An Application Seeking Funding Under the Federal Railroad Administration's Federal-State Partnership Program

Vista Road Crossing Closure and Grade Separation Project

Appendix A: Attachment 2 – Project Specific Terms and Conditions

Applicant:
San Bernardino County

SAN BERNARDINO COUNTY

January 7, 2026

Attachment 2

PROJECT-SPECIFIC TERMS AND CONDITIONS

Version Date: April 30, 2025

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Project-Specific Terms and Conditions
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ARTICLE 1: PROJECT-SPECIFIC DESIGNATIONS

1.1 Recipient

This Agreement (Agreement) is between the Federal Railroad Administration (FRA) and San Bernadino County (the Recipient).

1.2 Project and Purpose

The purpose of this award is to fund a Federal-State Partnership for Intercity Rail (FSP) grant for the Vista Road Crossing Closure and Grade Separation Project (the Project), as described in Article 4 of this Attachment 2, to help achieve the goals identified in the Notice of Funding Opportunity for Federal-State Partnership for Intercity Passenger Rail Program For Projects Not Located on the Northeast Corridor (FSP-National) that solicited applications for Federal financial assistance. FRA and the Recipient will accomplish that purpose by timely completing the Project and ensuring that this award does not substitute for non-Federal investment in the Project, except as proposed in the Application.

1.3 Program Designations

(a) Research and Development. This award is not for research and development.

(b) Project Size. This award is for a non-Major Project as that term is defined in FRA Guidance on Development and Implementation of Railroad Capital Projects, January 11, 2023 (Railroad Capital Projects Guidance).

(c) Phased Funding. This award is not a phased funding agreement as further discussed in Section 6.7 of this Attachment 2.

(d) Grant or Cooperative Agreement. This award is made as a Grant Agreement.

(e) Security Risk. This award is for a Project that has a low security risk.

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ARTICLE 2: SPECIAL TERMS AND CONDITIONS

There are no special terms for this award.

ARTICLE 3: ADMINISTRATIVE INFORMATION

3.1 Application

Application Title: Vista Road Crossing Closure and Grade Separation Project

Application Date: January 7th, 2026

3.2 FRA Awarding Official

FRA Office of Railroad Development
Federal Railroad Administration
1200 New Jersey Ave, SE
Washington, DC 20590
FRA-Grants@dot.gov

3.3 Federal Award Date

The "Federal Award Date" is the effective date of this Agreement, as defined under Section 25.2 of Attachment 1 of this Agreement.

3.4 Program Name and Assistance Listings Number

For the Federal-State Partnership for Intercity Passenger Rail Program For Projects Not Located on the Northeast Corridor, the Assistance Listings Number is 20.326 and the Assistance Listings Title is Federal-State Partnership for Intercity Passenger Rail.

3.5 Recipient's Unique Entity Identifier

The Recipient's Unique Entity Identifier, as defined at 2 C.F.R. § 25.415, is listed in Section 1B on the Agreement cover sheet.

3.6 Federal Award Identification Number

The Federal Award Identification Number is listed in Section 2 on the Agreement cover sheet as the "Agreement Number."

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ARTICLE 4: STATEMENT OF WORK

4.1 General Project Description

The Vista Road Grade Separation Safety and Mobility Project (Project) will fund Project development lifecycle activities such as environmental review, 60% to 95% design, final design, and construction. The Project will eliminate the existing highway-grade rail crossing (U.S. Department of Transportation [USDOT] No. 026068N) at Vista Road in the unincorporated rural community of Helendale. Vista Road will be extended south approximately three-quarters of a mile where it will connect to a newly constructed grade separated structure over the rail corridor and along an approximately 750-foot road extension connecting to the National Trails Highway (also known as Route 66).

The overarching objective of the Vista Road Crossing Closure and Grade Separation Project is to enable safer, more efficient, and more reliable operations for intercity passenger rail, freight rail, and road vehicles. In addition to improving mobility, the Project's implementation will also promote economic opportunity in an area of rural unincorporated San Bernardino County (County) experiencing economic and social disadvantages. These objectives will be accomplished by constructing a grade separation and extended route, eliminating conflicts between automobiles and locomotives. The existing railroad accommodates intercity passenger rail and freight service including Amtrak, Union Pacific Railroad (UPRR), and Burlington Northern Santa Fe Railway Co. (BNSF). Vehicle traffic and train activity are increasing, leading to more frequent vehicular delays that impede access for emergency vehicles and increase the potential for crashes as drivers attempt to beat the train. The Project will deliver several benefits, including notable safety and mobility enhancements, by eliminating existing vehicle train conflicts and eliminating train-related travel delays for all travelers. Railroad crossing elimination will reduce travel delays significantly, promoting faster response times for emergency vehicles, greater access to community services and employment, and reduced safety hazards for the traveling public.

4.2 Project Location

The Project is located in unincorporated San Bernardino County near the community of Helendale, in California's 23rd Congressional district. The Vista Road crossing (USDOT No. 026068N) proposed for closure as part of the Project's implementation is located at railroad milepost 22 with a latitude of 34°43'58.67"N and a longitude of 117°19'45.35"W. The proposed grade separated structure crossing over the BNSF rail corridor would be located approximately three-fourths of a mile south of the existing Vista Road crossing at latitude of 34°43'32.93"N and a longitude of 117°19'56.52"W.

A map of the Project location relative to the Los Angeles metropolitan area as well as detail of the location of the Project elements relative to Helendale and the National Trails Highway is shown in Figure 1.

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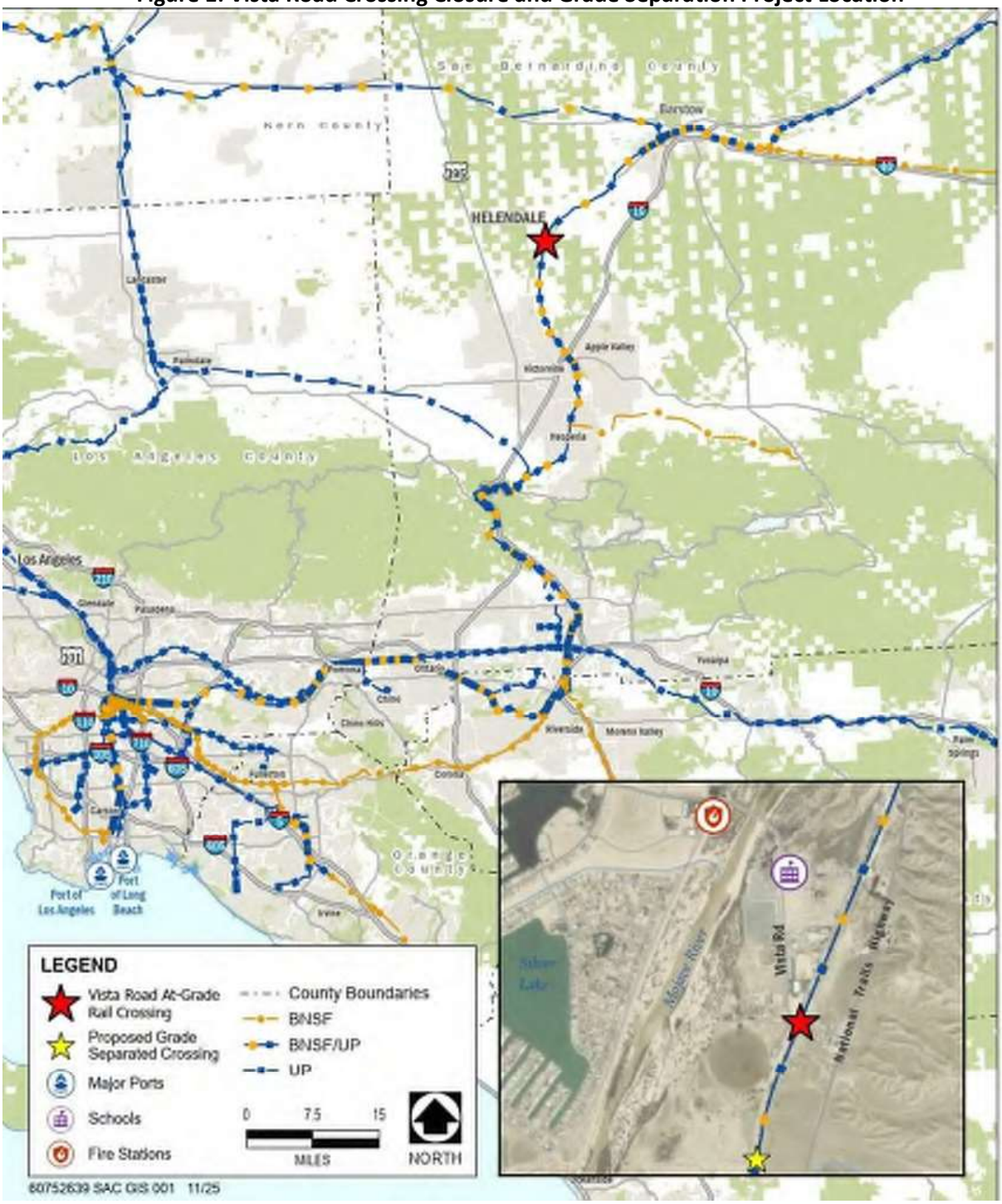
Figure 1: Vista Road Crossing Closure and Grade Separation Project Location



Source: AECOM, ESRI

Situated in the western part of San Bernardino County, between Victorville and Barstow, Helendale is comprised primarily of the Silver Lakes community and is a peaceful rural retreat in the Victor Valley of

the Mojave Desert. With a population of 6,163 according to the 2020 U.S. Census, Helendale is defined by its remote desert location. Helendale's history is closely linked to the 1926 opening of Route 66. The area is predominantly made up of the Silver Lakes community but also encompasses ranches and agricultural lands. Since the early 1970s, the Silver Lakes community centers around two manmade lakes, covering approximately 277 acres, and includes a clubhouse, equestrian center, an inn, and three schools. The major roadways in the area are National Trails Highway (Route 66), Vista Road, and Shadow Mountain Road.

The state of California ranks sixth in total at grade railroad crossings while San Bernardino County has the most incidents in the state. The Port of Los Angeles and Long Beach are major gateways for goods imported from Asia and elsewhere. Freight transit through this corridor is a lynchpin distribution leverage point with great economic significance for Southern California and nation. The Project's location in this region enhances the importance of efficiency and safety of this freight network.

4.3 Project Scope

The Recipient will notify FRA in writing of any requested changes in Project Scope and will not proceed with the changed scope unless approved by FRA in writing. If approved, changes to Project Scope may require additional environmental review or an amendment to this Agreement.

Task 1: Project Administration and Management

Subtask 1.1: Project Administration

The County will perform all tasks required for the Project through a coordinated process, which will involve affected railroad owners, operators, and funding partners, including:

- FRA
- Burlington Northern Santa Fe Railway (BNSF), Owner operator
- Union Pacific Railroad (UPRR)
- Amtrak

The County will coordinate all activities necessary for implementation of the Project. The County will complete the following activities:

- Participate in a project kickoff meeting with FRA following award.
- Complete steps to hire a qualified consultant/contractor to perform required project work.
- Hold regularly scheduled project meetings with FRA.
- Inspect and approve work as it is completed.

Subtask 1.2: Project Management Plan

The Recipient will prepare a Project Management Plan (PMP), that describes how the Project will be implemented and monitored to ensure effective, efficient, and safe delivery of the Project on time and within budget. The PMP will describe, in detail, the activities and steps necessary to complete the tasks outlined in this Statement of Work.

The PMP will include a Project Schedule and Project Budget for the work to be performed under this Agreement. The Project Schedule will be consistent with the Estimated Project Schedule in Section 5.2 of this Attachment 2, but provide a greater level of detail. Similarly, the Project Budget should be consistent with the Approved Project Budget in Section 6.5 of this Attachment 2, but provide a greater level of detail.

The Recipient will submit the PMP to FRA for review and approval. The Recipient will implement the Project as described in the approved PMP. The Recipient will not begin work on subsequent tasks until FRA has provided written approval of the PMP, unless FRA has provided pre-award authority for such work under Section 6.6 of this Attachment 2. FRA will not reimburse the Recipient for costs incurred in contravention of this requirement.

FRA may require the Recipient to update the PMP. The Recipient will submit any such updates to FRA for review and approval, and FRA will determine if updates to the PMP require an amendment to this Agreement. The Project Budget and Project Schedule may be revised consistent with Article 5 of Attachment 1 of this Agreement without amending this Agreement.

The Recipient will identify agreements governing the construction, operation, and maintenance of the Project in the PMP. If requested by FRA, the Recipient will provide FRA the final, executed copies of any agreements within ten business days of the request.

The PMP will be consistent with the FRA Guidance on Development and Implementation of Railroad Capital Projects (Railroad Capital Projects Guidance) and 49 U.S.C. § 22903, as applicable.

Subtask 1.3: Project Closeout

The Recipient will submit a Final Performance Report as required by Section 7.2 of Attachment 1 of this Agreement, which should describe the cumulative activities of the Project, including a complete description of the Recipient's achievements with respect to the Project objectives and milestones.

Task 1 Deliverables:

Deliverable ID	Subtask	Deliverable Name
1.1	1.2	Project Management Plan
1.2	1.3	Final Performance Report

Task 2: Design and Environmental Review

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Subtask 2.1: Environmental Review

The County completed a Preliminary Environmental Study in 2012 evaluating the crossing closure, extension of Vista Road, and the proposed grade separation for permit and environmental requirements. The study found the Project is expected to be cleared with a Categorical Exclusion under current regulation 771.117(d)(3) enabling the construction of grade separations to replace existing at-grade railroad crossings.

In coordination with the FRA, the County will prepare necessary NEPA documents, including, but not limited to the following:

- Definition of the Project and existing conditions;
- Identification of the purpose of and need for the Project;
- Identification and analysis of Project build alternatives and a no-action alternative; and
- An analysis of existing conditions in comparison to the impacts of the proposed action, including any needed technical reports to perform section 106 clearance on the connection to National Trails Highway.

The County will address FRA comments and produce a final document for review and approval.

The Project is expected to render a Categorical Exclusion under current regulation 771.117(d)(3) enabling the construction of grade separations to replace existing at-grade railroad crossings, assuming that the section 106 clearance is a not likely to adversely affect.

Subtask 2.2: Advancement of Preliminary Design

The County and their consultant team will build upon the existing preliminary engineering, and will review the current 60% design, updating standard and furthering the design to 95%, thus completing the planning, specification, and estimates (PS&E) stage.

The Project is at an advanced level of project development, with design complete up to 60%. The County's engineering team will advance the Project's design to 95% and will prepare an Engineering Design Review package, including Final Design (FD), to FRA for review and acceptance to support construction. The Engineering Design Review will include Final Design Plans, specifications, updated cost estimates based on FD quantities, and schedules necessary to demonstrate the effectiveness, feasibility, and readiness of the Project to be bid and/or constructed by a qualified contractor. The Engineering Design Review will include an engineer's schedule, construction estimate and documentation approval of the plan by stakeholders, as applicable. The County will be responsible for ensuring the Project is constructed in accordance with the FRA approved environmental documents and the FRA-accepted engineering documentation. The County is responsible for ensuring that any commitments identified in the approved environmental document are accounted for in the engineering design and implementation process.

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Task 2 Deliverables:

Deliverable ID	Subtask	Deliverable Name
2.1	Environmental Review	Permitting and NEPA/CEQA Determinations
2.2	Final Design	Final Design Review Package

Task 3: Right of Way Acquisition

The County will prepare all required documentation and seek all necessary approvals to acquire the ROW necessary for the completion of the Project. A technical memorandum summarizing ROW acquisition activities will be prepared.

Task 3 Deliverables:

Deliverable ID	Subtask	Deliverable Name
3.1	Acquisition of ROW	Technical Memorandum

Task 4: Final Design

Subtask 4.1: Final Design

Having advanced the Project's design to 95%, the County's engineering team will prepare an Engineering Design Review package, including Final Design (FD) for FRA for review and acceptance to support construction. The Engineering Design Review will include Final Design Plans, specifications, updated cost estimates based on FD quantities, and schedules necessary to demonstrate the effectiveness, feasibility, and readiness of the Project to be bid and/or constructed by a qualified contractor. The Engineering Design Review will include an engineer's schedule, construction estimate and documentation approval of the plan by stakeholders, as applicable.

Task 4 Deliverables:

Deliverable ID	Subtask	Deliverable Name
4.1	Final Design	Final Engineering Design Review Package

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Task 5: Construction

Subtask 5.1: Issue Design-Bid-Build Request for Proposals

San Bernardino County will go through the design bid build process to hire contractors for all phases of the project, including construction. This process will be managed by San Bernardino County staff, adhering to state and federal requirements. San Bernardino County will coordinate with FRA when necessary to select a contractor meeting all required qualifications.

Subtask 5.2 Finalization of Permits and Agreements

In coordination with the selected contractor, San Bernardino County will finalize all required permitting and agreements with appropriate agencies.

Subtask 5.3 Construction

San Bernardino County will oversee construction of the project including all associated tasks with the project including the relocation of utility poles. Contractor will complete all construction-oriented tasks and coordinate reviews with San Bernardino County. The two main construction elements are:

Road Reconfiguration and Extension

The roadway element of the Project will comprise of the realignment of the existing intersection with Vista Road and Jordan Road to allow for the free flow of traffic and eliminating the existing at-grade crossing with the BNSF corridor. Vista Road will be extended approximately 3,800 feet (0.72 miles) south within the footprint of the existing unpaved Jordan Road, where it will terminate at a "T" intersection with Shadow Mountain Road. The extended Vista Road will be comprised of two twelve-foot lanes with eight-foot shoulders and six-foot sidewalks, curbing, striping, and traffic signals. To the immediate east of the Vista Road's extension's terminus, a grade separated structure will carry Shadow Mountain Road over the BNSF corridor and along a newly constructed extension of Shadow Mountain Road of approximately 750 feet to a newly constructed "T" intersection with National Trails Highway. This approximately 1,100 foot section of Shadow Mountain Road will comprise of two twelve-foot lanes in each direction with eight-foot shoulders. Additional improvements will include drainage elements consistent with best management practices consistent with the County's water quality management plan (WQMP)

Grade Separated Structure and Roadway Extension

The grade separated structure carrying Shadow Mountain Road over the BNSF rail corridor a single span Cast-in-Place / Pre-Stressed (CIP/PS) Box Girder with a span length of 215 feet and width of 64.5 feet. with MSE walls to support bridge abutments and soil fill for the approaches. Abutments will be mechanically stabilized earth wall abutment on stub footings supported by deep foundations through reinforced fill. New roadway and embankments will be constructed on both abutment approaches up to 42 feet high with 2H:1V slopes. The facility will carry two twelve-foot lanes in each direction with eight-foot shoulders and concrete guardrails and fencing. The bridge will be built out to four lanes to accommodate the future four lane Shadow Mountain Road extension (Phase 2) which will provide secondary access to Helendale from National Trails Highway.

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The Recipient will not perform this Task unless: (1) all other work under this Agreement is complete, and (2) FRA provides the Recipient with written approval to proceed with this Additional Task in accordance with Section 5.5 of Attachment 1 of this Agreement.

Task 5 Deliverables:

Deliverable ID	Subtask	Deliverable Name
5.1	Issue Design-Bid-Build Request for Proposals	Request for Proposals Submission
5.2	Finalization of Permits and Agreements	Permits and Agreements
5.3	Construction	Notice of Physical Completion of Construction

4.4 Implement Required Environmental Commitments

The Project is expected to be cleared with a Categorical Exclusion under current regulation 771.117(d)(3) enabling the construction of grade separations to replace existing at-grade railroad crossings. As described in task 2 outlined above, environmental review will be completed as part of the FRA grant award. The Recipient will implement any environmental commitments identified through the NEPA process conducted under subtask 2.1 The Recipient will implement the Project consistent with the documents and environmental commitments identified in Table 4-A.

Table 4-A: Environmental Commitments

Document Type	Commitment Reference	Document Date
Categorical Exclusion	FRA Categorial Exclusion Documentation	Anticipated by mid-2027

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ARTICLE 5: AWARD DATES AND ESTIMATED PROJECT SCHEDULE

5.1 Award Dates

Budget Period End Date: December 31st, 2029

Period of Performance End Date: January 31st, 2030

5.2 Estimated Project Schedule

Milestones associated with this Agreement are identified in Table 5-A: Estimated Project Schedule. The Recipient will complete these milestones to FRA's satisfaction by the Schedule Date, subject to Article 5 of Attachment 1 of this Agreement. The Recipient will notify FRA in writing when it believes it has achieved the milestone.

Table 5-A: Estimated Project Schedule

Milestone	Schedule Date
Environmental Analysis and NEPA Determination	June 2027
60-95% Design	August 2027
Right of Way Acquisition	December 2027
Final Design	January 2028
Procurement	April 2028
Construction Commencement	June 2028
Construction Substantial Completion	December 2029

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ARTICLE 6: AWARD AND PROJECT FINANCIAL INFORMATION

6.1 Award Amount

Agreement Federal Funds: $37,496,000

6.2 Federal Obligation Information

Federal Obligation Type: Single

6.3 Federal Authorization and Funding Source.

Authorizing Statute: The FSP Program was authorized in Sections 22106 and 22307 of the IIJA, Pub. L. No. 117-58 (November 15, 2021); 49 U.S.C. 24911. Funding under the FY24–25 NOFO was made available by the Consolidated Appropriations Act, 2024, Div. F, Tit. I, Pub. L. 118-42 (March 9, 2024) (2024 Appropriation), the Full-Year Continuing Appropriations and Extensions Act, 2025, Div. A, Tit. XIII, Public Law 119-4 (March 15, 2025) (2025 Appropriation), and Title VIII of Division J of the IIJA.

Appropriation: FY2024-2025

6.4 Funding Availability

Program funding that is obligated under this Agreement remains available until expended.

6.5 Approved Project Budget

The estimated total Project cost under this Agreement is $46,870,000

FRA will contribute a maximum of 80% percent of the total Project cost, not to exceed the Agreement Federal Funds in Section 6.1 of this Attachment 2. FRA will fund the Project at the lesser amount of the Agreement Federal Funds or the FRA maximum contribution percentage of total Project costs.

The Recipient will contribute $9,374,000 in Agreement Non-Federal Funds. Recipient's Agreement Non-Federal Funds are comprised of [insert whether the Recipient is contributing cash contributions and the amount, in-kind contribution and the value, or a combination of both].

The Recipient will complete the Project to FRA's satisfaction within the Approved Project Budget, subject to Article 5 of Attachment 1 of this Agreement.

