

# Why and What ?

## WHY ARE WE DOING THIS PROJECT?

The existing Las Vegas RNAV procedures do not take full advantage of modern technology.

Current procedures do not have course guidance to and from each runway. This requires controllers to use techniques such as vectoring and speed control to ensure safe vertical and lateral separation between arrival and departure aircraft. These techniques result in a lack of predictability and high workloads for controllers and pilots.

Constraints associated with military airspace, mountainous terrain, and close proximity of the Study Airports result in complex interactions between arrival and departure flows. This requires controllers to carefully observe aircraft activity along the nearby or crossing flight routes and be prepared to intervene, ensuring standard separation is maintained.

Flexibility in the management of the Las Vegas Metroplex airspace is affected by a limited number of entry and exit points, as well as a limited number of departure procedures. This constrains efficiency in the airspace and requires multiple traffic flows to merge before aircraft arrive at and depart the Las Vegas area.

## WHAT DOES THIS PROJECT HOPE TO ACHIEVE?

Take advantage of Performance-Based Navigation by implementing RNAV procedures that will help improve the efficiency of the airspace in the Las Vegas Metroplex

Improve the predictability of air traffic flows by increasing the number of RNAV SIDs and STARs and adding transitions to/from airport runways

Improve the segregation of arrivals and departures in the airspace by designing RNAV SIDs /STARs that can be used independently to/from the Study Airports and where practical, include optimized climb and descent profiles

Improve flexibility in transitioning traffic between enroute and terminal area airspace and between terminal area airspace and the runways by increasing the number of entry and exit points, available transitions and overall number of RNAV SIDs and STARs

## TERMINOLOGY

### RNAV

Area Navigation

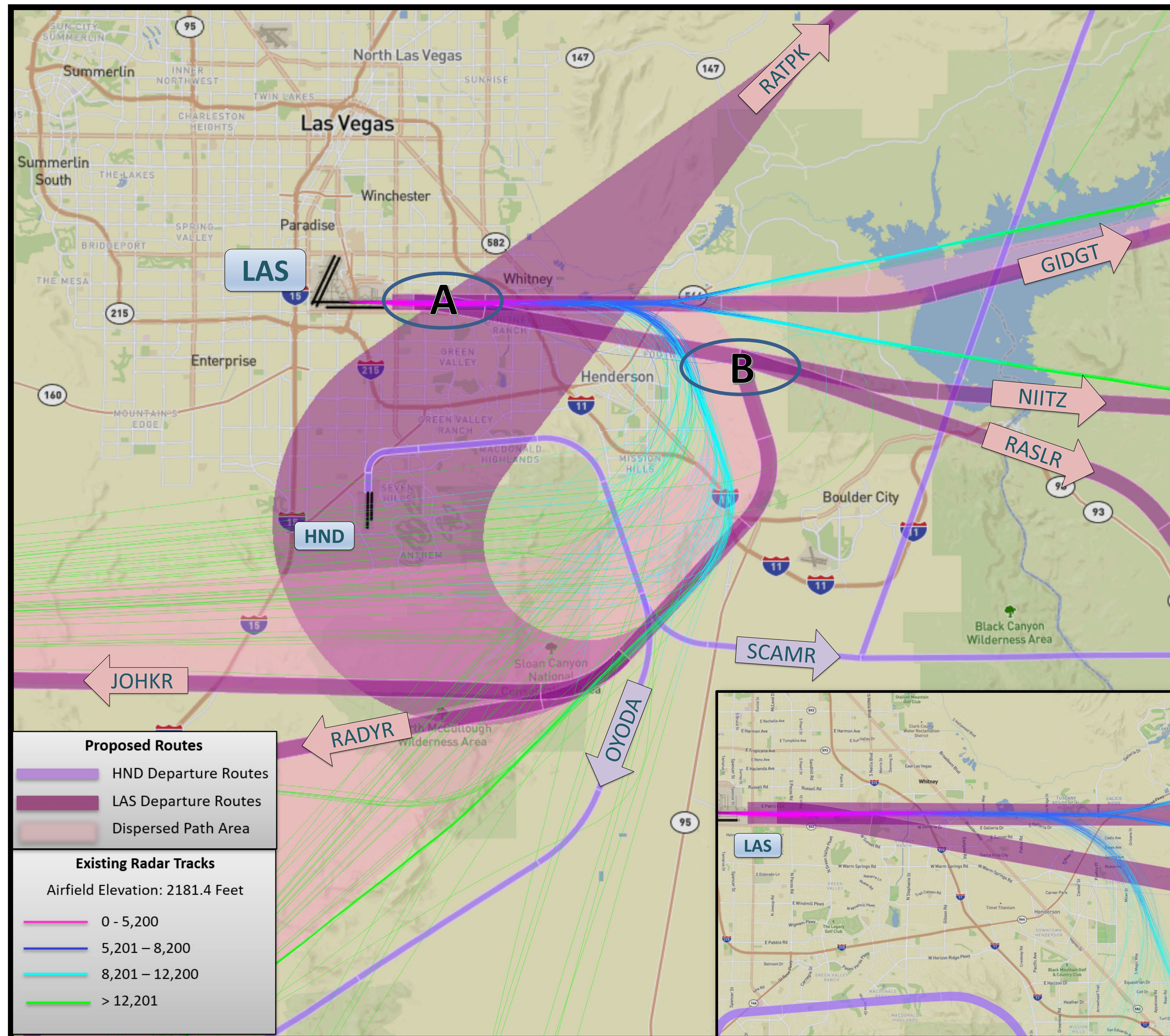
### SID

Standard Instrument Departure

### STAR

Standard Terminal Arrival





**LAS** McCarran International Airport

**HND** Henderson Executive Airport

### Proposed Departure Routes

**LAS East Flow : Runway 08L**

RATPK (north destinations)

GIDGT (northeast destinations)

NIITZ (east destinations)

RASLR (southeast destinations)

RADYR (south destinations)

JOHKR (northwest destinations)

**HND North Flow : Runway 35**

OYODA (west destinations)

SCAMR (east destinations)

**Challenge:** Current procedures require significant radio communication between air traffic controllers and pilots to keep departing aircraft properly separated from each other until the flight paths diverge.

### Solution:

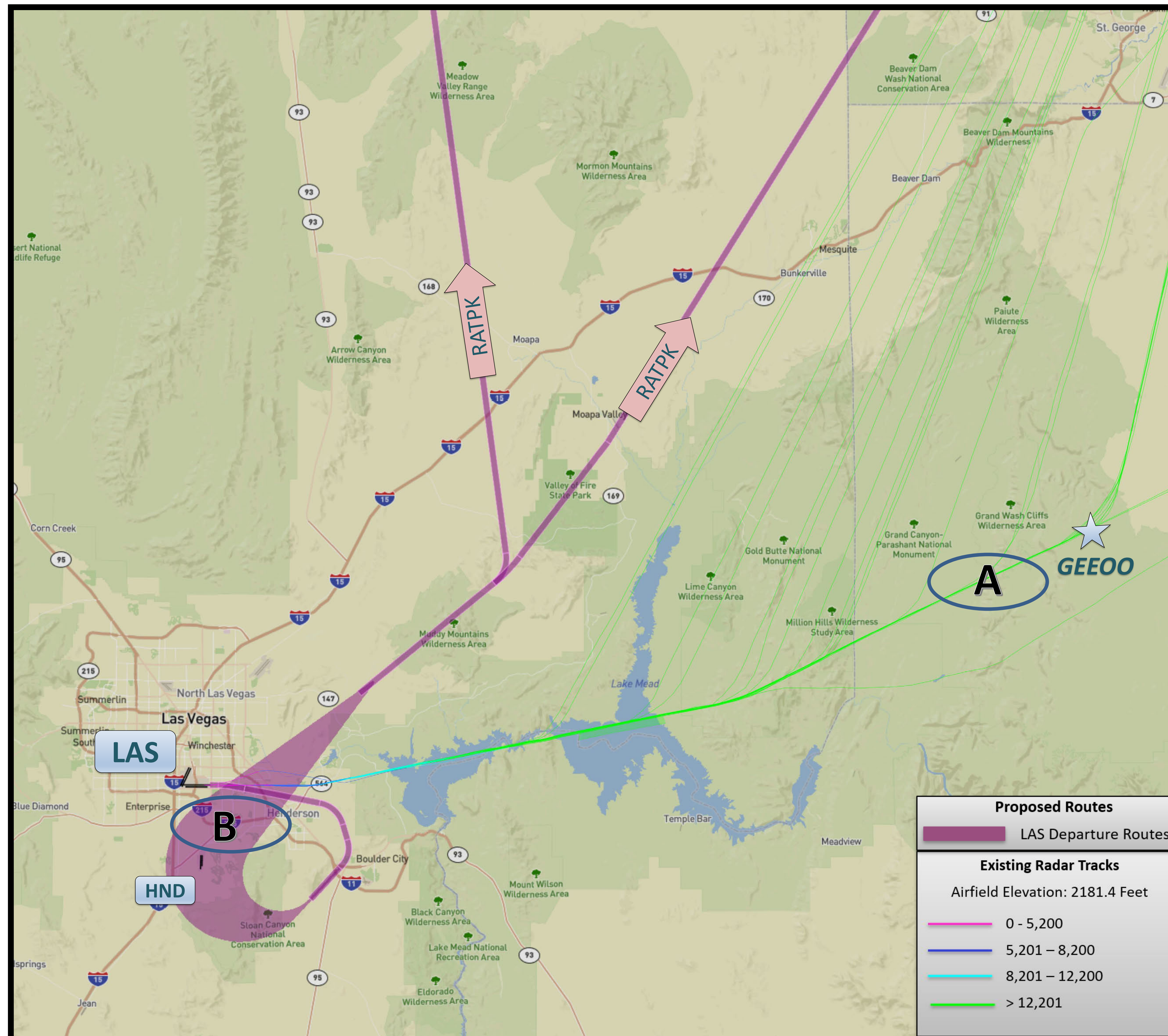
- Split the departure paths earlier (see "A" and the inset). The GIDGT splits from the NIITZ/RASLR shortly after take off, and significantly earlier than current procedures split.
- Splitting the departure paths earlier would reduce controller-pilot communications.

