

# Final Environmental Impact Statement and Final Section 4(f) Evaluation for the Proposed **DesertXpress High-Speed Passenger Train** Victorville, California to Las Vegas, Nevada



## Volume I: Report



U.S. Department  
of Transportation  
**Federal Railroad  
Administration**

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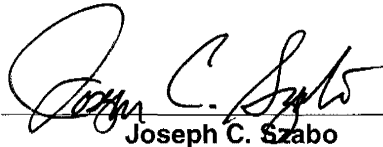
**DESERTXPRESS HIGH-SPEED PASSENGER TRAIN  
FINAL ENVIRONMENTAL IMPACT STATEMENT  
AND 4(F) EVALUATION**

**Prepared by  
USDOT Federal Railroad Administration**

With Cooperating Agencies  
**Bureau of Land Management  
Surface Transportation Board  
Federal Highway Administration  
National Park Service**

Pursuant to:

National Environmental Policy Act (42 U.S.C. § 4332 et seq), and implementing regulations (40 C.F.R. Parts 1500-1508), 64 FR 28545, 23 CFR §771, 65 FR 33960, 49 C.F.R. § 1105; 49 U.S.C. § 303 (formerly Department of Transportation Act of 1966, Section 4(f)); National Historic Preservation Act (16 U.S.C. § 470); Clean Air Act as amended (42 USC §§ 7401 et seq. and 40 CFR Parts 51 and 93); the Endangered Species Act of 1973 (16 USC § 1531-1544); the Clean Water Act (33 USC § 1251-1387); and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 USC § 4601)



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Administrator**

**Federal Railroad Administration  
U.S. Department of Transportation**

Date 3/8/11

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**Abstract:** DesertXpress Enterprises Inc., the DesertXpress High-Speed Passenger Train Project (DesertXpress project) Applicant, proposes the construction and operation of a fully grade-separated, dedicated double track passenger-only railroad along an approximately 200-mile corridor, from Victorville, CA to Las Vegas, NV. The purpose of the DesertXpress project is to provide reliable and safe passenger rail transportation between southern California and Las Vegas using proven high-speed rail technology that results in a convenient alternative to automobile or air travel that also adds transportation capacity to the I-15 freeway corridor. The need for the DesertXpress project stems from several factors, including but not limited to high and increasing travel demand on I-15 – the only major roadway linking southern California to Las Vegas, with limited opportunities to increase capacity. Other factors include constraints on the expansion of air travel from southern California and an above-average automobile accident rate on the I-15 freeway.

The Federal Railroad Administration (FRA) is the Lead Agency for the environmental review of the project. The Cooperating Agencies are the Bureau of Land Management, the Surface Transportation Board, the Federal Highway Administration, and the National Park Service.

In March 2009, FRA, in coordination with the Cooperating Agencies, published a Draft EIS and circulated the document for a 56-day public and agency review and comment period. Following publication of the Draft EIS, the project applicant proposed several modifications and additions based upon substantive comments received during public and agency review to reduce or avoid significant environmental effects. These proposed project modifications and additions were analyzed in Supplemental Draft EIS, published by FRA and the Cooperating Agencies in September 2010 and circulated for a 46-day public and agency review and comment period.

In accordance with regulations implementing NEPA, the Final EIS evaluates the environmental effects associated with the Preferred Alternative selected by FRA and the Cooperating Agencies and the No Action Alternative. The Preferred Alternative rail alignment would be almost entirely located within the existing I-15 corridor, with tracks running alongside freeway travel lanes. The Preferred Alternative also specifies station and maintenance facility sites and identifies Electrical Multiple Unit (EMU) as the locomotive technology. The Final EIS also compares the environmental effects of the Preferred Alternative to the other Action Alternatives. The Final EIS also includes amendments to the Draft EIS and Supplemental Draft EIS to both reflect updated information since publication of the previous documents and to address certain comments received during the respective public and agency comment periods (40 CFR 1502.9(b)).

The Preferred Alternative would have adverse environmental effects related to sensitive biological resources, cultural resources, hydrological resources, utility infrastructure, localized traffic effects near the Victorville and Las Vegas stations, land use and community impacts relative to business displacements, increased noise levels, air quality pollutant emissions during construction, and existing grazing land allotments. Mitigation measures and strategies are described to avoid or minimize these adverse effects. Conversely, the Preferred Alternative demonstrates several beneficial effects to the environment, including diverting automobile traffic from the I-15 freeway, providing economic growth during construction, and improving air quality and energy consumption during operation.

This Final EIS is being made available to the public in accordance with NEPA. Pursuant to 40 CFR 1506.10, this Final EIS will be circulated for a 30-day waiting period commencing on the publication date of EPA's notice of availability in the Federal Register, which is expected to be Friday, April 1, 2011. Following this waiting period, the Lead and Cooperating Agencies will each issue a Record of Decision on the proposed project. A Record of Decision is a concise public document that formally states the decision of the federal agency on the project and explains factors considered in reaching the decision.

The Final EIS is available at public libraries identified below as well as on the internet at the following address: <http://www.fra.dot.gov/rpd/freight/1703.shtml>.

<u>Victorville City Library</u>	<u>Barstow Library</u>	<u>Las Vegas Library</u>	<u>Clark County Library</u>
15011 Circle Drive	304 East Buena Vista	833 Las Vegas Blvd. N.	1401 Flamingo Road
Victorville, CA 92395	Barstow, CA 92311	Las Vegas, NV 89101	Las Vegas, NV 89119

Written concerns on this Final EIS should be sent by mail and received by **Monday, May 2, 2011**, addressed to the Federal Railroad Administration as follows:

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<b>Appendix F-M</b>	Biological Assessment
<b>Appendix F-N</b>	Special-Status Plant Survey Report for the Proposed Segment 4C Alignment
<b>Appendix F-O</b>	Mojave Ground Squirrel Habitat Assessment
<b>Appendix F-P</b>	Vegetation Mapping Surveys
<b>Appendix F-Q</b>	Special-Status Plant and Wildlife Species

# Project Background and Executive Summary

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This is the Final Environmental Impact Statement (EIS) for the proposed DesertXpress project.

This summary is intended to assist readers in answering these and other important questions:

- What is the DesertXpress project?
- What is an environmental impact statement?
- What goes into an environmental impact statement?
- How is an environmental impact statement prepared? Who prepares it?
- What were the steps in the environmental review of the DesertXpress project?
- What are some areas of controversy related to the DesertXpress project?
- What are some of the environmental effects related to the DesertXpress project?

A list of acronyms used in this Final EIS follows this chapter.

## What is the DesertXpress project?

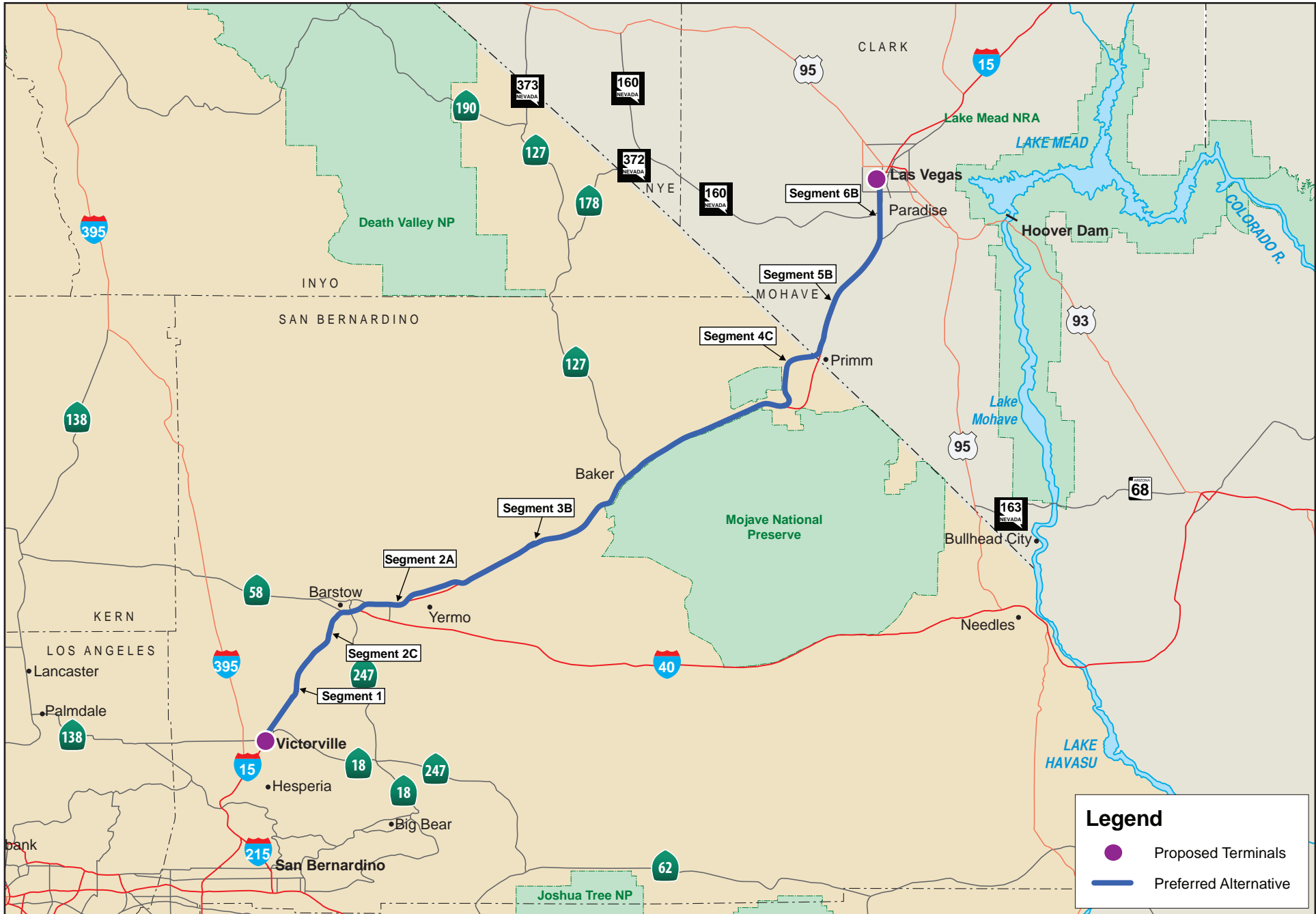
The project involves the construction, operation, and maintenance of a high-speed passenger train along the 200-mile corridor between southern California (Victorville) and Las Vegas, Nevada. The project would include stations and maintenance facilities at each end of the rail alignment in Victorville and Las Vegas. **Figure A** shows where the project would be located.

