SANDAG | San Diego LOSSAN Rail Realignment Project

San Diego LOSSAN Rail Realignment Project

Final Value Analysis Study Report

Prepared for: SANDAG

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ACRONYMS/ABBREVIATIONS

Acronym/ Abbreviation	Definition
Caltrans	California Department of Transportation
CCC	California Coastal Commission
CEQA	California Environmental Quality Act
EIR	Environmental Impact Report
FRA	Federal Railroad Administration
GHG	greenhouse gases
LOSSAN	Los Angeles—San Diego—San Luis Obispo Rail Corridor
mph	miles per hour
MTS	San Diego Metropolitan Transit System
NCTD	North County Transit District
NOP	Notice of Preparation
ROW	right-of-way
SANDAG	San Diego Association of Governments
SB	Senate Bill
SDLRR	San Diego LOSSAN Rail Realignment Project
SME	subject matter expert
VM	Value Methodology
VMS	Value Management Strategies, Inc.

TERMS AND DEFINITIONS

Term	Definition
function	A non-specific, two-word abstraction, consisting of a verb and noun, that describes what an element of a project, product, process, service, or organization does.
positive drainage	A condition where water can flow continuously downhill on a slope.
sag curve	A vertical curve, which is concave, that connects a descending grade with an ascending grade to form a low point in a profile, similar to the shape of a bowl.
shoofly track	Temporary track used to maintain service.
soft costs	Costs not directly tied to the physical construction of a project. These costs typically include, but are not limited to, expenditures related to project development, environmental reviews, engineering and design services, project management, permits, and legal services.
subsurface easement	The right to use land below the ground surface. For example, the construction and operation of trains in a tunnel could require subsurface easements from parcels located above the tunnel. Subsurface easements for bored tunnels typically do not require owners and occupants to relocate from the property.
Value Analysis	A systematic process used by a multidisciplinary team, led by a qualified Value Methodology Facilitator, to improve the value of a project, product, process, service, or organization through the analysis of functions.
Value Analysis Job Plan	A sequential approach for applying the Value Methodology, consisting of the following eight phases: 1) Preparation, 2) Information, 3) Function Analysis, 4) Creativity, 5) Evaluation, 6) Development, 7) Presentation, and 8) Implementation. The VA Job Plan is recognized by SAVE International®, the professional VM society, as the approved approach for conducting VA Studies.
VA Study	A structured effort to improve the value of a project, product, process, service, or organization through the application of the Value Methodology by a multidisciplinary team facilitated by one who is competent in VM techniques.
VA Team	Individuals who were directly involved in the various phases of the VA Study. The VA Team was comprised of representatives from the Cities of Carlsbad, Del Mar, Encinitas, San Diego, and Solana Beach; the 22nd District Agricultural Association; California Department of Transportation; and North County Transit District. Subject matter experts were also part of the VA Team.

The San Diego Association of Governments (SANDAG) initiated formal environmental review of the San Diego LOSSAN Rail Realignment Project (Project) under the California Environmental Quality Act (CEQA) on June 4, 2024, with the release of the Notice of Preparation (NOP) of a Draft Environmental Impact Report (EIR) for the Project. SANDAG's release of the NOP initiated a Draft EIR scoping period under CEQA. The CEQA environmental review process is ongoing.

Pursuant to the direction of the SANDAG Board of Directors, SANDAG sponsored a Value Analysis Study to provide a venue for technical discussion of the potential alternatives identified in the NOP.

The findings of the Value Analysis Process will be presented to the SANDAG Board of Directors to inform further SANDAG Board of Directors guidance on the development of the Project Draft EIR, including the potential release of a revised NOP, if needed. The Value Analysis Process is not intended as, and does not include, an analysis of environmental impacts, or a discussion of the relative merits and feasibility of project alternatives under CEQA. These, and other topics, will be addressed in the Draft EIR, in accordance with CEQA.