**Challenge:** LAS departure routes overlap with HND departure routes.

### Solution:

- Route LAS departure further east, away from HND traffic, before turning them south. The RADYR/JOHKR route is east of the current HND departure route (see "B").





**LAS** McCarran International Airport

**HND** Henderson Executive Airport

### Proposed Departure Routes

**East Flow : Runway 08L**

**RATPK (north destinations)**

**Challenge:** During hot weather, aircraft flying to northern destinations often are required to fly 70 to 100 miles east to avoid aircraft arriving into Las Vegas Valley airports from the northeast (see “A”).

**Solution:**

- The RATPK would allow departures to climb over the arrivals near the airport and proceed on course (see “B”).



## LAS McCarran International Airport

### Proposed Arrival and Departure Routes

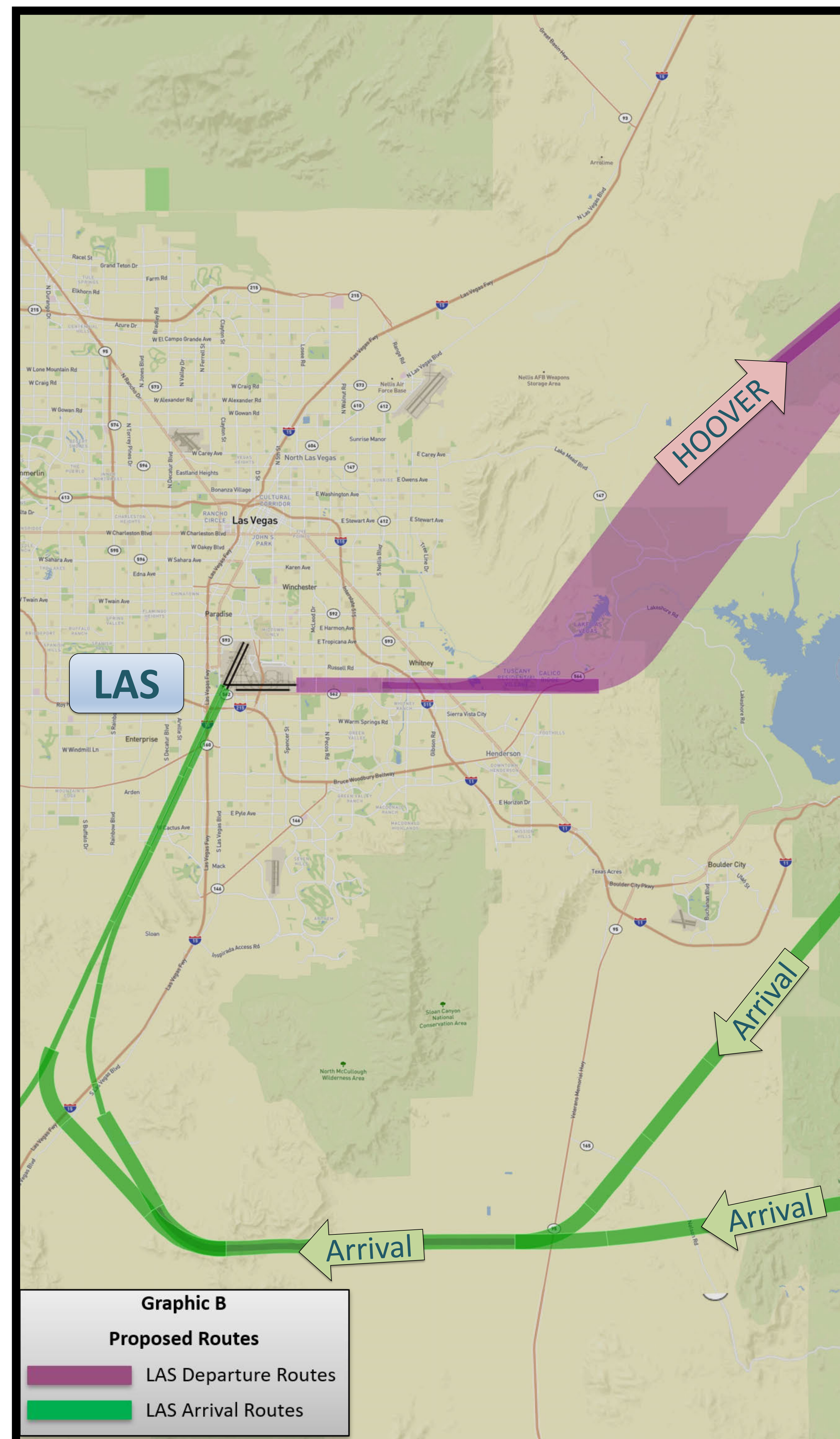
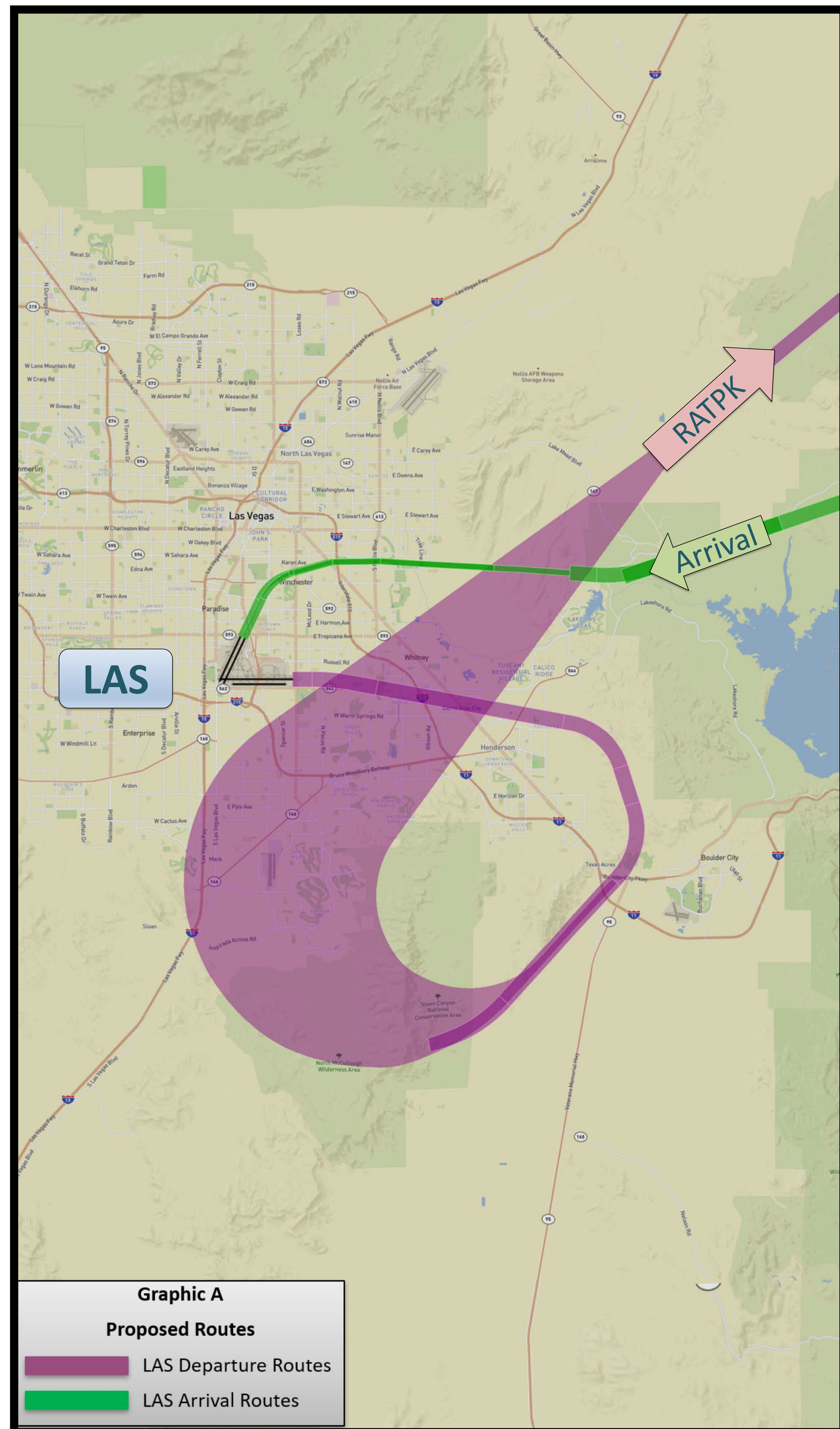
#### East Flow : Runway 08L