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Table 6-A: Approved Project Budget by Task

Task #	Task Title	Agreement Federal Funds	Agreement Non-Federal Funds	[Other Federal Funds]	[Other Non-Federal Funds]	Total
1	Project Administration and Management	$0	$0	$	$	$0
2	Advancement of Preliminary Design and Environmental Review	$0	$2.1M	$0	$0	$2.1M
3	Right-of-Way Acquisition	$0	$1.51M	$0	$0	$1.51M
4	Final Design	$0	$0.5M	$0	$0	$0.5M
5	Construction	$37.50	$5.26	$0	$0	$42.76M
Total		**$37.5**	**$9.37**	**$0**	**$0**	**Total Project Cost: $46.87M**

Table 6-B: Approved Project Budget by Source

Funding Source	Total Amount	Percentage of Total Project Cost
Federal Share	$37,496,000	80%
Agreement Federal Funds	$37,496,000	80%
[FSP Grant Program]	$37,496,000	80%
[Other Federal Funds]	N/A	0%
Agreement Non-Federal Funds	$9,374,000	20%
BNSF Railways	$9,374,000	20%
[Other Non-Federal Funds]	$ N/A	0%

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6.6 Pre-Award Costs

None. Consistent with 2 C.F.R. part 200, costs incurred before the date of this Agreement are not allowable costs under this award. FRA will neither reimburse those costs under this award nor consider them as a non-Federal cost-sharing contribution to this award.

6.7 Phased Funding Agreement

Not applicable.

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ARTICLE 7: PERFORMANCE MEASUREMENT INFORMATION

Table 7-A: Performance Measurement Table identifies the performance measures that this Project is expected to achieve. These performance measures will enable FRA to assess the Recipient's progress in achieving grant program goals and objectives. The Recipient will report on these performance measures in accordance with the frequency and duration specified in Table 7-A.

Upon Project completion, the Recipient will submit reports comparing the actual Project performance of the new and or improved asset(s) against the pre-Project (baseline) performance and expected post-Project performance as described in Table 7-A. The Recipient will submit the performance measures report to the Project Manager in accordance with Table 7-A.

Table 7-A: Performance Measurement Table

Goal	Objective	Performance Measure	Description of Measure	Measurement	Reporting
Goal 1	To create a safer road/rail crossing	Reduction in safety incidents at the existing Vista Road at-grade crossing	The Project will eliminate potential accidents by eliminating the conflict between trains and roadway traffic.	**Pre-Project (Baseline) Performance as of:** 2 safety incidents recorded in past five years	**Frequency:** Annual
				Expected Post-Project Performance: 100% reduction in accidents at Vista Road crossing	**Duration:** For 3 years after the Project Performance Period end date
Goal 2	Improve reliability of passenger and freight rail train movements	Reduction in closure of rail corridor	The Project will close the existing at-grade crossing, thereby eliminating the potential to have crossing closed to both rail and road traffic following a safety incident.	**Pre-Project (Baseline) Performance as of:** Closure of crossing to both rail and vehicular traffic for 8 hours.	**Frequency:** Once every 2.5 years.
				Expected Post-Project Performance: Zero closure of crossing to either rail or road traffic.	**Duration:** For 3 years after the Project Performance Period end date

The Recipient will prepare a Project Outcomes Report pursuant to Section 8.3 of Attachment 1 of this Agreement.


SAN BERNARDINO
COUNTY

An Application Seeking Funding Under the Federal Railroad Administration's Federal-State Partnership Program

Vista Road Crossing Closure and Grade Separation Project

Appendix B: Benefit Costs Analysis Technical Memorandum

Applicant:
San Bernardino County

SAN BERNARDINO COUNTY

January 7, 2026

Benefit Cost Analysis Memorandum

Vista Road Grade Separation Safety and Mobility Project

Prepared for San Bernadino County by AECOM

November 26, 2025

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Exhibits

Executive Summary

A benefit-cost analysis (BCA) for the Vista Road Crossing Closure and Grade Separation Project ("Project" hereafter) was prepared at the request of San Bernadino County (the County) for the purposes of supporting their application seeking funding under the Federal-State Partnership for Intercity Passenger Rail Program for Projects Not Located on the Northeast Corridor (FSP-National). The BCA was conducted in accordance with the U.S. Department of Transportation's (USDOT's) "May 2025 Benefit-Cost Analysis Guidance for Discretionary Grant Programs."[1] This BCA compares expected benefits and costs of undertaking the Project (the "Build" alternative) to the "No Build" baseline alternative, to estimate the Project's net benefits.

[1] https://www.transportation.gov/sites/dot.gov/files/2025-05/Benefit%20Cost%20Analysis%20Guidance%202025%20Update%20II%20%28Final%29.pdf

Exhibit 1 – Impact Matrix presents the Impact Matrix, which describes the baseline, the Project, and all estimated benefits.

Exhibit 1 – Impact Matrix

Current Status/Baseline & Problem to be Addressed	Change to Baseline or Alternatives	Types of Impacts	Affected Population	Economic Benefit (Net Present Values, $2023 M) Discounted at 7%
The increasing frequency of both freight and passenger trains, operated by Union Pacific Railroad (UPRR), Burlington Northern Santa Fe Railway (BNSF), and Amtrak, has resulted in a significant rise in vehicle trip delays at the rail crossing. The situation obstructs emergency response vehicles and increases the risk of vehicle accidents as drivers attempt to cross the tracks ahead of the train. The Project is designed to improve road safety and traffic flow in the area by eliminating intersections between vehicles and trains, thereby eliminating train-induced travel delays for all commuters.	the Project will improve the safety and reliability of passenger and freight rail operations through the elimination of an at-grade crossing with a history of safety incidents. The Project will also deliver safer, more efficient, and more reliable travel for autos and trucks coming to and from Helendale, while providing safer pedestrian and cyclist movement across the rail corridor. In addition, the Project will reduce carbon emissions and promote short- and long-term economic opportunities for the local community and greater regions.	**Effects on Safety**		
		Reduced accidents	Auto and Truck	$19.3
		Effects on System and Service Performance		
		Residual value	San Bernadino County	$3.1
		O&M Costs	San Bernardino County	-$0.5
		Reduced Amtrak Operational Costs	Amtrak	$0.1
		Reduced Freight Train Operational Costs	BNSF	$0.5
		Effects on Competitiveness, Reliability, Trip Time, and Resilience		
		Travel Time Saving (Autos and Passengers)	Autos and Passengers	$7.1
		Travel Time Savings (Commercial Trucks)	Commercial Trucks	$0.9
		Travel Time Savings (Passenger Rail)	Amtrak	$0.3
		Commercial Vehicle Operating Cost Savings	Commercial Trucks	$1.6
		Automobile Fuel Costs Savings	Auto	$0.3
		Emission Savings	Auto and Truck	$0.3
		Train Emission Savings	Amtrak and BNSF	$1.6
		Ability to Meet Existing or Anticipated Demand		
		Effects on the rest of the Network		*Qualitative*

Source: AECOM
Notes: BCA = benefit-cost analysis, M = millions

All values are in 2023 dollars and are discounted to 2023. analysis covers a 20-year operating period following the commencement of operations of the Project beginning in 2030. The BCA estimates the Project's Net Present Value to be $2.15 million and the benefit-cost ratio (BCR) to be 1.21:1. The discounted cost of the Project is $32. 45 million.

As shown in Exhibit 2, the Project provides $34.50 million in total benefits over the analysis period, using a 7% discount rate. The quantitative benefits include Reduced Accidents; Residual value; Reduced Amtrak and Freight Train Operational Costs; Travel Time Savings for Autos, Passenger Rail, and Commercial Trucks; Commercial Vehicle Operating Cost Savings; Automobile Fuel Costs Savings; and Emission Savings for Vehicles and Trains. Additionally, the positive effects on the rest of the network were identified as a qualitative benefit.

Exhibit 2 – Costs and Benefits Delivered by Long-Term Outcomes (2030 – 2049)

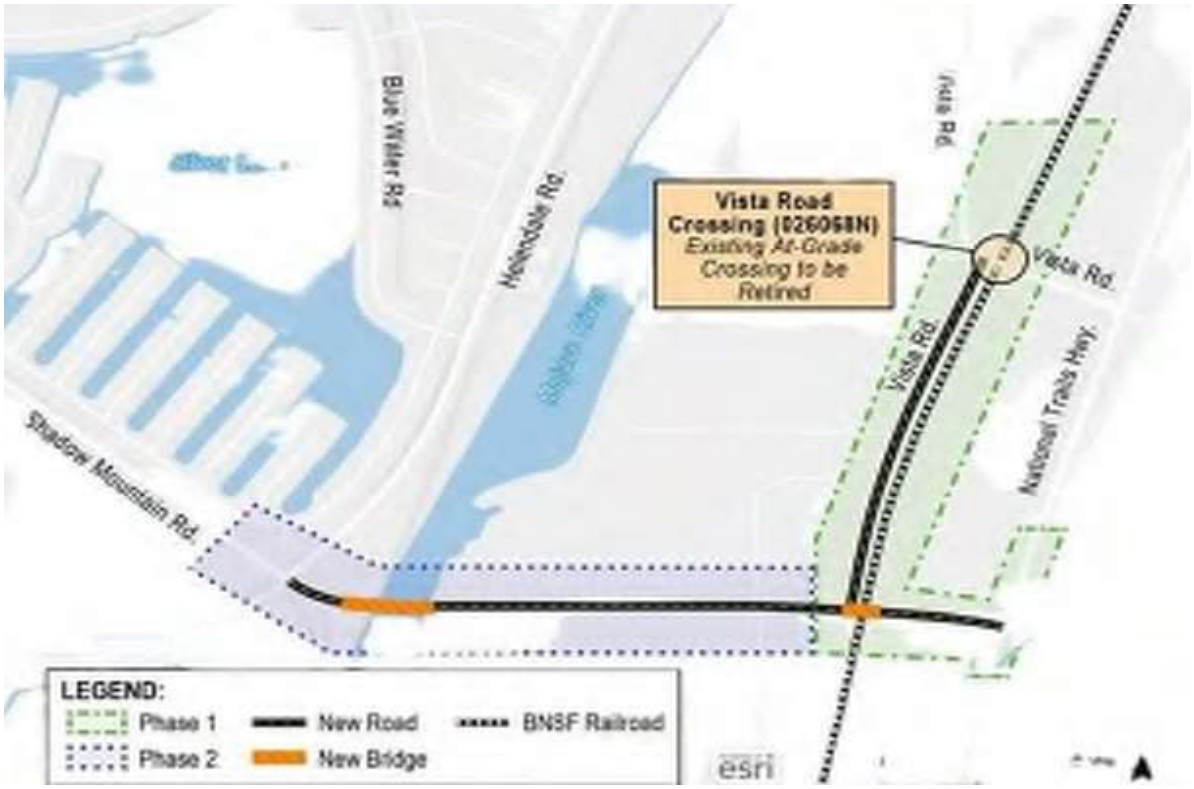
Vista Road Grade Separation Safety and Mobility Project	
Benefit-Cost Analysis	
20 Year Analysis Period (2030-2049)	
All Values are in Millions of 2023$ - 7% Discount Rate	
Costs	
Capital Costs	***$32.45***
Benefits	
Effects on Safety	
Reduced Accidents	$19.29
Effects on System and Service Performance	
Residual value	$3.09
O&M Costs	-$0.54
Reduced Amtrak Operational Costs	$0.10
Reduced Freight Train Operational Costs	$0.48
Effects on Competitiveness, Reliability, Trip Time, and Resilience	
Travel Time Savings (Autos and Passengers)	$7.06
Travel Time Savings (Commercial Trucks)	$0.95
Travel Time Savings (Passenger Rail)	$0.31
Commercial Vehicle Operating Cost Savings	$1.56
Automobile Fuel Costs Savings	$0.33
Emission Savings	$0.31
Train Emission Savings	$1.56
Ability to Meet Existing or Anticipated Demand	
Effects on the rest of the Network	*Qualitative*
Total Benefits	***$34.50***
BC Ratio	**1.1**
Net Present Value	**$2.05**

Source: AECOM

1. Introduction

The Vista Road Crossing Closure and Grade Separation Project ("the Project") is comprised of a program of infrastructure improvements including the closure of an existing at-grade crossing at Vista Road (USDOT Crossing ID 026068N) and the Southern Transcontinental rail corridor (Transcon) in the community of Helendale, the extension of Vista Road approximately three-quarters of a miles south and the construction of a new grade-separated structure over the rail corridor connecting to the National Trails Highway (also known as Route 66). When implemented and operational, the Project will improve the safety and reliability of passenger and freight rail operations through the elimination of an at-grade crossing with a history of safety incidents. The Project will also deliver safer, more efficient, and more reliable travel for autos and trucks coming to and from Helendale, while providing safer pedestrian and cyclist movement across the rail corridor. In addition, the Project will reduce carbon emissions and promote short- and long-term economic opportunities for the local community and greater region. This analysis considers the Project's costs to be expended between 2026 and 20229 and for its benefits to accrue between 2030 and 2049, consistent with the USDOT's 20-year analysis period. A map of the Project location and planned improvements can be seen below.

Exhibit 3 – Project Area and Sites



Source: Amtrak, BNSF

2. Benefits Analysis Framework

This benefits analysis was conducted using the "USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs" document[2] as a guide for preferred methods and monetized values. The parameters of the benefits analysis follow the protocols set by the Office of Management and Budget (OMB) "Circular A-94,"[3] as well as recommended benefit quantification methods from the USDOT. Generally, for benefits calculations, standard factors and values accepted by Federal agencies were used, except in cases where Project-specific values or prices were available. In such cases, modifications are noted, and references are provided for data sources.

This analysis follows a conservative estimation of the quantifiable benefits of the Project; the actual total benefits of the Project may be greater than depicted in the results. The "No-Build" alternative (baseline) assumes that the Project will not be built and the purpose of, and need for, the Project would not be met. The Project ("Build" alternative) was compared to the "No-Build" alternative to identify net benefits in the following categories: "Effects on Safety", "Effects on competitiveness, Reliability, Transit time, and Resilience"; "Effects on System and Service performance"; and "Efficiencies from Improved Integration with other Modes".[4]

A custom model was applied to estimate the future benefits of the Project. Benefits were estimated over a 20-year period, beginning with completion of construction and commencement of operations in 2030 and concluding after 20 full years of operation in 2049. All dollar values are in 2023 dollars and were discounted to 2023 at 7%. The calculations, assumptions, and sources for the benefit analysis are reported in their respective sheets within the provided BCA workbook.

[2] Benefit-Cost Analysis Guidance for Discretionary Grant Programs – 2025 Update II (Final), May 2025. https://www.transportation.gov/office-policy/transportation-policy/benefit-cost-analysis-guidance-discretionary-grant-programs-0
[3] https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/a94/a094.pdf
[4] Benefits categories are consistent with the merit criteria found in the FY 2024–2025 FSP-National NOFO

3. Analysis Assumptions

This BCA is based on several assumptions regarding the differences between the Build and No-Build models. A list of assumptions and sources used in the analysis is provided in Exhibit 4.

Exhibit 4 – Benefit-Cost Analysis Inputs

Input	Value	Source
General		
Discount Rate	7%	Benefit-Cost Analysis Guidance for Discretionary Grant Programs – 2025 Update II (Final), May 2025
Discount Year	2023	
Dollar Year	2023	
Analysis Period (years)	20	
Construction Start Date	6/1/2028	Construction Schedule
Construction End Date	12/31/2029	
Operations Start	1/1/2030	
Construction End Year	12/31/2029	
Project Opening - Benefits Realized	2030	
Last Year in Operations Period/Analysis Period End	2049	
Operations Period	20	
Annualization Factor	365	
Annual Growth Rate	1%	
Conversion rate for grams per metric ton	1,000,000	https://www.metric-conversions.org/weight/grams-to-metric-tons.htm
AADT at the crossing Vista Road W (0.5%)	7,512	
AADT Route 66 Northbound 2025 (0.75%)	2,977	
AADT Rout 66 Southbound 2025 (1%)	5,733	
Capital Cost		
Project Cost ($2023)	$32,446,039	AECOM Estimate (November 2025)
Reduced Accidents		
O - No Injury	$5,300	Benefit-Cost Analysis Guidance for Discretionary Grant Programs – 2025 Update II (Final), May 2025
C - Possible Injury	$118,000	
B - Non-incapacitating	$246,900	
A - Incapacitating	$1,254,700	
K - Killed	$13,200,000	
U - Injured (Severity Unknown)	$229,800	
# Accidents Reported (Unknown if Injured)	$159,800	
Property Damage Only (PDO) Crashes (per vehicle)	$9,500	
O&M Costs		
Annual O&M Costs Year 1-5 - Percentage of Project Capital Costs	0%	Assumptions
Annual O&M Costs Year 5-15 - Percentage of Project Capital Costs	0.25%	
Annual O&M Costs Year 11-20 - Percentage of Project Capital Costs	0.50%	

Input	Value	Source
Amtrak Passenger & Operational Savings		
Frequency of crashes per year (Expected closures per year)	0.33	Assuming one crash every 3 years
Closure duration due to accident (Hours)	12	Conservative estimate
Passenger trains affected per closure	2	Amtrak
Closure a year	4	The average delay each train avoids per year
Train-hours delayed per closure	24	Calculation
Annual Passenger trains trip delayed hours per closure	8	Train-hours delayed/year
Amtrak Long-Distance Operating Cost per Hour, Hauling, 2023$	$1,123	Benefit Cost Analysis Guidance for Discretionary Grant Programs – 2025 Update II (Final), May 2025
Amtrak Long-Distance Operating Cost per Hour, Idling, 2023$	$718	
BNSF Freight Train Operational Costs		
Frequency of crashes per year (Expected closures per year)	0.33	Assuming one crash every 3 years
Closure duration due to accident (Hours)	12	Conservative estimate
# BNSF Freight trains affected per closure	35	BNSF
Hours of crossing closure a year	4	The average delay each train avoids per year
Total Train-hours delayed per closure	420	Calculation
Annual Freight trains delayed hours per closure	140	Train-hours delayed/year; Calculation
Ridership 2024 - SNB (San Bernardino, CA)	88,429	Amtrak (November 2025) - Passengers between Barstow and Victorville Stations
Ridership 2024 - VRV (Victorville, CA)	86,706	
Freight Train Operating Cost per Hour, Idling, 2023$	$262	Benefit-Cost Analysis Guidance for Discretionary Grant Programs – 2025 Update II (Final), May 2025
Hourly Operating Costs, Hauling, Freight Train , 2023$	$706	
Travel Time Saving (Autos and Passengers) & Commercial Truck		
Intersection Delay Data Inputs		
Average Daily Train Crossings at Vista Road	70	BNSF
Average Time per Train Crossing (minutes)	3.6	Assumption
Total Daily Delay from Train Crossings (hours)	4.2	Calculation
Percentage of Traffic Affected by Train Crossings	18%	Calculation
Average Delay per Affected Vehicle (No Build)-minutes	4	Assumption, vehicle delay time is 100% of train crossing time
Average Delay per Vehicle (No Build)-Minutes	0.7	
Average Delay per Vehicle (No Build)-hours	0.012	Calculation
Average Delay per Vehicle (Build)-hours	0	Assumption, vehicle delay time is eliminated
Annualization Factor	365	Factor
Detour / alignment		
Extra miles for north users (miles)	2	Google Map
Speed (mph)	60	Google Map
Extra travel time for northbound users (hours)	0.03	

Input	Value	Source
For southbound users- net time saved per trip (hrs)	0.012	
For northbound users- net time saved per trip (hrs)	0.006	
Percentage of traffic from north	18%	Percentage of Traffic Affected by Train Crossings
Trucks as Percentage of Traffic in Project Area	10%	
Value of Personal Time, 2023$	$19.40	Benefit-Cost Analysis Guidance for Discretionary Grant Programs – 2025 Update II (Final), May 2025
Value of Time All Purposes, 2023$	$21.10	
Value of Time Truck, 2023$	$35.70	
Auto Occupancy	1.52	
Vehicle Operating Savings		
Hourly fuel consumption (idling)	0.4	https://afdc.energy.gov/files/u/publication/which_is_greener.pdf
Fuel Cost West Coast 2025$	$4.159	https://www.eia.gov/petroleum/gasdiesel/
Fuel Cost West Coast 2023$	$3.96	Discounted from 2025
Truck operating costs per hour (2022$)	$58.60	Analysis of the Operational Costs of Trucking: 2025 Update https://truckingresearch.org/2025/07/an-analysis-of-the-operational-costs-of-trucking-2025-update/
Emissions		
Light Vehicle Idle Emissions Rates g/hr. NOx	4	Idling Vehicle Emissions for Passenger Cars, Light-Duty Trucks, and Heavy-Duty Trucks Emission Facts, EPA420-F-08-025, October 2008
Heavy Duty (Class VII) Idle Emissions Rates g/hr. NOx	30	
Heavy Duty (Class VII) Idle Emissions Rates g/hr. PM2.5	1	
Conversion - g/metric ton	1,000,000	
Freight Train Emission cost per hour hauling 2023$	$2,284	Benefit-Cost Analysis Guidance for Discretionary Grant Programs – 2025 Update II (Final), May 2025
Freight Train Emission cost per hour idling 2023$	$776	
Amtrak Long Distance Emission cost per hour hauling 2023$	$755	
Amtrak Long Distance Emission cost per hour idling 2023$	$106	
Cost of SOx, Nox, PM2.5 emissions (per metric ton)	See Sheet "Emissions Dollar Values"	
Truck emissions rates of SOx, Nox, PM2.5 (g/mile)	See Sheet "EMFAC2021"	California ARB / EMFAC

Source: USDOT BCA Guidance, Amtrak, BNSF

4. Benefits Methodology

This Project will produce "Effects on Safety" benefit; "effects on System and Service Performance" benefits; "Effects on Competitiveness, Reliability, Transit time, and Resilience" benefits; and "Ability to Meet Existing or Anticipated Demand" benefits. The methodologies used to estimate the benefits of the Project are described in the following sections, along with associated results.

Effects on Safety

The analysis evaluates the reduction in collisions between roadway vehicles and trains with the elimination of the Vista Road at-grade crossing. According to the Accident/Incident Report extracted from the FRA's Annual GAXPS 2025 crossing inventory for the project crossing # 026068N, from 2019 to 2023, crashes resulting in two injuries and one fatality occurred between a roadway vehicle and a train. With the replacement of the at-grade crossing with a grade-separated crossing as part of the Project, future collisions between roadway vehicles and trains are expected to be eliminated. The project avoided collisions under the Build conditions demonstrates the value of the proposed improvements. The analysis monetizes the value of these impacts using the KABCO scale for collision severity and standardized factors published by the USDOT.

