

|                                                                                                                                                                                                                                                                                                                               |                              |                                               |                                     |                                                   |                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------------------------------------------|-------------------------------------|---------------------------------------------------|------------------------------------------------------|
| Flight Procedures Cover Page                                                                                                                                                                                                                                                                                                  | Task Action:<br>FLIGHT CHECK | Task Type:<br>STAR                            | Estimated Chart Date:<br>08/07/2025 | APWS Task ID:<br>1621CA7A31214B829068BCD2DDD160C1 | APWS Project ID:<br>1338C5C08E3C4493BAB00726E1C87F48 |
| Procedure:<br>STAR BAINY FOUR (RNAV) MINNEAPOLIS MN KMSP                                                                                                                                                                                                                                                                      |                              | Enroute:<br>YES                               | Specialist:<br>Gorman, Barbara      |                                                   | Agreement Number:                                    |
| Airport ID:<br>KMSP                                                                                                                                                                                                                                                                                                           |                              |                                               | Airport City:<br>MINNEAPOLIS        |                                                   | State:<br>MN                                         |
| Facility ID:                                                                                                                                                                                                                                                                                                                  | Facility Type:               | Flight Inspection Remark Type:<br>New FC Slot |                                     |                                                   |                                                      |
| <div>Procedure Comments:<br/>APPROVAL LETTER (1): DESCENT GRADIENT GREATER THEN MAXIMUM PERMISSIBLE GRADIENT ALLOWED.<br/>MSP VORMON<br/>ACTIVE DATA USED FOR KRSW AIRPORT AND RUNWAYS.<br/>CONTACT: CASIMIR TABAKA: 405.954.7931</div> <div><div>QUALITY<br/>35<br/>CHECKED</div><div>QUALITY<br/>41<br/>CHECKED</div></div> |                              |                                               |                                     |                                                   |                                                      |



# Federal Aviation Administration

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## Memorandum

Date: December 13, 2024  
To: Charles R Erickson, (Acting) Fight Procedures Team Manager  
From: Jessica Roses, Support Manager, Airspace and Procedures  
Prepared by: Scott Enander, CSA NAVTAC II Task Order Manager  
Subject: AFS Approval Request BAINY (RNAV) STAR, KMSP

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### KMSP BAINY RNAV STAR: BAINY - LUCCY Descent Gradient

Currently, FAAO 8260.3F, para 2-2-8a (1), the maximum permissible descent gradient above 10,000ft MSL and above is 330 ft/nm (approximately 3.11 degrees). BAINY altitude restriction of at or above 15000 and LUCCY altitude restriction of at or above 11000. The descent gradient (368.93 ft/NM) from BAINY to LUCCY is greater than the maximum permissible gradient allowed. Flight Standards approval is required.

The BAINY STAR serves Minneapolis St. Paul International/Wold-Chamberlain Airport. The descent gradient of 368.93 ft/NM from BAINY to LUCCY is calculated from altitude of at or above 15000 at BAINY descending to an altitude of at or above 11000 at LUCCY, over a distance of 10.84 NM.

Industry flight data shows that when aircraft are following the descent profiles along multiple segments prior to and following this segment, they will be descending in the permissible descent gradient ranges as evident in simulator results.

Therefore, ZMP is requesting AFS approval to utilize the altitude at BAINY (at or above 15000) to LUCCY (at or above 11000) resulting in a descent gradient of 368.93/NM as developed for the BAINY STAR.

Sincerely,

Jessica Roses  
Support Manager, Airspace & Procedures  
Minneapolis ARTCC, MN



# Federal Aviation Administration

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## Memorandum

Date: January 31, 2023

To: Instrument Flight Procedure Service Providers

WADE EK TERRELL  
Digitally signed by WADE  
EK TERRELL  
Date: 2023.01.31 09:21:16  
-06'00'

From: Wade E.K. Terrell, Manager, Flight Procedures and Airspace Group

Subject: Waiver to FAA Order 8260.58C paragraph 1-2-5.c.(3), Maximum bank angle

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**Background:** The Performance Based Navigation (PBN) Aviation Rulemaking Committee (PARC) made a recommendation that the FAA adjust the turn parameters used in PBN instrument flight procedure (IFP) design to reflect modern avionics values. The Flight Procedures and Airspace Group analyzed current avionics specifications with the help of several FAA offices and RTCA SC-227 to identify the new bank angles necessary for current IFP design. The Flight Procedures and Airspace Group then conducted an Operational Safety Review (OSR) for this amendment to bank angle criteria. The outcome of the OSR was that no new hazard is introduced into the National Aerospace System (NAS).

