veterans Memorial Park, Taft Park, and Morris Park. The Minnesota Valley National Wildlife Refuge is adjacent to MSP, located just south of I-494 in Bloomington.

Additionally, many historic sites are at or near MSP. Historic sites include Fort Snelling beyond the northeast corner of the Airport, and the Original Wold-Chamberlain Terminal Historic District on Airport property.

The Minnesota River runs along the east side of MSP from the northeast corner and continues south. The majority of stormwater from the Airport drains via storm sewers to retention ponds prior to discharge to the Minnesota River. Many lakes are also within the vicinity of MSP, including Mother Lake at the northwest corner of the Airport and Snelling Lake to the southeast. Only a few remnant wetlands at the north end of Runway 17, adjacent to the Mother Lake area, are still in existence on the airfield.

The wetlands were mitigated through permits granted by the U.S. Army Corps of Engineers (USACE) and the Minnesota Department of Natural Resources (DNR), as well as in accordance with federal and state laws. The MAC serves as its own local government unit for any Wetland Conservation Act (WCA) jurisdictional wetlands. The Minnesota DNR would have jurisdiction over any remnants that qualify under its authority. **Exhibit 1-13** depicts the National Wetlands Inventory within the Airport property.



NATIONAL WETLANDS INVENTORY CLASSIFICATION LEGEND	
L1UBH	Lacustrine Littoral Unconsolidated Bottom Permanently Flooded
LU2B	Lacustrine Unconsolidated Littoral Seasonally Saturated
PFO1	Palustrine Forested Broad-Leaved Deciduous
PFO1A	Palustrine Forested Broad-Leaved Deciduous Temporarily Flooded
PFO1C	Palustrine Forested Broad-Leaved Deciduous Seasonally Flooded
PEM	Palustrine Emergent
PEMC	Palustrine Emergent Seasonally Flooded
PEMF	Palustrine Emergent Semi-Permanently Flooded
PUB	Palustrine Unconsolidated Bottom
PUBG	Palustrine Unconsolidated Bottom Intermittenly Exposed
PUS	Palustrine Unconsolidated Shore
PSS1	Palustrine Scrub-Shrub Broad-Leaved Deciduous
R2US	Riverine Lower Perennial Unconsolidated Shore
R2UB	Riverine Lower Perennial Unconsolidated Bottom

SOURCES: Metropolitan Airports Commission, 2022 (Basemap); Nearmap, September 2022 (Aerial Imagery), Ricondo & Associates, Inc., 2022.

LEGEND

Wetlands

Property Line

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EXHIBIT 1-13

National Wetlands Inventory

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1.6.2 2020 Improvements Environmental Assessment / Environmental Assessment Worksheet Overview

Most of the environmental considerations for the 2040 LTP have not changed from the 2030 LTP document. Both plans' requirements for growth are focused primarily on the terminal and landside development efforts. Due to the similarities between the two plans, it was determined that the MSP 2020 Improvements Environmental Assessment / Environmental Assessment Worksheet (EA/EAW), which covers anticipated Airport development needs, would be an appropriate document for the inventory of environmental considerations for the 2040 LTP.

The MSP 2020 EA/EAW was completed in 2013 to ensure an acceptable LOS at the Airport through 2020. Proposed projects and improvements covered by the EA/EAW were based on the preferred development option from the 2030 LTP. Reference **Appendix B** for the entire document.

The MAC coordinated with the FAA, stakeholders, and the public throughout the preparation of the EA/EAW. Coordination began in late 2010, which was followed by public presentations and briefings throughout 2011 and 2012. Public comments for the EA/EAW closed in October 2012.