During the 20-year analysis period, the total value of avoided injuries and fatalities is calculated to be $54.63 million in undiscounted 2023 dollars. **Assuming a base year of 2023 and real discount rate of 7 percent, the net present value of avoided injuries and fatalities is calculated to be $19.29 million in discounted 2023 dollars.**

Effects on System and Service Performance

The project would generate train-related benefits by avoiding corridor closures caused by grade-crossing crashes. FRA Historical Accident/Incident Reports indicate that one crash has occurred approximately every three years since 2019. Each crash is assumed to result in a 12-hour closure of the crossing (accounting for accident response, investigation, clearance, and inspections) as a conservative assumption. Eliminating these crash-related disruptions would prevent roughly 140 freight train-hours and 8 passenger train-hours of delay annually.

These avoided delays equate to operating and emissions cost savings, as well as passenger travel time savings for Amtrak's *Southwest Chief* service around the Project area. The project would also generate operating savings for train operators by eliminating idling and reverse movements at the Project site, along with corresponding emissions reductions from the elimination of these inefficiencies.

Reduced Freight Operational Costs

The delay avoided per freight train was calculated by annualizing the assumed 12-hour closure duration associated with each crash, which occurs approximately once every three years. This annualized delay per train was then multiplied by the estimated number of BNSF freight trains affected during each 12-hour closure to determine the total annual freight train delay avoided (in train hours).

The reduced travel time for impacted trains will lead to operational cost savings for BNSF freight operations. Because freight trains must slow down and sometimes stop to maintain sufficient distance from Amtrak trains, it was assumed that the impacted trainsets will split idling and hauling time evenly (50/50). These operating cost figures were applied to each delay of 140 annual freight train hours per closure to calculate the cost savings in the Build scenario. With the Project, these delays are expected to disappear entirely due to reduced freight train delays and improved rail infrastructure.

These computations were subsequently used to estimate the annual train operating savings by applying the USDOT guidance values for Freight Train Operating Cost per Hour for Idling and Hourly Operating Costs for Freight Train Hauling.

The Reduced Freight Operational Costs due to the Project amounted to $0.48 million in 2023 dollars, discounted at 7%.

Reduced Amtrak Operational Costs

The reduced delays mean that Amtrak trains will have fewer active operating hours, leading to cost savings for the company. USDOT BCA Guidance estimates that an Amtrak Long-Distance train costs approximately $718 per hour to run while idling, and $1,223 per hour when hauling. These values were applied to the total amount of hours Amtrak trains will be delayed each year, which in turn is based on the average delay reduction per train of 4 hours (with 2 trains per day, one idling and one hauling), allowing for the calculation of the Amtrak operational cost savings. The delay reduction is estimated to equal half of the current delay per train, as the reverse move distance is being reduced by more than half.

The value of Reduced Amtrak Operational Costs for the Project amounted to $0.31 million in 2023 dollars, discounted at 7%.

Residual Value

The Project would produce benefits beyond the 20-year period of analysis because the useful life of the Project is greater than 20 years. The useful life of the Project (75 years for bridge structures[5], 30 years for roadways [6], and 50 years for utilities) is used to depreciate the asset to the end of the analysis period using straight-line depreciation. The remaining value of this cost is discounted from the final year of the 20-year analysis period 2049. Only material and equipment costs were considered, thus excluding labor costs from the calculation. ROW does not depreciate and is expected to maintain its full value by the end of the analysis period.

The value of the remaining useful life for the Project amounts to $3.09 million in 2023 dollars, discounted at 7%.

[5] https://nap.nationalacademies.org/catalog/25672/guide-specification-for-service-life-design-of-highway-bridges
[6] Bureau Of Economic Analysis, Depreciation Rates. https://apps.bea.gov/national/pdf/BEA_depreciation_rates.pdf

Effects on Competitiveness, Reliability, Trip Time, and Resilience

Travel Time Saving (Autos and Passengers)

In the No-Build scenario, all vehicles traveling to and from Route 66 to and from Helendale would continue to experience delays at the Vista Road at-grade crossing due to train gate downtime when freight or passenger trains pass through the corridor. In the Build scenario on the other hand, the Vista Road crossing would be closed, and all vehicles accessing Helendale would instead cross the BNSF corridor using the proposed grade separation located approximately three quarters of a mile south of the existing crossing. Using the intersection data provided in Exhibit 4, the average delay per vehicle in the No-Build condition is calculated by multiplying the share of vehicles affected (18 percent) by the average existing delay per affected vehicle, conservatively assumed to be four minutes and representative of gate down time. Under the Build scenario, these train-related delays would be fully eliminated for all vehicles.

In the analysis, the travel time effects differ by direction of travel. Vehicles approaching Helendale from the southbound will experience no additional travel distance, as the new overpass lies directly along their existing route. Thus, southbound autos receive the full benefit of eliminating train-related delays. In contrast, vehicles approaching Helendale from the northbound must travel an additional two miles, one mile south to reach the new overpass and one mile north to reconnect with Vista Road crossing. This detour would result in a net travel time impact of 0.006 hours per northbound vehicle.

For each direction, the analysis multiplies the appropriate AADT (northbound or southbound) by the relevant vehicle time saved to estimate total annual vehicle-hours traveled (VHT) savings. These VHT savings are then applied to USDOT's recommended average auto occupancy and monetized value to determine the travel time saving.

The present value of travel time savings for autos and passengers (northbound and southbound) is estimated at $7.06 million in 2023 dollars over the 20-year analysis period, using a 7% discount rate.

Travel Time Savings (Commercial Trucks)

To quantify the annual travel time saving for Commercial Trucks, the analysis multiplies the directional AADT for trucks (northbound and southbound) by the corresponding vehicle hours saved to compute annual vehicle-hours travel (VHT). These VHT values are then monetized using USDOT's recommended commercial vehicle driver value of time from Exhibit 4.

The present value of travel time savings for commercial trucks (northbound and southbound) is estimated at $0.95 million in 2023 dollars over the 20-year analysis period, using a 7% discount rate.

Travel Time Savings (Passenger Rail)

Passenger train travel time savings are generated by avoiding train delays associated with incident-related closures of the at-grade crossing. Under the No Build scenario, a safety incident at the crossing is assumed to close the corridor and delay Amtrak's Southwest Chief service, between the San Bernadino and Victorville stations, whereas under the Build scenario, the project is

expected to eliminate these closures and thereby avoid the associated passenger delay. FRA's Historical Accident/Incident Reports indicate that, since 2019, one crash-related closure occurs, on average, once every three years, and each event is assumed to result in a 12-hour corridor shutdown under a conservative assumption.

Two Amtrak passenger trains are expected to be affected by each closure. Using Amtrak's ridership data, it was possible to calculate how many passengers are affected by each delay. For this analysis, the 2024 ridership data for the segment between the San Bernardino and Victorville stations on Amtrak's Southwest Chief service was provided by Amtrak, as stated in Exhibit 4. The reported ridership of 88,429 for San Bernardino (SNB) was converted to an average daily ridership and then divided by two to estimate the daily ridership in each direction. This resulted in a daily directional ridership of 120 passengers. This daily ridership was projected over the analysis period using a 5% growth rate for 2025 and a 1% growth rate for the remainder of the analysis period.

Using the average number of passengers impacted per train and the average delay incurred, it was possible to calculate the total time lost by passengers on each trip at the Project location. USDOT estimates that each hour of travel (for all purposes) is valued at $19.40, which allows the monetization of the total time saved in the Build scenario.

The Travel Time Savings for Passenger Rail due to the Project is $0.31 million, discounted at 7% in 2023 dollars.

Commercial Vehicle Operating Cost Savings

The Commercial Vehicle Operating Cost Savings were calculated by multiplying the annual truck delay hours avoided by the truck operating costs per hour of $58.60, excluding tolls and driver wages, as recommended by the 2025 American Transportation Research Institute report (Table 9) on the *Operational Cost of Trucking 2023*[7].

The present value of this benefit stream is estimated at $1.56 million in 2023 dollars over the 20-year analysis period using a 7 percent discount rate.

Automobile Fuel Costs Savings

The automobile vehicle operating cost savings were estimated using the Fuel Cost Savings Benefit for autos. For this benefit, the Auto Annual VHT avoided was multiplied by the hourly fuel consumption rate while idling[8] (0.4 gallons per hour) to calculate the avoided fuel use during idling. This avoided fuel consumption was then multiplied by the West Coast average gasoline price (2023 dollars)[9] to determine the Avoided Fuel Used Benefit for automobiles.

The present value of Fuel Cost Savings Benefit for autos is estimated at $0.33 million in 2023 dollars over the 20-year analysis period, using a 7% discount rate.

Emissions Reductions

Reductions in vehicle hours traveled (VHT) resulting from the Project will lead to lower vehicle emissions for autos and trucks. This reduction in VHT and idling time results in the reduction in

[7] Analysis of the Operational Costs of Trucking: 2025 Update; https://truckingresearch.org/2025/07/an-analysis-of-the-operational-costs-of-trucking-2025-update/
[8] https://afdc.energy.gov/files/u/publication/which_is_greener.pdf

[9] https://www.eia.gov/petroleum/gasdiesel/

nitrous oxides (NOx) and PM2.5 (MT) in the atmosphere. These reductions in VHT were then multiplied by emission rates (g/hr.) found from the EPA report[10] and held constant throughout the analysis period. Subsequently, they were monetized using the recommended emission values from the 2025 USDOT BCA Guidance (refer to Exhibit 4).

The total emissions savings for both trucks and autos amount to $0.31 million in 2023 dollars and 7 percent for all other emissions.

Train Emission Savings

The Project will lead to reductions in emissions for trains, as both Amtrak and BNSF trains would avoid idling during instances where the crossing is closed due to the occurrence of a safety incident, .

Two Amtrak Southwest Chief trains, travelling between the San Bernadino and Victorville stations, would be affected on average of two per day, one of which must idle and wait, the other of which must reverse down another track, and return to the main line after traffic has passed by. The idling and hauling USDOT BCA Guidance values were used to calculate the impact of these delays, with idling costing $106 per hour and hauling costing $755 per hour. The average delay times discussed in the Passenger Time Savings section were applied with these values, yielding avoided emission costs with the Project.

While 35 BNSF trains are impacted per day, they must reduce speed and sometimes stop, depending on their position when the Amtrak trains approach. For this reason, a 50/50 split of hauling and idling emission values was used to calculate the pollution avoided by the Project in the Build scenario. According to USDOT BCA Guidance, per hour, idling freight trains cost $776 per hour and hauling freight trains cost $2,284 per hour.

The value of Train Emissions Reductions for the Project amounted to $1.56 million in 2023 dollars, discounted at 7%.

Ability to Meet Existing or Anticipated Demand

Effects on the rest of the Network

Reducing delays for both Amtrak and BNSF trains on the Southwest Chief route is expected to have widespread positive impacts throughout the rail network. Improved punctuality and reduced idling times enhance the overall efficiency of the rail system, allowing for more precise scheduling and better allocation of resources. For BNSF, the benefits include more streamlined freight operations, reducing transit times and operational costs, and improving delivery service to customers. For Amtrak, the benefits are similar, with the addition of increasing customer satisfaction and the value proposition of the route.

The value of the positive effects on the rest of the network are qualitatively evaluated.

[10] Idling Vehicle Emissions for Passenger Cars, Light-Duty Trucks, and Heavy-Duty Trucks Emission Facts, EPA420-F-08-025, October 2008

5. Costs

Capital Cost

The capital costs for the Project shown in Exhibit 5. Capital costs are expected to be expended between mid-2026 and end-2029 in accordance with the engineer estimate's schedule, with the Project opening in 20230. The costs for the Project were provided in 2023 dollars.

Exhibit 5 – Summary of Project Capital Costs

Lifecycle Stage Activity	Grade Separated Structure	Roadway	Undiscounted Cost 7%
Environmental Documentation	$175,000	$175,000	$350,000
Preliminary Design (60-95%)	$875,000	$875,000	$1,750,000
Right-of-Way and Utilities Relocation	$755,000	$755,000	$1,510,000
Final Design	$250,000	$250,000	$500,000
Construction	$15,755,200	$15,017,550	$30,770,000
Construction Soft Costs (PMCM, Contingency)	$5,995,000	$5,995,000	$11,990,000
Project Total Cost	$23,805,200	$23,067,550	**$46,870,000**

Exhibit 6 - Discounted Summary of Project Capital Costs Expenditure by Year In $2023

EXPENDITURE BY YEAR In $2023	2026	2027	2028	2029	Discounted (7%)
Environmental Documentation	$142,852	$133,507	-	-	$276,359
Preliminary Design (60-95%)	-	$1,335,067	-	-	$1,335,067
Right-of-Way and Utilities Relocation	-	$1,151,972	-	-	$1,151,972
Final Design	-	$381,448	-	-	$381,448
Construction	-	-	$8,082,636	$12,949,484	$21,032,121
Construction Soft Costs (PMCM, Contingency)	-	-	$4,274,352	$3,994,722	$8,269,074
Total	$142,852	$3,001,993	$12,356,989	$16,944,206	**$32,446,039**

The total capital costs for the Project amount to $32.44 million in 2023 dollars, discounted at 7 percent.

Operations and Maintenance (O&M) Costs

The analysis estimates annual operations and maintenance (O&M) costs as a percentage of total project capital costs. To maintain a conservative approach, O&M costs are assumed to be negligible (zero) during the first five years following project completion, based on the expectation that newly constructed infrastructure typically requires minimal upkeep in its early lifecycle.

Starting in Year 6 and through Year 15, annual O&M costs are estimated at 0.25 percent of total capital costs. From Year 16 through Year 20, the rate increases to 0.50 percent, reflecting the greater maintenance needs associated with aging infrastructure.

The total O&M costs over the analysis period are valued at $0.54 million as disbenefit, discounted at 7 percent.

6. BCA Results

The analysis results in a total Project BCR of 1.1:1 when discounted at a rate of 7%. Exhibit 7 provides a summary of the BCA results for the Project.

Exhibit 7 – Benefit Cost Analysis Results

Vista Road Grade Separation Safety and Mobility Project	
Benefit-Cost Analysis	
20 Year Analysis Period (2030-2049)	
All Values are in Millions of 2023$ - 7% Discount Rate	
Costs	
Capital Costs	***$32.45***
Benefits	
Effects on Safety	
Reduced Accidents	$19.29
Effects on System and Service Performance	
Residual value	$3.09
O&M Costs	-$0.54
Reduced Amtrak Operational Costs	$0.10
Reduced Freight Train Operational Costs	$0.48
Effects on Competitiveness, Reliability, Trip Time, and Resilience	
Travel Time Savings (Autos and Passengers)	$7.06
Travel Time Savings (Commercial Trucks)	$0.95
Travel Time Savings (Passenger Rail)	$0.31
Commercial Vehicle Operating Cost Savings	$1.56
Automobile Fuel Costs Savings	$0.33
Emission Savings	$0.31
Train Emission Savings	$1.56
Ability to Meet Existing or Anticipated Demand	
Effects on the rest of the Network	*Qualitative*
Total Benefits	***$34.50***
BC Ratio	**1.1**
Net Present Value	**$2.05**

Source: AECOM


SAN BERNARDINO
COUNTY

An Application Seeking Funding Under the Federal Railroad Administration's Federal-State Partnership Program

Vista Road Crossing Closure and Grade Separation Project

Appendix C: Draft 22905 Agreement

Applicant:
San Bernardino County

January 7, 2026


SAN BERNARDINO
COUNTY

An Application Seeking Funding Under the Federal Railroad Administration's Federal-State Partnership Program

Vista Road Crossing Closure and Grade Separation Project

Appendix D: Environmental Documentation

Applicant:
San Bernardino County

January 7, 2026

SAN BERNARDINO COUNTY
INITIAL STUDY ENVIRONMENTAL CHECKLIST FORM

This form and the descriptive information in the application package constitute the contents of Initial Study pursuant to County Guidelines under Ordinance 3040 and Section 15063 of the State CEQA Guidelines.

PROJECT LABEL:

APN:	0467-014-10 0467-101-1, 0467-101-02, 0467-101-11, 0467-101-15, 0467-101-16, 0467-101-17 0467-102-01 0467-111-02, 0467-111-20, 0467-111-23, 0467-111-24, 0467-111-29, 0467-111-30, 0467-111-36, 0467-111-37 0467-121-05, 0467-121-06, 0467-121-17, 0467-121-22, 0467-121-24, 0467-121-28, 0467-121-30 0467-141-20		
Applicant:	County of San Bernardino Department of Public Works	***USGS Quad:***	Helendale
Community:	Near unincorporated community of Helendale	***T, R, Section:***	T 7/8 N, R 4/5 W, S 5, 6, 31, 32
Location:	Approximately ½ mile south of the existing at-grade crossing of Vista Road and the Burlington Northern and Santa Fe (BNSF) rail line, in the southwestern portion of San Bernardino County.	***Thomas Bros.:***	P 3934 / GRID: H-6, H-7, J-6, J-7 P 3936 / GRID: A-5, A-6, A-7
Project No:	TBD	***Planning Area:***	DESERT REGION
Staff:	Chris C. Nguyen, P.E.	***LUZD:***	RS – Single Residential FW – Floodway RL-5 – Rural Living (min. lot size 5 ac.) IC – Community Industrial
Rep:	TBD	***Overlays:***	FP1 (Zone A – Inside 100 Year Flood Plain) FP2 (Zone X – Inside 500 Year Flood Plain) Dam Inundation – Area of Inundation
Proposal:	Shadow Mountain Road would be extended east and terminate at a new "T" intersection at National Trails Highway. Shadow Mountain Road extension would result in the construction of two bridges, one over the Mojave River Basin, and the other over the BNSF rail line on the segment of Shadow Mountain Road between Jordan Road and National Trails Highway. In addition, Vista Road would be extended south, parallel to the BNSF right-of-way to meet with the new Shadow Mountain Road extension.		

PROJECT CONTACT INFORMATION:

Lead agency: County of San Bernardino
Department of Public Works-Team B, Transportation Design
825 East Third Street
San Bernardino, CA 92415

Contact person: Chris C. Nguyen, P.E.
Phone No: (909) 387-7948 Fax No: (909) 387-7899
E-mail: cnguyen@dpw.sbcounty.gov

Project Sponsor: County of San Bernardino
Department of Public Works
825 East Third Street
San Bernardino, CA 92415

PROJECT OVERVIEW:

Shadow Mountain Road is one of the principal east/west arterials within this part of the County of San Bernardino, connecting U.S. Route 395 and National Trails Highway. Currently Shadow Mountain Road ends at Helendale Road, but traffic can still access to/from National Trails Highway via Helendale Road and Vista Road. Vista Road is the only route between National Trails Highway and Helendale/Silver Lake Community. An at-grade BNSF railroad crossing is located on Vista Road approximately 900 feet west of the intersection of Vista Road and National Trails Highway. Increased traffic, and increased train movement, have resulted in the increase of delays at the existing at-grade crossings of Vista Road and BNSF mainline double-track. These delays have not only affected traffic but also have impacted the access by emergency vehicles to/from National Trails Highway. In addition, several accidents have occurred in the immediate vicinity of Vista Road at the BNSF at-grade railroad crossing.

The Shadow Mountain Road Grade Separation (Proposed Project) includes the extension of Shadow Mountain Road (east) which terminates at a new "T" intersection at National Trails Highway. Shadow Mountain Road extension would result in the construction of two bridges, one over the Mojave River Basin and the other over the Burlington Northern and Santa Fe (BNSF) rail line. In addition, Vista Road would be extended south, parallel to the BNSF right-of-way, to meet with the new Shadow Mountain Road extension.

ENVIRONMENTAL/EXISTING SITE CONDITIONS:

The Project Site encompasses a portion of the Mojave River valley but has a relatively flat topography with elevations ranging from approximately 2,480 feet at the southeast corner to approximately 2,448 feet along the river bed in the central Project area. The Project Site is within the Mojave River watershed (HUC 18090208), within Regional Water Quality Control Board (RWQCB) Region 6, South Lahontan Hydrologic Basin Planning Area. The annual rainfall in the region is about 3.9 inches, and humidity is low throughout the year. Most of the Project Site is covered in Pleistocene-age soils (1.8 million to 10,000 years before present). These younger alluvium soils are composed of unconsolidated and poorly sorted stream, fan, and basin deposits ranging from clay to boulder in size. The Project Site also includes limited areas of Quaternary older alluvium consisting of dry, loose-to-medium dense, silty fine-to-coarse sand with occasional gravel. No hydric soils are present within the Project Site. Majority of the (approximately 85 percent of the total acreage) Project Site located east of the Mojave River slopes to the west toward the river. The other portion of the Project Site, west of the river, slopes eastward toward the river. The Mojave River in this area flows to the north-northeast. Based on surface topography, groundwater flow in this area would tend to be northerly and toward the river.

EXISTING LAND USE DESIGNATIONS	ZONING/OVERLAY DISTRICTS
Single Residential	RS
Floodway	FW
Rural Living (min. lot size 5 ac.)	RL-5
Community Industrial	IC
	FP1 (Zone A – Inside 100-Year Flood Plain)
	FP2 (Zone X – Inside 500-Year Flood Plain)
	Dam Inundation – Area of Inundation

In addition to the County of San Bernardino, other public agencies that may also have oversight over the Proposed Project or may be responsible for issuing subsequent permits necessary to implement the Proposed Project are identified below:

Federal

- Army Corps of Engineers (USACE)

State

- California Department of Fish and Game (CDFG)
- Regional Water Quality Control Board (RWQCB)
- South Coast Air Quality Management District (SCAQMD)

PROJECT DESCRIPTION:

Project Site Location

The Project Site is located in the southwestern portion of San Bernardino County, near the unincorporated community of Helendale, along the segment of Shadow Mountain Road between US Highway 395 (US 395) and National Trails Highway (also known historically as Route 66) (see Figure 1, Regional Map). The Proposed Project limits are approximately 1.5 mile in length (see Figure 2, Vicinity Map).

