III. Alternatives

The Council on Environmental Quality (CEQ) regulations[1] implementing the NEPA, stipulate that an alternatives analysis is a key function of an EA. Those regulations require the following tasks:

- Rigorously explore and objectively evaluate all reasonable alternatives, and, for those alternatives that were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.
- Devote substantial treatment to each alternative considered in detail, including the Proposed Action so reviewers may evaluate their comparative merits.
- Include reasonable alternatives not within the jurisdiction of the lead agency; and
- Include the alternative of "No Action."

This section documents the alternatives considered and the evaluation and screening of those alternatives. Alternatives were screened based on their ability to meet the Purpose and Need, and those that did were carried forward for the environmental impact analysis.

This section includes the following:

- Alternatives Evaluation Process
- Identification of Potential Alternatives
- Alternatives Considered
- Description of Alternatives Carried Forward
- Comparison of Alternatives Carried Forward
- Preferred Alternative Determination
- Listing of Federal Laws and Regulations Considered

3.1 Alternatives Evaluation Process

FAA conducted a thorough and objective review of reasonable alternatives to the Proposed Action in accordance with CEQ regulations and FAA Order 1050.1E. In consideration of these regulations, FAA rejected alternatives if they showed no possibility of meeting the Purpose and Need or offered no prospect of being implemented.

As defined in Section II, the Purpose and Need of the Proposed Action is *to improve the efficiency and reduce the complexity of the air traffic routes serving the EA Airports.*

A critical step in the NEPA review process is the identification of a range of reasonable alternatives to the Proposed Action. The subsequent sections identify the alternatives that were considered and an evaluation as to whether they might reasonably meet the Purpose and Need. Alternatives that would not reasonably meet the Purpose and Need were eliminated and not considered further.

3.2 Identification of Potential Alternatives

The range of alternatives considered in this EA, including those beyond FAA's jurisdiction, include alternatives within the following categories:

- Increase Use of Other Airports
- Improve Airport Infrastructure
- Implement Air Travel Demand Management Programs
- Increase Use of Alternative Modes of Transportation and Telecommunication

[1] Title 40 Code of Federal Regulations 1502.14.

- Use of Improved Air Traffic Control Technology
- Optimize Air Traffic Routes
- Maintain Existing Air Traffic Routes (No Action Alternative)

Alternatives that are not within the jurisdiction of the FAA are included in this EA, in accordance with CEQ regulations implementing NEPA.[2] The No Action alternative is also included in this EA, in accordance with CEQ regulations implementing NEPA.[3]

3.3 Alternatives Considered

Alternatives were identified and each was evaluated to determine whether it would meet the Purpose and Need (see Section 3.1). The following sections describe the alternatives that were considered and the qualitative reasoning behind the decision why or why not an alternative met the Purpose and Need. If an alternative did not meet the Purpose and Need, it was not considered to be a reasonable alternative and was not carried forward for further consideration.

3.3.1 Increase Use of Other Airports

This alternative would shift aircraft operations from the EA Airports to other airports in the region. The Proposed Action is intended to address constraints affecting aircraft operating under IFR in the Las Vegas area that result in inefficient and complex air traffic routes. Those constraints would not be addressed by shifting aircraft operations to other airports.

Further, the majority of IFR aircraft operating in the Las Vegas area are large jets. Significant infrastructure improvements would be needed at any of the airports in the Las Vegas area other than LAS for those airports to accommodate large jets. Even if that infrastructure were in place and operations could be shifted to other airports, the constraints on the routes serving the EA Airports would not be addressed.

Finally, aircraft operators, not the FAA, determine which airport(s) they choose to serve. No regulatory mechanism exists for FAA to redistribute air traffic to other airports; thus, implementation of this alternative is not within the jurisdiction of the FAA.

For the reasons stated above, shifting aircraft operations from the EA Airports to other airports in the region would not meet the stated Purpose and Need. Therefore, this alternative will not be carried forward for further consideration.

3.3.2 Improve Airport Infrastructure

This alternative would involve improvements to airport infrastructure, such as the addition of a new runway. Such improvements are typically undertaken by the operator of the airport to address airfield capacity constraints. However, the inefficiencies and complexities of the air traffic routes, rather than the airfield capacities themselves, result in the constraint and is the problem that the Proposed Action is intended to address. Adding infrastructure on the ground, which is not within the jurisdiction of the FAA, would not address the problem and would result in runway capacity that would be underutilized due to the constraints of the air traffic routes.

Also, as stated in Section 3.3.1, significant infrastructure improvements would be needed at any of the other airports in the Las Vegas area other than LAS for those airports to be able to accommodate large jets that operate under IFR. Section 3.3.1 describes why such improvements and the shifting of operations to other airports would not meet the Purpose and Need.

[2] Title 40 Code of Federal Regulations 1502.14(c).
[3] Title 40 Code of Federal Regulations 1502.14(d).

For the reasons stated above, improving airport infrastructure at the EA Airports or other airports in the region would not meet the Purpose and Need. Therefore, this alternative will not be carried forward for further consideration.

3.3.3 Implement Air Travel Demand Management Programs

This alternative would involve demand management measures to limit the number of aircraft operations at the EA Airports during peak periods or shift operations to less congested times of the day. Examples of demand management measures include:

- **Administrative Approaches**—Administrative approaches may include operational controls that limit the number of IFR operations by requiring a reservation for an operation, commonly known as a "slot," such as the controls currently in place at Ronald Reagan Washington National and LaGuardia Airports. This approach includes an administrative cap on the number of hourly operations to control demand and implementation of the approach is within the FAA's jurisdiction.
- **Voluntary Schedule Modifications**—Voluntary modifications to schedules would be initiated by individual air carriers, not by the FAA. In this scenario, an air carrier would modify its schedule to redistribute operations to less congested times of the day to relieve demand for operating in the Las Vegas area during congested periods.
- **Market-based Approaches**—Market-based approaches may include congestion-based landing fees or the auctioning of landing and take-off rights, to use market forces to encourage system users to schedule their operations during less congested times of the day. A market-based approach may be instituted either by the FAA or by an airport operator.

This alternative would limit the number of aircraft operations during peak periods based on airspace constraints (i.e., the existing inefficiencies and complexities of the existing air traffic routes) rather than addressing the need to improve the efficiency and reduce the complexity of the air traffic routes serving the EA Airports.

For the reasons stated above, implementing air travel demand management programs to reduce demand during the congested times of the day would not meet the stated Purpose and Need. Therefore, this alternative will not be carried forward for further consideration.

3.3.4 Increase Use of Alternative Modes of Transportation and Telecommunication

Alternative modes of transportation and telecommunication include expanded use of rail, bus, or auto travel, to offset air travel or increase the use of telecommunications to avoid travel. Implementation of this alternative is not within the jurisdiction of the FAA. Specific examples that could be considered for Las Vegas include: building the high-speed rail system linking Las Vegas and large metropolitan areas such as Los Angeles and San Francisco, developing dedicated highway lanes for Bus Rapid Transit systems, and increasing the use of video conferencing. Such programs have been proposed and are being considered.

While the implementation of projects involving alternative modes of transportation could result in greater usage of these transportation modes with potentially corresponding reduction in demand for air travel and associated reductions in air traffic congestion, this alternative does not address the constraints of the air traffic routes. Similarly, increasing the use of telecommunications to avoid air travel does not address those constraints. Demand for air travel would continue to exist in the Las Vegas area and the constraints of the air traffic routes would not be addressed.

For the reasons stated above, pursuing improvement projects or other means to reduce the demand, for air travel in the Las Vegas area that presently exists and will continue to exist does not meet the Purpose and Need. Therefore, this alternative will not be carried forward for additional consideration.

3.3.5 Use of Improved Air Traffic Control Technology

The FAA and the industry are regularly developing new and improved technologies to maximize the efficiency of the NAS (refer to Section 1.3.2), an alternative that is within the jurisdiction of the FAA. Although conceptually future technology improvements have the potential to allow air traffic controllers to manage airspace more efficiently, the design of the existing procedures and the supporting airspace management structure in the Las Vegas area is not conducive to allowing the FAA and industry to utilize the full capabilities of these new technologies. This need for both air traffic control technology improvements along with improvements to air traffic routes is recognized in FAA's plans to implement NextGen (refer to Section 1.1.3), which involves the integration of existing and new air traffic control technologies along with the use of PBN navigation (such as RNAV STARs and SIDs) instead of step-by-step procedures (such as Conventional STARs and SIDs).[4, 5]

To the extent that the existing procedures and the supporting airspace management structure would allow the FAA to implement new technologies, these improvements are assumed to be a part of the No Action Alternative, as discussed in Section 3.3.7.

The alternative to optimize aircraft procedures, discussed in Section 3.3.6, involves the redesign of procedures and the supporting airspace management structure serving the EA Airports to allow the FAA to implement new air traffic control technologies.

The use of improved air traffic control technology without redesign of the procedures and the supporting airspace management structure serving the EA Airports would not, by itself, meet the Purpose and Need. Therefore, this alternative is not considered to be a reasonable alternative on its own for meeting the Purpose and Need for the Proposed Action and will not be carried forward for additional consideration. The use of improved air traffic control technology, however, would be a component of both the No Action Alternative, to the extent practical given the design of existing procedures, and of the alternative to optimize air traffic routes.

3.3.6 Optimize Air Traffic Routes

Air traffic routes in the Las Vegas area could be redesigned by adding new terminal airspace entry and exit points, adding to and modifying the procedures serving aircraft operating under IFR in the Las Vegas area, and modifying the supporting airspace management structure. Additional entry and exit points would permit the development of new procedures and modification of existing procedures in and out of the airspace. These procedures can be designed for RNAV-equipped aircraft and define routes that include runway transitions between runway ends and the entry/exit points, improving the predictability of air traffic routes in the L30 terminal airspace, while reducing the need for intensive air traffic management of aircraft in the airspace (such as vectoring and holding).

These actions, which are within the jurisdiction of the FAA, have the potential to improve the efficiency and reduce the complexity of the air traffic routes serving the EA Airports. New

[4] Testimony Before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, House of Representatives, "Next Generation Air Transportation System: FAA Has Made Some Progress in Implementation, but Delays Threaten to Impact Costs and Benefits," GAO-12-141T, October 5, 2011.

[5] U.S. Department of Transportation, Federal Aviation Administration, *NextGEN Implementation Plan*, "Executive Summary," March 2012, page 5.

procedures could increase the throughput of the L30 terminal airspace by removing constraints and by providing more predictable routings throughout the airspace and to/from the runways.

This alternative, to optimize air traffic routes, has the potential improve the efficiency and reduce the complexity of the air traffic routes serving the EA Airports. Therefore, this alternative has the potential to meet the Purpose and Need and will be carried forward for further analysis.

3.3.7 Maintain Existing Air Traffic Routes (No Action Alternative)

The No Action Alternative would maintain the procedures and routes serving the Las Vegas area in use as of 2009 (representing existing conditions), along with approved procedure modifications as described in Chapter 4, Affected Environment, Section 4.4, Table IV-14, Regional Airspace Projects category.

Under the No Action Alternative, the constraints identified in Section 2.1.2 would remain. In summary, these causal factors are:

- Procedures lack the flexibility to efficiently transfer aircraft between the en route airspace and the terminal airspace.
- Aircraft departing from and landing at the EA Airports share entry and exit points and arrival and departure routes that limit air traffic controller flexibility to manage EA Airport traffic.
- Complex converging interactions between arriving and departing flights impede efficiency.
- Current procedures do not take full advantage of RNAV capabilities that can provide more predictable and repeatable flight routing.
- Lack of procedures to direct aircraft to and from the EA Airport runways increases complexity.

Although the No Action Alternative does not have the potential to address the Purpose and Need, it is carried forward for further environmental analysis in accordance with CEQ regulations implementing NEPA.

3.4 Description of Alternatives Carried Forward for Analysis

This section provides descriptions of the alternatives carried forward for analysis in the EA—the No Action Alternative and the LAS Optimization Alternative. The descriptions highlight the following key features of the primary air traffic routes to and from the EA Airports:

- **Arrival and Departure Gates**—the general areas along the L30 terminal airspace boundary through which aircraft of similar origins or destinations typically pass when landing at or taking off from the EA Airports. The arrival and departure gates correspond to general direction flows of air traffic.
- **Entry and Exit Points**—locations along an arrival or departure gate through which aircraft following a STAR or SID transition between the L30 terminal airspace and the en route airspace. One or several entry points may be located along an arrival gate and one or several exit points may be located along a departure gate.
- **Procedure Type**—the type of procedure an aircraft follows through the L30 terminal airspace, including:
  - RNAV SIDs and STARs—standard instrument procedures that accommodate aircraft that are RNAV-equipped (refer to Section 1.1).

  - Conventional SIDs and STARs—standard instrument procedures based on ground-based NAVAIDs that provide instrument guidance to a pilot as the aircraft flies over each NAVAID, or based on verbal instructions from an air traffic controller (refer to Section 1.1).
  - Victor Airways—defined routes for low-performance aircraft that operate at altitudes below jets and turboprops (as opposed to jets and turboprops that typically follow routes defined by jet airways [refer to Section 1.1.2.1 for a discussion on jet airways]).
  - Vectoring—a route based on verbal instructions from an air traffic controller.
- **Runway Ends Served by Procedure**—identifies which runway ends are served by a procedure and how aircraft flow through the L30 terminal airspace (either by following runway transitions defined in the procedure or by vectoring).

For LAS, the majority of aircraft operating under IFR are jets and turboprops (i.e., high-performance propeller aircraft such as the DASH-8 or the Embraer EMB 120); therefore, the flows identified for LAS in the exhibits in this section focus on Conventional and RNAV SIDs and STARs, the types of procedures typically followed by jets and high-performance propeller aircraft. Jets and turboprops also operate at VGT and HND following Conventional and RNAV STARs and SIDs; however, a smaller percentage of RNAV-equipped aircraft operated by RNAV-trained pilots operate at VGT and HND as compared with LAS.

Some low-performance propeller aircraft operate under IFR at the EA Airports following routes defined by Victor Airways. Flows along Victor Airways to and from VGT and HND are presented on the exhibits in this section. Although an infrequent occurrence, propeller aircraft landing at or taking off from LAS may share the routes defined by Victor Airways. Although the Victor Airways are not depicted on the exhibits for LAS, the flows are similar to those presented for VGT and HND.

Traffic flows to and from the EA Airports are discussed and depicted in two dimensions on exhibits in this section in order to capture the primary changes to airspace structure through a comparison of aircraft flows under the No Action Alternative and the LAS Optimization Alternative. The altitudes of aircraft operating along a route are not presented because altitude alone at specific points may not provide a meaningful comparison between alternatives when considering potential impacts. For example, noise exposure levels resulting from aircraft operations depend on angle or distance from the source of the sound, thus, the altitude alone is not a meaningful descriptor. Likewise, the number of aircraft on a particular aircraft path alone may not provide a meaningful comparison among alternatives because the same number of aircraft can result in different noise exposure levels depending on other factors.

The two-dimensional graphics of the alternatives depict generalized aircraft traffic flow in the GSA. The width of the flows, or corridors, represent the dispersion of aircraft following that particular flow, including dispersion caused by vectoring, rather than the number of aircraft in the flow. Each traffic flow is described and illustrated by using references to major landmarks to provide reference.

The entry and exit points and the gates presented in this section may not exactly align geographically with those used by FAA for the purpose of controlling air traffic. The entry and exit points and gates presented in this section were developed specifically to describe and illustrate the alternatives.

3.4.1 No Action Alternative

The following provides an overview of the airspace structure and flows of aircraft operating under IFR in the Las Vegas area under the No Action Alternative.

3.4.1.1 Airspace Structure

The existing hybrid four corner-post organization of the L30 terminal airspace would be maintained in the No Action Alternative. In a typical four-corner post system, departing aircraft exit the terminal airspace through departure gates to the north, east, south, and west, and arriving aircraft enter the terminal airspace through arrival gates to the northeast, southeast, southwest, and northwest. However, the constraints around the L30 terminal airspace, described in Section 1.2, limit the ability for aircraft to enter or exit the L30 terminal airspace from or to the north, east, or west. Consequently, the locations of several of the gates are not typical to a four corner-post airspace structure, and the L30 terminal airspace is therefore considered a hybrid four corner-post system.

3.4.1.2 Arrival Flows

This section provides a summary of the procedures and other routes that aircraft landing at the EA Airports follow through the L30 terminal airspace under the No Action Alternative. Exhibits illustrate the general flows of air traffic from the arrival gate of the L30 terminal airspace to the runway ends at the EA Airports. Four arrival gates (consistent with 2009 existing conditions) would accommodate aircraft traffic entering the L30 terminal airspace under the No Action Alternative:

- **LUXOR Arrival Gate**—generally accommodating traffic from areas to the northeast of the Las Vegas areas as well as from some areas to the north and east.
- **KADDY Arrival Gate**—generally accommodating traffic from areas to the southeast and south of the Las Vegas area as well as from some areas to the east.
- **CLARR Arrival Gate**—generally accommodating traffic from areas to the southwest of the Las Vegas area.
- **FUZZY Arrival Gate**—generally accommodating traffic from areas to the northwest of the Las Vegas area as well as from some areas to the north.

The primary aircraft traffic flows through each arrival gate to the EA Airports in the No Action Alternative are discussed in this section.

LUXOR (Northeast) Arrival Gate

Exhibits III-1, III-2, and **III-3** depict the aircraft traffic flows from the northeast to LAS, VGT, and HND, respectively. **Table III-1** provides an overview of the procedures and other routes serving IFR traffic from the northeast to the EA Airports. Specifically, this table, and the subsequent tables in Sections 3.4.1 and 3.4.2, defines how the procedures and routes link the entry points (or exit points for departures) and the EA Airport runway ends. The table highlights entry points that are exclusive to a single airport, routes that are exclusive to a single airport, and runway ends for which a procedure includes a runway transition rather than some portion of the procedure being dependent on vectoring by an air traffic controller.

Table III-1

Aircraft Procedures and Routes from the Northeast to the EA Airports, No Action Alternative

Entry Point	Route Name	Procedure Type	EA Airport Runway Ends Served by Procedure																	
			LAS								VGT						HND			
			01L	01R	07L	07R	19L	19R	25L	25R	7	12L	12R	25	30L	30R	17L	17R	35L	35R
LUXOR	LUXOR	CONV	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
	GRNPA	**RNAV**	V	V	V	V	V	V	V	V	-	-	-	-	-	-	-	-	-	-
MORRK	NOOTN	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V	V	RT	RT
Other Routes																				
Via LUXOR Arrival Gate	V21 (Northeast)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via NATCF Airspace	V394 (Northeast)	VICTOR	-	-	-	-	-	-	-	-	V	V	V	V	V	V	-	-	-	-

Notes:

CONV = Conventional STAR

RNAV = Area Navigation (RNAV) STAR

VICTOR = Victor Airway (Certain Victor Airways serve arrivals to LAS, although in very small numbers. Therefore, the Victor Airways are only depicted on Exhibits III-2 and III-3, for VGT and HND, respectively.)

V = Procedure does not include a runway transition route to the final approach to the runway end, so aircraft are vectored to the final approach.

RT = Procedure includes a runway transition route to the final approach to the runway end.

Blue shading indicates an entry point that is exclusive to a single airport.

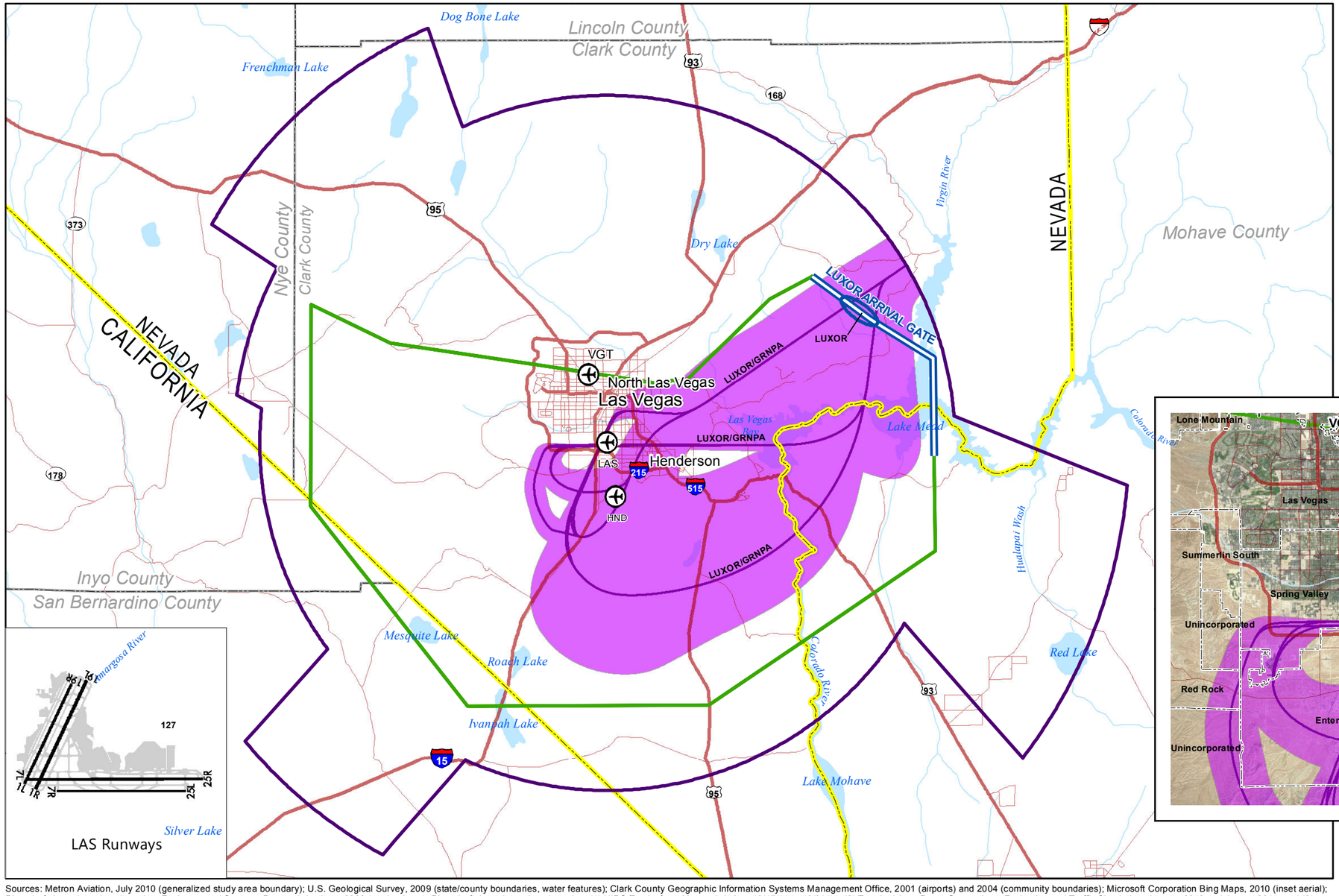
Light green shading indicates routes that are exclusive to one EA Airport.

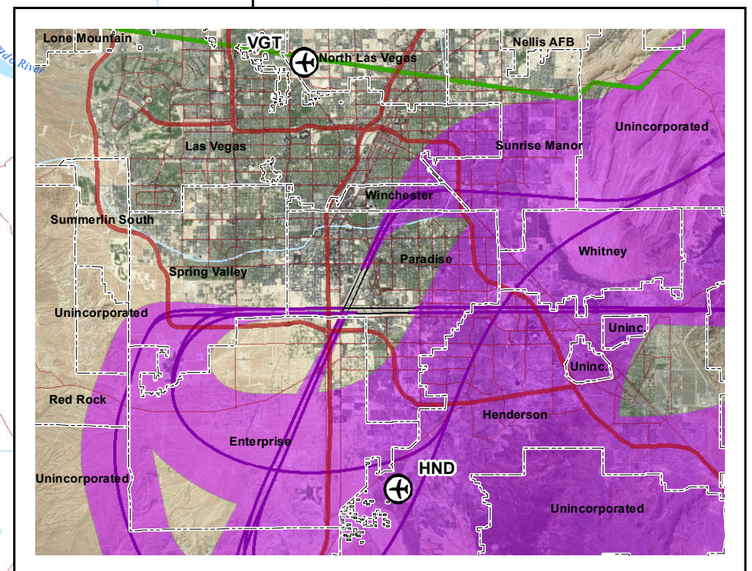
NATCF = Nellis Air Traffic Control Facility

Sources: Ricondo & Associates, Inc., January 2012, based on (1) NIRS Tracks from Metron Aviation, October 17-31, 2011; and (2) U.S. Department of Transportation, Federal Aviation Administration, *Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement*, Subject: Terminal Area Control, Effective: June 30, 2011.

Prepared by: Ricondo & Associates, Inc., February 2012.

Two entry points to the L30 terminal airspace (LUXOR and MORRK), through which two RNAV STARs (GRNPA to LAS and NOOTN to HND) and one Conventional STAR (LUXOR to all three EA Airports) pass, are located along the LUXOR Arrival Gate. The GRNPA RNAV STAR to LAS is an overlay of the shared LUXOR Conventional STAR. An RNAV overlay of a conventional STAR provides RNAV guidance along a route that follows the Conventional STAR. The GRNPA and LUXOR STARs share the LUXOR entry point. The NOOTN RNAV STAR to HND passes through the MORRK entry point, which is exclusive to that STAR. Two additional flows are defined by Victor Airways from the northeast—one from the northeast to the EA Airports (V21 [Northeast]), but primarily serving propeller aircraft landing at VGT and HND, and one through the NATCF airspace serving VGT exclusively (V394 [Northeast]).





LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-1

0 13 NM

north

No Action Alternative
LAS - LUXOR Arrival Gate

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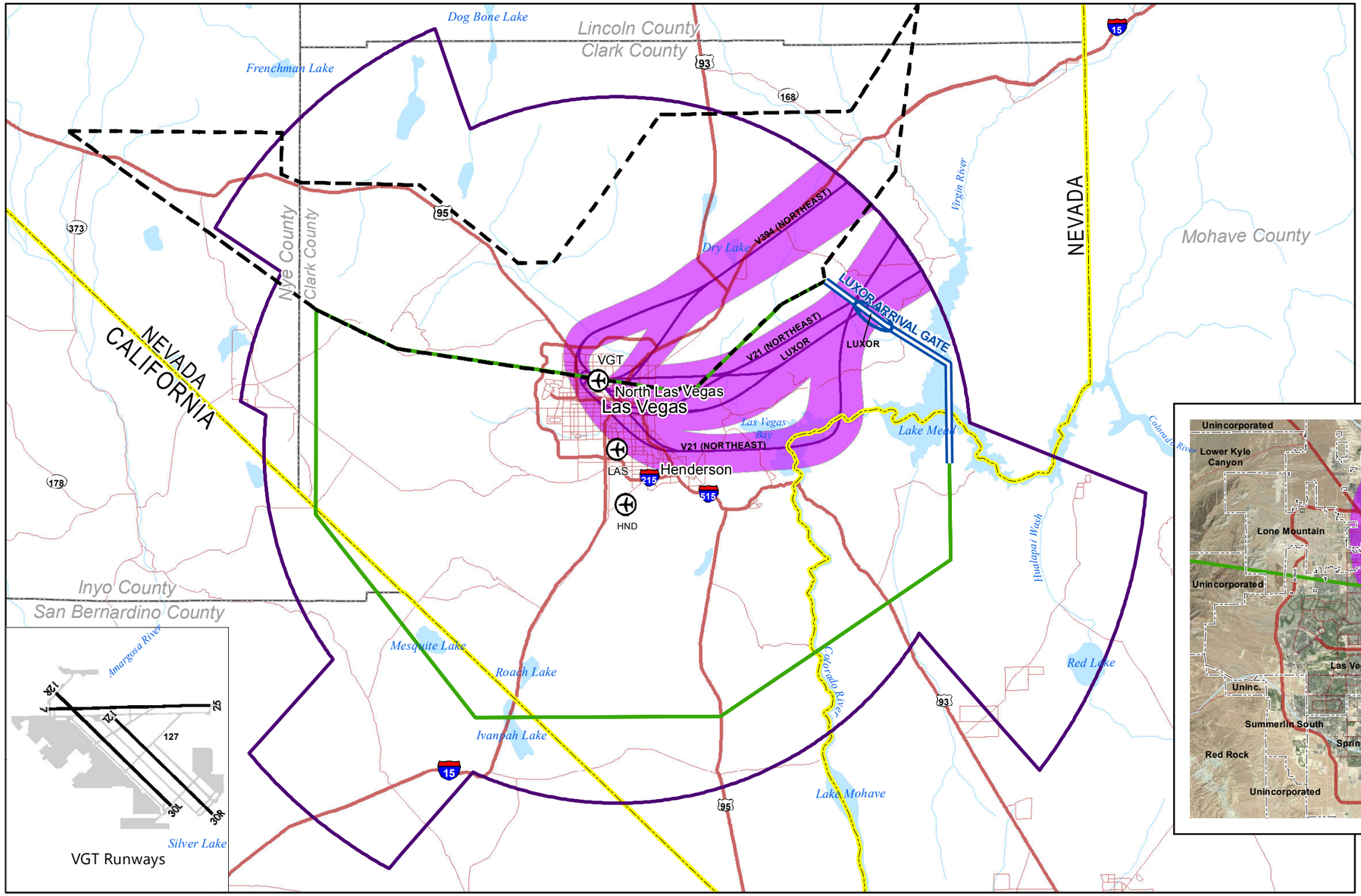

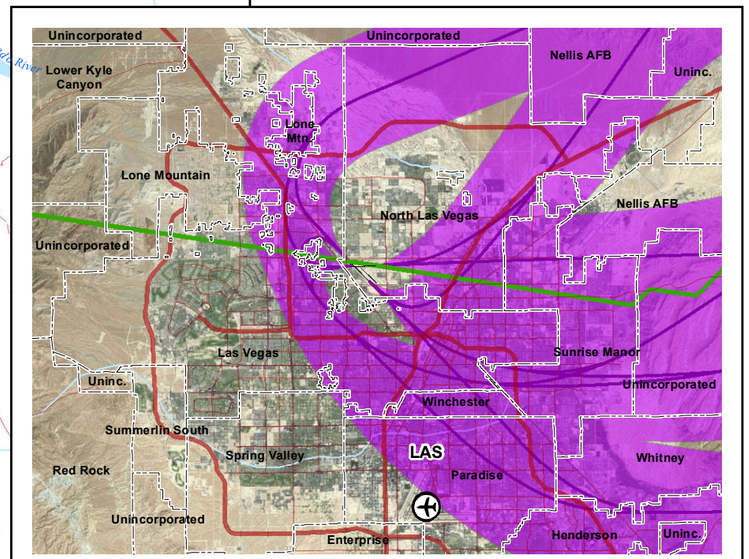

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- NATCF Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport;
NATCF - Nellis Air Traffic Control Facility
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-2

0 13 NM

north

No Action Alternative
VGT - LUXOR Arrival Gate

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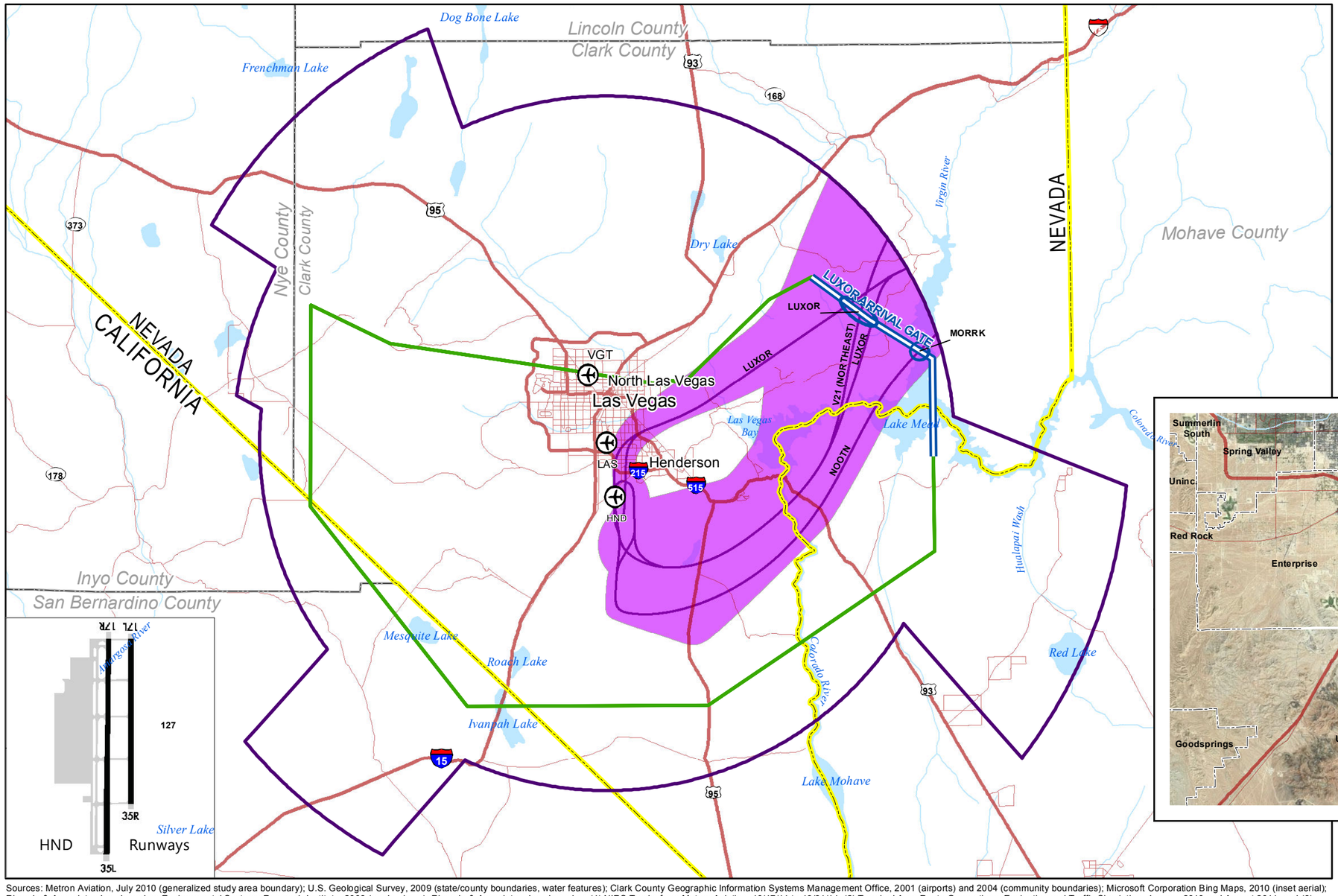

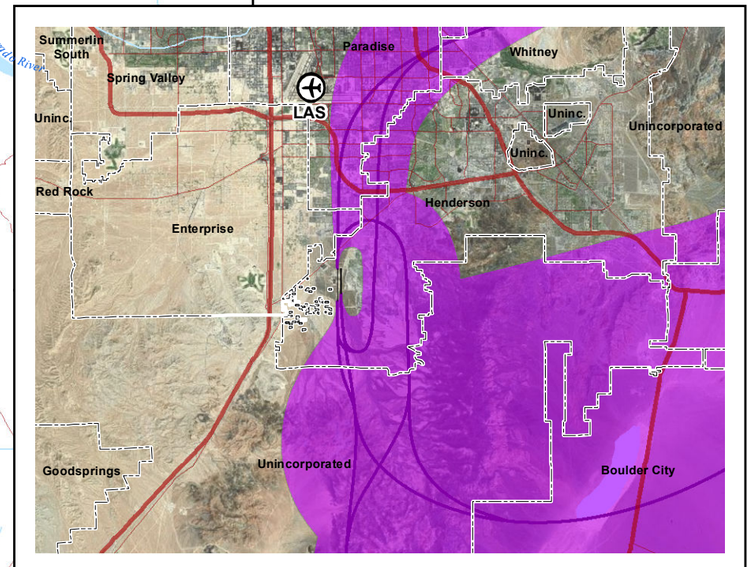

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-3

0 13 NM

north

No Action Alternative
HND - LUXOR Arrival Gate

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KADDY (Southeast) Arrival Gate

Exhibits III-4, III-5, and **III-6** depict the aircraft traffic flows from the southeast to LAS, VGT, and HND, respectively. **Table III-2** provides a summary overview of the procedures and other routes serving IFR traffic from the southeast to the EA Airports.

Table III-2

Aircraft Procedures from the Southeast to the EA Airports, No Action Alternative

Entry Point	Route Name	Procedure Type	EA Airport Runway Ends Served by Procedure																	
			LAS								VGT						HND			
			01L	01R	07L	07R	19L	19R	25L	25R	7	12L	12R	25	30L	30R	17L	17R	35L	35R
KADDY	KADDY	CONV	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
	TYSSN	**RNAV**	V	V	V	V	V	V	RT	RT	-	-	-	-	-	-	-	-	-	-
LYNSY	KNGMN	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V	V	RT	RT
Other Routes																				
Via KADDY Arrival Gate	V105 (Southeast)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via Southeast	V562	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

Notes:

CONV = Conventional STAR

RNAV = Area Navigation (RNAV) STAR

VICTOR = Victor Airway (Certain Victor Airways serve arrivals to LAS, although in very small numbers. Therefore, the Victor Airways are only depicted on Exhibits III-5 and III-6, for VGT and HND, respectively.)

V = Procedure does not include a runway transition route to the final approach to the runway end, so aircraft are vectored to the final approach.

RT = Procedure includes a runway transition route to the final approach to the runway end.

Blue shading indicates an entry point that is exclusive to a single airport.

Light green shading indicates routes that are exclusive to one EA Airport.

Sources: Ricondo & Associates, Inc., January 2012, based on (1) NIRS Tracks from Metron Aviation, October 17-31, 2011; and (2) U.S. Department of Transportation, Federal Aviation Administration, *Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement*, Subject: Terminal Area Control, Effective: June 30, 2011.

Prepared by: Ricondo & Associates, Inc., February 2012.

Two entry points to the L30 terminal airspace (KADDY and LYNSY), through which two RNAV STARs (TYSSN to LAS and KNGMN to HND) and one Conventional STAR (KADDY to all three EA Airports) pass, are located along the KADDY Arrival Gate. The TYSSN RNAV STAR to LAS is an overlay of the shared KADDY Conventional STAR. The TYSSN and KADDY STARs share the KADDY entry point. The KNGMN RNAV STAR to HND passes through the LYNSY entry point, which is exclusive to that STAR. Two additional flows are defined by Victor Airways from the southeast to the EA Airports, but primarily serving propeller aircraft landing at VGT and HND (V105 [Southeast] and V562).

