New Southern Nevada Airport

Final Airspace Briefing

Airspace Design, Standard Instrument Arrival Procedures, and Standard Instrument Departures

Clark County Department of Aviation
ASRC Research and Technology Solutions
Ricondo & Associates, Inc.

1/17/2007

Welcome / Meeting Agenda

- Meeting logistics
- Introductions
- Meeting schedule and agenda
  - New airport process
  - Airspace project history and progress to date
  - Project assumptions
  - Preliminary SID and STAR design
  - TAAM analysis
  - Preliminary approach design
  - Preliminary airspace design
  - Radar and NAVAID Sites
  - Next steps
  - Open discussion
  - Question and answer
  - Feedback and comments
  - Meeting closeout

Proposed New Airport Process

- LAS expansion considered
- Site selection process
- Ivanpah Valley site location
- Land acquisition and Mojave Preserve overflights
- Planning process
- Environmental process
  - In progress

Project History
Objectives of Airspace Study - I

- Develop arrival and departure corridors for air new airport
- Develop preliminary design of instrument procedures for new airport
  - Approach
  - Arrival (STARs)
  - Departure (SIDs)
- Develop preliminary design of airspace for new airport
  - TRACON
  - Class B
  - Class C
  - Class E

Project History
Objectives of Airspace Study - II

- Identify navigational requirements of airspace
  - NAVAID requirements
  - RADAR/surveillance requirements
- Identify potential RADAR and NAVAID sites
- Identify airspace interactions between facilities in the Las Vegas area
- Identify existing and future air traffic constraints
- Ensure air traffic design is feasible (avoiding Mojave)
- Establish airspace assumptions for analysis in the EIS

Project History
Project Accomplishments to Date

- Acquisition of SOP's and LOA's
- Base map creation
- FAA and Military coordination
- Arrival and departure corridor development
- Radar and NAVAID coverage assessment
- Preliminary airspace conceptual design
- Documentation
- Submitted arrival and departure corridors to EIS Team
- Preliminary procedure design (approach, SIDs and STARs)
- Preliminary Airspace Modeling (TAAM)
- Submittal of draft Preliminary Airspace Design report
- Identification of preliminary Radar and NAVAID sites
- Submittal of draft Preliminary RADAR & NAVAID Site Selection reports

Project History
Coordination Meetings

- Kickoff/Stakeholder Meeting 1 – February 2005
- China Lake site visit – March 2005
- Twenty Nine Palms site visit – March 2005
- ZLA site visit – April 2005
- L30 site visit – May 2005
- Working Meeting I – June 2005
- Working Meeting II – July 2005
- Working Meeting III – July 2005
- Nellis site visit – August 2005
- Stakeholder Meeting 2 – August 2005
- Working Meeting IV – September 2005
- Military Meeting – April 2006
- Working Meeting V – May 2006
- TRACON Working Meeting VI – June 2006
- Working Meeting VII – December 2006

Project History
Working Group Participants

- Clark County Department of Aviation
  - Mike Loghides
- Las Vegas TRACON (L30)
  - Del Meadows
  - Tom Petrakis
  - Laura Kaplan
  - Scott DeHart
- Los Angeles Center (ZLA)
  - Johnnie Garza
  - John Schuster
  - Buck Dodson
- Western En Route Oceanic Service Area (WEOSA)
  - Rodney Lindbeck
- Ricondo & Associates
  - Tom Cornell
  - John Bergener
- ASRC Aerospace/Research and Technology Solutions
  - Robert Varani
  - Shaun Meehan

Project History
Working Group Participants
(Continued)

- Military
  - Shayne Sheehey – Nellis AFB
  - Jesse Machuca – Nellis AFB
  - Gary Dundon – Edwards AFB
  - Phil Barks – Nellis AFB
  - Allen Barton – USAF/FAA Rep
  - Terry Hansen – Miramar MCAS
  - Tom Paquette – Miramar MCAS
  - Wesley Bomyea – Navy Fleet Area Control and Surveillance Area
- Airlines
  - Perry Clausen – Southwest Airlines
  - Jeremy Irish – America West Airlines

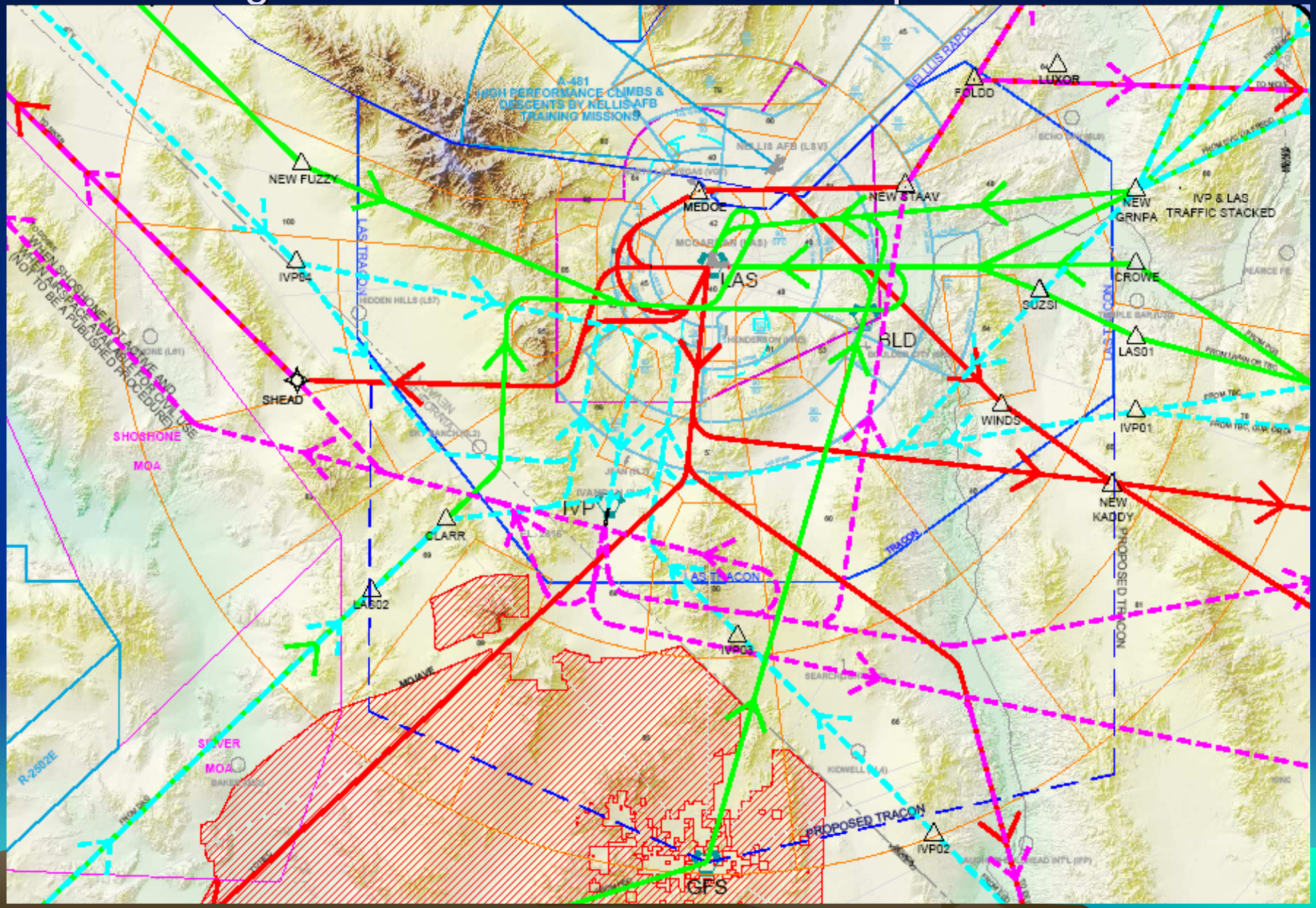
Assumptions for Airspace Environment

- Mojave Preserve restrictions
- VOR/TACAN to be installed at airport
  - One on airport
  - Others at off site location(s)
- New RADAR(s) to be implemented
    - One on airport
    - One at off airport location
    - ADS-B
- Precision instrument landing approaches to each runway
- Use of RNAV capabilities
- Airspace realignments with ZLA, L30, and LSV (new sectors, control positions, new delegated terminal airspace)