Proposed Alignment

The County of San Bernardino (County) proposes to replace the existing at-grade crossing of Vista Road and the BNSF rail line with an elevated grade separation crossing (see Figure 3, Project Site Components). After review of several alignment alternatives, the County has decided to retire the existing at-grade BNSF rail line crossing at Vista Road and shift the crossing approximately 3,000 feet to the south. The existing segment of Vista Road east of the rail line would become a cul-de-sac, while the segment to the west would be extended to the south, parallel to the BNSF right-of-way (ROW). Shadow Mountain Road, the main east-west roadway corridor serving the southern portion of the Helendale community, would be extended from its current eastern termination at Helendale Road, east to Vista Road. A bridge extending Shadow Mountain Road would be constructed over the Mojave River, after which Shadow Mountain Road would be extended through the flat area between the Mojave River and the BNSF rail line and cross with the above-described Vista Road extension at an elevated grade. The proposed Vista Road extension would end at a 90-degree intersection with the proposed Shadow Mountain Road extension. The new Shadow Mountain Road extension would continue east and cross over the BNSF rail line (at grade) with another proposed bridge structure (the southerly-shifted, grade-separated crossing mentioned above) and terminate at a new “T” intersection at National Trails Highway. Widening and cross-grade modifications would be required on National Trails Highway approaching the new T-intersection to accommodate new dual left-turn pockets for northbound traffic and one dedicated right-turn lane for southbound traffic onto future Shadow Mountain Road. A new traffic signal would be installed at this intersection which would serve as an upgraded “gateway” to the fast growing Helendale community.

The proposed Shadow Mountain Road extension throughout the Project area would be categorized as Secondary Highway per the County's transportation standard with two 12-foot wide traffic lanes in each direction plus one 8-foot wide shoulder (or potentially bike lane) with curb, gutter, and sidewalk. As previously mentioned, Vista Road would be extended toward the south to meet with the new Shadow Mountain Road extension. Wherever the proposed alignment is above the existing ground level at a location other than the two new bridge structures, an embankment would be constructed beneath the roadway, with slope applied behind the back of the sidewalk on both sides. The design speed for both Vista Road and Shadow Mountain Road would be 65 miles per hour (mph), and the posted speed would be 55 mph.

Project Characteristics

The proposed Shadow Mountain Road extension crossing the Mojave River would use a six-span bridge configuration, approximately 805 feet (one bridge bent/column to the next) in length and 82-89 feet in width. Caltrans Type 26 sidewalk/barriers are proposed on both sides of the bridge for pedestrian traffic. A concrete barrier would separate vehicle traffic. The substructure consists of pier walls and seat-type abutments supported on drilled shafted piles, with rock slope protection used for scour protection of the abutment foundations.

The proposed Shadow Mountain Road extension crossing the BNSF rail line would use a single-span bridge configuration measuring 220 feet (one span at 220 feet) in length and varying in width from 79 feet to 89 feet because of traffic lane tapering. Caltrans Type 26 sidewalk/barriers are proposed on both sides of the bridge for pedestrian traffic. The substructure consists of circular columns, supported on drilled shaft foundations, and seat-type abutments supported on driven piles, with rock slope protection used for protection of the abutment foundations.

In addition to the bridge work, the Proposed Project would include roadway improvements. Infrastructure improvements for the Proposed Project include constructing accesses to multiple nearby ranch properties adjacent to the Proposed Project.

Staging Area

The staging areas for construction equipment would be selected so as to provide appropriate acreage and proximity to the work areas, including the storing of false work beams and materials if they cannot be stored in the river bed. Two potential staging areas have been tentatively identified and would be designated by the contractor during construction. The first staging area would be located in the triangular area bounded by the proposed Shadow Mountain Road extension, the existing Helendale Road, and the Mojave River. The second staging area would be located in a triangular area (parcel 0467-111-20) west of the BNSF rail line, bounded to the north by Jordan Road and to the west by Pearl Road (see Figure 3). The majority of the construction would occur within the County's right-of-way. The balance of the construction would occur on BNSF right-of-way or private holdings that would be acquired.

Access

The Project Site has adequate clearance to accommodate access roads for the construction of the bridges. Temporary construction easements would be required from local property owners and BNSF during the construction phase. If needed, additional access roads would be built within the project footprint of disturbance. The access roads would be used for accessing the river bed and for hauling materials with dump trucks, for delivery of materials and equipment, and by workers to perform the work (including forming, placing rebar, pouring concrete, etc.).

Utilities

Implementation of the Proposed Project would require the relocation of some utilities. The utility companies with facilities within the Project Site are: Southern California Edison (SCE), Southwest Gas Company, Mojave Water Agency, County of San Bernardino, telephone companies (Verizon, Sprint), and cable companies (Charter Communications, Level 3 Communications, Verizon).

Figure 1 – Regional Map
Shadow Mountain Road Grade Separation

Figure 2 – Vicinity Map
Shadow Mountain Road Grade Separation

Figure 3 – Proposed Project
Shadow Mountain Road Grade Separation

EVALUATION FORMAT

This initial study is prepared in compliance with the California Environmental Quality Act (CEQA) pursuant to Public Resources Code Section 21000, et seq. and the State CEQA Guidelines (California Code of Regulations Section 15000, et seq.). Specifically, the preparation of an Initial Study is guided by Section 15063 of the State CEQA Guidelines. This format of the study is presented as follows. The Proposed Project is evaluated based upon its effect on seventeen (17) major categories of environmental factors. Each factor is reviewed by responding to a series of questions regarding the impact of the Proposed Project on each element of the overall factor. The Initial Study Checklist provides a formatted analysis that provides a determination of the effect of the Proposed Project on the factor and its elements. The effect of the Proposed Project is categorized into one of the following four categories of possible determinations:

Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact

Substantiation is then provided to justify each determination. One of the four following conclusions is then provided as a summary of the analysis for each of the major environmental factors.

1. **No Impact**: Therefore, no impacts are identified or anticipated and no mitigation measures are required.

2. **Less than Significant Impact**: Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

3. **Less than Significant Impact with Mitigation Incorporated**: Possible significant adverse impacts have been identified or anticipated and the following mitigation measures are required as a condition of Project approval to reduce these impacts to a level below significant. The required mitigation measures are: (List mitigation measures)

4. **Potentially Significant Impact**: Significant adverse impacts have been identified or anticipated. An Environmental Impact Report (EIR) is required to evaluate these impacts, which are (Listing the impacts requiring analysis within the EIR).

At the end of the analysis the required mitigation measures are restated for the Mitigation Monitoring and Reporting Program.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this Proposed Project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture and Forestry Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology / Soils
☐ Greenhouse Gas Emissions	☐ Hazards & Hazardous Materials	☐ Hydrology / Water Quality
☐ Land Use / Planning	☐ Mineral Resources	☐ Noise
☐ Population / Housing	☐ Public Services	☐ Recreation
☐ Transportation / Traffic	☐ Utilities / Service Systems	☐ Mandatory Findings of Significance

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation, the following finding is made:

☐ The Proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ Although the Proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ The Proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ The Proposed Project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ Although the Proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the Proposed Project, nothing further is required.

Signature (prepared by XX, XX)	XX XX, 2012 Date
Signature: Chema Ude, Senior Associate Planner	Date

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
I. AESTHETICS - Would the project				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

SUBSTANTIATION: *(Check ☒ if project is located within the view-shed of any Scenic Route listed in the General Plan):*

a) **Less than Significant Impact.** According to the Open Space Element of the County's General Plan, San Bernardino County possesses vast expanses of scenic vistas (i.e., vast undeveloped tracts of land). The Proposed Project consists of an extension to Shadow Mountain Road and associated road improvements within the vicinity of the Helendale community. As part of the Proposed Project, the extension of Shadow Mountain Road would be bridged over the Mojave River for approximately 800 feet in length and would be bridged over the BNSF railroad for approximately 220 feet in length. These bridge structures and their substructures, which would consist of pier walls and seat-type abutments or circular columns supported on drilled/driven piles with rock slope protection, would be visible from some locations within the vicinity of the Helendale community.

Visual simulations were prepared to show a before-and-after illustration of the Proposed Project. Exhibit 1 (Attachment A) provides a key view location map showing the location/direction of the visual simulation view. Exhibits 2 and 3 (Attachment A) provide the existing view and the unvegetated and vegetated visual simulations of the Proposed Project from viewpoints A and B. Viewpoint A provides a before-and-after view of above-grade sections of the Proposed Project. This view is from Helendale Road looking southeast across the Mojave River. This viewpoint was chosen to be representative of views from residences along Helendale Road in the Helendale community. In the existing view, vegetation and trees dominate the foreground and middle-ground of the view, and predominantly undeveloped land and mountains dominate the background of the view. The BNSF railroad is visible on the left side of the view in the middle of the photo and appears as a dark, horizontal linear feature. National Trails Highway is located beyond the BNSF. The relatively undeveloped appearance in the middle- and background of this view could be considered scenic due to their relatively undeveloped nature. In the unvegetated and

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

vegetated views, the Proposed Project structures are primarily blocked by existing vegetation and trees, with only portions of the above-grade elements visible through gaps in the vegetation/trees or immediately below the BNSF on the left side of the view. The visible elements of the Proposed Project in this view are most noticeable in the unvegetated visual simulation due to their light tan color; however, in the vegetated visual simulation, these tan-colored areas are landscaped with native plants of similar color to the surrounding area that blend these elements with the existing setting. Therefore, from this view point, introduction of the above-grade Project features would not substantially alter the view, as the view would continue to be dominated by vegetation, trees, and largely undeveloped tracts of land and mountains.

Viewpoint B is from National Trails Highway looking southwest. In the existing view, the foreground and middle-ground are dominated by low, shrubby vegetation. In the background, a ridge-like feature is visible, which is the elevated western bank of the Mojave River. Beyond this elevated bank, mountains are barely discernible in this photograph due to poor visibility. The normally visible outline of these mountains has been traced in the exhibit with a gray-dashed line to provide a visual reference. The undeveloped character of this view could be considered scenic. In the unvegetated and vegetated views, above-grade elements of the Proposed Project are very prominent. The bridge over the BNSF railroad is located in the center of this view; and the foundations of the bridge extend horizontally across much of the view, blocking views of the elevated western bank of the Mojave River from this particular vantage point. The faint-appearing mountains would still be visible beyond the bridge and road foundations. The visible elements of the Proposed Project in this view are most noticeable in the unvegetated visual simulation due to their light tan color; however, in the vegetated visual simulation, these tan-colored areas are landscaped with native plants of similar color to the surrounding area that blend these elements with the existing setting. It should be noted that this view was chosen as a worst-case scenario view to depict the most prominent view of the Proposed Project from a motorist's line of sight. However, this worst-case view of these Project elements would be of a short duration, as motorists would be traveling past this location at a fairly high rate of speed (i.e., the posted speed limit for National Trails Highway at this location is 55 mph). Furthermore, all elements of the Proposed Project would be constructed on the west side of National Trails Highway, in the vicinity and context of existing development associated with the Helendale community. No development would occur to the east of National Trails Highway, which for the most part consists of views of undeveloped tracts of land and mountains. Therefore, potential impacts to scenic vistas would be considered less than significant, and no mitigation measures would be required.

b) **Less than Significant Impact.** The Project Site is within the viewshed of National Trails Highway, a County-designated Scenic Route. As stated in the General Plan, "the County desires to retain the scenic character of visually important roadways throughout the County. A 'scenic route' is a roadway that has scenic vistas and other scenic and aesthetic qualities

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

that over time have been found to add beauty to the County." According to the General Plan, "the boundaries of a scenic corridor generally encompass the land adjacent to and visible from the highway using a motorist's line of sight." As discussed in the response for question I(a) above, a visual simulation representing the most prominent view of the Proposed Project from a motorist's line of sight while on National Trails Highway was prepared. As described for the visual simulation, above-grade elements of the Proposed Project are very prominent. The bridge over the BNSF railroad is located in the center of this view; and the foundations of the bridge extend horizontally across much of the view, blocking views of the elevated western bank of the Mojave River from this particular vantage point. The faint-appearing mountains are still visible beyond the bridge and road foundations. This worst-case view of these Project elements would be of a short duration, as motorists would be traveling past this location at a fairly high rate of speed (i.e., the posted speed limit for National Trails Highway at this location is 55 mph). Furthermore, all elements of the Proposed Project would be constructed on the west side of National Trails Highway, in the vicinity and context of existing development associated with the Helendale community. No development would occur to the east of National Trails Highway, which for the most part consists of views of undeveloped tracts of land and mountains.

It should be noted the Proposed Project would require some modification to National Trails Highway. A new "T" intersection at National Trails Highway would be introduced. Widening and cross-grade modifications would be required on National Trails Highway approaching the new T-intersection to accommodate new dual left-turn pockets for northbound traffic and one dedicated right-turn lane for southbound traffic onto future Shadow Mountain Road. A new traffic signal would also be installed at this intersection. These changes to National Trails Highway would not be considered substantial, as National Trails Highway has previously been modified in this area (i.e., repaved and widened to accommodate a third lane for left-turning northbound vehicles at Vista Road), which has altered the historic character of the road in this area. A limited number of trees would need to be removed to accommodate the new road alignment; however, the nearest location of these trees to National Trails Highway would be approximately 1,000 feet. Also, these trees would not be considered scenic, as they are shade trees and not sensitive species of the San Bernardino Desert Region, such as Joshua, mesquite, smoketree, desert ironwood, palo verdes, etc.

Therefore, implementation of the Proposed Project would not substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. Impacts would be considered less than significant, and no mitigation measures would be required.

c) **Less than Significant Impact.** As discussed in the responses for questions I(a) and (b), above, the Proposed Project would not substantially degrade the existing visual character or quality of the site and its surroundings. Therefore, impacts to visual character and quality of the site would be considered less than significant, and no mitigation measures would be

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

required.

d) **Less than Significant Impact.** Implementation of the Proposed Project would result in the introduction of new signaled intersections and new street lighting (i.e., high-pressure sodium vapor safety luminaries [150- to 200-watt]). All lighting would comply with the San Bernardino County Development Code with respect to glare and outdoor lighting requirements for the desert region. Therefore, impacts related to light and glare would be considered less than significant, and no mitigation measures would be required.

No significant adverse impacts are identified or anticipated and no mitigation measures would be required.

II. AGRICULTURE AND FORESTRY RESOURCES - In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code	☐	☐	☐	☒

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

SUBSTANTIATION: *(Check ☐ if project is located in the Important Farmlands Overlay):*

a) **No Impact**. The Project Site is not identified or designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency. Therefore, no impacts related to the conversion of farmland would occur, and no mitigation measures would be required.

b) **No Impact**. The Project Site contains the following land use zoning districts: Single Residential (RS); Floodway (FW); Rural Living 1 unit per 5 acres (RL-5); and Community Industrial (IC). According to Table LU-1 (Primary Purpose and Intended Uses of Land Use Zoning Districts) of the County of San Bernardino General Plan (2007), the RL-5 District "provides for incidental agricultural uses," and the FW District "provides sites for animal raising, grazing, crop production, and similar and compatible uses." Although agricultural uses are allowed within these two districts, agriculture is not the focus of these districts, as in other districts such as the Agriculture (AG) District. Development of a non-agricultural use on the Project Site, such as the proposed road improvements, would not conflict with the districts discussed above. In addition, no Williamson Act Contracts cover the Project Site. Therefore, no conflicts with agricultural zoning or Williamson Act Contracts would occur, and no mitigation measures would be required.

c) **No Impact**. The Project Site does not conflict with nor would it result in the rezoning of forest or timberland. As mentioned above, the property is zoned for residential uses, floodway uses, and community industrial uses. Therefore, no conflicts with zoning for forest or timberland would occur, and no mitigation measures would be required.

d) **No Impact**. The Proposed Project would not involve the conversion or removal of forest land. Therefore, no impacts would occur, and no mitigation measures would be required.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

e) **No Impact**. The Proposed Project would not involve any other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use. Therefore, no impacts would occur, and no mitigation measures would be required.

No significant adverse impacts are identified or anticipated and no mitigation measures would be required.

III.	**AIR QUALITY -** Where available, the significance criteria established by the applicable air quality management or air pollution control district might be relied upon to make the following determinations. Would the project:				
a)	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b)	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d)	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e)	Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

SUBSTANTIATION: *(Discuss conformity with the South Coast Air Quality Management Plan, if applicable):*

The analysis and information in the following section is primarily derived from the *Shadow Mountain Railroad Grade Separation – Air Quality and Climate Change Technical Report* prepared for the Proposed Project. This document is included as Appendix A of this Initial Study.

a) **Less Than Significant Impact.** The Project Site is located in the Mojave Desert Air Basin

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

(MDAB). The Mojave Desert Air Quality Management District (MDAQMD) is the regional agency responsible for regulation and enforcement of federal, state, and local air pollution control regulations in the MDAB. The MDAQMD operates seven monitoring stations in the MDAB, develops and enforces rules and regulations for stationary sources and equipment, prepares emissions inventory and air quality attainment planning documents, and conducts source testing and inspections. The most recent Air Quality Attainment Plans (AQAPs) for the region include the 2008 MDAQMD Federal 8-Hour Ozone Attainment Plan (Western Mojave Desert Non-attainment Area), the 2004 (1-hr) Ozone Attainment Plan, and the 1995 Final Mojave Desert Planning Area Federal PM_{10} Attainment Plan. These AQAP's include control measures and strategies to attain the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) in the MDAB. The MDAQMD then implements these control measures as regulations to control or reduce criteria pollutant emissions from stationary sources or equipment (MDAQMD, 2008, 2004, 1995).

The MDAQMD developed the *CEQA and Federal Conformity Guidelines* (Guidelines) for use in evaluating project-level impacts resulting from construction activities and operations. The MDAQMD Guidelines specify thresholds of significance, provided in both daily and annual mass emission rates for direct and indirect sources, and conformity requirements. Per MDAQMD guidance, project-level conformity is determined through demonstration of consistency with AQAPs, compliance with all applicable local rules and regulations, and all proposed control measures not yet adopted from the applicable plan, and is consistent with the growth forecasts in the applicable plan (or is directly included in the applicable plan) (MDAQMD 2009).

Existing control measures presented in the 8-hr Ozone Attainment Plan are geared towards reducing emissions from permitted stationary sources through technology requirements (Reasonably Available Control Technology) and would not apply to the Proposed Project. Rules and regulations adopted by the MDAQMD which are applicable to the Proposed Project are presented below:

Rule 403 Fugitive Dust aims to reduce and control fugitive dust from activities such as material handling and storage and construction and requires emissions to be controlled such that transport beyond the property boundary does not occur. All feasible control measures are to be implemented. Additionally, the regulatory emission limit is 100 $\mu g/m^3$; this limit shall be based on the difference between upwind and downwind concentrations measured by high-volume sampling devices, averaged over a minimum 5-hour period.

Rule 403.2 Fugitive Dust Control for the Mojave Desert Planning Area aims to reduce and control fugitive dust emissions such that the NAAQS for PM_{10} and $PM_{2.5}$ are not exceeded and requires implementation of specific control measures for various project types. For the Proposed Project, categorized as a "Construction/Demolition

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

source," required control measures include the following: periodic site watering, installation of track-out devices, requirement for haul loads to be covered, and implementation of soil stabilization measures for graded surfaces.

Rule 1113 Architectural Coatings aims to reduce VOC emissions from the manufacture, sale, or use of industrial maintenance coatings. Typical materials that could be used during the Proposed Project include waterproofing sealers, with an applicable VOC content limit of 250 g/L. The Project proponent should verify that all materials purchased and used during the Proposed Project are in compliance with the current regulatory VOC limits.

Construction of the Proposed Project would include roadway clearing and grading, aerial bridge construction, site grading and excavation, drainage work/utility relocation, roadway improvements, and application of architectural coatings such as sealer or waterproofing membranes. The types of construction equipment required for these activities include the following: dozer, grader, roller, water truck, drill rig, cement/mortar mixer, crane, compactor, pump, tractor/loader/backhoe, scraper, excavator, skid steer loader, trencher, paver, and paving equipment.

Peak daily emissions generated during construction activities result from concurrent equipment operations. This analysis estimated peak daily emissions based on concurrent operations of 18 pieces of equipment during activities associated with aerial bridge construction, site grading, and excavation, as presented in Table 1.

Table 1: Peak Daily Construction Emissions Summary (lbs/day)

Activity	VOCs	NOx	CO	SO_2	Fugitive Dust[1]		Combustion	
					PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Aerial Bridge Construction	1.21	7.42	8.96	0.00	0.00	0.00	0.35	0.32
Site Grading/Excavation	5.15	35.52	22.52	0.00	13.62	2.85	1.29	1.50
On-road Mobile Sources								
Haul Trucks	5.48	36.67	48.82	--	--	--	1.73	1.22
Employee Commute	0.17	0.69	8.09	0.00	--	--	0.23	0.12
Peak Daily Emissions Total (lbs/day)=	12.01	80.30	88.39	0.00	13.62	2.85	3.60	3.16
Daily Significance Threshold (lbs/day) =	137	137	548	137	82		82	
Exceed Significance Threshold (Y or N)? =	No	No	No	No	No		No	

Notes: "—" indicates source or activity would not result in generation of criteria pollutant.

1. A control efficiency of 70% has been applied to fugitive dust emissions based on implementation of required control measures including site watering, application of soil stabilization measures on graded surfaces, installation of trackout devices at ingress and egress points, and requirements for haul truck enclosure or covering.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

Source: Modeled by AECOM, 2012

A 70 percent control efficiency has been applied to fugitive dust emissions based on implementation of required control measures per SCAQMD Rule 403 including site watering, application of soil stabilization measures on graded surfaces, installation of track-out devices at ingress and egress points, and requirements for haul truck enclosure or covering. As presented in Table 1, peak daily construction emissions would not exceed the MDAQMD's daily threshold for volatile organic chemicals (VOCs), nitrogen oxides (NOx), carbon monoxide (CO), sulphur dioxide (SO_2), and particulate matter less than 10 microns in diameter (PM_{10}) or particulate matter less than 2.5 microns in diameter ($PM_{2.5}$).

Project-level emissions within the MDAQMD are evaluated based on peak daily emissions as well as annual emissions, through comparison to the mass-annual thresholds, as presented in Table 2 below.

Table 2: Annual Construction Emissions Summary (TPY)

Activity (Duration)	VOCs	NOx	CO	SO_2	Fugitive Dust[1]		Combustion	
					PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Roadway Clearing and Grading (1 month)	0.02	0.13	0.11	0.00	0.15	0.03	0.01	0.01
Aerial Bridge Construction (8 months)	0.10	0.64	0.78	0.00	0.00	0.00	0.03	0.03
Site Grading/Excavation (4 months)	0.22	1.51	0.96	0.00	0.58	0.12	0.05	0.05
Drainage Work/Utilize Relocation (1 month)	0.02	0.10	0.12	0.00	0.00	0.00	0.01	0.01
Roadway Improvements (6 months)	0.13	0.75	0.76	0.00	0.00	0.00	0.05	0.05
Architectural Coatings (1 month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
On-Road Mobile Source								
Haul Trucks	0.59	3.96	5.27	--	--	--	0.16	0.12
Employee Trips	3.31E-03	1.98E-.03	4.82E-02	--	--	--	1.67E-03	1.55E-04
Annual Emissions Summary, TPY =	1.09	7.10	8.05	0.00	0.73	0.15	0.31	0.26
Annual Significance Threshold, TPY =	25	25	100	25	15		15	
Exceed Significance Threshold (Y or N)? =	No	No	No	No	No		No	

Notes: "—" indicates source or activity would not result in generation of criteria pollutant.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

1. A control efficiency of 70% has been applied to fugitive dust emissions based on implementation of required control measures including site watering, application of soil stabilization measures on graded surfaces, installation of trackout devices at ingress and egress points, and requirements for haul truck enclosure or covering.