The purpose of the project is to provide reliable and safe passenger rail transportation between southern California and Las Vegas.

## What is an Environmental Impact Statement?

An EIS is a document required by the National Environmental Policy Act (NEPA) that describes the environmental effects of a proposed action to inform decision makers and the public. NEPA is an U.S. environmental law that facilitates public disclosure and establishes policies for federal agencies to study the reasonable range of alternatives and assess environmental impacts of proposed projects.

An EIS must be prepared by a federal agency for any major federal action significantly affecting the quality of the natural and built environment. A **“major federal action”** might include an agency proposal to approve or implement a project or program. The term **“environment”** refers to the natural and physical setting, including resources like animals,



**Legend**

- Proposed Terminals
- Preferred Alternative



**DesertXpress  
Final EIS**

Project Location

**FIG 68 A**

Source: CirclePoint, 2011.

plants, buildings, and landscapes, and the relationship of people with that natural and physical setting.<sup>1</sup> An “environmental effect” is any change to the environment resulting from the proposed activity. Environmental effects can be both positive (beneficial) or negative (adverse). An EIS typically includes measures to avoid, mitigate, or lessen the potential adverse effects.<sup>2</sup>

## What goes into an EIS?

NEPA assumes that any proposed goal can be achieved through different means. To this end, NEPA requires that an EIS evaluate the environmental effects of a “reasonable range” of project alternatives. NEPA defines a “reasonable alternative” as an option that would feasibly achieve the objectives of a particular proposed action.<sup>3</sup>

NEPA does not require any specific number of alternatives. Instead, the number and type of reasonable alternatives depends on the specific nature of the project. The reasonable range of alternatives is determined after careful consideration a number of factors which may include technical and environmental criteria. Practicality is another consideration in determining whether an alternative is “reasonable”—NEPA allows cost, engineering considerations, and other factors to be considered.

However, NEPA does require that an environmental document explicitly note several specific alternatives:

### **Key Acronyms:**

**NEPA** – National Environmental Policy Act

**EIS** – Environmental Impact Statement

### **Key Players in NEPA Process:**

**Lead Agency** – Agency preparing or having taken responsibility for preparation of the EIS. The Federal Railroad Administration is the Lead Agency for the DesertXpress project.

**Cooperating Agency** – Agency with special expertise on environmental issue or jurisdiction by law. The Federal Highway Administration, Bureau of Land Management, Surface Transportation Board, and National Park Service are the Cooperating Agencies for the DesertXpress project.

### **Key NEPA Terminology:**

**Environmental Effect** – A change to the environment, positive or negative, as a result of a project or specific activity.

**Proposed Action** – The federal project or specific activity evaluated in the EIS.

**No Action Alternative** – The condition where the project (or action) is not implemented; maintains the status quo.

**Agency Preferred Alternative** – The option/alternative which the agency believes would fulfill their statutory mission and responsibilities, after thorough consideration of relevant economic, environmental, and technical factors.

**Environmentally Preferable Alternative** – The option/alternative which will cause the least damage to the biological and physical environment, and best protect, preserve and enhance historic, cultural, and natural resources .

<sup>1</sup> 40 CFR 1508.14.

<sup>2</sup> National Environmental Policy Act of 1969, 42 U.S.C. 4332.

<sup>3</sup> Council on Environmental Quality, “Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations,” 46 Fed. Reg. 18026 (March 1981).



- No Action Alternative
- Agency Preferred Alternative
- Environmentally Preferable Alternative

Each of these is discussed in more detail below.

Under NEPA, the “No Action Alternative” details the environmental effects that would result if no action were taken.<sup>4</sup> **Taking “no action” does not automatically mean “no environmental effects.” For example, for a project that proposes to clean up or remediate a contaminated area, the “No Action Alternative” would mean that no clean up or remediation takes place, potentially leading to substantial negative environmental effects from the existing contamination.**

**The term “Agency Preferred Alternative” refers to the option/alternative that the lead and cooperating agencies believe would best fulfill each agency’s statutory mission and responsibilities, in consideration with economic, environmental, and technical factors.**<sup>5</sup> In the case of the DesertXpress project, neither the lead nor cooperating agencies indicated a Preferred Alternative at the Draft EIS stage. Instead, the agencies used the Draft EIS and Supplemental Draft EIS to identify the Agency Preferred Alternative.

NEPA defines the “Environmentally Preferable **Alternative**” as the alternative that will best promote **NEPA’s overall goals: that is to say, the alternative that causes the least damage to the environment and best protects natural and cultural resources.**<sup>6</sup> Determining the environmentally preferable alternative requires judgment on the part of the Federal agencies insofar as one alternative could be preferable for some resources while another alternative is preferable for other resources.

### **What is the process for preparing the DesertXpress EIS?**

NEPA and the Council on Environmental Quality’s (CEQ) implementing regulations define the general framework for preparing an EIS. Each federal agency may also have its own, more specific guidelines for implementing NEPA that will influence the contents of an EIS. For example, the Federal Railroad Administration (FRA) uses its Procedures for Considering Environmental Impacts to supplement the CEQ regulations.<sup>7</sup>

**Figure B** illustrates the DesertXpress EIS process.

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<sup>4</sup> 40 CFR 1502.14(e); CEQ’s Forty Questions, No. 4(a)

<sup>5</sup> 40 CFR 1502.14(e); CEQ’s Forty Questions, No 4(b), 5.

<sup>6</sup> CEQ’s Forty Questions, No. 6(a), 6(b).

<sup>7</sup> Federal Railroad Administration Procedures for Considering Environmental Impacts, 64 FR 28546 (May 26, 1999).

July 2006: Notice of Intent & Public Scoping Meeting

2006 - 2008: Environmental Technical Studies

2008 - March 2009: Prepare Draft EIS

April 2009: Circulate Draft EIS & Hold Public Hearings

September - October 2010: Circulate Supplemental Draft EIS & Hold Public Hearings

October - December 2010: Federal Agencies Identify Preferred Alternative

March 2011: Release Final EIS

Spring 2011: Agency Approvals

## Scoping

The scoping process refers to the early and open process for identifying significant issues related to a proposed action. As part of the scoping process, agencies and the public are invited to participate and provide comment. Public scoping meetings are held to give agencies and the public a chance to verbally submit comments, discuss the proposed alternatives, and talk about the EIS process with project team members.

The Notice of Intent (NOI) for the DesertXpress project was published in the Federal Register on July 14, 2006. FRA also sent out notices to property owners and published announcements in local newspapers in the vicinity of the project areas. These notices and announcements included an invitation to attend a series of public scoping meetings (held July 25 and 26 in Barstow, Las Vegas, and Victorville) to obtain input from the public regarding the scope and content of the environmental studies to be conducted for the Draft EIS.

## Draft EIS

The purpose of the Draft EIS is to disclose all environmental effects associated with the alternatives, whether they are adverse or beneficial and allow for public to review and comment of the document. The lead agency will publish the document, informing people of its availability through a variety of means.

The Draft EIS for the DesertXpress project was published and made available for public review in March 2009. A Notice of Availability was published in the Federal Register on March 27, 2009. Newspaper ads, mailings to property owners, and press releases to the local media were just a few ways in which people were informed about the project and availability of the Draft EIS. Public hearings for the Draft EIS were held in Las Vegas, Barstow, and Victorville in April 2009. **Appendix F-A** of this Final EIS contains summary reports of the public hearings held for the Draft EIS.

## Supplemental Draft EIS

Sometimes, following publication of a Draft EIS, significant new circumstances or information relevant to environmental concerns or impacts arise or substantial changes in the proposed action relevant to environmental concerns or impacts are proposed. In these situations NEPA requires the preparation of one or more Supplemental Draft EIS documents.

The Supplemental Draft EIS for the DesertXpress project was published and made available for public review in September 2010. A Notice of Availability was published in the Federal Register on September 3, 2010. Newspaper ads, mailings to property owners, and press releases to the local media were used to inform the public about the project and availability of the Supplemental Draft EIS. Public hearings for the Supplemental Draft EIS were held at Las Vegas and Barstow in October 2010. **Appendix F-A** of this Final EIS contains summary reports of the public hearings held for the Supplemental Draft EIS.

## Final EIS

Once the public comment period for the Draft EIS and Supplemental Draft EIS is complete, the next step is to prepare the Final EIS. The Final EIS addresses all of the comments received on the Draft EIS and Supplemental Draft EIS with responses to those comments by the lead agency. In addition, the Final EIS must **also define the “Agency’s Preferred Alternative”** – meaning the action that **fulfills the agency’s statutory mission and responsibilities**, given consideration to economic, technical and other factors and that the lead agency recommends among all the alternatives considered. This could be an action **alternative or the “no action” alternative**.

## The Record of Decision

This is the final step in the EIS process. The Record of Decision (ROD) is a concise public document that formally states the decisions of the federal agencies on the project and identifies the alternatives considered, the Preferred Alternative, and the required mitigation plans and monitoring commitments. For the DesertXpress project, the Lead Agency and each Cooperating Agency will draft and publish individual RODs no sooner than 30 days from issuance of the Final EIS.