#### Graphic A:

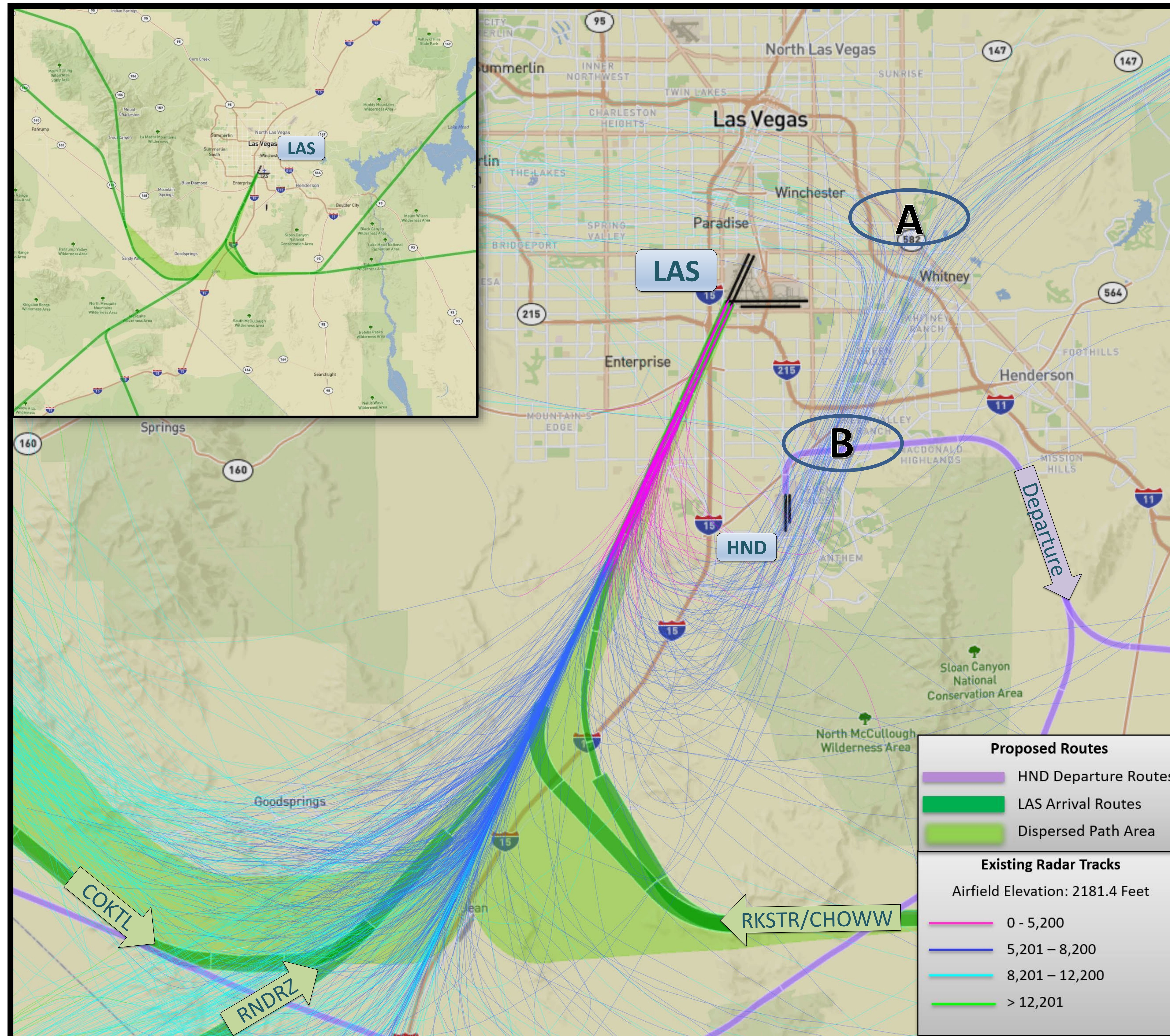
- This graphic shows the proposed RATPK departure route for aircraft that are departing to the East.
- The FAA originally proposed to use this procedure approximately 13.5% of the time, when aircraft were landing from the North and from the South.
- In response to public comments the FAA amended the proposed use of this procedure.
- The FAA is now proposing to use it only when aircraft are landing from the North.
- Historically, aircraft land from the North and depart to the East approximately 7% of the time.

#### Graphic B:

- The FAA is now proposing not to use the RATPK departure when aircraft are landing from the South and departing to the East.
- Instead, the FAA is proposing to amend the existing HOOVER departure route to fly straight out eastbound and turn left.
- Historically, aircraft land from the South and depart to the East approximately 6.5% of the time.







**LAS** McCarran International Airport

**HND** Henderson Executive Airport

### Proposed Arrival Routes

**North Flow : Runway 01**

**RNDZ** (arrivals from the southwest)

**CHOWW** (arrivals from the northeast)

**COKTL** (arrivals from the northwest)

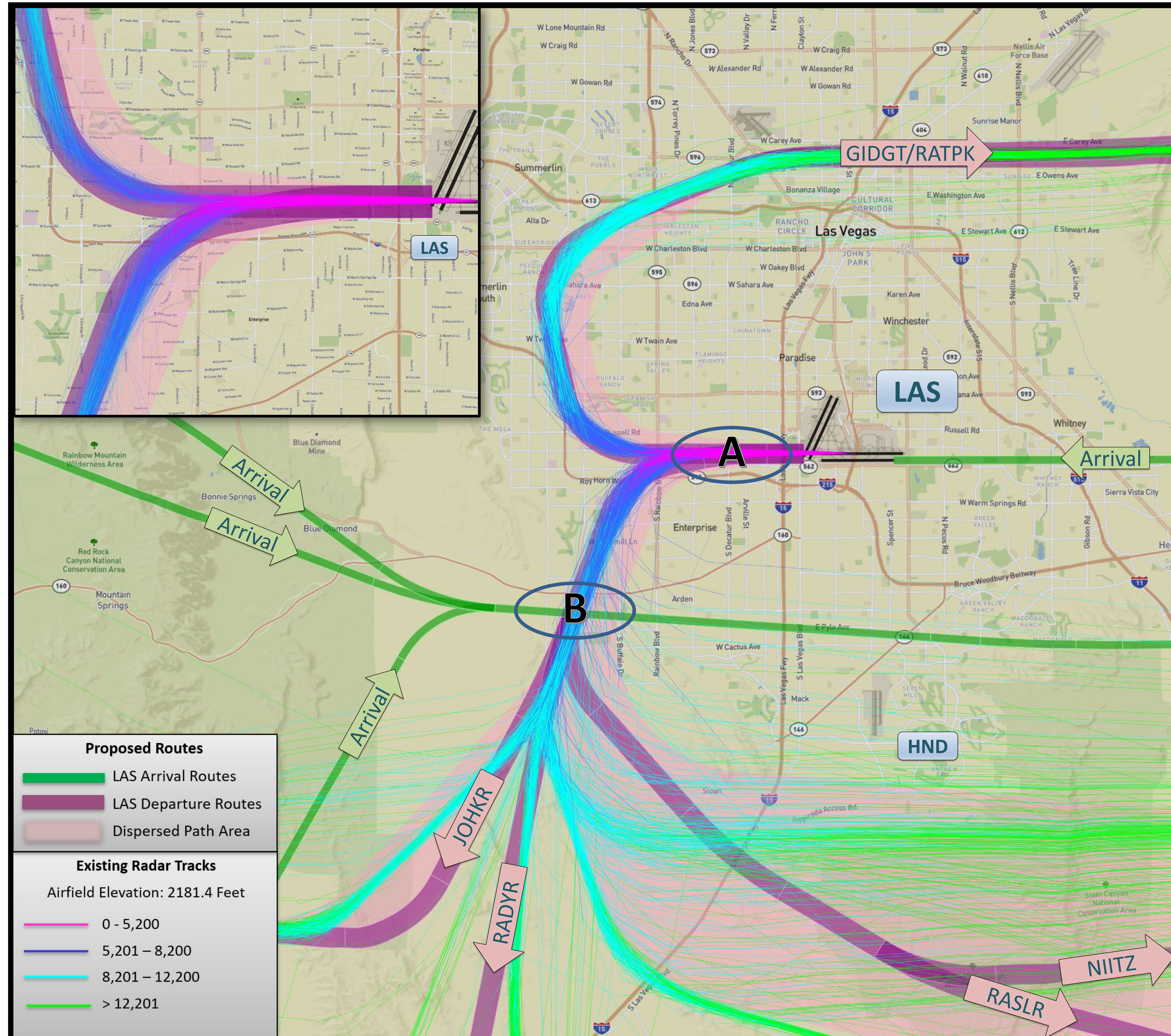
**RKSTR** (arrivals from the southeast)

**Challenge:** Currently there are no defined flight paths for aircraft landing Runway 01. Air traffic controllers issue a series of instructions to pilots to guide them down to the runway.