Source: Modeled by AECOM, 2012

As presented in Table 2, annual construction emissions would not exceed the MDAQMD's annual threshold for VOCs, NOx, CO, SO_2, PM_{10} or $PM_{2.5}$.

Operation of the Proposed Project would alter the existing travel route only in the local vicinity and, therefore, would not generate any new vehicle trips or associated criteria pollutant emissions. Furthermore, as presented previously in Tables 1 and 2, Project-related emissions are below both the annual and the peak daily construction emissions; therefore, the Proposed Project would not conflict with or obstruct implementation of the applicable AQAP. Therefore, impacts related to the AQAP would be considered less than significant, and no mitigation measures would be required.

b) **Less Than Significant Impact**. As discussed in item (a) above, the Proposed Project would not generate any air quality emissions during operation and would result in the generation of criteria pollutant emissions below the MDAQMD annual and peak daily emissions for construction activities. These thresholds are designed to identify those projects which may result in significant levels of air pollution and to assist the region in attaining the applicable state and federal ambient air quality standards. Because the Proposed Project would not exceed any MDAQMD air quality significance threshold, it would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. Therefore, impacts would be considered less than significant, and no mitigation measures would be required.

c) **Less Than Significant Impact**. An evaluation of CEQA-approved concurrent projects within Helendale, the City of Victorville, and the County of San Bernardino was conducted utilizing the online CEQA database. No other projects were identified within a 5-mile radius which would result in concurrent construction activities. In addition, because the Proposed Project would not exceed any MDAQMD air quality threshold, the incremental ambient air quality impact resulting from construction-related emissions would not result in a significant impact to existing attainment and non-attainment designations. The Proposed Project is not considered to result in significant levels of emissions, and these emissions are not cumulatively considerable or cumulatively significant. Therefore, cumulative air quality impacts would be considered less than significant, and no mitigation measures would be required.

d) **Less Than Significant Impact.** Construction of the Proposed Project would result in the temporary and short-term generation of diesel particulate matter (DPM) from the use of diesel-powered on- and off-road equipment required for site grading and excavation,

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

paving, and other construction activities including material hauling. The dose to which the receptors are exposed (a function of concentration and duration of exposure) is the primary factor used to determine health risk (i.e., potential exposure to toxic air contaminant [TAC] emission levels that exceed applicable standards). According to the California Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments (HRAs) that determine the exposure of sensitive receptors to TAC emissions should be based on a 70-year exposure period.

The duration of mobilized equipment used near sensitive receptors located near the corner intersection of Shadow Mountain Road and Helendale Road should be less than 12 months. In addition, as roadway improvements are completed, mobile equipment would progress along the proposed new alignment and would not operate near (within approximately 500 feet of) any one sensitive receptor for more than a maximum of a few weeks at a time. The Proposed Project would represent less than 0.1 percent of the 70-year exposure period for any nearby sensitive receptor in the area. Because the exposure period for receptors in the vicinity of the Proposed Project would be minimal, and because the MDAQMD does not have guidance for evaluation of short-term DPM exposure, additional analysis has not been conducted for this evaluation.

During operation, intersections have the potential to result in a CO hotspot if the level of service (LOS) is rated D, E, or F, which is based on conditions related to traffic flow. Based on results obtained from the Traffic and Transportation Technical Report, intersections within the project Study Area, during the interim (2020) and full build-out (2040) years with the Proposed Project, would operate at an LOS of C or better. As such, CO hotspots would not be generated.

Therefore, implementation of the Proposed Project would not expose sensitive receptors to substantial pollutant concentrations. Impacts would be considered less than significant, and no mitigation measures would be required.

e) **Less Than Significant Impact.** Operation of the Proposed Project would not generate unusual or objectionable odors because the Proposed Project consists of an extension to Shadow Mountain Road and associated road improvements. Some odors may be associated with diesel engines used during construction; however, these odors are typical during construction and would be subject to construction and air quality regulations, including proper maintenance of diesel engines to minimize engine emissions. These emissions would also be of short duration during the construction phase. Implementation of the Proposed Project would not create objectionable odors that would affect a substantial number of people. Therefore, impacts related to odors would be considered less than significant, and no mitigation measures would be required.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

No significant adverse impacts are identified or anticipated and no mitigation measures would be required.

IV. BIOLOGICAL RESOURCES - Would the project:

a)	Have substantial adverse effects, either directly or through habitat modifications, on any species identified as a candidate, sensitive or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☒	☐	☐
c)	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc…) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?	☐	☐	☒	☐

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

SUBSTANTIATION: *(Check if project is located in the Biological Resources Overlay or contains habitat for any species listed in the California Natural Diversity Database ☒): Category N/A*

The analysis and information in the following section is primarily derived from the *Biological Resources Technical Report For The Proposed Shadow Mountain Road Grade Separation Project* and the *Shadow Mountain Road Extension Jurisdictional Delineation Report* prepared for the Proposed Project. These documents are included as Appendix B of this Initial Study.

a) **Less Than Significant With Mitigation Incorporated.** Impacts to existing upland plant community and land cover types (i.e., fallow agriculture land, disturbed land, and saltbush scrub) are anticipated to occur during construction of the Proposed Project; however, these existing plant community and land cover types are not determined sensitive nor are they determined to provide habitat for special status species.

Four special status plant species, cited by the California Natural Diversity Database (CNDDB) and California Native Plant Society (CNPS), were determined to potentially occur within the regional area of the Proposed Project (CNDDB 2003 and CNPS 2011). Of the four special status plant species, none are federal- or state-listed as endangered or threatened. Only one of these species, white pygmy-poppy (*Canbya candida*), was determined to have a moderate potential to occur at the Project Site. White pygmy-poppy is typically found in creosote scrub desert and therefore would likely be restricted to the area east of National Trails Highway (outside the Proposed Project limits), as most of the creosote scrub west of the highway is moderately to heavily disturbed.

Five special status wildlife species, cited by the CNDDB, were determined to potentially occur within the regional area of the Proposed Project (CNDDB 2003). These special status wildlife species include the desert tortoise (*Gopherus agassizii*), Mohave ground squirrel (*Xerospermophilus mohavensis*), burrowing owl (*Athene cunicularia*), prairie falcon (*Falco mexicanus*), and the Mojave river vole (*Microtus californicus mohavensis*).

Although suitable foraging habitat for the prairie falcon is present within the Project Site, no breeding habitat for this species occurs within, or in proximity to, the Project Site. Also, although the Project Site is within the known range of the Mojave river vole, potentially suitable habitat is limited due to disturbance from past use for agricultural production, flood control activities along the Mojave River, and the dominance of salt cedar in the moister habitats adjacent to the Mojave River. Therefore, no significant impacts to the prairie falcon or Mojave river vole are anticipated. Focused surveys for the burrowing owl and the Mohave ground squirrel and a preliminary desert tortoise survey were conducted within and adjacent to the Project Site between February and July of 2011. These surveys were conducted to determine presence of these species due to potential habitat located within and adjacent to the permanent and temporary disturbance areas. The surveys were negative for all three species; however, despite absence of these species, suitable habitat

Issues	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

remains on and near the Project Site. Since construction of the Proposed Project would occur at later, Mohave ground squirrel, burrowing owl, or desert tortoise have potential to utilize and/or occupy this suitable habitat. Therefore, the Proposed Project has the potential to impact Mohave ground squirrel, burrowing owl, or desert tortoise. Impacts would be less than significant with the implementation of Mitigation Measures BIO-1 through BIO-6.

Incidental observations of four mammal, 46 bird, and two reptile species were found within and surrounding the Project Site. Among those species observed, the following three are California Department of Fish and Game (CDFG) California Species of Special Concern: olive-sided flycatcher (*Contopus cooperi*), loggerhead shrike (*Lanius ludovicianus*), and yellow warbler (*Dendroica petechia*). The olive-sided flycatcher and yellow warbler incidental observations are considered to be migrant individuals due to the time period (mid-April to early June) and due to the lack of typical habitat for these two species. However, suitable habitat for the loggerhead shrike was observed in the south-eastern portion of the Project Site. Therefore, should construction of the Proposed Project occur during the breeding season, potential impacts to nesting loggerhead shrike could occur. The Migratory Bird Treaty Act makes it unlawful to pursue, hunt, take, capture, or kill migratory birds, including active nests. The County's standard protocol for construction includes a provision to limit construction activity occurring during bird-nesting season (March 15 through September 15) without a breeding bird survey conducted within seven (7) days prior to construction to determine if active nests are present. If no nesting birds are observed, project activities may begin. If an active bird nest is located, the nest site shall be flagged and a buffer established at the appropriate distance, depending on the nesting species.

Impacts would be less than significant with the above stated mitigation measures and incorporation of County nesting bird protocol.

b) **Less Than Significant With Mitigation Incorporated.** Construction activity in the vicinity of the Mojave River is expected to result in potential impacts to riparian scrub (i.e., would be crushed or removed) due to required access of construction equipment within the Mojave River. Although the bridge is designed to span the Mojave River, direct impacts of the pilings and indirect impacts of shading would result in some impacts to riparian vegetation; however, the riparian scrub is scattered across the floodplain, and does not represent a continuous riparian corridor. In addition, the most common shrub species in this riparian scrub is a nonnative plant (tamarisk). This nonnative shrub is considered an invasive plant species and often dominates floodplains where it is located. The tamarisk-dominated scrub does not represent good quality habitat. Thus, although riparian vegetation (in general) is often considered a sensitive community, the minor, temporary impacts associated with bridge construction would not result in a significant impact to the riparian scrub.

Further protection for the Project Site would occur through the implementation of construction-related Best Management Practices (BMPs) required by the County to be

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

approved as part of a Storm Water Pollution Prevention Plan (SWPPP). Examples of protection policies in such plans may include, but not be limited to, the following:

> All debris, bark, slash, sawdust, rubbish, silt, cement or concrete or washings thereof, asphalt, paint or other coating materials, oil or other petroleum products, or any other substance resulting from Project-related activities which would be hazardous to aquatic life or water of the state, shall be prevented from contaminating the soil and/or entering the waters of the state. None of these materials shall be allowed to enter into or be placed within or where they may be washed by rainfall or runoff into waters of the state. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any stream.

Aquatic resources, including the entire length of the Mojave River within the Project Site, are also protected under the Clean Water Act (CWA) and the Porter Cologne Water Quality Control Act. These resources are regulated under CWA Sections 404 and 401 by the U.S. Army Corps of Engineers (USACE) and the Lahontan Regional Water Quality Control Board (RWQCB), respectively, and Section 1602 of the California Fish and Game Code, by the California Department of Fish and Game (CDFG). Permits from each of these three regulatory agencies would be required prior to any construction activities within the Mojave River. These permits may include additional requirements for protection of the Project Site.

Impacts would be less than significant with County policy, regulatory permits, and the implementation of Mitigation Measures BIO-1, BIO-2, and BIO-3.

c) **Less Than Significant With Mitigation Incorporated.** The Proposed Project would cross over the Mojave River and would therefore result in temporary and permanent impacts to jurisdictional waters of the United States and state. The Proposed Project is anticipated to directly impact approximately 0.02 acre of jurisdictional waters of the United States and 0.02 acre of jurisdictional waters of the state. The proposed bridge includes six pilings, all of which are located directly within waters of the United States and state. The entire shaded portion under the bridge (1.36 acres) is subject to CDFG jurisdiction. Potential impacts to jurisdictional waters and wetlands include the following:

- Shading from the new bridge has the potential to impact riparian scrub or wetland plant communities associated with the bridge crossing of the Mojave River.
- The installation and permanent existence of the pilings is anticipated to directly impact 0.02 acre of existing habitat.
- The proposed staging area would result in impacts to the isolated water of the state

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

(0.05 acre) located in the western section of the Proposed Project.

- The construction and operation of the Proposed Project could potentially result in runoff from dirt piles during rain events, which could cause siltation.

- The construction of the Proposed Project would result in the removal of approximately 0.5 acre of riparian scrub associated with the Mojave River and an identified isolated water of the state.

Impacts would be less than significant with the implementation of Mitigation Measures BIO-1, BIO-2, BIO-3, and BIO-7.

d) **Less Than Significant Impact.** Wildlife corridors and linkages are essential to maintain populations of healthy and genetically diverse wildlife species. At a minimum, wildlife corridors promote colonization of habitat and genetic variability for both plant and wildlife species by connecting fragments of habitat that are separated by otherwise foreign or inhospitable habitats. Isolation of plant and wildlife populations can have many harmful effects and may contribute significantly to local species extinctions. Therefore, wildlife corridors are important because they help sustain individual species distributions within these habitat fragments.

The Mojave River is a major watercourse/floodplain and hydraulic feature within the desert and represents a substantial linear resource with connectivity to a large expanse of habitat and open space. In fact, the Mojave River is designated as a Wildlife Corridor in the Open Space element of the County of San Bernardino General Plan. This linear feature, coupled with presence of seasonal waters and riparian vegetation, provides cover, forage, rest, breeding, and movement opportunities that are more abundant due to the topography and focused hydrology. The Mojave River presents movement opportunities for free-ranging mammals, dispersal of bird populations, reptile movement and dispersal, and local and regional migration of butterfly/moth populations due partly to the presence of host plants and nectar. This resource can also attract insectivorous and nectar-loving bat species and local movement. As the Proposed Project is expected to bridge over the Mojave River, with minimal infrastructure that would potentially provide substantial impediments to wildlife movement, no significant impacts from the Proposed Project on potential wildlife movement would be expected. Although adverse impacts on wildlife movement may be most likely to occur during the construction phase of the Proposed Project, these impacts would be considered temporary and not significant. As such, impacts associated with interference with a migratory wildlife corridor would be considered less than significant, and no mitigation measures would be required.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

e) **Less Than Significant Impact.** The Proposed Project would comply with the San Bernardino County Development Code which requires a Tree or Plant Removal Permit for the removal of regulated desert native plants or regulated riparian plants near the Mojave River. According to Section 83.10.080(c), Regulated Desert Native Plants, creosote rings (i.e., a circular group or patch) 10 feet or greater in diameter, "shall not be removed except under a Tree or Plant Removal Permit in compliance with Section 88.01.050 (Tree or Plant Removal Permits)." According to Section 88.01.080, Riparian Plant Conservation, "the removal of vegetation within 200 feet of the bank of a stream . . . shall require approval of a Tree or Plant Removal Permit in compliance with Section 88.01.050 (Tree or Plant Removal Permits)." Construction-related activities requiring the removal of creosote rings 10-feet or greater in diameter and all vegetation within 200 feet of the Mojave River would be subject to the Tree or Plant Removal Permit. As such, the Proposed Project would not conflict with any local policies or ordinances protecting biological resources. Impacts would be considered less than significant, and no mitigation measures would be required.

f) **Less Than Significant Impact.** The West Mojave Plan is a Habitat Conservation Plan (HCP) and federal land use plan amendment that (1) presents a comprehensive strategy to conserve and protect the desert tortoise, the Mohave ground squirrel, and nearly 100 other sensitive plants and animals and the natural communities of which they are a part and (2) provides a streamlined program for complying with the requirements of the California and federal Endangered Species Acts (CESA and FESA, respectively). Although the Proposed Project is located within the West Mojave Plan, it is not anticipated to have an adverse effect on those species identified in the West Mojave Plan, as the desert tortoise and Mohave ground squirrel were not found at or adjacent to the Project Site. Therefore, impacts associated with an adopted Habitat Conservation Plan would be considered less than significant, and no mitigation measures would be required.

Potentially significant impacts have been identified or anticipated and the mitigation measures that follow are required as conditions of Project approval to reduce these impacts to a level below significant.

Mitigation Measures

BIO-1. <u>Contractor Education Program</u> – Prior to construction, the County or its designee will retain the services of a qualified biological monitor. The biological monitor will conduct a contractor education program for all personnel regarding the avoidance, as much as is practicable, of harm, harassment, injury, or death of wildlife. This program will emphasize the conservation of the wetlands/riparian systems, native habitats, and associative wildlife during Project construction and include: (a) the purpose of resource protection, (b) a description of the on-site sensitive habitats (e.g., wetland/riparian habitat), (c) the conservation measures that will be implemented in conjunction with project construction,

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

and (d) any special site issues. This instruction will be given as often as necessary to ensure that all personnel working on site are adequately briefed as to these matters.

BIO-2. Construction Work Limits and Hydroseeding – Prior to construction/site preparation, the County or its designee shall confirm that the construction work limits, including temporary staging areas, are surveyed, staked, and marked (i.e., by caution tape, temporary fencing, etc.) by qualified personnel. No vegetation removal or grading will occur outside the designated work limits. All fencing or other markers will be clearly visible to construction personnel and verified by the biological monitor. Parking; stockpiling and storage of equipment; all equipment maintenance; and dispensing of fuel, oil, or coolant; or other similar activities will be restricted to designated areas within the fenced work limits. Additional measures will include erosion and siltation control measures, protective fencing guidelines, dust control measures, grading techniques, construction area limits, and biological monitoring requirements.

After Project construction, the County or its Contractor will use fiber rolls and hydroseeding for the side slopes along the edge of the road. The hydroseeding will occur using a native seed mix of locally endemic plant species adapted to the desert environment.

BIO-3. Erosion Control – The County or its designee will ensure that the fenced impact limits include erosion control measures to minimize erosion and siltation during initial vegetation clearing/removal and Project construction through the use of silt fencing, siltation basins, sand bags, or other controls necessary to stabilize the soil in cleared or graded areas. Erosion control measures will be installed prior to the onset of vegetation clearing/removal. These measures will be maintained in good repair until the completion of Project construction.

BIO-4. Burrowing Owl Avoidance – As suitable burrowing owl habitat is present on portions of the Proposed Project Site, a preconstruction presence/absence survey should be conducted if grading or other soil disturbance activities are proposed in areas of suitable habitat. This would minimize the potential for the Proposed Project to impact burrows and habitat that might be occupied by burrowing owls at the time of construction. The preconstruction surveys should be completed no more than 30 days prior to initial ground-disturbing activity to minimize the chance that owls might occupy burrows on the site in the interim period between the surveys and initial ground-disturbing activity.

The following burrowing owl avoidance measures are adapted from recommendations provided by CDFG and the California Burrowing Owl Consortium. If a burrowing owl is observed and it is possible for the Proposed Project to avoid the area of the active burrow, no disturbance should occur within about 50 meters of the burrow during the non-breeding season (September 1 through January 31) or within about 75 meters during the breeding season (February 1 through August 31). Avoidance of an active burrow also requires that a

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

minimum of 6.5 acres of foraging habitat be permanently preserved contiguous with the burrow site.

If burrowing owls are detected during the preconstruction surveys, and impacts to the site cannot be avoided, it is recommended that the birds be removed by implementing "passive relocation" techniques. In compliance with resource agency requirements, however, any form of owl relocation must be completed outside the owl's breeding season to avoid impacts to active nests or dependent young. If burrowing owls are found, coordination with CDFG will be necessary.

BIO-5. Mohave Ground Squirrel – Mohave Ground Squirrel (MGS) focused surveys shall be conducted for the Proposed Project at least one year prior to construction in order to obtain a current determination as to the status of MGS on the site. Alternatively, development of the site can be mitigated by purchasing suitable or occupied MGS habitat in an accepted MGS habitat area.

BIO-6. Desert Tortoise Monitoring – A desert tortoise monitor shall be required during all grading and other construction operations. This individual may be the assigned biological monitor or another biologist that specializes in desert tortoise identification and relocation. If a tortoise is found, USFWS shall be notified to discuss protocol.

BIO-7. Regulatory Permits and Authorizations – Prior to the approval of project plans and specifications, the County or its designee shall ensure that the plans and specifications stipulate that prior to undertaking ground-disturbing activities within any USACE- and CDFG-jurisdictional resources, the County shall coordinate with the appropriate regulatory agencies to verify wetland delineation and jurisdictional determination results and obtain all discretionary permits and authorizations. The County will also demonstrate compliance with applicable regulatory permits per the Clean Water Act, California Fish and Game Code, and the Porter-Cologne Act (if necessary). With the above action, it is the intent of the County to mitigate for any impacts to wetland/riparian habitat, consistent with resource agency requirements and conditions presented in the following permits: Section 404 Nationwide Permit, Section 1602 Streambed Alteration Agreement, and Section 401 Water Quality Certification. Regulatory permitting may also involve waters of the state (isolated wetlands/waters not jurisdictional to USACE) which requires a waste discharge requirement (WDR) per the Porter-Cologne Act. The County shall comply with the regulatory permits.

As part of the regulatory permitting process, the County will prepare (if required by the permits) a Habitat Mitigation and Monitoring Plan (HMMP) in order to mitigate for any permanent and temporary impacts to potential wetland waters of the United States and riparian areas within the Project area. Details of a conceptual mitigation approach will be developed further during the subsequent permitting process and will include the preparation of a conceptual HMMP consistent with USACE's Mitigation Rule (Federal Register 2008).

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

Mitigation shall include offsite (or onsite, if feasible) mitigation in the form of habitat creation, restoration, and/or enhancement and may include an agency-approved contribution to a mitigation bank or in-lieu fee mitigation program. The plan shall be prepared by a qualified restoration biologist familiar with the biology and ecology of southern California plant communities and that of the Project Site.

The HMMP shall include (but not be limited to) the following:

(a) Sources of plant materials and methods of propagation.
(b) Site preparation (clearing, grading, weed eradication, soil amendment, topsoil storage), irrigation, planting (container plantings, seeding), maintenance (weed control, irrigation system checks, replanting), and monitoring of the mitigation area.
(c) Remedial measures to be taken if performance standards are not met.
(d) Methods and requirements for monitoring.

Additional Mitigation Measures

The Mojave River presents movement opportunities for free-ranging mammals, dispersal of bird populations, reptile movement and dispersal, and local and regional migration of butterfly/moth populations due partly to the presence of host plants and nectar. This resource can also attract insectivorous and nectar-loving bat species. Although the Proposed Project would not result in any significant impacts to bat species, regulatory agencies (i.e., CDFG) have requested that the bridge over the Mojave River be designed to accommodate bats. Mitigation Measure BIO-8 will be incorporated into the Project design to satisfy this request.