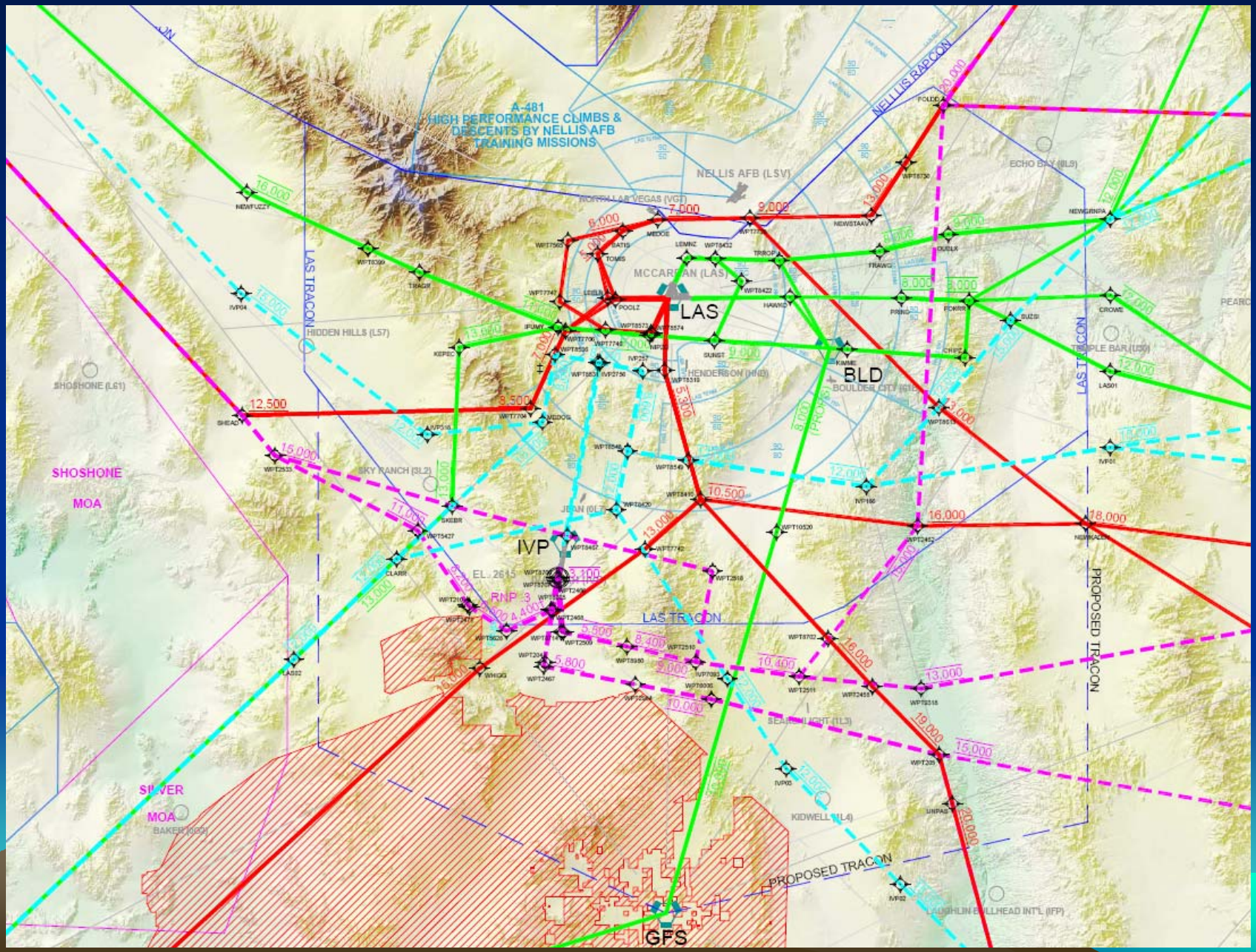
Preliminary SID and STAR Design

- Establishment of arrival and departure corridors
  - Two Alternatives Considered
    - Alt. 1A - No Change to LAS operating environment
      - Not feasible
    - Alt. 1B - Changes to entire airspace environment
      - Preferred alternative
      - Dependent on LAS operation
      - 6 Operating Flows at LAS
- Development of Preliminary RNAV SIDs and STARs
  - Developed using TARGETS
    - Meeting current FAA RNAV criteria
    - All pass Flyability at 110 F with 30K tailwind
    - Most pass Flyability at 110 F with 60K tailwind
  - RNP considered
  - Vector to RNAV technique applied

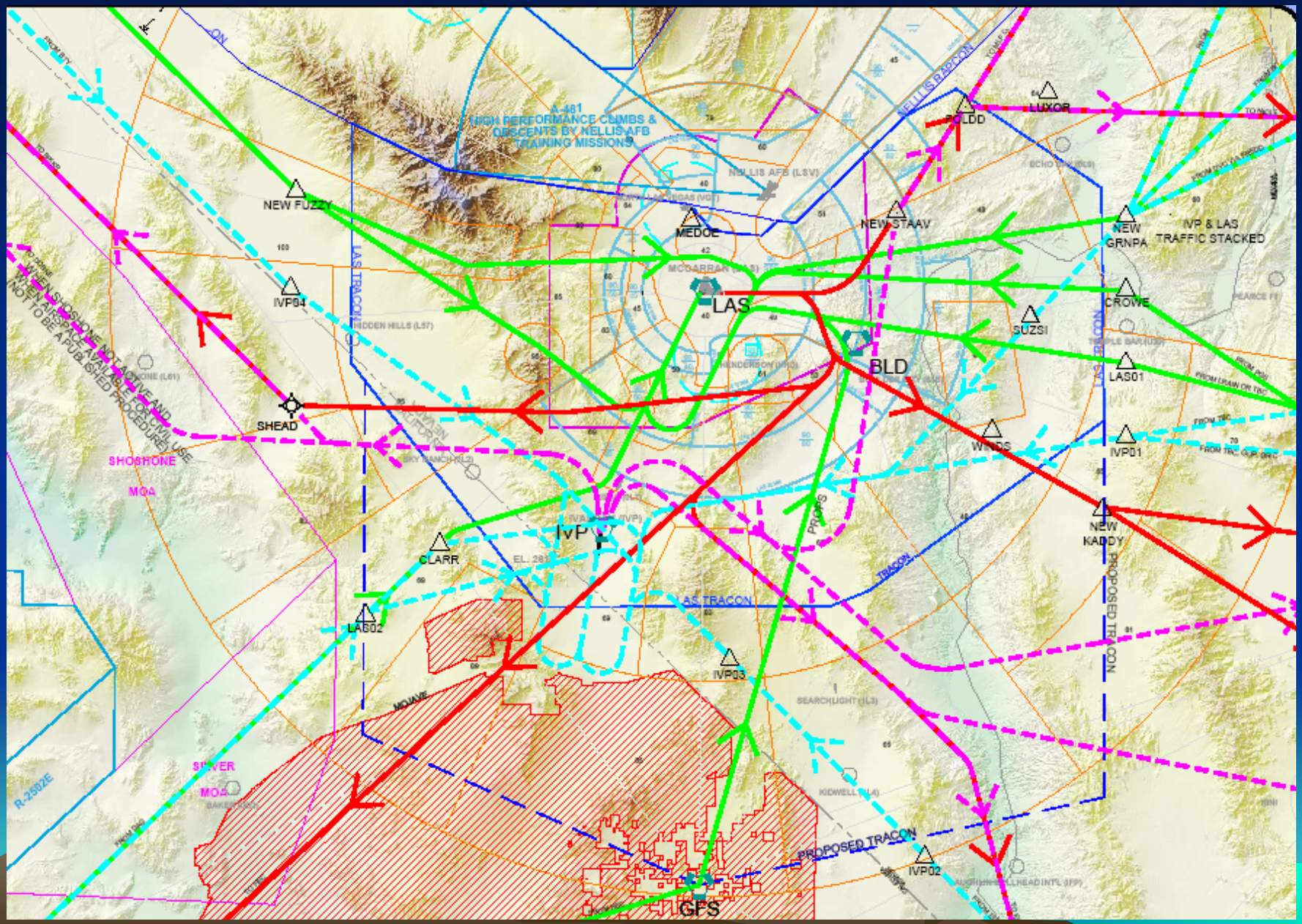
Configuration 1- Land 19R & 25L-Depart 19L & 25R