## Who prepares an EIS?

NEPA establishes a framework whereby federal, state, local and tribal agencies as well as the public can have important roles in project development and the environmental review process. **Figure C** illustrates the responsible parties associated with the preparation of this EIS.

FRA is the Lead Agency preparing this EIS for the DesertXpress High-Speed Passenger Train Project (DesertXpress project). FRA has the authority to regulate the safety of railroads, including the DesertXpress project, and manages financial assistance programs for rail capital investments.

For the DesertXpress NEPA process, FRA has worked with several **Cooperating Agencies**, as detailed in the table to the right. The role of the Cooperating Agencies is to assist

<b>Cooperating Agency</b>	<b>Responsibility</b>
<b>Surface Transportation Board</b>	<i>Authority over construction, acquisition, operation, and abandonment of rail lines, railroad rates and services, and rail carrier consolidations and mergers.</i>
<b>Bureau of Land Management</b>	<i>Approval authority over the use of public lands under their management.</i>
<b>Federal Highway Administration</b>	<i>Authority over the use of and/or modification of Interstate highway right-of-way.</i>
<b>National Park Service</b>	<i>Authority over the management and use of the Mojave National Preserve.</i>

**Lead Agency**

**Federal Railroad Administration (FRA)**



Federal Railroad Administration

**Private Applicant**

**DesertXpress Enterprise, LLC**



**Federal Highway Administration (FHWA)**



Federal Highway Administration

**Bureau of Land Management (BLM)**



**National Park Service (NPS)**



**Surface Transportation Board (STB)**



**Cooperating Agencies**

**Other Interested Parties**

**State and Local Governments**  
 Clark County, NV  
 San Bernardino County, CA  
 City of Victorville  
 City of Barstow  
 City of Las Vegas

**Interested Members of the Public**

**Federal Resource Agencies**  
 EPA  
 USACE  
 USFWS  
 and others

**California Department of Transportation (CALTRANS)**



**Nevada Department of Transportation (NDOT)**



**Native American Tribes**  
 Tribal Organizations

the Lead Agency during the scoping process and in developing information and preparing environmental analyses; the specific roles depend **on the agency's expertise and relationship** to the proposed action.

While not considered formal Cooperating Agencies, the California Department of Transportation (Caltrans) and the Nevada Department of Transportation (NDOT) also work closely with FRA throughout the EIS process. These agencies reviewed the proposed project and environmental analyses and provided comments and input on the overall process. FRA also conducted extensive consultation with Tribal organizations throughout all stages of the environmental review. **Chapter 4.0, Comments and Coordination**, of this Final EIS lists all of the agencies and tribal organizations that were consulted in the development of these documents.

Typically, for transportation projects, the Lead Agency is the agency that proposes a specific project or action to be evaluated. In the case of the DesertXpress project, DesertXpress Enterprises, LLC (the Applicant) is a private entity and has proposed to construct and operate the DesertXpress project. The Applicant is not associated with any federal, state, or local agency. The Applicant will secure financing and own the **high-speed train system and be responsible for the project's development, construction, operation, and maintenance**. Although the Applicant is a private entity, the Applicant is still required to comply with the NEPA process and obtain approval and permits from FRA and the Cooperating Agencies to construct and operate the DesertXpress project. Information provided by the lead and Cooperating Agencies and others during the environmental review process has informed the Applicant of the **project's development and design**.

### **How was the DesertXpress environmental review process conducted?**

The environmental process for the DesertXpress project began formally in July 2006. Scoping Meetings for the DesertXpress project were held in August 2006 and a Draft EIS was published on March 27, 2009.

The Draft EIS presented the reasonable range of alternatives for rail alignment, station site, maintenance facility, and train technology options and discloses the environmental effects of those alternatives. The Draft EIS described the alternatives, existing environmental settings, effects from construction, and operation, and mitigation measures to reduce or eliminate adverse environmental effects.

The Draft EIS informed decision makers, interested parties, and the public to about the differences and tradeoffs among various alternatives and options. The alternatives were **organized to allow for the Lead and Cooperating agencies to "mix and match"** by choosing various segments and site options in composing a Preferred Alternative.

The Draft EIS was circulated for 56 days for public review and comment. Public hearings were held in Las Vegas, Barstow, and Victorville to provide additional opportunity for the

public to comment on the Draft EIS. **Appendix F-A** of this Final EIS contains summary reports of the public hearings held for the Draft EIS.

Subsequent to the publication of the Draft EIS, the Applicant proposed several project modifications and additions to address comments received on the Draft EIS and to reduce or avoid significant environmental effects.

FRA prepared a Supplemental Draft EIS to evaluate the project modifications and additions, which included an additional station site option in Victorville, two new rail alignment options, modifications to the Victorville and Las Vegas maintenance facilities, and rail alignment adjustments.

FRA published the Supplemental Draft EIS on September 3, 2010 and circulated it for a 46 day public review period. FRA held public hearings on the Supplemental Draft EIS in Las Vegas and Barstow to provide additional opportunity for the public to comment.

**Appendix F-A** of this Final EIS contains summary reports of the public hearings held for the Supplemental Draft EIS.

The information presented in and the comments received on the Draft EIS and Supplemental Draft EIS were considered when preparing this Final EIS. Both documents are incorporated by reference. This Final EIS addresses any changes to the DesertXpress Project Draft EIS and Supplemental Draft EIS as a result of public or agency comments. This Final EIS also provides an evaluation of the environmental effects of the Preferred Alternative, which was selected by the Lead and Cooperating Agencies from the range of Action Alternatives presented in the Draft EIS and Supplemental Draft EIS. Mitigation measures for the Preferred Alternative are included to reduce or eliminate adverse environmental effects of the Preferred Alternative.

### What is the purpose of the DesertXpress project?

One of the most important aspects of NEPA is the requirement to define the “purpose and need” of a project. In other words—what is the project for? What need will it fulfill?

In this case, the purpose is to provide reliable and safe passenger rail transportation between southern California (Victorville) and Las Vegas.

It is estimated that the DesertXpress project would divert approximately 3 million annual automobile trips from Interstate 15 (I-15) each year. This transportation shift would reduce air pollutant emissions from

#### **Purpose of DesertXpress Project**

- *Provide reliable and safe high-speed passenger train service as alternative to auto or air travel in I-15 corridor*
- *Relieve congestion on I-15*
- *Improve air quality by diverting auto trips from I-15*
- *Improve safety, reliability, and convenience of travel in I-15 corridor*
- *Provide future capacity to meet growth projections*
- *Reduce transportation energy consumption*

automobiles, reduce fuel consumption for automobile use on the I-15 corridor, and limit the need to expand the I-15 highway. Future increases in ridership demand for the high-speed train would be handled by adding more trains to the service as needed.

In part, the need this project will address is the rapid increase in travel demand between southern California and Las Vegas that has placed increasing pressures on the highways and airports serving the region. For motorists traveling to Las Vegas from southern California, the major highway systems, including Interstate 215 (I-215), Interstate 10 (I-10), U.S. Route 395 (U.S. 95), Interstate 210 (I-210)/California State Route 210 (SR 210), and California State Route 138 (SR 138), converge with the I-15 freeway near Victorville. **Figure D** illustrates this transportation connection. The convergence of major transportation corridors funnels automobiles onto the I-15 freeway corridor, which results in traffic congestion on the I-15 freeway near Victorville and along the I-15 freeway corridor between Victorville and Las Vegas. The number of automobiles traveling on the I-15 corridor between these two locations has been steadily increasing and the projected growth will add more automobiles to the existing roadway system. It is estimated that approximately 75,000 automobiles will drive this portion of the I-15 freeway every day in 2015 and up to 100,000 automobiles per day in 2025.<sup>8</sup>

The need for the high-speed rail service also stems from safety concerns due to frequent accidents in the I-15 corridor; constraints to the expansion of air travel, such as expanding airports; and the lack of funding available to substantially widen or improve the I-15 to increase traffic capacity.

Refer to **Chapter 1.0, Purpose and Need**, of this Final EIS for further discussion of the purpose and need for the DesertXpress project.

The Applicant would be responsible for financing the development, construction, operation, and maintenance of the high-speed train. The estimated capital cost for the DesertXpress project would be approximately \$6 to \$6.5 billion.