BIO-8. **Bat Boxes** – In order to decrease the potential for the new bridge structure to adversely affect bats that may use the new bridge for shelter, it is recommended that the County or its designee implement the use of "bat boxes" in the bridge design. As such, a specification may be included in the construction plans to ensure the proper type and placement of such bat boxes (e.g., Caltrans specifications for similar type projects).

V. CULTURAL RESOURCES - Would the project

a)	Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☒	☐
b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐

Issues	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

SUBSTANTIATION: *(Check if the project is located in the Cultural ☐ or Paleontologic ☐ Resources overlays or cite results of cultural resource review):*

The analysis and information in the following section is primarily derived from the *Cultural Resources Survey Report for Shadow Mountain Road Grade Separation Project* prepared for the Proposed Project. This document is included as Appendix C of this Initial Study.

a) **Less Than Significant Impact.** A reconnaissance built environment survey, designed to recognize and evaluate historic standing structures, was conducted by AECOM on June 7, 2011. Prior to the survey, available aerial photographs and historic maps of the built environment/area of potential effect (APE) were reviewed to identify existing structures and to determine whether historic buildings and structures were present. Resources located in the APE that were 45 or more years old were identified and documented.

Fifteen newly identified built environment resources were recorded (i.e., 046-701-405, 046-701-410, 046-710-102, 046-710-111, 046-710-113, 046-711-102, 046-711-105 (SM-TC-H-008), 046-711-113, 046-711-114, 046-711-120, 046-711-124, 046-711-130, 046-711-132, 046-711-202, 046-712-106), which were comprised of residential and commercial buildings and agricultural structures that date to the mid-twentieth century. The majority of these resources do not have significant associations with historical events or persons, or exhibit architectural significance, to meet the criteria of the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR). The remaining resources which demonstrated significant historical associations or architectural merit did not retain sufficient integrity to meet the requirements for inclusion in the NRHP or CRHR. As such, none of these resources is recommended eligible for the NRHP or CRHR; and implementation of the Proposed Project would not result in a significant impact on these resources through the alteration of these resources or their setting.

Additionally, four previously recorded historic linear resources were identified. These consisted of National Trails Highway (P-36-002910 [CA-SBR-2910]);, Mojave Trail (P-36-003033 [CA-SBR-3033H]); Atchison, Topeka and Santa Fe (AT&SF) Railroad (P-36-006793 [CA-SBR-6793H]); and a telecommunication line (CA-SBR-10318H). Of these four resources, National Trails Highway, the Mojave Trail, and the AT&SF are the only resources within the APE that are considered historic properties; and implementation of the Proposed Project would intersect with all three significant linear resources. Although these are listed in or determined eligible for NRHP listing, segments of the National Trails Highway and the Mojave Trail within the APE appear to have lost aspects of integrity that would contribute to

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

the historical significance of the entire historic properties. The segment of the National Trails Highway within the APE has been repaved and widened at the Vista Road intersection and has lost material integrity. Evidence of the segment of the Mojave Trail within the APE could not be identified during the survey, and its material integrity is also compromised. As such, these segments are not contributing factors to the overall eligibility of these resources; and the Proposed Project would have no significant impact on the historic properties. The segment of the AT&SF within the Project limits of disturbance is approximately 0.2-mile long; however, the Proposed Project would not directly affect or impact this resource. The Proposed Project has the potential to compromise the integrity of the resource's setting; but because the segment of the AT&SF within the APE is a miniscule portion of the overall historic property, an indirect change to the setting of this segment would not change the overall eligibility of the historic property. Therefore, impacts associated with historic resources would be considered less than significant, and no mitigation measures would be required.

b) **Less Than Significant With Mitigation Incorporated.** A pedestrian archaeological survey, designed to identify and evaluate archaeological sites to the extent possible from observed surface conditions, was conducted by AECOM between June 7 and June 9, 2011. The surveys were conducted to identify possible cultural resources that may be impacted by the Proposed Project's construction activities. Five archaeological resource sites consisting of historical dumping or refuse (i.e., SM-TC-H-002; SM-TC-H-004, SM-TC-H-005, SM-TC-H-006, and SM-TC-H-007) were located. The five newly recorded refuse scatter sites were mostly in fair condition, although the condition of portions of some sites in washes was poor due to erosion. In most instances, these sites were extremely unlikely to have subsurface extensions due to their relatively recent age. While most of these sites did retain integrity of location and setting and could be associated with a particular historical period, the mid-twentieth century, their content was limited and they could not be meaningfully associated with a particular historic activity or theme. In addition, none of the refuse scatters holds substantive research potential beyond its already recorded cultural constituents. Thus, none of the five refuse scatters was recommended as significant or eligible to the CRHR or NRHP.

However, although not anticipated, unknown artifacts, features, site components, or even sites have the potential to be encountered during construction activities. Impacts would be less than significant with the implementation of Mitigation Measure CUL-1.

c) **Less Than Significant With Mitigation Incorporated.** Construction of the Proposed Project would involve ground-disturbing activities, such as pile driving for bridge footings. As such, sub-surface paleontological resources have potential to be encountered. Impacts would be less than significant with the implementation of Mitigation Measure CUL-1.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

d) **Less Than Significant With Mitigation Incorporated.** No known historic or prehistoric burial sites have been associated with this Project Site. According to County of San Bernardino standard policies, if any human remains are discovered during construction, the developer is required to contact the County Coroner and the County Museum for determination of appropriate mitigation measures. If the remains are determined to be of Native American origin, a Native American representative will also be contacted. Impacts would be less than significant with the implementation of Mitigation Measure CUL-1.

Potentially significant impacts have been identified or anticipated, and the mitigation measures that follow are required as conditions of Project approval to reduce these impacts to a level below significant.

Mitigation Measures

CUL-1. <u>Monitoring Plan</u> – A monitoring plan shall be prepared prior to the start of construction/sub-surface ground-disturbing activities, and all ground disturbing activities shall be monitored by a qualified archaeologist and paleontologist. The Monitoring Plan should include stop-work protocols in the unanticipated event resources are discovered to allow for evaluation. In the event of discovery, the qualified archaeologist or paleontologist will coordinate with the Project construction manager and environmental compliance manager to stop all work in the vicinity of the find until the find can be assessed. For archaeological resources, the resource will be documented on Department of Parks and Recreation (DPR) 523 Forms. If the discovery is determined to be not eligible for listing on CRHR or NRHP, work will be allowed to continue. For paleontological resources, the resources will be examined by the paleontologist to determine the extent of the find and proper actions to be taken. All recovered paleontologic specimens will be prepared to a point of identification and permanent preservation, including washing of sediments to recover small specimens. Identification and full curation of all specimens into an established, accredited museum repository with permanent retrievable paleontological storage is required. A Monitoring Report documenting the monitoring efforts should be prepared and submitted when construction is completed.

VI. GEOLOGY AND SOILS - Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map Issued by the State Geologist for the area or based on other substantial evidence of a	☐	☐	☒	☐

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
known fault? Refer to Division of Mines and Geology Special Publication 42.				
ii. Strong seismic ground shaking?	☐	☐	☒	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☒	☐	☐
iv. Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or off site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☒	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the California Building Code (2001) creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

SUBSTANTIATION: *(Check ☐ if project is located in the Geologic Hazards Overlay District):*

The analysis and information in the following section is primarily derived from the *Geotechnical Design and Foundation Report* prepared for the Proposed Project. This document is included as Appendix D of this Initial Study.

a) (i) **Less Than Significant Impact.** The Project Site is not located in an Alquist-Priolo Earthquake Fault Special Studies Zone. The Project Site is located within an area source known as the Eastern California Shear Zone, which is an apparent zone of distributed shear, treated by Caltrans as having the potential for a maximum earthquake magnitude (M_{max}) of 7.6 on a strike-slip fault at a distance of 10 km. The closest known active fault is the Helendale-South Lockhart Fault Zone at a distance of 4.8 km (3 mi) to the northeast. No active faults are known to cross or project towards the Project Site; therefore, fault rupture hazard is considered remote. Impacts associated with fault rupture would be considered less than significant, and no mitigation measures would be required.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

(ii) **Less Than Significant Impact.** The Project Site is located in the seismically active southern California region which is prone to earthquakes that may result in hazardous conditions to people within the region. Earthquakes and ground motion can affect a widespread area. The Proposed Project will be designed and constructed in accordance with applicable State requirements, including the California Building Code seismic safety requirements. Therefore, impacts associated with seismic ground shaking would be considered less than significant, and no mitigation measures would be required.

(iii) **Less Than Significant Impact With Mitigation Incorporated.** Liquefaction involves the sudden loss in strength of a saturated, cohesionless soil caused by the build-up of pore water pressure during cyclic loading, such as produced by an earthquake; and where it occurs its effects can include vertical and lateral ground displacements, slope instability and lateral spreading, and bearing failure.

Analyses performed for the Proposed Project indicate that limited layers of silty and sandy soils below the design groundwater level will liquefy in the design earthquake (7.6 M_{max}). For the Mojave River Bridge, the piles caps for bents within the channel are located at a depth of about 25 feet below the channel bottom and below the depth of any liquefiable soils; therefore, piers will not be subjected to liquefaction-induced downdrag. However, the abutments are about 30 feet higher than the bent piles and will be subjected to downdrag and loss of strength and reduction of lateral capacity from liquefaction. As such, a potentially significant impact related to liquefaction could occur.

Impacts would be less than significant with the implementation of Mitigation Measure GEO-1.

(iv) **Less Than Significant Impact.** Slope instability, in the form of landslides and mudslides, is a potential adverse impact associated with seismic shaking. No landslide-prone formations are known in the vicinity of the Project Site. Existing slopes along the alignment are globally stable under static conditions, and no significant cuts are proposed for the Proposed Project. Impacts associated with slope instability would be considered less than significant, and no mitigation measures would be required.

b) **Less Than Significant Impact.** To avoid impacts caused by soil erosion or the loss of topsoil, and according to standard County policy, construction BMPs will be approved as part of the Storm Water Pollution Prevention Plan (SWPPP) required prior to the start of construction. (See discussion under Biological Resources Section IV(b) above and Hydrology and Water Quality Section IX(a) below.) The Project design also includes that post-construction all denuded slopes would be hydroseeded with a specially formulated mix of native grass seeds. (See Mitigation Measure BIO-2.) With these standards and Mitigation Measures in place, impacts would be considered less than significant.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

c) **Less Than Significant Impact With Mitigation Incorporated.** The Project Site has no known history of subsidence. The site is relatively level with channel slopes less than about 10 feet high. Settlement ("seismic compaction") of loose to medium dense, clean, dry sands can occur during seismic shaking; however, due to density and fines content of sandy soils at the Project Site, calculated seismic compaction settlements are less than ¼ inch, which is not considered significant.

Slope instability, in the form of landslides and mudslides, is a potential adverse impact associated with seismic shaking. No landslide-prone formations are known in the vicinity of the Project Site. Existing slopes along the alignment are globally stable under static conditions, and no significant cuts are proposed for the Proposed Project.

The proposed fill slopes along the alignment are anticipated to be stable under seismic shaking. Pseudo-static analyses indicate a factor of at least 1.1 using 1/3 of PGA or Kh=0.14 to 0.15 for embankment slopes. Shallow surface sloughing of mechanically-stabilized earth (MSE) embankments or natural slopes could occur in a major seismic event. As such, a potentially significant impact related to the seismic stability of MSE embankments could occur.

Impacts would be less than significant with the implementation of Mitigation Measure GEO-1.

d) **No Impact.** The Project Site is not located in an area that has been identified as having the potential for expansive soils. Therefore, no impacts would occur, and no mitigation measures would be required.

e) **No Impact.** The Proposed Project does not include septic tanks or other alternative wastewater disposal systems. No impact would occur, and no mitigation measures would be required.

Potentially significant impacts have been identified or anticipated, and the mitigation measures that follow are required as conditions of Project approval to reduce these impacts to a level below significant.

Mitigation Measures

GEO-1. <u>Geotechnical Report Recommendations</u> – The Proposed Project shall be designed and constructed in accordance with the geotechnical recommendations identified in the Draft Geotechnical Design and Foundation Report, dated May 29, 2012, related to bridge foundation and mechanically-stabilized earth (MSE) Walls.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
VII. GREENHOUSE GAS EMISSIONS - Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

SUBSTANTIATION:

The analysis and information in the following section is primarily derived from the *Shadow Mountain Railroad Grade Separation – Air Quality and Climate Change Technical Report* prepared for the Proposed Project. This document is included as Appendix A of this Initial Study.

Local agencies, including the County and MDAQMD, have not established standards or significance thresholds for evaluation of project-level or cumulative climate change impacts under CEQA. Jurisdictional and lead agencies such as the California Air Resources Board (CARB), the California Air Pollution Control Officers Association (CAPCOA), and other AQMD's including the South Coast Air Quality Management District (SCAQMD) and the Bay Area Air Quality Management District (BAAQMD), have developed both quantitative and qualitative interim significance thresholds for project-level Greenhouse Gas (GHG) emissions. Proposed and adopted significance thresholds which are currently available are briefly described below.

In 2008, CARB released a Preliminary Draft Staff Proposal, *Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under CEQA*, which recommended a tiered approach for both the industrial and residential/commercial sectors. The proposed interim threshold for the industrial sector is 7,000 $MTCO_2e$/yr for stationary, non-transportation (or operational) emissions; construction and transportation-related GHG emissions are recommended to be evaluated based on performance standards, which have yet to be developed. The proposed interim threshold for residential/commercial projects is based on performance standards, which have yet to be developed.

In 2008, the California Air Pollution Control Officers Association (CAPCOA) published a white paper entitled *CEQA and Climate Change, Evaluating and Addressing GHG Emissions from Projects Subject to the CEQA*. Although a 900-$MTCO_2e$/yr threshold is presented as an option for evaluation of project-level impacts from non-industrial and industrial projects, it does not account for emissions generated during construction and has not been adopted by a lead agency.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

In 2008, SCAQMD adopted a numerical GHG significance threshold of 10,000 metric tons of carbon dioxide equivalent ($MTCO_2e$) for industrial projects. The interim threshold accounts for emissions generated during both construction and operation and allows for a 30-year amortization of construction emissions based on a projected project lifetime. In 2009, SCAQMD recommended options for evaluating non-industrial projects including thresholds for residential, commercial, and mixed use projects of 3,500, 1,400, and 3,000 $MTCO_2e/yr$, respectively; however, these thresholds were never adopted. An additional option has been recommended for establishing a single numerical threshold of 3,000 $MTCO_2e/yr$ for all non-industrial projects. These options do not account for construction emissions and have not yet been adopted.

In 2010, BAAQMD adopted numerical GHG significance thresholds established at 1,100 $MTCO_2e/yr$ for projects other than stationary sources and 10.000 $MTCO_2e/yr$ for stationary sources. Projects other than stationary sources can also be evaluated based on compliance with a qualified GHG reduction strategy. These threshold options are specific to operational impacts and are not intended to evaluate construction impacts.

For this analysis, GHG emissions and climate change impacts have been evaluated in comparison to SCAQMD's interim threshold of 10,000 $MTCO_2e/yr$. Although the threshold is applicable to industrial projects predominantly in the form of stationary (or permitted) sources, it is the only currently available threshold that includes a numerical baseline for evaluating construction impacts. The Proposed Project is considered a "construction–only" project; and, therefore, the best available threshold is 10,000 $MTCO_2e/yr$, which accounts for amortized construction emissions over the life of the project, or a 30-year projected timeframe, as described above.

a) **Less Than Significant Impact.** Construction activities would not result in increased GHG emissions resulting from indirect sources, such as offsite electricity generation required to power electric tools or equipment. Construction-related GHG emissions characterized as "direct" would predominantly be in the form of carbon dioxide (CO_2) as a result of fossil fuel combustion. During construction, combustion would result from equipment operation and on- and off-road vehicle trips. Construction activities will include site grading and demolition, aerial bridge construction, and roadway improvements.

While any increase in GHG emissions would add CO_2 to the atmosphere and therefore may contribute to global climate change, it is important for the purpose of evaluating impacts from construction activities to consider that construction-related emissions will occur only over a finite period of time (14 to 16 months), which is accounted for through SCAQMD's allowance of short-term construction-related GHG emissions to be amortized over the expected (long-term) operational life of a project, which is assumed to be 30 years, based on SCAQMD guidance.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

Table 3 presents project-level GHG emissions, based on amortized construction emissions, and compares them to the SCAQMD interim significance threshold of 10,000 metric tons of carbon dioxide equivalent ($MTCO_{2e}$)/yr.

Table 3: Annual GHG Emissions Summary - Construction

Source1	$MTCO_{2e}$ /YR
Roadway Clearing and Grading (1 month)	22
Aerial Bridge Construction (8 months)	187
Site Grading/Excavation (4 months)	303
Drainage Work/Utilize Relocation (1 month)	17
Roadway Improvements (6 months)	125
Architectural Coatings (1 month)	--
On-Road Mobile Source	
Haul Trucks	1,382
Employee Trips	278
Annual GHG Emissions Summary =	**2,314**
Amortized Construction-related GHG Emissions	**77**
SCAQMD's Interim GHG Threshold	**10,000**
Exceed SCAQMD's Interim GHG Threshold (Y/N)?	**No**

Notes: "—" indicates source would not generate GHG emissions.

Values have been rounded to the nearest ten.

1. All sources are categorized as "direct" emission sources; no additional indirect GHG sources are proposed during construction.

Source: Modeled by AECOM, 2012

As presented in Table 3, GHG emissions generated during construction activities would not exceed SCAQMD's interim threshold.

Construction activities would also involve removal of up to five trees within the footprint of the Proposed Project. Tree brush removal, as well as mulching associated with disposal of this material, would cause some of the accumulated carbon in the woodland biomass ("carbon stock") to be released into the atmosphere. An estimate of the total biomass accumulation in trees within the Proposed Project footprint has been performed to evaluate how much sequestered carbon dioxide equivalent (CO_2e) would be released during removal and post-processing activities. The average quantity of carbon contained in a given acre of forested area is 29.5 metric tons of carbon per acre (MT C/acre), or 108.3 MT of carbon dioxide per acre ($MTCO_2$/acre) (EPA 2010). The estimated existing carbon stock within the

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

Proposed Project footprint is presented in Table 4 below.

Table 4: Estimated Carbon Stock

Acres1	Metric Tons of Carbon Stock (MT C)2	Metric Tons of CO2 (MTCO2)3
0.04	0.8	2.9

Notes:

Acronyms: C = carbon; CO2 = carbon dioxide; MT = metric tons

1 Total impacted area assumed to be 0.04 acre based on removal of up to 5 trees (assuming a tree canopy diameter of 20 feet per tree).

2 Metric tons of C calculated using the following equation: Acres x Carbon Stock (29.55 MT C/acre).

3 Metric tons of CO2 calculated using the following equation: MT C x Molecular Weight Ratio of CO2:C (44/12).

Sources: EPA 2010

The total potential carbon stock that could be released if the live trees, standing dead trees, or downed-woody debris are removed and disposed (through mulching or other Project-approved process) is 2.9 $MTCO_2$, as shown in Table 4. This is a one-time loss of carbon stock (not an annual loss). When added to the GHG emissions generated during construction activities, total emissions would not exceed SCAQMD's interim threshold. Therefore, impacts associated with construction-related greenhouse gas emissions would be considered less than significant, and no mitigation measure would be required.

The Proposed Project would not generate new vehicle trips but would only alter the travel route. Therefore, the Proposed Project would not result in a net increase in direct operational GHG emissions. Indirect GHG emissions would be generated through the installation and operation of street lighting associated with roadway improvements. As presented in Table 5, annual emissions from indirect sources would not exceed SCAQMD's GHG threshold of 10,000 $MTCO_2e$/yr established for stationary sources.

Table 5: Annual GHG Emissions Summary – Operation

Source	MTCO2e/Yr
Annual Indirect GHG Emissions Summary =	4.61E-03
SCAQMD's Interim GHG Threshold	**10,000**
Exceed SCAQMD's Interim GHG Threshold (Y/N)?	**No**
Source: Modeled by AECOM, 2012	

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

Additionally, carbon sequestration is the process by which atmospheric carbon dioxide is absorbed by trees (plants) through photosynthesis and stored as carbon in biomass and soils. Sequestration rates for the trees are based on an estimated average factor drawn from EPA's guidance on Best Practices for Including Carbon Sinks in GHG Inventories (Ravin and Raine 2007). Table 6 lists the sequestration rate assumptions and total annual sequestration calculations.

Table 6: Total Impact on Carbon Stock and Sequestration within the Project Impact Area

Affected Area (acres)	Estimated Existing Carbon Stock (MT CO2)1	Sequestration Rate2 (MT CO2/acre/year)	Total Annual Sequestration (MT CO2/Yr)3
0.04	2.9	0.8	0.03

Notes: Acronyms: MT = metric tons; MT CO2/yr = metric tons of carbon dioxide per year

1 Carbon stock obtained from Table 4.

2 Sequestration rate based on general forest management practices, obtained from Best Practices for Including Carbon Sinks in Greenhouse Gas Inventories (cited below).

3 Annual sequestration calculated based on sequestration rate (0.8 MT CO2/acre/year) x total affected acres.

Source: Ravin and Raine 2007

The loss of annual carbon sequestration potential is estimated to be approximately 0.03 $MTCO_2$/yr. The annual emissions from indirect sources combined with this loss of annual carbon sequestration, as well as combined with the amortized construction-related emissions, would not exceed SCAQMD's GHG threshold of 10,000 $MTCO_2e$/yr established for stationary sources. Therefore, impacts associated with operation-related greenhouse gas emissions would be considered less than significant.

b) **Less Than Significant Impact.** Currently, GHGs are not required under law to be included in Air Quality Management Plans and are not currently regulated by local Air Quality Management Districts. Statewide GHG emissions are regulated through AB 32, which codifies the State's GHG emissions target by requiring the State's GHG emissions be reduced to 1990 levels by 2020 and directs CARB to enforce the statewide cap that would begin phasing in by 2012. As shown in Tables 3 and 5 above, the Proposed Project is below the SCAQMD interim threshold and therefore would not conflict with any local or state targets for GHG emission reductions. Therefore, impacts related to conflicts with GHG plans, policies, or regulations would be considered less than significant and no mitigation measures would be required.