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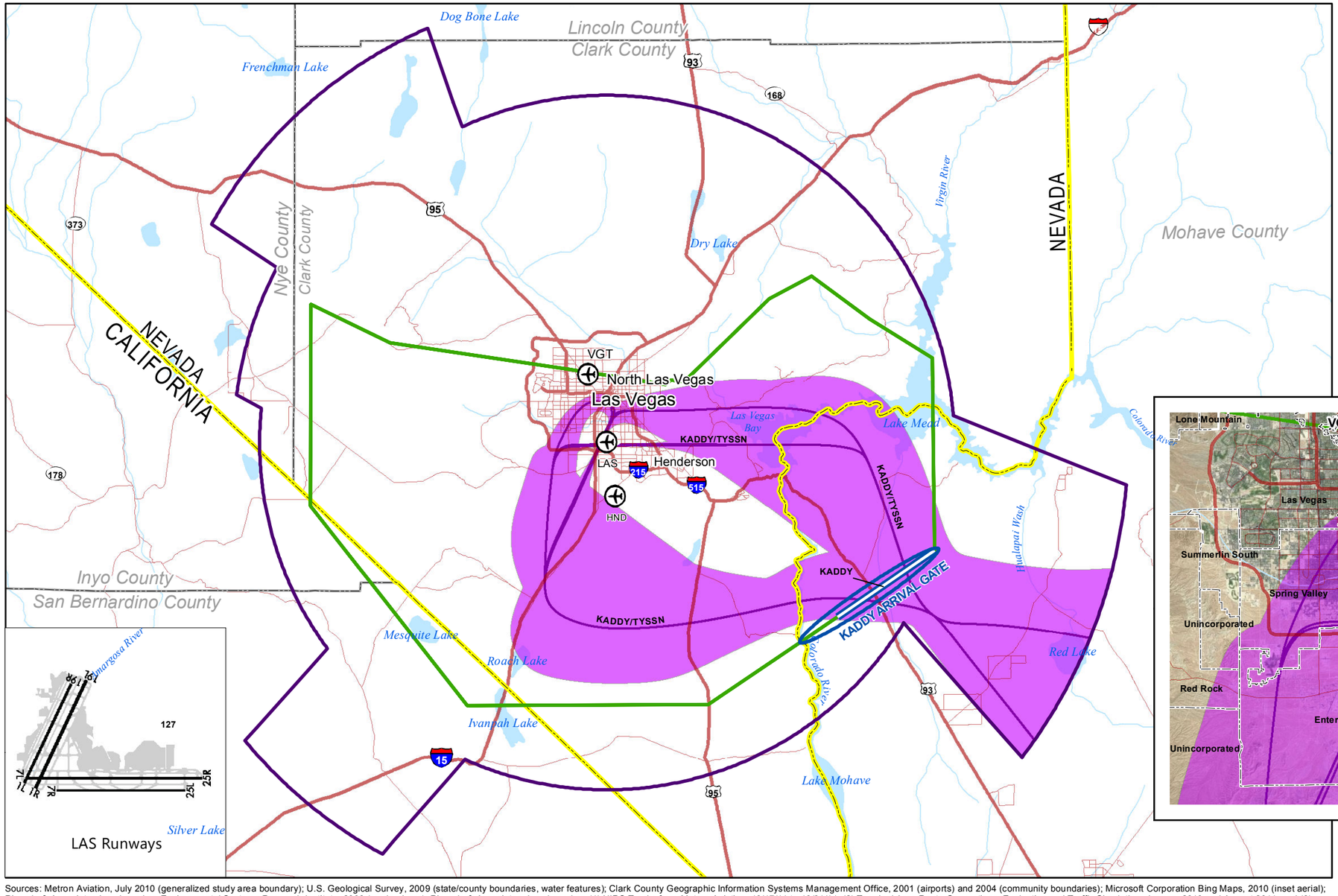

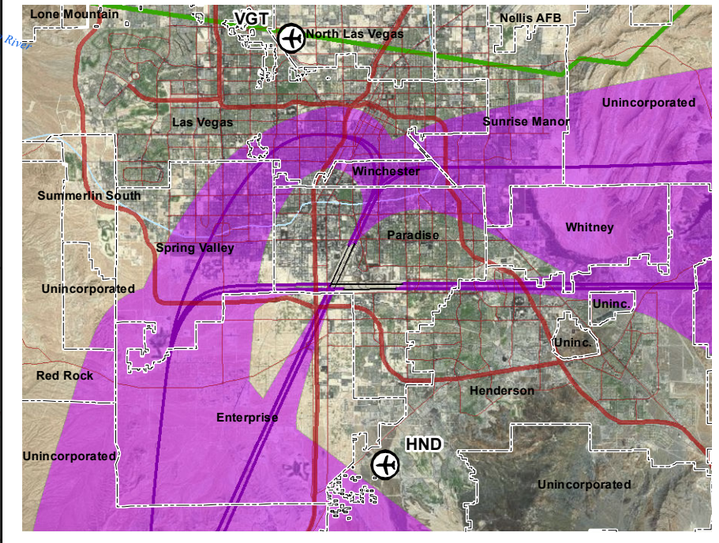

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-4

0 13 NM

north

No Action Alternative
LAS - KADDY Arrival Gate

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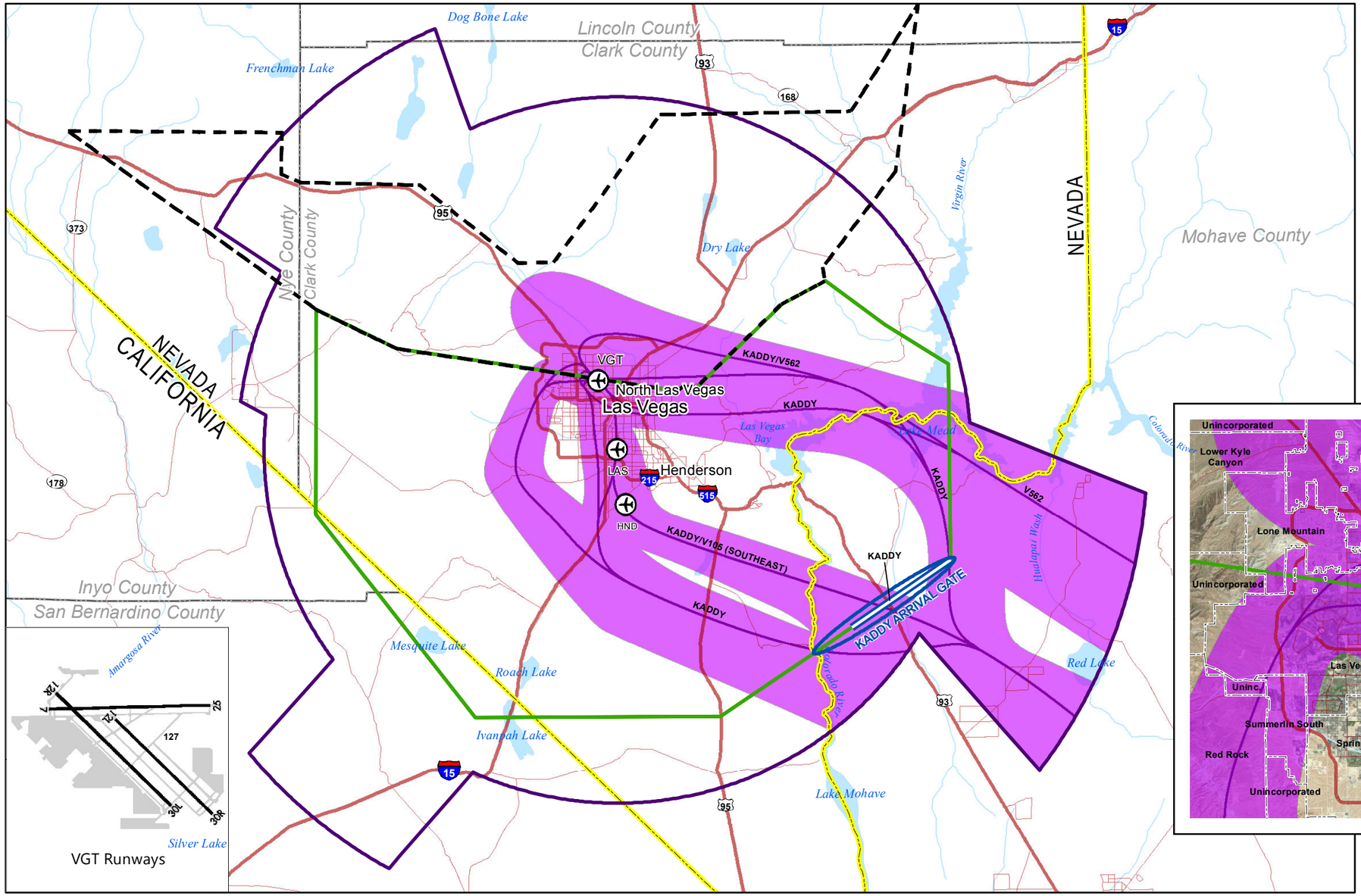

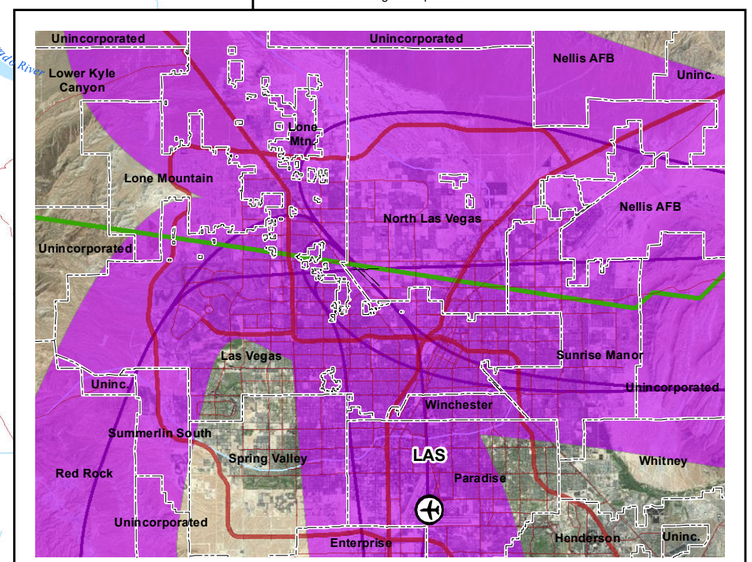

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- NATCF Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport;
NATCF - Nellis Air Traffic Control Facility
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-5

0 13 NM

north

No Action Alternative
VGT - KADDY Arrival Gate

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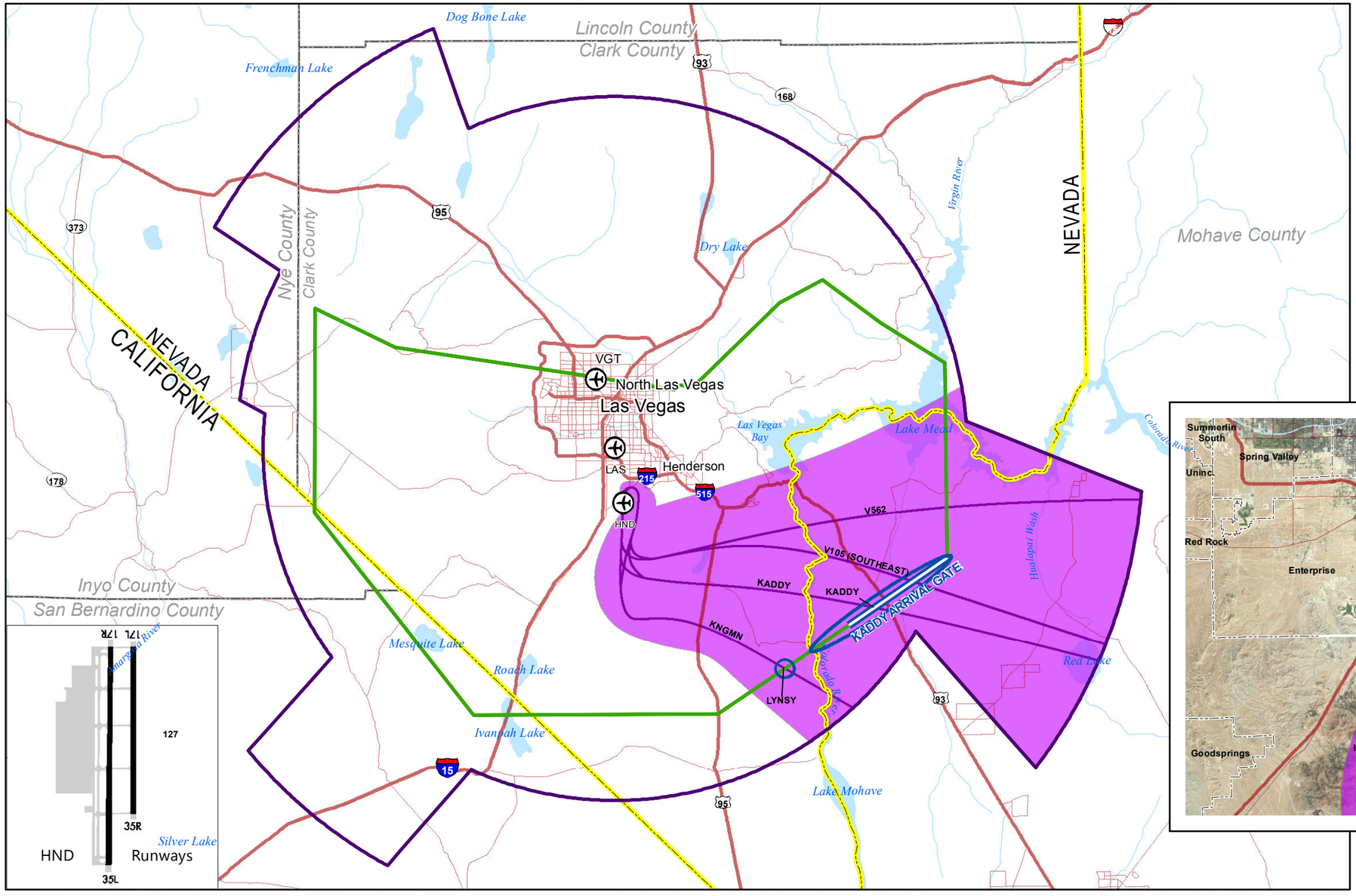

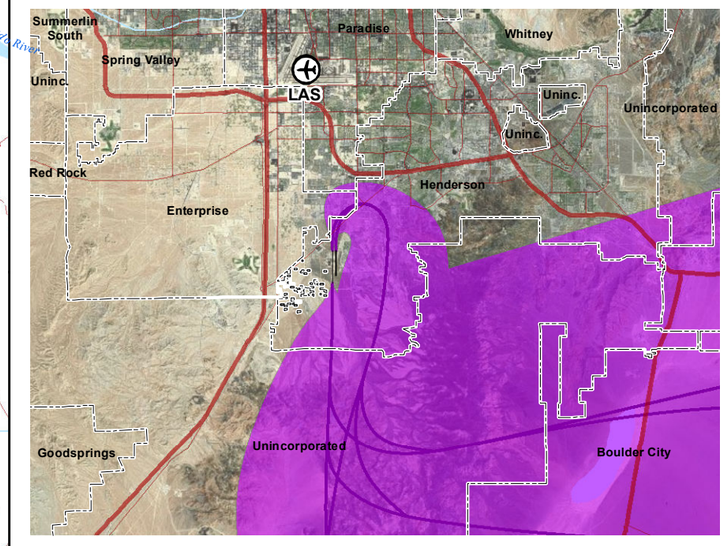

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-6

0 13 NM

north

No Action Alternative
HND - KADDY Arrival Gate

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CLARR (Southwest) Arrival Gate

Exhibits III-7, III-8, and **III-9** depict the aircraft traffic flows from the south and southwest to LAS, VGT, and HND, respectively. **Table III-3** provides a summary overview of the procedures and other routes serving IFR traffic from the south and southwest to the EA Airports.

Table III-3

Aircraft Procedures from the South and Southwest to the EA Airports, No Action Alternative

Entry Point	Route Name	Procedure Type	EA Airport Runway Ends Served by Procedure																	
			LAS								VGT						HND			
			01L	01R	07L	07R	19L	19R	25L	25R	7	12L	12R	25	30L	30R	17L	17R	35L	35R
CLARR	CLARR	CONV	V	V	V	V	V	V	RT	RT	V	V	V	V	V	V	V	V	V	V
	KEPEC	**RNAV**	V	V	V	V	V	V	RT	RT	-	-	-	-	-	-	-	-	-	-
WHIGG	CRESO	CONV	V	V	V	V	V	V	RT	RT	V	V	V	V	V	V	V	V	V	V
JOMIX	JOMIX	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V	V	RT	RT
Other Routes																				
Via CLARR Arrival Gate	V21 (Southwest)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via CLARR Arrival Gate	V394 (Southwest)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via CLARR Arrival Gate	V538	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

Notes:

CONV = Conventional STAR

RNAV = Area Navigation (RNAV) STAR

VICTOR = Victor Airway (Certain Victor Airways serve arrivals to LAS, although in very small numbers. Therefore, the Victor Airways are only depicted on Exhibits III-8 and III-9, for VGT and HND, respectively.)

V = Procedure does not include a runway transition route to the final approach to the runway end, so aircraft are vectored to the final approach.

RT = Procedure includes a runway transition route to the final approach to the runway end.

Blue shading indicates an entry point that is exclusive to a single airport.

Light green shading indicates routes that are exclusive to one EA Airport.

Sources: Ricondo & Associates, Inc., January 2012, based on (1) NIRS Tracks from Metron Aviation, October 17-31, 2011; and (2) U.S. Department of Transportation, Federal Aviation Administration, *Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement*, Subject: Terminal Area Control, Effective: June 30, 2011.

Prepared by: Ricondo & Associates, Inc., February 2012.

Three entry points to the L30 terminal airspace (CLARR, WHIGG, and JOMIX), through which two RNAV STARs (KEPEC to LAS and JOMIX to HND) and two Conventional STARs (CLARR and CRESO to all three EA Airports) pass, are located along the CLARR Arrival Gate. The KEPEC RNAV STAR to LAS is an overlay of the shared CLARR Conventional STAR. The KEPEC and CLARR STARs share the CLARR entry point. The CRESO Conventional STAR passes through the WHIGG entry point, which is exclusive to the Conventional STAR, and the JOMIX RNAV STAR to HND passes through the JOMIX entry point, which is exclusive to the RNAV STAR. Three additional flows are defined by Victor Airways from the south and southwest to the EA Airports, but primarily serving propeller aircraft landing at VGT and HND (V21 [Southwest], V394 [Southwest], and V538).

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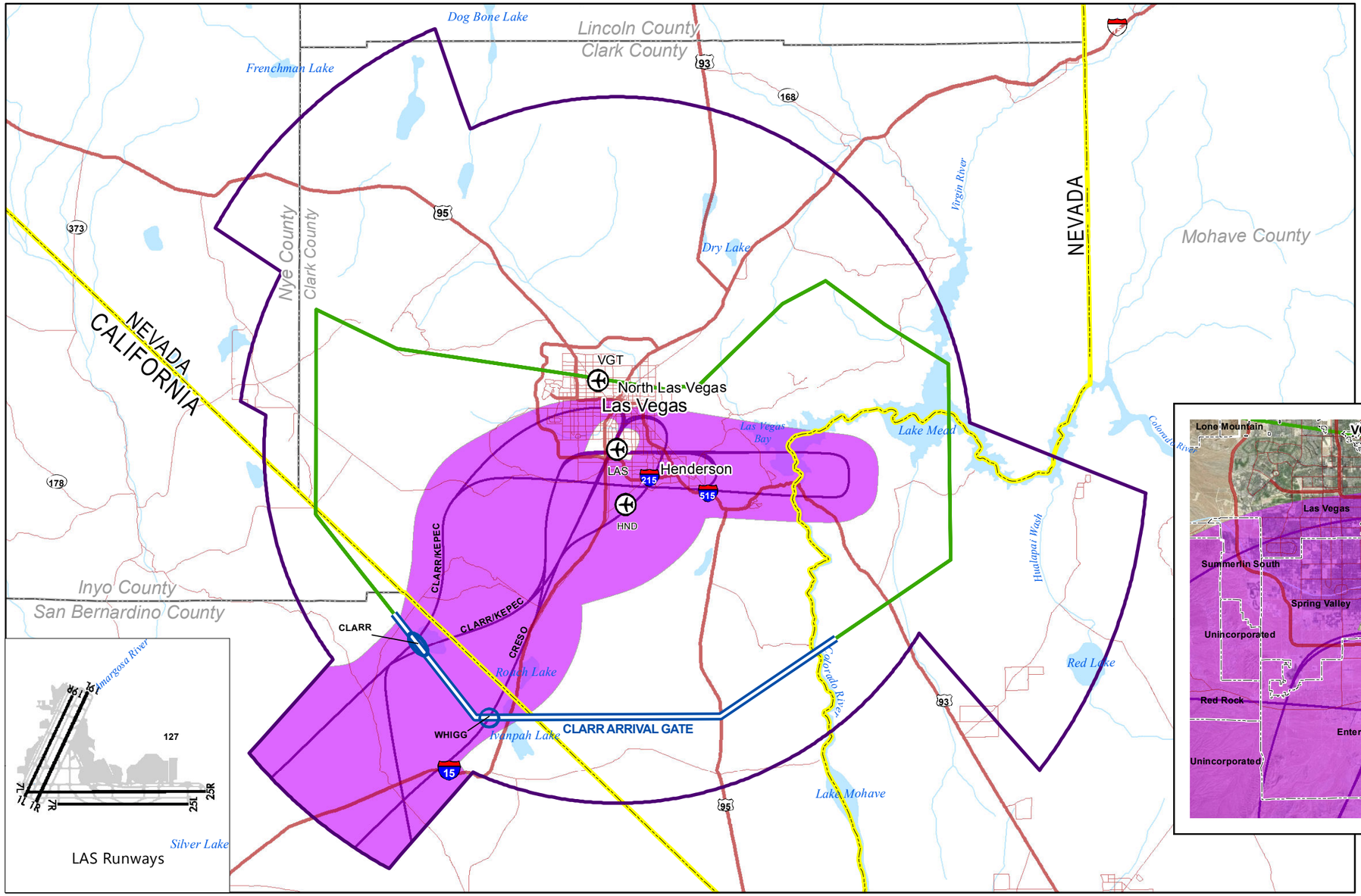

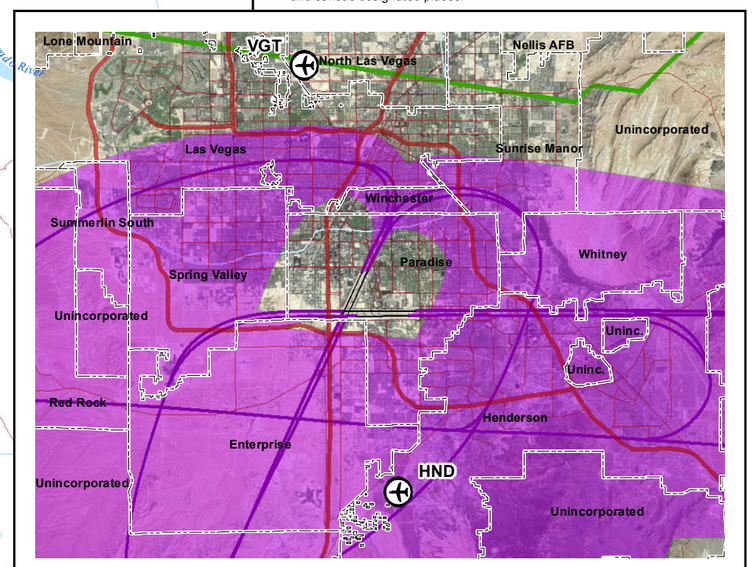

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-7

0 13 NM

north

No Action Alternative
LAS - CLARR Arrival Gate

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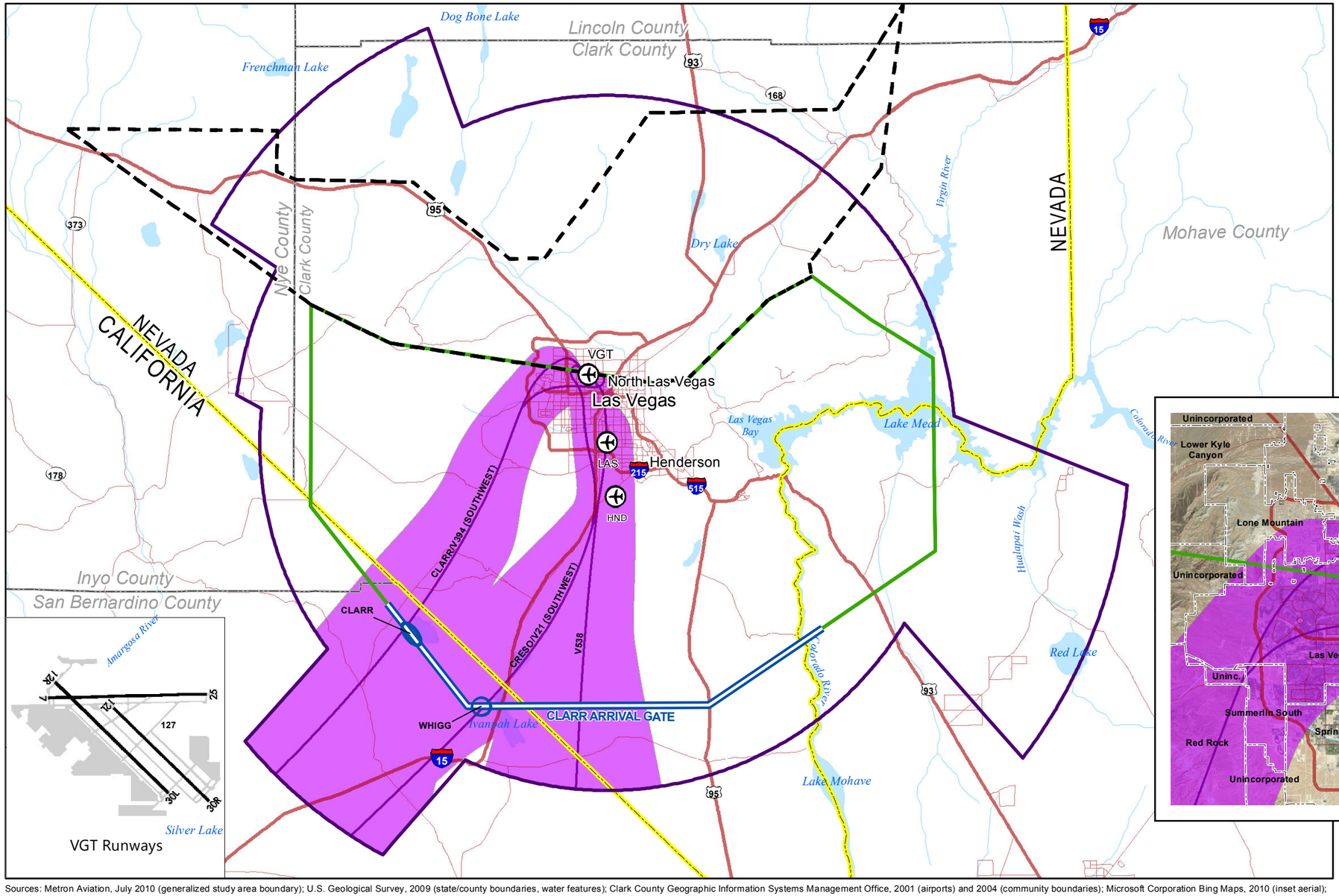
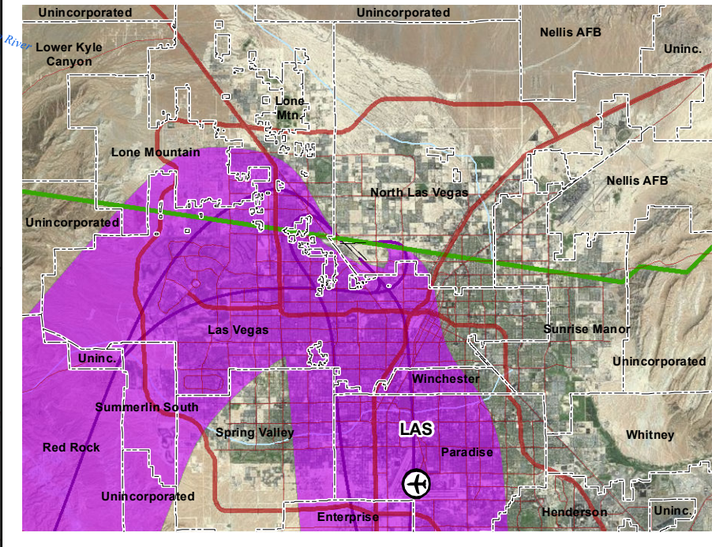


LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- NATCF Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.



Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport;
NATCF - Nellis Air Traffic Control Facility
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-8

0 13 NM

north

No Action Alternative
VGT - CLARR Arrival Gate

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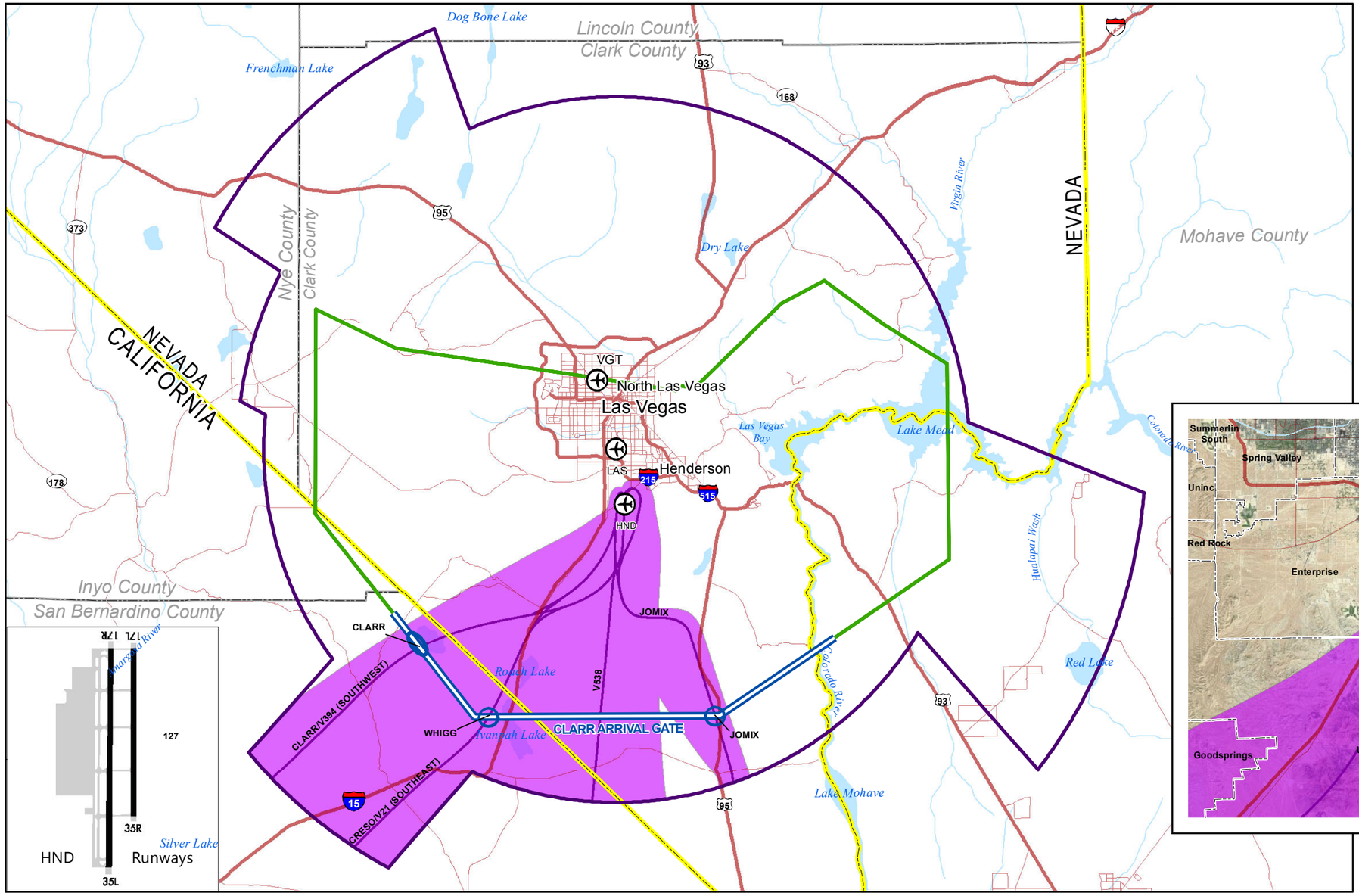

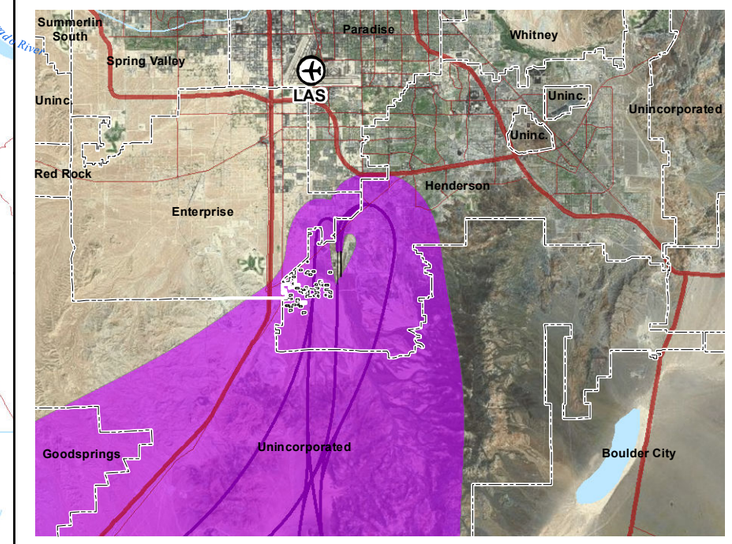

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-9

0 13 NM

north

No Action Alternative
HND - CLARR Arrival Gate

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FUZZY (Northwest) Arrival Gate

Exhibits III-10, III-11, and **III-12** depict the aircraft traffic flows from the northwest to LAS, VGT, and HND, respectively. **Table III-4** provides a summary overview of the procedures and other routes serving IFR traffic from the northwest to the EA Airports.

Table III-4

Aircraft Procedures from the Northwest to the EA Airports, No Action Alternative

Entry Point	Route Name	Procedure Type	EA Airport Runway Ends Served by Procedure																	
			LAS								VGT						HND			
			01L	01R	07L	07R	19L	19R	25L	25R	7	12L	12R	25	30L	30R	17L	17R	35L	35R
FUZZY	FUZZY	CONV	V	V	V	V	V	V	RT	RT	V	V	V	V	V	V	V	V	V	V
	SUNST	**RNAV**	V	V	V	V	V	V	RT	RT	-	-	-	-	-	-	-	-	-	-
	ADDEL	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V	V	RT	RT
Other Routes																				
Via FUZZY Arrival Gate	V105 (Northwest)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via NATCF Airspace	JNNET	Vector	V	V	V	V	V	V	V	V	-	-	-	-	-	-	-	-	-	-
Via NATCF Airspace	NATCF Northwest Flow	Vector	-	-	-	-	-	-	-	-	V	V	V	V	V	V	-	-	-	-

Notes:

CONV = Conventional STAR

RNAV = Area Navigation (RNAV) STAR

VICTOR = Victor Airway (Certain Victor Airways serve arrivals to LAS, although in very small numbers. Therefore, the Victor Airways are only depicted on Exhibits III-11 and III-12, for VGT and HND, respectively.)

Vector = A route along which aircraft are vectored through the airspace to the final approach.

V = Procedure does not include a runway transition route to the final approach to the runway end, so aircraft are vectored to the final approach.

RT = Procedure includes a runway transition route to the final approach to the runway end.

Light green shading indicates routes that are exclusive to one EA Airport.

NATCF = Nellis Air Traffic Control Facility

Sources: Ricondo & Associates, Inc., January 2012, based on (1) NIRS Tracks from Metron Aviation, October 17-31, 2011; and (2) U.S. Department of Transportation, Federal Aviation Administration, *Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement,* Subject: Terminal Area Control, Effective: June 30, 2011.

Prepared by: Ricondo & Associates, Inc., February 2012.

One entry point to the L30 terminal airspace (FUZZY), through which two RNAV STARs (SUNST to LAS and ADDEL to HND) and one Conventional STAR (FUZZY to all three EA Airports) pass, are located along the FUZZY Arrival Gate. All three STARs share the FUZZY entry point. The SUNST RNAV STAR to LAS is an overlay of the shared FUZZY Conventional STAR. The ADDEL RNAV STAR serves HND exclusively. In addition, one Victor Airway (V105 [Northwest]) enters the L30 terminal airspace to the south of the FUZZY entry point, serving the three EA Airports, but primarily serving propeller aircraft landing at VGT and HND, and two routes flow through NATCF airspace—a vector route for military charters to LAS (JNNET) and a vector route for propeller aircraft and some jets and turboprops to VGT (NATCF Northwest Flow).

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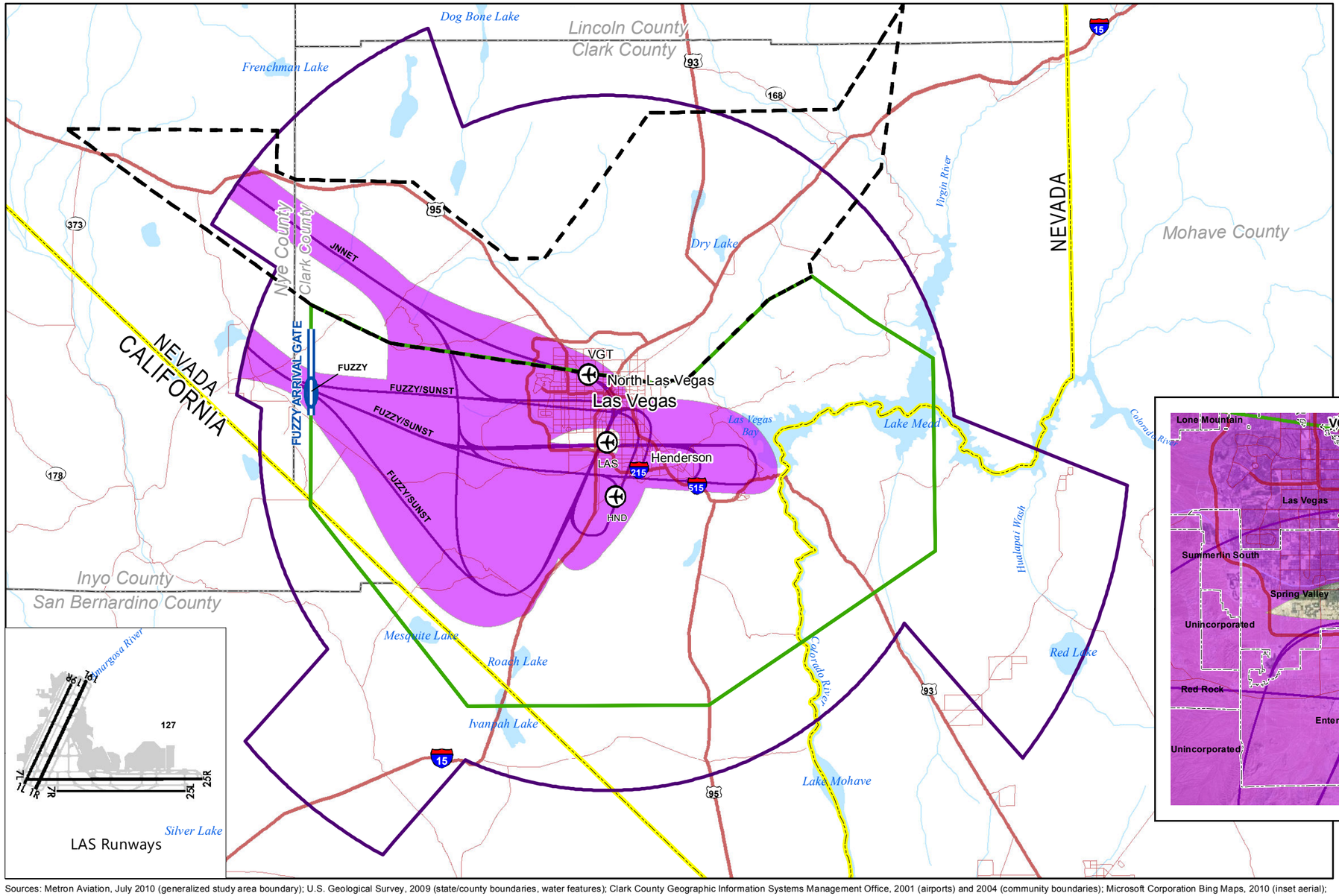

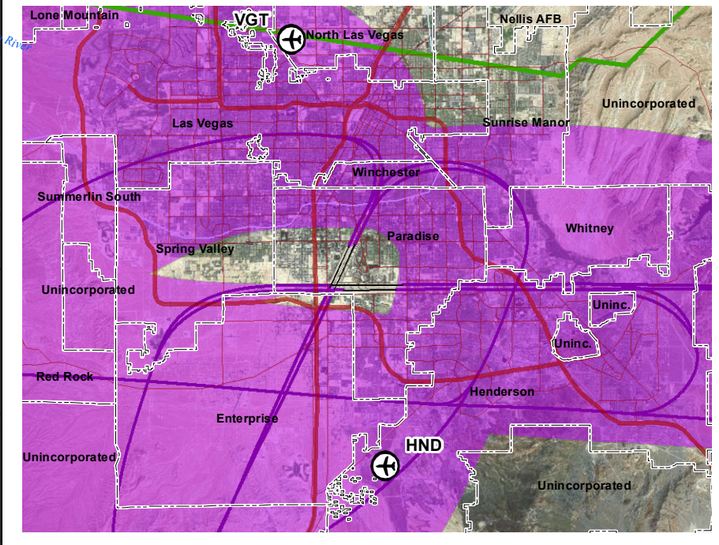

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- NATCF Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport;
NATCF - Nellis Air Traffic Control Facility
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-10

0 13 NM

north

No Action Alternative
LAS - FUZZY Arrival Gate

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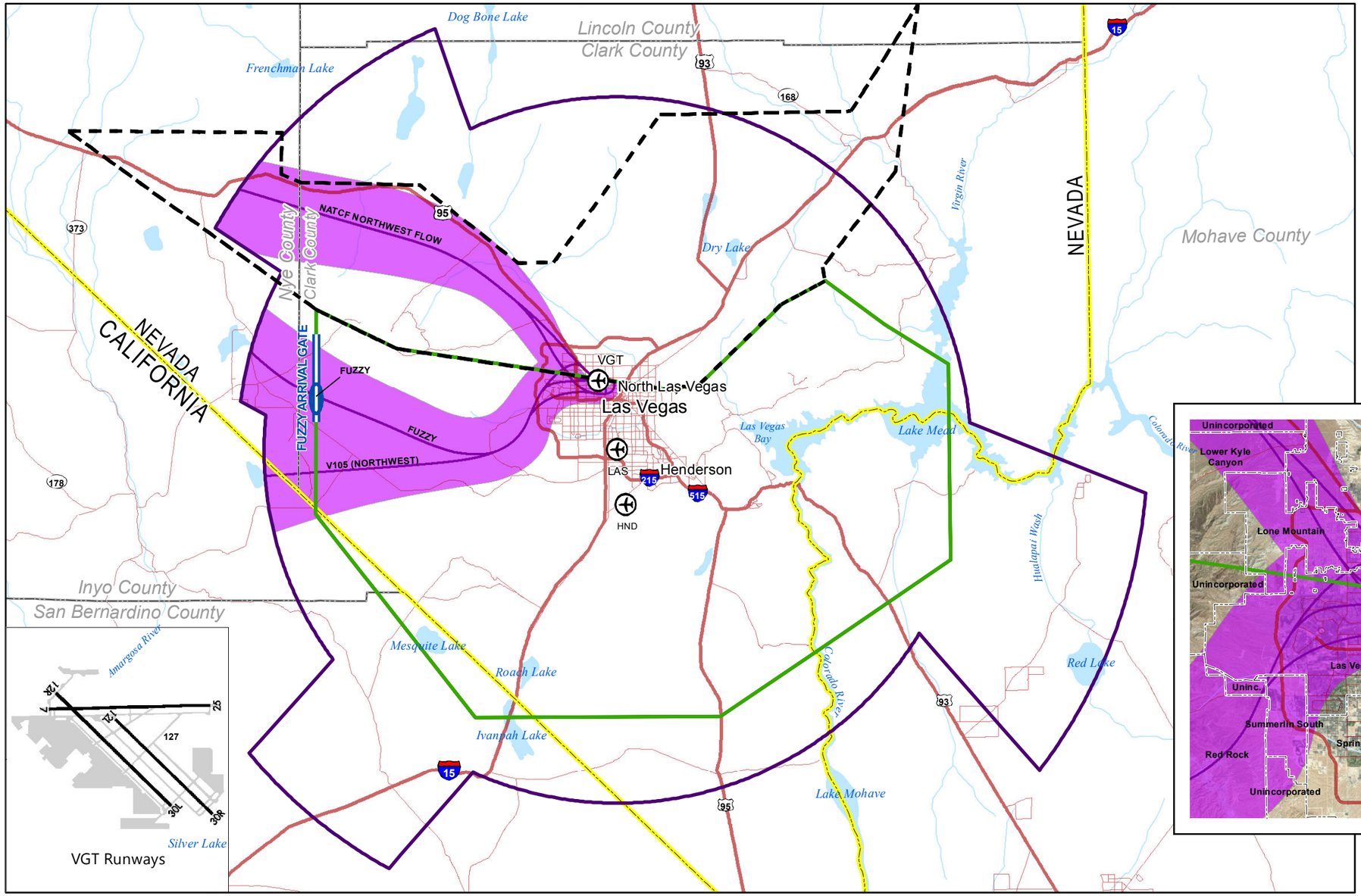

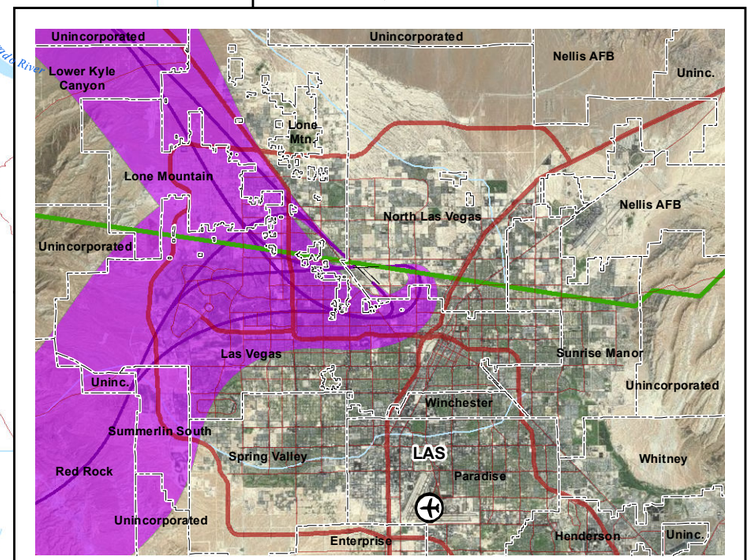

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- NATCF Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport;
NATCF - Nellis Air Traffic Control Facility
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-11

0 13 NM

north

No Action Alternative
VGT - FUZZY Arrival Gate

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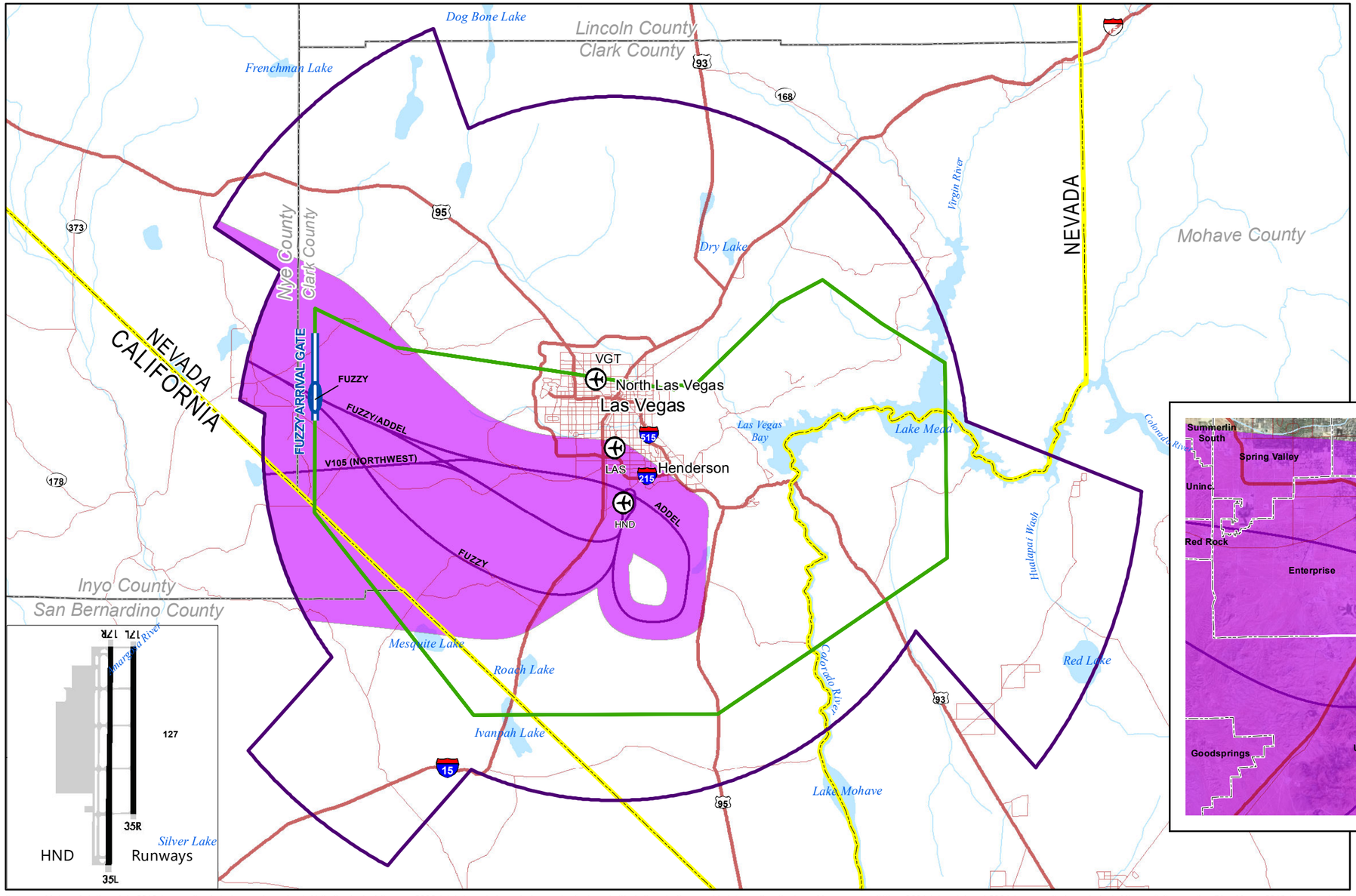

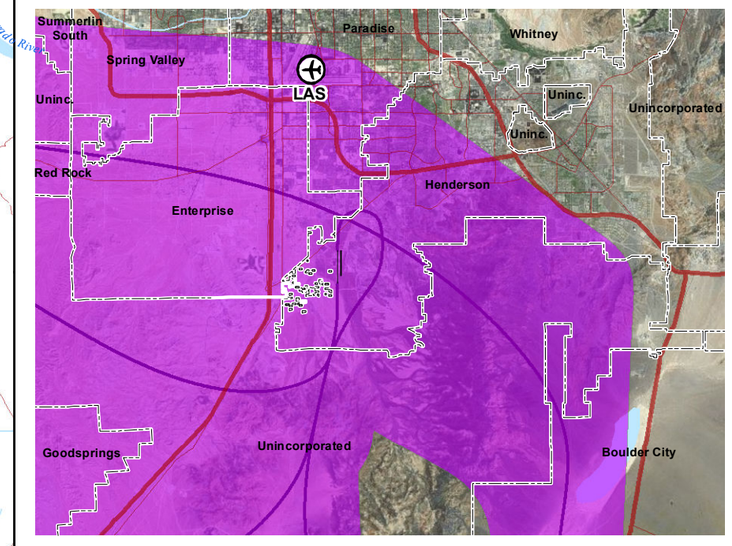

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-12

0 13 NM

north

No Action Alternative
HND - FUZZY Arrival Gate

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3.4.1.3 Departure Flows

This section provides a summary of the procedures and other routes that aircraft taking off from the EA Airports follow through the L30 terminal airspace under the No Action Alternative. Exhibits illustrate the general flows of air traffic from the runway ends at the EA Airports to a departure gate of the L30 terminal airspace. Four departure gates (consistent with gates in 2009 existing conditions) would accommodate aircraft traffic entering the L30 terminal airspace in the No Action Alternative:

- **Northeast Departure Gate**—generally accommodating traffic departing to areas to the northeast of the Las Vegas area as well as to some areas to the north and east.
- **Southeast Departure Gate**—generally accommodating traffic departing to areas to the southeast and south of the Las Vegas area as well as to some areas to the east.
- **South Departure Gate**—generally accommodating traffic departing to areas to the south and southwest of the Las Vegas area.
- **West Departure Gate**—generally accommodating traffic departing to areas to the west and northwest of the Las Vegas area as well as to some areas to the north.