1. EXECUTIVE SUMMARY

A Value Analysis (VA) Study, sponsored by the San Diego Association of Governments (SANDAG) and facilitated by Value Management Strategies, Inc. (VMS), was conducted for the San Diego LOSSAN Rail Realignment (SDLRR) Project located in San Diego County, California. The VA Study was completed via a series of workshops and meetings with representatives from the Cities of Carlsbad, Del Mar, Encinitas, San Diego, and Solana Beach; the 22nd District Agricultural Association; the California Department of Transportation (Caltrans); and the North County Transit District (NCTD) from September through December 2024. The VA Study was collaborative and technically driven with the goal of providing a fresh look at alternative concepts that would address the challenges that climate change and the eroding Del Mar bluffs pose to the reliability of passenger and freight service on the bluffs. This VA Study Report is a summary of the VA Study and presents the ideas, suggestions, and alternative concepts developed and evaluated collaboratively by the VA Team.

1.1 Background

The Los Angeles—San Diego—San Luis Obispo (LOSSAN) rail corridor is the only rail connection between San Diego and the rest of the state and nation. This corridor is also the second busiest intercity passenger rail route in the U.S., serving commuter (COASTER), intercity (Pacific Surfliner), and freight (BNSF) rail services. The segment of the LOSSAN corridor along the Del Mar bluffs is single tracked and has experienced temporary closures and speed reductions resulting from bluff collapses, erosion, and repair work to stabilize the bluffs and protect the rail corridor from more substantial erosion effects. While the stabilization projects and emergency repairs address safety and operational concerns with a 30-year design life, they do not provide a long-term solution for sea level rise and the ongoing coastal erosion that pose substantial safety and economic risks to the region.

Over the years, numerous planning and environmental studies have been undertaken by agencies such as the Federal Railroad Administration (FRA), Caltrans, and SANDAG to analyze the potential for realigning the LOSSAN corridor away from the coastal bluffs. In concert with realignment, the studies have also considered double-tracking the alignment, which would increase system efficiency and service reliability, reduce travel times for passengers, facilitate goods movement, and allow for increased passenger and freight rail services in the future. However, the portion of the LOSSAN corridor on the Del Mar bluffs is in an extremely constrained area, making it challenging to identify solutions that minimize impacts on communities, biological and coastal resources, and prior corridor investments.

In 2017, SANDAG completed a conceptual alignment study to discover ways to improve speed, capacity, and safety of current and future rail service. This study was followed by an alternatives analysis that was released in 2023, subsequent public outreach and stakeholder coordination in 2023, and a screening report that was released in 2024. These planning efforts culminated with the June 2024 release of a Notice of Preparation (NOP) for an Environmental Impact Report (EIR) for the SDLRR Project. The NOP identified a proposed Project, including three proposed build alternatives for consideration in an EIR, in addition to a No Project Alternative. The scoping period for the NOP lasted through July 19, 2024, and sought to solicit public and stakeholder input on the alternatives identified.

In response to feedback received during the scoping period, SANDAG initiated a VA Study comprised of representatives from potentially effected jurisdictions and SANDAG member agencies to gain additional input on the alternatives included in the NOP and collaboratively brainstorm ideas for potential project alignments. While the location of the Project identified in the NOP was originally focused on the portion of the LOSSAN alignment between Solana Beach and Sorrento Valley where the alignment is single tracked and along the Del Mar bluffs, the boundaries were expanded during the course of the VA Study so as not to constrain ideas.

1.2 VA Study and Objectives

A VA Study employs a body of knowledge, referred to as the Value Methodology (VM), which is defined as follows:

A **systematic process** used by a **multidisciplinary team**, led by a qualified VM Facilitator, to improve the **value** of a project, product, process, service, or organization through the analysis of **functions**.

The VA Study is defined as a structured effort to improve the value of a project, product, process, service, or organization through the application of the Value Methodology by a multidisciplinary team facilitated by one who is competent in VM techniques. The VA Study is comprised of eight distinct phases referred to as the VA Job Plan. The phases are described in the sections that follow and shown on Figure 1. Note that for the purposes of this report, "VA Team" refers to individuals who were involved in the VA Study. Additional information on the VA Study for the SDLRR Project is provided in Section 3.