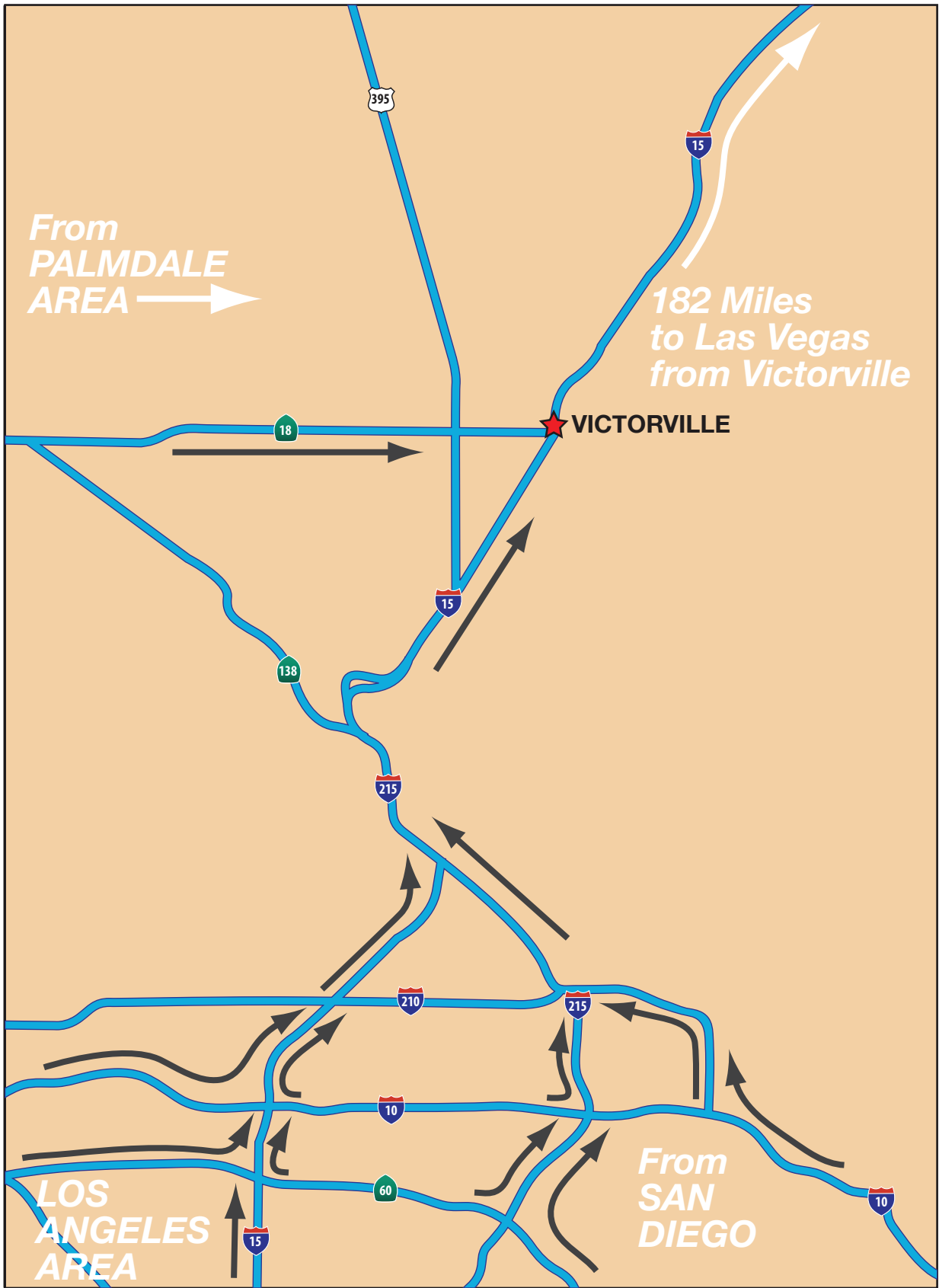
#### **Need for the DesertXpress Project**

- *High and increasing demand in the I-15 freeway corridor*
- *Accident frequency on I-15*
- *Constraints to expansion of air travel*
- *Environmental impacts of continued reliance upon the private automobile in I-15 corridor*
- *Lack of funding available to significantly widen or improve I-15*

While the project is privately sponsored, the applicant may become eligible for financial assistance from the federal government through a federal loan program, Railroad Rehabilitation and Improvement Financing (RRIF).

<sup>8</sup> Initial Study/Environmental Assessment, Victorville to Barstow-Add Southbound Mixed-Flow Lane, Caltrans, FHWA, County of San Bernardino, May 2001.





U. S. Department of Transportation  
**Federal Railroad Administration**

**DesertXpress  
 Final EIS**

*Converging Transportation  
 Corridors Near Victorville*

**FIG | D**

Source: Geografika Consulting, 2011.

## What alternatives were considered in the DesertXpress EIS?

The Draft EIS and Supplemental Draft EIS presented a reasonable range of alternatives for rail alignment, station site, maintenance facility, and train technology options. The alternatives were developed to allow for maximum flexibility in choosing a preferred alternative.

### No Action Alternative

NEPA requires consideration of a No Action Alternative. In other words, what would the environmental effects be if no action were taken? The No Action Alternative is used as a comparative baseline for the DesertXpress project. Under this scenario, the high-speed train and associated facilities would not be constructed.

Individuals traveling between southern California and Las Vegas would continue to use the existing forms of transportation, including driving their personal automobiles, utilizing public or private bus transportation, or traveling on airplanes.

The No Action Alternative also includes the planned and programmed improvements or reasonably foreseeable projects in the region between Victorville and Las Vegas through the long-range planning horizon year 2030. These projects are detailed in **Section 2.3.1.**

### Action Alternatives

Prior to publication of the Draft EIS, the FRA and the Applicant considered a number of alternative options for the DesertXpress project. Some of these alternatives were screened and eliminated from further evaluation based on technical and environmental criteria developed by the Applicant, FRA, and the Cooperating Agencies. The criterion included the following:

- Technical and alignment factors, such as connectivity and physical space constraints within the existing right-of-way (ROW)
- Ridership potential
- Constructability
- Environmental impacts
- Consistency with adopted plans and programs
- Conflicts with the transportation purposes of the I-15 freeway corridor.

A range of alternatives was identified to be evaluated in the Draft EIS and was refined and added to in the Supplemental Draft EIS. The alternatives were designed to allow the Lead and Cooperating Agencies to mix and match potential alternatives in selecting a Preferred Alternative. The alternatives evaluated in the Draft EIS and Supplemental Draft EIS are summarized below. Refer to **Chapter 2.0, Alternatives**, of this Final EIS for a detailed description of each alternative.

## Rail Alignments

The proposed rail alignments begin from station site options in Victorville and terminate at station site options in Las Vegas. Victorville was chosen as a logical termini for the rail alignment due to the collector effect of the major highway systems for southern California, which converge in Victorville, as depicted in **Figure D**. Due to the length of the proposed rail alignment between Victorville and Las Vegas, the DesertXpress project rail alignment has been divided into seven segments (Segments 1 through 7). **Figure A** shows the general boundaries of each rail alignment segment.

Alternative A options consists primarily of rail alignment segments that would be within the median of the I-15 freeway. Alternative B options consists primarily of rail alignment segments that would be within the fenced area of the I-15 freeway, adjacent to automobile travel lanes. In addition, a third alignment option was proposed for Segment 6 and 7, Option C. The Option C alignment would diverge from the I-15 corridor near the community of Sloan in unincorporated Clark County and generally follow, or be located within, the existing Union Pacific Railroad (UPRR) ROW.<sup>9</sup>

The rail alignment alternative options include a mixture of at-grade, elevated, depressed, or tunneled alignments.

## Station Site Options

The DesertXpress project would include one passenger station at each end of the rail alignment in Victorville and Las Vegas. Several station site options were considered in the Draft EIS and Supplemental Draft EIS.

Three station site options north of central Victorville and immediately west of the I-15 freeway were considered for the Victorville Station

- Victorville Station Site 1 (VV1)
- Victorville Station Site 2 (VV2)
- Victorville Station Site 3 (VV3)

Four station site options within close proximity to the Las Vegas strip were considered for the Las Vegas Station site.

- Las Vegas Central Station A
- Las Vegas Central Station B
- Las Vegas Southern Station
- Las Vegas Downtown Station

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<sup>9</sup> Option C would require approval by the UPRR.

Passengers would board and de-board the high-speed trains at the stations that would provide parking and passenger drop off facilities. The passenger stations would also include ticketing facilities, baggage handling, train boarding platforms, and waiting areas for train passengers. The Victorville Station site options would also include long-term parking facilities and hotel room check-in services for Las Vegas resorts.

### **Maintenance Facility Site Options**

Each station site option would be paired with a maintenance facility in Victorville and Las Vegas. Multiple site options were considered for the Victorville and Las Vegas maintenance facilities.

The maintenance facility paired with any of the three Victorville Station site options would be an operations, maintenance, and storage facility (OMSF). Two site options were considered:

- OMSF Site Option 1 (OMSF 1) would function with VV1 only
- OMSF Site Option 2 (OMSF 2) would function with any of the three Victorville Station site options.

The Las Vegas maintenance facility site options would serve as a maintenance and storage facility (MSF). Each maintenance facility would pair with any of the Las Vegas Station site options. Four site options were considered:

- Sloan Road MSF<sup>10</sup>
- Relocated Sloan Road MSF
- Wigwam Avenue MSF
- Robindale Avenue MSF

A third maintenance facility would be located near the midpoint of the rail alignment in Baker. This midpoint maintenance facility is referred to as the Baker Maintenance of Way (MOW) facility. Only one option was considered for the Baker MOW facility site.

### **Train Technology, Autotransformers, and Utility Corridors**

Trains run on many different forms of power. For the DesertXpress project, two different operating technologies were considered.

The first is referred to as the diesel-electric multiple unit train, or DEMU train technology. Under this option, small diesel engines under the floor of train cars. A diesel fuel supply would be required for this train technology. The diesel-electric powered trains would have a maximum speed of 125 miles per hour (mph).

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<sup>10</sup> The Supplemental Draft EIS evaluated the “Relocated Sloan MSF,” located approximately two miles south of the Sloan Road MSF considered in the Draft EIS. The Relocated Sloan MSF site location was developed in specific response to comments raised on the Draft EIS advising of potential conflicts between the Sloan MSF and planned transportation facilities in southern Clark County.

The second option is referred to as the electric multiple unit train, or EMU train technology. This train technology would exclusively use electricity to power the train motors. No on-board fuel would be required and the trains themselves would have no direct exhaust. EMU trains would travel at up to 150 miles per hour.

Trains would be at top speeds in areas where the tracks are generally straight and elevation changes are gradual. Where tracks would curve substantially, train speeds would be lower. And near stations, where trains would be taking off or slowing down, speeds would be lower still. **Figure E** shows a diagram of typical train speeds in different portions of the rail alignment.