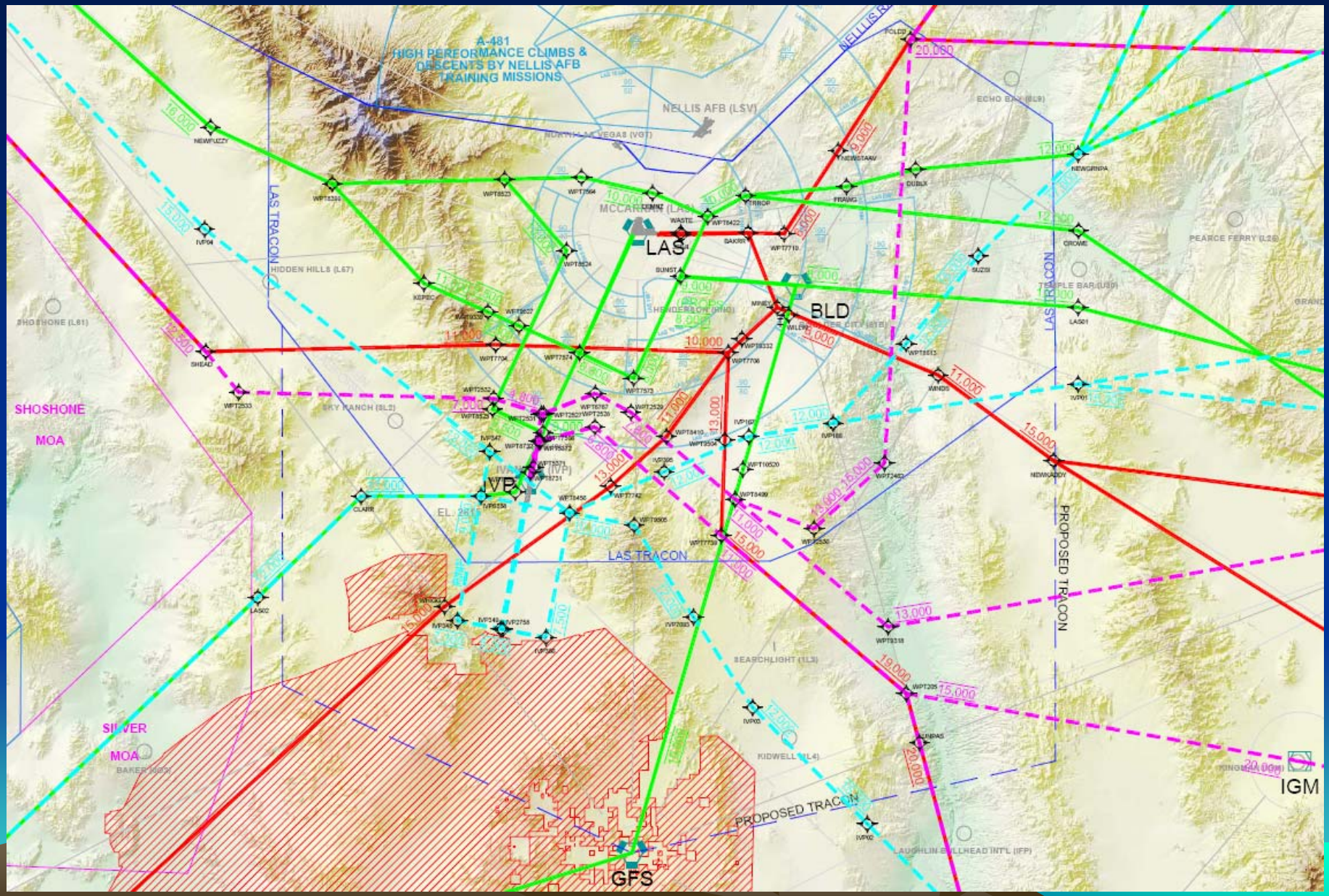
RNAV Configuration 1- Land 19R & 25L-Depart 19L & 25R