**Purpose:** This memorandum waives FAA Order 8260.58C, United States Standard for Performance Based Navigation (PBN) Instrument Procedure Design, paragraph 1-2-5.c.(3) and authorizes use of a maximum bank angle of 23 degrees above FL195 up to FL245 and a maximum bank angle of 16 degrees above FL245.

This waiver remains in effect until rescinded. No additional waiver request action is required. Please direct all inquiries to Thomas J. Nichols, Standards Section Manager, Flight Procedures and Airspace Group at 405-954-1171 or [thomas.j.nichols@faa.gov](mailto:thomas.j.nichols@faa.gov)

## BAINY FOUR ARRIVAL (RNAV)

MINNEAPOLIS-ST PAUL INTL/WOLD-CHAMBERLAIN (MSP)

AL-264 (FAA)

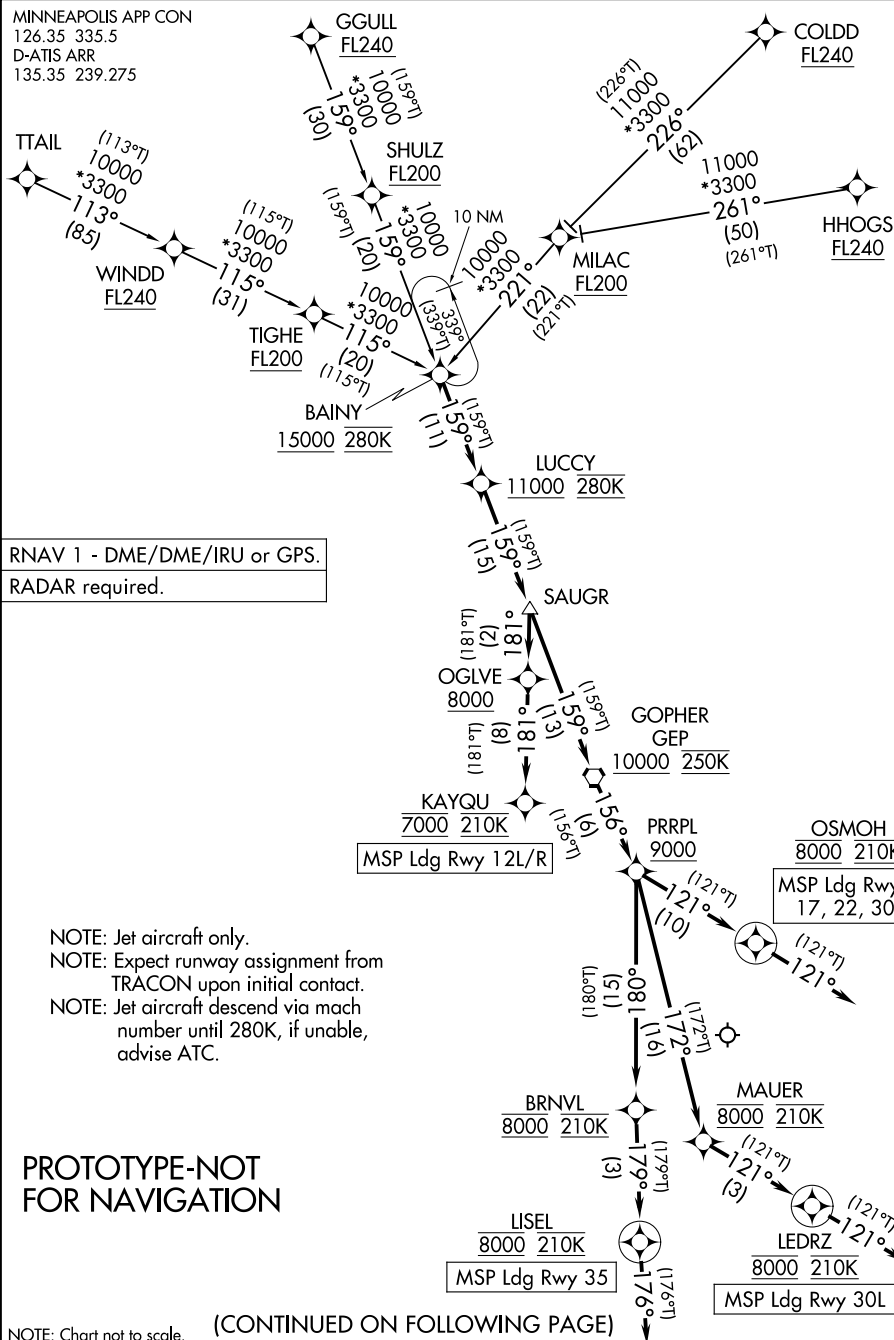
MINNEAPOLIS, MINNESOTA

MINNEAPOLIS APP CON

126.35 335.5

D-ATIS ARR

135.35 239.275



NOTE: Chart not to scale.