***Typical Overhead Catenary***

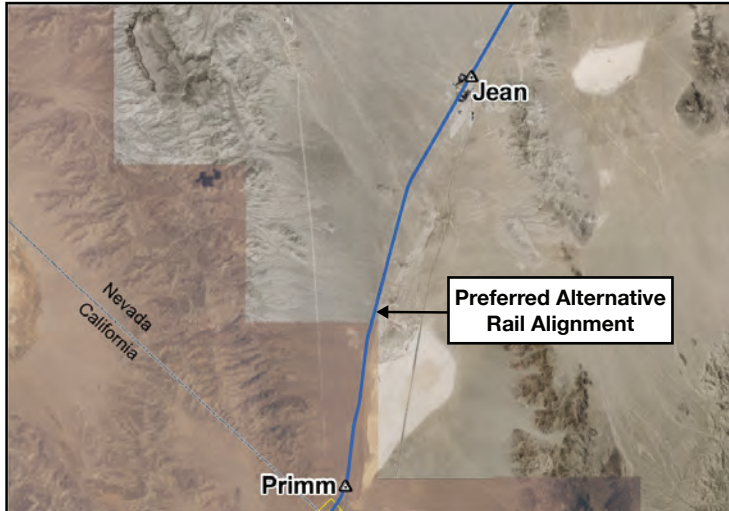
Overhead curved wires and supports (also referred to as catenary) would be required along the length of the rail alignment to provide continuous electric power to the trains. The photograph above shows a typical overhead catenary wire for a similar train system.

Three electrical substations would be required to provide power to the EMU option, with one at each end of the rail alignment and one near the midpoint. The photograph to the right shows a typical substation design. The substations would connect to existing electricity systems and would transmit and distribute power to the rail alignment. Two of the substations would be located within the Victorville and Baker maintenance facilities. In Las Vegas, the Sloan MSF site option would include a substation. The Wigwam Avenue MSF and Robindale Avenue MSF site options would function with a separate substation in the southern Las Vegas metropolitan Las Vegas area, known as the Frias Substation.



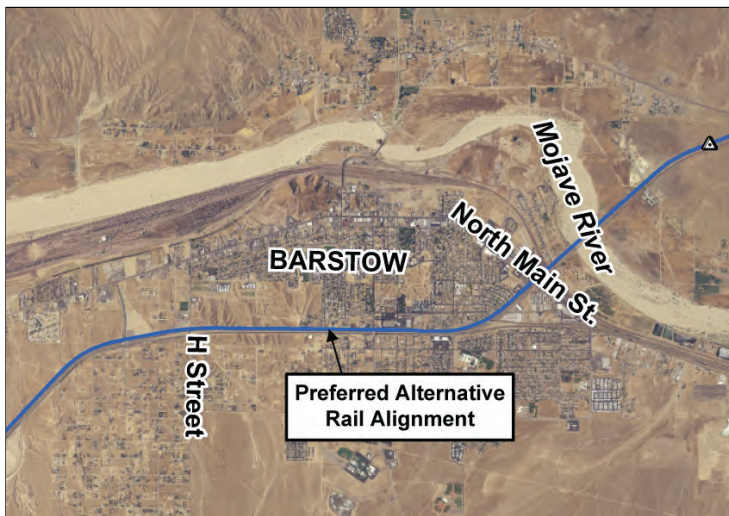
***Typical Electric Substation***

The substations at the Victorville, Baker, and Las Vegas Sloan Road maintenance facilities would require the construction of a new utility corridor with new overhead transmission lines to connection the substation to the nearest power source. The Frias Substation would be constructed immediately adjacent to overhead electrical transmission line and would not require a separate new utility corridor.



### TYPICAL STRAIGHTAWAY

Straightaways  
Speed: up to 150 mph



### TYPICAL CURVED SECTION

Curved Sections  
Speed: up to 110 mph



### TYPICAL STATION LOCATION

Within 0.5 miles of Station  
Speed: 35 mph



U. S. Department  
of Transportation  
**Federal Railroad  
Administration**

**DesertXpress  
Final EIS**

TYPICAL TRAIN SPEEDS

**FIG | E**

Source: Geografika Consulting, 2011.

Autotransformers, or small electrical units that maintain and regulate the voltage along the rail alignment, would also be required for the electric train option. The autotransformers would be spaced about every 10 to 12 miles along the rail alignment.

### **Temporary Construction Areas**

Temporary construction areas (TCA) refer to specified sites that would be used to store equipment or stage construction activities during construction of the DesertXpress project. The majority of the TCAs would be restored to their natural state after completion of project construction. Several TCAs would be located on part or entirely on proposed sites for stations and/or maintenance facilities. Each rail alignment alternative option includes a subset of associated TCAs.

### **What is the Preferred Alternative and why is it important?**

The Preferred Alternative is the project alternative that is favored by the agencies for approval and future construction. The Preferred Alternative is the alternative which FRA, Federal Highway Administration (FHWA), Bureau of Land Management (BLM), National Park Service (NPS) and the Surface Transportation Board's (STB) believe would most closely align with their statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors.

**Considerations for Agency Selection of Preferred Alternative**

*Environmental Effects*  
*Public and Agency Comments on Draft EIS and Supplemental Draft EIS*  
*Technical Feasibility*  
*Interagency Coordination*

As Lead Agency, FRA was responsible for considering the recommendations of Cooperating Agencies for the selection of the Preferred Alternative. FRA and the Cooperating Agencies have considered the range of alternatives presented in the Draft EIS and Supplemental Draft EIS when selecting the Preferred Alternative.

The Preferred Alternative is a 200-mile rail corridor between Victorville and Las Vegas consisting of the following rail alignments and station/maintenance facilities.

- **Rail Alignments**

- Segment 1
- Segment 2C Side Running
- Segment 3B (Modified)
- Segment 4C (*absent legislation allowing implementation of Segment 4A*)
- Segment 5B
- Segment 6B

- **Victorville Station Site Option:** Victorville Station Site 3, Parking Option B (VV3B)
- **Las Vegas Station Site Option:** Las Vegas Southern Station or Central Station B
- **Victorville OMSF Site Option:** OMSF 2
- **Las Vegas MSF Site Option:** Wigwam Avenue **MSF**
- **Las Vegas MSF Substation:** Frias Substation
- **Train Technology:** Electric (EMU)

Refer to **Chapter 2.0, Alternatives**, of this Final EIS for a full description of each Preferred Alternative component.

### **What are some of the areas of concern related to the DesertXpress project?**

NEPA requires an EIS to include a summary of the areas of controversy, including the issues raised by agencies and the public.<sup>11</sup> Areas of controversy are raised by agencies and the public during the formal scoping period, and during the public review of the Draft EIS and Supplemental Draft EIS. Some of the areas of controversy related to the DesertXpress project are provided below by environmental resource topic.

- **Biological Resources**
  - Adverse impacts to species and habitat areas
  - Use of sensitive lands, such as the Mojave National Preserve
- **Cultural Resources**
  - Potential effects related to pre-historic archeological resources
- **Growth**
  - Adverse economic effects to the City of Barstow
- **Noise and Vibration**
  - Noise impacts during construction and operation within populated areas, including Barstow and the greater Las Vegas area
- **Air Quality**
  - Emissions and localization of emissions associated with construction of the Preferred Alternative
- **Traffic and Transportation**
  - Extent of traffic-reducing benefits within in the Las Vegas area

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<sup>11</sup> Council on Environmental Quality Regulations, Section 1502.12.



Refer to **Sections 3.1, Land Use and Community Impacts**, through **Section 3.16, Cumulative Impacts**, of this Final EIS for a full description of the environmental impacts and mitigation measures related to the areas of controversy listed above.

### What are some of the environmental effects of the DesertXpress project?

This Final EIS provides an evaluation of the environmental effects associated with the Preferred Alternative. The box to the right lists the environmental resource areas considered of note.

The Preferred Alternative would have both negative (adverse) and positive (beneficial) impacts on the environment. Avoidance, minimization, and mitigation measures are provided to reduce or eliminate adverse environmental effects.

#### Potential Effects

The potential effects, both beneficial and adverse, of the Preferred Alternative are summarized below.

#### **Environmental Resource Areas**

*Land Use and Community Impacts*  
*Growth*  
*Farmlands and Grazing Lands*  
*Utilities/Emergency Services*  
*Traffic and Transportation*  
*Visual Resources*  
*Cultural and Paleontological Resources*  
*Hydrology and Water Quality*  
*Geology and Soils*  
*Hazardous Materials*  
*Air Quality and Global Climate Change*  
*Noise and Vibration*  
*Energy*  
*Biological Resources*

**Table 1** summarizes the comparable effects of the Preferred Alternative and the No Action Alternative for the DesertXpress project and follows the topical discussion of potential effects below.

The Preferred Alternative has the potential to adversely affect sensitive biological resources, cultural resources, hydrologic resources, localized traffic near stations, land use and community impacts, including business displacement, utility water supply and service, noise level increase, air quality pollutant emissions during construction, and existing grazing land allotments. However, mitigation measures will be required that will reduce these potential adverse effects. In addition, the Preferred Alternative will have beneficial environmental effects, such as traffic diversion from I-15 freeway, economic growth, air quality improvements during operation, and energy consumption improvements during operation.

#### Land Use and Community Impacts

The land use and community impacts analysis identifies existing regional and local land use and development plans that apply to the project area. It describes the changes that would occur as a result of the Preferred Alternative, evaluates the consistency of the Preferred Alternative with local and regional planning documents, and discusses the effects on community cohesion. While the Preferred Alternative would not displace any housing units or local residents, the Preferred Alternative Las Vegas Station (Central

Station B) and Las Vegas maintenance facility (Wigwam Avenue MSF) would displace existing businesses. The Preferred Alternative Las Vegas Station would displace existing industrial uses on the site, including staging and storage areas and a large warehouse with **an indoor “kart” racing facility**. **The Preferred Alternative Las Vegas maintenance facility** would also result in the displacement of two landscape and garden design businesses. The Applicant would be responsible for complying with the appropriate federal and state laws pertaining to the displacement of these businesses.