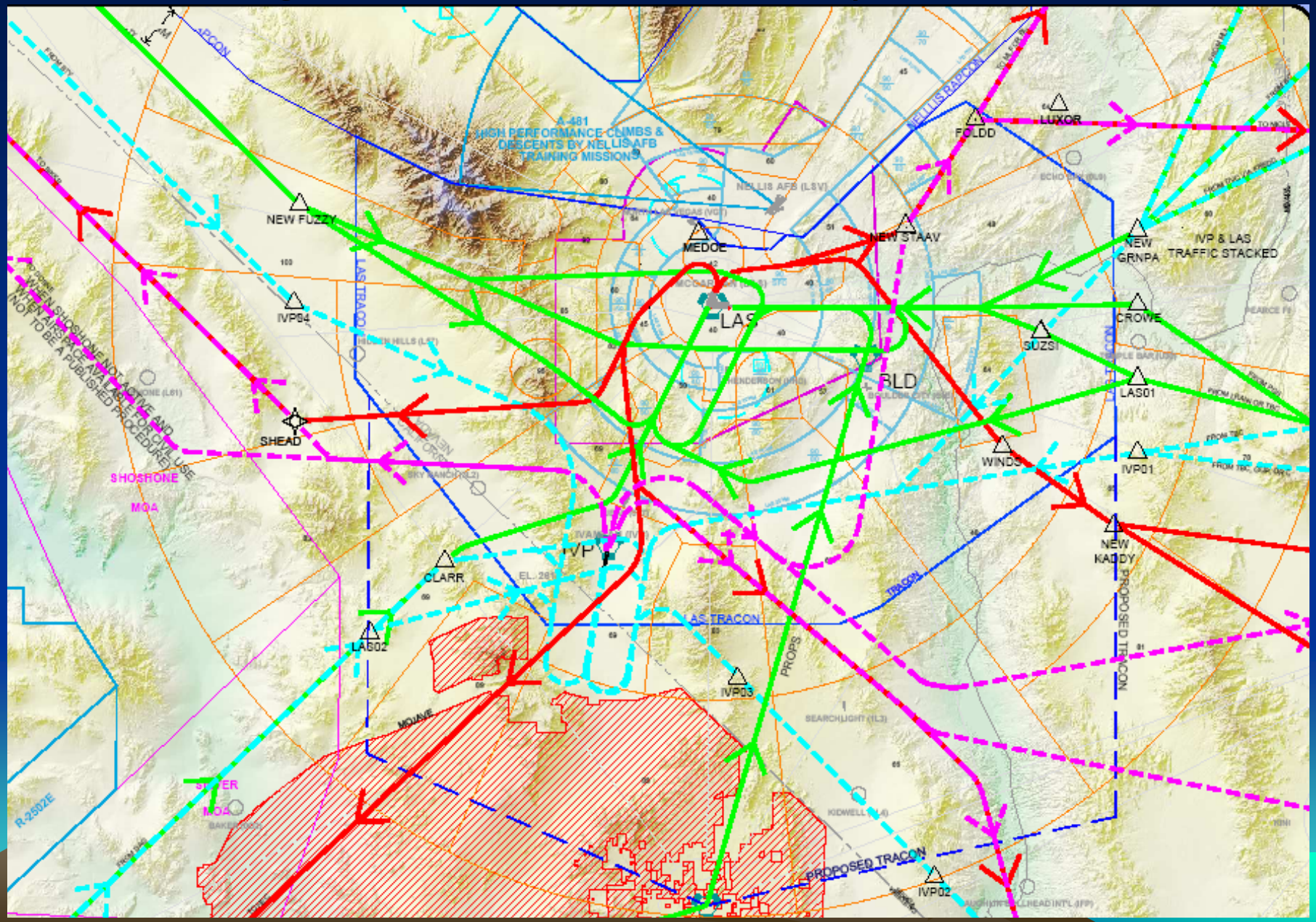
Configuration 2- Land 01 L/R-Depart 07L



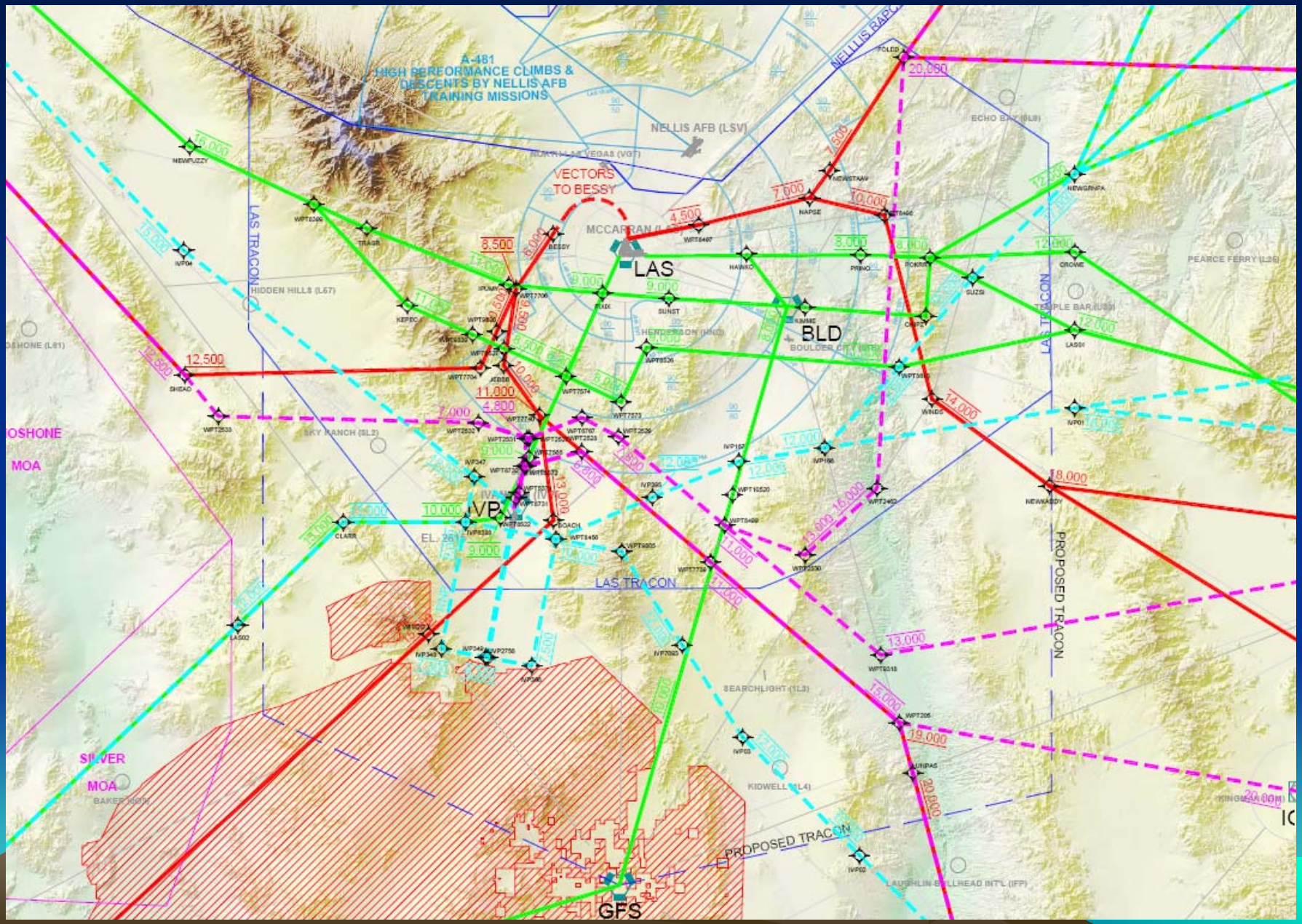
RNAV Configuration 2 - Land 01 L/R-Depart 07L



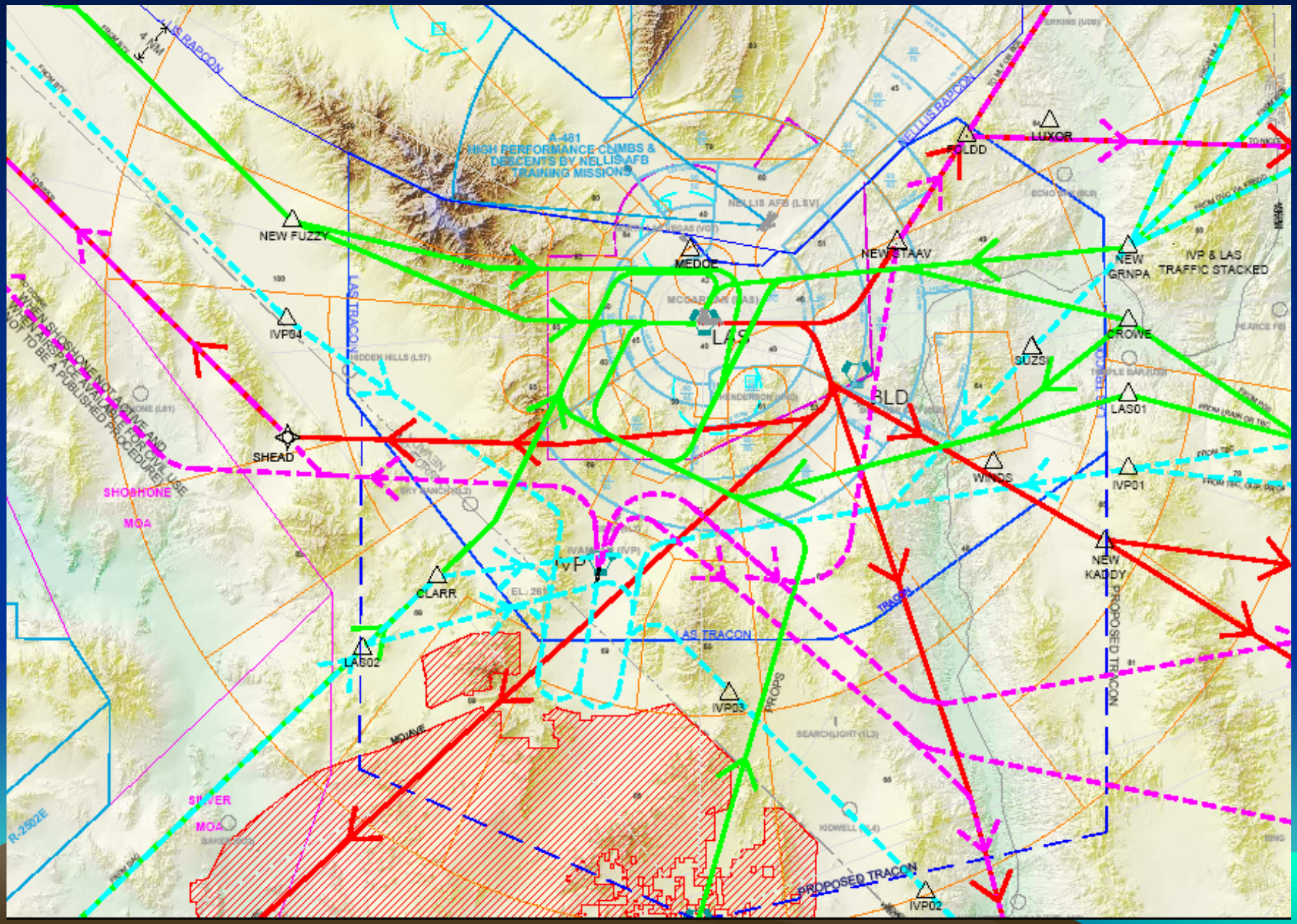
Configuration 3 - Land 01 L/R-Depart 01L & 25L