### Solution:

- Create satellite-based arrival routes that would provide a predictable path and guide aircraft all the way down to the runway, thereby reducing pilot-controller communications and simplifying workloads.
- Most arrivals to Runway 01 would no longer overfly the more urbanized areas east of McCarran (see “A” and inset).
- Arrivals would likely be at higher altitudes, allowing for reduced aircraft power settings.
- Consolidating arrivals further to the south and placing them on more predictable flight paths would keep them better separated from operations at Henderson Executive Airport (see “B”).





**LAS** McCarran International Airport

**HND** Henderson Executive Airport

## Proposed Departure Routes

**LAS West Flow : Runway 26R**

**RATPK (north destinations)**

**GIDGT (northeast destinations)**

**NIITZ (east destinations)**

**RASLR (southeast destinations)**

**RADYR (south destinations)**

**JOHKR (northwest destinations)**

**Challenge:** Current procedures require significant radio communication between air traffic controllers and pilots to keep departing aircraft properly separated from each other until the flight paths diverge.

## Solution:

- Split the departure paths earlier. Compared to current procedures, the RADYR/JOHKR/RASLR/NIITZ flows would split earlier from the GIDGT/RATPK flow (see “A” and the inset).
- Splitting the departure paths earlier would reduce controller-pilot communications.

**Challenge:** Current departure procedures interact with arrival procedures (see “B”). This requires aircraft to climb slowly or fly level for long periods until they pass under the arrival stream.

## Solution:

- Raise the altitude on the arrival route to allow departing aircraft to climb with fewer level-offs which could reduce fuel burn and CO2 emissions.

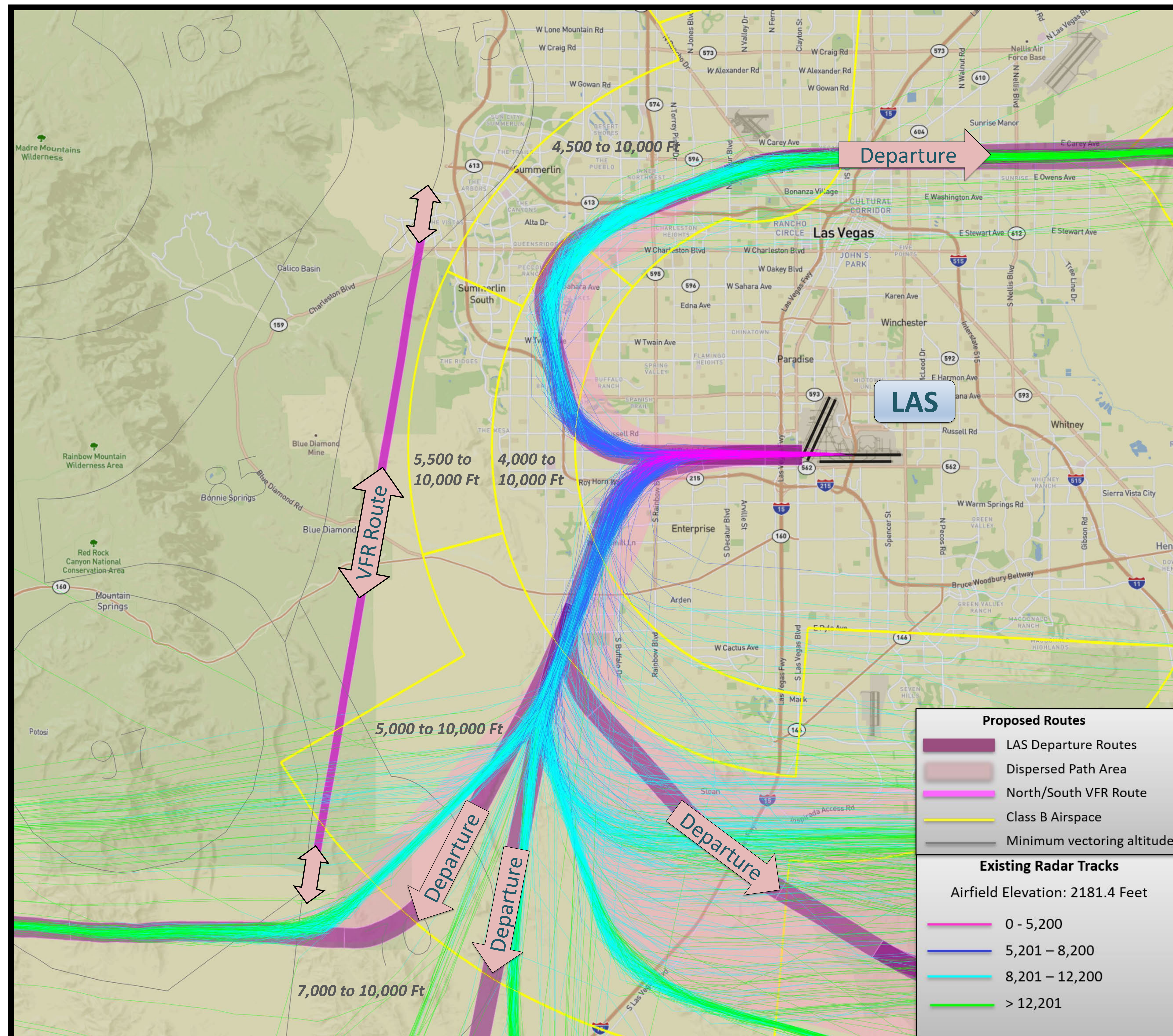


# LAS McCarran International Airport

## Proposed Departure Routes

### LAS West Flow : Runway 26R

- The initial segments of the proposed new westerly departures off Runway 26 mirror the existing routes.
- The FAA was unable to extend the departures further west before they turn north and south. This is due to three factors:
  - ❖ The need to keep departing aircraft safely above rising terrain to the west.
  - ❖ The need to keep departure routes safely contained within the highly controlled Class B airspace around McCarran.
  - ❖ The need to keep departing aircraft safely away from a Visual Flight Rules (VFR) route west of the airport. Aircraft on this route are typically small private aircraft at either 5,500 or 6,500 feet AGL.





**LAS** McCarran International Airport

**HND** Henderson Executive Airport

## Proposed Departure Routes

**South Flow : Runway 19**

**NIITZ** (east destinations)

**RASLR** (southeast destinations)

**RADYR** (south destinations)

**JOHKR** (northwest destinations)

**Challenge:** Current south flow departure procedures make a turn to the west into the flight path of other departing aircraft (see “A”). Nine procedures converge at this point. This requires aircraft to be delayed on the ground until the flight path is clear.