The primary aircraft traffic flows to the departure gates in the No Action Alternative are discussed in this section.

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Northeast Departure Gate

Exhibits III-13, III-14, and **III-15** depict the aircraft traffic flows to the northeast from LAS, VGT, and HND, respectively. **Table III-5** provides a summary overview of the procedures and other routes serving IFR traffic from the EA Airports to the northeast.

Table III-5

Aircraft Procedures from the EA Airports to the Northeast, No Action Alternative

Exit Point	Route Name	Procedure Type	EA Airport Runway Ends Served by Procedure																	
			LAS								VGT						HND			
			01L	01R	07L	07R	19L	19R	25L	25R	7	12L	12R	25	30L	30R	17L	17R	35L	35R
TRALR	LAS VEGAS [1/]	CONV	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
	TRALR	**RNAV**	RT	RT	RT	RT	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
	STAAV	**RNAV**	-	-	-	-	-	-	RT	RT	-	-	-	-	-	-	-	-	-	-
	ACSIN	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	RT	RT	V	V
FOLDD	STAAV	**RNAV**	-	-	-	-	-	-	RT	RT	-	-	-	-	-	-	-	-	-	-
Other Routes																				
Via Northeast or NATCF Airspace [2/]	V394 (Northeast)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

Notes:
CONV = Conventional SID
RNAV = Area Navigation (RNAV) SID
VICTOR = Victor Airway (Certain Victor Airways serve departures from LAS, although in very small numbers. Therefore, the Victor Airways are only depicted on Exhibits III-13 and III-14, for VGT and HND, respectively.)
V = Procedure does not include a runway transition route from the runway end to the exit point, so aircraft are vectored to the exit point.
RT = Procedure includes a runway transition route from the runway end to the exit point.
Blue shading indicates an exit point that is exclusive to a single airport.
Light green shading indicates routes that are exclusive to one EA Airport.
NATCF = Nellis Air Traffic Control Facility
1/ Air traffic controllers can join aircraft taking off from VGT and HND that are not RNAV equipped to the LAS VEGAS Conventional SID by vectoring.
2/ Aircraft taking off from HND and LAS can follow V394 and exit the L30 terminal airspace to the northeast, while aircraft taking off from VGT exit the NATCF airspace directly without passing through L30 terminal airspace.

Sources: Ricondo & Associates, Inc., January 2012, based on (1) NIRS Tracks from Metron Aviation, October 17-31, 2011; and (2) U.S. Department of Transportation, Federal Aviation Administration, *Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement,* Subject: Terminal Area Control, Effective: June 30, 2011.
Prepared by: Ricondo & Associates, Inc., February 2012.

Two exit points from the L30 terminal airspace (TRALR and FOLDD), through which three RNAV SIDs (TRALR and STAAV from LAS and ASCIN from HND) and one Conventional SID (LAS VEGAS from all three EA Airports) pass, are located along the Northeast Departure Gate. The TRALR and STAAV RNAV SIDs from LAS are overlays of the shared LAS VEGAS Conventional SID. These three SIDs, along with the ASCIN RANV SID from HND, share the TRALR exit point. A second route is defined in the STAAV RNAV SID that passes through the FOLDD exit point, which is exclusive to that route of the SID. An additional flow is defined by a Victor Airway from the EA Airports, primarily serving propeller aircraft from VGT and HND, to the northeast (V394 [Northeast]).

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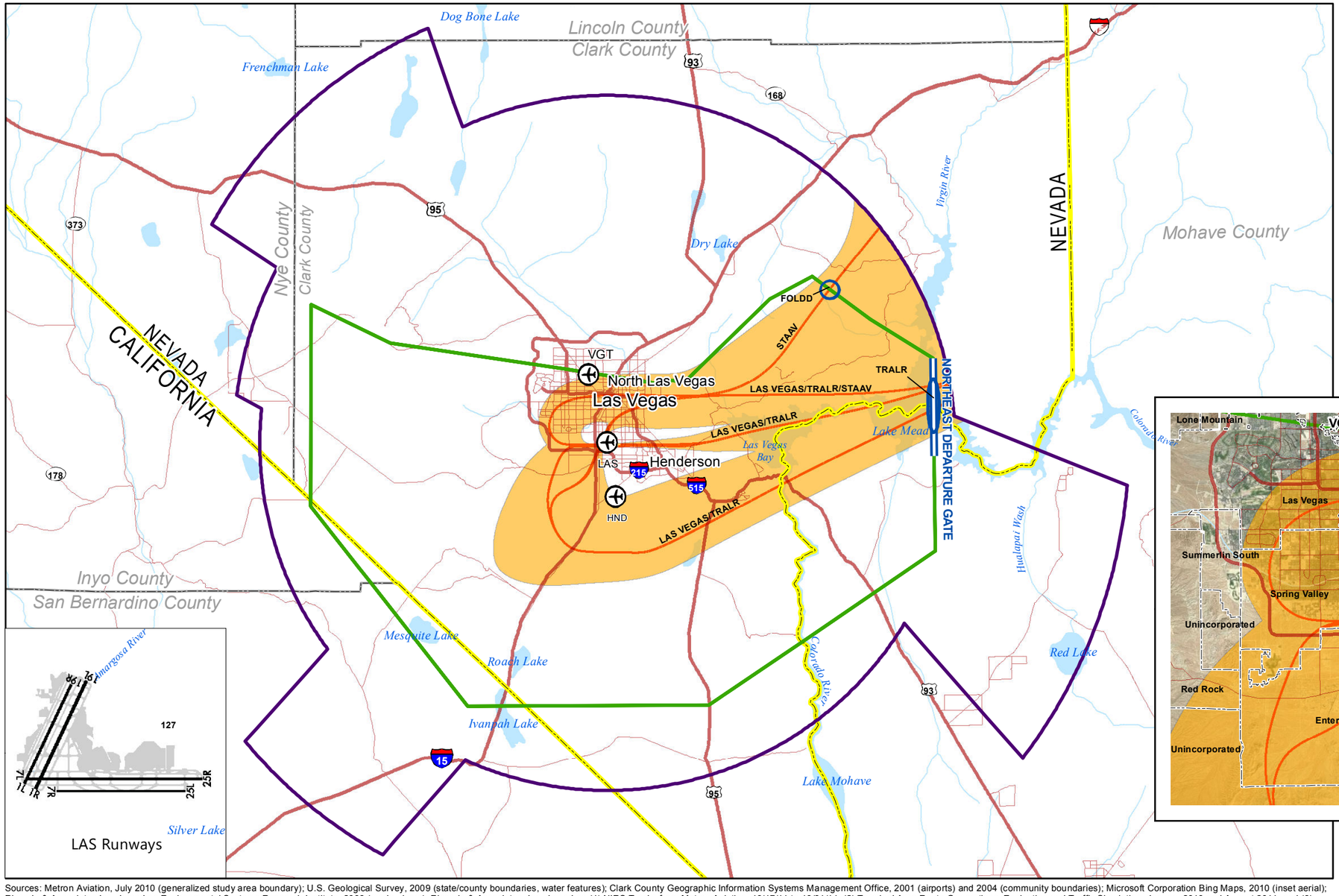

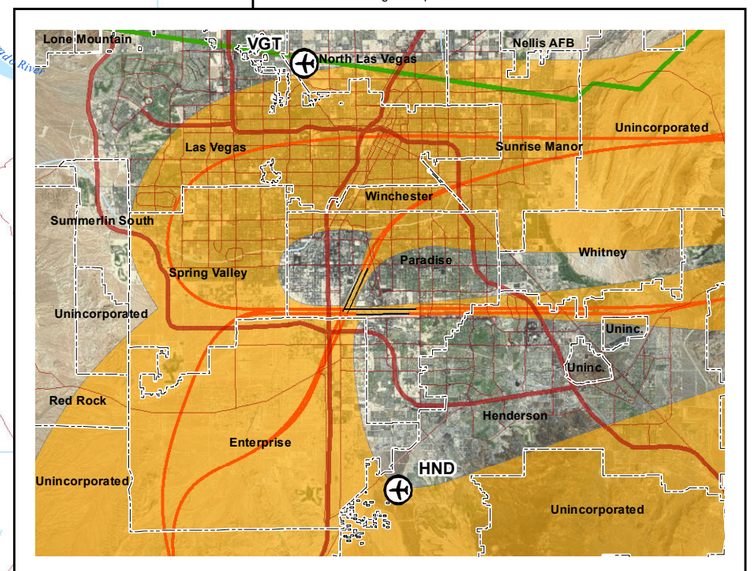

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-13

0 13 NM

north

No Action Alternative
LAS - Northeast Departure Gate

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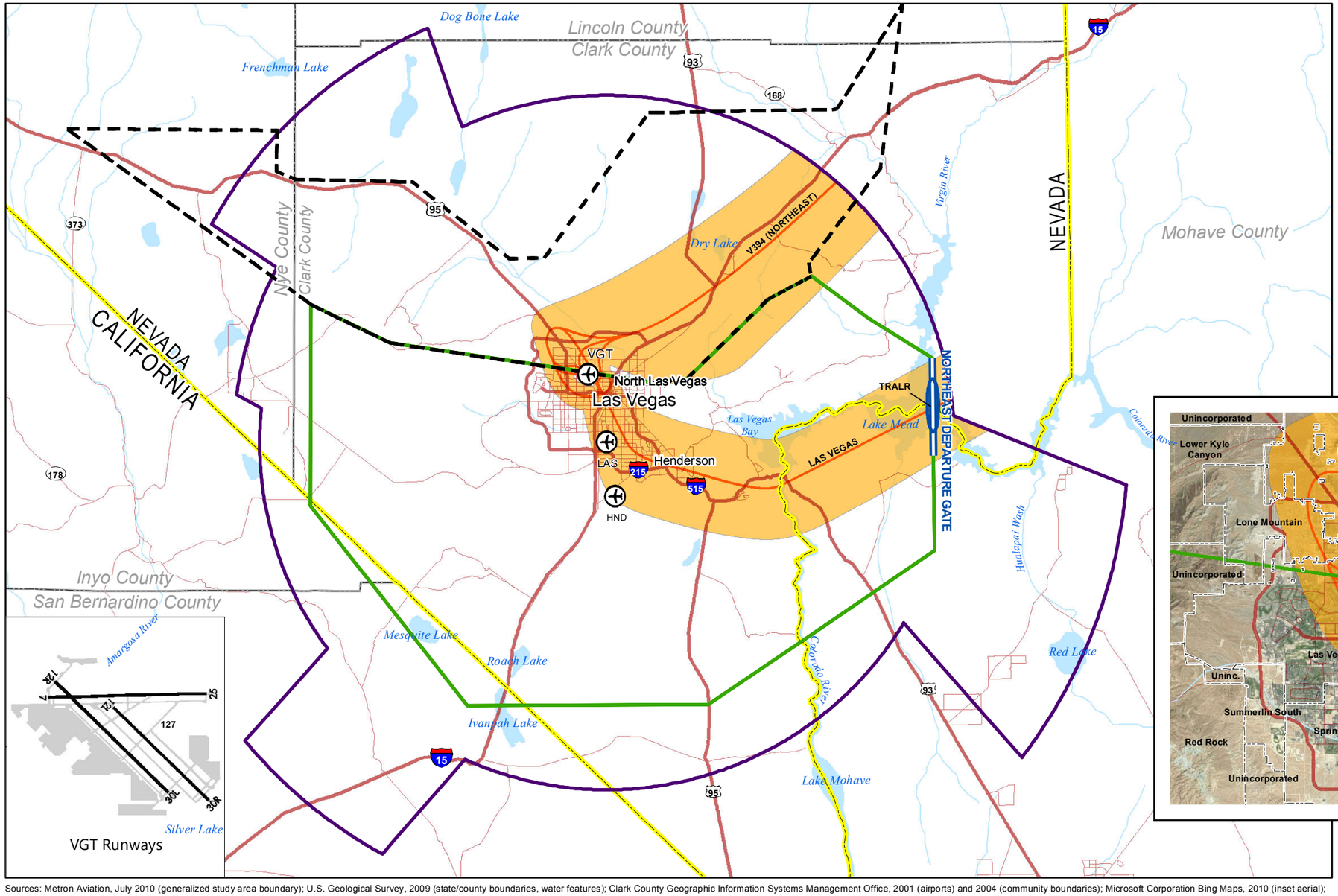

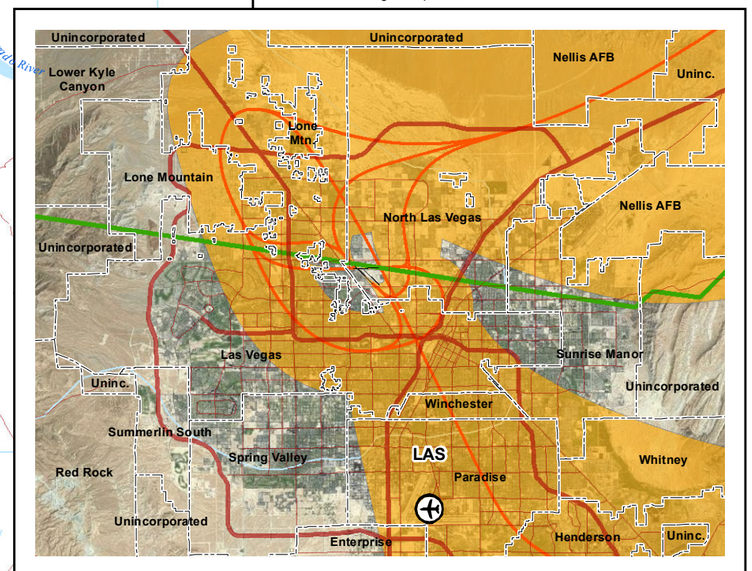

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- NATCF Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport;
NATCF - Nellis Air Traffic Control Facility
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-14

0 13 NM

north

No Action Alternative
VGT - Northeast Departure Gate

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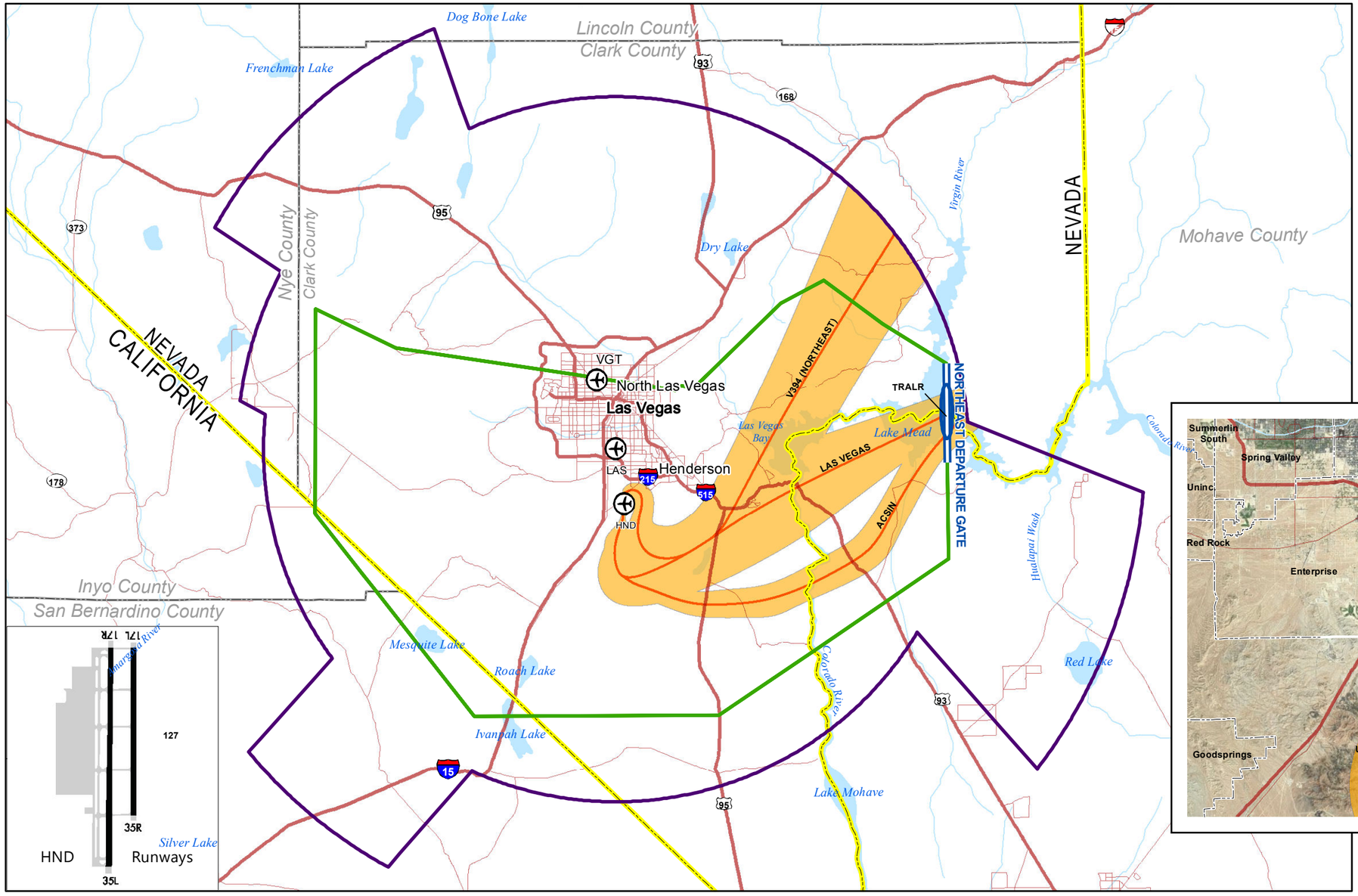

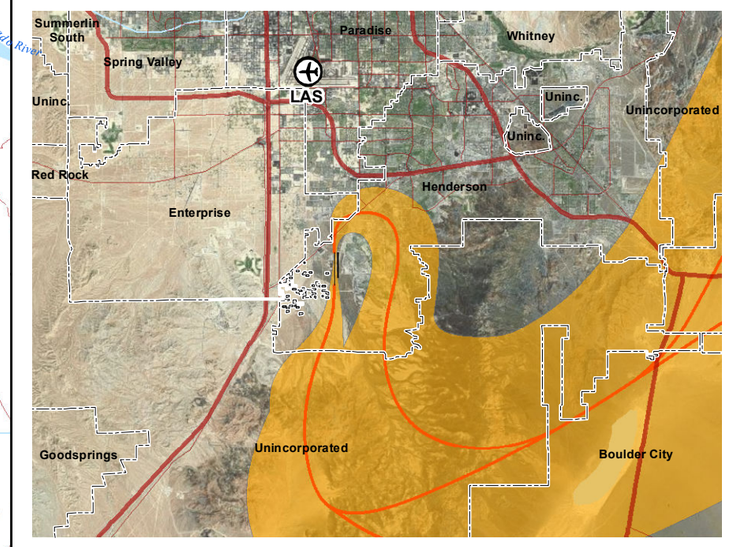

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-15

0 13 NM

north

No Action Alternative
HND - Northeast Departure Gate

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Southeast Departure Gate

Exhibits III-16, III-17, and **III-18** depict the aircraft traffic flows to the southeast from LAS, VGT, and HND, respectively. **Table III-6** provides a summary overview of the procedures and other routes serving IFR traffic from the EA Airports to the southeast.

Table III-6

Aircraft Procedures from the EA Airports to the Southeast, No Action Alternative

Exit Point	Route Name	Procedure Type	EA Airport Runway Ends Served by Procedure																	
			LAS								VGT						HND			
			01L	01R	07L	07R	19L	19R	25L	25R	7	12L	12R	25	30L	30R	17L	17R	35L	35R
COWBY	HOOVER [1/]	CONV	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
	COWBY	**RNAV**	RT	RT	RT	RT	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
KADDY	PRFUM	**RNAV**	-	-	-	-	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
FLAMZ	FLAMZ	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	RT	RT	V	V
Other Routes																				
Via Southeast	V105 (Southeast)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via Southeast	V562	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

Notes:

CONV = Conventional SID

RNAV = Area Navigation (RNAV) SID

VICTOR = Victor Airway (Certain Victor Airways serve departures from LAS, although in very small numbers. Therefore, the Victor Airways are only depicted on Exhibits III-17 and III-18, for VGT and HND, respectively.)

V = Procedure does not include a runway transition route from the runway end to the exit point, so aircraft are vectored to the exit point.

RT = Procedure includes a runway transition route from the runway end to the exit point.

Blue shading indicates an exit point that is exclusive to a single airport.

Light green shading indicates routes that are exclusive to one EA Airport.

1/ Air traffic controllers can join aircraft taking off from VGT and HND that are not RNAV equipped to the HOOVER Conventional SID by vectoring.

Sources: Ricondo & Associates, Inc., January 2012, based on (1) NIRS Tracks from Metron Aviation, October 17-31, 2011; and (2) U.S. Department of Transportation, Federal Aviation Administration, *Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement*, Subject: Terminal Area Control, Effective: June 30, 2011.

Prepared by: Ricondo & Associates, Inc., February 2012.

Three exit points from the L30 terminal airspace (COWBY, KADDY, and FLAMZ), through which three RNAV SIDs (COWBY and PRFUM from LAS and FLAMZ from HND) and one Conventional SID (HOOVER from all three EA Airports) pass, are located along the Southeast Departure Gate. The COWBY RNAV SID from LAS is an overlay of the shared HOOVER Conventional SID. The COWBY and HOOVER SIDs share the COWBY exit point. Two RNAV SIDs (PRFUM from LAS and FLAMZ from HND) exit through exit points exclusive to each RNAV SID (KADDY and FLAMZ, respectively). Two additional flows are defined by Victor Airways from the EA Airports, primarily serving propeller aircraft from VGT and HND, to the southeast (V105 [Southeast] and V562).

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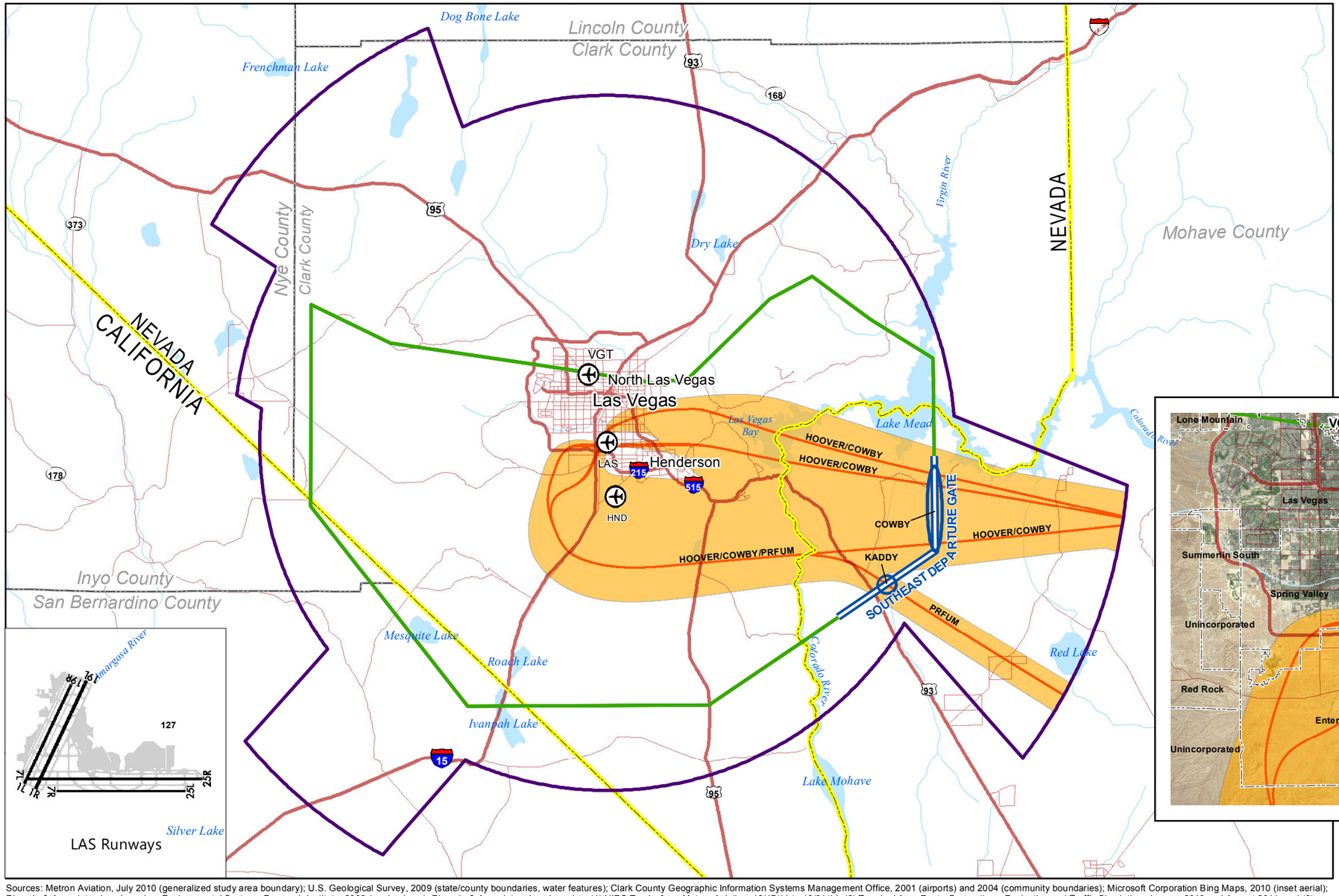

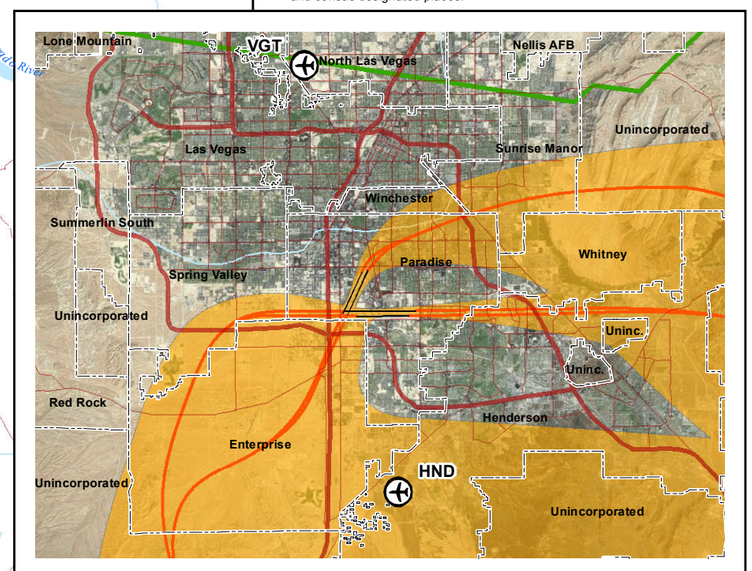

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-16

0 13 NM

north

No Action Alternative
LAS - Southeast Departure Gate

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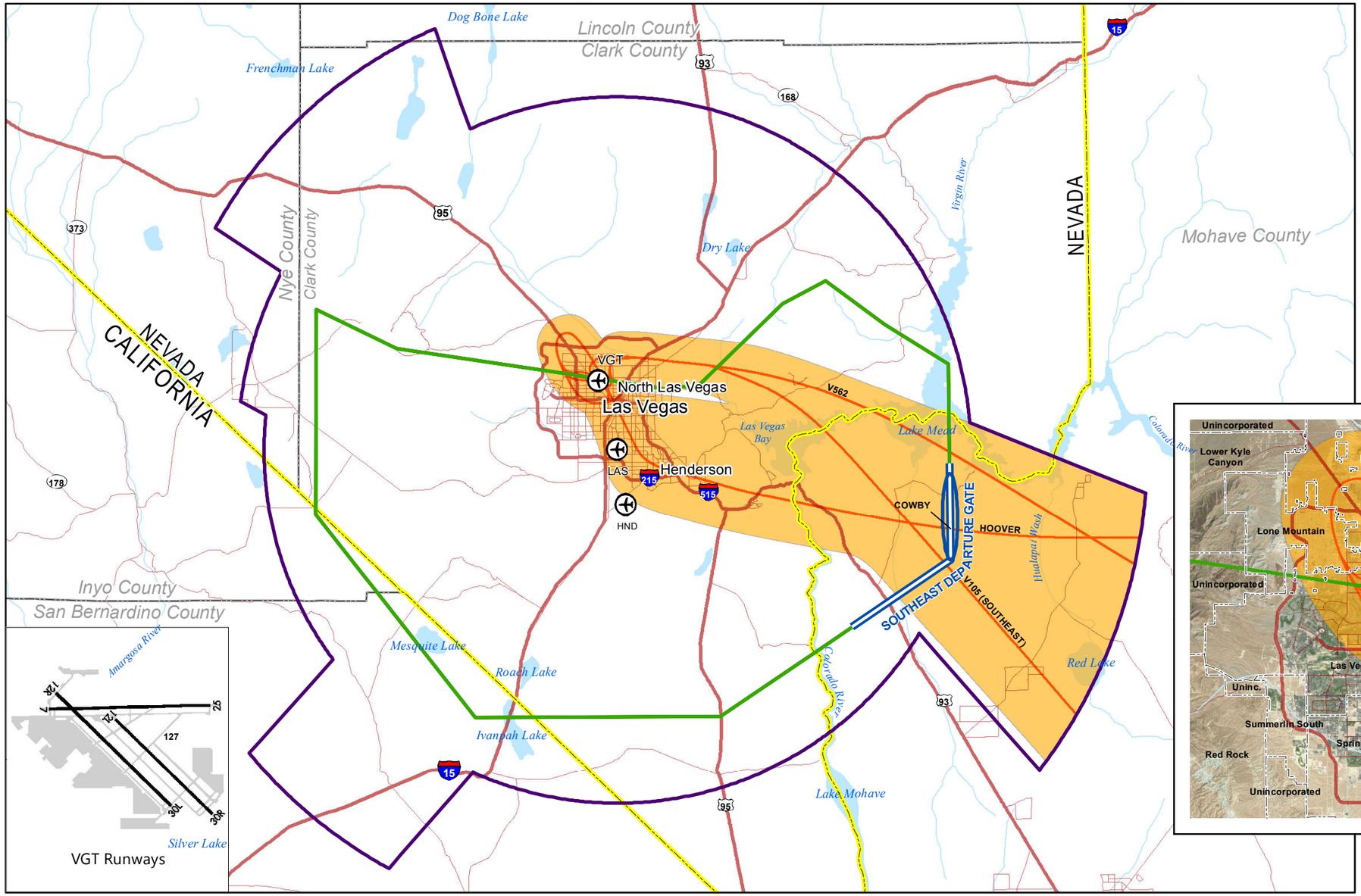

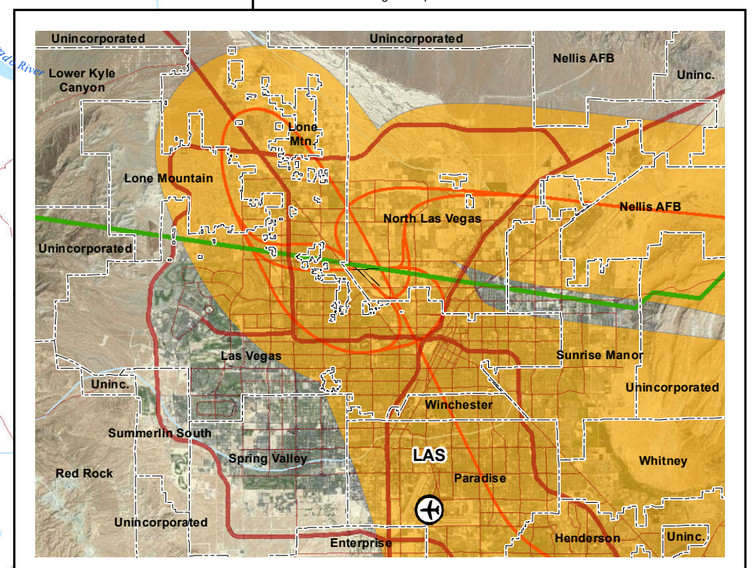

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-17

0 13 NM

north

No Action Alternative
VGT - Southeast Departure Gate

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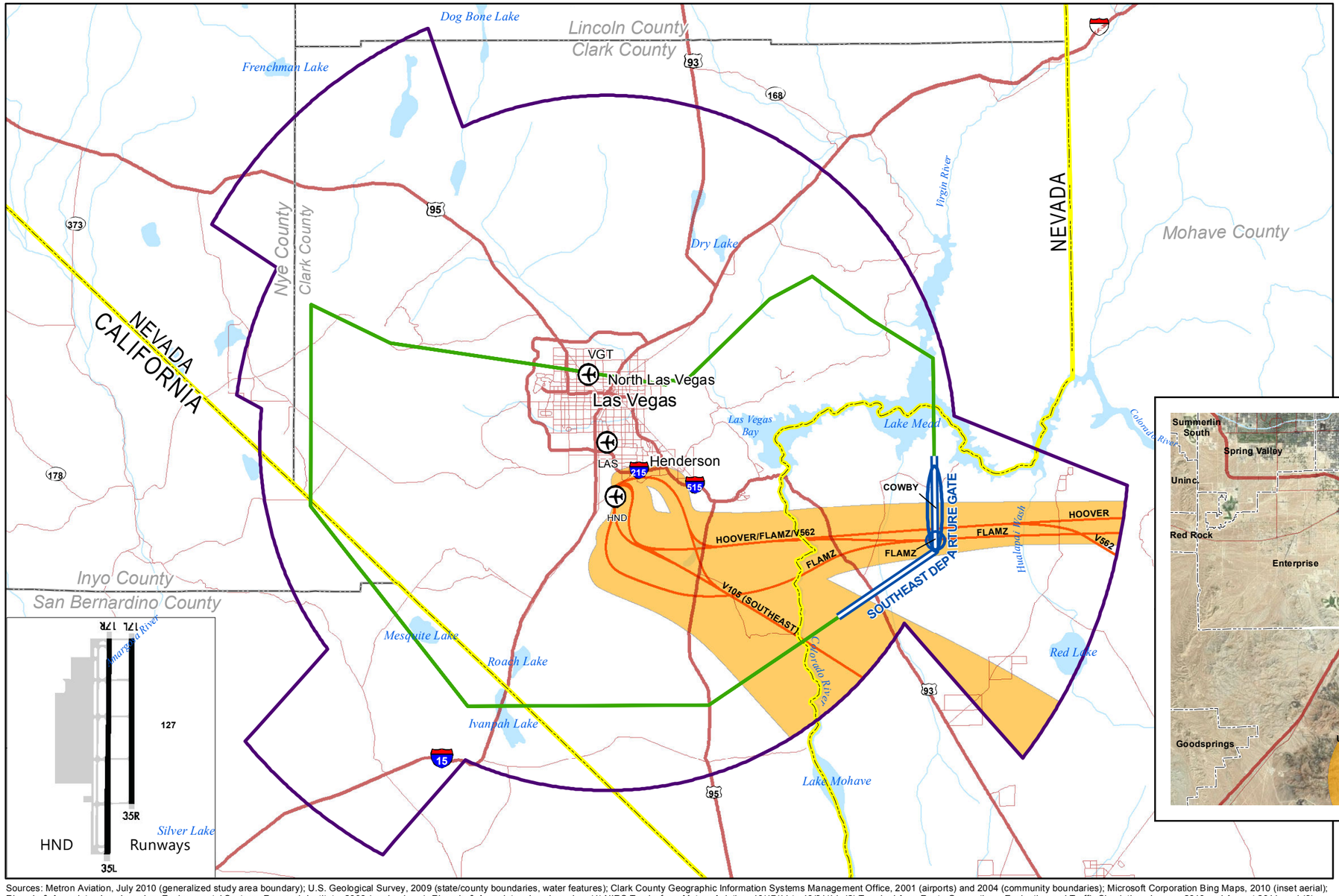

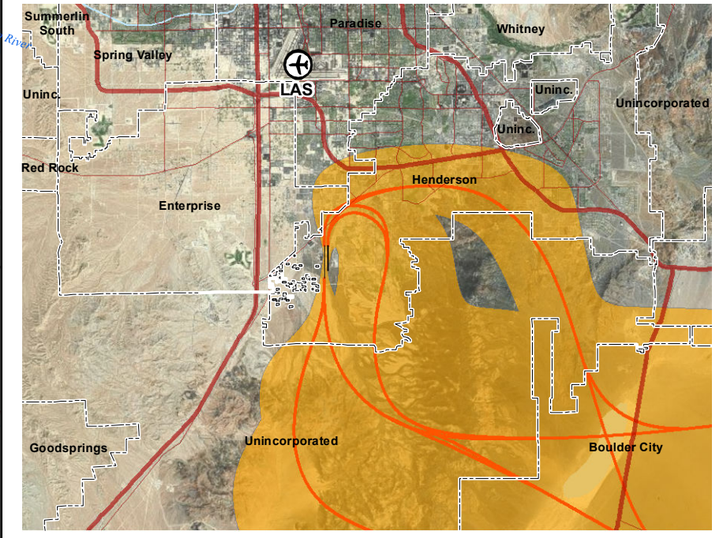

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-18

0 13 NM

north

No Action Alternative
HND - Southeast Departure Gate

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South Departure Gate

Exhibits III-19, III-20, and **III-21** depict the aircraft traffic flows to the south and southwest from LAS, VGT, and HND, respectively. **Table III-7** provides a summary overview of the procedures and other routes serving IFR traffic from the EA Airports to the south and southwest.