Figure 1. VA Study Phases

The following SANDAG member agencies and potentially effected jurisdictions were invited to participate in the VA Study for the SDLRR Project (listed in alphabetical order):

- 22nd District Agricultural Association (Del Mar Fairgrounds)
- Caltrans
- City of Carlsbad
- City of Del Mar
- City of Encinitas

- City of Oceanside
- City of San Diego
- City of Solana Beach
- NCTD
- San Diego Metropolitan Transit System (MTS)

It should be noted that the MTS and the City of Oceanside opted not to participate in the VA Study; however, a representative from MTS attended the December 20, 2024, Feedback Meeting to observe the discussions. The VA Team was comprised of representatives of the remaining entities. Additionally, subject matter experts (SMEs) representing a variety of technical disciplines (e.g., tunneling, civil engineering, constructability) were part of the VA Team.

The objectives of the VA Study were to engage with the VA Team to:

- Develop a better understanding of their perspectives and potential effects to their communities/jurisdictions
- Explore and develop additional alternative concepts based on achieving key project functions
- Identify potential Project refinements or alternatives for consideration in the Draft EIR via an amended NOP, if necessary

1.2.1 VA Study Phases

The following phases occurred during the VA Study:

Phase 1—Preparation Phase: The planning, organization, and coordination of the VA Study is the primary focus of this phase. Key activities included identifying the VA Study objectives, participants, schedule, and key information needed to perform the VA Study. Additionally, the following activities occurred as part of this phase:

- Stakeholder Interviews, as described in Section 3.2.1
- Orientation Meeting, as described in Section 3.2.2
- Site Visit, as described in Section 3.2.3
- Project Objectives Workshop, as described in Section 3.2.4

Phase 2—Information Phase: The VA Team reviewed the information gathered during the stakeholder interviews and further discussed the technical merits of the proposed alternatives from the NOP.

Phase 3—Function Analysis Phase: The VA Team analyzed the functions associated with the project and identified key functions to focus on to generate ideas. In the VA Study, functions are defined as two-word statements, comprised of a verb and a noun, that succinctly state the intent of a project element. This technique helps participants focus on the underlying functions, rather than current design, to generate innovative ideas.

Phase 4—Creativity Phase: During the Creativity Phase, the VA Team participated in individual and group creativity techniques that focused on generating ideas relative to the key functions identified during the Function Analysis Phase. Over 200 ideas were initially generated by the VA Team.

Phase 5—Evaluation Phase: The Evaluation Phase engaged the VA Team with a series of techniques aimed at reviewing and selecting the most promising ideas. An initial screening was conducted to reduce the number of ideas down to about two dozen, which was followed by an evaluation to further consider the pros and cons of each idea. At the end of this phase, a Mid-Point Review Meeting was conducted to review the refined short list of 16 ideas (13 new alternative concepts plus the 3 proposed alternatives from the NOP).

Phase 6—Development Phase: During this phase, the VA Team further developed the short list of ideas (i.e., 13 new alternative concepts plus the 3 proposed alternatives from the NOP). The VA Team members provided feedback on the alternative concepts, and the SMEs and project team members developed high level, conceptual design exhibits. Preliminary rough order of magnitude cost estimates were also developed for the majority of the alternative concepts (additional information on the cost estimates is provided in Section 4). In addition, numerous additional ideas were partially developed for further consideration in later phases of the project's design development process. The proposed draft revised project objectives were also shared with the VA Team, and further refinements were made collaboratively by participants.

Phase 7—Presentation Phase: An Outbrief Presentation was conducted as part of the Presentation Phase, during which the proposed revised draft project objectives and the alternative concepts were presented to the VA Team. Further edits were received on the proposed project objectives during and after the meeting, which are reflected in Section 1.3.