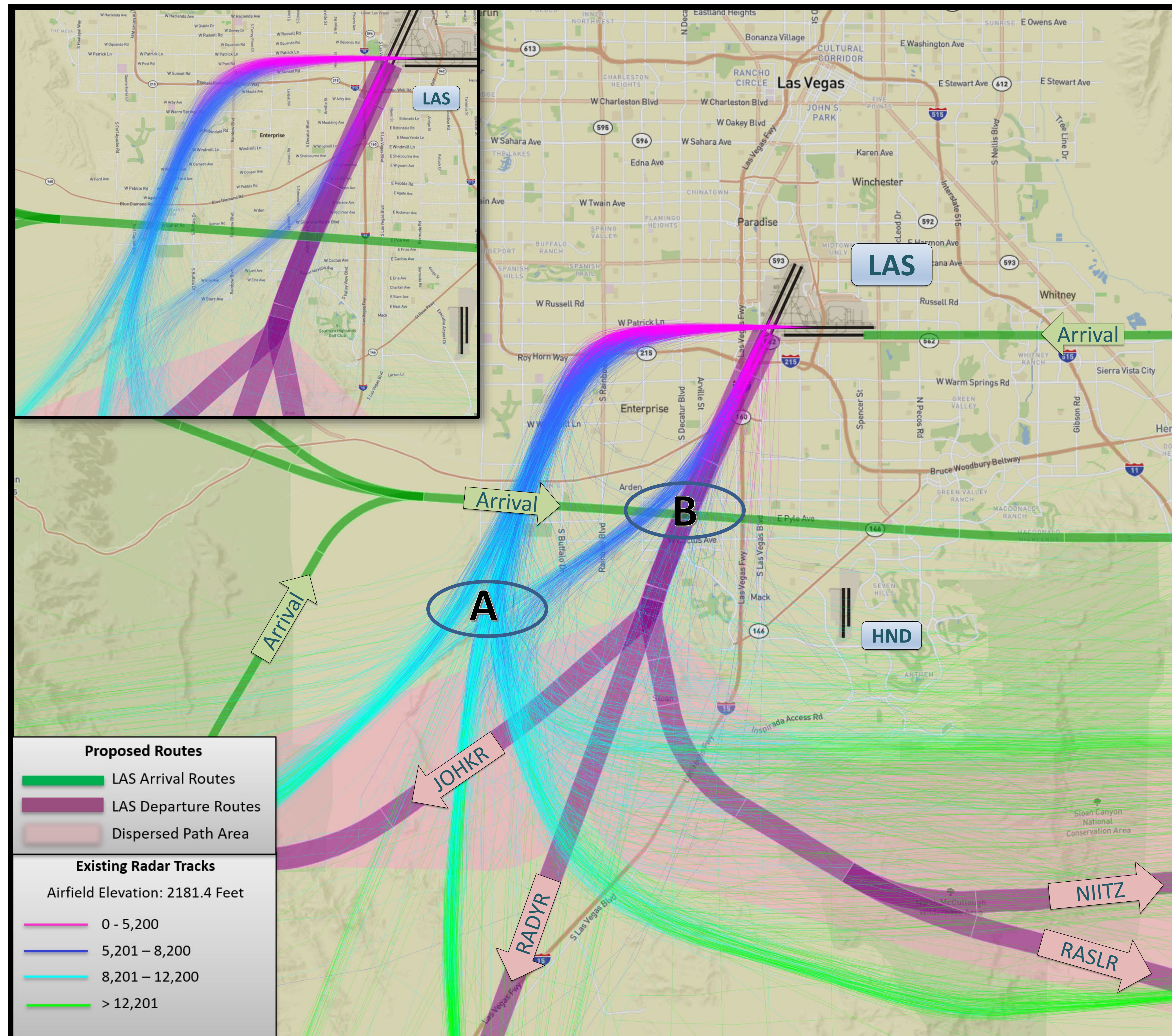
### Solution:

- Proposed procedures would continue straight ahead, reducing delays.
- Proposed procedures would reduce complexity by keeping several of them from converging or crossing.

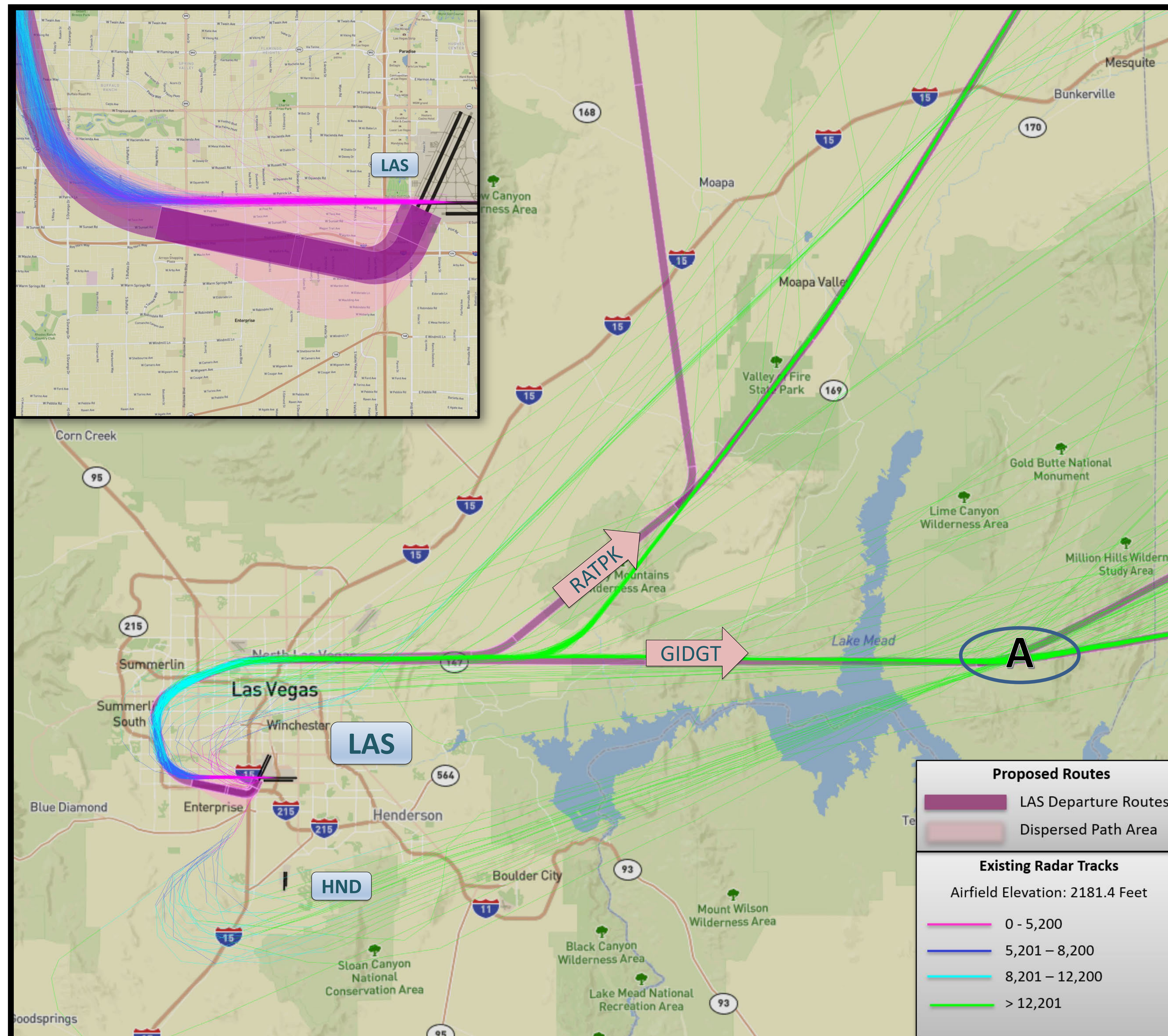
**Challenge:** Current departure procedures interact with arrival procedures. (See “B”). This requires aircraft to climb slowly or fly level for long periods until they pass under the arrival stream.

### Solution:

- Raise the altitude on the arrival route to allow departing aircraft to climb with fewer level-offs which could reduce fuel burn and CO2 emissions







**LAS** McCarran International Airport

**HND** Henderson Executive Airport

## Proposed Departure Routes

**South Flow : Runway 19**

**RATPK (north destinations)**

**GIDGT (northeast destinations)**

**Challenge:** Under current procedures, departing aircraft take different paths from either Runway 19 or Runway 26 to the same point northeast of the airport (see “A”). This results in high air traffic controller workloads for three reasons.

- Controllers must delay Runway 19 departures until there are no departures off Runway 26 going to point “A”,
- Controllers must taxi general aviation aircraft, which park on the west side of the airport, across two busy runways (Runways 1/19 left and right) to get to Runway 26 for departure, or
- Controllers must issue instructions to pilots that depart off Runway 19 to provide separation prior to the aircraft reaching point “A”.

## Solution:

- Some general aviation aircraft would depart off Runway 19.
  - ❖ All aircraft heading to eastern destinations would be routed on the same path regardless of runway.
  - ❖ This eliminates the need to taxi across two runways to depart.
  - ❖ This would greatly simplify controller workload.



**LAS** McCarran International Airport**HND** Henderson Executive Airport**Proposed Departure Routes****North Flow : Runway 01**

RATPK (north destinations)

GIDGT (northeast destinations)