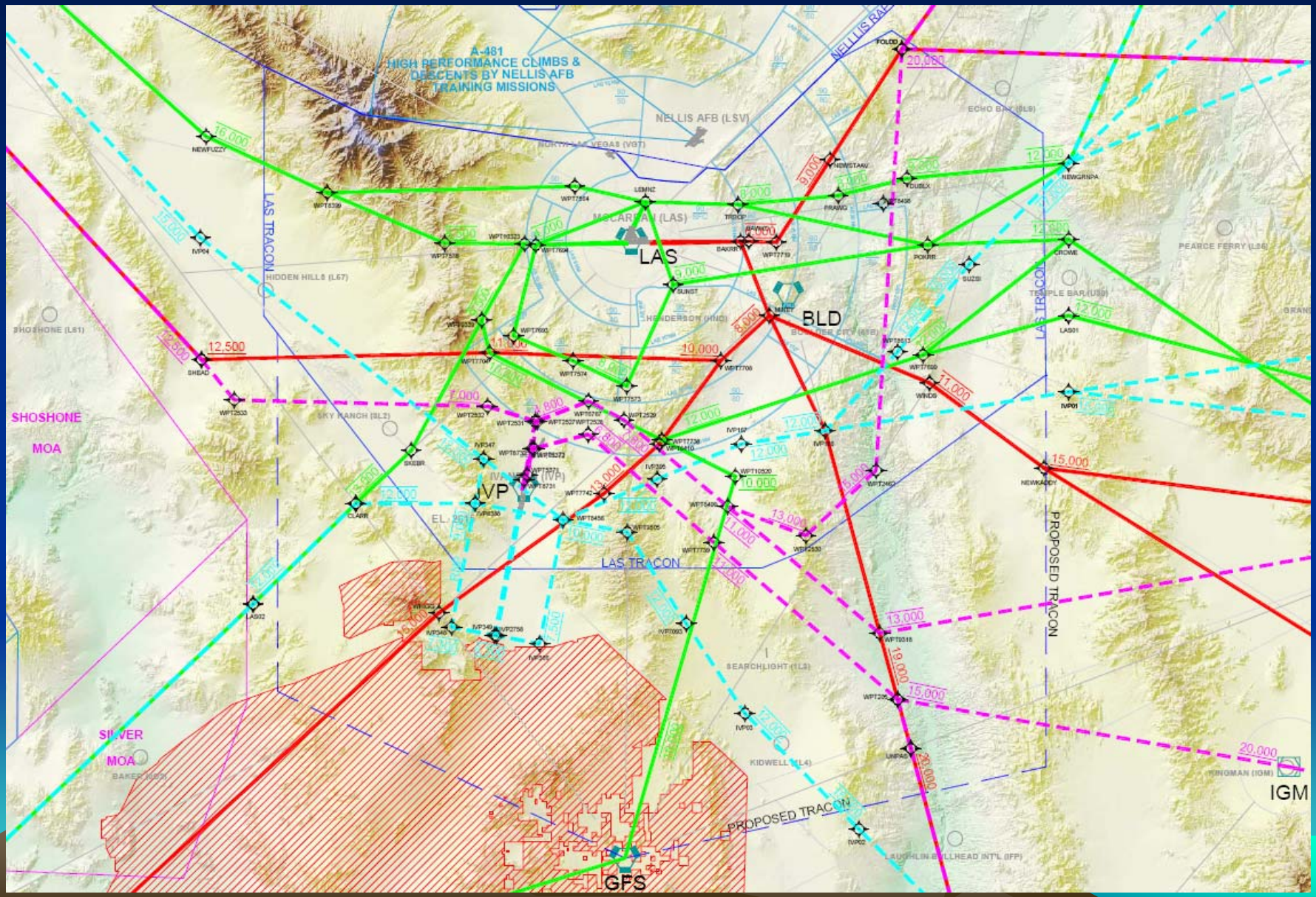
RNAV Configuration 3 - Land 01 L/R-Depart 01L & 25L



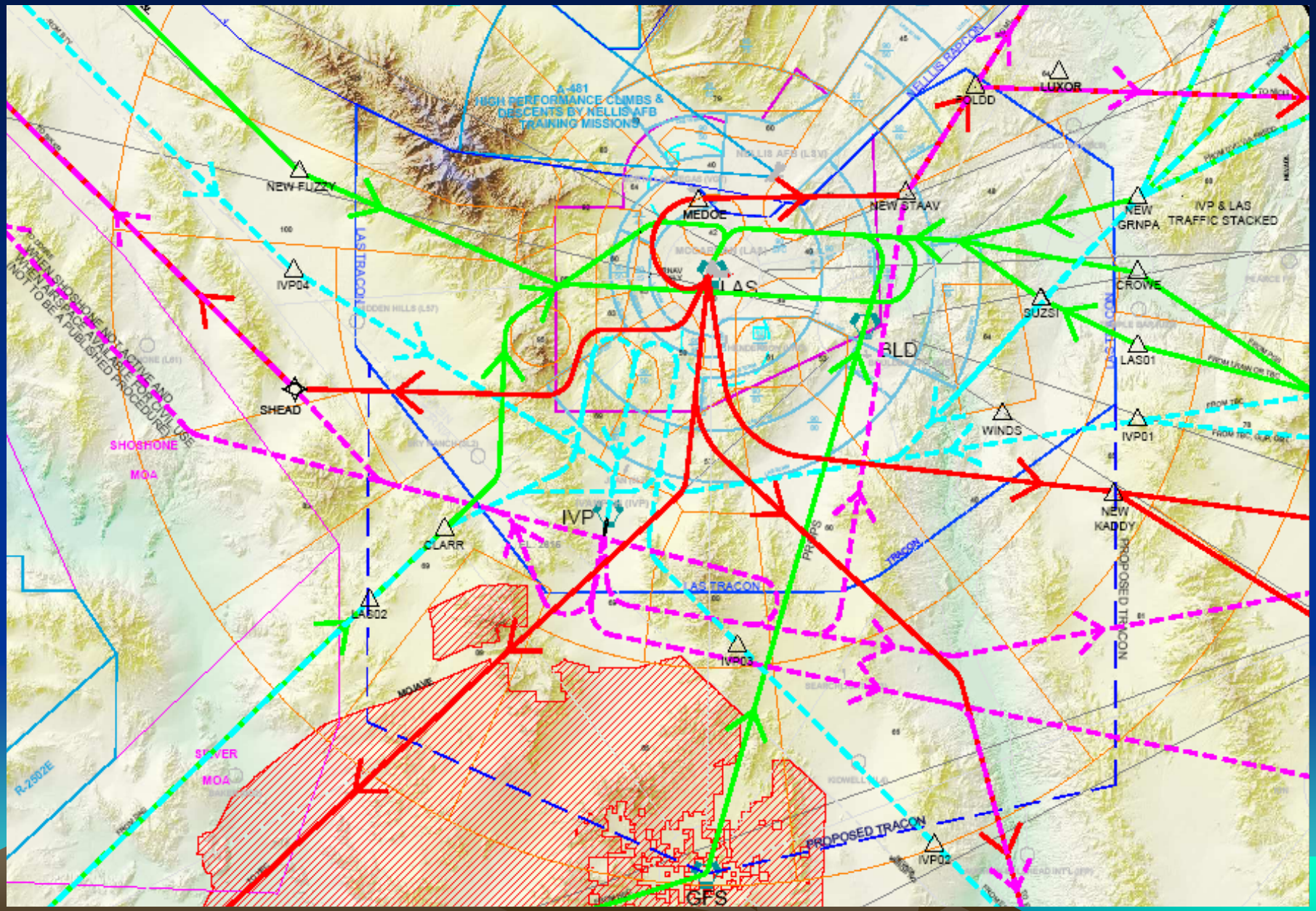
Configuration 4 & 6-Land 07 L/R or 19 L/R-Depart 07 L/R