Phase 8—Implementation Phase: The final phase focused on determining how the findings of the VA Study will be implemented. A Feedback Meeting was conducted on December 20, 2024, to receive feedback on the Draft VA Study Report. This report incorporates feedback received from the VA Team on the Draft VA Report and summarizes the December 20, 2024, meeting. Additional information on the feedback meeting is provided in Sections 3.9 and 5.1.

1.3 Project Goal and Objectives

During the course of the VA Study, VA Team members noted a desire to establish a project goal. As such, the following goal was identified by the project team:

- To maintain and enhance passenger and freight service along the San Diego segment of the LOSSAN rail corridor.

As noted in Section 1.2.1, the objectives from the NOP were collaboratively refined during the VA Study. Additionally, one new objective was added based on feedback from the VA Team. The following are the proposed revised project objectives, with underlined text indicating additions and strikethrough text indicating deletions:

- Improve rail service reliability by minimizing risks from climate change, including consideration of sea level rise, flooding, and the stability of the ~~relocating the existing railroad tracks away from the eroding~~ coastal bluffs ~~in Del Mar~~.

- Maintain passenger rail service to ~~the existing train stations serving~~ Solana Beach and Sorrento Valley and accommodate direct rail access to the 22nd District Agricultural Association (Del Mar Fairgrounds) while minimizing disruptions to passenger and freight service during construction.
- Minimize impacts ~~in the surrounding communities~~ to existing homes, businesses, tourism, and major economic generators, including the Del Mar Fairgrounds, and transportation facilities during and after construction.
- Avoid and/or minimize negative effects, and where possible enhance ~~impacts on~~ biological, cultural, and recreational resources of national, state, or local significance, including publicly owned parks, recreational trails, beaches, wetlands, ecological reserves, wildlife or waterfowl refuges, and any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places.
- Help meet the goals of the ~~2021~~ Regional Plan and the ~~2018~~ California State Rail Plan by increasing passenger and freight train capacity, further reducing travel times, improving reliability, and ~~accommodating additional rail service~~ considering existing and planned investments.
- Improve coastal access and safety by eliminating at-grade railroad crossings and minimizing ~~other pedestrian-rail~~ points of interaction between rail and all other modes of transportation.
- Demonstrate good public stewardship by delivering the project in a timely way that considers prior investments, construction, right-of-way, operations, and maintenance costs.

The objectives were developed collaboratively and shared with VA Team participants at various points during the VA Study. There was consensus on the objectives in general, although not all participants agreed on the wording shown.

1.4 VA Alternative Concepts

The VA Team evaluated 16 VA alternative concepts, including the 3 original NOP proposed alternatives and the 13 new alternative concepts that were developed during the course of the VA Study. Table 1 lists the alternative concepts evaluated during the VA Study along with the estimated costs and a brief summary of the intent of the alternative concept. With the exception of the proposed alternatives from the NOP, alternative concepts were numbered in the order they were developed. The preliminary rough order magnitude cost estimates include construction, right-of-way, soft costs, and cost escalation to the final year of construction. Preliminary rough order of magnitude cost estimates were not developed for Alternative Concepts No. 4 and 7. Alternative Concept No. 4 could be incorporated into several of the alternative concepts that are under consideration and would not be implemented as a standalone concept. For Alternative Concept No. 7, the optimization of bridges and berms would be considered during the environmental clearance phase for any alternative concept that advances and includes sections of an alignment in a lagoon. Additional information on the preliminary rough order of magnitude cost estimates is provided in Section 4.