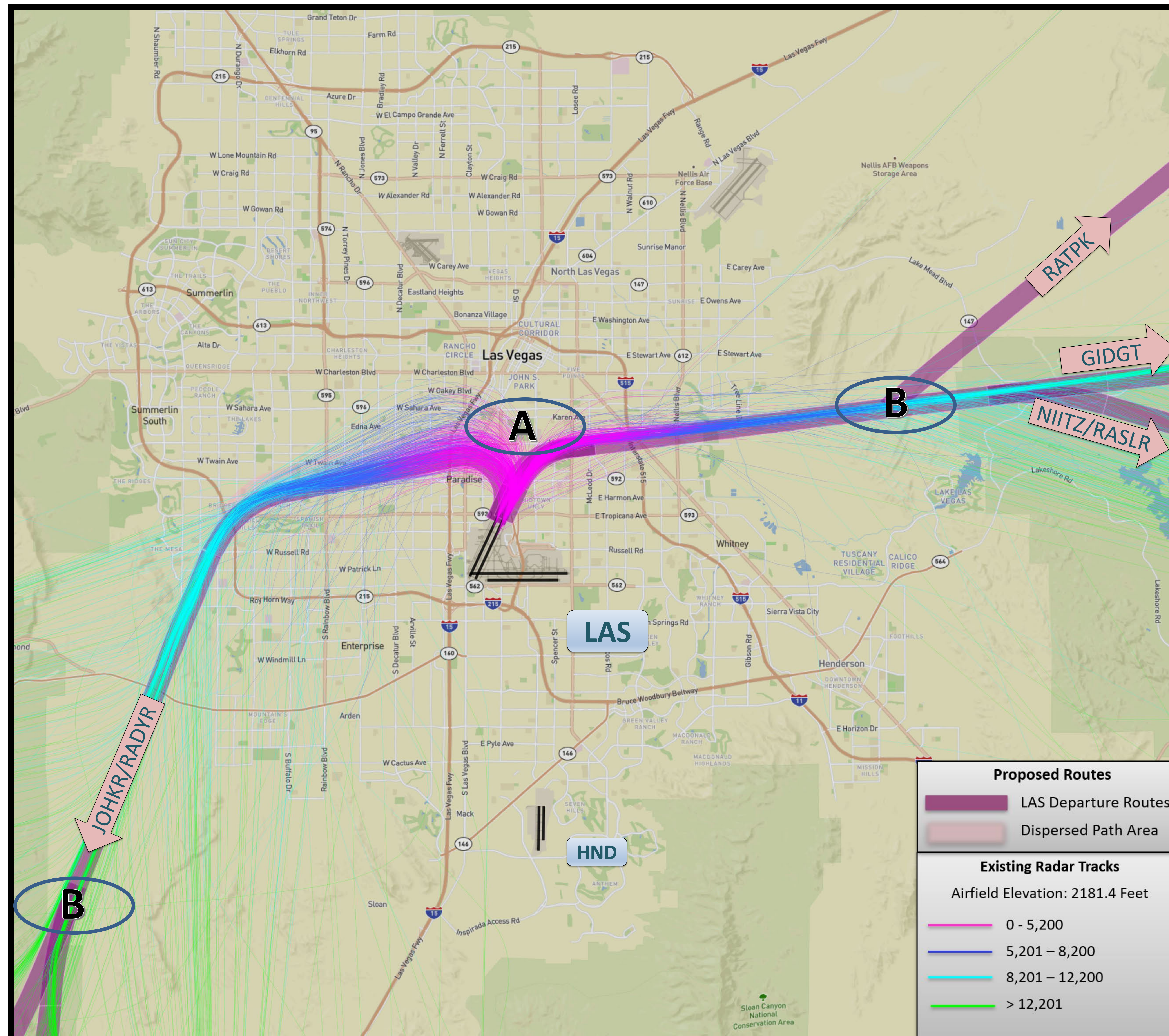
NIITZ (east destinations)

RASLR (southeast destinations)

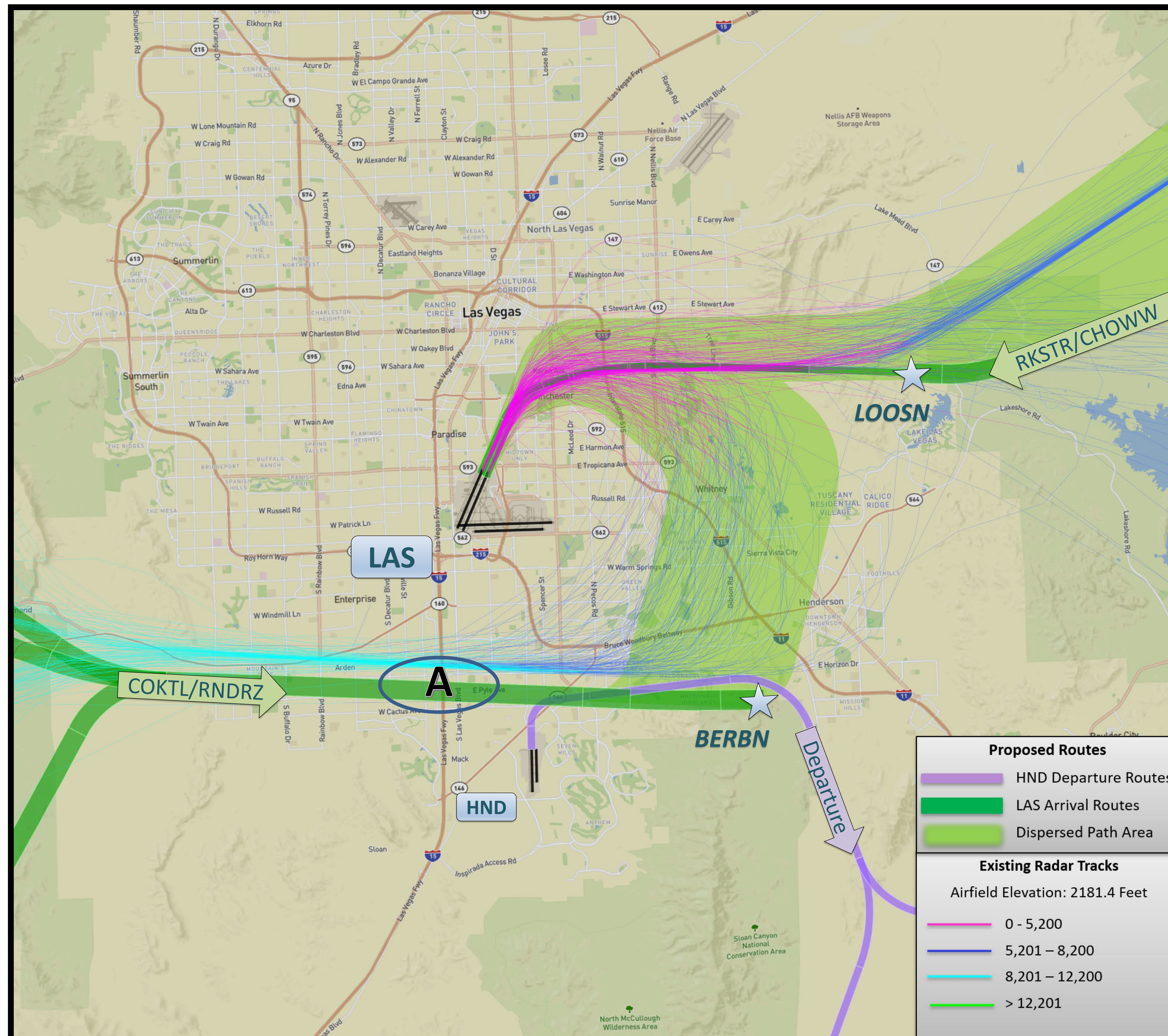
RADYR (south destinations)

JOHKR (northwest destinations)

The FAA is not proposing any changes to flight paths over the densely populated Las Vegas metropolitan area for aircraft departing off Runway 01. The new routes will be overlays of the existing routes (see “A”). The changes would occur further from the airport, where the procedures diverge (see “B”).







**LAS** McCarran International Airport

**HND** Henderson Executive Airport

## Proposed Arrival Routes

**South Flow : Runway 19**

**RNDZ** (arrivals from the southwest)

**CHOWW** (arrivals from the northeast)

**COKTL** (arrivals from the northwest)

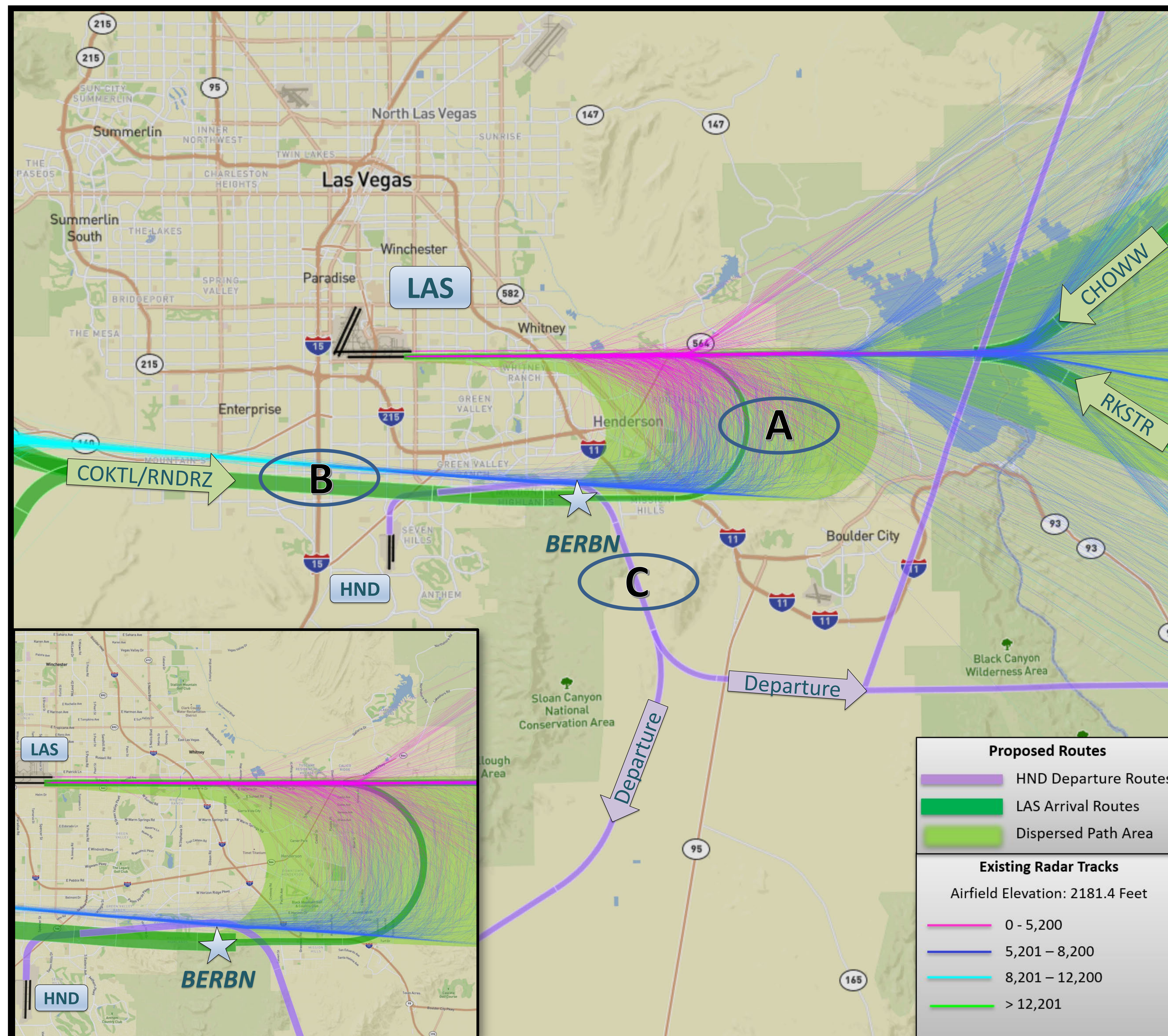
**RKSTR** (arrivals from the southeast)