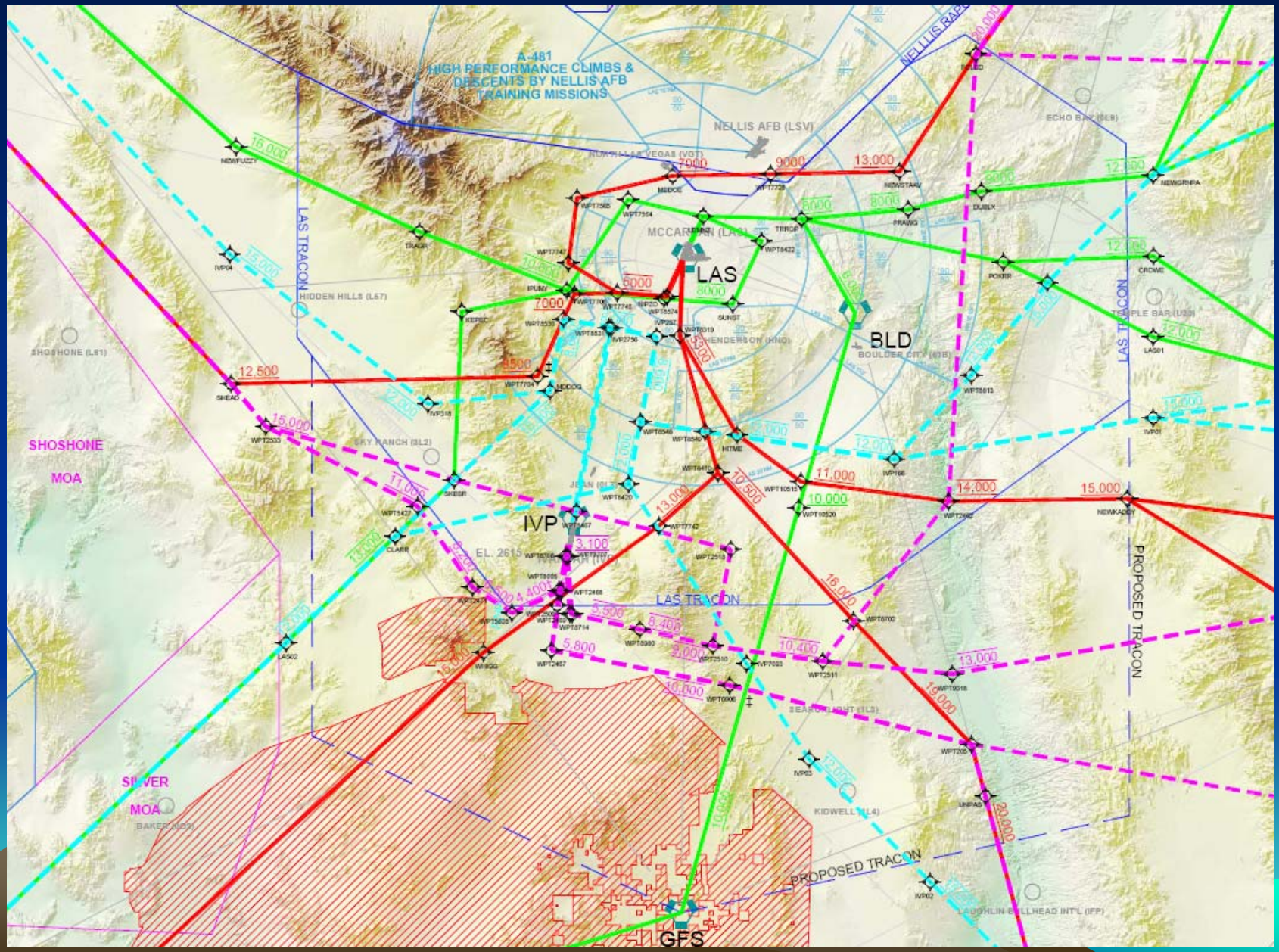
RNAV Configuration 4 & 6 - Land 07 L/R or 19 L/R - Depart 07 L/R



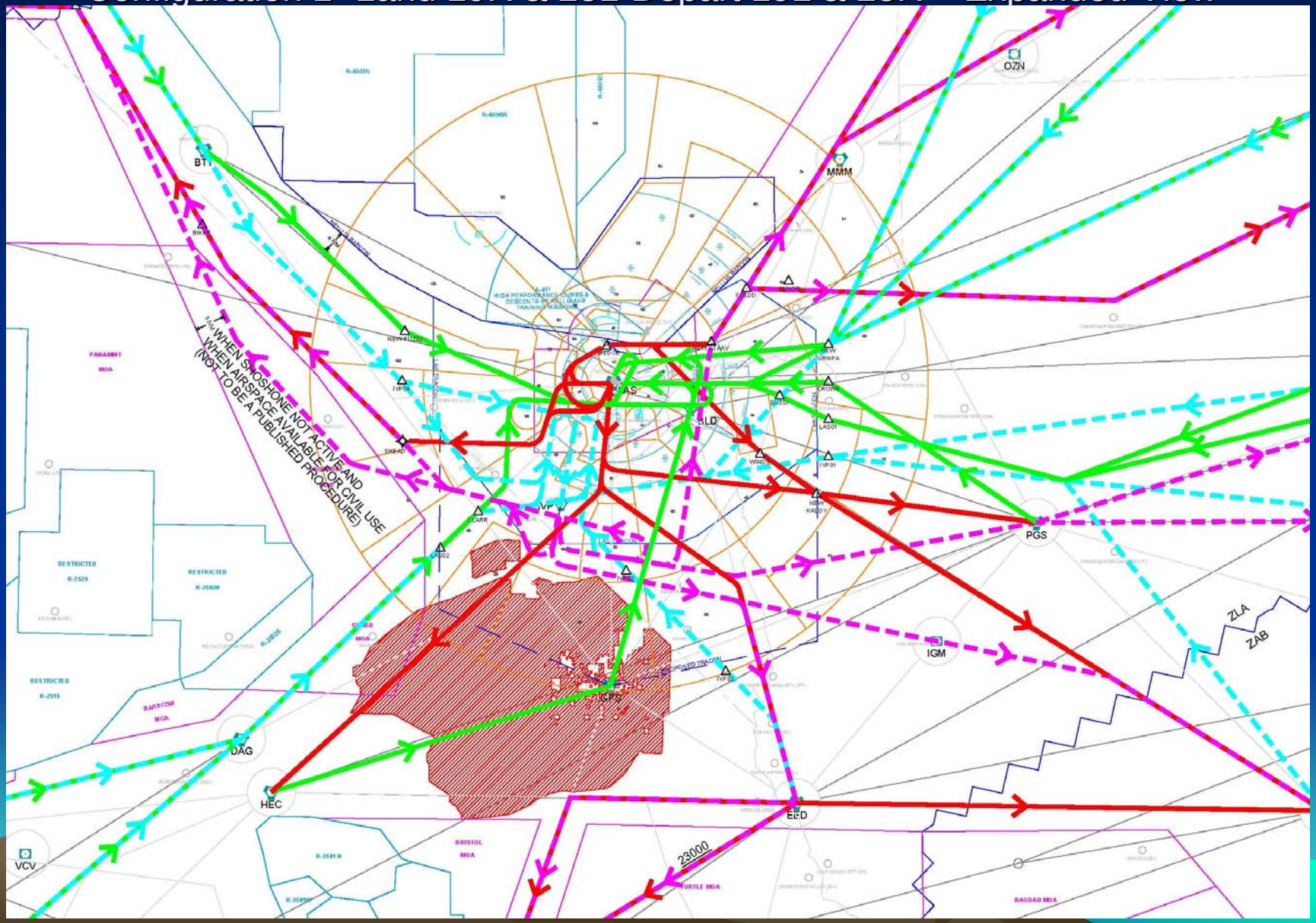
Configuration 5 - Land & Depart 19L/R



RNAV Configuration 5- Land & Depart 19L/R



Configuration 1- Land 19R & 25L-Depart 19L & 25R – Expanded View



Preliminary SID & STAR Designs

- Developed with TARGETS
  - Based on RNAV criteria

Arrival and departure Procedures

SID	Direction (To)	STAR	Direction (From)
	LAS		
NEW STAAV	Northeast	NEW GRNPA	Northeast
NEW KADDY	East	CROWE	East
WPT 205	South	LAS01	Southeast
WHIGG	Southwest	CLARR	Southwest
SHEAD	Northwest	WPT 10520	Southwest
		NEW FUZZY	Northwest
	IVP		
WPT 9318	East	NEW GRNPA	Northeast
WPT 205	South/Southeast	IVP01	East
SHEAD	Northwest	IVP02	Southeast
WPT 2462	North	CLARR	Southwest
		IVP04	Northwest

Source: ASRC Research & Technology Solutions Site Selection Analysis
Prepared by: ASRC Research & Technology Solutions

Preliminary SID and STAR Design

- TAAM Analysis
  - Ricondo & Associates, Inc.