No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
VIII. HAZARDS AND HAZARDOUS MATERIALS - Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

SUBSTANTIATION:

The analysis and information in the following section is primarily derived from the *Hazards and Hazardous Materials Technical Report* prepared for the Proposed Project. This document is included as Appendix E of this Initial Study.

a) **Less Than Significant Impact.** Potential public health hazards posed by transportation projects such as the Proposed Project include disturbance of pre-existing contaminated or impacted materials (e.g., soil), the use of hazardous materials during construction, and the presence or usage of hazardous materials during operation of the completed project. Because construction of the Proposed Project would primarily be performed at or above existing grade (except for limited areas where excavation/driving for bridge pilings and similar structures is to occur), disturbance of existing soils is anticipated to be minimal. In principle, pesticide residues have a minor potential to be present in soils in the fallow agricultural areas east of the Mojave River; and aerially-deposited lead (ADL)[1] could be present in soils along National Trails Highway. An ADL survey of the Project Site was performed which included the installation of 16 hand auger borings in accordance with Caltrans guidance for ADL. The analytical results indicated lead concentration from below detection limits (<2.5 milligrams per kilogram [mg/kg]) to 16.3 mg/kg. The mean was calculated to be 6.3 mg/kg. Soil pH ranged from 8.24 to 9.33. The mean and maximum lead concentrations were below the concentration of 50 mg/kg that would trigger a requirement for additional analysis for solubility. As such, the soils qualify as not being ADL-impacted and are nonhazardous. In addition, above-grade road construction would entail the use of imported fill material which would be required in the Project specifications to be clean, qualified fill material. Operation of the Proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, as the Project does not involve the construction of any facilities that would generate, utilize, or dispose of any hazardous substances. In addition, as the Proposed Project does not involve the building of structures used for living or working, it would not result in the exposure of individuals to such activities. Therefore, impacts associated with hazards to the public or the environment through the routine transport, use, or disposal of hazardous materials would be considered less than significant; and no mitigation measures would be required.

b) **Less Than Significant Impact.** Construction of the Proposed Project would entail the use of typical construction equipment, including graders, loaders, bulldozers, and support equipment. No unusual or extremely hazardous substances are planned to be used. Construction would be performed under site-specific health and safety plans and procedures to be provided by the construction contractor and approved by the San

[1] Aerially-deposited lead results from lead-containing particulates being emitted by vehicles using leaded gasoline as a fuel. Because leaded gasoline was banned in the late 1970s, concerns regarding aerially deposited lead apply to older highways. Although traffic along National Trails Highway is very light, it has been part of the interstate highway system since the 1920s.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

Bernardino County Highway Department. Therefore, no construction-related upset or accident conditions that might pose a potential impact are anticipated. During operation, the extended Shadow Mountain Road and Vista Road would be classified as Secondary Roads in accordance with San Bernardino County transportation standards. Traffic on these roads is anticipated to be relatively light due to the low population in the area. Truck weight and cargo limits would be as specified by San Bernardino County regulations. No nearby facilities that are likely to require the transport of unusually hazardous materials are present. Therefore, impacts associated with hazards to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment would be considered less than significant, and no mitigation measures would be required.

c) **No Impact.** The nearest school to the study area is Riverview Middle School, 15350 Riverview Road, approximately one-half mile north of the northern end of the Project Site along Vista Road. This location is one mile north of the northernmost end of the disturbance limits for the Proposed Project and therefore not within one-quarter mile of any part of the Proposed Project. Therefore, no impacts associated with the emission or handling of hazardous materials within one-quarter mile of a school would occur, and no mitigation measures would be required.

d) **No Impact.** The Project Site is not included on or near a site listed on the Environmental Protection Agency's National Priorities List (NPL) database, and no sites appear on the regulatory databases within the Environmental Data Resources (EDR) search radii required by ASTM Standard Practice E1527-05 for Phase I Environmental Site Assessments. Therefore no impacts would occur, and no mitigation measures would be required.

e) **No Impact.** The Project Site is not located within two miles of a public airport or public use airport. Therefore, no impacts associated with the safety hazard for people residing or working in the Project area would occur, and no mitigation measures would be required.

f) **No Impact.** The Project Site is not within the vicinity of a private airstrip. Therefore, no impacts associated with the safety hazard for people residing or working in the Project area would occur, and no mitigation measures would be required.

g) **Less Than Significant Impact.** Fire and police services are currently provided to the Community of Helendale by the San Bernardino County Fire and Sherriff's departments. Due to the low population density of the area, neither fire department has prepared an emergency response plan for the Helendale community. Because construction of the Proposed Project would only entail extending existing roadways (with the exception of the creation of the Vista Road cul-de-sac) rather than requiring temporary closures, no significant impacts to emergency response would occur. In addition, with the extension of Shadow Mountain Road and grade separation, movement of traffic from the south end of the Helendale community to National Trails Highway would be better facilitated after Project

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

completion and would allow for emergency vehicles to cross the BNSF railroad without any delays. Therefore, impacts associated with emergency response would be considered less than significant, and no mitigation measures would be required.

h) **Less Than Significant Impact.** The vicinity of the Proposed Site is fallow agricultural land or pasture, or open desert land with sparse scrub vegetation, except for the area in the immediate vicinity of the Mojave River, where denser but generally light vegetation is present. The Helendale area is depicted as an area of Moderate fire potential on the California Department of Forestry and Fire Protection's Fire Hazard Severity Zone (FHSZ) map for San Bernardino County. No Wildland-Urban Interface (WUI) zones have been mapped in the area or were observed in the field. The nearest developed area, the residences around Silver Lake in the Helendale community, are not within the disturbance limits of the Proposed Project and are not adjacent to the vegetated areas along the Mojave River. Therefore, impacts associated with exposing people to a significant risk of loss, injury, or death involving wildland fires would be considered less than significant; and no mitigation measures would be required.

No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.

IX.	**HYDROLOGY AND WATER QUALITY -** Would the project:				
a)	Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level, which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐
c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
d)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the	☐	☐	☒	☐

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
	course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?				
e)	Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f)	Otherwise substantially degrade water quality?	☐	☐	☒	☐
g)	Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☒	☐
h)	Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j)	Inundation by seiche, tsunami, or mudflow?	☐	☐	☒	☐

SUBSTANTIATION:

The analysis and information in the following section is primarily derived from the *Water Quality Management Plan* and the *Bridge Hydraulic Analyses for Shadow Mountain Road Bridge at Mojave River* prepared for the Proposed Project. These documents are included as Appendix F and Appendix G, respectively, of this Initial Study.

a) **Less Than Significant Impact.** The Project Site is located within the Upper Mojave Hydrologic Area (HAS 628.20). This area falls within the jurisdiction of the Lahontan Regional Water Quality Control Board (RWQCB). To avoid the violation of any water quality standards or waste discharge requirements, the Proposed Project would require the implementation of appropriate BMPs that would be approved as part of a Storm Water Pollution Prevention Plan (SWPPP). Examples of protection policies in such plans may include, but not be limited to, the following:

> All debris, bark, slash, sawdust, rubbish, silt, cement or concrete or washings thereof, asphalt, paint or other coating materials, oil or other petroleum products, or any other substance resulting from project related activities which would be hazardous to aquatic life or water of the state, shall be prevented

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

from contaminating the soil and/or entering the waters of the state. None of these materials shall be allowed to enter into or be placed within or where they may be washed by rainfall or runoff into waters of the state. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any stream.

In addition, as construction would take place within an ephemeral stream channel identified as "waters of the United States," a Clean Water Act Section 401 Water Quality Certification would be required from the Lahontan RWQCB prior to Project implementation. This permit process is specifically designed to avoid, minimize, and/or mitigate water quality and waste discharge impacts. Therefore, impacts are considered to be less than significant, and no mitigation measures would be required. (See additional discussion under Biological Resources Section IV(b) above.)

b) **Less Than Significant Impact.** The Proposed Project would not result in an increase in the demand for water production because the Proposed Project consists of an extension to Shadow Mountain Road and associated road improvements. The Proposed Project would result in an increase of approximately 35.5 acres of new, impermeable surfaces; however, these surfaces would be designed to collect and convey stormwater to the Mojave River, which currently receives all sheet flow as part of the regional drainage pattern. The Proposed Project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that a net deficit in aquifer volume or a lowering of the local groundwater table level would occur. Therefore, impacts would be considered less than significant, and no mitigation measures would be required.

c) **Less Than Significant Impact.** The Project Site is located within a watershed that has a high soil loss rate with poor land cover. The regional drainage pattern of all tributary areas around the Project Site currently drain to the Mojave River, which would not be changed with implementation of the Proposed Project. The proposed road embankment would intercept local surface flow only from the south, and the intercepted flows would eventually drain towards Mojave River. The east Mojave River Bridge abutment, which is within the 100-year floodplain, could cause local backwater effect to the upstream; however, this would be controlled with drainage features located within the proposed right-of-way.

Five discharge locations (Nodes 190, 280, 290, 390, and 490) will provide roadway drainage. For Nodes 290 and 390, the post construction flow rates and volumes for 1-year, 2-years, and 5-years are less than the preconstruction conditions. The flows would eventually discharge to the Mojave River by means of surface flow, which would be the same as the preconstruction conditions. The surface flow that currently drains to Node 290 would be routed to Node 280, then discharged to the Mojave River without commingling with any untreated street flow from the Proposed Project.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

At Node 490, the increase in flow rates and volumes would be intercepted by the proposed retention basin, which would be designed to handle a 100-year storm event. Therefore, all flows coming from the new Vista Road would be retained and percolate into the ground and thus would not cause adverse impact to the downstream private properties during storm events equal or smaller than a 100-year return period.

An increase in flows and volumes would occur at Node 190; however, compared with the mainstream time of concentration within the Mojave River, the time of concentration at Node 190 is much shorter. Therefore, the slight increase of the local surface runoff amount would not substantially impact the hydrologic and hydraulic conditions in the Mojave River, as the two streams would reach peak flow condition at different time intervals (i.e., confluence effect).

Implementation of the Proposed Project would cause a 0.35-foot rise in water surface elevation and up to 100 feet of "backwater" effect. Changes in water surface elevation and mean velocity would be reduced to less than significant with the incorporation of a basin east of the river bank. The piers and east bank bridge abutment have the potential to cause some scouring (i.e., scour depths of up to 15 feet and 25 feet, respectively); however, the incorporation of rock slope protection would eliminate these impacts.

Overall, the Proposed Project may cause a minor "backwater" effect and a minor water surface elevation increase during peak flow conditions but would not adversely impact drainage areas or result in substantial erosion or siltation on or off site. Therefore, impacts would be considered less than significant and no mitigation measures would be required.

d) **Less Than Significant Impact.** As discussed in the response to IX(c), above, the Proposed Project may cause minor water surface elevation increase during peak flow conditions but would not adversely impact drainage areas or result in flooding on or off site. Therefore, impacts would be considered less than significant, and no mitigation measures would be required.

e) **Less Than Significant Impact.** As discussed in the response to IX(c), above, the Proposed Project may cause minor water surface elevation increase during peak flow conditions but would not adversely impact drainage areas or result in flooding. Also, all proposed storm drain systems would drain to water-quality Best Management Practices devices, such as a vegetated swale or retention basin, prior to discharge to the Mojave River. Therefore, impacts related to runoff/water quality would be considered less than significant, and no mitigation measures would be required.

f) **Less Than Significant Impact.** As discussed in the response to question IX(a), above, implementation of appropriate Best Management Practices would be approved as part of a SWPPP. Therefore, impacts to groundwater and water quality would be considered less

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

than significant, and no mitigation measures would be required.

g, h) **Less Than Significant Impact.** While the extension of Shadow Mountain Road would introduce new structures within the 100-year floodplain, such as the bridge embankment on the eastern side of the Mojave River, these structures are related to roads and are not habitable structures. Although the proposed eastern bridge embankment could intercept local surface flow and cause a local backwater effect, sufficient right-of-way along this embankment would be used for drainage improvements. Therefore, impacts would be considered less than significant, and no mitigation measures would be required.

i) **Less Than Significant Impact.** The Project Site is located within a Dam Inundation – Area of Inundation Overlay; however, the Proposed Project would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam, as the Proposed Project consists of an extension to Shadow Mountain Road and associated road improvements. Therefore, impacts would be considered less than significant, and no mitigation measures would be required.

j) **Less Than Significant Impact.** Seiches are extensive wave actions on lakes, reservoirs, or other enclosed bodies of water caused by meteorological or seismic activity, such as earthquakes. Tsunamis are seismically induced sea waves generated by offshore earthquake, submarine landslide, or volcanic activity. The Project Site is located more than 130 km from the coast and is situated at elevations greater than 2,400 feet above mean sea level (MSL). Impacts related to tsunamis are not anticipated. The Project Site is located near two enclosed bodies of water (i.e., North Lake and South Lake) and, therefore, is subject to seiches. However, because the Proposed Project consists of an extension to Shadow Mountain Road and associated road improvements, risks associated with seiches would not increase and would be the same as under existing conditions. Similarly, risks associated with mudflows would be the same as under existing conditions. Therefore, impacts related to seiches, tsunamis, and mudflow would be considered less than significant; and no mitigation measures would be required.

No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.

X. LAND USE AND PLANNING - Would the project:

a)	Physically divide an established community?	☐	☐	☐	☒
b)	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or	☐	☐	☐	☒

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
mitigating an environmental effect?				
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☒	☐

SUBSTANTIATION:

a) **No Impact.** The Proposed Project consists of an extension to Shadow Mountain Road and associated road improvements. The Proposed Project is a public works project intending to improve local traffic and safety by eliminating the existing at-grade crossing of the BNSF railroad. While the use of eminent domain would be required to secure the needed land for the Proposed Project, takes would be minimal and would not physically divide an established community. Therefore, no impacts related to physically dividing an established community would occur, and no mitigation measures would be required.

b) **No Impact.** The Proposed Project consists of an extension to Shadow Mountain Road and associated road improvements. It would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Proposed Project and would not conflict with the land use zoning designations identified for the Project Site (i.e., RS – Single Residential, FW – Floodway, RL-5 – Rural Living (min. lot size 5 ac.), IC – Community Industrial). Implementation of the Proposed Project would not conflict with either the existing land use or zoning designations. Therefore, no impacts related to conflicts with any applicable land use plan, policy, or regulation would occur; and no mitigation measures would be required.

c) **Less Than Significant Impact.** The West Mojave Plan is a Habitat Conservation Plan and federal land use plan amendment that (1) presents a comprehensive strategy to conserve and protect the desert tortoise, the Mohave ground squirrel, and nearly 100 other sensitive plants and animals and the natural communities of which they are a part and (2) provides a streamlined program for complying with the requirements of the California and federal Endangered Species Acts (CESA and FESA, respectively). Although the Proposed Project is located within the West Mojave Plan, it is not anticipated to have an adverse effect on those species identified in the plan, as the desert tortoise and Mohave ground squirrel were not found at or adjacent to the Project Site. Therefore, impacts would be considered less than significant, and no mitigation measures would be required.

No significant adverse impacts are identified or anticipated; and no mitigation measures would be required

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
XI. MINERAL RESOURCES - Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

SUBSTANTIATION: *(Check ☐ if project is located within the Mineral Resource Zone Overlay): MRZ-3a*

a) **No Impact.** The Proposed Project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state because no important mineral resources are identified on the Project Site, and the site is not within a designated Mineral Resource Zone Overlay. Therefore, no impacts related to the loss of a known mineral would occur, and no mitigation measures would be required.

b) **No Impact.** The Proposed Project would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan because no locally important mineral resources are identified on the Project Site. Therefore, no impacts to related locally important mineral resources would occur, and no mitigation measures would be required.

No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.

XII. NOISE - Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐
d) A substantial temporary or periodic increase in	☐	☐	☒	☐

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
ambient noise levels in the project vicinity above levels existing without the project?				
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

SUBSTANTIATION: *(Check if the project is located in the Noise Hazard Overlay District ☐ or is subject to severe noise levels according to the General Plan Noise Element ☐):*

The analysis and information in the following section is primarily derived from the *Noise Study Report* prepared for the Proposed Project. This document is included as Appendix H of this Initial Study.

a) **Less Than Significant With Mitigation Incorporated.** Construction noise would be generated by diesel engine-driven construction equipment used for site preparation and grading; removal of existing pavement; loading, unloading, and placing materials; and paving. Diesel engine-driven trucks also would bring materials to the Project Site and remove the spoils from excavation. Under load conditions, diesel engine noise levels may be 85 to 90 A-weighted decibel(s) (dBA) at a distance of 50 feet from the equipment (Federal Highway Administration [FHWA] 2006). Occasional pile driving may be performed, which would generate noise levels of 95 dBA at 50 feet from the equipment (FHWA 2006). Construction equipment noise is considered a "point source" and is attenuated over distance at a rate of 6 dBA for each doubling of distance. Thus, a noise level of 85 dBA at 50 feet would be 79 dBA at 100 feet and 73 dBA at 200 feet from the source. During excavating, grading, and paving operations, equipment moves to different locations and goes through varying load cycles, with breaks for the operators and for non-equipment tasks such as measurement. Although maximum noise levels may be 85 to 90 dBA at a distance of 50 feet during most construction activities, hourly average noise levels near the edge of the Project Site at locations where the excavation, grading, and paving occur would be anticipated to be 75 dBA Equivalent Sound Level ($L_{eq.}$). Maximum noise levels during these activities would be approximately 85 dBA Maximum Sound Level ($L_{max.}$).

The nearest residential receivers are located approximately 50 feet or greater from the center of proposed construction and pavement-breaking activities. Hourly construction noise levels at this distance would be approximately 75 dBA L_{eq} and would take place

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

during daytime hours as exempted by the County noise ordinance. Noises at this level would be noticeable and may even be considered annoying; however, they would not be considered adverse or harmful for the period of construction. Therefore, construction-related noise impacts from diesel engine noise or pavement-breaking activities would be considered less than significant.

Pile driving would be required during construction of new bridge footings. Because construction would occur during the daytime, it is important to note that no pile driving would occur during nighttime hours; and therefore pile driving noise would be exempt from the County ordinance. Pile-driving activities would generate maximum noise levels of 95 dBA at 50 feet each time the hammer head strikes the pile (Federal Transit Authority [FTA] 2006). It is estimated that the actual strike of an impact pile driver accounts for 20 percent of an hour, which results in an average hourly noise level of 88 dBA L_{eq} at 50 feet from the pile. The nearest residential receiver to the bridge would be approximately 750 feet from the nearest pile-driving activities. At this distance, noise levels would average 64 dBA $L_{eq;}$ and maximum noise levels would be about 71 dBA L_{max}. These noise levels would be temporary and would cease at the end of construction on the bridge. Therefore, construction-related noise impacts from pile driving activities would be considered less than significant.

To summarize, construction noise would be heard at nearby residential receivers and may cause occasional speech disruption, principally during times of pavement breaking. Pile driving would generate higher noise levels than standard construction but, as with all construction, would occur during daytime hours and would not result in adverse noise levels at local properties. Thus, construction-related noise impacts would be considered less than significant. Even though construction noise impacts would be exempt by the County noise ordinance, implementation of Mitigation Measures NOI-1 through NOI-4 have been recommended as project enhancement measures to minimize noise generated during the construction phase of the Proposed Project.

During operation, increases in noise levels under the Proposed Project would be caused by the realignment of Shadow Mountain Road and the introduction of increased traffic noise in areas that do not currently have a thoroughfare roadway. Under the Proposed Project, noise levels would change, ranging from -6 to 22 dBA. The traffic noise level decreases would be the result of traffic being rerouted onto the new Shadow Mountain Road and no longer using the retired Vista Road alignment. The changes in noise levels would result in increases of 12 dBA or more at nine residences. Seven of the nine residences would not experience noise levels that exceed the County noise standards of 60 dBA Day-Night Level (L_{dn}). However, two of the nine residences would experience increased noise levels, due to the rerouting of traffic that would exceed 60 dBA $L_{dn.}$ Impacts would be less than significant with the implementation of Mitigation Measure NOI-5.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

b) **Less Than Significant Impact.** Although it is possible for vibrations from construction projects to cause building damage, the vibrations from construction activities are almost never of sufficient amplitude to cause more than minor cosmetic damage to buildings (FTA 2006). Groundborne vibration generated by construction projects is usually highest during pile driving, soil compacting, jackhammering, and demolition-related activities.

The nearest sensitive receptors would be the residences along the existing alignment of Shadow Mountain Road, approximately 50 feet from the nearest point of construction. At this distance, receptors would be exposed to approximately 0.03 in/sec peak particle velocity (ppv) during pavement removal, grading, or scarifying operations. Vibration levels of this magnitude would not be perceivable. Additionally, while construction activity occurring between the hours of 7:00 a.m. and 7:00 p.m. is exempt, construction vibration would not exceed the County standard of 0.2 in/sec ppv. All other receptors are farther away; thus, vibrations at those locations would be less. It should be noted that at 500 feet, sensitive receptors would be exposed to approximately 0.02 in/sec ppv (below County standard of 0.2 in/sec ppv) during pile driving operations. Because no sensitive receptors are within 500 feet of pile driving locations, vibration impacts associated with pile driving would be considered less than significant. For operation of the Proposed Project, studies conducted to assess the impact of operational traffic-induced vibrations have shown that both measured and predicted vibration levels are less than any known criteria for structural damage to buildings (FHWA 2011). In addition, normal living activities (e.g., closing doors, walking across floors, operating appliances) within a building have been shown to create greater levels of vibration than highway traffic (FHWA 2011). Thus, the primary vibration sources for the Proposed Project would be construction equipment. Therefore, impacts would be considered less than significant, and no mitigation measures would be required.

c) **Less Than Significant With Mitigation Incorporated.** As discussed in the response to question XII(a), above, two residences would experience increased noise levels, due to the rerouting of traffic, that would exceed 60 dBA L_{dn}. Impacts would be less than significant with the implementation of Mitigation Measure NOI-5.

d) **Less Than Significant Impact.** As discussed in the response to question XII(a), above, construction of the Proposed Project would generate noise impacts, but this noise impact would be temporary and exempt by the County noise ordinance and would be considered less than significant. Therefore, impacts would be considered less than significant, and no mitigation measures would be required.

e) **No Impact.** The Project Site is not located within an airport land use plan or within two miles of a public airport or public use airport. Therefore, no impacts associated with exposure of persons residing or working in the Project area to excessive noise levels would occur, and no mitigation measures would be required.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

f) **No Impact.** The Project Site is not within the vicinity of a private airstrip. Therefore, no impacts associated with exposure of persons residing or working in the Project area to excessive noise levels would occur and no mitigation measures would be required.

Potentially significant impacts have been identified or anticipated, and the mitigation measures that follow are required as conditions of Project approval to reduce these impacts to a level below significant.

Mitigation Measures

NOI-1. Mufflers – Each internal combustion engine should be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine should be operated on the Project Site without said muffler.

NOI-2. Staging Areas – Within staging areas, stationary equipment should be located as far from occupied residential units as possible. Whenever possible, material stockpiles should be used to block the line of sight from local residences to the staging areas. Work in staging areas that generate loud noises, such as equipment maintenance, should not occur during the hours prohibited for construction work.