**Challenge:** Current flights are at low altitudes and close to the airport. Aircraft are on inefficient descent profiles, and controllers have to issue instructions to pilots to keep arrivals separated from HND departures.

## Solution:

- Move arrivals from the west ½ mile to the south and raise the altitude of the aircraft on the route (see “A”). This would enable aircraft to come in at higher altitudes and on more efficient reduced-power settings.
- This arrival procedure (see “A”) would be an Optimized Profile Descent (OPD), which enables aircraft to glide down to their final approaches at reduced-power settings. Use of OPDs can reduce fuel burn, CO2 emissions and reduce pilot-controller communications, thus simplifying workloads and reducing the chances of miscommunications.
- The consolidation of the arrival path north of the airport would help keep arriving aircraft away from air tour helicopters that operate in that area. Properly equipped aircraft would fly a precise approach right down to the runways, which simplifies pilot and controller workload.





**LAS** McCarran International Airport

**HND** Henderson Executive Airport

### Proposed Arrival Routes

#### West Flow : Runway 26L

**RNDRZ** (arrivals from the southwest)

**CHOWW** (arrivals from the northeast)

**COKTL** (arrivals from the northwest)

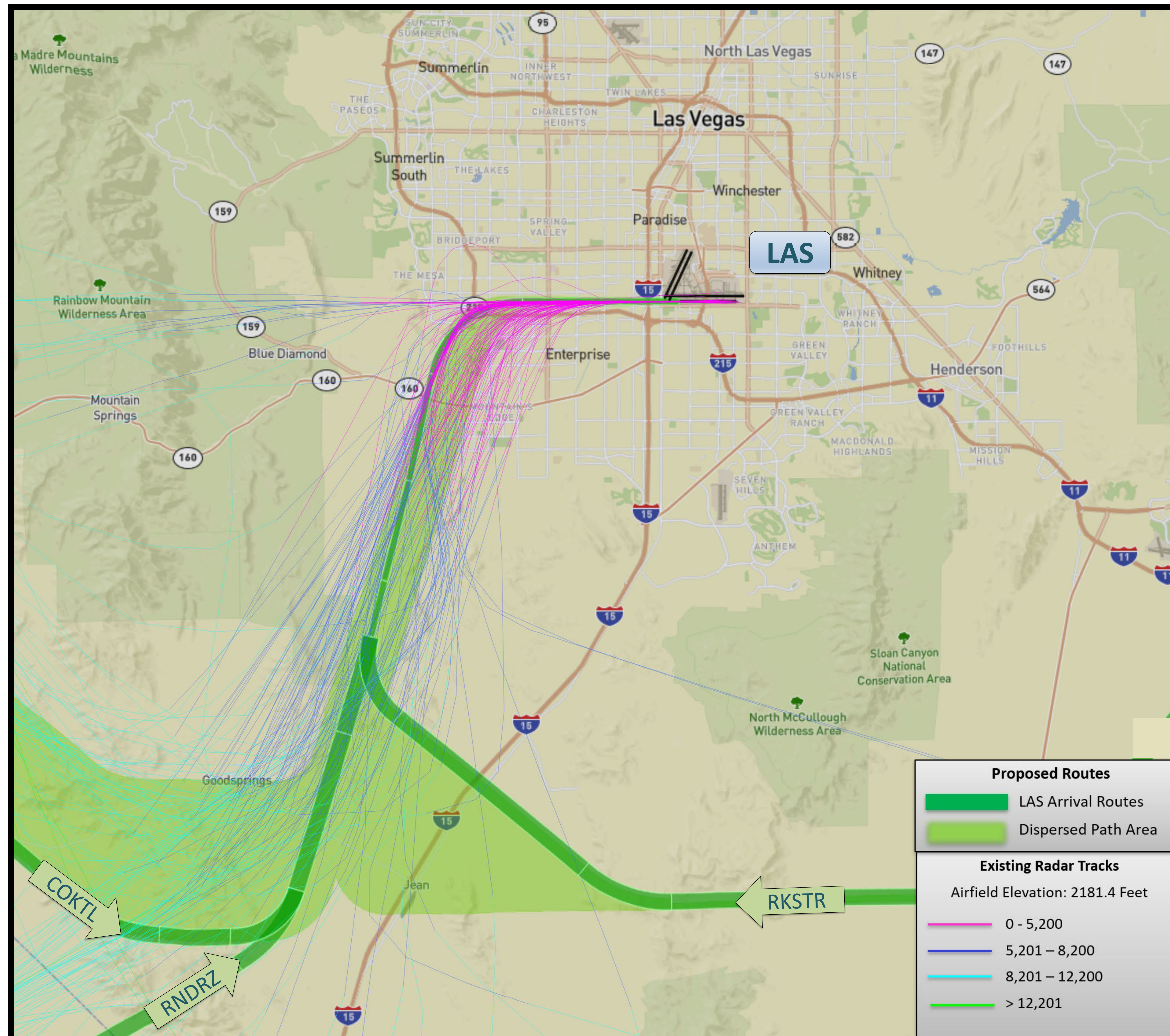
**RKSTR** (arrivals from the southeast)

**Challenge:** The current arrival flow is widely dispersed because controllers have to issue instructions to pilots turn in for their approaches to airport (see "A").

#### Solution:

- Move arrivals from the west ½ mile to the south and raise the altitude of the aircraft on the route (see "B"). This would enable aircraft to come in on more efficient reduced-power settings and at higher altitudes and keeping them above HND departures (see "C").
- This arrival procedure would be an Optimized Profile Descent (OPD), which enables aircraft to glide down to their final approaches at reduced-power settings. Use of OPDs can reduce fuel burn, CO2 emissions and pilot-controller communications, thus simplifying workloads and reducing the chances of miscommunications.
- Properly equipped aircraft would fly a precise approach right down to the runway, further simplifying pilot and controller workload.
- Most of the aircraft not able to fly the precise approach would be issued instructions which would concentrate more arriving aircraft east of Henderson, over less populated areas.





**LAS** McCarran International Airport

## Proposed Arrival Routes

**East Flow : Runway 08R**

**RNDRZ (arrivals from the southwest)**

**COKTL (arrivals from the northwest)**

**RKSTR (arrivals from the southeast)**

**Challenge:** Currently there are no defined flight paths for aircraft that land to the east on Runway 08. Air traffic controllers issue a series of instructions to pilots to guide them down to the runway.