**Section 3.1, Land Use and Community Impacts**, of this Final EIS describes these environmental effects and associated mitigation measures in detail.

### **Growth**

The Victorville and Las Vegas stations and maintenance facilities would provide new permanent job opportunities and would bring employees to the area. As a result, this could cause an increase in spending in the area, thus contributing to the growth in the local economy.

Construction of the Preferred Alternative would also result in temporary construction jobs. It is assumed that these jobs would be filled by individuals living within the project region and would not result in significant permanent relocation of construction workers from outside the project area. Thus, the new construction jobs would have a beneficial effect on local employment and growth. Barstow would be the most central city for construction of the Preferred Alternative, particularly for the 113-mile stretch of the rail alignment between Barstow and Primm. During the construction period of the Preferred Alternative, it is assumed that a significant share of the temporary construction jobs and associated revenue created by the DesertXpress project in San Bernardino County would flow into Barstow and its immediate environs. The salaries of these construction workers could also contribute to additional economic growth in the area.

**Operation of the Preferred Alternative would have a downward influence on Barstow’s economic growth.** The Barstow economy is largely driven by taxable retail sales from freeway-related traffic on the I-15 freeway. With the anticipated shift of non-truck freeway-related traffic to the high-speed passenger train, the DesertXpress project would **have an indirect negative growth effect to Barstow’s economy during operation**. While this is a potential adverse economic growth effect to Barstow, it is not at a level that would result in secondary physical environmental effects to the city.

**Section 3.2, Growth**, of this Final EIS describes these environmental effects in detail.

### **Grazing Land**

The analysis of grazing lands considers the potential for the Preferred Alternative to eliminate or sever grazing land activities on specified grazing land allotments. The Preferred Alternative would cross through several designated grazing land allotments in California. There are no grazing land allotments within the vicinity of the Preferred

Alternative in Nevada. The Preferred Alternative rail alignment and Victorville station and maintenance facilities would result in the permanent conversion of grazing land to transportation uses. Some areas of the Preferred Alternative rail alignment near the Mojave National Preserve would also introduce a new linear barrier within an existing grazing allotment, which could cut off livestock access to available water resources. The Preferred Alternative rail alignment would hinder the crossing of livestock in the area, which could result in the overuse of the Mojave National Preserve for grazing activities, thereby representing an adverse effect. Mitigation would be implemented to minimize effects to grazing land and activities.

**Section 3.3, Farmlands and Grazing Lands**, of this Final EIS describes these environmental effects and associated mitigation measures in detail.

### **Utilities/Emergency Service**

The utilities/emergency services analysis identifies the existing public service and utility providers in the vicinity of the Preferred Alternative's track infrastructure and associated project stations, maintenance facilities, and other features to be constructed and operated. The services evaluated in this section include electricity and gas, water, wastewater facilities, and solid waste providers as well as police, fire, and emergency response. The Preferred Alternative Victorville Station (VV3) and maintenance facility (OMSF 2) would not be adequately served by existing Victorville Water Department facilities due to their distance from existing water mains. The nearest existing water facility is approximately 7 miles south at a substantially lower elevation. The existing main does not extend far enough to serve VV3 and OMSF 2. Therefore, the Preferred Alternative would require the construction and/or expansion of new water facilities, including storage facilities, wells, and/or transmission and distribution pipelines. Mitigation, including the payment of connection and/or user/service/tipping fees, would be implemented to reduce adverse effects related to utilities and emergency services.

**Section 3.4, Utilities/Emergency Services**, of this Final EIS describes these environmental effects and associated mitigation measures in detail.

### **Traffic and Transportation**

The traffic and transportation analysis examines existing and future conditions of the Preferred Alternative and quantifies the long-term transportation impacts of the Preferred Alternative. The Preferred Alternative would provide an alternative to automobile transportation between Victorville and Las Vegas along the I-15 corridor. Future I-15 freeway traffic volumes would be reduced after construction of the Preferred Alternative. With fewer vehicles on the roadway, congestion along the I-15 freeway between Victorville and Las Vegas would be reduced and traffic operations would be improved, representing a beneficial effect to the I-15 freeway traffic volumes.

By reducing the number of automobiles on I-15, the project could potentially reduce the accident rate, thus improving traffic safety. Along the California portion of the I-15 corridor between 2003 and 2005, the fatal accident rate has exceeded statewide averages for highway facilities, particularly for the portion of I-15 between Barstow and the Nevada state line.<sup>12</sup> Given the relatively low resident population in this portion of the corridor, the data suggest that a disproportionate number of fatalities are related to longer-distance travel between Southern California and the Las Vegas Area. In Nevada, traffic accident data gathered from 2003 through 2006 suggests that congestion is a key factor in the number and type of accidents. In the stretch of I-15 between the Nevada state line and Spring Mountain Road, nearly 50 percent of the traffic accidents in between 2003 and 2006 were rear-end collisions. Congestion can be a key factor in increasing the rate of rear-end collisions. On a more lightly traveled freeway, a vehicle would more likely pass another rather than follow too closely.<sup>13</sup>

FHWA identified potential risks to freeway traffic created by locating the Preferred Alternative within the I-15 ROW. Existing freeway conditions were considered, as well as other planned and programmed transportation improvement projects, and compared to the proposed alignment of the high speed passenger railroad. Features of the Preferred Alternative would be new obstacles on the roadside and present a potential increase in the severity of run-off-road crashes. They may also obstruct drivers' **sight distances, thus** reducing the amount of time drivers have to perceive and react to changing roadway conditions. The presence of trains running in the highway right-of-way, and especially the train lights, could also become a visual distraction for motorists where none exist today. Mitigation, including the placement of visual barriers, would be implemented to reduce adverse effects related to safety risks created by locating the Preferred Alternative within the I-15 ROW.

Operation of the Preferred Alternative would result in increased localized traffic near the Victorville and Las Vegas Station sites, as travelers would drive to the stations to drop off or pick up passengers or to utilize the long-term parking areas. This would result in congestion along local roadways and increased waiting times at local intersections. Near Victorville, the increased traffic would also worsen congestion and traffic delays at the I-15/Dale Evans Parkway interchange. In Las Vegas, the increase traffic would worsen congestion and traffic delays at the nearby I-15 interchanges on West Tropicana and Flamingo Road. These intersections and I-15 freeway on- and off-ramps would be considered to function at unacceptable levels, whereby the delay and congestion would exceed local standards of traffic operations.

**Section 3.5, Traffic and Transportation**, of this Final EIS describes these environmental effects and associated mitigation measures in detail.

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<sup>12</sup> Korve Engineering, 2006.

<sup>13</sup> Korve Engineering, 2006.

## **Cultural Resources**

The cultural resources analysis evaluates the archeological and historic resources in the vicinity of the Preferred Alternative, along with associated federal, state, and local regulations pertaining to these. Due to its primarily undeveloped nature, the Mojave Desert area between Victorville and Las Vegas contains a collection of cultural resources, including sensitive archaeological sites and cultural landscape features. Construction of the Preferred Alternative would involve extensive ground disturbing activities. These activities would directly affect sensitive cultural resource sites since portions of the properties would be disturbed. This ground disturbance coupled with the presence of high-speed trains would also result in adverse indirect effects related to noise and visual effects. These adverse effects to cultural resources would be primarily limited to the undeveloped areas between Victorville and Las Vegas. Mitigation, including archaeological investigation and monitoring, would be incorporated to reduce all adverse effects to cultural resources.

**Section 3.7, Cultural and Paleontological Resources**, of this Final EIS describes these environmental effects and associated mitigation measures in detail.

## **Hydrology and Water Quality**

The hydrology and water quality analysis evaluates the direct, indirect, and residual impacts from construction and operation of Preferred Alternative to drainages, including the Mojave River, ephemeral washes, ditches, and the 100-year floodplain in the vicinity of the project area. The Preferred Alternative would cross Bell Mountain Wash, the Mojave River, and a number of named and unnamed ephemeral washes along the corridor. A subset of the water resources identified above meet the qualifications to be considered “waters of the United States”.<sup>14</sup> Construction of Preferred Alternative would directly affect waters of the United States. The Preferred Alternative would not permanently affect wetlands, as no wetlands were found in the area. Mitigation, including restoring impacted ephemeral drainages through the reestablishment of former ephemeral drainages to compensate for temporary construction impacts to waters of the United States, would be incorporated to reduce or mitigate adverse effects related to hydrology and water quality.

**Section 3.8, Hydrology and Water Quality**, of this Final EIS describes these environmental effects and associated mitigation measures in detail.

## **Air Quality**

The Preferred Alternative would provide an alternative to automobile travel on the I-15 corridor between Victorville and Las Vegas. Motorists who would have normally driven their automobile along the I-15 corridor would now have the opportunity to ride the high-speed train, resulting in the diversion of vehicles from the I-15 freeway. As compared to

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<sup>14</sup> This term is defined within the Clean Water Act at 40 CFR 230.3(s).

the No Action Alternative, the Preferred Alternative would result in an overall decrease in pollutant emissions in the region. The reduction in automobile pollutant emissions is assumed to be greater than the new pollutant emissions associated with the Preferred Alternative and the Preferred Alternative would therefore have a beneficial effect in regards to air quality through operation.

In addition to long-term impacts to regional air quality during operation, the air quality analysis considers potential short-term impacts to regional air quality during construction. Construction of the Preferred Alternative would temporarily generate pollutant emissions from dust, construction equipment emissions, and pollutant emissions from paving and painting. Nearby sensitive receptors, such as residential developments in Barstow, Yermo, and Las Vegas, could be temporarily affected by the pollutant emissions during construction of the Preferred Alternative, representing a short-term adverse effect. Mitigation would be implemented to control construction emissions to alleviate the adverse air quality effects during construction.