Table III-7

Aircraft Procedures from the EA Airports to the South and Southwest, No Action Alternative

Exit Point	Route Name	Procedure Type	EA Airport Runway Ends Served by Procedure																	
			LAS								VGT						HND			
			01L	01R	07L	07R	19L	19R	25L	25R	7	12L	12R	25	30L	30R	17L	17R	35L	35R
BOACH	MCCARRAN 1/, 2/	CONV	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
	BOACH	**RNAV**	RT	RT	RT	RT	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
Other Routes																				
Via South Departure Gate	V21 (Southwest)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via Southwest	V394 (Southwest)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via South Departure Gate	V538 (South)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

Notes:

CONV = Conventional SID

RNAV = Area Navigation (RNAV) SID

VICTOR = Victor Airway (Certain Victor Airways serve departures from LAS, although in very small numbers. Therefore, the Victor Airways are only depicted on Exhibits III-20 and III-21, for VGT and HND, respectively.)

V = Procedure does not include a runway transition route from the runway end to the exit point, so aircraft are vectored to the exit point.

RT = Procedure includes a runway transition route from the runway end to the exit point.

Light green shading indicates routes that are exclusive to one EA Airport.

1/ Air traffic controllers can join aircraft taking off from VGT and HND that are not RNAV equipped to the MCCARRAN Conventional SID by vectoring.

2/ The MCCARRAN Conventional SID defines a second route to exit the L30 terminal airspace to the south from VGT and HND.

Sources: Ricondo & Associates, Inc., January 2012, based on (1) NIRS Tracks from Metron Aviation, October 17-31, 2011; and (2) U.S. Department of Transportation, Federal Aviation Administration, *Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement*, Subject: Terminal Area Control, Effective: June 30, 2011.

Prepared by: Ricondo & Associates, Inc., February 2012.

One exit point from the L30 terminal airspace (BOACH), through which one RNAV SID (BOACH from LAS) and one Conventional SID (MCCARRAN from all three EA Airports) passes, is located along the South Departure Gate. The BOACH RNAV SID from LAS is an overlay of the shared MCCARRAN Conventional SID. The BOACH and MCCARRAN SIDs share the BOACH exit point. In addition to exiting the L30 terminal airspace through the BOACH exit point, the MCCARRAN Conventional SID defines a second route to exit the L30 terminal airspace to the south from VGT and HND (see Exhibits III-20 and III-21). Three additional flows are defined by Victor Airways from the EA Airports, primarily serving propeller aircraft from VGT and HND, to the south and southwest (V21 [Southwest], V394 [Southwest], and V538 [South]).

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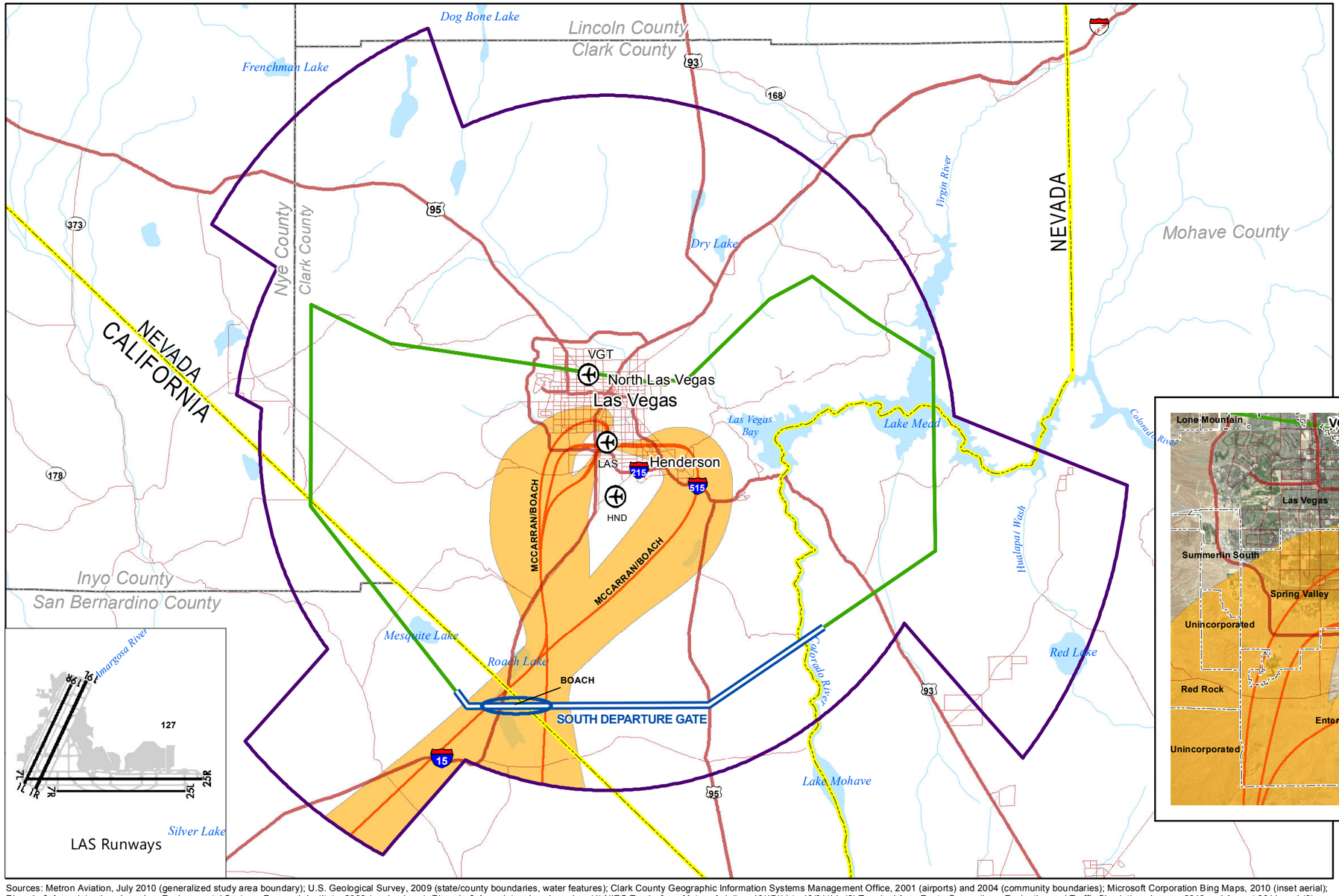

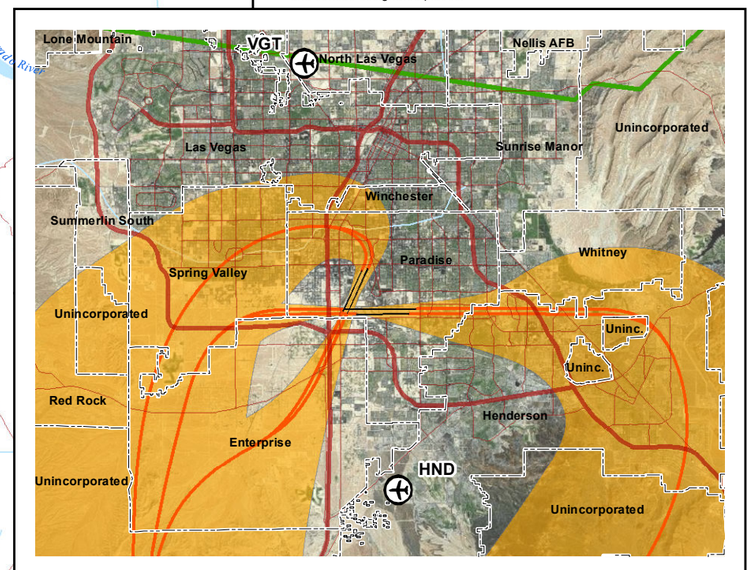

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-19

0 13 NM

north

No Action Alternative
LAS - South Departure Gate

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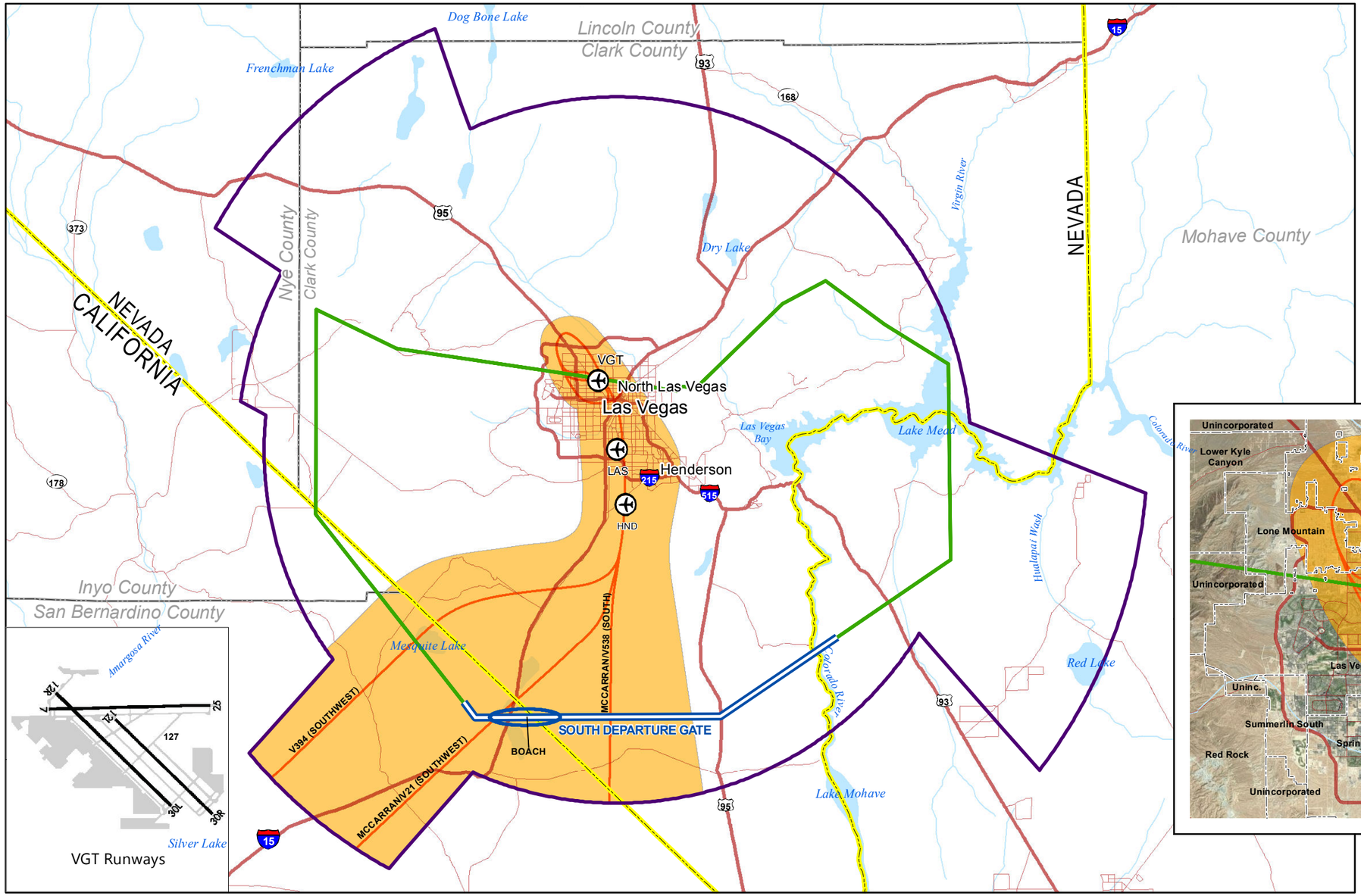

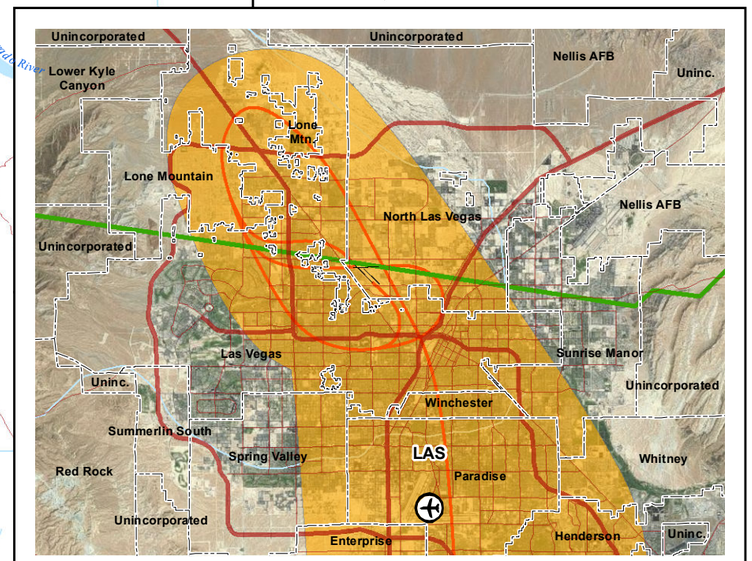

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-20

0 13 NM

north

No Action Alternative
VGT - South Departure Gate

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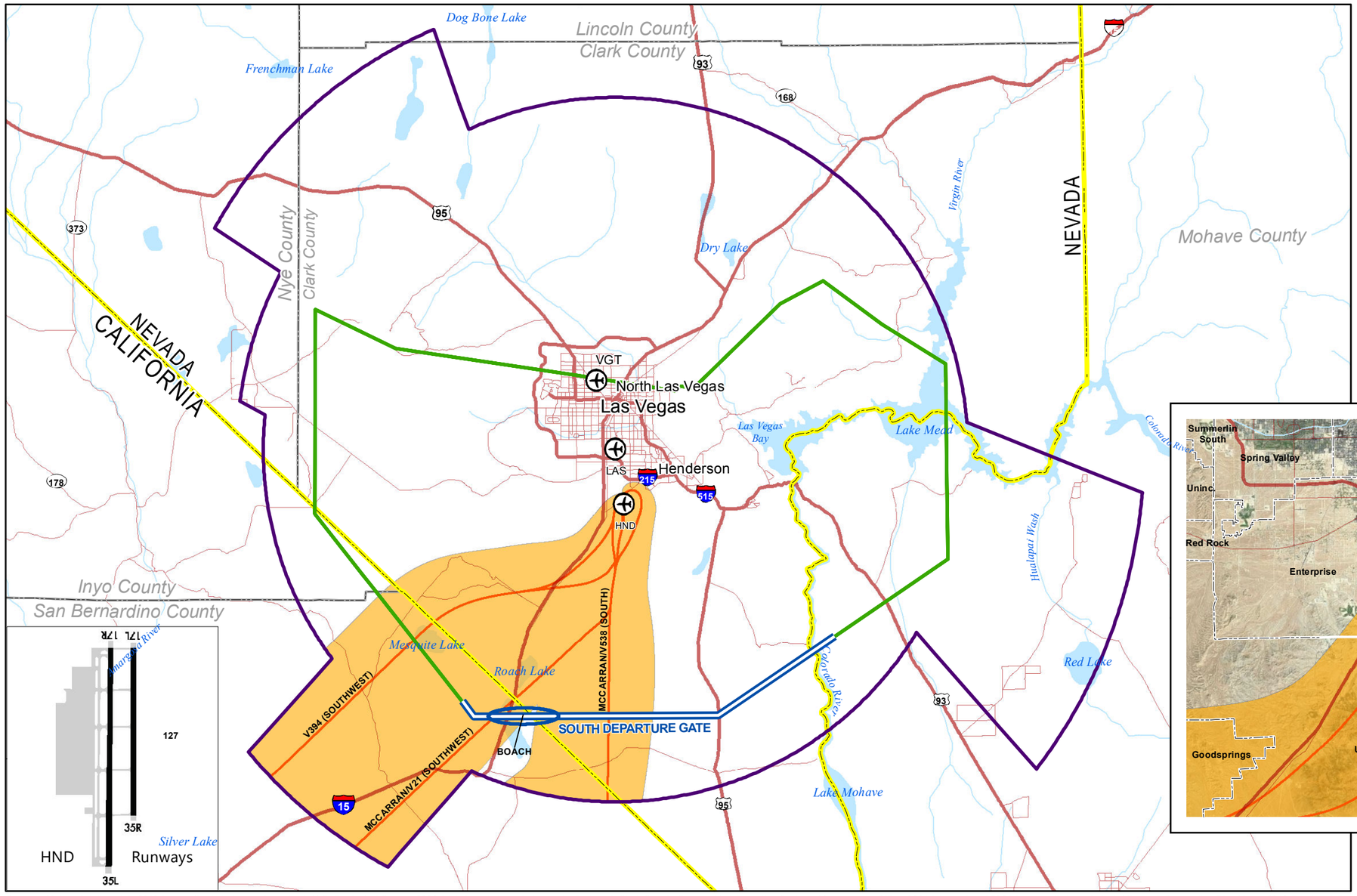

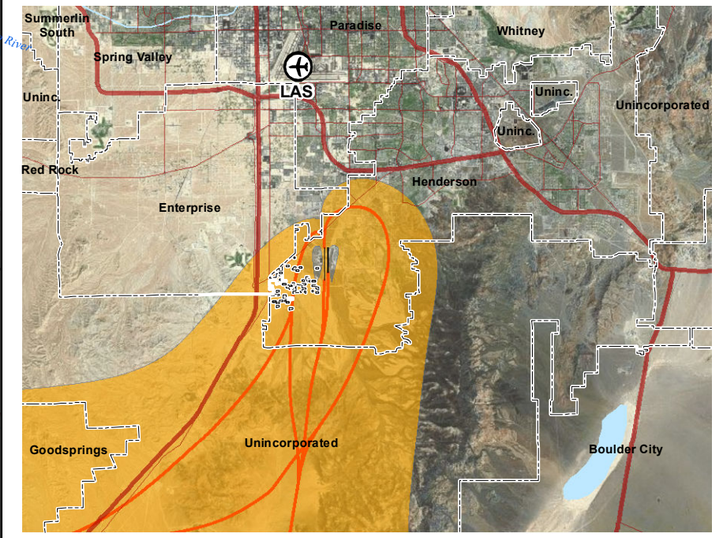

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-21

0 13 NM

north

No Action Alternative
HND - South Departure Gate

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West Departure Gate

Exhibits III-22, III-23, and **III-24** depict the aircraft traffic flows to the west and northwest from LAS, VGT, and HND, respectively. **Table III-8** provides a summary overview of the procedures and other routes serving IFR traffic from the EA Airports to the west and northwest.

Table III-8

Aircraft Procedures from the EA Airports to the West and Northwest, No Action Alternative

Exit Point	Route Name	Procedure Type	EA Airport Runway Ends Served by Procedure																	
			LAS								VGT						HND			
			01L	01R	07L	07R	19L	19R	25L	25R	7	12L	12R	25	30L	30R	17L	17R	35L	35R
SHEAD	MCCARRAN [1/]	CONV	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
	SHEAD	**RNAV**	RT	RT	RT	RT	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
HEDAL	PALLY	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	RT	RT	V	V
Other Routes																				
Via West	V105 (Northwest)	VICTOR	V	V	V	V	V	V	V	V	-	-	-	-	-	-	V	V	V	V
Via NATCF Airspace	NATCF Northwest Flow	Vector	-	-	-	-	-	-	-	-	V	V	V	V	V	V	-	-	-	-

Notes:

CONV = Conventional SID

RNAV = Area Navigation (RNAV) SID

VICTOR = Victor Airway (Certain Victor Airways serve departures from LAS, although in very small numbers. Therefore, the Victor Airways are only depicted on Exhibits III-23 and III-24, for VGT and HND, respectively.)

Vector = A route along which aircraft are vectored through the airspace to the exit point.

V = Procedure does not include a runway transition route from the runway end to the exit point, so aircraft are vectored to the exit point.

RT = Procedure includes a runway transition route from the runway end to the exit point.

Blue shading indicates an exit point that is exclusive to a single airport.

Light green shading indicates routes that are exclusive to one EA Airport.

NATCF = Nellis Air Traffic Control Facility

1/ Air traffic controllers can join aircraft taking off from VGT and HND that are not RNAV equipped to the MCCARRAN Conventional SID by vectoring.

Sources: Ricondo & Associates, Inc., January 2012, based on (1) NIRS Tracks from Metron Aviation, October 17-31, 2011; and (2) U.S. Department of Transportation, Federal Aviation Administration, *Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement*, Subject: Terminal Area Control, Effective: June 30, 2011.

Prepared by: Ricondo & Associates, Inc., February 2012.

Two exit points from the L30 terminal airspace (SHEAD and HEDAL), through which two RNAV SIDs (SHEAD from LAS and PALLY from HND) and one Conventional SID (MCCARRAN from all three EA Airports) pass, are located along the West Departure Gate. The SHEAD RNAV SID from LAS is an overlay of the shared MCCARRAN Conventional SID. The SHEAD and MCCARRAN SIDs share the SHEAD exit point. The PALLY RNAV SID from HND exits through the HEDAL exit point, which is exclusive to the RNAV SID. Two additional flows serve aircraft taking off from the EA Airports—one defined by a Victor Airway to the northwest primarily for use by propeller aircraft taking off from HND and LAS (V105 [Northwest]) and a second accommodating propeller aircraft that are vectored from VGT through NATCF airspace (NATCF Northwest Flow).

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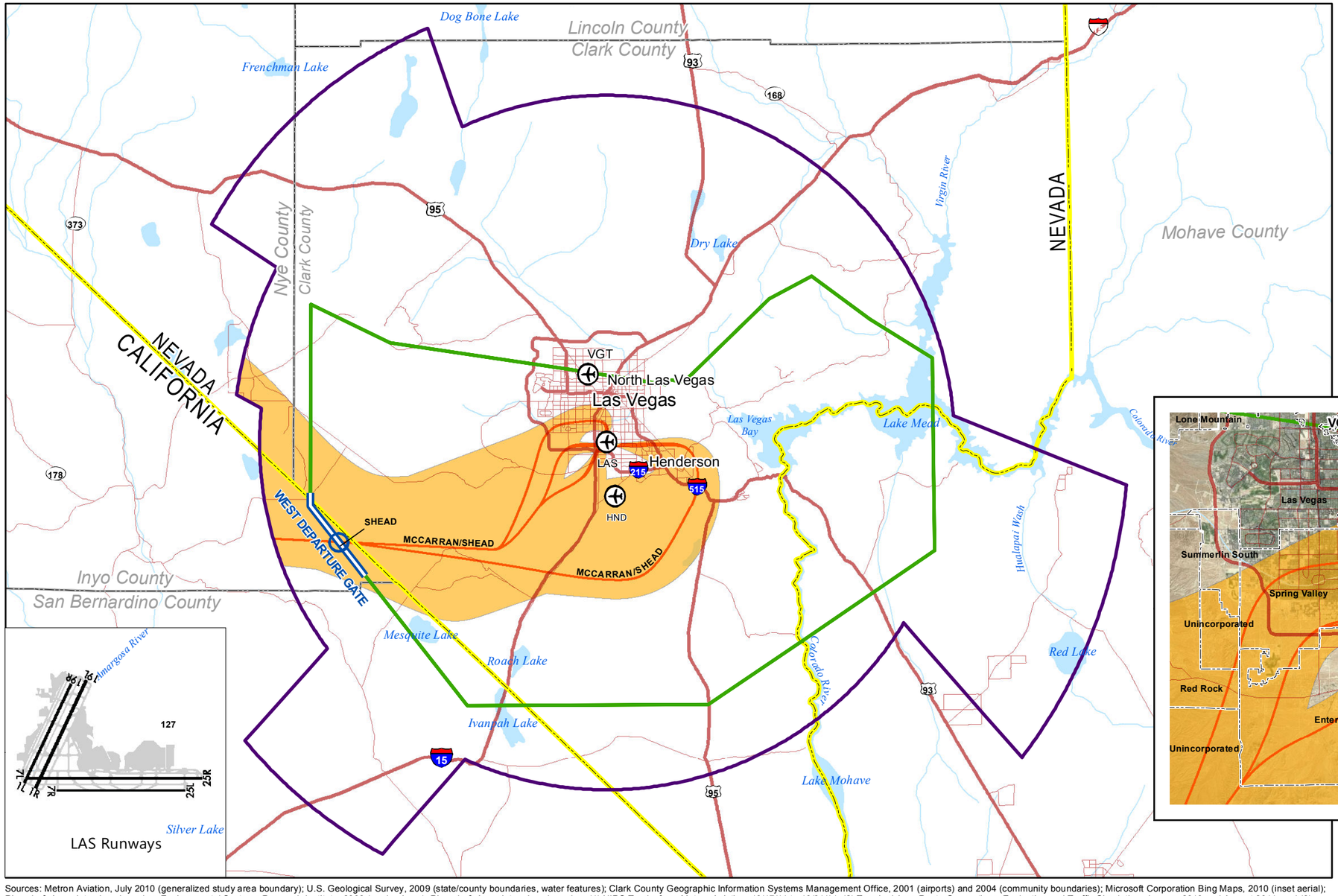
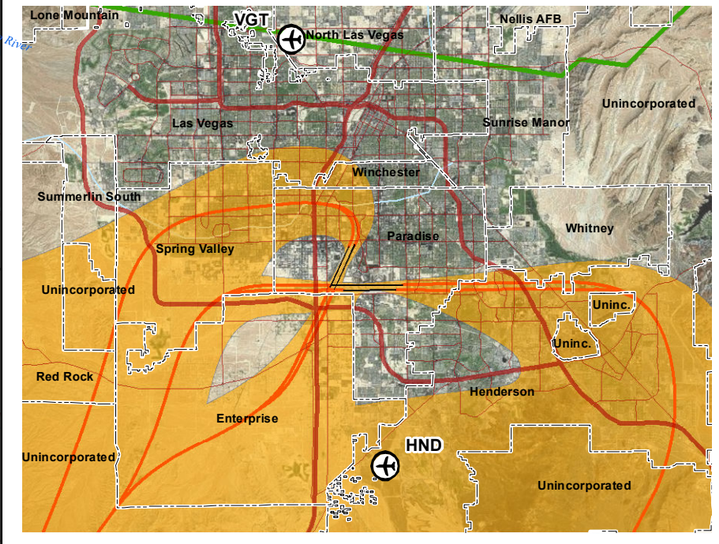


LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.



Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-22

0 13 NM

north

No Action Alternative
LAS - West Departure Gate

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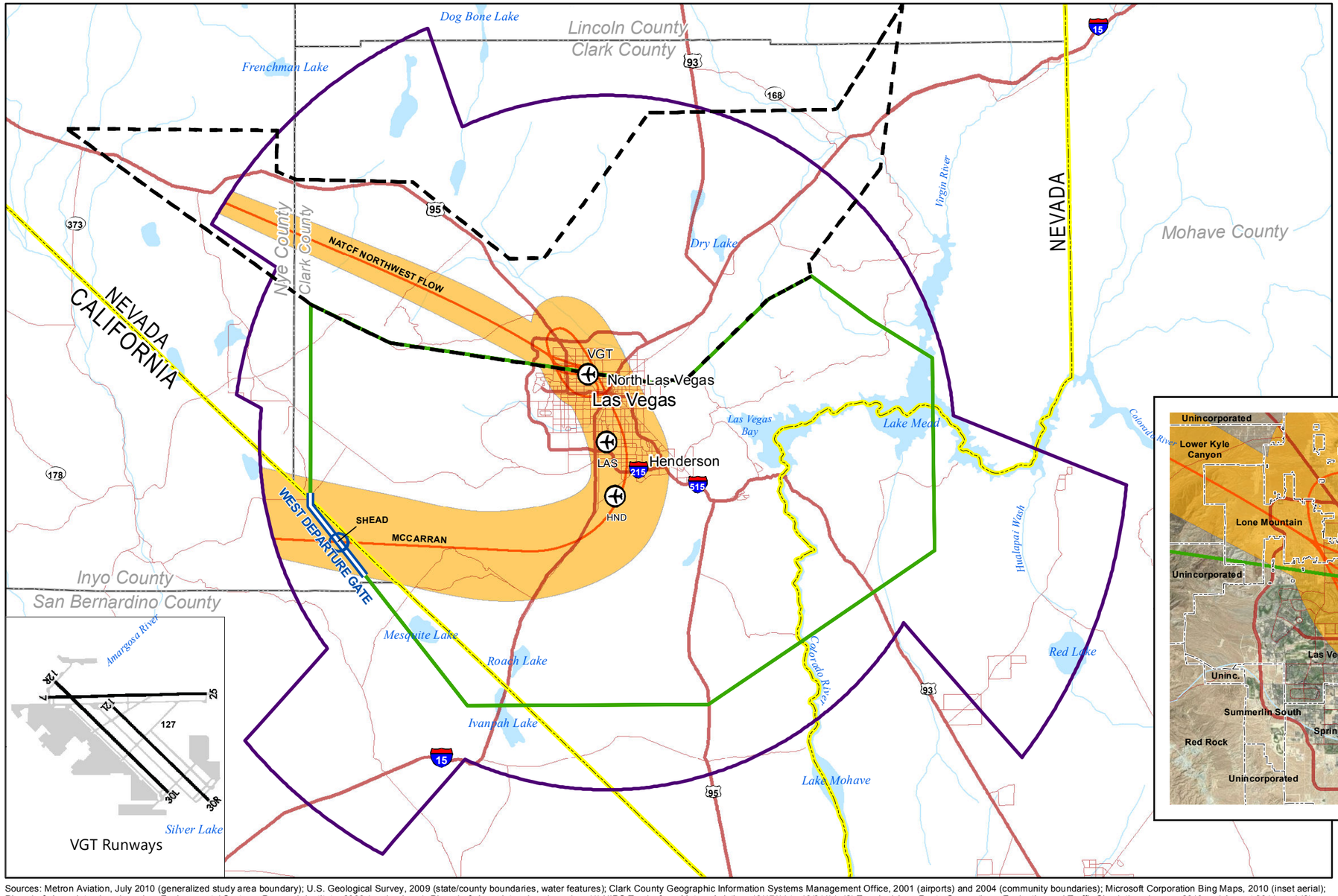

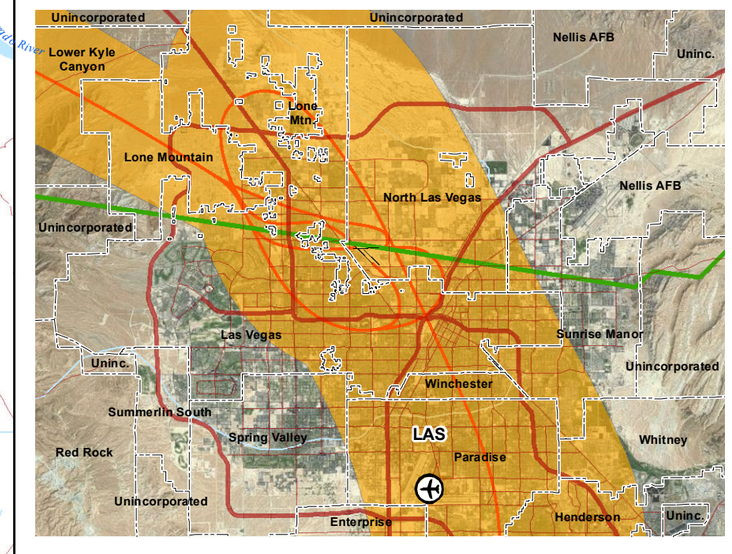

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- NATCF Airspace Boundary (Estimated)
- Departure Gate and Exit Point

Notes: 1) Community boundaries include both municipalities and census designated places; 2) NATCF Airspace Boundary assumed to align with LAS Optimization L30 Terminal Airspace Boundary.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport;
NATCF - Nellis Air Traffic Control Facility
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-23

0 13 NM

north

No Action Alternative
VGT - West Departure Gate

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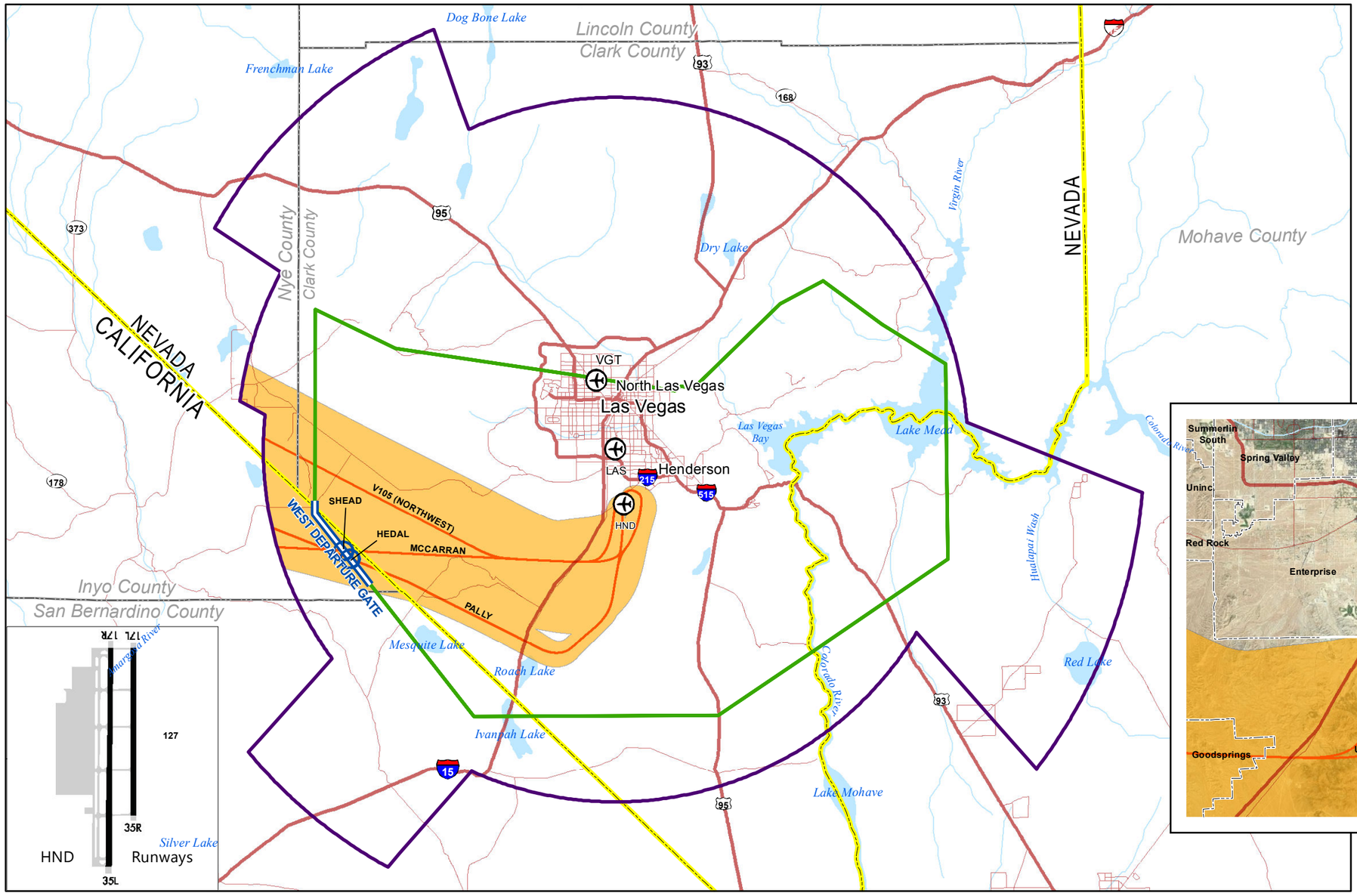

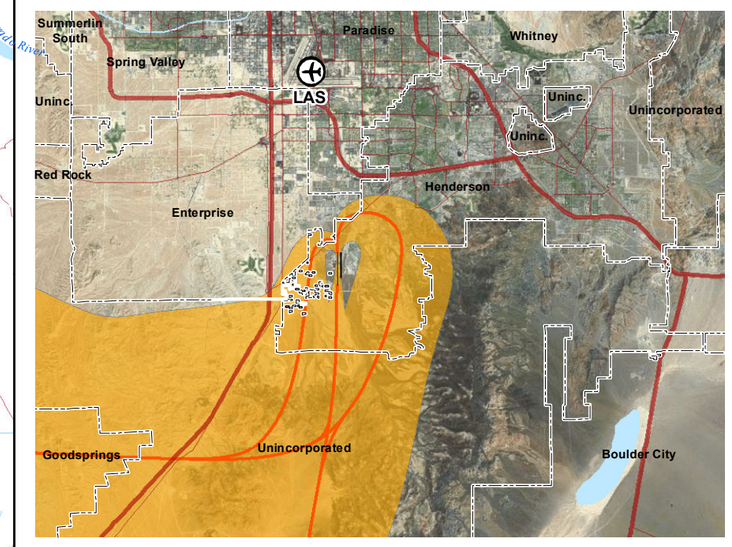

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-24

0 13 NM

north

No Action Alternative
HND - West Departure Gate

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3.4.2 LAS Optimization Alternative

The following provides an overview of the alternative to optimize the air traffic routes in the Las Vegas area, referred to as the LAS Optimization Alternative.

3.4.2.1 Air Traffic Route Redesign Process

Beginning in 2008, a working group known as the LAS Optimization Airspace Design Team (Airspace Design Team) was formed to identify existing problems and to design procedures intended to resolve the issues described in the Purpose and Need section. The Airspace Design Team included representatives from the FAA Air Traffic Organization (ATO) Western Service Center (WSC), the Las Vegas TRACON, and Los Angeles ARTCC. The Airspace Design Team consulted representatives from other air traffic control facilities outside of the study area, including the Salt Lake City ARTCC, Albuquerque ARTCC, Denver ARTCC, and NATCF. This was done to ensure consideration of the airspace management responsibilities of the adjacent Centers and TRACONs.

Extensive coordination was a key component of the aircraft procedures redesign process. FAA internal coordination included an exchange of information between the various air traffic control facilities. External input from airspace users (e.g., airlines, airport operators) was solicited and considered. In addition, recommendations were received from the Radio Technical Commission for Aeronautics (RTCA) Western Pacific Subgroup of the Airspace Working Group (WPSAWG) and the Las Vegas User's Council. Airline industry stakeholders were briefed and provided significant feedback on operational aspects of the design during a series of meetings and conference calls between the airline stakeholders and the Airspace Design Team. Airline stakeholders also provided valuable insight after flying components of the designs in their aircraft simulators.

Based on the Purpose and Need and related causal factors documented in Section II, the Airspace Design Team developed specific objectives and assumptions for the Airspace Redesign. The objectives reflect general steps needed to achieve the purpose and meet the need of the Proposed Action. The assumptions were the common conditions upon which the alternative was conceptualized. The following assumptions and objectives guided the development of the LAS Optimization Alternative:

- Objectives
  - Increase overall operational efficiency via dual arrival routes, additional L30 terminal airspace exit points, and separation of LAS traffic from HND and VGT;
  - The development of all new STARs and SIDs should use RNAV technology;
  - Impose fewer climb restrictions on departing aircraft and keep arrivals higher longer, which can be achieved through the use of RNAV design and separated routes; and
  - Create a flexible structure of air traffic routes to maximize use of available runway capacity at the EA Airports, which can be achieved through inclusion of runway transitions in all STARs and SIDs.
- Assumptions
  - Define routes based on fixed location points rather than vectoring.
  - Terminal area aircraft separation standards applied over a larger airspace area, and
  - Primary means of navigation is RNAV-based.

A set of constraints were placed upon the Airspace Design Team at the beginning of the process in order to minimize potential environmental impacts of the redesign and facilitate rapid implementation. They included:

- The existing STAAV SID could not be changed below 10,000 feet above ground level (AGL);
- New routes or route changes over the Grand Canyon National Park below 18,000 feet AGL were not permitted;
- Route changes for LAS traffic below 3,000 feet AGL were to be avoided whenever possible;
- Existing Special Use Airspace (SUA) could not be modified;
- Only minor modifications of the L30 terminal airspace boundary shared with the NATCF airspace were permitted
- Minimize need for new or modified infrastructure requirements; and
- Do not induce new safety risk hazards or increase the level of risk of existing hazards.

The process of developing aircraft procedures was an iterative one. Each procedure is required to meet FAA RNAV design criteria while working within the constraints of available airspace. In addition, each procedure was tested using Human-in-the-Loop (HITL) simulation, which involved active air traffic controllers managing traffic real-time in a simulated environment. Procedures also went through FAA SMS review to confirm the proposed procedures meet safety requirements and do not cause new safety hazards and/or worsen existing hazards.

3.4.2.2 Airspace Structure

The existing hybrid four corner-post organization of the L30 terminal airspace would be maintained in the LAS Optimization Alternative, and the supporting airspace structure was adjusted to support changes to the air traffic routes. The hybrid four corner-post system is described in the No Action Alternative discussion (refer to Section 3.4.1.1).

3.4.2.3 Arrival Flows

This section provides a summary of the procedures and other routes that aircraft landing at the EA Airports would follow through the L30 terminal airspace under the LAS Optimization Alternative. Exhibits illustrate the general flows of air traffic from the arrival gate of the L30 terminal airspace to the runway ends at the EA Airports. Four arrival gates would accommodate aircraft traffic entering the L30 terminal airspace in the LAS Optimization Alternative:

- **Northeast Arrival Gate**—generally accommodating traffic from areas to the northeast of the Las Vegas area as well as from some areas to the north and east.
- **Southeast Arrival Gate**—generally accommodating traffic from areas to the southeast and south of the Las Vegas area as well as from some areas to the east.
- **Southwest Arrival Gate**—generally accommodating traffic from areas to the southwest of the Las Vegas area.
- **Northwest Arrival Gate**—generally accommodating traffic from the areas to the northwest of the Las Vegas area as well as from some areas to the north.

The primary aircraft traffic flows through each arrival gate to the EA Airports in the LAS Optimization Alternative are discussed in this section.

Northeast Arrival Gate

Exhibits III-25, III-26, and **III-27** depict the arrival flows through the Northeast Gate to LAS, VGT, and HND, respectively. **Table III-9** provides a summary overview of the procedures serving IFR traffic from the northeast to the EA Airports, including notes providing comparisons with the No Action Alternative, as appropriate.