## Solution:

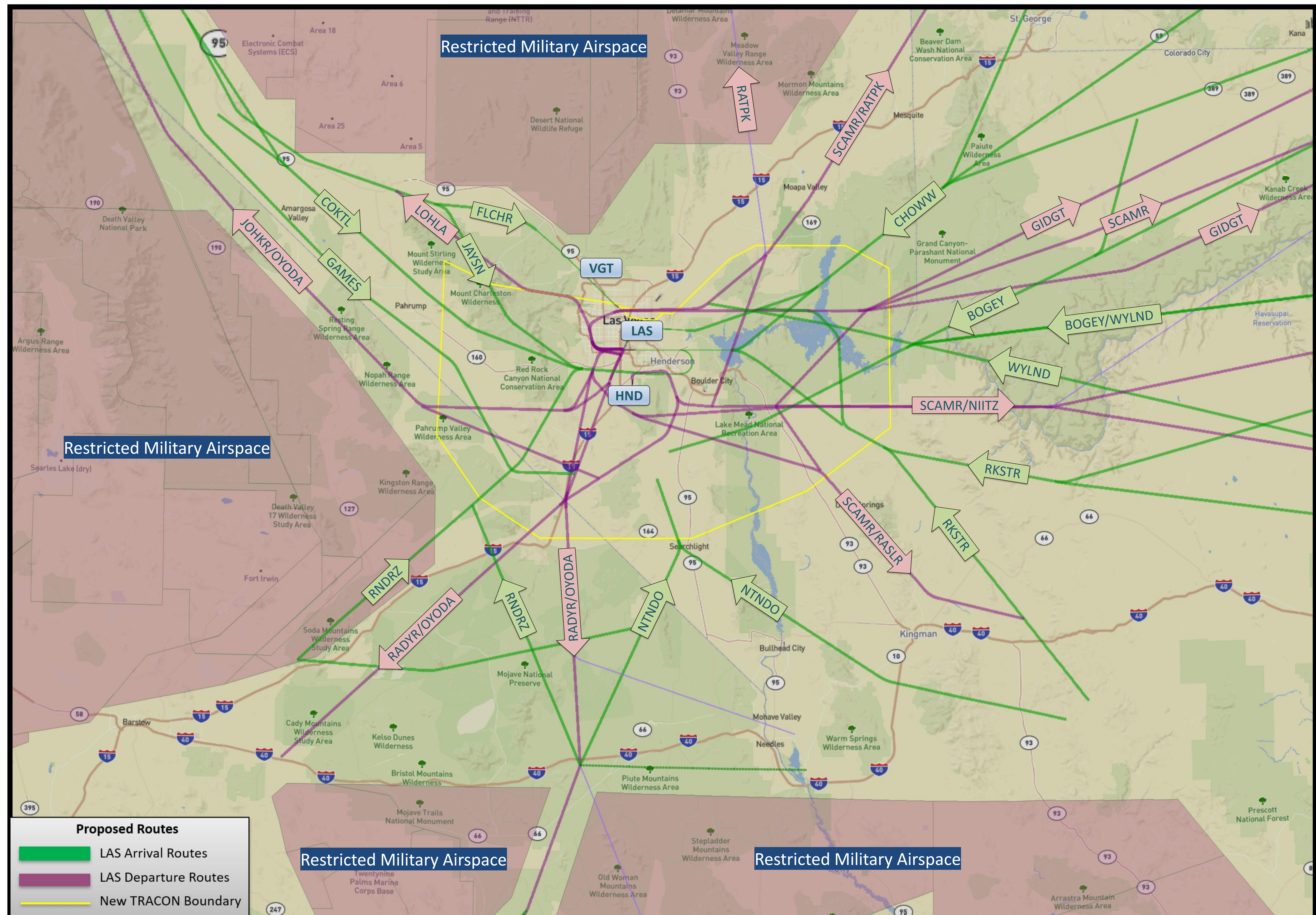
- Create satellite-based arrival routes that would provide a predictable path and guide aircraft all the way down to the runway, thereby reducing pilot-controller communications and simplifying workloads.
- These arrival procedures would be Optimized Profile Descents (OPDs), which enable aircraft to glide down to their final approaches at reduced-power settings. The OPDs would connect a precise approach that would guide aircraft down to the runway.
- Use of OPDs can reduce fuel burn, CO2 emissions and pilot-controller communications, thus simplifying workloads and reducing the chances of miscommunications.





# Proposed Final Design of air routes serving the Las Vegas Valley

Las Vegas Metroplex







**LAS** McCarran International Airport

**Proposed Departure Routes**

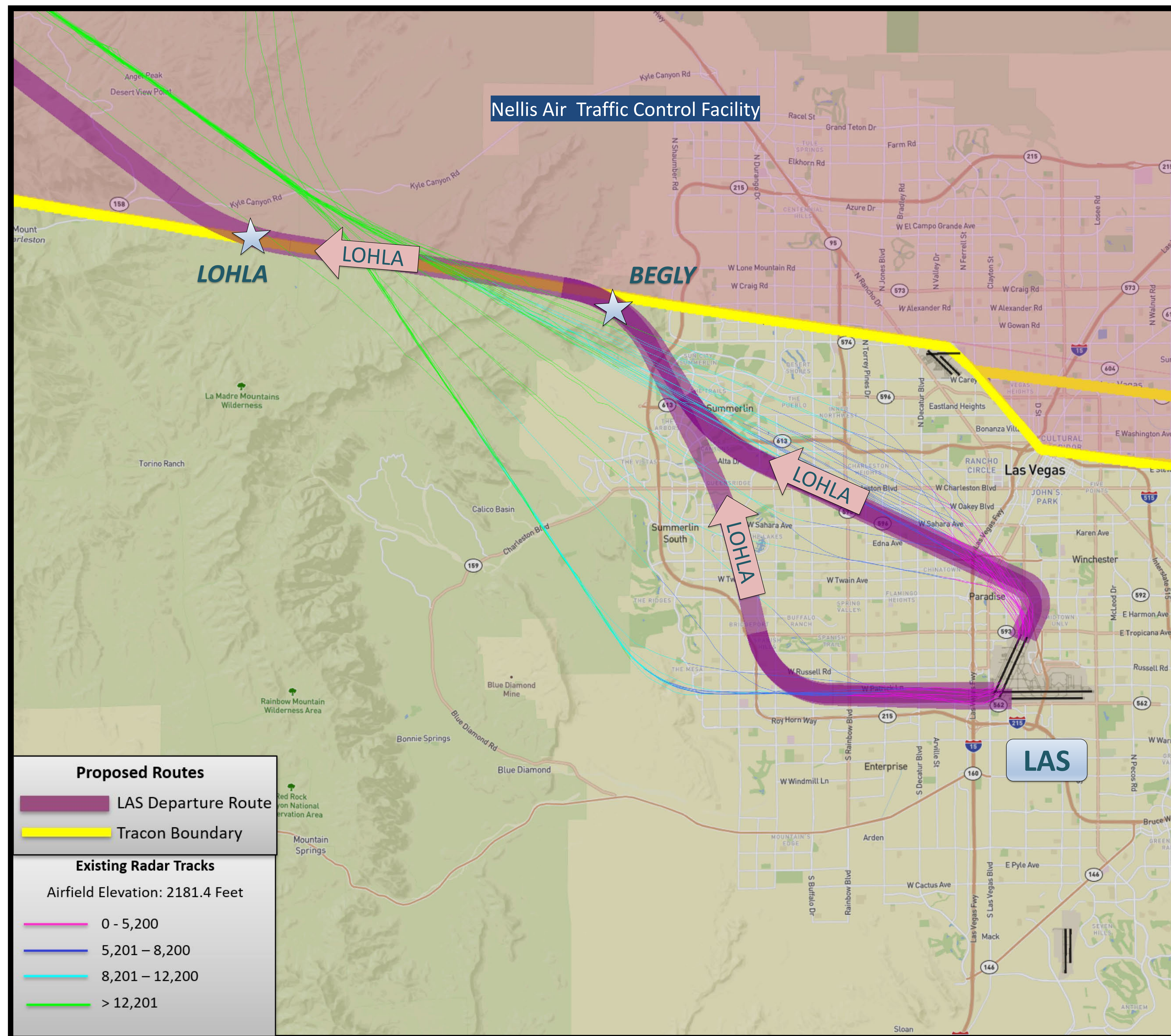
**North Flow and  
South/West Flow**

**LOHLA (north west destinations)**

**Challenge:** There is no procedure for aircraft flying northbound from McCarran Airport into the airspace controlled by the Nellis Air Force Base utilizing satellite technology.

**Solution:**

- Develop a departure route based on satellite technology for traffic from McCarran that will enter airspace controlled by the Nellis Air Force Base.





# Environmental Study Process

## Consideration of a Proposed Action under the National Environmental Policy Act (NEPA)

NEPA requires that the FAA evaluate the environmental and related social and economic effects of a proposed action.

### Preliminary Technical Review

FAA conducts an internal technical review before deciding to consider moving forward with an environmental review.

### Preliminary Environmental Review

FAA conducts an internal environmental review to evaluate any potential environmental concerns.

### Internal Review and choice of appropriate level of NEPA review

Internal analysis such as the noise screening reports as well as input from the public are used to assist the FAA in determining the appropriate level of NEPA review to conduct.

### Extraordinary Circumstances

Paragraph 5-2 of FAA Order 1050.1F identifies the range of factors which define Extraordinary Circumstances.

### Significant Impacts

The FAA uses thresholds that serve as specific indicators of significant impact for some environmental impact categories. FAA proposed actions that would result in impacts at or above these thresholds require the preparation of an EIS, unless impacts can be reduced below threshold levels.