Table 1. Summary of VA Alternative Concepts (With the exception of the proposed alternatives from the NOP, alternative concepts were numbered in the order they were developed)

Alternative Concept No. and Description	Estimated Cost ($ billions)
1. Locate North Portal at David Way following under Crest Canyon with 90 mph curves The intent of this alternative concept is to minimize private subsurface easements by locating the bored tunnel segment of the alignment under the Crest Canyon Open Space Park and Torrey Pines State Natural Reserve Extension, to the extent practicable, using a maximum passenger operating speed of 90 mph within the tunnel.	$3.8–$5.0
2. Keep the tunnel profile above projected flooding elevations and provide positive drainage The intent of this alternative concept is to provide a tunnel profile that would remain above projected flood levels and sea level rise and provide positive drainage in the tunnel. This design would not require the need for floodwalls, flood gates, or sump pumps.	$3.4–$4.6
3. Locate the Southern Portal south of existing pump station at Carmel Mountain Road The intent of this alternative concept is to minimize permanent effects to existing wetlands by locating the southern portal south of Los Peñasquitos Lagoon.	$4.5–$6.0
4. Realign intersection at Jimmy Durante Boulevard and Camino Del Mar The intent of this alternative concept is to reduce property effects and acquisitions, and improve local traffic circulation by realigning Jimmy Durante Boulevard to the west over the existing rail alignment with a new roundabout intersection at Camino Del Mar. A preliminary rough order of magnitude cost estimate was not developed for this alternative concept because it could be incorporated into several of the alternative concepts that are under consideration and would not be implemented as a standalone concept.	Not developed
5. Locate north portal within Camino Del Mar The intent of this alternative concept is to minimize permanent effects on private properties by locating the transition from cut-and-cover to bored tunnel to be within public right-of-way of the existing roads.	$3.9–$5.2
6. Locate North Portal Under Jimmy Durante Boulevard following under Crest Canyon with 90 mph curves The intent of this alternative concept is to minimize private subsurface easements by locating the bored tunnel segment of the alignment under Crest Canyon Open Space Park and Torrey Pines Natural Reserve Extension, to the extent practicable, using maximum passenger operations speeds for 90 mph within the tunnel.	$3.7–$4.9

Alternative Concept No. and Description	Estimated Cost ($ billions)
7. Optimize the use of bridges and berms of Los Peñasquitos Lagoon The intent of this alternative concept is to optimize the locations and lengths of bridges and berms along the alignment passing through the lagoon. This alternative concept would include analysis to consider the necessary hydraulic openings to maintain or improve flows within the wetlands and to accommodate projected flooding while minimizing impacts to habitat. A preliminary rough order of magnitude cost estimate was not developed because optimization of bridges and berms would occur during the environmental clearance phase for any alternative that advances.	Not developed
8. Locate alignment under Camino Del Mar with 90 mph curves The intent of this alternative concept is to minimize private subsurface easements by locating the bored tunnel segment of the alignment directly under Camino Del Mar, to the extent practicable, using a maximum passenger operating speed of 90 mph.	$3.6–$4.8
9. Locate the bored tunnel transition south of Carmel Valley Road The intent of this alternative concept is to minimize private property effects by locating the cut-and-cover tunnel segment at the south portal to the south of Carmel Valley Road and locating it west toward North Torrey Pines Road.	$3.3–$4.4
10. Relocate LOSSAN corridor along I-5 from Oceanside to Sorrento Valley The intent of this alternative concept is to explore relocating the rail corridor and operations from the existing alignment to a new location along I-5 between Oceanside and Sorrento Valley. The design for the alternative concept includes the horizontal and vertical geometry needed to support freight and passenger rail. The existing grades and the constrained right-of-way of the I-5 corridor require the double-tracked alignment to be located either in a tunnel or on an aerial structure for the entire length. Further, north of the Agua Hedionda Lagoon in the City of Carlsbad, the rail alignment would need to transition from side to side and across the I-5 median to maintain a minimum 90 mph design speed, although 110 mph is desirable. South of the Lagoon, the alignment would transition to the west side of the freeway and stay along the west to Sorrento Valley where it would connect with the existing rail alignment.	$34–$45
11. Locate the bored tunnel transition at the old Del Mar Train Station The intent of this alternative concept is to minimize private property effects by using the site of the old Del Mar train station and parking lots for construction staging areas and locating the bored tunnel transition to cut-and-cover at the north end within the railroad right-of-way.	$4.1–$5.4
12. Stabilize bluffs and widen existing alignment to accommodate a second track The intent of this alternative concept is to maintain the location of the existing rail alignment and add a second track to the east of the existing tracks within the railroad right-of-way. The second track would pass under the existing Torrey Pines Overhead bridge.	$1.9–$2.5