Table III-9

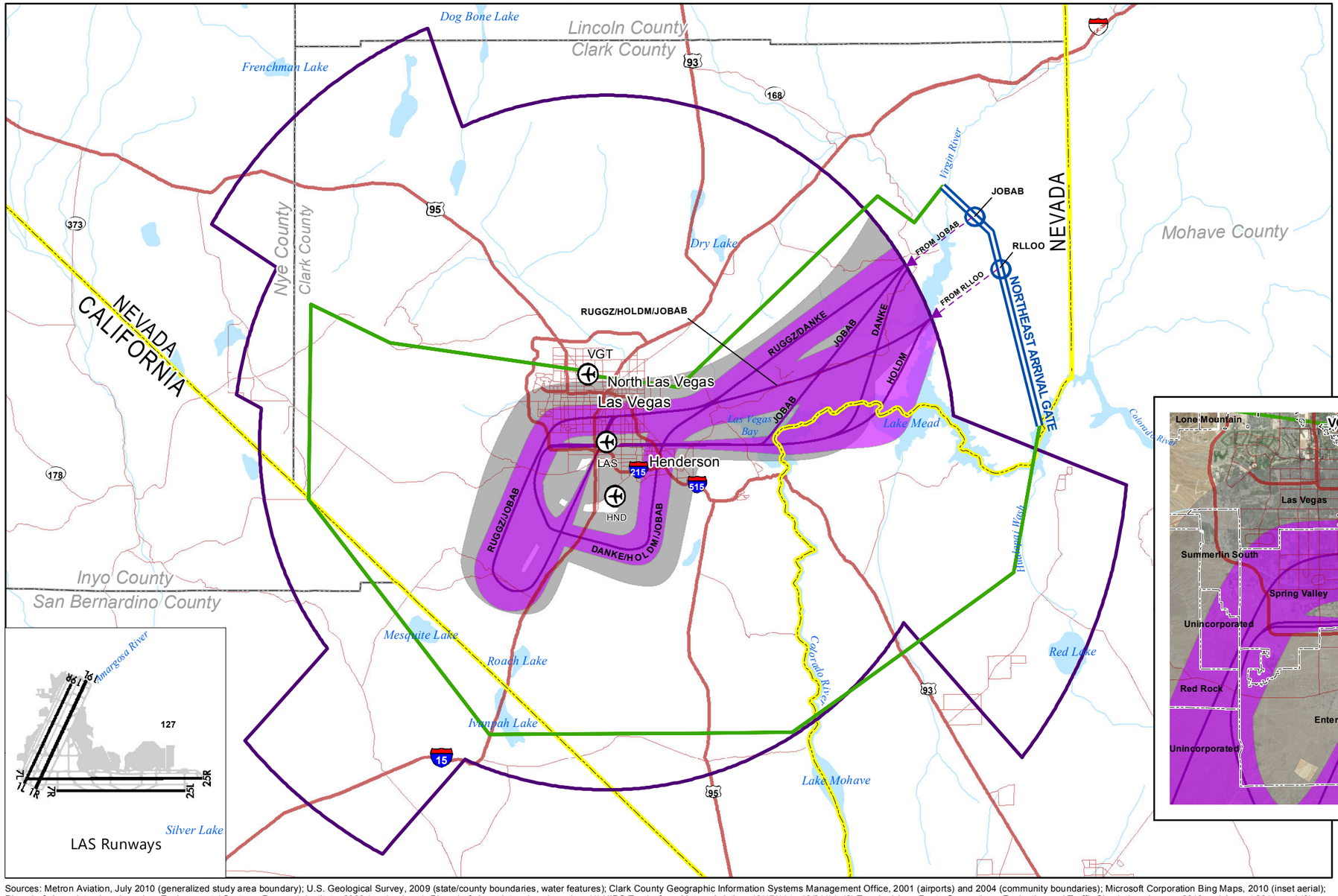
Aircraft Procedures from the Northeast to the EA Airports, LAS Optimization Alternative

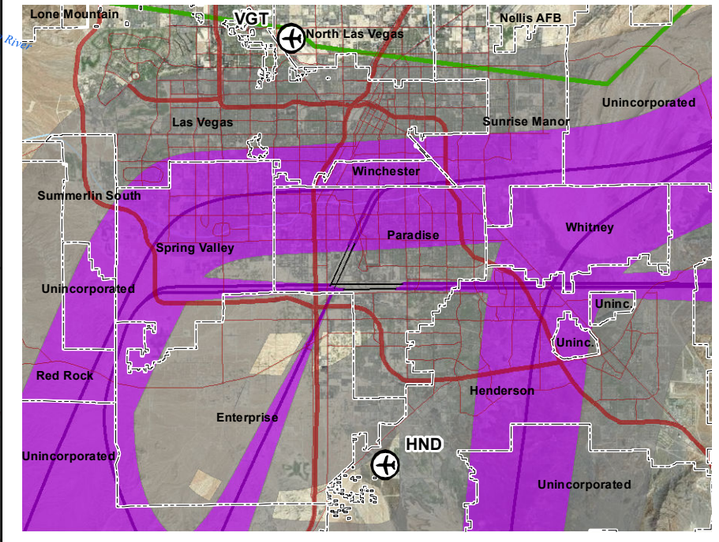
Entry Point	Route Name	Procedure Type	EA Airport Runway Ends Served by Procedure																	
			LAS								VGT						HND			
			01L	01R	07L	07R	19L	19R	25L	25R	7	12L	12R	25	30L	30R	17L	17R	35L	35R
JOBAB	DANKE	**RNAV**	-	-	V	V	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
	RUGGZ	**RNAV**	RT	RT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	JOBAB [1/]	CONV	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
RLLOO	HOLDM	**RNAV**	-	-	V	V	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
	RUGGZ	**RNAV**	RT	RT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HERAS	NOOTN	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V	V	RT	RT
Other Routes																				
Via Northeast	V21 [2/] (Northeast)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via NATCF Airspace	NORRA [2/]	**RNAV**	-	-	-	-	-	-	-	-	V	V	V	V	V	V	-	-	-	-
Via NATCF Airspace	V394 [2/] (Northeast)	VICTOR	-	-	-	-	-	-	-	-	V	V	V	V	V	V	-	-	-	-

Notes:
CONV = Conventional STAR
RNAV = Area Navigation (RNAV) STAR
VICTOR = Victor Airway (Certain Victor Airways serve arrivals to LAS, although in very small numbers. Therefore, the Victor Airways are only depicted on Exhibits III-26 and III-27, for VGT and HND, respectively.)
V = Procedure does not include a runway transition route to the final approach to the runway end, so aircraft are vectored to the final approach.
RT = Procedure includes a runway transition route to the final approach to the runway end.
Blue shading indicates an entry point that is exclusive to a single airport.
Light green shading indicates routes that are exclusive to one EA Airport.
NATCF = Nellis Air Traffic Control Facility
1/ The JOBAB Conventional STAR replaces the LUXOR Conventional STAR in the No Action Alternative and is depicted on Exhibit III-25.
2/ V21 is similar to V21 in the No Action Alternative, and NORRA and V394 are similar to V394 in the No Action Alternative.

Sources: Ricondo & Associates, Inc., January 2012, based on (1) NIRS Tracks from Metron Aviation, October 17-31, 2011; and (2) U.S. Department of Transportation, Federal Aviation Administration, *Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement,* Subject: Terminal Area Control, Effective: June 30, 2011.
Prepared by: Ricondo & Associates, Inc., February 2012.

Three entry points to the L30 terminal airspace (JOBAB, RLLOO, and HERAS), through which four RNAV STARs (DANKE, RUGGZ, and HOLDM to LAS and NOOTN to HND) and one Conventional STAR (JOBAB to all three EA Airports) would pass, would be located along the Northeast Arrival Gate; and an additional RNAV STAR (NORRA to VGT) would pass through NATCF airspace. The RUGGZ and DANKE RNAV STARs to LAS and the shared JOBAB Conventional STAR (a new Conventional STAR that would replace the LUXOR Conventional STAR in the No Action Alternative) would share the JOBAB entry point. In addition to entering the L30 terminal airspace through the JOBAB entry point, the RUGGZ RNAV STAR to LAS defines a second route through the RLLOO entry point, which is shared with the HOLDM RNAV STAR to LAS; therefore, the RLLOO entry point would be used exclusively for aircraft landing at LAS. The NOOTN RNAV STAR to HND would pass through the HERAS entry point, which would be exclusive to the RNAV STAR. The NORRA RNAV STAR to VGT would flow through the NATCF airspace, accompanied by a Victor Airway flow for propeller aircraft landing at VGT (V394 [Northeast]). An additional flow would be defined by a Victor Airway from the northeast to the EA Airports (V21 [Northeast]), but would serve primarily propeller aircraft landing at VGT and HND.





LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- RNAV Arrival Corridors
- Conventional Arrival Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-25

0 13 NM

north

LAS Optimization Alternative
LAS - Northeast Arrival Gate

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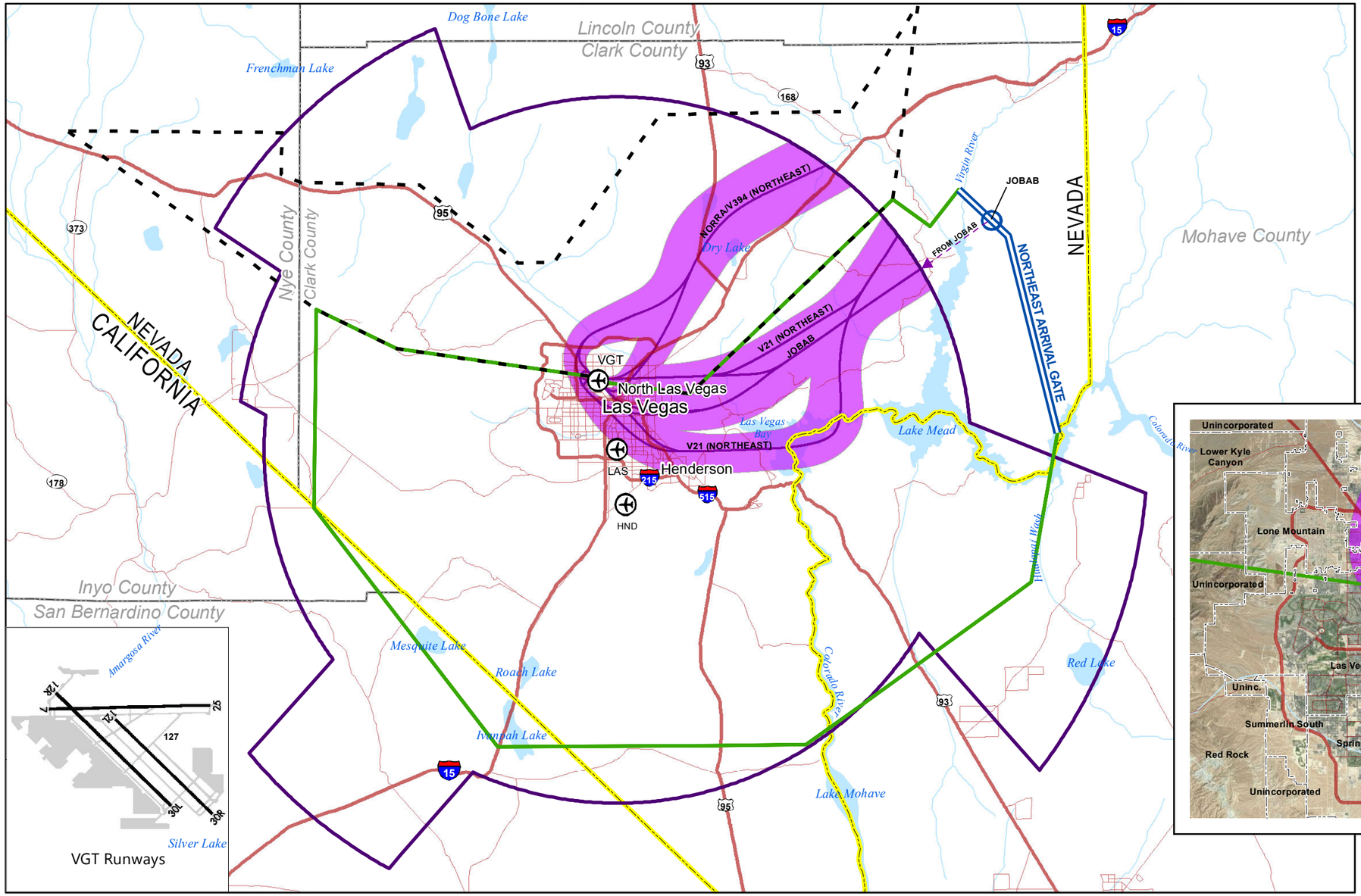

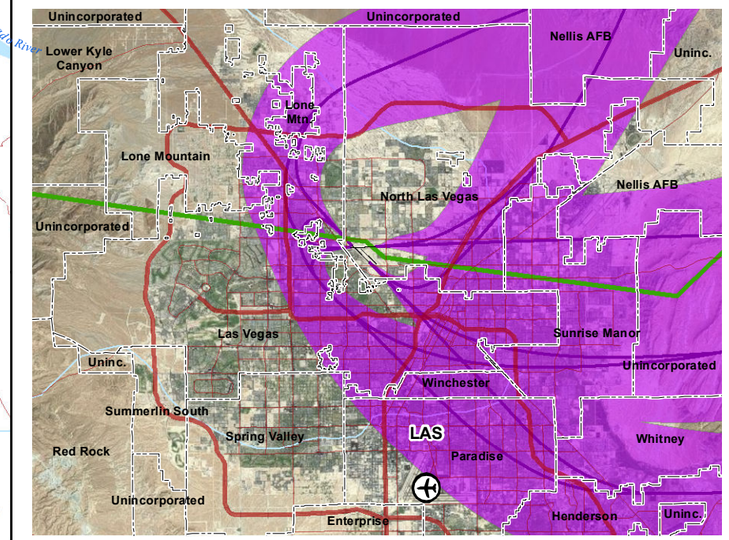

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- NATCF Airspace Boundary (Estimated)
- Arrival Gate and Entry Point

Notes: 1) Community boundaries include both municipalities and census designated places; 2) NATCF Airspace Boundary assumed to align with LAS Optimization L30 Terminal Airspace Boundary.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport;
NATCF - Nellis Air Traffic Control Facility
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-26

0 13 NM

north

LAS Optimization Alternative
VGT - Northeast Arrival Gate

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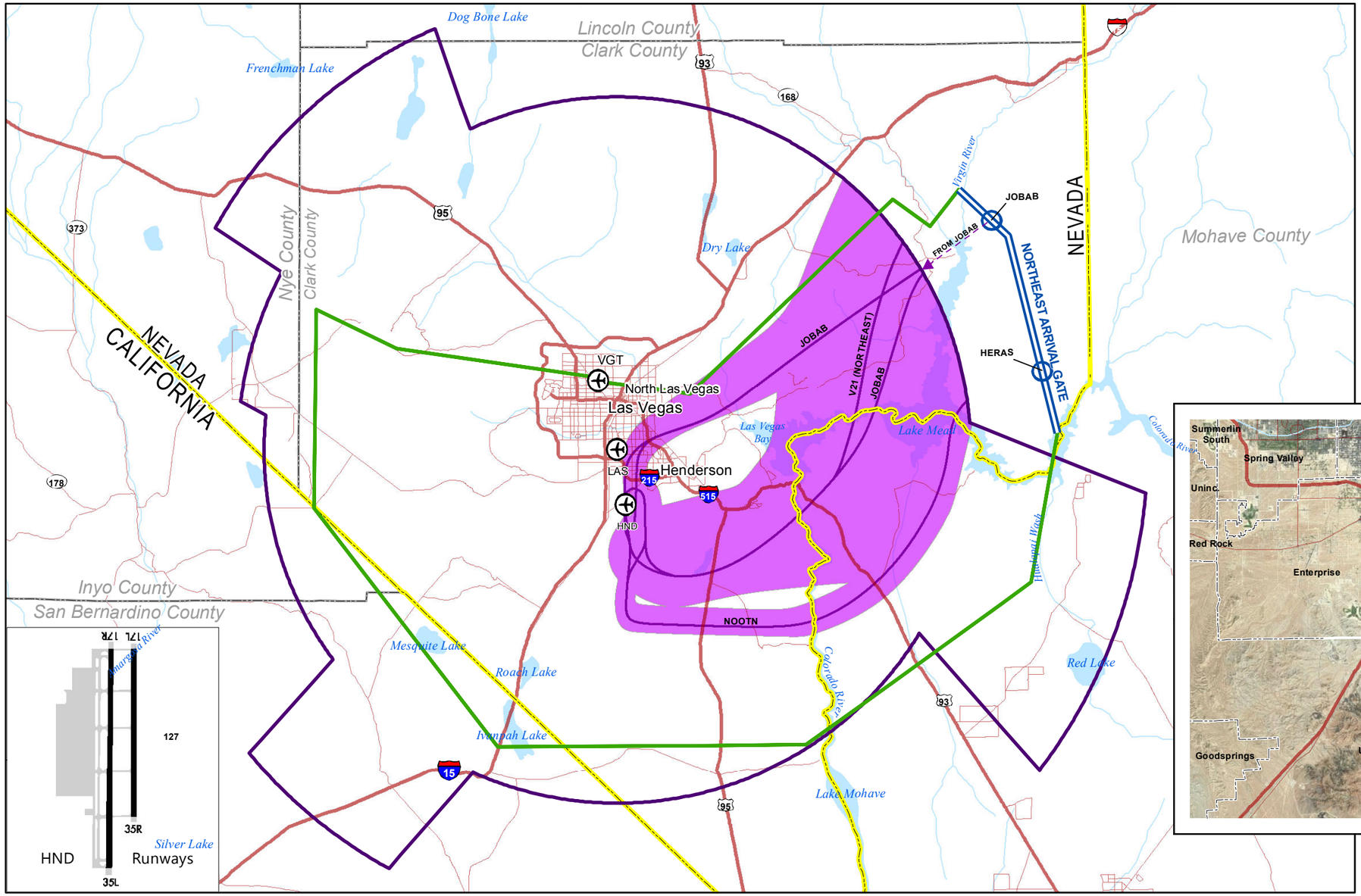

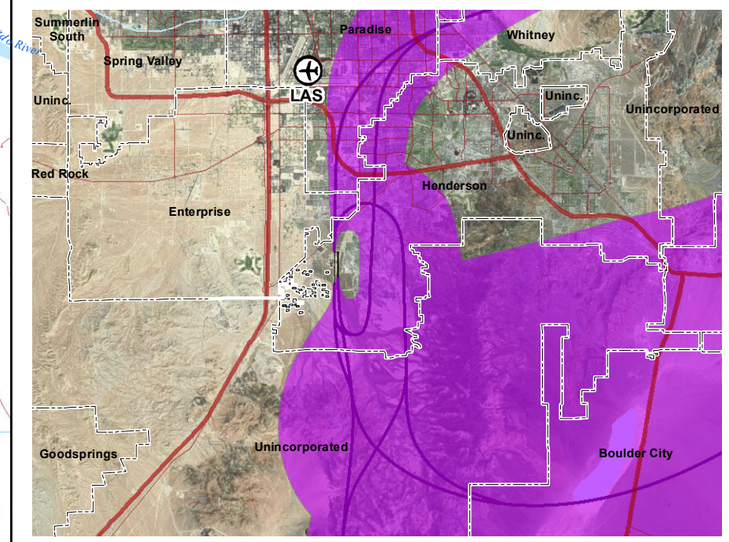

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-27

0 13 NM

north

LAS Optimization Alternative
HND - Northeast Arrival Gate

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Southeast Arrival Gate

Exhibits III-28, III-29, and **III-30** depict the aircraft traffic flows from the southeast to LAS, VGT, and HND, respectively. **Table III-10** provides a summary overview of the procedures and other routes serving IFR traffic from the southeast to the EA Airports, including notes providing comparisons with the No Action Alternative, as appropriate.

Table III-10

Aircraft Procedures from the Southeast to the EA Airports, LAS Optimization Alternative

Entry Point	Route Name	Procedure Type	EA Airport Runway Ends Served by Procedure																	
			LAS								VGT						HND			
			01L	01R	07L	07R	19L	19R	25L	25R	7	12L	12R	25	30L	30R	17L	17R	35L	35R
BOZER	DUESE	**RNAV**	RT	RT	V	V	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIDOG	**RNAV**	-	-	-	-	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
	BOZER	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V	V	RT	RT
KADDY	CEJAY	**RNAV**	RT	RT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	KADDY [1/]	CONV	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
HEMSA	JYBRD	**RNAV**	-	-	-	-	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
DUESE	NOMAD	**RNAV**	-	-	-	-	-	-	-	-	V	V	V	V	V	V	-	-	-	-
Other Routes																				
Via Southeast Arrival Gate	V105 [1/] (Southeast)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via Southeast Arrival Gate	V562 [1/]	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

Notes:

CONV = Conventional STAR

RNAV = Area Navigation (RNAV) STAR

VICTOR = Victor Airway (Certain Victor Airways serve arrivals to LAS, although in very small numbers. Therefore, the Victor Airways are only depicted on Exhibits III-29 and III-30, for VGT and HND, respectively.)

V = Procedure does not include a runway transition route to the final approach to the runway end, so aircraft are vectored to the final approach.

RT = Procedure includes a runway transition route to the final approach to the runway end.

Blue shading indicates an entry point that is exclusive to a single airport.

Light green shading indicates routes that are exclusive to one EA Airport.

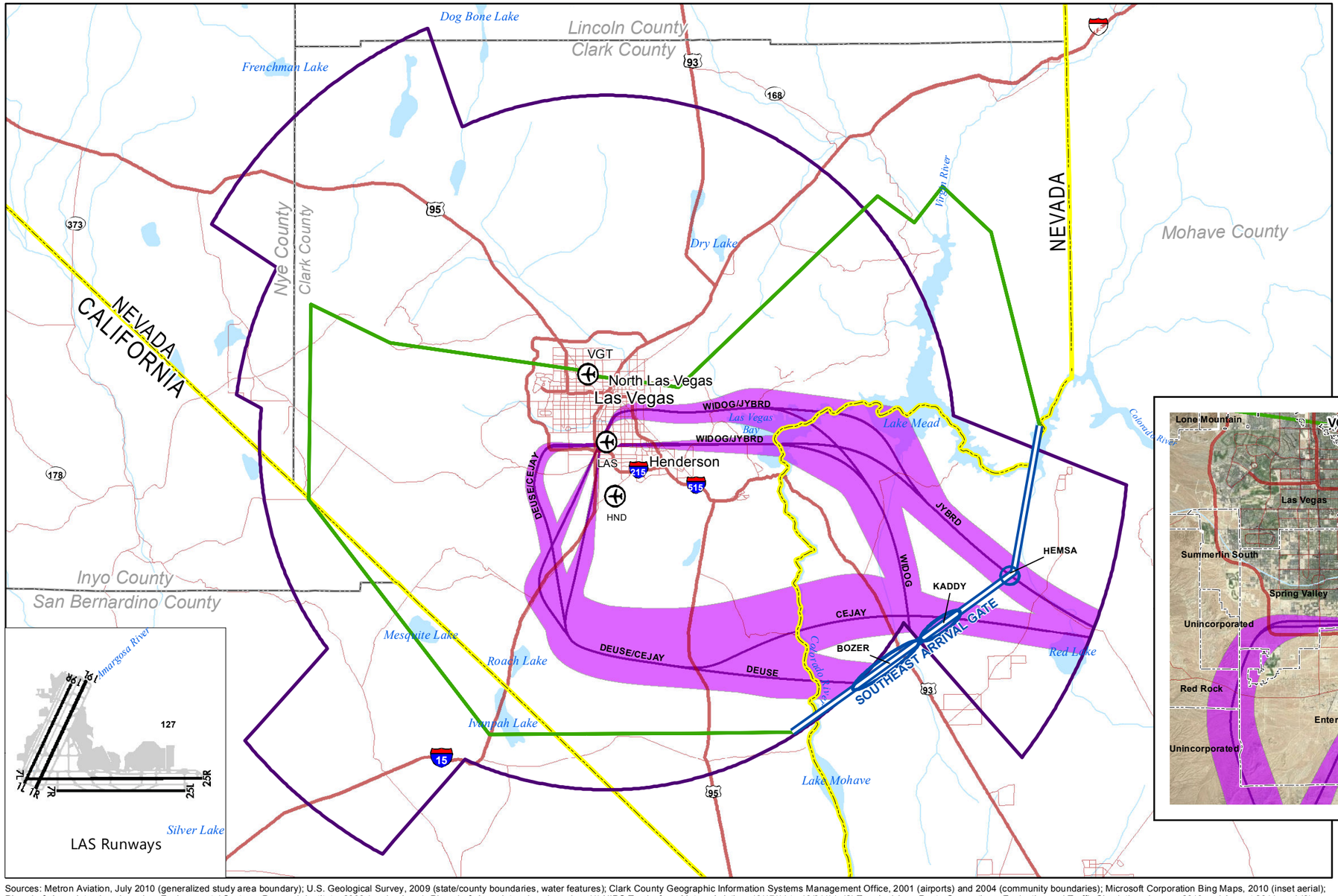
NATCF = Nellis Air Traffic Control Facility

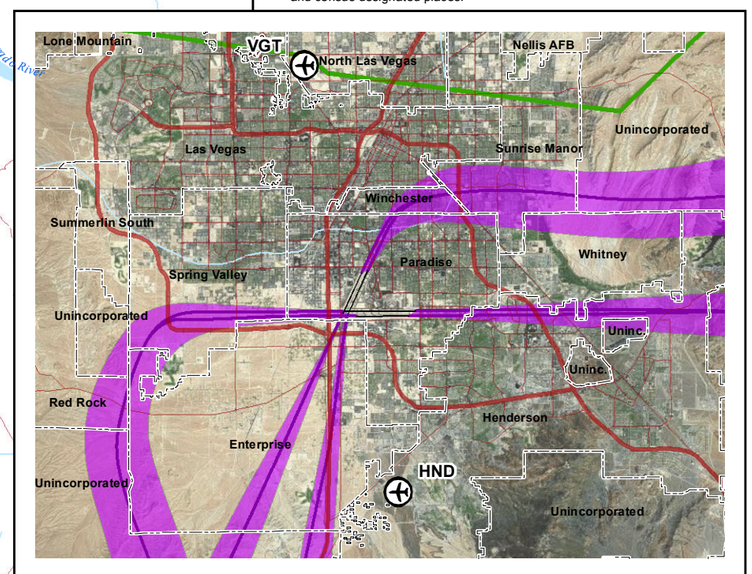
1/ KADDY Conventional STAR, V105 (Southeast), and V562 are similar to the routes in the No Action Alternative.

Sources: Ricondo & Associates, Inc., January 2012, based on (1) NIRS Tracks from Metron Aviation, October 17-31, 2011; and (2) U.S. Department of Transportation, Federal Aviation Administration, *Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement,* Subject: Terminal Area Control, Effective: June 30, 2011.

Prepared by: Ricondo & Associates, Inc., February 2012.

Four entry points to the L30 terminal airspace (BOZER, KADDY, HEMSA, and DUESE), through which six RNAV STARs (DUESE, WIDOG, CEJAY, and JYBRD to LAS, NOMAD to VGT, and BOZER to HND) and one Conventional STAR (KADDY to all three EA Airports) would pass, would be located along the Southeast Arrival Gate. The DUESE and WIDOG RNAV STARs to LAS and the BOZER RNAV STAR to HND would share the BOZER entry point. The CEJAY RNAV STAR to LAS and the shared KADDY Conventional STAR would share the KADDY entry point. The JYBRD RNAV STAR to LAS and the NOMAD RNAV STAR to VGT would enter the L30 terminal airspace through entry points exclusive to each STAR (HEMSA and DUESE, respectively). Two additional flows would be defined by Victor Airways from the southeast to the EA Airports, but would serve primarily propeller aircraft landing at VGT and HND (V105 [Southeast] and V562).





LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport
Conventional STARs are not depicted.
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-28

0 13 NM

north

LAS Optimization Alternative
LAS - Southeast Arrival Gate

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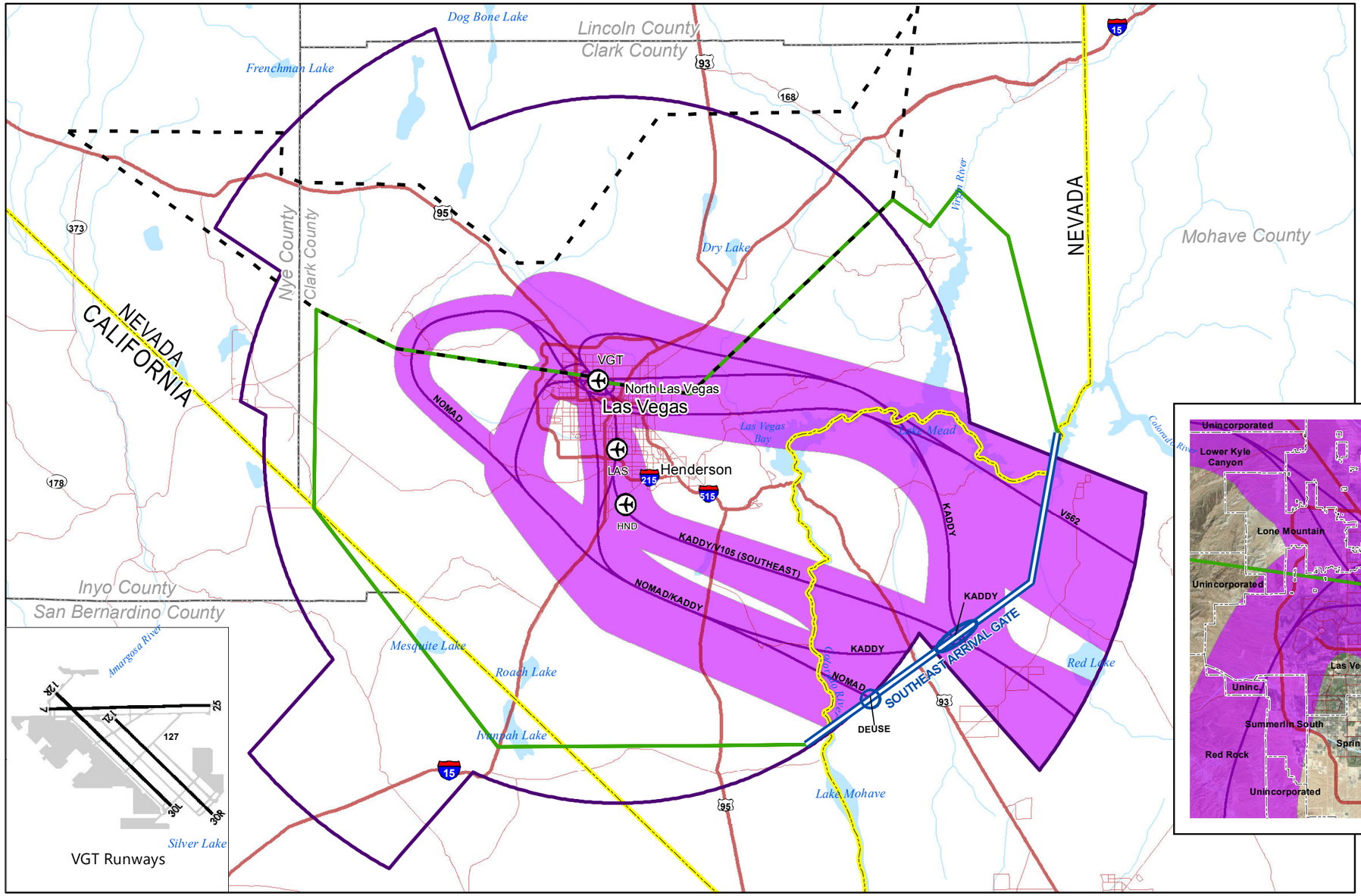

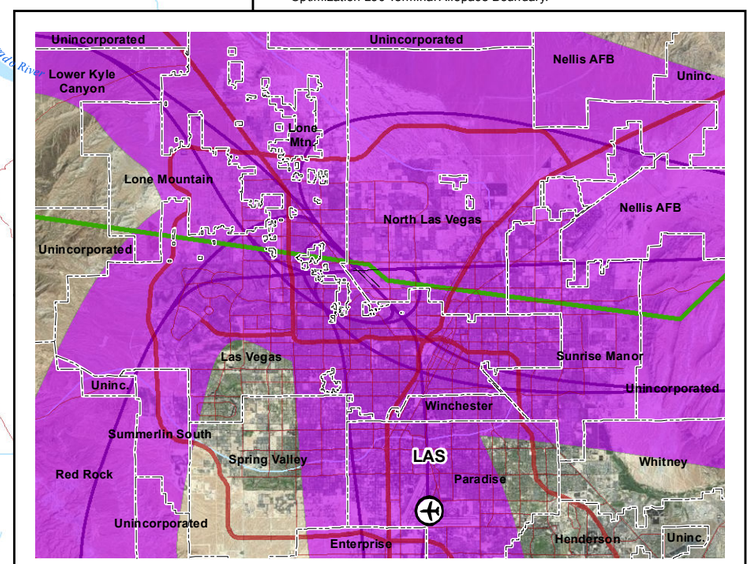

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- NATCF Airspace Boundary (Estimated)
- Arrival Gate and Entry Point

Notes: 1) Community boundaries include both municipalities and census designated places; 2) NATCF Airspace Boundary assumed to align with LAS Optimization L30 Terminal Airspace Boundary.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport;
NATCF - Nellis Air Traffic Control Facility
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-29

0 13 NM

north

LAS Optimization Alternative
VGT - Southeast Arrival Gate

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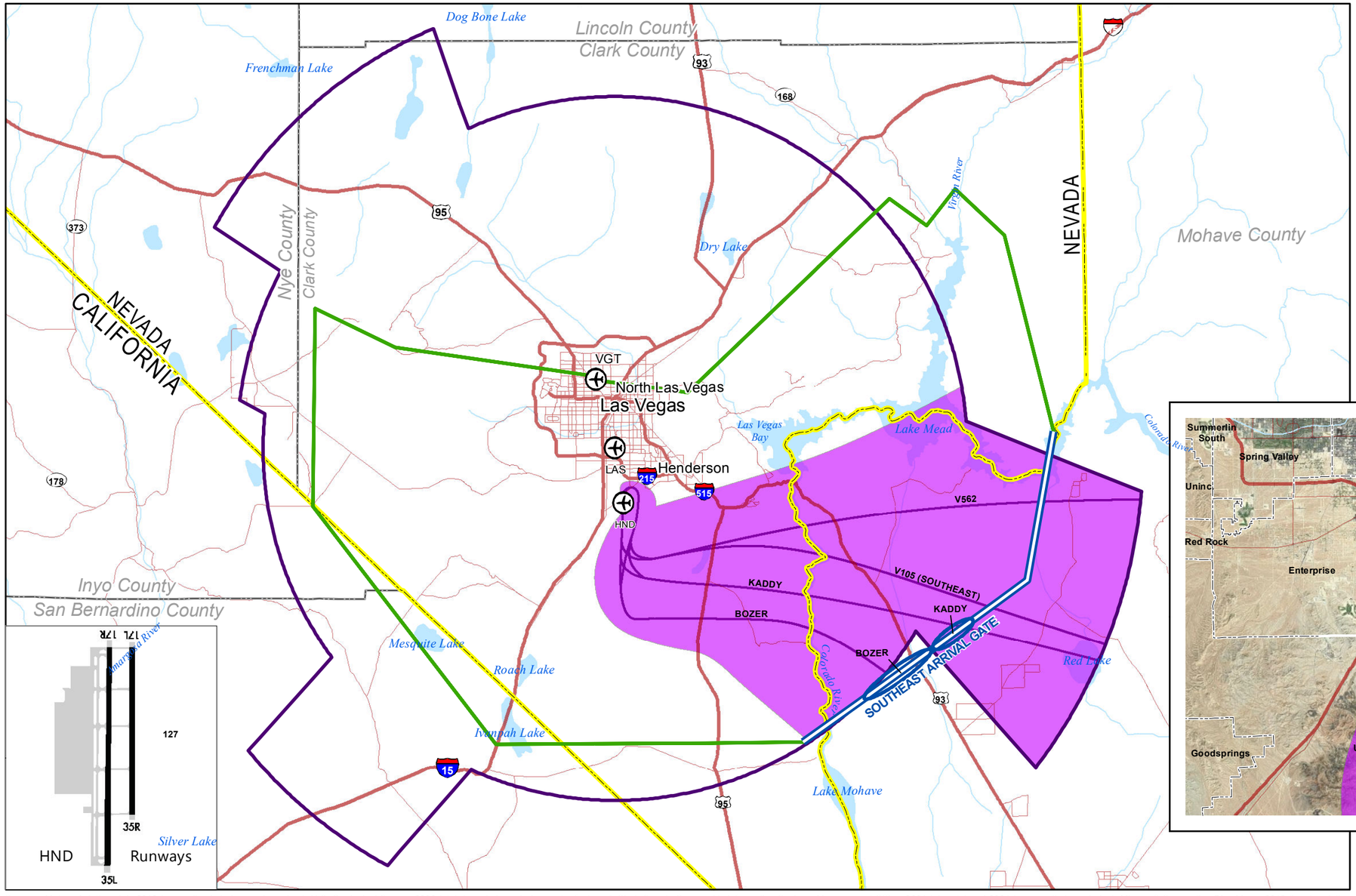

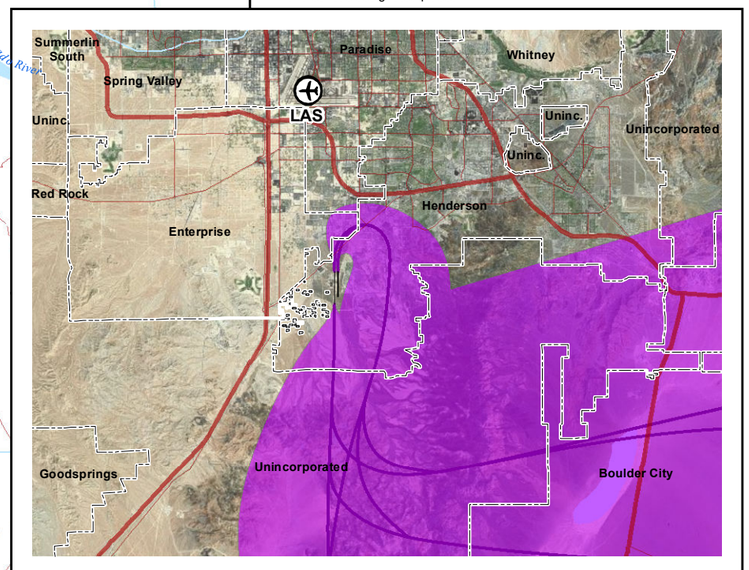

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-30

0 13 NM

north

LAS Optimization Alternative
HND - Southeast Arrival Gate

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Southwest Arrival Gate

Exhibits III-31, III-32, and **III-33** depict the aircraft traffic flows from the southwest to LAS, VGT, and HND, respectively. **Table III-11** provides a summary overview of the procedures and other routes serving IFR traffic from the southwest to the EA Airports, including notes providing comparisons with the No Action Alternative, as appropriate.

Table III-11

Aircraft Procedures from the Southwest to the EA Airports, LAS Optimization Alternative

Entry Point	Route Name	Procedure Type	EA Airport Runway Ends Served by Procedure																	
			LAS								VGT						HND			
			01L	01R	07L	07R	19L	19R	25L	25R	7	12L	12R	25	30L	30R	17L	17R	35L	35R
CLARR	GLRNO	**RNAV**	-	-	-	-	V	V	RT	RT	-	-	-	-	-	-	-	-	-	-
	NOMAD	**RNAV**	-	-	-	-	-	-	-	-	V	V	V	V	V	V	-	-	-	-
	CLARR [1/]	CONV	V	V	V	V	V	V	RT	RT	V	V	V	V	V	V	V	V	V	V
CEDAX	MDERA	**RNAV**	RT	RT	V	V	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	CEDAX	CONV	V	V	V	V	V	V	V	V	-	-	-	-	-	-	V	V	V	V
JOMIX	JOMIX	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V	V	RT	RT
CRESO	CRESO	CONV	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Other Routes																				
Via Southwest Arrival Gate	V21 [1/] (Southwest)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via Southwest Arrival Gate	V394 [1/] (Southwest)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via Southwest Arrival Gate	V538 [1/]	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via Southwest Arrival Gate	VXX1 [2/]	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

Notes:

CONV = Conventional STAR

RNAV = Area Navigation (RNAV) STAR

VICTOR = Victor Airway (Certain Victor Airways serve arrivals to LAS, although in very small numbers. Therefore, the Victor Airways are only depicted on Exhibits III-32 and III-33, for VGT and HND, respectively.)

V = Procedure does not include a runway transition route to the final approach to the runway end, so aircraft are vectored to the final approach.

RT = Procedure includes a runway transition route to the final approach to the runway end.

Blue shading indicates an entry point that is exclusive to a single airport.

Light green shading indicates routes that are exclusive to one EA Airport.

NATCF = Nellis Air Traffic Control Facility

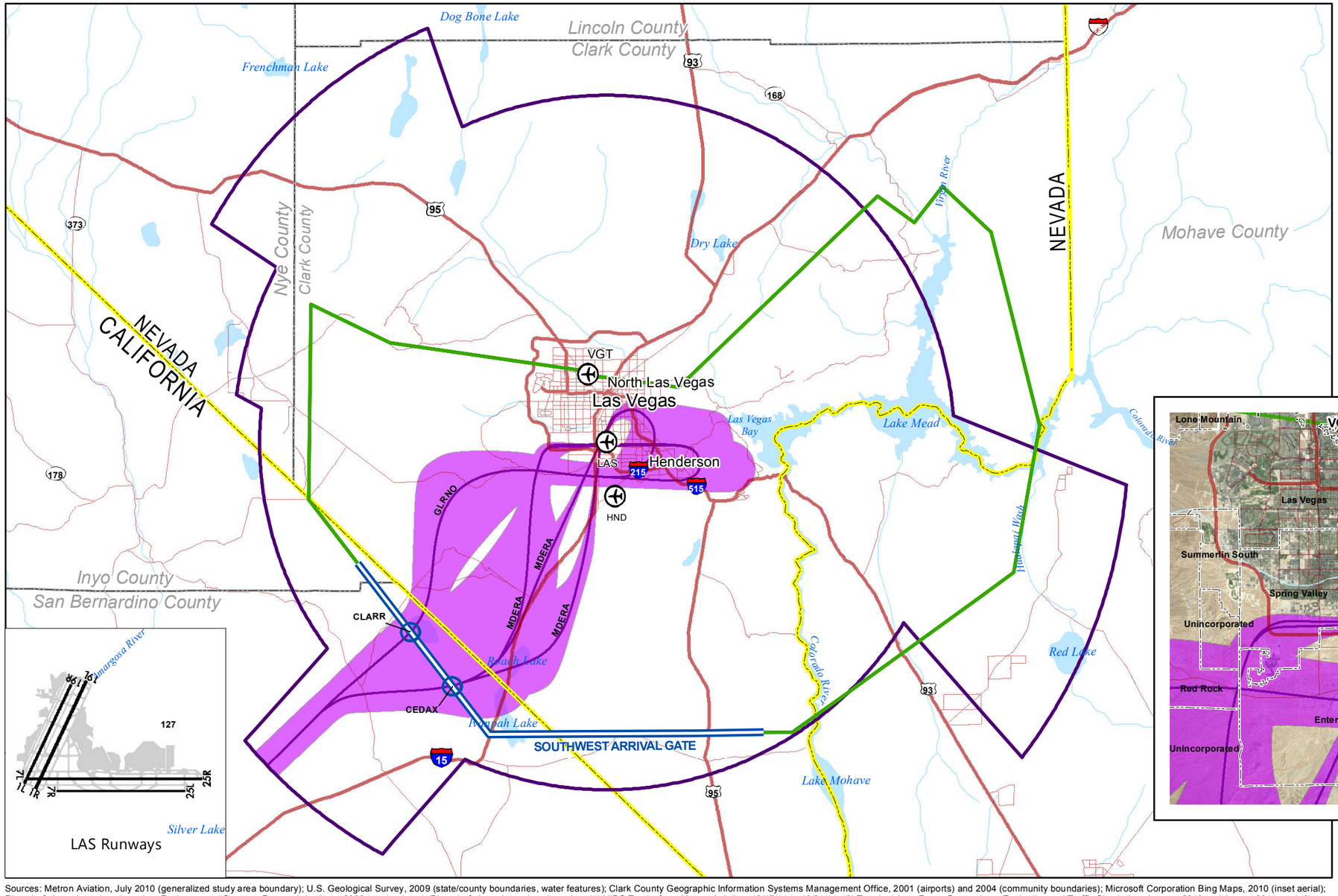
1/ CLARR Conventional STAR, CRESO Conventional STAR, V21 (Southwest), V394, and V538 are similar to the respective routes as in the No Action Alternative.