(CONTINUED ON FOLLOWING PAGE)

## BAINY FOUR ARRIVAL (RNAV)

(BAINY.BAINY4) FIG

MINNEAPOLIS, MINNESOTA

MINNEAPOLIS-ST PAUL INTL/WOLD-CHAMBERLAIN (MSP)

ARRIVAL ROUTE DESCRIPTION

- COLDD TRANSITION (COLDD.BAINY4)
- GGULL TRANSITION (GGULL.BAINY4)
- HHOGS TRANSITION (HHOGS.BAINY4)
- MILAC TRANSITION (MILAC.BAINY4)
- SHULZ TRANSITION (SHULZ.BAINY4)
- TIGHE TRANSITION (TIGHE.BAINY4)
- TTAIL TRANSITION (TTAIL.BAINY4)
- WINDD TRANSITION (WINDD.BAINY4)

From BAINY on track 159° to cross LUCCY at or above 11000 and at 280K, then on track 159° to SAUGR.

LANDING RUNWAYS 4, 17, 22, 30R: From SAUGR on track 159° to cross GEP VORTAC at or above 10000 and at 250K, then on track 156° to cross PRRPL at or above 9000, then on track 121° to cross OSMOH at 8000 and at 210K, then on track 121°. Expect RADAR vectors to final approach course.

LANDING RUNWAYS 12L/R: From SAUGR on track 181° to cross OGLVE at or above 8000, then on track 181° to cross KAYQU at 7000 and at 210K. Expect RNAV (RNP), RNAV (GPS), or ILS Rwy 12L approach or RADAR vectors to Rwy 12L/R final approach course.

LANDING RUNWAY 30L: From SAUGR on track 159° to cross GEP VORTAC at or above 10000 and at 250K, then on track 156° to cross PRRPL at or above 9000, then on track 172° to cross MAUER at 8000 and at 210K, then on track 121° to cross LEDRZ at 8000 and at 210K, then on track 121°. Expect RADAR vectors to final approach course.

LANDING RUNWAY 35: From SAUGR on track 159° to cross GEP VORTAC at or above 10000 and at 250K, then on track 156° to cross PRRPL at or above 9000, then on track 180° to cross BRNVL at 8000 and at 210K, then on track 179° to cross LISEL at 8000 and at 210K, then on track 176°. Expect RADAR vectors to final approach course.