The MAC determined that the MSP 2020 Improvements Project was adequate under the Minnesota Environmental Policy Act (MEPA), and the proposed MSP 2020 Improvements EA/EAW did not have the potential for significant environmental effects. In turn, an environmental impact statement (EIS) for the proposed MSP 2020 Improvements Project was not necessary. The EA/EAW findings were as follows:

- The air quality assessment for the preferred development meets National Ambient Air Quality Standards (NAAQS) for Hennepin County, designated as the attainment area for the EA/EAW.
- The proposed project would result in an increase in greenhouse gas (GHG) emissions of less than 1% over the Airport's 2010 existing GHG emissions.
- The project improves highway operations without adding significant new capacity; therefore, emissions from vehicles within the project attainment area will not differ materially from 2010 conditions.
- Emissions from construction projects associated with the proposed project will be *de minimis* and temporary. Mitigation measures, such as dust control measures and management of soil and water contamination, will be necessary for any impacts during these projects.
- As of 2020, the Airport's existing airfield can accommodate forecasted daily and annual demand at a reduced LOS. Aircraft noise impacts are virtually identical under the no-action alternative and the preferred development project.
- The proposed project will not result in changed conditions in land use compatibility related to socioeconomic impacts, vehicular traffic, endangered or threatened species, or historical, architectural, archeological, and cultural resources.

- Surface water and groundwater impacts are virtually identical under the no-action alternative and the proposed development project. (The National Wetlands Inventory is depicted on **Exhibit 1-13**.)

The proposed development required federal actions and approvals by the FAA and the Federal Highway Administration (FHWA), including local approvals by the MAC. The EA/EAW addressed all the impact categories discussed in the EAW form under MEPA, as well as all FAA and FHWA impact categories. In 2013, the FAA issued a finding of no significant impact/record of decision (FONSI /ROD), determining the EA/EAW for the proposed MSP 2020 Improvements project was adequate under the National Environmental Policy Act (NEPA), and there were no significant impacts associated with the proposed project.

1.6.3 Approved Environmental Review Projects

The proposed MSP 2020 Improvements project did not necessitate changes to runway usage or increase aircraft operations. The Airport's existing infrastructure could accommodate the forecast daily and annual demand for 2020, with a reduced LOS. Future impacts were found to be compliant with existing environmental conditions, with mitigation in several aspects of Airport development.

The environmental projects list for the 2040 LTP is derived from the preferred development option in the MSP 2020 Improvements EA/EAW (January 2013). **Table 1-24** lists the historical improvements that are included and approved. **Table 1-25** lists the proposed improvements that are included and approved. These improvements are presented on **Exhibit 1-14**. Diagrams of the approved environmental review projects for T1 and T2 are presented on **Exhibits 1-15** and **1-16**, respectively.

These development projects in the list have been completed since the approval of the EA/EAW:

- Runway 17 Deicing Pad Construction
- Runway 17-35 Land Acquisition

Table 1-24: (1 of 3) Historical Airport Projects Previously Identified for Consideration of Cumulative Environmental Impacts at the Airport

Project	Description	Construction Year
Runway 17 Deicing Pad Construction	Constructed a deicing/holding pad for Runway 17. Included paving of adjacent Taxiways W, Y, K8, and Y3 and a snow-melt pad associated with the glycol collection system. Also included construction of a support facility for deicing vehicles. The support facility has six 2,000-gallon glycol tanks and pumps and supply piping for Type I glycol.	2005
Runway 17-35 Land Acquisition	Acquired off-Airport land required to provide for the Runway 17-35 runway protection zone (RPZ). In addition, 29 single-family residences and 2 apartment complexes with a total of 132 units located in Bloomington, south and east of Mall of America, were acquired for noise mitigation purposes.	2005–2006
Taxiway Q Construction	Constructed Taxiway Q between Runway 4-22 and Taxiway C.	2005
Residential Sound Insulation – 2007 Day-Night Average Sound Level (DNL) 65 Contour	Completed the program to insulate single-family residential houses within the certified 2007 DNL 65 noise contour.	2007
Taxiway C/D Complex	Reconstructed and reconfigured Taxiways C and D between Runway 12L-30R and Runway 12R-30L. This project relocated both taxiways further to the west, which allowed unrestricted access of Group V aircraft around the west side of Concourses E and F.	2005–2010
34th Avenue Reconstruction – North of 70th Street	Reconstructed 34th Avenue north of 70th Street.	2005
Taxiway M Extension	Extended Taxiway M to the south, approximately 2,100 feet, to connect with Taxiway S to provide an alternative taxi route for Runway 17 departures for T1 during low visibility conditions.	2006
Multi-Family Sound Insulation (Inside 2007 65 DNL)	Sound insulated 575 multi-family units within the 2007 65 DNL contour.	2007

SOURCE: HNTB Corporation, 2013.