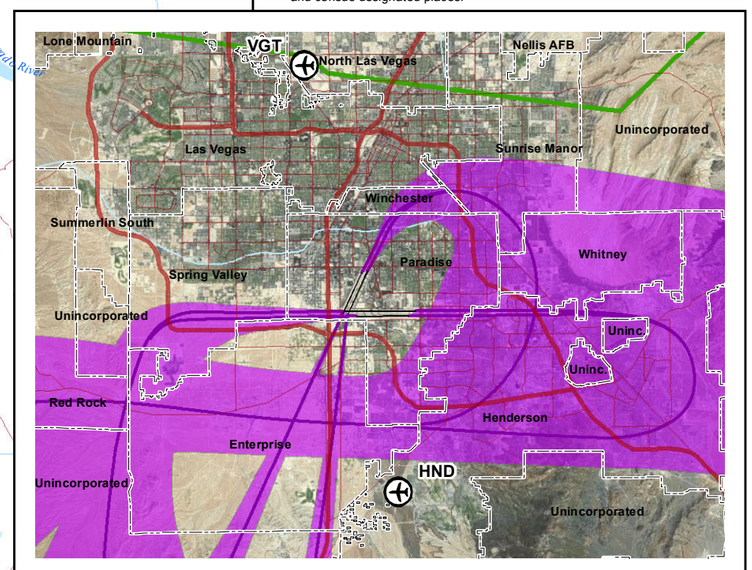
2/ VXX1 is a new Victor Airway under the LAS Optimization Alternative, for which a route name/number would be defined.

Sources: Ricondo & Associates, Inc., January 2012, based on (1) NIRS Tracks from Metron Aviation, October 17-31, 2011; and (2) U.S. Department of Transportation, Federal Aviation Administration, *Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement,* Subject: Terminal Area Control, Effective: June 30, 2011.

Prepared by: Ricondo & Associates, Inc., February 2012.

Four entry points to the L30 terminal airspace (CLARR, CEDAX, JOMIX, and CRESO), through which four RNAV STARs (GLRNO and MDERA to LAS, NOMAD to VGT, and JOMIX to HND) and three Conventional STARs (CLARR and CRESO to all three EA Airports and CEDAX to LAS and HND) would pass, would be located along the Southwest Arrival Gate. The GLRNO RNAV STAR to LAS, the NOMAD RNAV STAR to VGT, and the shared CLARR Conventional STAR would share the CLARR entry point. The MDERA RNAV STAR to LAS and the CEDAX Conventional STAR shared by LAS and HND would share the CEDAX entry point. The JOMIX RNAV STAR to HND would enter the L30 terminal airspace through the JOMIX entry point, which is exclusive to the RNAV STAR. The shared CRESO Conventional STAR would pass through the CRESO entry point, which is exclusive to the Conventional STAR. Four additional flows would be defined by Victor Airways from the south and southwest to the EA Airports, but would serve primarily propeller aircraft landing at VGT and HND (V21 [Southwest], V394 [Southwest], V538, and VXX1).





LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport
Conventional STARs are not depicted.
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-31

0 13 NM

north

LAS Optimization Alternative
LAS - Southwest Arrival Gate

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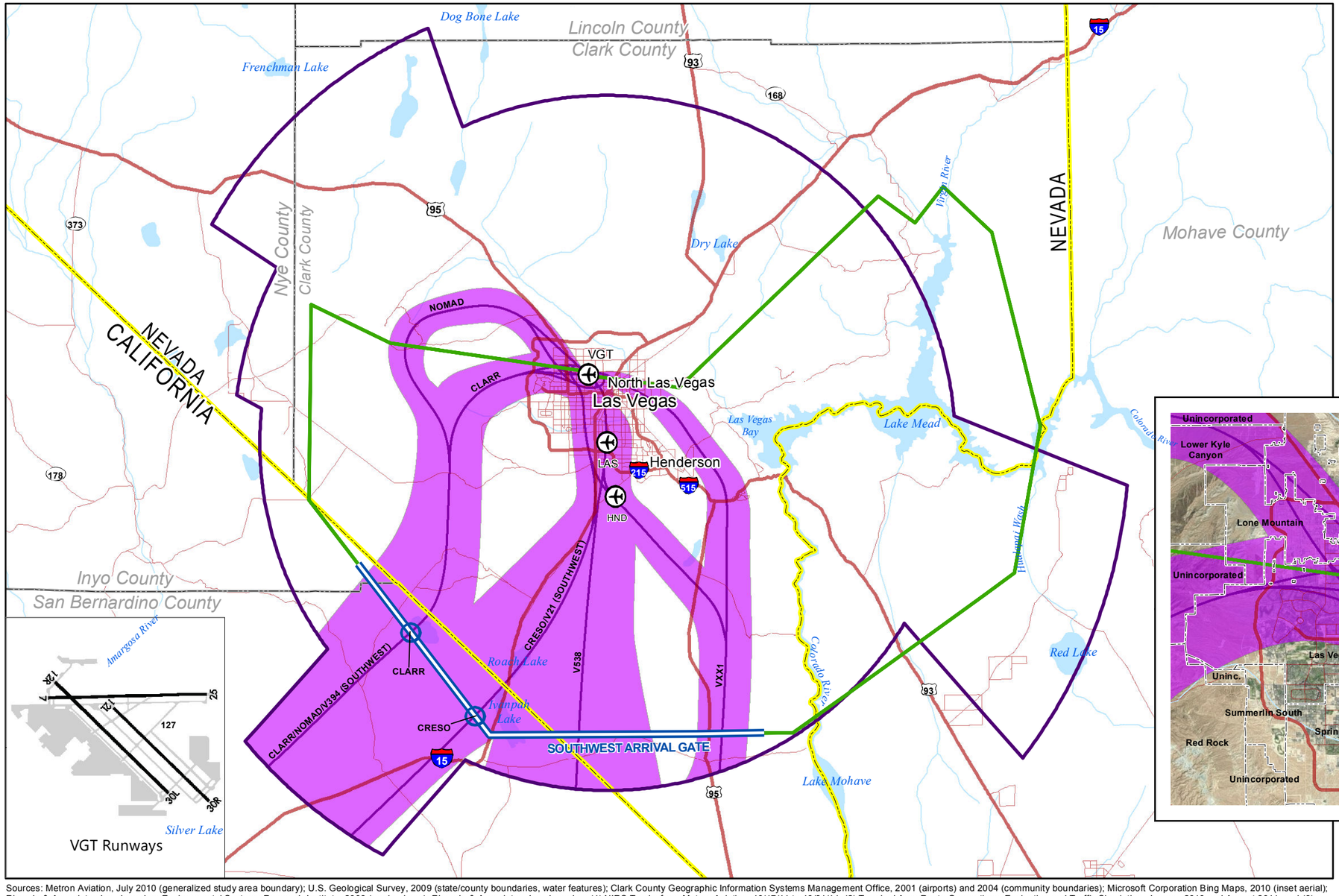

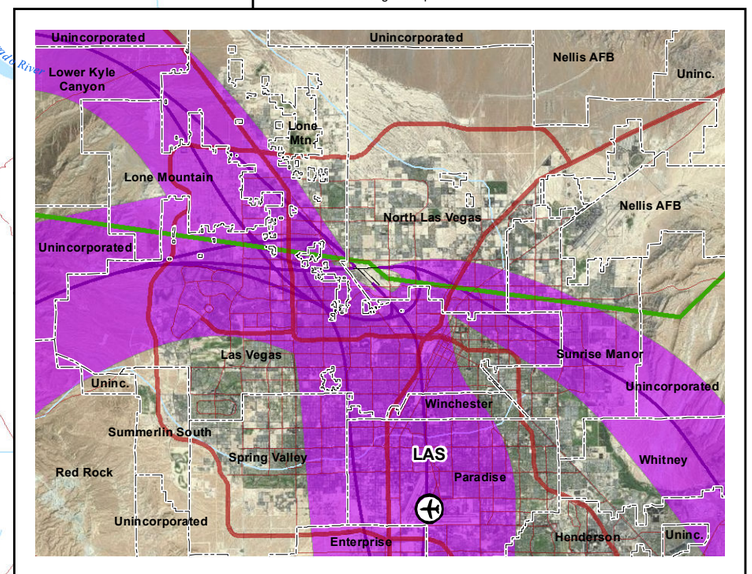

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-32

0 13 NM

north

LAS Optimization Alternative
VGT - Southwest Arrival Gate

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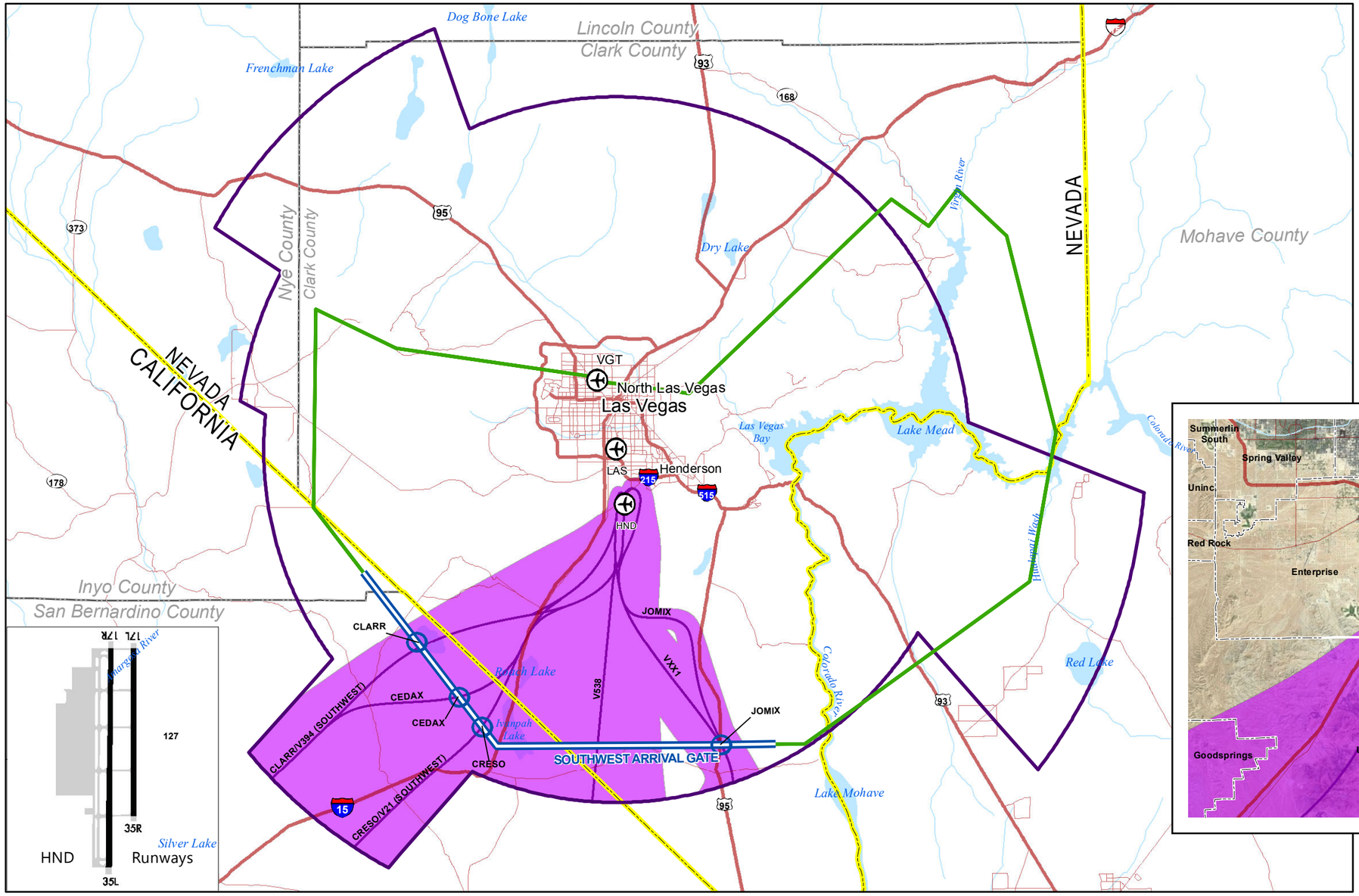
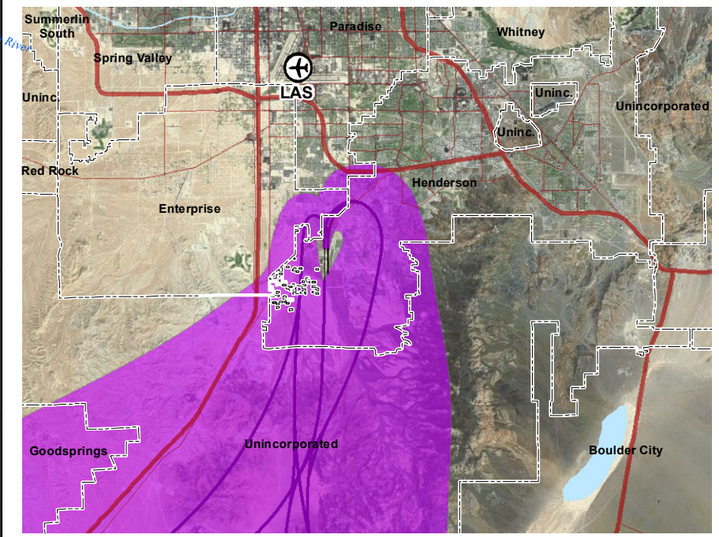


LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.



Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
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Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-33

0 13 NM

north

LAS Optimization Alternative
HND - Southwest Arrival Gate

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Northwest Arrival Gate

Exhibits III-34, III-35, and **III-36** depict the aircraft traffic flows from the northwest to LAS, VGT, and HND, respectively. **Table III-12** provides a summary overview of the procedures and other routes serving IFR traffic from the northwest to the EA Airports, including notes providing comparisons with the No Action Alternative, as appropriate.

Table III-12

Aircraft Procedures from the Northwest to the EA Airports, LAS Optimization Alternative

Entry Point	Route Name	Procedure Type	EA Airport Runway Ends Served by Procedure																	
			LAS								VGT						HND			
			01L	01R	07L	07R	19L	19R	25L	25R	7	12L	12R	25	30L	30R	17L	17R	35L	35R
FUZZY	MYCAL	**RNAV**	RT	V	V	V	V	V	RT	RT	-	-	-	-	-	-	-	-	-	-
	KINKS	**RNAV**	V	V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ADDEL [1/]	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V	V	RT	RT
	FUZZY [1/]	CONV	V	V	V	V	V	V	RT	RT	V	V	V	V	V	V	V	V	V	V
Other Routes																				
Via FUZZY Arrival Gate	V105 [1/] (Northwest)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via NATCF Airspace	JNNET	**RNAV**	RT	V	V	V	V	V	RT	RT	-	-	-	-	-	-	-	-	-	-
Via NATCF Airspace	WAPID [2/]	**RNAV**	-	-	-	-	-	-	-	-	V	V	V	V	V	V	-	-	-	-
Via NATCF Airspace	NATCF Northwest Flow [1/]	Vector	-	-	-	-	-	-	-	-	V	V	V	V	V	V	-	-	-	-

Notes:

CONV = Conventional STAR

RNAV = Area Navigation (RNAV) STAR

VICTOR = Victor Airway (Certain Victor Airways serve arrivals to LAS, although in very small numbers. Therefore, the Victor Airways are only depicted on Exhibits III-35 and III-36, for VGT and HND, respectively.)

Vector = A route along which aircraft are vectored through the airspace to the final approach.

V = Procedure does not include a runway transition route to the final approach to the runway end, so aircraft are vectored to the final approach.

RT = Procedure includes a runway transition route to the final approach to the runway end.

Light green shading indicates routes that are exclusive to one EA Airport.

NATCF = Nellis Air Traffic Control Facility

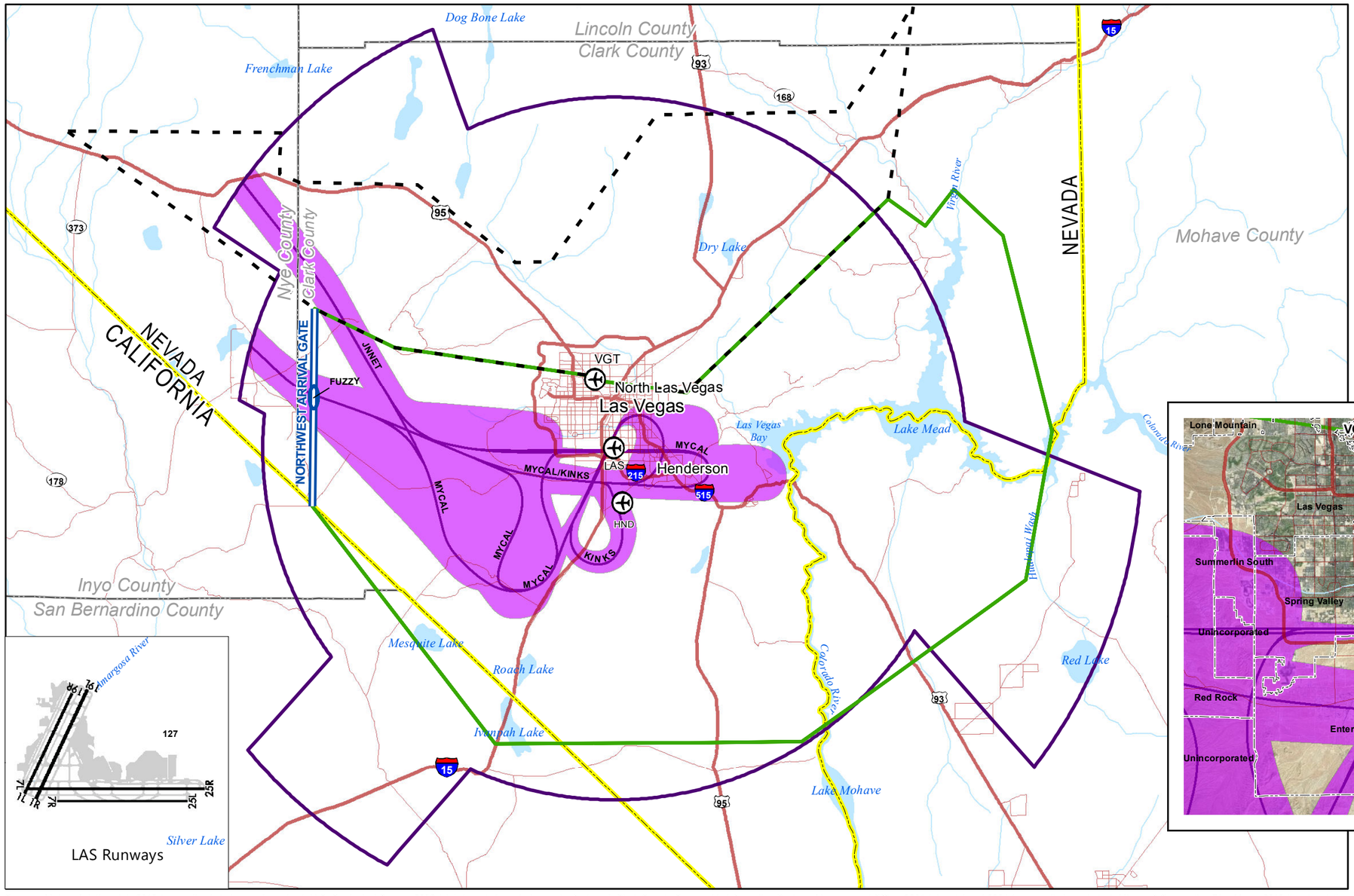
1/ FUZZY Conv. STAR, ADDEL RNAV STAR, V105, and NATCT Northwest Flow are similar to the respective routes as in the No Action Alternative.

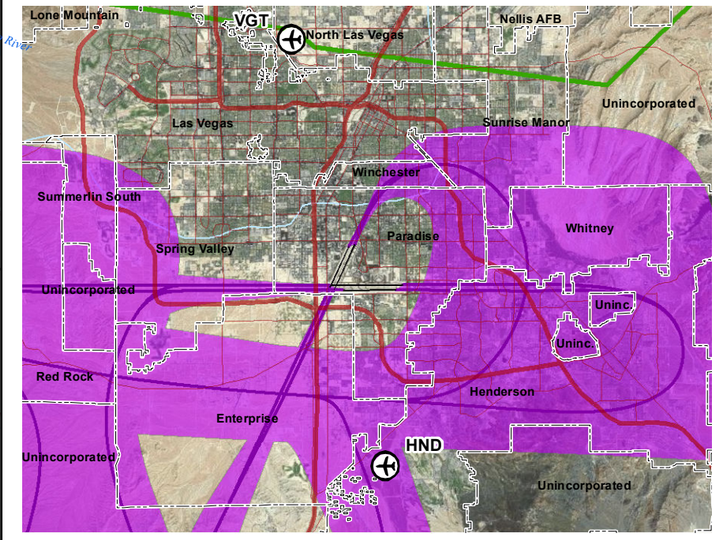
2/ The WAPID RNAV STAR is similar to the NATCF Northwest Flow in the No Action Alternative.

Sources: Ricondo & Associates, Inc., January 2012, based on (1) NIRS Tracks from Metron Aviation, October 17-31, 2011; and (2) U.S. Department of Transportation, Federal Aviation Administration, *Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement,* Subject: Terminal Area Control, Effective: June 30, 2011.

Prepared by: Ricondo & Associates, Inc., February 2012.

One entry point to the L30 terminal airspace (FUZZY), through which three RNAV STARs (MYCAL and KINKS to LAS and ADDEL to HND) and one Conventional STAR (FUZZY to all three EA Airports) would pass, would be located along the Northwest Arrival Gate; and two additional RNAV STARs (a procedure for military charter aircraft to LAS [JNNET] and a procedure to VGT [WAPID]) would pass through NATCF airspace. The MYCAL and KINKS RNAV STARs to LAS, the ADDEL RNAV STAR to HND, and the shared FUZZY Conventional STAR would share the FUZZY entry point. In addition to the JNNET and WAPID RNAV STARs through NATCF airspace, a flow to VGT through NATCF airspace would be based on vectoring (NATCF Northwest Flow). An additional flow would be defined by a Victor Airway from the northwest to the EA Airports but, would serve primarily propeller aircraft landing at VGT and HND (V105 [Northwest]).





LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- NATCF Airspace Boundary (Estimated)
- Arrival Gate and Entry Point

Notes: 1) Community boundaries include both municipalities and census designated places; 2) NATCF Airspace Boundary assumed to align with LAS Optimization L30 Terminal Airspace Boundary.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport;
NATCF - Nellis Air Traffic Control Facility
Conventional STARs are not depicted.
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-34

0 13 NM

north

LAS Optimization Alternative
LAS - Northwest Arrival Gate

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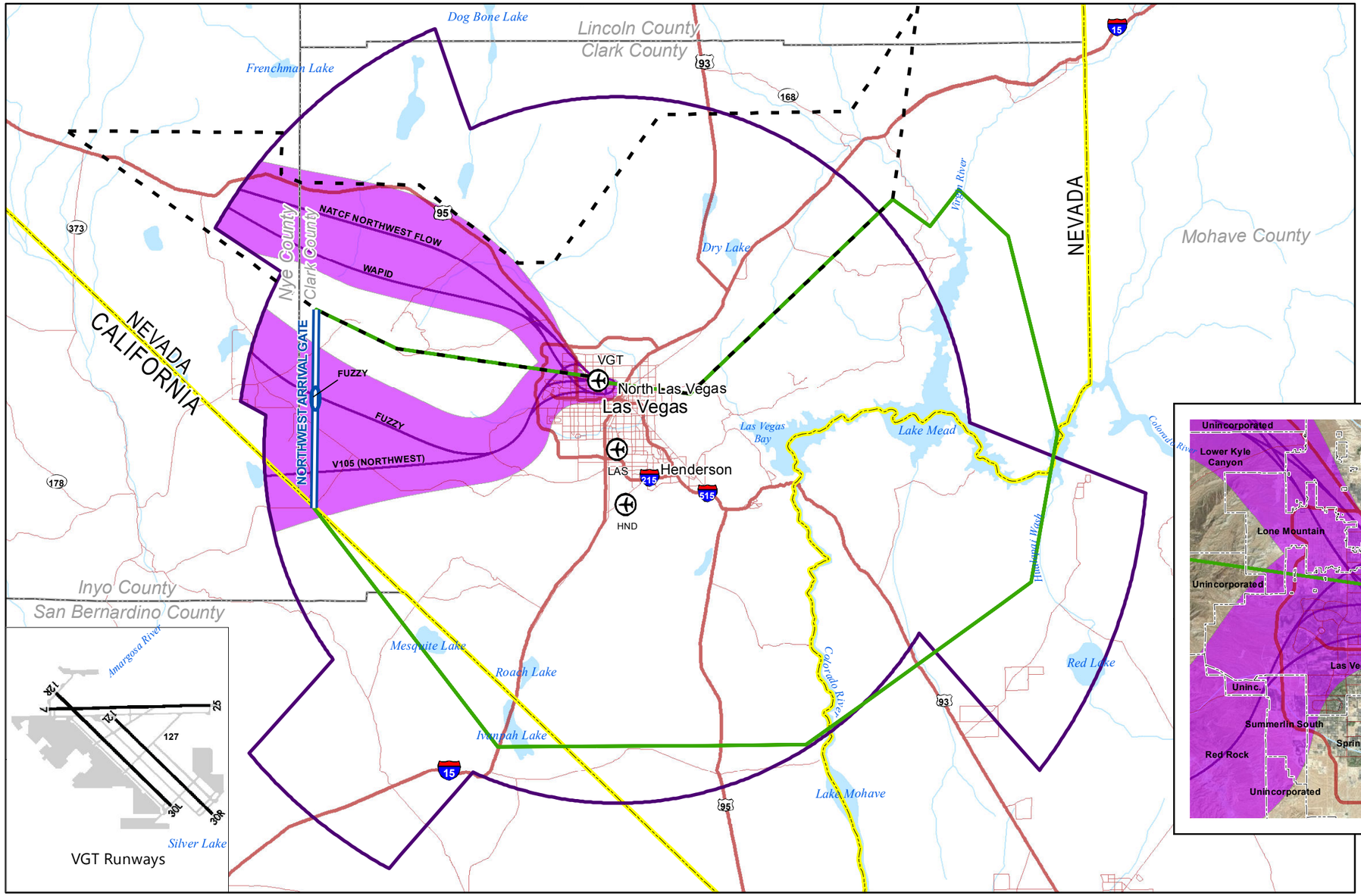
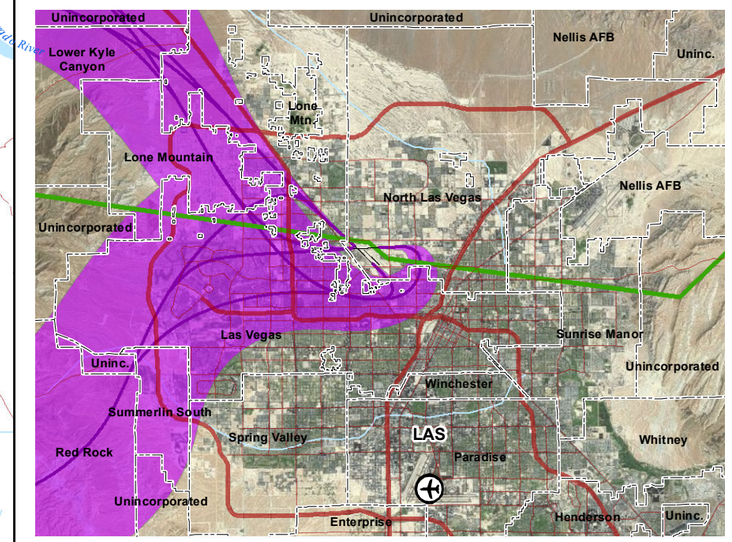


LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- NATCF Airspace Boundary (Estimated)
- Arrival Gate and Entry Point

Notes: 1) Community boundaries include both municipalities and census designated places; 2) NATCF Airspace Boundary assumed to align with LAS Optimization L30 Terminal Airspace Boundary.



Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport;
NATCF - Nellis Air Traffic Control Facility
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-35

0 13 NM

north

LAS Optimization Alternative
VGT - Northwest Arrival Gate

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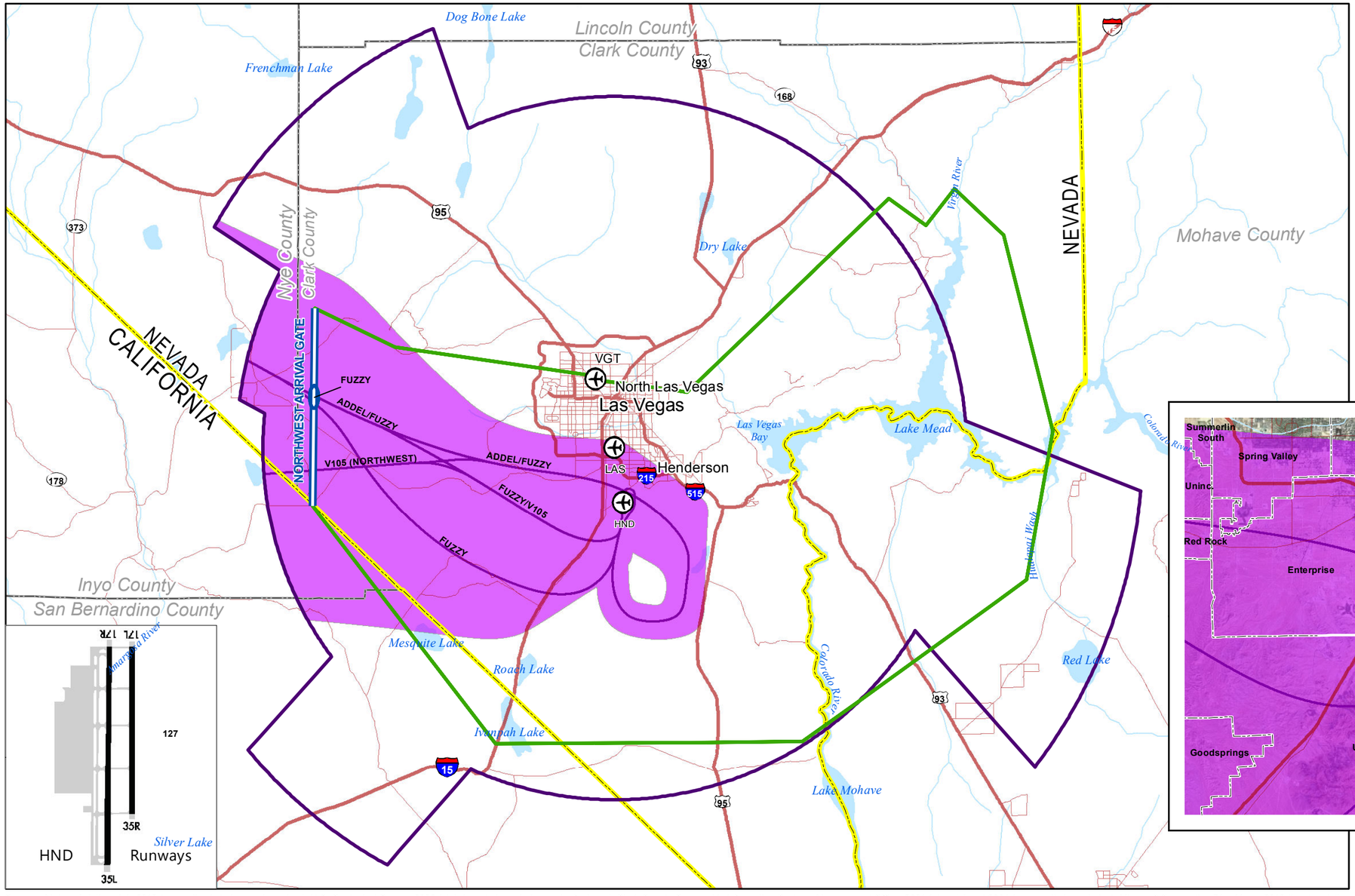

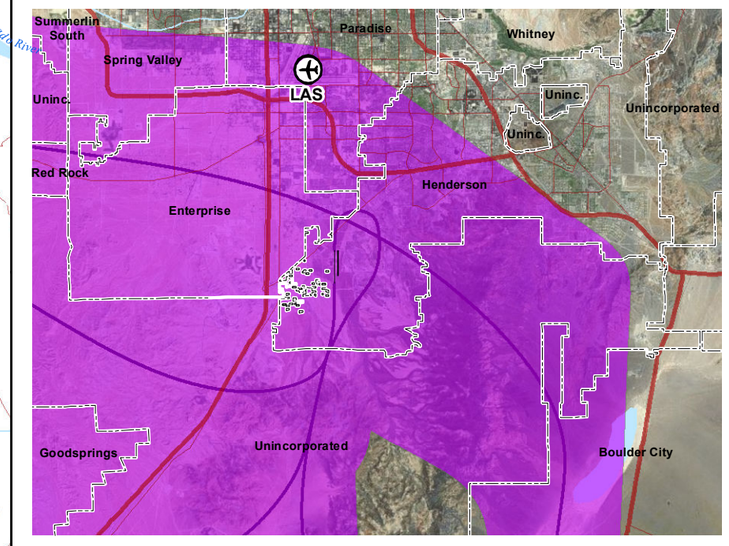

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Arrival Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Arrival Gate and Entry Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-36

0 13 NM

north

LAS Optimization Alternative
HND - Northwest Arrival Gate

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3.4.2.4 Departure Flows

This section provides a summary of the procedures and other routes that aircraft taking off from the EA Airports would follow through the L30 terminal airspace under the LAS Optimization Alternative. Exhibits illustrate the general flows of air traffic from the runway ends at the EA Airports to a departure gate of the L30 terminal airspace. Four departure gates would accommodate aircraft traffic departing the L30 terminal airspace in the LAS Optimization Alternative:

- **Northeast Departure Gate**—generally accommodating traffic departing to areas to the northeast of the Las Vegas area as well as to some areas to the north and east.
- **Southeast Departure Gate**—generally accommodating traffic departing to areas to the southeast and south of the Las Vegas area as well as to some areas to the east. This gate also accommodates a route specific to Phoenix.
- **South Departure Gate**—generally accommodating traffic departing to areas to the south and southwest of the Las Vegas area.
- **West Departure Gate**—generally accommodating traffic departing to areas to the north and northwest of the Las Vegas area as well as to some areas to the north.

The primary aircraft traffic flows to each departure gate in the LAS Optimization Alternative are discussed in this section.

Northeast Departure Gate

Exhibits III-37, III-38, and **III-39** depict the aircraft traffic flows to the northeast from LAS, VGT, and HND, respectively. **Table III-13** provides a summary overview of the procedures and other routes serving IFR traffic from the EA Airports to the northeast, including notes providing comparisons with the No Action Alternative, as appropriate.

Table III-13 (1 of 2)

Aircraft Procedures from the EA Airports to the Northeast, LAS Optimization Alternative

Exit Point	Route Name	Procedure Type	EA Airport Runway Ends Served by Procedure																	
			LAS								VGT						HND			
			01L	01R	07L	07R	19L	19R	25L	25R	7	12L	12R	25	30L	30R	17L	17R	35L	35R
TRALR	BEERZ	**RNAV**	RT	RT	RT	RT	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
	GERYU [1/]	**RNAV**	-	-	-	-	-	-	-	-	RT	V	RT	RT	RT	V	-	-	-	-
	ASCIN	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V	RT	RT	V
	LAS VEGAS [2/]	CONV	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
FOLDD	FOLDD [3/]	**RNAV**	-	-	-	-	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
	DARDN	**RNAV**	RT	RT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Routes																				
Via Northeast Departure Gate	Direct DARDN [4/]	Vector	V	V	V	V	V	V	V	V	-	-	-	-	-	-	-	-	-	-
Via NATCF Airspace	BERYL [5/]	**RNAV**	-	-	-	-	-	-	-	-	RT	V	RT	RT	RT	V	-	-	-	-
Via Northeast or NATCF Airspace [6/]	V394 [2/] (Northeast)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

Notes:

CONV = Conventional SID

RNAV = Area Navigation (RNAV) SID

VICTOR = Victor Airway (Certain Victor Airways serve departures from LAS, although in very small numbers. Therefore, the Victor Airways are only depicted on Exhibits III-38 and III-39, for VGT and HND, respectively.)

V = Procedure does not include a runway transition route from the runway end to the exit point, so aircraft are vectored to the exit point.

RT = Procedure includes a runway transition route from the runway end to the exit point.

Blue shading indicates an entry point that is exclusive to a single airport.

Light green shading indicates routes that are exclusive to one EA Airport.

NATCF = Nellis Air Traffic Control Facility

Table III-13 (2 of 2)

Aircraft Procedures from the EA Airports to the Northeast, LAS Optimization Alternative

1/ The GERYU RNAV SID is similar to the LAS VEGAS Conventional SID in the No Action Alternative, with the addition of runway transitions from VGT.

2/ LAS VEGAS Conventional SID and V394 (Northeast) are similar to the respective flows in the No Action Alternative.

3/ The FOLDD RNAV SID is similar to the STAAV RNAV SID for departures from Runways 25L and 25R at LAS in the No Action Alternative.

4/ The Direct DARDEN procedure is based on air traffic controllers vectoring propeller aircraft from LAS directly towards the FOLDD exit point. The procedure is not expected to be used frequently and the associated flow is not shown on Exhibit III-37.

5/ The BERYL RNAV SID is a route similar to V394 (Northeast), but for RNAV-equipped aircraft; thus, the flow is similar to the V394 (Northeast) flow in the No Action Alternative.

6/ Aircraft taking off from HND and LAS can follow V394 (Northeast) and exit the L30 terminal airspace to the northeast, while aircraft taking off from VGT exit the NATCF airspace directly without passing through L30 terminal airspace. V394 (Northeast) is used infrequently by aircraft taking off from LAS and therefore, is shown only on Exhibit III-39 for HND.

Sources: Ricondo & Associates, Inc., January 2012, based on (1) NIRS Tracks from Metron Aviation, October 17-31, 2011; and (2) U.S. Department of Transportation, Federal Aviation Administration, *Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement*, Subject: Terminal Area Control, Effective: June 30, 2011.
Prepared by: Ricondo & Associates, Inc., February 2012.

Two exit points from L30 terminal airspace (TRALR and FOLDD), through which five RNAV SIDs (BEERZ, FOLDD, and DARDN from LAS; GERYU from VGT; and ASCIN from HND) and one Conventional SID (LAS VEGAS from all three EA Airports) would pass, would be located along the Northeast Departure Gate, and an additional RNAV SID (BERYL from VGT) would pass through NATCF airspace. The BEERZ RNAV SID from LAS, the GERYU RNAV SID from VGT, the ASCIN RNAV SID from HND, and the shared LAS VEGAS Conventional SID would share the TRALR exit point. The FOLDD and DARDN RNAV SIDs from LAS would exit the L30 terminal airspace through the FOLDD exit point; therefore, the FOLDD exit point would be used exclusively by aircraft taking off from LAS. The BERYL RNAV SID from VGT would exit through the NATCF airspace, along a flow parallel to a Victor Airway flow for propeller aircraft (V394 [Northeast] from VGT). The V394 (Northeast) Victor Airway would also serve propeller aircraft taking off from HND and LAS, but the flow from these two airports would pass through the L30 terminal airspace to the south of rather than through the NATCF airspace. A final flow for propeller aircraft taking off from LAS (Direct DARDN), use of which is expected to be infrequent, would be based on air traffic control vectoring.

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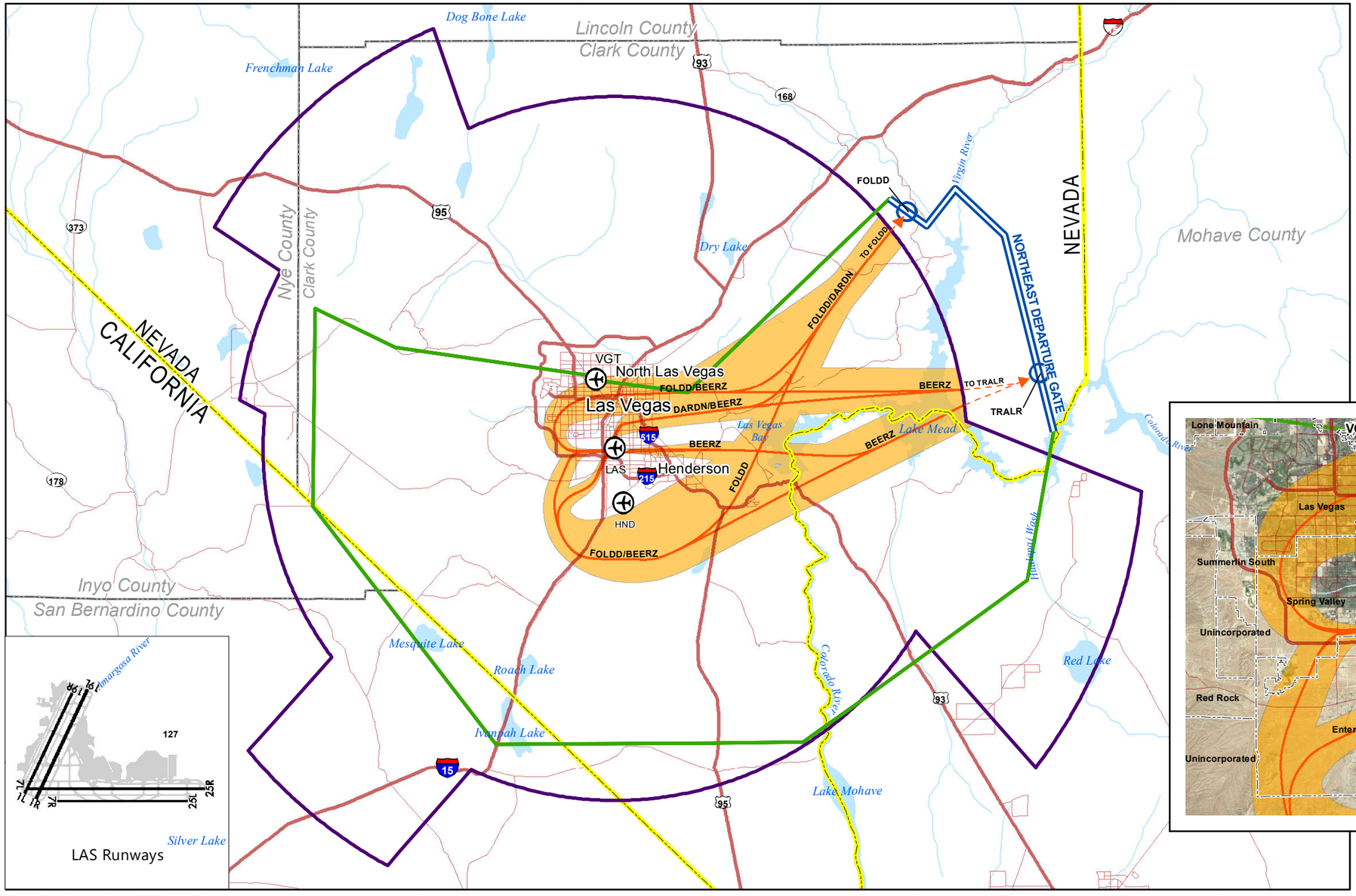

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
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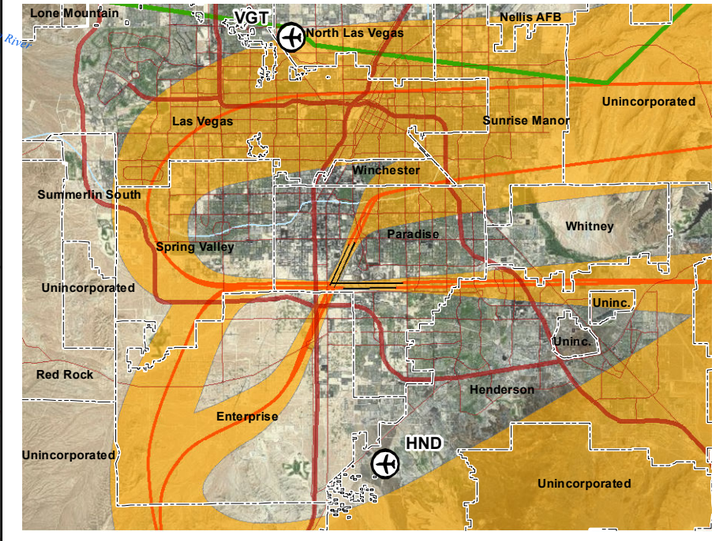
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.



Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport
Conventional SIDs are not depicted.
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-37

0 13 NM

north

LAS Optimization Alternative
LAS - Northeast Departure Gate

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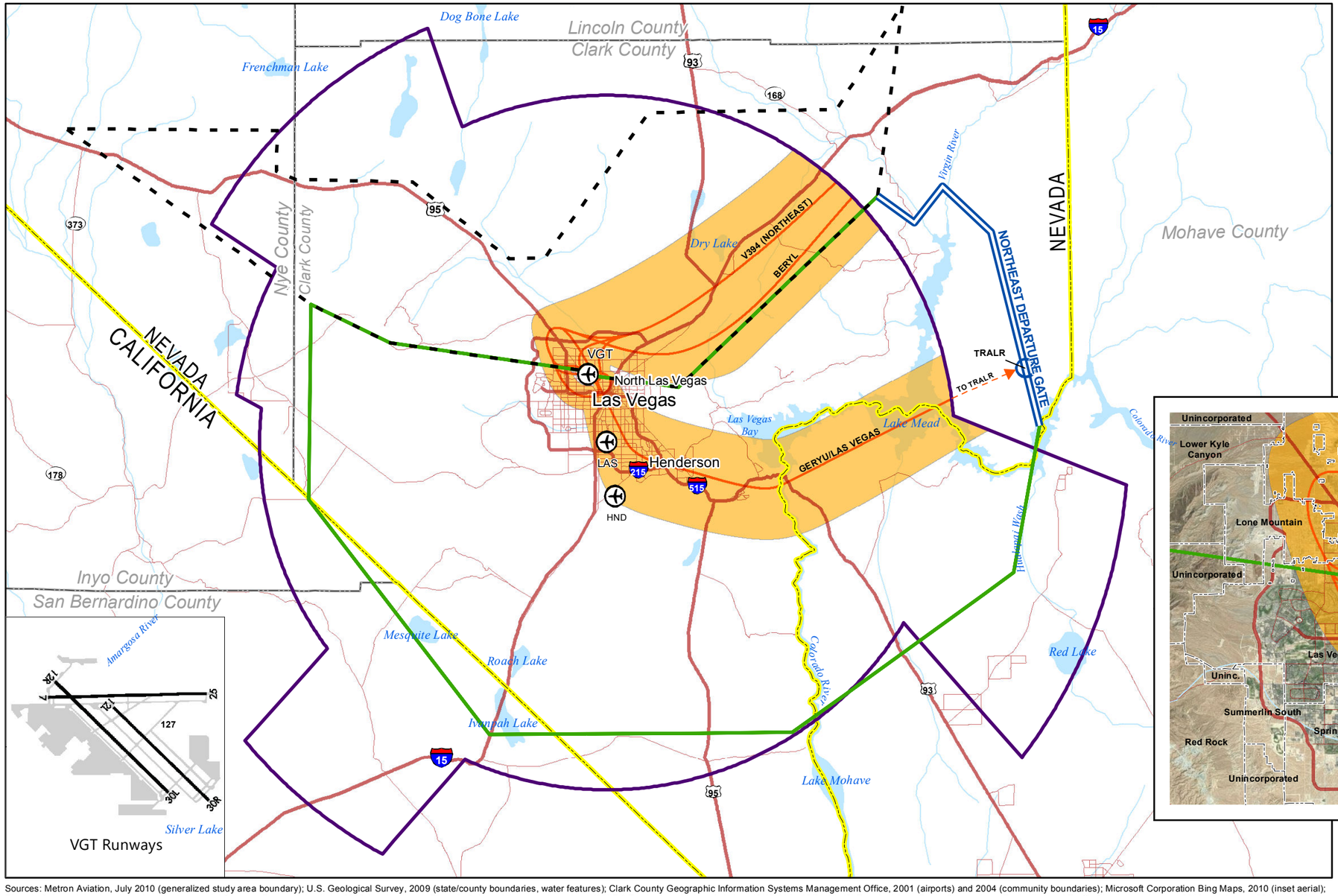

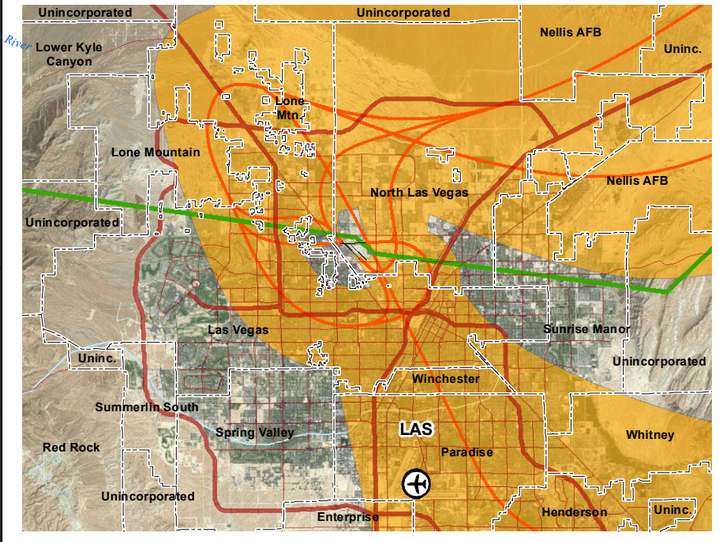

LEGEND

- EA Airports
- State Boundaries
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- NATCF Airspace Boundary (Estimated)
- Arrival Gate and Exit Point

Notes: 1) Community boundaries include both municipalities and census designated places; 2) NATCF Airspace Boundary assumed to align with LAS Optimization L30 Terminal Airspace Boundary.

Notes:
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VGT - North Las Vegas Airport; HND - Henderson Executive Airport;
NATCF - Nellis Air Traffic Control Facility
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-38

0 13 NM

north

LAS Optimization Alternative
VGT - Northeast Departure Gate

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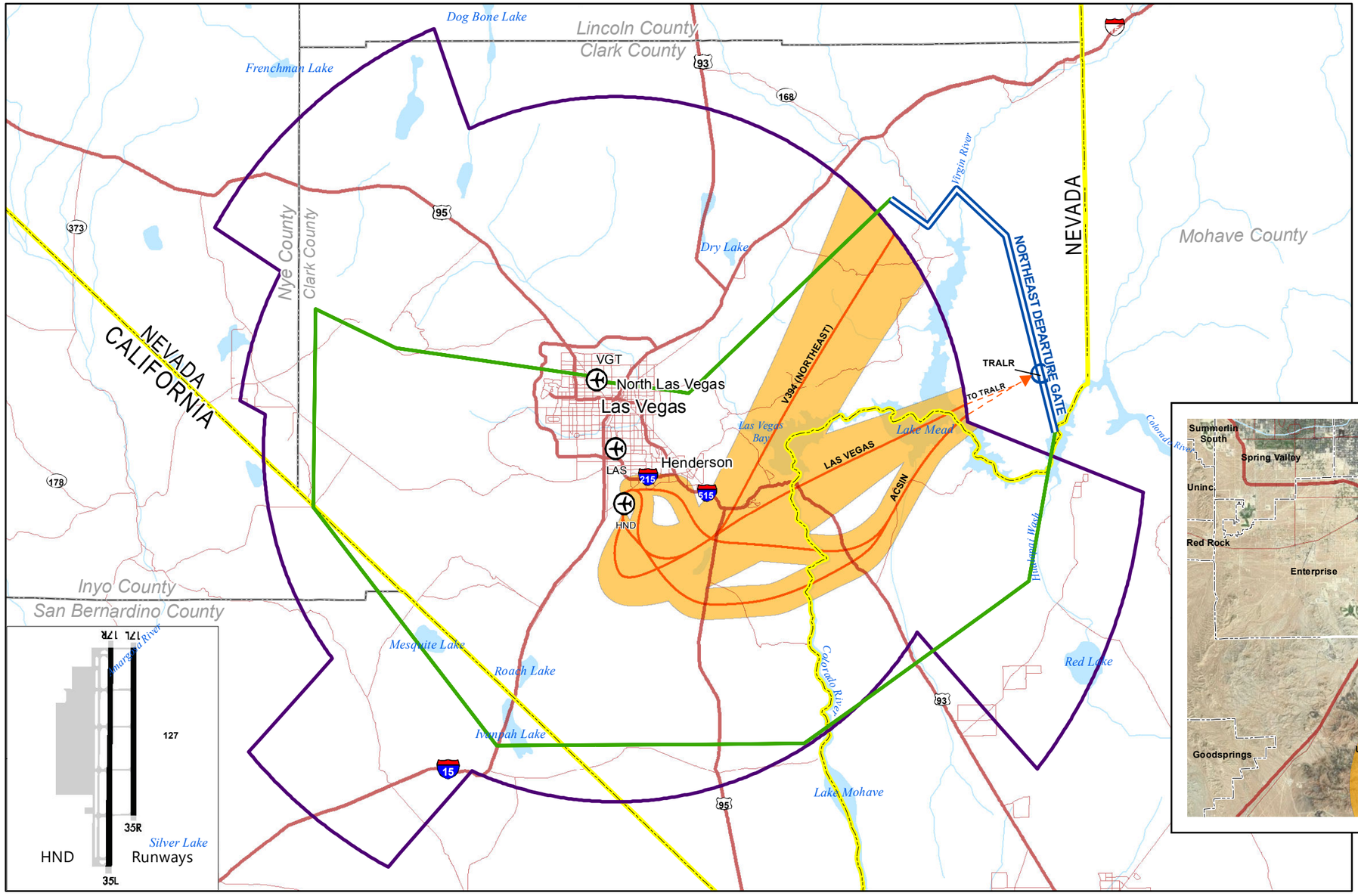

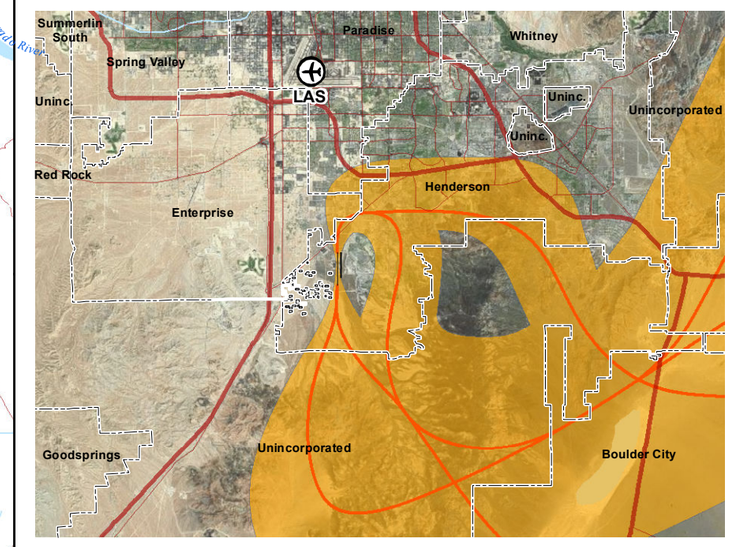

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-39

0 13 NM

north

LAS Optimization Alternative
HND - Northeast Departure Gate

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Southeast Departure Gate

Exhibits III-40, III-41, and **III-42** depict the aircraft traffic flows to the southeast from LAS, VGT, and HND, respectively. **Table III-14** provides a summary overview of the procedures and other routes serving IFR traffic from the EA Airports to the southeast, including notes providing comparisons with the No Action Alternative, as appropriate.

Table III-14 (1 of 2)

Aircraft Procedures from the EA Airports to the Southeast, LAS Optimization Alternative

Exit Point	Route Name	Procedure Type	EA Airport Runway Ends Served by Procedure																	
			LAS								VGT						HND			
			01L	01R	07L	07R	19L	19R	25L	25R	7	12L	12R	25	30L	30R	17L	17R	35L	35R
FEEEF	FEEEF	**RNAV**	RT	RT	RT	RT	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
	GUMPZ	**RNAV**	RT	RT	-	-	-	-	-	-										
	GERYU [1/]	**RNAV**	-	-	-	-	-	-	-	-	RT	V	RT	RT	RT	V	-	-	-	-
	ASCIN [4/]	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V	RT	RT	V
FLAMZ	GUMPZ	**RNAV**	-	-	RT	RT	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
	GERYU [1/]	**RNAV**	-	-	-	-	-	-	-	-	RT	V	RT	RT	RT	V	-	-	-	-
	FLAMZ [2/]	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V	RT	RT	V
	HOOVER [3/]	CONV	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
CHETR	CHETR	**RNAV**	RT	RT	RT	RT	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
	HAKID	**RNAV**	-	-	-	-	-	-	-	-	RT	V	RT	RT	RT	V	-	-	-	-
	MCLVN	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V	RT	RT	V
Other Routes																				
To CHETR	CHETR [5/]	Vector	V	V	V	V	V	V	V	V	-	-	-	-	-	-	-	-	-	-
Via Southeast Departure Gate	V105 [3/] (Southeast)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via Southeast Departure Gate	V562 [3/]	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

Notes:

CONV = Conventional SID

RNAV = Area Navigation (RNAV) SID

VICTOR = Victor Airway (Certain Victor Airways serve departures from LAS, although in very small numbers. Therefore, the Victor Airways are only depicted on Exhibits III-41 and III-42, for VGT and HND, respectively.)

V = Procedure does not include a runway transition route from the runway end to the exit point, so aircraft are vectored to the exit point.

RT = Procedure includes a runway transition route from the runway end to the exit point.

Light green shading indicates routes that are exclusive to one EA Airport.

NATCF = Nellis Air Traffic Control Facility

Table III-14 (2 of 2)

Aircraft Procedures from the EA Airports to the Southeast, LAS Optimization Alternative

1/ The GERYU RNAV SID is similar to the HOOVER Conventional SID in the No Action Alternative, with the addition of runway transitions from VGT.

2/ As compared to FLAMZ RNAV SID in the No Action Alternative, the FLAMZ RNAV SID would serve propeller aircraft in the LAS Optimization Alternative rather than jet and turboprop aircraft as in the No Action Alternative, but the route would be similar to that in the No Action Alternative.

3/ The HOOVER Conventional SID, V105 (Southeast), and V562 are similar to the respective flows in the No Action Alternative.

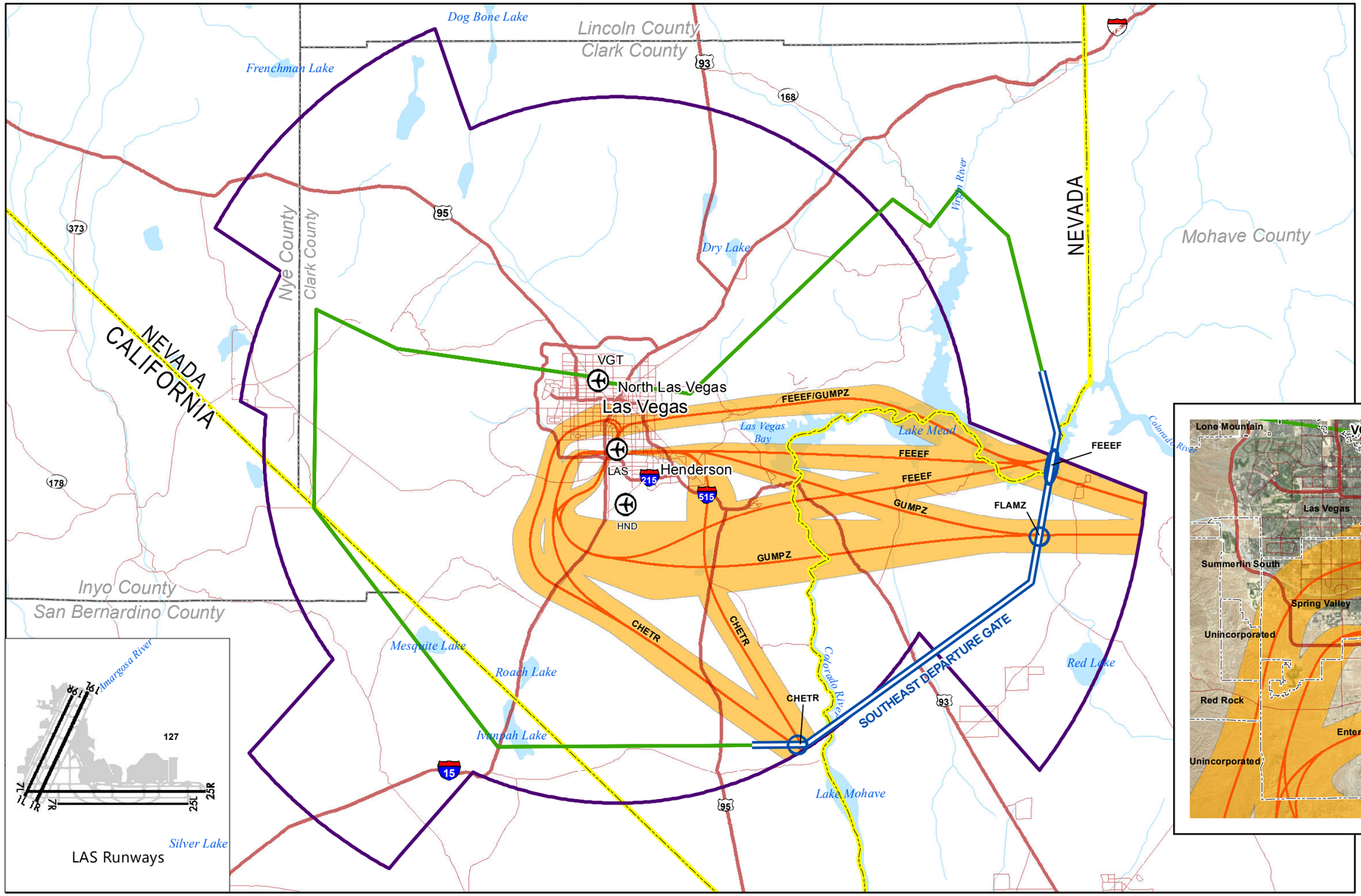
4/ The ASCIN RNAV SID is similar to the flow for the ASCIN RNAV SID in the No Action Alternative, which, under the No Action Alternative exited through the Northeast Departure Gate (TRALR exit point).

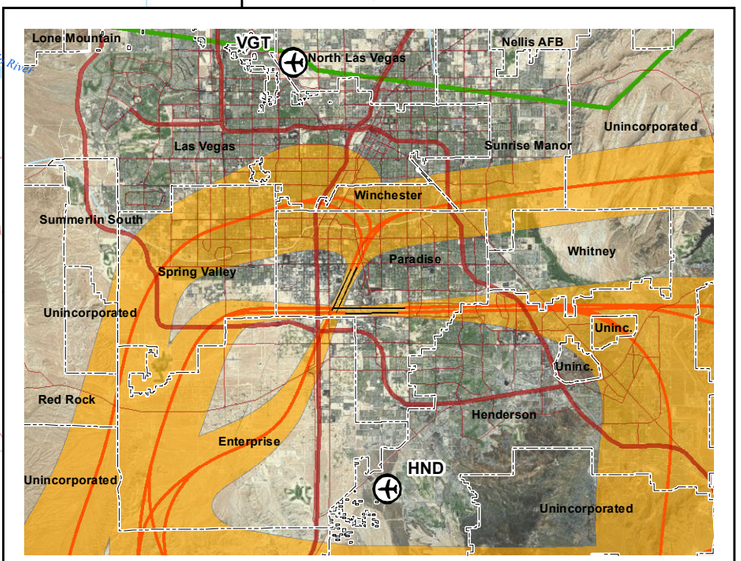
5/ This route is similar to the CHETR RNAV SID, and allows air traffic controllers to vector aircraft that are not RNAV equipped along a flow similar to that defined by the CHETR RNAV SID.

Sources: Ricondo & Associates, Inc., January 2012, based on (1) NIRS Tracks from Metron Aviation, October 17-31, 2011; and (2) U.S. Department of Transportation, Federal Aviation Administration, *Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement*, Subject: Terminal Area Control, Effective: June 30, 2011.

Prepared by: Ricondo & Associates, Inc., February 2012.

Three exit points from the L30 terminal airspace (FEEEF, FLAMZ, and CHETR), through which eight RNAV SIDs (FEEEF, GUMPZ, and CHETR from LAS, GERYU and HAKID from VGT, and ASCIN, FLAMZ, and MCLVN from HND) and one Conventional SID (HOOVER from all three EA Airports) would pass, would be located along the Southeast Departure Gate. Overall, RNAV SIDs would define routes with runway transitions from all EA Airports to all three exit points, with two of the RNAV SIDs (GUMPZ and GERYU) defining routes to two exit points. The availability of the three exit points for all three EA Airports would allow air traffic controllers to manage demand dynamically (e.g., assigning aircraft departing from one EA Airport to an exclusive exit point, or to multiple exit points, as needed). The GUMPZ RNAV SID from LAS would exit the L30 terminal airspace through either the FEEEF or FLAMZ exit point, with the exit point dependent on the runway end from which an aircraft takes off. The GERYU RNAV SID from VGT would include runway transitions from all runway ends to the FEEEF and FLAMZ exit points. A route (CHETR) from LAS would be based on air traffic controller vectoring of non-RNAV-equipped aircraft along a similar flow as that defined for the CHETR RNAV SID. Two additional flows would be defined by Victor Airways from the EA Airports, primarily serving propeller aircraft from VGT and HND, to the southeast (V105 [Southeast] and V562).





LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport
Conventional SIDs are not depicted.
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-40

0 13 NM

north

LAS Optimization Alternative
LAS - Southeast Departure Gate

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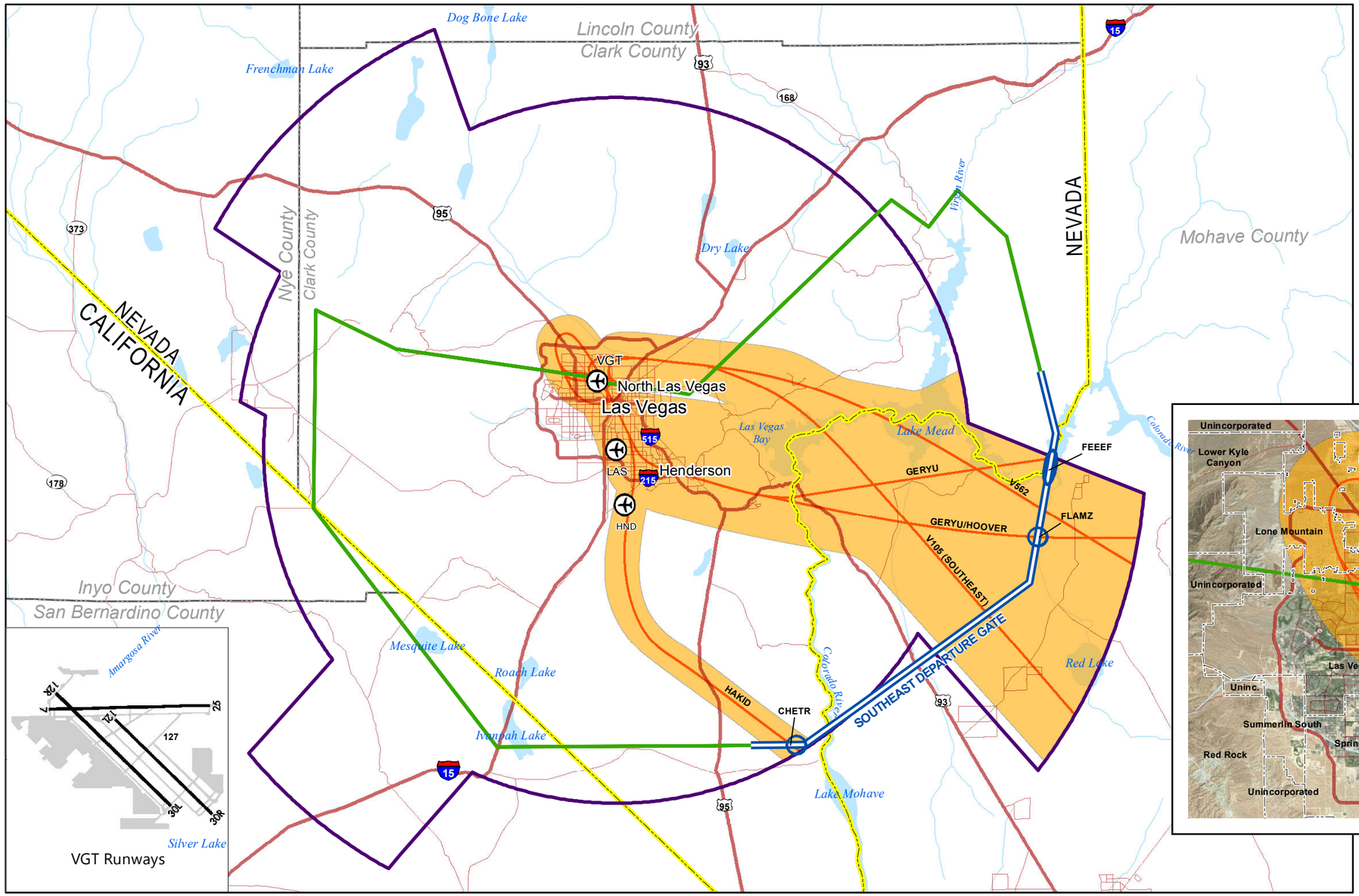

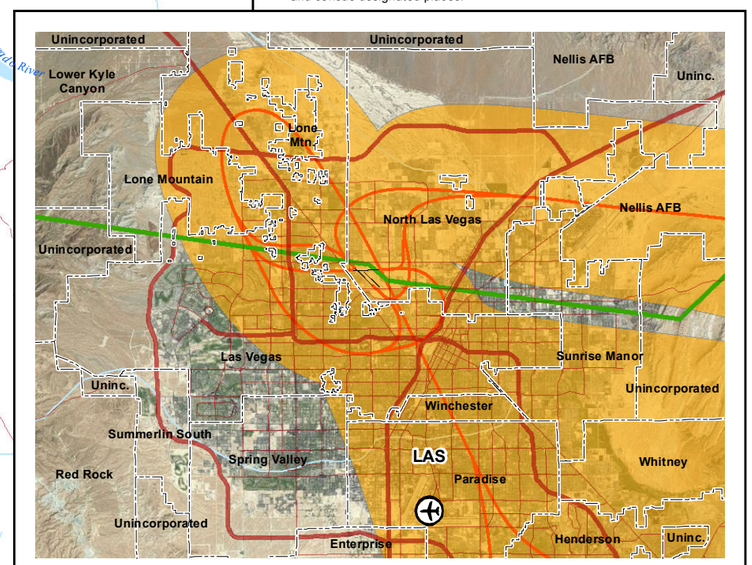

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-41

0 13 NM

north

LAS Optimization Alternative
VGT - Southeast Departure Gate

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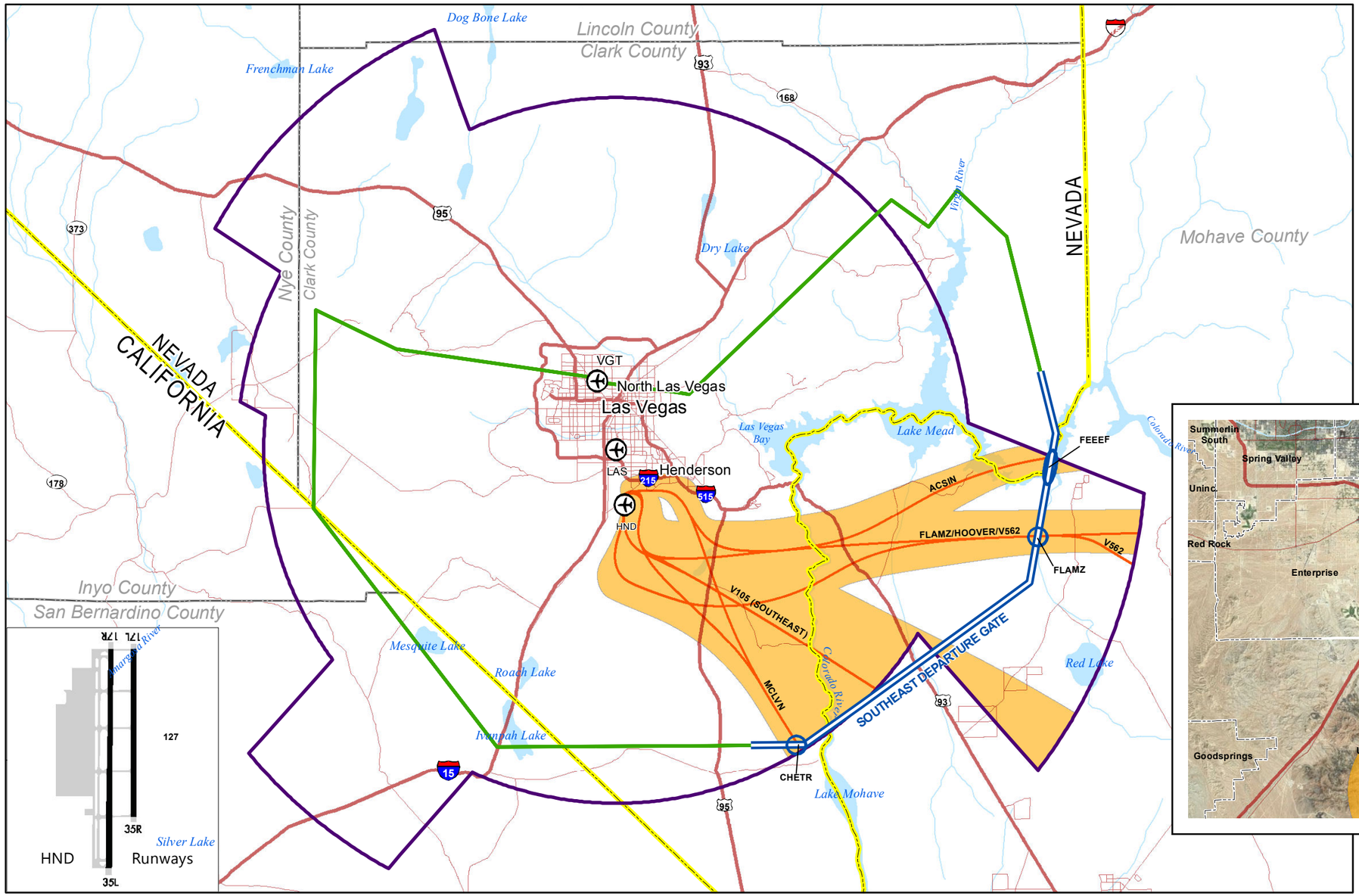

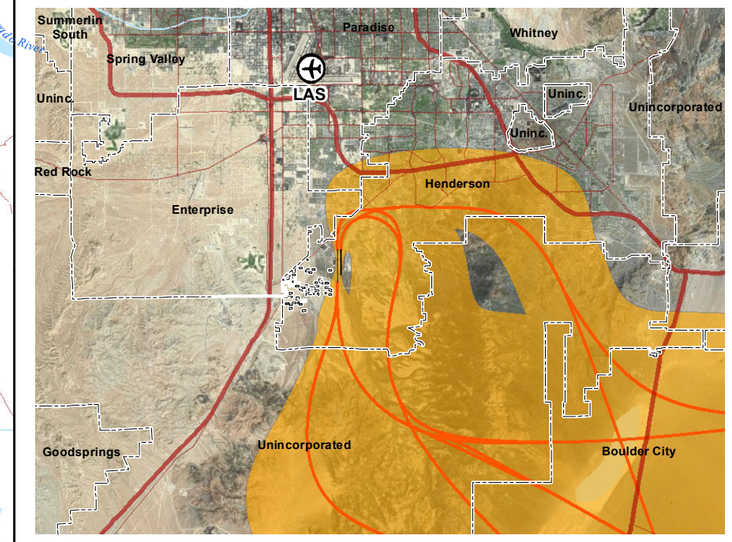

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-42

0 13 NM

north

LAS Optimization Alternative
HND - Southeast Departure Gate

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South Departure Gate

Exhibits III-43, III-44, and **III-45** depict the aircraft traffic flows to the south and southwest from LAS, VGT, and HND, respectively. **Table III-15** provides a summary overview of the procedures and other routes serving IFR traffic from the EA Airports to the south and southwest, including notes providing comparisons with the No Action Alternative, as appropriate.

Table III-15

Aircraft Procedures from the EA Airports to the South and Southwest, LAS Optimization Alternative

Exit Point	Route Name	Procedure Type	EA Airport Runway Ends Served by Procedure																	
			LAS								VGT						HND			
			01L	01R	07L	07R	19L	19R	25L	25R	7	12L	12R	25	30L	30R	17L	17R	35L	35R
REBAL	REBAL	**RNAV**	RT	RT	RT	RT	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
	HAKID	**RNAV**	-	-	-	-	-	-	-	-	RT	V	RT	RT	RT	V	-	-	-	-
	MCCARRAN[1/]	CONV	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
ZELMA	ZELMA	**RNAV**	RT	RT	RT	RT	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
WRGLY	HAKID	**RNAV**	-	-	-	-	-	-	-	-	RT	V	RT	RT	RT	V	-	-	-	-
	WRGLY	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V	RT	RT	V
Other Routes																				
Via South Departure Gate	V21 [1/] (Southwest)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via Southwest	V394 [1/] (Southwest)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Via South Departure Gate	V538 [1/] (South)	VICTOR	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

Notes:

CONV = Conventional SID

RNAV = Area Navigation (RNAV) SID

VICTOR = Victor Airway (Certain Victor Airways serve departures from LAS, although in very small numbers. Therefore, the Victor Airways are only depicted on Exhibits III-44 and III-45, for VGT and HND, respectively.)

V = Procedure does not include a runway transition route from the runway end to the exit point, so aircraft are vectored to the exit point.

RT = Procedure includes a runway transition route from the runway end to the exit point.

Blue shading indicates an entry point that is exclusive to a single airport.

Light green shading indicates routes that are exclusive to one EA Airport.

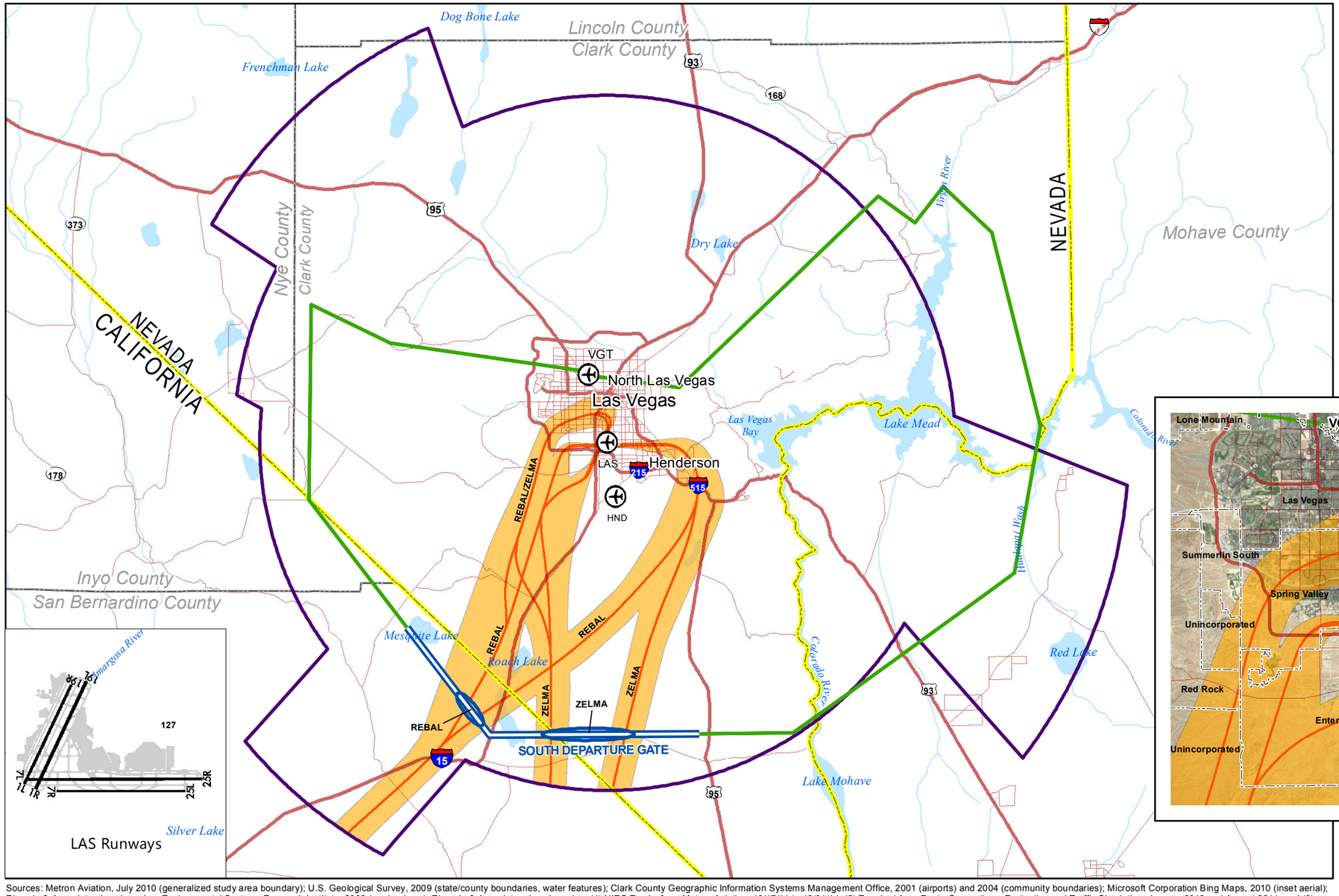
NATCF = Nellis Air Traffic Control Facility

1/ The MCCARRAN Conventional SID (including the route through the existing L30 terminal airspace to the south from HND), V21 (South), V538 (South), and V394 (Southwest) are similar to the respective flows in the No Action Alternative.

Sources: Ricondo & Associates, Inc., January 2012, based on (1) NIRS Tracks from Metron Aviation, October 17-31, 2011; and (2) U.S. Department of Transportation, Federal Aviation Administration, *Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement*, Subject: Terminal Area Control, Effective: June 30, 2011.

Prepared by: Ricondo & Associates, Inc., February 2012.

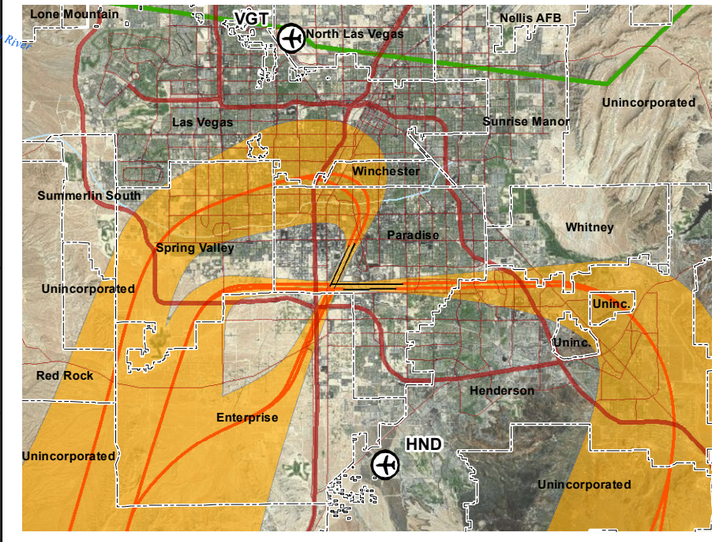
Three exit points from the L30 terminal airspace (REBAL, ZELMA, and WRGLY), through which four RNAV SIDs (REBAL and ZELMA from LAS, HAKID from VGT, and WRGLY from HND) and one Conventional SID (MCCARRAN from all three EA Airports) would pass, would be located along the South Departure Gate. The REBAL RNAV SID from LAS, the HAKID RNAV SID from VGT, and the shared MCCARRAN Conventional SID would share the REBAL exit point. In addition to exiting the L30 terminal airspace through the REBAL exit point, the HAKID RNAV SID from VGT would define a second route through the WRGLY exit point, which would be shared with the WRGLY RNAV SID from HND. The ZELMA RNAV SID from LAS would exit through the ZELMA exit point, which would be exclusive to the RNAV SID. Three additional flows would be defined by Victor Airways from the EA Airports, primarily serving propeller aircraft from VGT and HND, to the south and southwest (V21 [Southwest], V394 [Southwest], and V538 [South]).



LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.



Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport
Conventional SIDs are not depicted.
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-43

0 13 NM

north

LAS Optimization Alternative
LAS - South Departure Gate

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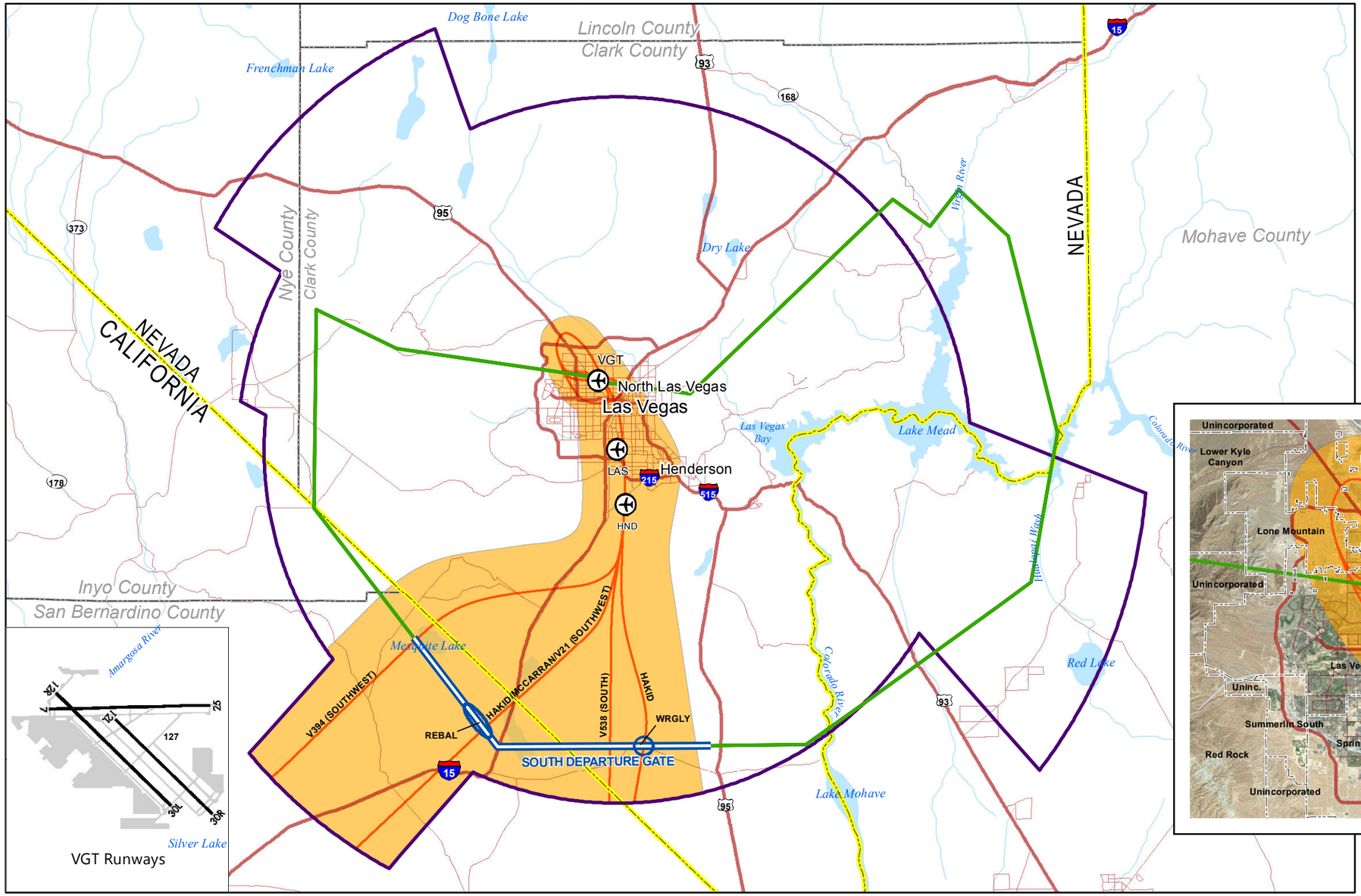

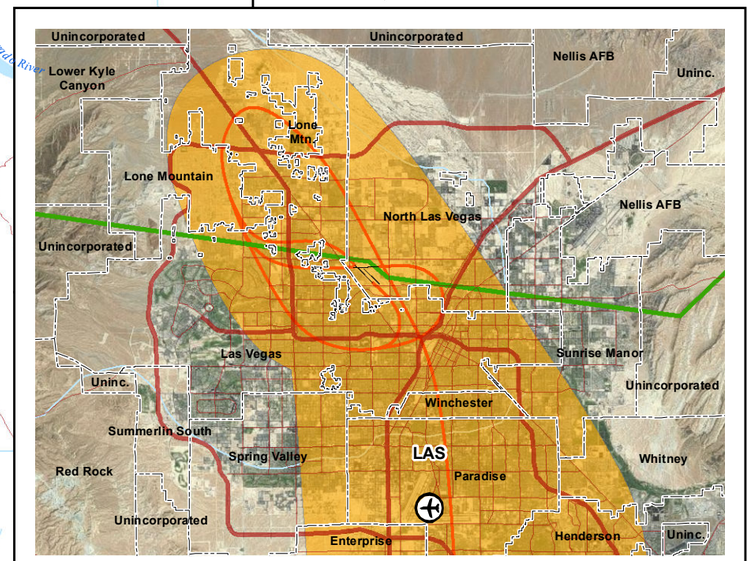

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
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Notes:
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Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-44

0 13 NM

north

LAS Optimization Alternative
VGT- South Departure Gate

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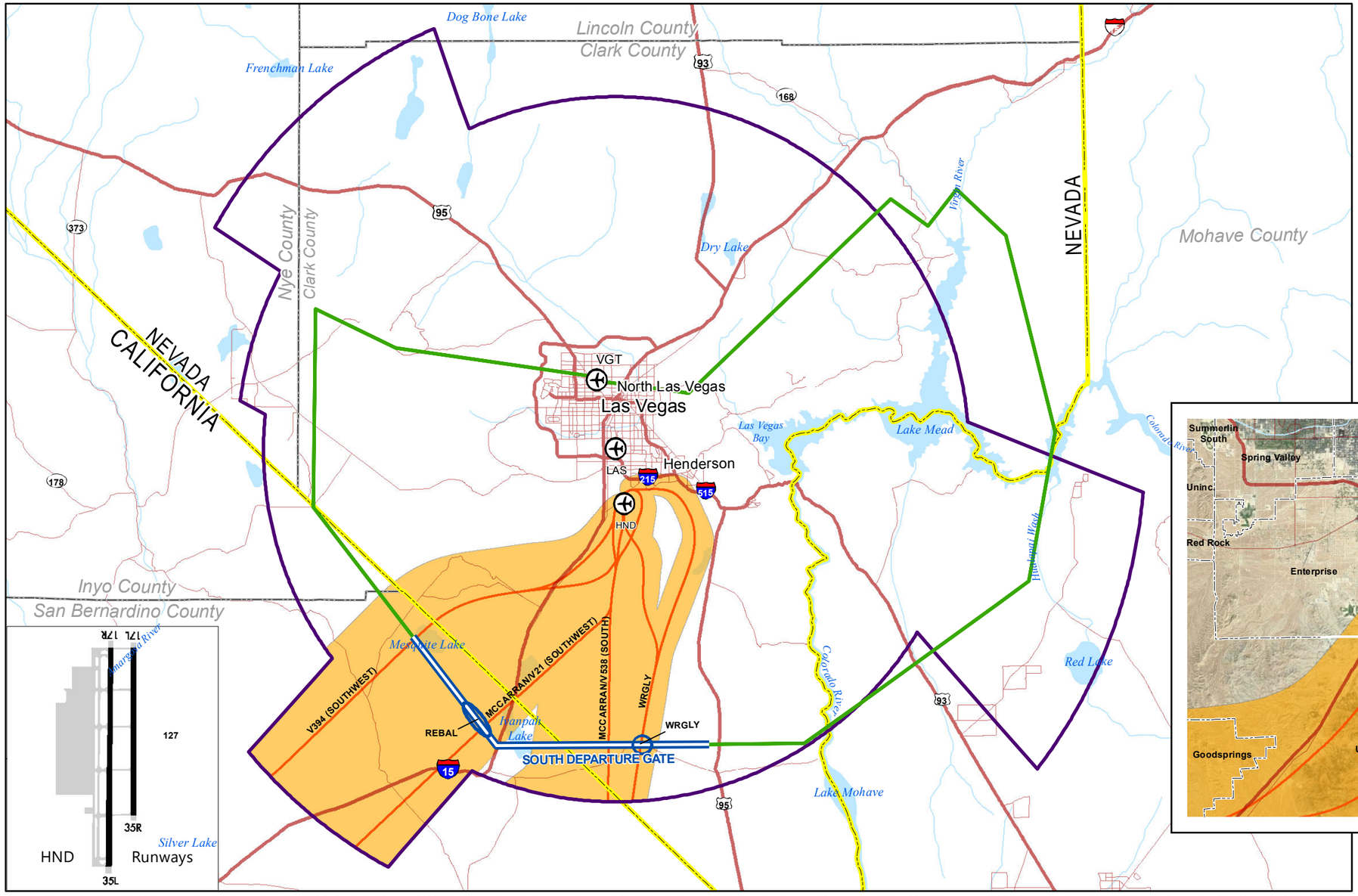

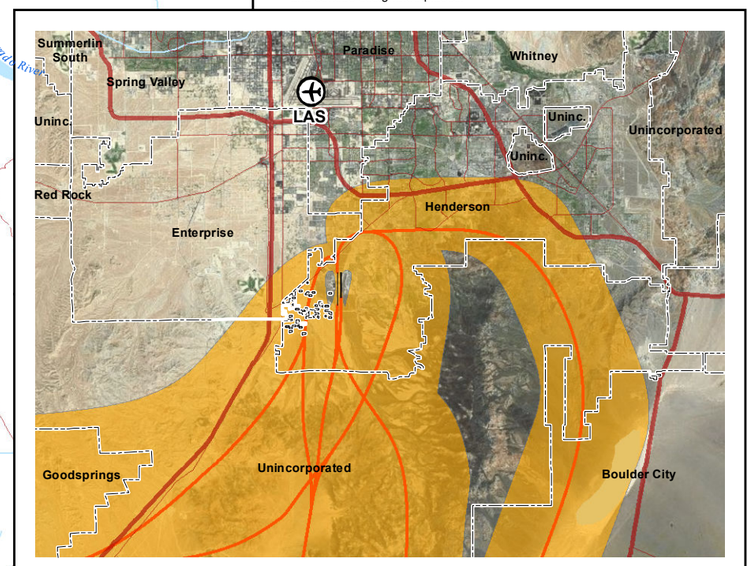

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-45

0 13 NM

north

LAS Optimization Alternative
HND - South Departure Gate

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West Departure Gate

Exhibits III-46, III-47, and **III-48** depict the aircraft traffic flows to the west and northwest from LAS, VGT, and HND, respectively. **Table III-16** provides a summary overview of the procedures and other routes serving IFR traffic from the EA Airports to the west and northwest, including notes providing comparisons with the No Action Alternative, as appropriate.

Table III-16

Aircraft Procedures from the EA Airports to the West and Northwest, LAS Optimization Alternative

Exit Point	Route Name	Procedure Type	EA Airport Runway Ends Served by Procedure																	
			LAS								VGT						HND			
			01L	01R	07L	07R	19L	19R	25L	25R	7	12L	12R	25	30L	30R	17L	17R	35L	35R
SHEAD	MCCARRAN [1/]	CONV	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
HEDAL	HEDAL	**RNAV**	RT	RT	RT	RT	RT	RT	RT	RT	-	-	-	-	-	-	-	-	-	-
	BIKKR	**RNAV**	-	-	-	-	-	-	-	-	RT	V	RT	RT	RT	V	-	-	-	-
	PALLY	**RNAV**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V	RT	RT	V
Other Routes																				
Via West Departure Gate	V105 [1/] (Northwest)	VICTOR	V	V	V	V	V	V	V	V	-	-	-	-	-	-	V	V	V	V
Via NATCF Airspace	NATCF Northwest Flow [1/]	Vector	-	-	-	-	-	-	-	-	V	V	V	V	V	V	-	-	-	-

Notes:

CONV = Conventional SID

RNAV = Area Navigation (RNAV) SID

VICTOR = Victor Airway (Certain Victor Airways serve departures from LAS, although in very small numbers. Therefore, the Victor Airways are only depicted on Exhibits III-47 and III-48, for VGT and HND, respectively.)

V = Procedure does not include a runway transition route from the runway end to the exit point, so aircraft are vectored to the exit point.

RT = Procedure includes a runway transition route from the runway end to the exit point.

Light green shading indicates routes that are exclusive to one EA Airport.

NATCF = Nellis Air Traffic Control Facility

1/ MCCARRAN Conventional SID, V105 (Northwest), and NATCF Northwest Flow are similar to the respective flows in the No Action Alternative.

Sources: Ricondo & Associates, Inc., January 2012, based on (1) NIRS Tracks from Metron Aviation, October 17-31, 2011; and (2) U.S. Department of Transportation, Federal Aviation Administration, *Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement*, Subject: Terminal Area Control, Effective: June 30, 2011.

Prepared by: Ricondo & Associates, Inc., February 2012.

Two exit points from the L30 terminal airspace (SHEAD and HEDAL), through which three RNAV SIDs (HEDAL from LAS, BIKKR from VGT, and PALLY from HND) and one Conventional SID (MCCARRAN from all three EA Airports) would pass, would be located in proximity to each other along the West Departure Gate. The three RNAV SIDs would share the HEDAL exit point. The shared MCCARRAN Conventional SID would exit through the SHEAD exit point, which would be exclusive to the Conventional SID. Two additional flows would serve aircraft taking off from the EA Airports—one defined by a Victor Airway from LAS and HND to the northwest, primarily serving propeller aircraft from HND (V105 [Northwest]), and a second accommodating propeller aircraft that would be vectored from VGT through NATCF airspace (NATCF Northwest Flow).

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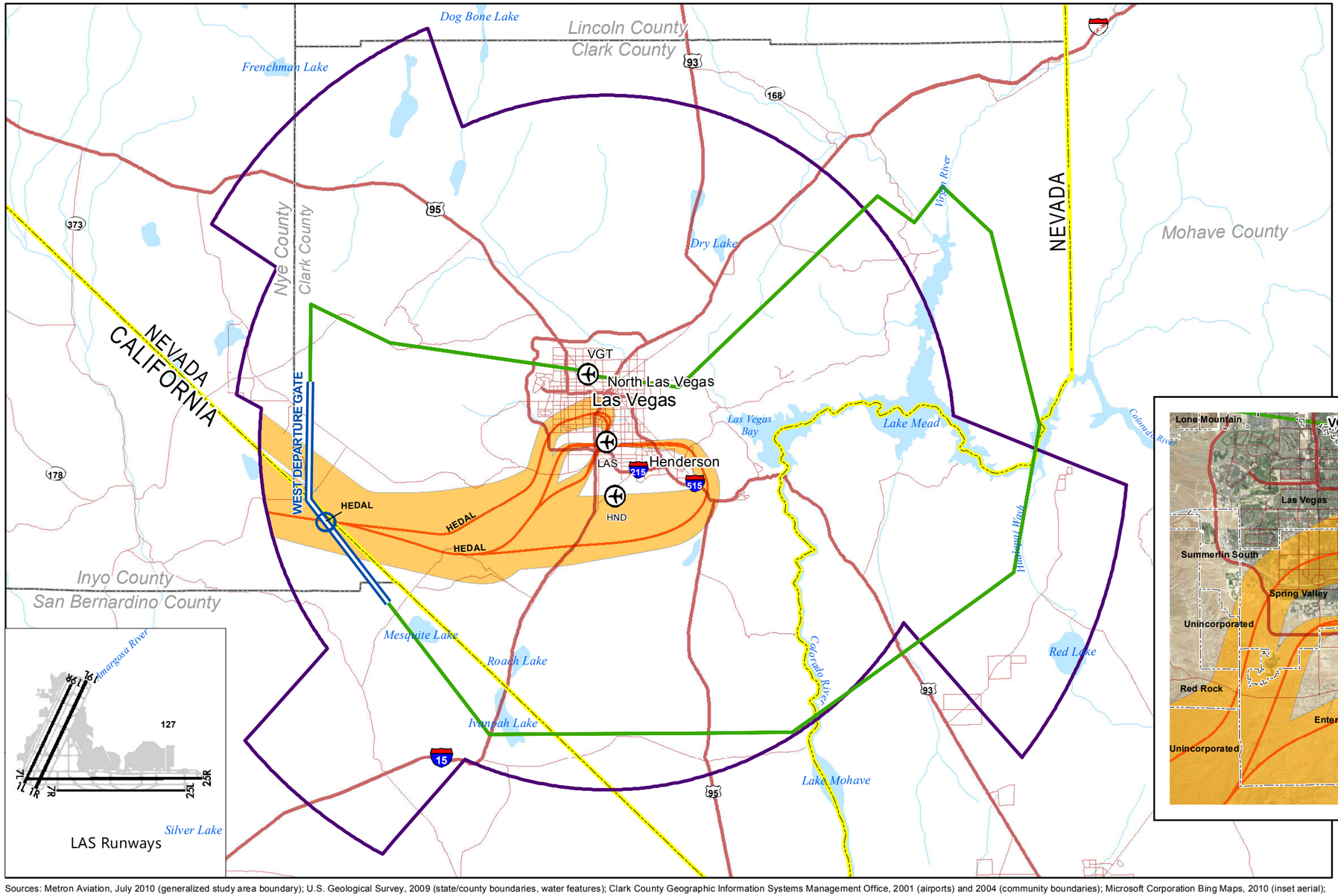

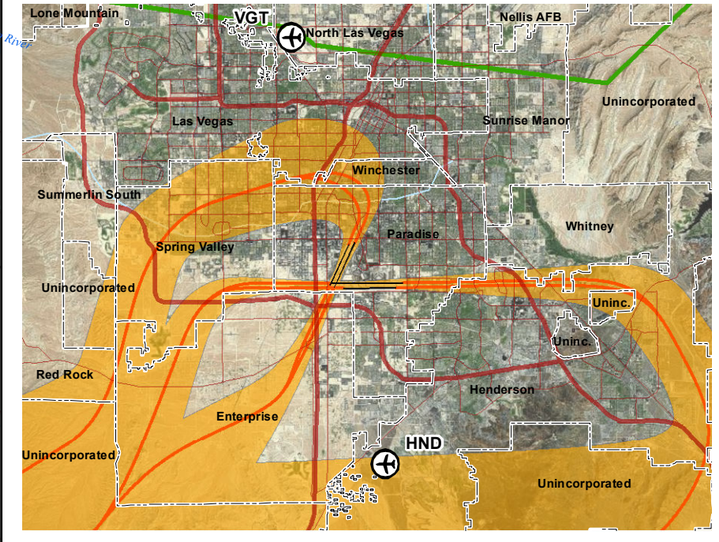

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport
Conventional SIDs are not depicted.
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-46

0 13 NM

north

LAS Optimization Alternative
LAS - West Departure Gate

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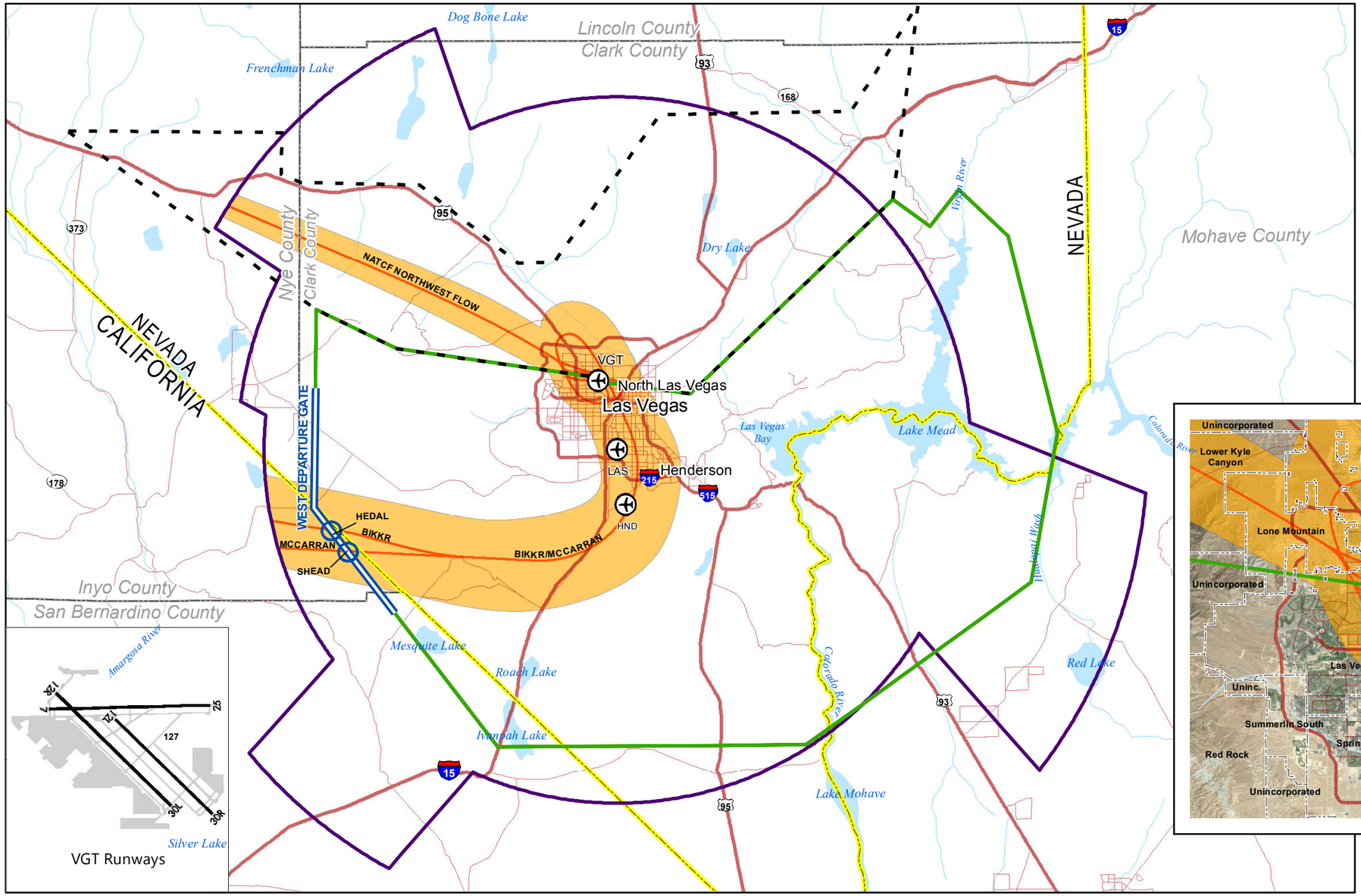

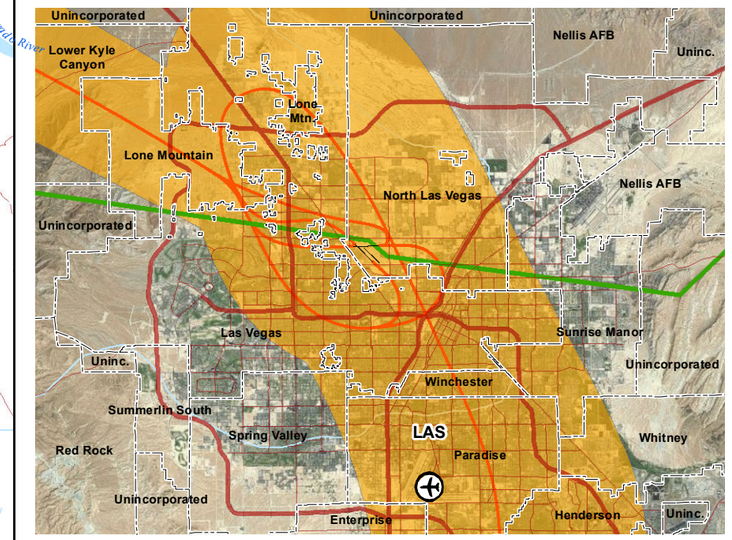

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- NATCF Airspace Boundary (Estimated)
- Departure Gate and Exit Point

Notes: 1) Community boundaries include both municipalities and census designated places; 2) NATCF Airspace Boundary assumed to align with LAS Optimization L30 Terminal Airspace Boundary.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport;
VGT - North Las Vegas Airport; HND - Henderson Executive Airport;
NATCF - Nellis Air Traffic Control Facility
Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-47

0 13 NM

north

LAS Optimization Alternative
VGT - West Departure Gate

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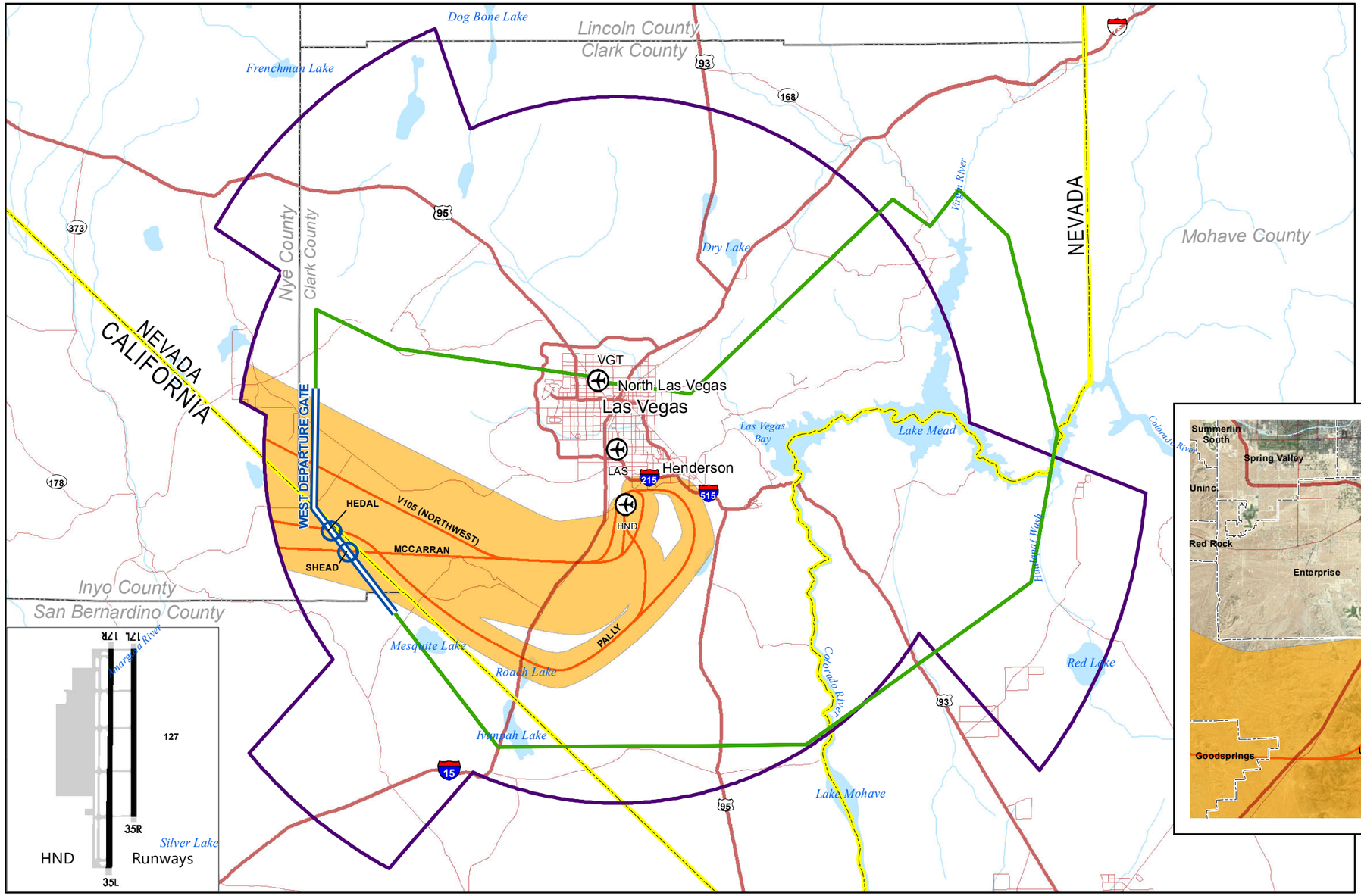

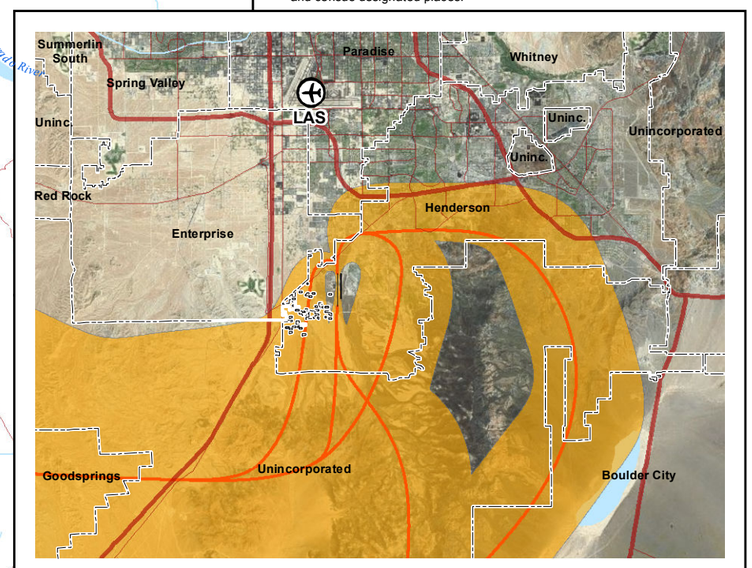

LEGEND

- EA Airports
- State Boundaries
- County Boundaries
- Community Boundaries
- Highways
- Major Roads
- Runways
- Rivers
- Water Bodies
- Generalized Study Area Boundary
- Departure Corridors
- Representative Corridor Centerlines
- LAS Optimization L30 Terminal Airspace Boundary
- Departure Gate and Exit Point

Note: Community boundaries include both municipalities and census designated places.

Notes:
EA - Environmental Assessment; LAS - McCarran International Airport; VGT - North Las Vegas Airport; HND - Henderson Executive Airport

Projection: State Plane, Nevada East Zone

Sources: Metron Aviation, July 2010 (generalized study area boundary); U.S. Geological Survey, 2009 (state/county boundaries, water features); Clark County Geographic Information Systems Management Office, 2001 (airports) and 2004 (community boundaries); Microsoft Corporation Bing Maps, 2010 (inset aerial); Ricondo & Associates Inc., based on Environmental Systems Research Institute, 2008 (roads, rivers); Ricondo & Associates, Inc., based on (1) NIRS Tracks from Metron Aviation, 10/17/11 to 10/31/11, (2) Terminal Area Route Generations, Evaluation and Traffic Simulation, January 2010 and August 2011, and (3) Federal Aviation Administration, Los Angeles ARTC Center, Las Vegas TRACON and Las Vegas Tower Letter of Agreement, Subject: Terminal Area Control, Effective: June 30, 2011 (flight corridors, centerlines, L30/NATCF boundaries, entry/exit points, gates); and Google Earth Pro, January 2012 (mountains, towns).
Prepared by: Ricondo & Associates, Inc., January 2012.

Exhibit III-48

0 13 NM

north

LAS Optimization Alternative
HND - West Departure Gate

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3.5 Summary Comparison of Alternatives Carried Forward for Analysis

This section provides a summary comparison of the No Action Alternative and the LAS Optimization Alternative based on the objectives defined in Section 2.2 to evaluate alternatives relative to the Purpose and Need criteria. The objectives were defined as:

- Improve the flexibility in transitioning aircraft between the en route and terminal airspace.
- Improve the predictability of air traffic flow in the terminal airspace.
- Improve the segregation of arrivals and departures in the terminal airspace and in the en route airspace.

3.5.1 Improve Flexibility in Transitioning Aircraft

Two criteria were established in Section 2.2.1 to measure the objective to increase the flexibility in transitioning aircraft between the terminal airspace and the en route airspace:

- Where possible, increase the number of entry and exit points compared with the No Action Alternative.
- Segregate LAS traffic from VGT and HND traffic via entry and exit points.

Providing additional entry and exit points and segregating LAS traffic from VGT and HND traffic would be expected to improve the throughput of the L30 terminal airspace.

Table III-17 provides a summary comparison of the No Action Alternative and the LAS Optimization Alternative based on the two criteria defined above. As shown in the table, the LAS Optimization Alternative would provide more entry points and exit points, as well as more entry points that would be exclusive to LAS traffic (thus segregated from VGT and HND traffic) in comparison to the No Action Alternative. Although the number of exit points exclusive to LAS traffic is the same between the LAS Optimization and the No Action Alternatives, FAA would have the ability to dynamically assign exit points using RNAV SIDs exclusively to LAS based on operating conditions for departures passing through the Southeast departure gate under the LAS Optimization Alternative. Thus, from an operational perspective, the LAS Optimization Alternative would provide more exit points compared with the No Action Alternative.

Therefore, the additional entry/exit points and additional entry/exit points exclusive to LAS (which includes consideration of how the LAS Optimization Alternative would be implemented) indicate that the LAS Optimization Alternative would achieve the objective to increase the flexibility in transitioning aircraft between the terminal airspace and the en route airspace, and thus would be expected to improve the efficiency of the air traffic routes in the L30 terminal airspace serving the EA Airports.

Table III-17

Alternatives Evaluation: Provide Flexibility in Transitioning Aircraft

Criteria	Alternative	
	No Action	LAS Optimization
Number of Entry Points		
Shared with Other Airports	5	7
Exclusive to LAS	0	2
Exclusive to VGT or HND	3	3
Total	8	12
Number of Exit Points		
Shared with Other Airports	4	8
Exclusive to LAS	2	2 1/
Exclusive to VGT or HND	2	0
Total	8	10

Notes:

Blue shading indicates alternative that achieves desired criteria.

1/ Although the number of exit points exclusive to LAS traffic is the same between the LAS Optimization and the No Action Alternatives, FAA expects that it would dynamically assign exit points using RNAV SIDs exclusively to LAS based on operating conditions for departures passing through the Southeast departure gate under the LAS Optimization Alternative. Thus, from an operational perspective, the LAS Optimization Alternative would provide more exit points compared with the No Action Alternative.

Sources: Ricondo & Associates, Inc., based on Tables III-1 through III-16, February 2012.
Prepared by: Ricondo & Associates, Inc., February 2012.

3.5.2 Improve Predictability of Air Traffic Flow

Two criteria were established in Section 2.2.2 to measure the objective to improve the predictability of air traffic flow in the L30 terminal airspace to and from the EA Airports:

- Ensure that the majority of STARs and SIDs to and from the EA Airports are based on RNAV technology.
- Increase the number of entry/exit point and runway end combinations served by runway transitions in the RNAV STARs and SIDs in comparison to the No Action Alternative.

RNAV procedures provide for a predictable flow of air traffic through the airspace and require less controller-to-controller and controller-to-pilot communications to manage air traffic flows through the airspace. Predictability through the L30 terminal airspace can be further improved by increasing the number of runway transitions defined in the RNAV STARs and SIDs. An increase in the number and use of routes defined by RNAV procedures, especially those that include runway transitions, would be expected to decrease the number of controller-to-controller and controller-to-pilot communications. An increase in the number of runway transitions defined in the RNAV procedures between entry points and the final approach to runway ends and between runway ends and exit points would be expected to improve air traffic controllers' ability to more effectively serve all of the runways at the EA Airports and balance demand across the L30 terminal airspace while maintaining a predictable flow of air traffic.

Table III-18 provides a summary comparison of the percent of total procedures and routes that would be based on RNAV technology in the No Action Alternative and the LAS Optimization Alternative and the number of combinations of entry/exit points and runway ends that would be served by RNAV procedures with runway transitions. The majority of procedures and routes under the LAS Optimization Alternative would be RNAV STARs and SIDs, 56 percent and 60 percent, respectively, as compared to 35 percent and 43 percent, respectively, under the No Action Alternative, and the number of combinations of entry/exit points and runway ends that would be served by runway transitions would increase under the LAS Optimization Alternative in comparison to the No Action Alternative. Therefore, the LAS Optimization Alternative would be expected to provide a more predictable flow of air traffic through the airspace, provide more flexibility to balance demand between entry/exit points and runway ends, and require less controller-to-controller and controller-to-pilot communications as compared to the No Action Alternative.

Table III-18

Alternatives Evaluation: Improve Predictability of Air Traffic Flow in L30 Terminal Airspace

Criteria	Alternative	
	No Action	LAS Optimization
Arrival Procedures		
Number of RNAV STARs	8	20
Total Arrival Procedures and Routes	23	36
Percent RNAV STARs of Total	35%	56%
Number of Combinations of Entry Points and Runway Ends Served by Runway Transitions in the RNAV STARs	14	39
Departure Procedures		
Number of RNAV SIDs	9	21
Total Departure Procedures and Routes	21	35
Percent RNAV SIDs of Total	43%	60%
Number of Combinations of Runway Ends and Exit Points Served by Runway Transitions in the RNAV SIDs	46	102

Note:
Blue Shading = indicates alternative that achieves desired criteria.

Sources: Ricondo & Associates, Inc., based on Tables III-1 through III-16, February 2012.
Prepared by: Ricondo & Associates, Inc., February 2012.

3.5.3 Segregate Arrival and Departure Flows

A criterion was established in Section 2.2.3 to measure the objective to segregate arrivals and departures in portions of the airspace where arrival and departure flows cross, converge, or are within proximity of each other:

- Where possible, increase the number of RNAV STARs and SIDs compared with the No Action Alternative.

RNAV procedures provide for predictable lateral and vertical guidance (including providing for unrestricted climb-outs) and separation of flows and, therefore, would require less controller-to-

controller and controller-to-pilot communications to manage flows that cross, converge, or are within proximity to each other.

Table III-19 provides a summary comparison of procedures and routes in the No Action Alternative and the LAS Optimization Alternative. Based on criterion defined above, the LAS Optimization Alternative would provide a total of 41 RNAV STARs and SIDs in the L30 terminal airspace, more than double the 17 RNAV STARs and SIDs provided in the No Action Alternative. With the increased number of predictable routes through the L30 terminal airspace under the LAS Optimization Alternative, the LAS Optimization Alternative would provide better segregation of arrival and departure flows in the L30 terminal airspace in comparison to the No Action Alternative.

Table III-19

Alternatives Evaluation: Segregate Arrivals and Departures

	Alternative	
Criteria	No Action	LAS Optimization
Number of RNAV STARs	8	20
Number of RNAV SIDs	9	21
Total RNAV STARs and SIDs	17	41

Blue Shading = indicates alternative that achieves desired criteria.

Sources: Ricondo & Associates, Inc., based on Tables III-1 through III-16, February 2012.
Prepared by: Ricondo & Associates, Inc., February 2012.

3.6 Proposed Action Determination

Of the two alternatives carried forward for analysis, the LAS Optimization Alternative would meet the Purpose and Need and is retained as the FAA's Proposed Action. Although it would not meet the Purpose and Need, the No Action Alternative was carried forward, as required by CEQ regulations, to establish a benchmark against which decision makers can compare the magnitude of the environmental effects of undertaking the Proposed Action.

3.7 Listing of Federal Laws and Regulations Considered

Tables III-20, III-21, and **III-22** include descriptions of the relevant federal laws and statutes, Executive Orders, and regulations applicable to the Proposed Action and the No Action Alternative.

Table III-20

Relevant Federal Laws and Statutes

Federal Law or Statute	Citation
National Environmental Policy Act of 1969, as amended	Public Law (PL) 91-190, 42 USC 4321-43470, effective January 1, 1970, as amended by PL 94-52, July 3, 1975, PL 94-83, August 9, 1975, and PL 97-258,Section 4(b), September 13, 1982
Clean Air Act of 1970, as amended	PL 91-604, 42 U.S.C. 7401-7661
Department of Transportation Act of 1966, Section 4(f)	49 U.S.C. Section 303(c)
Aviation Safety and Noise Abatement Act of 1979	14 CFR Part 150
Federal Aviation Act of 1958, as amended	49 U.S.C. 40101 *et seq.*
Endangered Species Act of 1973	PL 93-205, 16 U.S.C. 1531 *et seq.*
Fish and Wildlife Coordination Act of 1958	16 U.S.C. 661-666c
The Bald and Golden Eagle Protection Act of 1940	16 U.S.C. 668-668c
Lacey Act of 1900	16 U.S.C. 3371-3378
Migratory Bird Treaty Act of 1918	16 U.S.C. 703-712
National Historic Preservation Act of 1966, as amended	16 U.S.C. 470
Archaeological and Historic Preservation Act of 1974, as amended	16 U.S.C. 469 *et seq.*
Wild and Scenic Rivers Act of 1968	16 U.S.C. 1271-1287
The Wilderness Act of 1964	16 U.S.C. 1131-1136
American Indian Religious Freedom Act of 1978	PL 103-344

Source: Ricondo & Associates, Inc., May 2010.
Prepared by: Ricondo & Associates, Inc., April 2011.

Table III-21

Executive Orders

Executive Order	Citation
11593, *Protection and Enhancement of the Cultural Environment*	36 Federal Register (FR) 8921
12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*	59 FR 7629
13045, *Protection of Children from Environmental Health Risks and Safety Risks*	62 FR 19883

Source: Ricondo & Associates, Inc., May 2010.
Prepared by: Ricondo & Associates, Inc., April 2011.

Table III-22

Regulations

List of Regulations
U.S. DOT Order 5680.1: *Final Order to Address Environmental Justice in Low-Income and Minority Populations*, April 14, 1997.
FAA Order 1050.1E, Change 1: *Environmental Impacts: Policies and Procedures*, March 20, 2006.
FAA Order 7100.9D, *Standard Terminal Arrival Program and Procedures,* December 15, 2003.
FAA Order 8260.3B, Change 20, *United States Standard for Terminal Instrument Procedures (TERPS),* December 7, 2007.
FAA Order 8260.40B, *Flight Management System (FMS) Instrument Procedures Development,* December 31, 1998.
FAA Order 8260.44A, Change 2, *Civil Utilization of Area Navigation (RNAV) Departure Procedures,* November 6, 2006.
FAA Order 8260.46D, *Departure Procedure (DP) Program,* August 20, 2009.
FAA Order 8260.48, *Area Navigation (RNAV) Approach Construction Criteria,* April 8, 1999.
FAA Order 8260.52, *United States Standard for Required Navigation Performance (RNP) Approach Procedures with Special Aircraft and Aircrew Authorization Required (SAAAR),* June 3, 2005.
FAA Order 8260.54A, *The United States Standard for Area Navigation (RNAV),* December 7, 2007.
FAA Order JO 7110.65U, *Air Traffic Control,* February 9, 2012.
FAA Advisory Circular 150/5020-1: *Noise Control and Compatibility Planning for Airports*, August 5, 1983.
FAA Advisory Circular 150/5200-33B: *Hazardous Wildlife Attractants on or near Airports*, August 28, 2007.
FAA Advisory Circular 36-3H: *Estimated Airplane Noise Levels in A-Weighted Decibels*, April 25, 2002.
Federal Aviation Regulations (FAR) Part 71: *Designation of Class A, Class B, Class C, Class D, and Class E Airspace Areas; Airways; Routes; and Reporting Points*, December 17, 1991.

Source: Ricondo & Associates, Inc., May 2010.
Prepared by: Ricondo & Associates, Inc., April 2011.