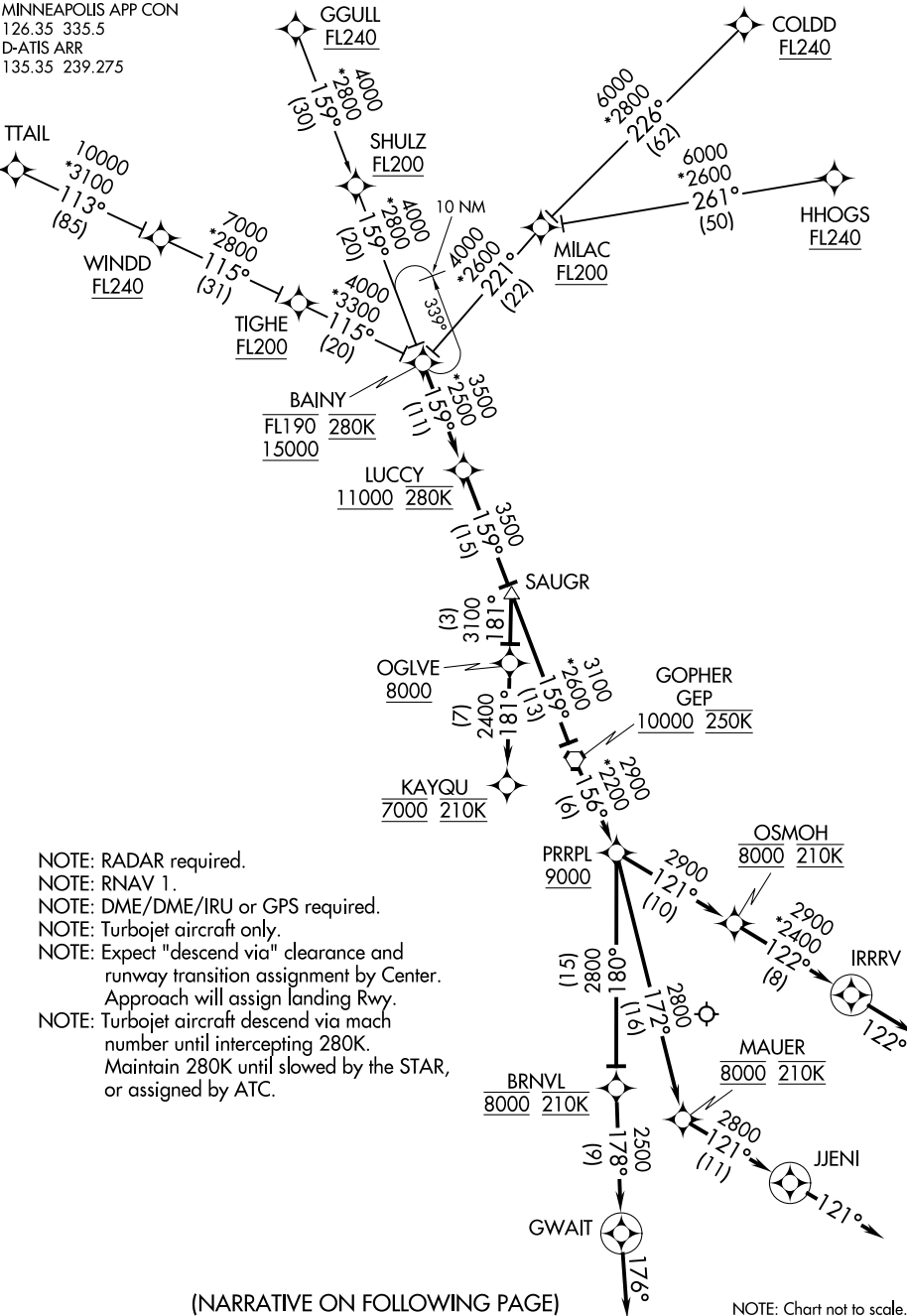
PROTOTYPE-NOT FOR NAVIGATION

(BAINY.BAINY3) 17173

BAINY THREE ARRIVAL (RNAV)

MINNEAPOLIS-ST PAUL INTL/WOLD-CHAMBERLAIN (MSP)  
AL-264 (FAA) MINNEAPOLIS, MINNESOTA

MINNEAPOLIS APP CON  
126.35 335.5  
D-ATIS ARR  
135.35 239.275



- NOTE: RADAR required.
- NOTE: RNAV 1.
- NOTE: DME/DME/IRU or GPS required.
- NOTE: Turbojet aircraft only.
- NOTE: Expect "descend via" clearance and runway transition assignment by Center.
- NOTE: Approach will assign landing Rwy.
- NOTE: Turbojet aircraft descend via mach number until intercepting 280K.
- NOTE: Maintain 280K until slowed by the STAR, or assigned by ATC.

(NARRATIVE ON FOLLOWING PAGE)

NOTE: Chart not to scale.

BAINY THREE ARRIVAL (RNAV)

(BAINY.BAINY3) 05JAN17

MINNEAPOLIS, MINNESOTA  
MINNEAPOLIS-ST PAUL INTL/WOLD-CHAMBERLAIN (MSP)

ARRIVAL ROUTE DESCRIPTION

- COLDD TRANSITION (COLDD.BAINY3)  
GGULL TRANSITION (GGULL.BAINY3)  
HHOGS TRANSITION (HHOGS.BAINY3)  
MILAC TRANSITION (MILAC.BAINY3)  
SHULZ TRANSITION (SHULZ.BAINY3)  
TIGHE TRANSITION (TIGHE.BAINY3)  
TTAIL TRANSITION (TTAIL.BAINY3)  
WINDD TRANSITION (WINDD.BAINY3)