Table 1-24: (2 of 3) Historical Airport Projects Previously Identified for Consideration of Cumulative Environmental Impacts at the Airport

Project	Description	Construction Year
Metropolitan Airports Commission (MAC)		
T2 Parking Structure Expansion	Expanded the T2 parking structure to provide an additional 4,550 parking spaces, as well as vertical circulation to link the Light Rail Transit (LRT) to the new skyway to the T2 Terminal.	2007
Pavement Rehabilitation – Runway 12R-30L	Reconstructed the middle section of Runway 12R-30L located between Runway 4-22 and Taxiway A4.	2009
Residential Sound Insulation	Conducted sound insulation program based on the 2007 Noise Exposure Map contained in the Part 150 Update, consistent with the terms and conditions of the court-ordered Consent Decree.	2008
Taxiway P Reconstruction	Realigned and reconstructed the section of Taxiway P from Taxiway C to Taxiway P4. This project provided for the mill and overlay of the bituminous section on Runway 12L-30R from Runway 4-22 to Taxiway P6.	2008–2009
Concourse G Extension – Site Preparation	Demolished the Building B complex, except for premises retained by Northwest.	2009
Airport Lane / 34th Avenue Access Reconfiguration	Realigned the access from 34th Avenue and the Airport to conform to standards for similar types of intersections.	2009
Noise Mitigation Settlement	Continued the implementation of the noise mitigation program based on the Noise Exposure Map contained in Part 150 Update, consistent with the terms and conditions of the court-ordered Consent Decree.	2011–2012
Data Center Facilities	Constructed a new consolidated data center.	2012
Taxiway C Extension to T2 Remote	Extended Taxiway C between Taxiway S and the T2 Remote Apron to improve access to and from the T2 Remote Apron and the Delta Building C maintenance complex.	2011
North-Side Storm Sewer Improvements	Conducted improvements to the storm sewer system and Ponds 3 and 4 between Pond 3 and the Minnesota River.	2012–2013
Minnesota Department of Transportation (MnDOT)		
I-494 between 34th Avenue and France Avenue	Included milling, overlay, and construction of a west-bound auxiliary lane from Portland Avenue to Nicollet Avenue, a median barrier, and drainage. It also included construction of a west-bound auxiliary lane 35W to TH 100 and replacement of the Xerxes Avenue bridges.	2013

SOURCE: HNTB Corporation, 2013.

Table 1-24: (3 of 3) Historical Airport Projects Previously Identified for Consideration of Cumulative Environmental Impacts at the Airport