NOI-3. Traffic Control and Construction Signs – If traffic control and construction signs that require power for lighting or flashing are located near residential units, the source of power should be batteries, solar cells, or another quiet source. Gas- or diesel-fueled internal combustion engines should not be used.

NOI-4. Pile Drivers – Pile driving should be restricted to the hours of 8:00 a.m. to 5:00 p.m. Monday through Friday and should not be allowed on Saturdays, Sundays, or holidays.

NOI-5. Noise Barrier – For the two residences that would experience increased noise levels exceeding 60 dBA L_{dn}, the County shall construct a noise barrier in the form of increasing the height of the existing backyard walls to 8 feet above the yard's grade.

XIII. POPULATION AND HOUSING - Would the project:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐

SUBSTANTIATION:

a) **Less Than Significant Impact.** The Proposed Project consists of an extension to Shadow Mountain Road and associated road improvements; however, it is a public works project intending to improve local traffic and safety by eliminating the existing at-grade crossing of the BNSF railroad. Although the extension of roads can indirectly foster population growth, the extension of Shadow Mountain Road improves local circulation through the provision of a more direct access over the BNSF railroad and the Mojave River. The Proposed Project does not provide new access to an isolated or previously undeveloped area. Therefore, impacts associated with the inducement of substantial population growth would be considered less than significant, and no mitigation measures would be required.

b-c) **Less Than Significant Impact.** The Proposed Project consists of an extension to Shadow Mountain Road and associated road improvements. The Proposed Project is a public works project intending to improve local traffic and safety by eliminating the existing at-grade crossing of the BNSF railroad. While the use of eminent domain would be required to secure the needed land for the Proposed Project, takes would be minimal and would not displace any existing housing or people. Therefore, impacts associated the displacement of substantial numbers of housing or people would be considered less than significant, and no mitigation measures would be required.

No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.

XIV. PUBLIC SERVICES

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire Protection?	☐	☐	☐	☒
Police Protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Parks?	☐	☐	☐	☒
Other Public Facilities?	☐	☐	☐	☒

SUBSTANTIATION:

a) **No Impact.** The Proposed Project consists of an extension to Shadow Mountain Road and associated road improvements. The Proposed Project is a public works project intending to improve local traffic and safety by eliminating the existing at-grade crossing of the BNSF railroad. As such, the Proposed Project would have no adverse impacts to public services/facilities such as fire and police protection, schools, or parks or increase the need for new such services. It should be noted that traffic flow would be better facilitated, which would allow for emergency vehicles to cross the BNSF railroad without any delays. Therefore, no impacts related to public services would occur, and no mitigation measures would be required.

No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.

XV. RECREATION

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

SUBSTANTIATION:

a, b) **No Impact.** No new residences or recreational facilities would be constructed as part of the Proposed Project. The Proposed Project consists of an extension to Shadow Mountain Road and associated road improvements. Although the extension of roads can indirectly foster population growth, the extension of Shadow Mountain Road improves local circulation through the provision of a more direct access over the BNSF railroad and the Mojave River. The Proposed Project does not provide new access to an isolated or previously undeveloped area and, therefore, would not induce population growth that could increase the use of recreational facilities in surrounding neighborhoods. Therefore, no impacts related to recreational facilities would occur, and no mitigation measures would be required.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.

XVI. TRANSPORTATION/TRAFFIC - Would the project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

SUBSTANTIATION:

The analysis and information in the following section is primarily derived from the *Shadow Mountain Road Grade Separation Traffic Impact Analysis* prepared for the Proposed Project. This document is included as Appendix I of this Initial Study.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

a) **No Impact.** The purpose of the Proposed Project is to improve local traffic and safety by eliminating the existing at-grade crossing of the BNSF railroad. Operation would not result in increased vehicular, pedestrian, or bicycle traffic because the Proposed Project consists of an extension to Shadow Mountain Road and associated road improvements. No new residences would be constructed as part of the Proposed Project. As such, implementation of the Proposed Project would not conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system. Therefore, no impacts associated with traffic-related plans, ordinance, or policy for the performance of the circulation system would occur; and no mitigation measures would be required.

b) **Less Than Significant Impact.** Construction of the Proposed Project would result in the generation of minor amounts of traffic from construction worker trips and the transport of materials and equipment. Therefore, impacts associated with construction traffic would be considered less than significant, and no mitigation measures would be required. The purpose of the Proposed Project is to improve local traffic and safety by eliminating the existing at-grade crossing of the BNSF railroad. As such, implementation of the Proposed Project would not result in any new vehicle trips.

The Traffic Impact Analysis that was prepared for the Proposed Project analyzed future conditions for the years 2020 (interim) and 2040 (long-range). As indicated in the Traffic Impact Analysis, the daily traffic volume roadway capacity analysis for 2020 (interim) With Project conditions indicates that all of the study area roadways are projected to achieve LOS “C” (or better) volume-to-capacity (V/C) operations except for National Trails Highway, south of Shadow Mountain Road; however, this identified road segment is an existing deficiency. With implementation of the Proposed Project, the length of the deficient segment would be reduced, as the partial segment between Vista Road and Shadow Mountain Road would no longer experience deficient daily operating conditions. Implementation of the Proposed Project would also eliminate the need to widen Vista Road between Helendale Road and National Trails Highway, as the Project would provide relief from this road segment. Finally, in 2020, all of the study area intersections are anticipated to operate at LOS “C” (or better) during the peak hours with the installation of warranted traffic signals, constructing additional lanes, and providing two (2) through lanes in each direction along Shadow Mountain Road.

The daily traffic volume roadway capacity analysis for 2040 (long-range) With Project conditions indicates all of the study area roadways are projected to achieve LOS “C” (or better) volume-to-capacity (V/C) operations except for (1) Helendale Road north of Shadow Mountain Road, (2) Shadow Mountain Road west of Helendale Road, and (3) National Trails Highway south of Shadow Mountain Road. The Proposed Project would not result in any new deficiencies that are not already expected in 2040 without the Proposed Project. Additionally, implementation of the Proposed Project would reduce the length of existing

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

deficiencies and would eliminate the needs for additional widening of road segments. Finally, in 2040, all of the study area intersections are anticipated to operate at LOS "C" (or better) during the peak hours with the installation of recommended improvements, such as the installation of warranted traffic signals, constructing additional turn lanes, reconstructing existing intersections and intersection approaches, and providing one (1) through lane along Shadow Mountain Road.

Since the Proposed Project would not result in the generation of any new vehicle trips, and it would not result in any new deficiencies that are not already expected in either 2020 or 2040 without the Proposed Project, it would not conflict with an applicable congestion management program, level of service standard, travel demand measure, or other standard. Therefore, impacts would be considered less than significant, and no mitigation measures would be required.

c) **No Impact.** The Proposed Project consists of an extension to Shadow Mountain Road and associated road improvements. It would not have the potential to affect air traffic. Therefore, no impacts related to air traffic would occur, and no mitigation measures would be required.

d) **No Impact.** The Proposed Project does not include any hazardous design features such as sharp curves or dangerous intersections and does not introduce incompatible uses. The purpose of the Proposed Project is to provide a safe and efficient crossing over the BNSF railroad. Increased traffic and train movement have resulted in an increase in delays at the existing at-grade crossings of Vista Road and BNSF mainline double-track. Several accidents have occurred in the immediate vicinity of Vista Road at the BNSF at-grade railroad crossing. The Proposed Project would not result in increased hazards due to Project design features. Therefore, no impacts related to hazardous design features would occur, and no mitigation measures would be required.

e) **Less Than Significant Impact.** As discussed in the response to question XVI(d), above, increased traffic and train movement have resulted in an increase in delays at the existing at-grade crossings of Vista Road and BNSF mainline double-track. These delays have not only affected traffic but also have impacted the access by emergency vehicles to/from National Trails Highway. With implementation of the Shadow Mountain Road extension, movement of traffic from the south end of the Helendale community to National Trails Highway would be better facilitated during emergencies. Because construction of the Proposed Project would entail extending only existing roadways (with the exception of the creation of the Vista Road cul-de-sac) rather than requiring temporary closures, no significant temporary impacts to emergency response would occur. Therefore, impacts associated with emergency access would be considered less than significant, and no mitigation measures would be required.

f) **No Impact.** The Proposed Project consists of an extension to Shadow Mountain Road and

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

associated road improvements. It would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities or otherwise decrease the performance or safety of such facilities. Therefore, no impacts would occur, and no mitigation measures would be required.

No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.

XVI.	**UTILITIES AND SERVICE SYSTEMS -** Would the project:				
a)	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b)	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c)	Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded, entitlements needed?	☐	☐	☐	☒
e)	Result in a determination by the wastewater treatment provider, which serves or may serve the project, that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f)	Be served by a landfill(s) with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g)	Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

SUBSTANTIATION:

a-b) **No Impact.** The Proposed Project consists of an extension to Shadow Mountain Road and associated road improvements. It does not include any modifications to existing wastewater treatment facilities and would not require the construction of any new wastewater treatment facilities. The Proposed Project would not need to connect to any existing sewer lines and would not exceed treatment requirements pursuant to the Regional Water Quality Control Board. Therefore, no impacts related to wastewater treatment would occur, and no mitigation measures would be required.

c) **Less Than Significant Impact.** The Proposed Project consists of an extension to Shadow Mountain Road and associated road improvements, requiring the construction of stormwater drainage facilities. As discussed throughout this Initial Study, the construction and operation of the Proposed Project would not result in any significant environmental effects that cannot be mitigated to a level that is less than significant. Issues specifically regarding impacts resulting from these new facilities are discussed in Section IX, Hydrology and Water Quality, above. Therefore, impacts related to new stormwater drainage facilities or expansion of existing facilities would be considered less than significant, and no mitigation measures would be required.

d) **No Impact.** Water supplies would be unaffected by the Proposed Project, as the only water use is anticipated to occur during construction. Groundwater resources were also evaluated in the Hydrology and Water Quality Section above. Therefore, no impacts related to water supply would occur, and no mitigation measures would be required.

e) **No Impact.** The Proposed Project consists of an extension to Shadow Mountain Road and associated road improvements. Because the Proposed Project does not need to treat wastewater, current wastewater treatment capacity would not be affected. Therefore, no impacts related to wastewater treatment would occur, and no mitigation measures would be required.

f-g) **No Impact.** Construction of the Proposed Project would increase the generation of solid waste; however, the construction contractor would be required to implement Best Management Practices to reduce, reuse, and/or recycle solid waste generated during construction of the Proposed Project to the maximum extent feasible. The construction contractor would comply with all federal, state, and local statutes and regulations to reduce and recycle solid waste. Operation of the Proposed Project is not anticipated to increase the generation of solid waste. Therefore, no impacts related to landfills and solid waste would occur, and no mitigation measures would be required.

No significant adverse impacts are identified or anticipated, and no mitigation measures would be required.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
XVII. MANDATORY FINDINGS OF SIGNIFICANCE:				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

SUBSTANTIATION:

a) **Less than Significant with Mitigation Incorporated.** As described in this Initial Study, implementation of the Proposed Project would not degrade the quality of the environment, substantially reduce the habitat of fish or wildlife species, cause a fish or wildlife population to drop below self sustaining levels, threaten to eliminate a plant or animal, or eliminate important examples of major periods of California history or prehistory once mitigation measures pertaining to Biological Resources and Cultural Resources have been implemented. Impacts are less than significant with mitigation incorporated. (See Mitigation Measures below.)

b) **Less Than Significant Impact.** As described in this Initial Study, the Proposed Project would not result in any operational environmental impacts. Therefore, no cumulative operational impacts associated with the Proposed Project would occur. The Proposed Project would result in some minor short-term impacts related to construction, all of which would be below a level of significance or reduced to below a level of significance once mitigation measures pertaining to Biological Resources and Cultural Resources have been implemented. The minor construction impacts associated with the Proposed Project would not be cumulatively considerable, even for the typically furthest reaching environmental factor, air quality, because the Proposed Project is very small in scale and scope and

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

impacts would be localized. The Proposed Project would result in cumulative impacts that would be less than significant. No mitigation measures are required.

c) **Less Than Significant Impact.** As described in this Initial Study, construction and operation of the Proposed Project would not cause substantial adverse effects on human beings, either directly or indirectly. Impacts would be considered less than significant and no mitigation measures would be required.

Potentially significant impacts have been identified or anticipated, and the mitigation measures that follow are required as conditions of Project approval to reduce these impacts to a level below significant.

XVIII. MITIGATION MEASURES: (Condition compliance will be verified by the County through the implementation of a Project-specific CEQA Mitigation and Monitoring Report.)

BIO-1. Contractor Education Program – Prior to construction, the County or its designee will retain the services of a qualified biological monitor. The biological monitor will conduct a contractor education program for all personnel regarding the avoidance, as much as is practicable, of harm, harassment, injury, or death of wildlife. This program will emphasize the conservation of the wetlands/riparian systems, native habitats, and associative wildlife during Project construction and include: (a) the purpose of resource protection, (b) a description of the onsite sensitive habitats (e.g., wetland/riparian habitat), (c) the conservation measures that will be implemented in conjunction with Project construction, and (d) any special site issues. This instruction will be given as often as necessary to ensure that all personnel working on site are adequately briefed as to these matters.

BIO-2. Construction Work Limits and Hydroseeding - Prior to construction/site preparation, the County or its designee shall confirm that the construction work limits, including temporary staging areas, are surveyed, staked, and marked (i.e., by caution tape, temporary fencing, etc.) by qualified personnel. No vegetation removal or grading will occur outside the designated work limits. All fencing or other markers will be clearly visible to construction personnel and verified by the biological monitor. Parking; stockpiling and storage of equipment; all equipment maintenance; dispensing of fuel, oil, or coolant; or other similar activities will be restricted to designated areas within the fenced work limits. Additional measures will include erosion and siltation control measures, protective fencing guidelines, dust control measures, grading techniques, construction area limits, and biological monitoring requirements.

After Project construction, the County or its Contractor will use fiber rolls and hydroseeding for the side slopes along the edge of the road. The hydroseeding will occur using a native seed mix of locally endemic plant species adapted to the desert environment.

BIO-3. Erosion Control – The County or its designee will ensure that the fenced impact limits include erosion control measures to minimize erosion and siltation during initial vegetation

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

clearing/removal and Project construction through the use of silt fencing, siltation basins, sand bags, or other controls necessary to stabilize the soil in cleared or graded areas. Erosion control measures will be installed prior to the onset of vegetation clearing/removal. These measures will be maintained in good repair until the completion of Project construction.

BIO-4. Burrowing Owl Avoidance – As suitable burrowing owl habitat is present on portions of the Proposed Project Site, a preconstruction presence/absence survey should be conducted if grading or other soil disturbance activities are proposed in areas of suitable habitat. This would minimize the potential for the Proposed Project to impact burrows and habitat that might be occupied by burrowing owls at the time of construction. The preconstruction surveys should be completed no more than 30 days prior to initial ground-disturbing activity to minimize the chance that owls might occupy burrows on the site in the interim period between the surveys and initial ground-disturbing activity.

The following burrowing owl avoidance measures are adapted from recommendations provided by CDFG and the California Burrowing Owl Consortium. If a burrowing owl is observed and it is possible for the Proposed Project to avoid the area of the active burrow, no disturbance should occur within about 50 meters of the burrow during the non-breeding season (September 1 through January 31) or within about 75 meters during the breeding season (February 1 through August 31). Avoidance of an active burrow also requires that a minimum of 6.5 acres of foraging habitat be permanently preserved contiguous with the burrow site.

If burrowing owls are detected during the preconstruction surveys, and impacts to the site cannot be avoided, it is recommended that the birds be removed by implementing “passive relocation” techniques. In compliance with resource agency requirements, however, any form of owl relocation must be completed outside the owl’s breeding season to avoid impacts to active nests or dependent young. If burrowing owls are found, coordination with CDFG will be necessary.

BIO-5. Mohave Ground Squirrel – Mohave Ground Squirrel (MGS) focused surveys shall be conducted for the Proposed Project at least one year prior to construction in order to obtain a current determination as to the status of MGS on the site. Alternatively, development of the site can be mitigated by purchasing suitable or occupied MGS habitat in an accepted MGS habitat area.

BIO-6. Desert Tortoise Monitoring – A desert tortoise monitor shall be required during all grading and other construction operations. This individual may be the assigned biological monitor or another biologist that specializes in desert tortoise identification and relocation. If a tortoise is found, USFWS shall be notified to discuss protocol.

BIO-7. Regulatory Permits and Authorizations – Prior to the approval of Project plans and specifications, the County or its designee shall ensure that the plans and specifications stipulate that prior to undertaking ground-disturbing activities within any USACE- and CDFG-jurisdictional resources, the County shall coordinate with the appropriate regulatory agencies to verify wetland delineation and jurisdictional determination results and obtain all discretionary permits and

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

authorizations. The County will also demonstrate compliance with applicable regulatory permits per the Clean Water Act, California Fish and Game Code, and the Porter-Cologne Act (if necessary). With the above action, it is the intent of County to mitigate for any impacts to wetland/riparian habitat, consistent with resource agency requirements and conditions presented in the following permits: Section 404 Nationwide Permit, Section 1602 Streambed Alteration Agreement, and Section 401 Water Quality Certification. Regulatory permitting may also involve waters of the state (isolated wetlands/waters not jurisdictional to USACE) which requires a waste discharge requirement (WDR) per the Porter-Cologne Act. The County shall comply with the regulatory permits.

As part of the regulatory permitting process, the County will prepare (if required by the permits) a Habitat Mitigation and Monitoring Plan (HMMP) in order to mitigate for any permanent and temporary impacts to potential wetland waters of the United States and riparian areas within the Project area. Details of a conceptual mitigation approach will be developed further during the subsequent permitting process and will include the preparation of a conceptual HMMP consistent with USACE's Mitigation Rule (Federal Register 2008). Mitigation shall include offsite (or onsite, if feasible) mitigation in the form of habitat creation, restoration, and/or enhancement and may include an agency-approved contribution to a mitigation bank or in-lieu fee mitigation program. The plan shall be prepared by a qualified restoration biologist familiar with the biology and ecology of southern California plant communities and that of the Project Site.

The HMMP shall include (but not be limited to) the following:

(a) Sources of plant materials and methods of propagation.
(b) Site preparation (clearing, grading, weed eradication, soil amendment, topsoil storage), irrigation, planting (container plantings, seeding), maintenance (weed control, irrigation system checks, replanting), and monitoring of the mitigation area.
(c) Remedial measures to be taken if performance standards are not met.
(d) Methods and requirements for monitoring.

CUL-1. <u>Monitoring Plan</u> – A monitoring plan shall be prepared prior to the start of construction/sub-surface ground-disturbing activities and all ground-disturbing activities shall be monitored by a qualified archaeologist and paleontologist. The Monitoring Plan should include stop-work protocols in the unanticipated event resources are discovered to allow for evaluation. In the event of discovery, the qualified archaeologist or paleontologist will coordinate with the Project construction manager and environmental compliance manager to stop all work in the vicinity of the find until the find can be assessed. For archaeological resources, the resource will be documented on DPR 523 Forms. If the discovery is determined to be not eligible for listing on CRHR or NRHP, work will be allowed to continue. For paleontological resources, the resources will be examined by the paleontologist to determine the extent of the find and proper actions to be taken. All recovered paleontologic specimens will be prepared to a point of identification and permanent preservation, including washing of sediments to recover small specimens. Identification and full curation of all specimens into an established, accredited museum repository with permanent retrievable paleontological storage is

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

required. A Monitoring Report documenting the monitoring efforts should be prepared and submitted when construction is completed.

GEO-1. Geotechnical Report Recommendations – The Proposed Project shall be designed and constructed in accordance with the geotechnical recommendations identified in the Draft Geotechnical Design and Foundation Report, dated May 29, 2012, related to bridge foundation and mechanically-stabilized earth (MSE) Walls.

NOI-1. Mufflers – Each internal combustion engine should be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine should be operated on the Project Site without said muffler.

NOI-2. Staging Areas – Within staging areas, stationary equipment should be located as far from occupied residential units as possible. Whenever possible, material stock piles should be used to block the line of sight from local residences to the staging areas. Work in staging areas that generate loud noises, such as equipment maintenance, should not occur during the hours prohibited for construction work.

NOI-3. Traffic Control and Construction Signs – If traffic control and construction signs that require power for lighting or flashing are located near residential units, the source of power should be batteries, solar cells, or another quiet source. Gas- or diesel-fueled internal combustion engines should not be used.

NOI-4. Pile Drivers – Pile driving should be restricted to the hours of 8:00 a.m. to 5:00 p.m. Monday through Friday and should not be allowed on Saturdays, Sundays, or holidays.

NOI-5. Noise Barrier – For the two residences that would experience increased noise levels exceeding 60 dBA L_{dn}, the County shall construct a noise barrier in the form of increasing the height of the existing backyard walls to 8 feet above the yard's grade.

Additional Mitigation Measures

The Mojave River presents movement opportunities for free-ranging mammals, dispersal of bird populations, reptile movement, and dispersal and local and regional migration of butterfly/moth populations due partly to the presence of host plants and nectar. This resource can also attract insectivorous and nectar-loving bat species. Although the Proposed Project would not result in any significant impacts to bat species, regulatory agencies (i.e., CDFG) have requested that the bridge over the Mojave River be designed to accommodate bats. Mitigation Measure BIO-8 will be incorporated into the Project design to satisfy this request.

BIO-8. Bat Boxes – In order to decrease the potential for the new bridge structure to adversely affect bats that may use the new bridge for shelter, it is recommended that the County or its designee

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

implement the use of “bat boxes” in the bridge design. As such, a specification may be included in the construction plans to ensure the proper type and placement of such bat boxes (e.g., Caltrans specifications for similar type projects).

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

ATTACHMENTS

Exhibit - 1 View Point Location Map

Exhibit - 2 View Point A

Exhibit - 3 View Point B

APPENDICES

Appendix A *Air Quality and Climate Change Technical Report*

Appendix B *Biological Resources Technical Report For The Proposed Shadow Mountain Road Grade Separation Project*

Appendix C *Cultural Resources Survey Report for Shadow Mountain Road Grade Separation Project*

Appendix D *Draft Geotechnical Design and Foundation Report*

Appendix E *Hazards and Hazardous Materials Technical Report*

Appendix F *Water Quality Management Plan*

Appendix G *Bridge Hydraulic Analyses for Shadow Mountain Road Bridge at Mojave River*

Appendix H *Noise Study Report*

Appendix I *Shadow Mountain Road Grade Separation Traffic Impact Analysis*

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*

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