**Section 3.11, Air Quality and Global Climate Change**, of this Final EIS describes these environmental effects and associated mitigation measures in detail.

### **Noise and Vibration**

The noise analysis considers noise levels associated with construction and future operation of the Preferred Alternative. The analysis compares the existing noise environment in the project area to predicted future noise levels. The Preferred Alternative would result in increased noise levels associated with passing trains on the rail alignment and increased activity and traffic near the station and maintenance facilities in Victorville and Las Vegas. The increased noise levels associated with passing trains on the Preferred Alternative rail alignment would be limited to sensitive noise-receptors, including residential uses and hotels/motels, within Barstow, Yermo, and the metropolitan Las Vegas area. Implementation of 4-foot high noise barriers along the rail alignment would reduce these adverse noise effects associated with train operation and all adverse effects would be fully mitigated. No other noise-sensitive receptors outside of these urban areas are in close enough proximity to the Preferred Alternative rail alignment to be affected by the train noise.

**Section 3.12, Noise and Vibration**, of this Final EIS describes these environmental effects in and associated mitigation measures detail.

### **Energy Consumption**

Operation of the Preferred Alternative would result in lower energy consumption when compared to the No Action Alternative. The reduction in the number of automobiles driving on the I-15 freeway would reduce gasoline consumption and result in a net decrease in energy use, as defined by the amount of barrels of oil needed to serve the region.

**Section 3.13, Energy**, of this Final EIS describes these environmental effects in detail.

**Biological Resources**

The biological resources analysis examines the sensitive plant and wildlife species and associated habitats in the vicinity of the Preferred Alternative. The Preferred Alternative would cross through areas of sensitive biological resources and would result in the permanent conversion of lands identified as sensitive habitat area. Specifically, the Preferred Alternative would result in the permanent loss of native vegetation communities, sensitive plant communities, and special-status plant populations in areas where permanent project features would be located. The Preferred Alternative would also result in the permanent loss of desert tortoise habitat, suitable habitat for the Mohave ground squirrel, and areas defined as special management lands by the BLM. The Preferred Alternative rail alignment and facilities would also cross or bisect existing washes in the project area, which could be defined as Waters of the US and could support special status species habitat. Mitigation would be incorporated to reduce these adverse effects or require the relocation or replacement of sensitive species or habitat.

**Section 3.14, Biological Resources**, of this Final EIS describes these environmental effects and associated mitigation measures in detail.

Table 1 Comparative Effects, Preferred Alternative Versus No Action Alternative

Environmental Topic	Preferred Alternative	No Action Alternative
<b>Land Use and Community Impacts</b>		
Compatibility with adjacent land uses	Varies from Low to High depending on location	High
Compatibility with land use plans	Varies from Low to High depending on location	High
Number of housing units displaced	0	Unknown
Extent of community disruption/severance	None expected	None expected
Number of environmental justice (EJ) communities crossed by or within one mile of facilities	At least 16 EJ census blocks crossed by rail alignment and facilities	Expected to be similar to Preferred Alternative
<b>Growth</b>		
Estimated permanent employment	About 722 jobs system-wide	None expected
Removal of obstacles to growth	None expected	None expected
Extent of effects to TOD potential	Beneficial effects at Victorville and LV passenger station sites	None expected
Extent of effects to economic vitality	Short-term beneficial effects through construction employment Long-term adverse effects to communities with economies tied to auto travel, but not at substantial level. Voluntary mitigation included.	None expected
<b>Farmlands and Grazing Lands</b>		
Acres of directly impacted farmland	0	None to minimal expected
Acres of Indirectly impacted farmland	0.008	Expected to be similar to Preferred Alternative
Potential severance of grazing allotment	Yes, but can be mitigated	None expected



Environmental Topic	Preferred Alternative	No Action Alternative
<b>Utilities/Emergency Services</b>		
Exceed capacity of utility or service systems:		
Electricity and gas	Trains would require electrical power for vehicle propulsion and energy at facilities, but no exceedance of capacity expected	Not expected
Water supply	Stations and maintenance facilities will require water, but not in excess of known available supply	Not expected
Sewage/wastewater	Stations and maintenance facilities would require connections and/or new conveyances	Not expected
Stormwater	Alignment areas would intertie with existing systems. Stations and maintenance facilities would require connections and/or new conveyances	Not expected
Solid waste	Stations and maintenance facilities would generate waste, but not in excess of landfill capacities	Not expected
Police services	New staff near station locations	Not expected
Fire/emergency services	New staff, equipment, and/or facilities required	Not expected
Potential conflict with existing utility distribution systems	Yes, but conflicts can be mitigated	Similar to Preferred Alternative: assumed that conflicts may occur but mitigation possible.

Environmental Topic	Preferred Alternative	No Action Alternative
<b>Traffic and Transportation</b>		
Result in substantial traffic increases:		
Freeway mainlines	Between Victorville and I-40, traffic reduction associated of up to 1400 vehicles/hour during peak hours by 2030.	LOS would degrade from D to F between Victorville and I-40. LOS would degrade between I-40 and the Nevada state line. LOS would degrade between Primm and Sloan. LOS would degrade between Sloan and I-215.
Intersections near station areas	Project traffic would contribute to traffic impacts at intersections near the Victorville and Las Vegas stations, but mitigation incorporated improves all to an acceptable Level of Service (LOS).	None expected
<b>Visual Resources</b>		
Extent of consistency with BLM VRM objectives	Varies depending on location	Consistent if impacts remain in existing corridor
Effect to FHWA visual quality sensitivity with project	Varies depending on location	Consistent if impacts remain in existing corridor
<b>Cultural and Paleontological Resources</b>		
Number of Eligible or Assumed Eligible Archaeological Resources Directly Affected	165	Assumed to be same as Preferred Alternative
Number of Eligible or Assumed Eligible Archaeological Resources Indirectly Affected	63	Assumed to be same as Preferred Alternative
Number of Historic Architectural Resources Directly/Indirectly Affected	0	Assumed 0

Environmental Topic	Preferred Alternative	No Action Alternative
<b>Hydrology and Water Quality</b>		
Linear feet of permanent impact to water resources	20,850.53	Varies depending on location
Acres within a 100-year floodplain	51.68 (terminating at Las Vegas Southern Station)	Varies depending on location
	57.48 (terminating at Las Vegas Central Station B)	
Result in substantial drainage pattern alteration	Yes for Victorville Station and OMSF and Autotransformers #7 and #11. Mitigation available.	Not expected
Estimated peak stormwater discharge (cubic feet/second)	462.5 (terminating at Las Vegas Southern Station)	n/a
	417.5 (terminating at Las Vegas Central Station B)	
<b>Geology and Soils</b>		
Expected Likelihood of Surface Fault Rupture	Varies; high in areas near Victorville and Barstow and between Yermo and Baker	Similar to Preferred Alternative
Expected Likelihood of Ground Shaking	Varies depending on location	Similar to Preferred Alternative
Expected Difficulty of Excavation	Varies from moderate to high depending on location	Similar to Preferred Alternative
Expected Likelihood of Landslides	Varies depending on location	Similar to Preferred Alternative
<b>Hazardous Materials</b>		
Number of Properties of Environmental Concern	21 total with Central Station B; 20 if Southern Station selected	Assumed to be same as Preferred Alternative with Southern Station – 20

Environmental Topic	Preferred Alternative	No Action Alternative
<b>Air Quality and Global Climate Change</b>		
Exceed a State or Federal Standard?	No	Not expected
Result in CO Hotspot?	No	Not expected
Expected Adverse Construction Period Impact?	Yes	Not expected
<b>Noise and Vibration</b>		
Expected Number of Impacts Under FRA Criteria	83	Anticipated Noise Increase, Impacts Not Quantified
Expected Number of Severe Impacts Under FRA Criteria	45 (terminating at Las Vegas Southern Station) 46 (terminating at Las Vegas Central Station B)	Anticipated Noise Increase, Impacts Not Quantified
Expected Number of Vibration Impacts	0	Anticipated Construction Vibration, Impacts Not Quantified
<b>Energy</b>		
Result in Significant Change in Energy Consumption?	Diversion to train use would reduce annual energy consumption related to No Action Alternative by an equivalent of 444,900 barrels of oil.	Would result in annual energy consumption of 449,000 more barrels of oil than the Preferred Alternative
<b>Biological Resources</b>		
Impose Barrier to wildlife movement	Yes, outside I-15 freeway corridor	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor
Number of stream crossings	About 300	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor

<b>Environmental Topic</b>	<b>Preferred Alternative</b>	<b>No Action Alternative</b>
<b>Sensitive plant community acreage affected</b>		
Permanent	84 (Joshua Tree), 3.9 (Mesquite), 4.6 (Mojave creosote)	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor
Temporary	194 (Joshua Tree), 16.1 (Mesquite)	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor
<b>Desert Tortoise habitat acreage affected</b>		
Permanent	1509.8	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor
Temporary	4,135.2	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor
<b>Mohave Ground Squirrel habitat acreage affected</b>		
Permanent	447.38	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor
Temporary	562.45	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor

Environmental Topic	Preferred Alternative	No Action Alternative
Potential to result in direct mortality/loss/disturbance to:		
Mojave Fringe-toed Lizard	3.6 permanent; 8.3 temporary	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor
Nesting raptors/migratory birds	Yes for all rail alignments, Yes at Baker MOW	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor
Banded Gila Monster	Yes for Segment 3B and Segment 4C	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor
Burrowing Owls	1,509.8 permanent; 4,135.2 temporary	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor
Roosting Bats	Yes for Segment 1, Segment 3B, Segment 4C, Segment 5B, and Segment 6B	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor
American Badger	1,509.8 permanent; 4,135.2 temporary	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor
Desert Bighorn Sheep	57.3 permanent; 239.1 temporary	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor
Clark County MSHCP Covered Reptiles	248.4 permanent; 821.4 temporary	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor
Acres of Special Management Lands Converted	249.97 (Superior Cronese) 202.98 (Ivanpah) 208.32 (Superior-Cronese DWMA) 103.02 (Shadow Valley DWMA) 3.6 (Cronese ACEC)	Assumed to be similar to Preferred Alternative rail segments within the I-15 corridor

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<b>Environmental Topic</b>	<b>Preferred Alternative</b>	<b>No Action Alternative</b>
<b>Section 4(f) Evaluation</b>		
Number of Section 4(f) properties used		
Park and Recreation	0	0
Cultural Resources	0	0

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Source: CirclePoint, 2011.