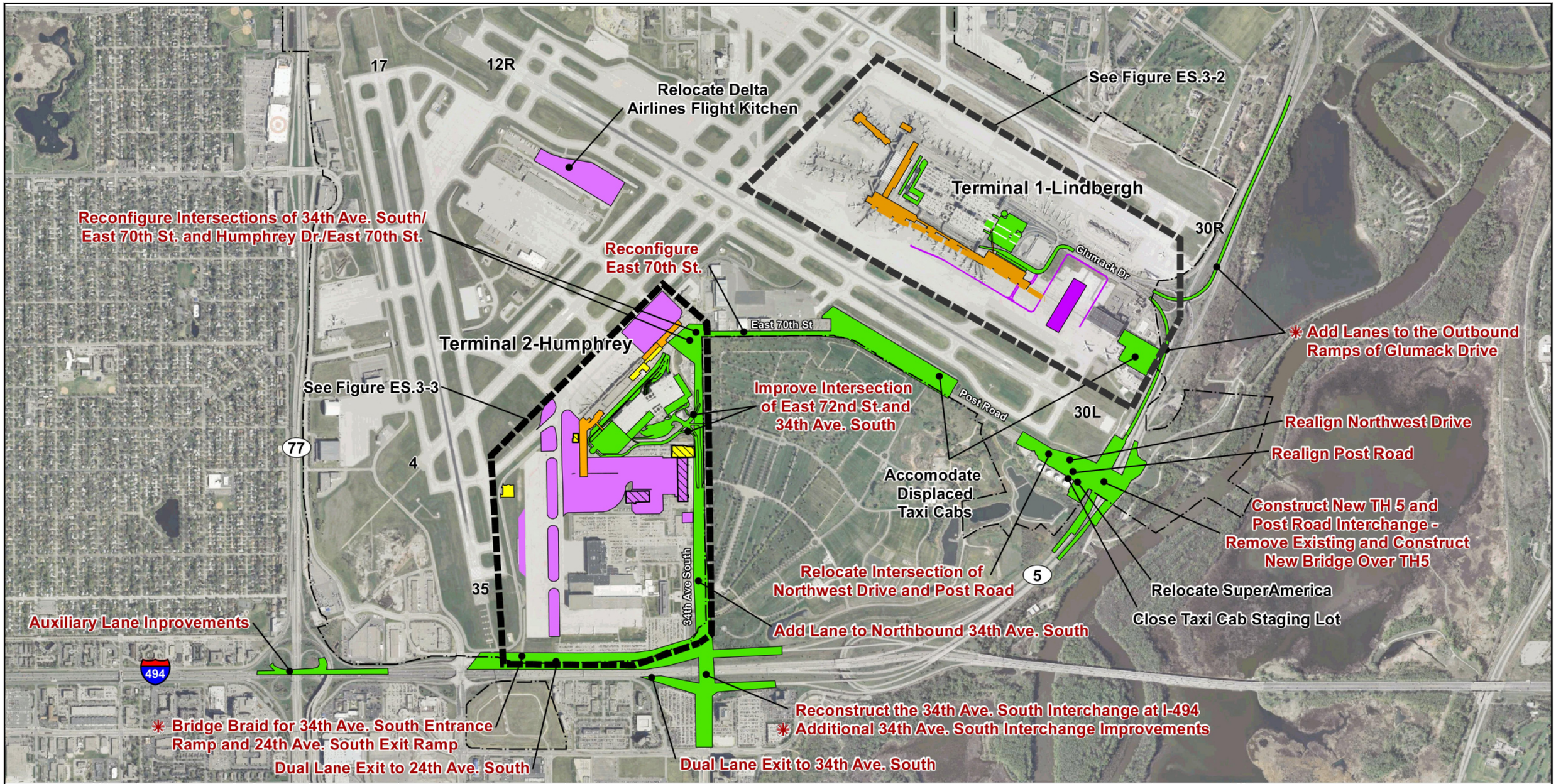
Project	Description	Construction Year
Federal Aviation Administration (FAA)		
Performance-Based Navigation (PBN) Procedure Design and Implementation	Beginning in November 2010, the FAA worked to develop PBN procedures and a plan for implementation. In addition to safety and operational considerations, the FAA included noise criteria that were developed by the Airport Noise Oversight Committee (NOC). The NOC noise criteria focused on a noise analysis, including DNL noise contour and single-event noise evaluations of the proposed procedures; a public information program; and various procedure design considerations intended to reduce noise impacts around the Airport, where possible.	2013
	At the Sept. 19, 2012, NOC meeting, the FAA Air Traffic Organization (ATO) presented the PBN procedures, highlighting the considerations given to the NOC design criteria. The Metropolitan Airports Commission (MAC) provided its noise analysis of the procedures in compliance with the related NOC criteria. The NOC facilitated the noise contour analysis. The FAA indicated during the meeting that a statement of support for the area navigation (RNAV) implementation was needed from the MAC by the end of November 2012, to avoid lengthy delays in procedure publications. This support was needed to meet FAA ATO requirements under FAA Order 7400.2. In response, the NOC moved forward with hosting two public open houses prior to the November 2012 NOC meeting. (The NOC facilitated the public information process.)	
	Subsequently, at the Nov. 14, 2012, NOC meeting, the Committee determined the FAA's process adequately considered the Committee's noise criteria, and the NOC sent its recommendations to the MAC. However, based on extensive input from community leaders and Airport neighbors, the MAC voted on Nov. 19, 2012, to provide support for the FAA's plan, except for departures on Runways 30L and 30R, which fly to the northwest of the Airport over communities such as South Minneapolis and Edina. The FAA ATO is currently evaluating the partial implementation supported by the MAC.	