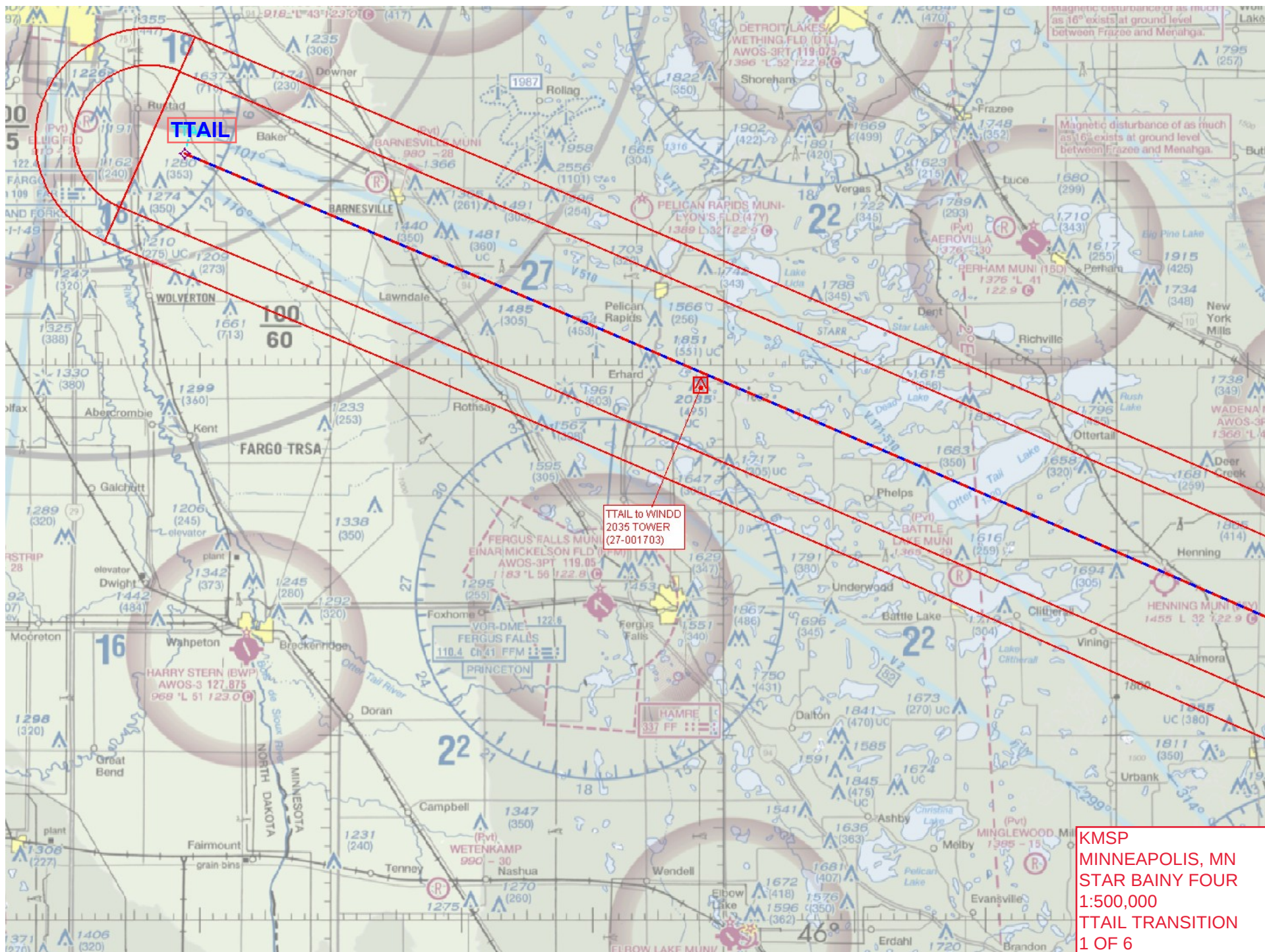
From BAINY on track 159° to cross LUCCY at or above 11000 and at 280K, then on track 159° to SAUGR.