Preliminary IVP Approach Procedures

- Instrument Approaches
  - Developed with IAPA and
  - Based on
    - ILS Criteria
    - LNAV/VNAV Criteria
    - Precision Approach with RNAV Final
    - LPV (WAAS)
    - RNP, RNP SAAR
- Minimums will be high for aircraft equipped with traditional navigation avionics
  - Due to terrain and proximity of Mojave
- CAT I minimums achievable using climb gradients

Approach Minimums Runway 36R

IAP	HAT (feet AGL)	MDA/DA (feet MSL)	Minimum Required Visibility (SM)	Minimum Climb Rate
ILS/RADAR	989	3600	4.0	200 ft/NM[1]
ILS/RNAV	200	2811	½	240 ft/NM
ILS/RNAV	404	3015	¾	200 ft/NM[1]
WAAS	404	3015	¾	200 ft/NM[1]
RNAV/LAAS	404	3015	¾	200 ft/NM[1]
RNAV LNAV	989	3600	2.5	200 ft/NM[1]
LPV	555	3166	1 ¼	200 ft/NM[1]
RNP	404	3015	¾	200 ft/NM[1]
RNP/SAAR	250	2861	¾	300 ft/NM[1]
VOR/DME - A	1265	3900	3.0	200 ft/NM[1]

[1] 200 ft/NM is the standard, assumed minimum climb gradient based on TERPS criteria

Approach Minimums Runway 36L

IAP	HAT (feet AGL)	MDA/DA (feet MSL)	Minimum Required Visibility (SM)	Minimum Climb Rate
ILS/RADAR	978	3589	4.0	200 ft/NM[1]
ILS/RNAV	200	2811	½	300 ft/NM
ILS/RNAV	341	2952	¾	200 ft/NM[1]
WAAS	341	2952	¾	200 ft/NM[1]
RNAV/LAAS	341	2952	¾	200 ft/NM[1]
RNAV LNAV	1129	3740	2.5	200 ft/NM[1]
LPV	450	3061	1.0	200 ft/NM[1]
RNP	341	2811	3/4	200 ft/NM[1]
RNP/SAAR	250	2861	¾	300 ft/NM
VOR/DME - A	1265	3900	3.0	200 ft/NM[1]

[1] 200 ft/NM is the standard, assumed minimum climb gradient based on TERPS criteria

Approach Minimums Runway 18R

IAP	HAT (feet AGL)	MDA/DA (feet MSL)	Minimum Required Visibility (SM)	Minimum Climb Rate
ILS (SE MISS)	2520	5145	9.0	200 ft/NM[1]
ILS (TURN MISS)	1700	4325	6.0	200 ft/NM[1]
ILS/RADAR	2520	5145	9.0	200 ft/NM[1]
ILS/RADAR (TURN MISS)	1700	4325	6.0	200 ft/NM[1]
ILS/RNAV	200	2825	½	300 ft/NM
ILS/RNAV	373	2998	½	200 ft/NM[1]
WAAS	373	2998	½	200 ft/NM[1]
RNAV/LAAS	373	2998	½	200 ft/NM[1]
LPV	443	3068	1.0	200 ft/NM[1]
RNP	373	2998	½	300 ft/NM
RNP/SAAR	250	2875	½	300 ft/NM
RNAV/LNAV	1335	3960	3.0	200 ft/NM[1]

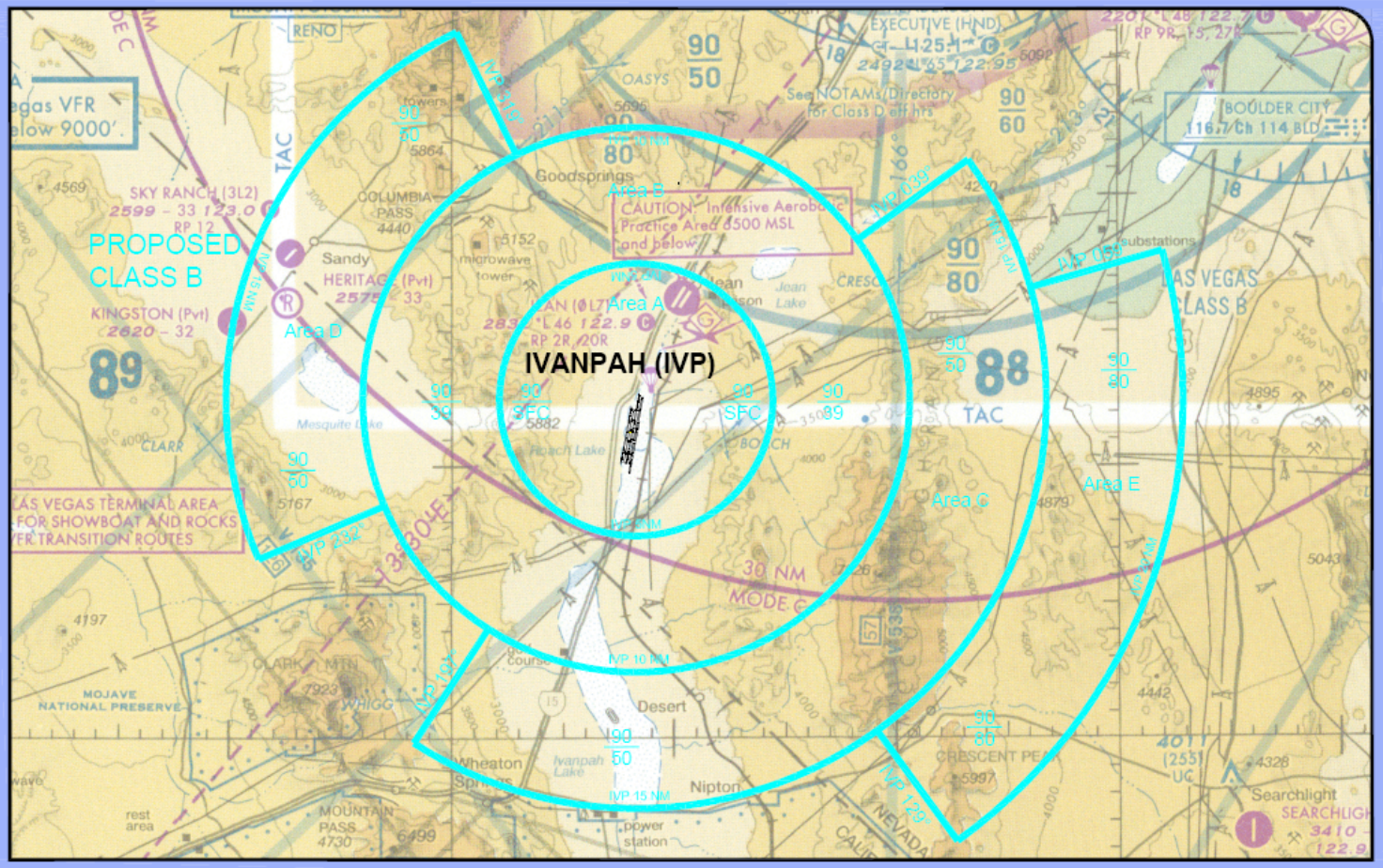
[1] 200 ft/NM is the standard, assumed minimum climb gradient based on TERPS criteria