SOURCE: HNTB Corporation, 2013.

Table 1-25: Historical Proposed Airport Projects Previously Identified for Consideration of Cumulative Environmental Impacts at the Airport

Project	Description	Construction Year
Proposed T2 North Terminal Expansion	Proposed concourse and apron extension of the north end of T2. The 2030 LTP discussed an additional 178% of demand capacity over the existing system.	TBD
Proposed T2 South Terminal Expansion	Proposed concourse and apron extension of the south end of T2. The 2030 LTP discussed an additional 178% of demand capacity over the existing system.	TBD
Concourse G Extension	Proposed concourse extension on the south end of the existing Concourse G. The 2030 LTP discussed an additional 54% demand capacity over the existing system.	TBD

SOURCE: HNTB Corporation, 2013.



LEGEND

- Proposed Terminal Projects
- Proposed Landside/Roadway Projects
- Proposed Airside Projects
- Planned Post 2020
- Projects that are Underway
- Remove and/or Relocate
- MAC Property

SOURCE: HNTB, *Minneapolis-Saint Paul International Airport* 2020 Improvements Final Environmental Assessment / Environmental Worksheet, January 2013

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EXHIBIT 1-14
2013 Approved Environmental Review Projects - Non-Terminal

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Remodel Concourse E

Expand Baggage Facilities

Remodel and Reconfigure Terminal Lobby / Reconfigure Baggage Facilities

Extend Underground Hub Tram Tunnel

D

C

C

B

A

E

Green Parking Ramp

Blue Parking Ramp

Construct New Parking Ramp

Post Office

Relocate Portions of Glumack Drive

Extend AOA Tunnel

Building B Hangar Complex

Maroon Parking Ramp

Gold Parking Ramp

Red Parking Ramp

F

G

G

Expand Concourse G / Construct New International Facility

Expand Arrivals Curb

Relocate Commercial GTC

Install New Concourse G Tram

Extend Airfield Service Road / Relocate Concourse G Fuel Main Line

Relocate Runway 30L Deicing Pad

LEGEND

- Existing Building
- Existing Airfield Pavement
- Proposed Terminal Projects
- Proposed Landside/Roadway Projects
- Proposed Airside Projects
- Remove and/or Relocate
- MAC Property
- Underground Hub Tram
- Concourse C Tram
- Proposed Tram
- Small Turboprop
- 50-Seat Regional Jet
- Large Regional Jet
- Narrow-body
- 757-Class
- Wide-body

SOURCE: HNTB, *Minneapolis-Saint Paul International Airport* 2020 Improvements Final Environmental Assessment / Environmental Worksheet, January 2013

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EXHIBIT 1-15

2013 Approved Environmental Review Projects - Terminal 1

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Construct RON Aircraft Apron and New Taxiway

Taxiway S

Expand Terminal Apron

Expand Terminal

Expand Terminal Curb

Building C Complex

Demolish Delta Air Lines Flight Kitchen

Construct New Parking Ramp

Purple Parking Ramp

Humphrey Drive

East 72nd Street

Construct RON Aircraft Apron

Relocate Run-Up Pad

Expand Existing Parking Ramps

Orange Parking Ramp

Expand Terminal

Expand Terminal Apron

Demolish Building F

Relocate GSE Facility

Building G

Building F

ARFF

34th Avenue South

East 70th Street

I-494

LEGEND

- Existing Building
- Existing Airfield Pavement
- Proposed Terminal Projects
- Proposed Airside Projects
- Proposed Landside/Roadway Projects
- Projects that are Underway
- LRT Tracks
- MAC Property
- Demolish and/or Relocate
- Small Turboprop
- 50-Seat Regional Jet
- Large Regional Jet
- Narrow-body
- 757-Class
- Wide-body

SOURCE: HNTB, *Minneapolis-Saint Paul International Airport* 2020 Improvements Final Environmental Assessment / Environmental Worksheet, January 2013

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EXHIBIT 1-16

2013 Approved Environmental Review Projects - Terminal 2

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1.7 LAND USE AND ZONING

Chapter 6 provides an analysis of land use, airspace, and zoning considerations in the context of existing and planned airport facilities.