## List of Acronyms

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AAA:	Alignment adjustment area
AADT:	Annual average daily traffic
ACEC:	Area of critical environmental concern
ACHP:	Advisory Council on Historic Preservation
ADT:	Average Daily Traffic
APE:	Area of Potential Effects
AQMD:	South Coast Air Quality Management District
AREMA:	American Railway Engineering Maintenance of Way Association
AT&SF:	Atchison Topeka & Santa Fe
BA:	Biological Assessment
BFPD:	Barstow Fire Protection District
BLM:	Bureau of Land Management
BMP:	Best management practices
BNSF:	Burlington Northern Santa Fe Railroad
BO:	Biological Opinion
BTU:	British thermal units
BUR:	Bob Hope Airport
Caltrans:	California Department of Transportation
CARB:	California Air Resources Board
CCDOA:	Clark County Department of Aviation
CCFD:	Clark County Fire Department
CCWRD:	Clark County Water Reclamation District
CDCA:	California Desert Conservation Area
CDFG:	California Department of Fish and Game



CDWR:	California Department of Water Resources
CEQ:	Council on Environmental Quality
CEQA:	California Environmental Quality Act
CFR:	Code of Federal Regulations
CH <sub>4</sub> :	methane
CHP:	California Highway Patrol
CHRIS:	California Historical Resources Information System
CHSR:	California High-Speed Rail project
CIWMB:	California Integrated Waste Management Board
CMP:	Congestion Management Plan
CNPS:	California Native Plant Society
CO:	carbon monoxide
CO <sub>2</sub> :	carbon dioxide
CO <sub>2</sub> e:	carbon dioxide equivalents
CRF:	Code of Federal Regulations
CWA:	Clean Water Act
DAQEM:	Clark County Department of Air Quality & Environmental Management
dB:	decibels
dBA:	A-weighted noise measurement
DEMU:	Diesel electric multiple unit
DOI:	U.S. Department of Interior
DWMA:	Desert wildlife management area
EB:	Eastbound
EIR:	Environmental Impact Report
EIS:	Environmental Impact Statement
EITP:	Eldorado-Ivanpah Transmission Project
EMM:	Electricity Market Modular
EMU:	Electric multiple unit
EPA:	Environmental Protection Agency

ESA:	Endangered Species Act
ESA:	Environmental Site Assessment
FAA:	Federal Aviation Administration
FERC:	Federal Energy Regulatory Commission
FHWA:	Federal Highway Administration
FLPMA:	Federal Land Policy and Management Act
FMMP:	Farmland Mapping and Monitoring Program
FONSI:	Finding of No Significant Impact
FRA:	Federal Railroad Administration
GHG:	greenhouse gas
GPS:	global positioning system
GW:	gigawatt
HABS/HAERS:	Historic American Buildings Survey/Historic American Engineering Record
HCP:	Habitat Conservation Plan
HEC-RAS:	Hydraulic Engineering Centers-River Analysis System
HMA:	Hazardous Material Assessment
HOT:	High occupancy toll lane
HOV:	High-occupancy vehicle lane
HPTP:	Historic Property Treatment Plan
HSP:	Health and Safety Plan
I-10:	Interstate 10
I-15:	Interstate 15
I-210:	Interstate 210
I-215:	Interstate 215
I-40:	Interstate 40
I-515:	Interstate 515
ICC:	Interstate Commerce Commission
ICCTA:	Interstate Commerce Commission Termination Act

in/sec:	inches per second
ISEGS:	Ivanpah Solar Electric Generating System project
ITS Project:	<b>NDOT's Intelligent Transportation System Project</b>
kV:	kilovolt
LADWP:	Los Angeles Department of Water and Power
LAMP:	Landscape and Aesthetics Master Plan
LAS:	McCarran International Airport
LAWA:	Los Angeles World Airports
LAX:	Los Angeles International Airport
lb/sq. ft.:	pounds per square feet
L <sub>dn</sub> :	Day-Night Sound Level Equivalent
L <sub>eq</sub> :	equivalent continuous noise level
LGB:	Long Beach Airport
LOS:	Level of Service
L RTP:	Long Range Transportation Plan
LUST:	leaking underground storage tank
LVFR:	Las Vegas Fire and Rescue
LVMC:	Las Vegas Monorail Company
LVPWD:	Las Vegas Public Works Department
LVVWD:	Las Vegas Valley Water District
MAGLEV:	High-speed magnetic levitation system
MAX:	Metropolitan Area Express
MDAB:	Mojave Desert Air Basin
MDAQMD:	Mojave Desert Air Quality Management District
METRO:	Las Vegas Metropolitan Police Department
MMBTU:	million British thermal units
MND:	Mitigated Negative Declaration
MOW:	Maintenance of Way Facility
mph:	miles per hour

mph/s:	miles per hour/second
MPO:	Metropolitan Planning Organization
MSF:	Maintenance and storage Facility
MSHCP:	Clark County Multiple Species Habitat Conservation Plan
MW:	megawatt
N <sub>2</sub> O:	nitrous oxide
NAAQS:	National Ambient Air Quality Standards
NAC:	Nevada Administrative Code
NAGPRA:	Native American Graves Protection and Repatriation Act
NB:	Northbound
NDEP:	Nevada Division of Environmental Protection
NDOT:	Nevada Department of Transportation
NDOW:	Nevada Department of Wildlife
NEPA:	National Environmental Policy Act
NHP:	Nevada Highway Patrol
NHPA:	National Historic Preservation Act
NO <sub>2</sub> :	nitrogen dioxide
NOA:	Notice of Availability
NOI:	Notice of Intent
NPDES:	National Pollutant Discharge Elimination System
NPS:	National Park Service
NRS:	Nevada Revised Statutes
O <sub>3</sub> :	Ozone
OCC:	Operations Control Center
OEA:	<b>Surface Transportation Board's Office of Environmental Analysis</b>
OHV:	off-highway vehicle
OMSF:	Operations, maintenance, and storage facility
OMSF 1:	OMSF Site Option 1
OMSF 2:	OMSF Site Option 2

ONT:	LA/Ontario International Airport
PA:	Programmatic Agreement
PID:	photoionization detectors
PLSS:	Public Lands Survey System
POA:	Plan of Action
PM <sub>10</sub> :	Particulate matter 10
ppm:	parts per million
PPV:	peak particle velocity
PRC:	Public Resources Code
RMP:	Resource Management Plan
ROC:	reactive organic compounds
ROD:	Record of Decision
ROW:	right-of-way
RRIF:	Railroad Rehabilitation and Investment Financing Program
RSMSE:	Relocated Sloan Road MSF
RTC:	Regional Transportation Commission of Southern Nevada
RTIP:	Regional Transportation Improvement Program
RTP:	Regional Transportation Plan
SAFETEA-LU:	Safe Accountable Flexible Efficient Transportation Equity Act; A Legacy for Users
SAN:	San Diego International Airport
SANBAG:	San Bernardino Associated Governments
SB:	Southbound
SBCFD:	San Bernardino County Fire Department
SBCSD:	<b>S an Bernardino County Sheriff's Department</b>
SCAG:	Southern California Associated of Governments
SCE:	Southern California Edison
SGC:	Southwest Gas Corporation
SHPO:	State Historic Preservation Officer

SNA:	John Wayne Airport
SNSA:	Southern Nevada Supplemental Airport
SPCCP:	Spill prevention, control, and countermeasure plan
SR 138:	California State Route 138
SR 14:	California State Route 14
SR 160:	Nevada State Route 160
SR 18:	California State Route 18
SR 210:	California State Route 210
SR 58:	California State Route 58
STB:	Surface Transportation Board
STIP:	State Transportation Improvement Plan
SVP:	Society of Vertebrate Paleontology
SWPPP:	Stormwater pollution prevention plan
TAC:	toxic air contaminant
TCA:	Temporary construction area
THPO:	Tribal Historic Preservation Officer
TIA:	Traffic Impact Analysis
TIP:	Transportation Improvement Program
TMT:	Train-mile traveled
TOD:	Transit-oriented development
U.S. 395:	U.S. Route 395
U.S. 95:	U.S. Route 95
U.S.C.:	United States Code
UNLV:	University of Nevada Las Vegas
UPRR:	Union Pacific Railroad
USACE:	U. S. Army Corps of Engineers
USDOE:	U.S. Department of Energy
USDOT:	U.S. Department of Transportation
USFWS:	U. S. Fish and Wildlife Service

USGS:	U.S. Geological Survey
UST:	Underground storage tank
VdB:	vibration decibels
VMT:	vehicle miles travels
VOC:	volatile organic compound
VV1:	Victorville Station Site 1
VV2:	Victorville Station Site 2
VV3:	Victorville Station Site 3
VV3A:	Victorville Station Site 3, Option A
VV3B:	Victorville Station Site 3, Option B
VVWRA:	Victor Valley Wastewater Reclamation Authority
VWD:	Victorville Water District
WB:	Westbound
WSA:	Water Supply Assessment