Approach Minimums Runway 18L

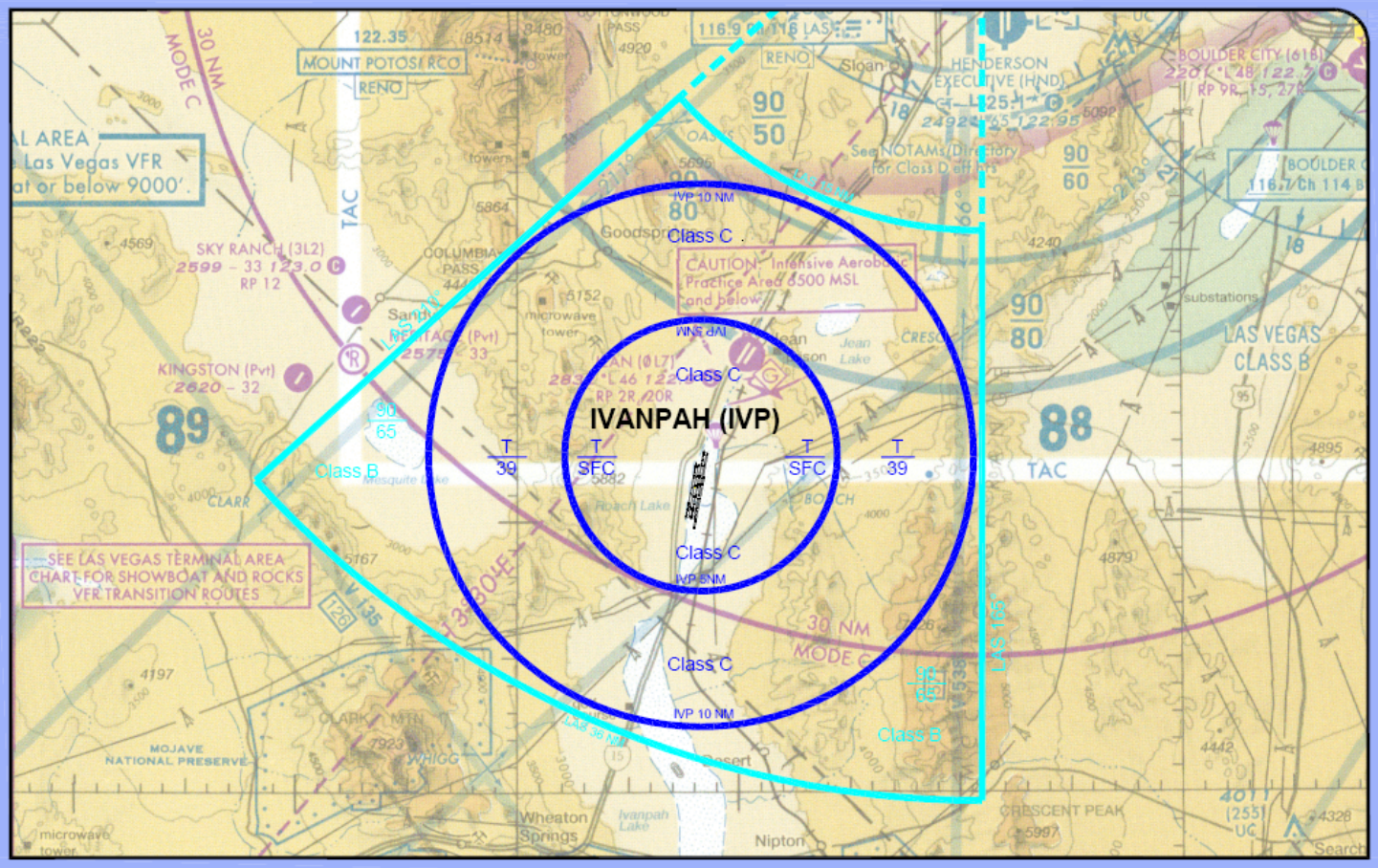
IAP	HAT (feet AGL)	MDA/DA (feet MSL)	Minimum Required Visibility (SM)	Minimum Climb Rate
ILS (SE MISS)	2520	5155	9.0	200 ft/NM[1]
ILS (TURN MISS)	1700	4335	6.0	200 ft/NM[1]
ILS/RADAR	2520	5155	9.0	200 ft/NM[1]
ILS/RADAR (TURN MISS)	1700	4335	6.0	200 ft/NM[1]
ILS/RNAV	200	2835	½	260 ft/NM
ILS/RNAV	308	2943	½	200 ft/NM[1]
WAAS	308	2943	½	200 ft/NM[1]
RNAV/LAAS	308	2943	½	200 ft/NM[1]
LPV	378	3013	¾	200 ft/NM[1]
RNP	308	2943	½	260 ft/NM
RNP/SAAR	250	2885	½	300 ft/NM
RNAV/LNAV	1285	3920	3.0	200 ft/NM[1]
VOR/DME	1845	4480	3.0	200 ft/NM[1]

[1] 200 ft/NM is the standard, assumed minimum climb gradient based on TERPS criteria

Proposed Class B Airspace



Proposed Class C Airspace



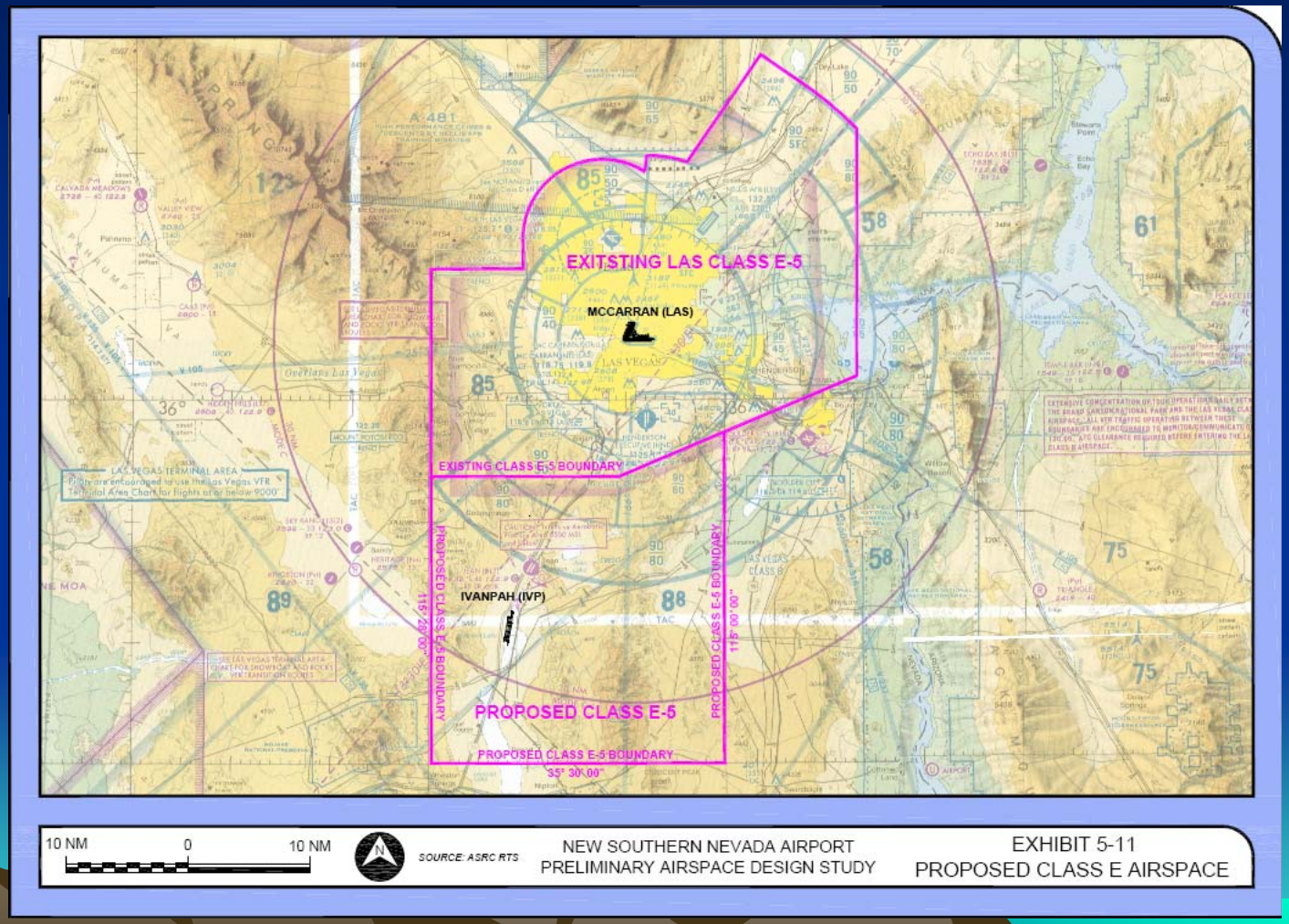
5 NM 0 5 NM

SOURCE: ASRC RTS

NEW SOUTHERN NEVADA AIRPORT
PRELIMINARY AIRSPACE DESIGN STUDY

EXHIBIT 5-10
PROPOSED CLASS C AIRSPACE

Proposed Class E Airspace



Proposed NAVAID and Radar Sites

Next Steps

- Final briefings
- Ongoing project coordination
- Finalization of Preliminary Airspace Design report / final documentation
  - Incorporating comments and feedback
- Finalization of Preliminary RADAR & NAVAID Site Selection reports
- Submit final reports to EIS team

Open Discussion

- Q&A

Meeting Close Out

- Send Feedback by January 26th to:
  John Bergener j_bergener@ricondo.com