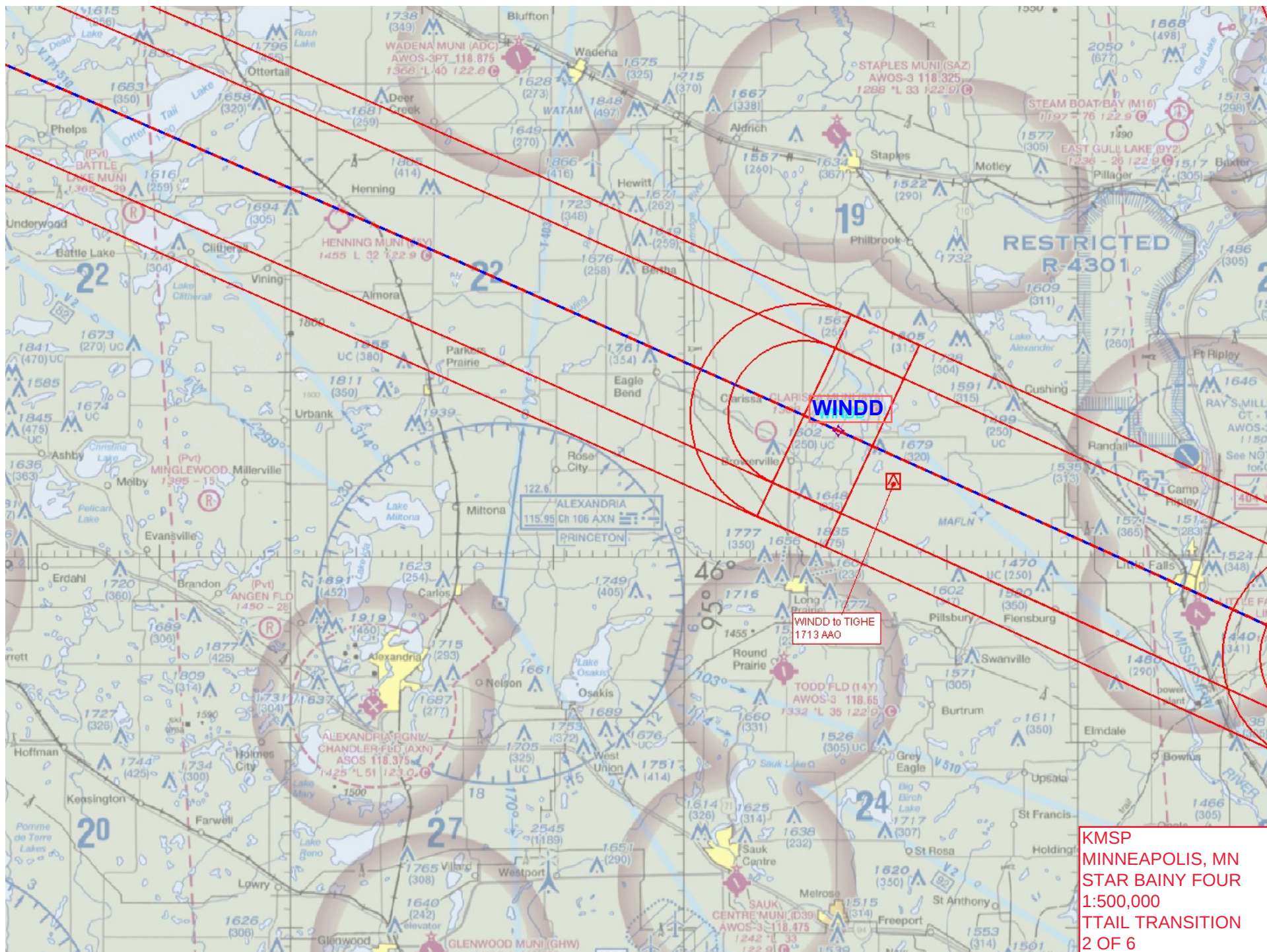
LANDING RUNWAYS 4, 17, 22, 30R: From SAUGR on track 159° to cross GEP VORTAC at or above 10000 and at 250K, then on track 156° to cross PRRPL at or above 9000, then on track 121° to cross OSMOH at 8000 and at 210K, then on track 122° to IRRRV, then on track 122°. Expect RADAR vectors to final approach course.

LANDING RUNWAYS 12L/R: From SAUGR on track 181° to cross OGLVE at or above 8000, then on track 181° to cross KAYQU at 7000 and at 210K. Expect RNAV (RNP), RNAV (GPS), or ILS approach or RADAR vectors to final approach course.

LANDING RUNWAY 30L: From SAUGR on track 159° to cross GEP VORTAC at or above 10000 and at 250K, then on track 156° to cross PRRPL at or above 9000, then on track 172° to cross MAUER at 8000 and at 210K, then on track 121° to JJENI, then on track 121°. Expect RADAR vectors to final approach course.

LANDING RUNWAY 35: From SAUGR on track 159° to cross GEP VORTAC at or above 10000 and at 250K, then on track 156° to cross PRRPL at or above 9000, then on track 180° to cross BRNVL at 8000 and at 210K, then on track 178° to GWAIT, then on track 176°. Expect RADAR vectors to final approach course.







KMSP  
MINNEAPOLIS, MN  
STAR BAINY FOUR  
1:500,000  
CCOLD TRANSITION  
4 OF 6