Alternative Concept No. and Description	Estimated Cost ($ billions)
13. Relocate all freight rail along I-15 corridor The intent of this alternative concept is to maintain passenger rail service near the current alignment and shift freight rail service to the I-15 corridor. The shift of freight to the I-15 corridor would allow passenger rail alignment modifications to achieve an increase in grade from 2.0 to 3.0 percent.	$118–$158
14. Locate North Portal in Solana Beach Trench to South Portal at I-5 Knoll with bored tunnel under Fairgrounds and I-5 (Proposed NOP Alternative Alignment A – I-5 Alignment) VA Alternative Concept 14 is the same as Alternative A from the NOP issued in June 2024. This alternative concept is approximately 6.8 miles in length and would descend immediately south of the Solana Beach Station toward the north portal. The north portal would be located north of the fairgrounds within the railroad trench in Solana Beach. The portal's infrastructure would start south of the existing Solana Beach Station. The alignment would continue south into the fairgrounds, where there would be a new underground special events platform. The alignment would continue under the San Dieguito Lagoon and turn to follow under the I-5 freeway, then continue south and exit at the Knoll Near I-5 South Portal. The southern portal would be located at a knoll south of Carmel Valley Road between I-5 and the segment of Sorrento Valley Road Trail that is closed to public vehicular traffic but open for bicycles, pedestrians, and authorized vehicles. The portal infrastructure would be within the undeveloped knoll and extend into the Los Peñasquitos Lagoon. The alignment would then rise above ground as it transitions back into the existing railroad alignment north of the Sorrento Valley Station.	$6.9–$9.2
15. Locate North Portal Under Jimmy Durante Boulevard to South Portal at I-5 Knoll (Proposed NOP Alternative Alignment B – Crest Canyon Alignment) VA Alternative Concept 15 is the same as Alternative B from the June 2024 NOP. This alternative concept is approximately 5.3 miles in length and would descend immediately south of the rail bridge that spans over the San Dieguito Lagoon and enter the north portal. The north portal would be located north of the intersection of Camino Del Mar and Jimmy Durante Boulevard. The portal's infrastructure would cross underneath Jimmy Durante Boulevard, which would be raised. The portal structures could extend into commercial and residential properties. The south portal would be located at a knoll south of Carmel Valley Road between I-5 and the segment of Sorrento Valley Road Trail that is closed to public vehicular traffic but open for bicycles, pedestrians, and authorized vehicles. The portal infrastructure would be within the undeveloped knoll and extend into the Los Peñasquitos Lagoon. The tracks would then rise as they transition back into the existing railroad alignment north of the Sorrento Valley Station.	$3.7–$4.9

Alternative Concept No. and Description	Estimated Cost ($ billions)
16. Locate North Portal at Under Jimmy Durante Boulevard to South Portal at Torrey Pines Road (Proposed NOP Alternative Alignment C – Camino Del Mar Alignment) VA Alternative 16 is the same as Alternative C from the June 2024 NOP. This alternative concept is approximately 4.9 miles in length and would descend immediately south of the rail bridge that spans over San Dieguito Lagoon and enter the north portal, which would be located north of the intersection of Camino Del Mar and Jimmy Durante Boulevard. The portal's infrastructure would cross underneath Jimmy Durante Boulevard, which would be raised. The portal structures could extend into commercial and residential properties. This alternative concept would continue south and exit at the south portal located near the intersection of Carmel Valley Road and North Torrey Pines Road. The portal infrastructure would cross underneath Carmel Valley Road and potentially extend into residential properties. The alignment would continue south on bridge and berm over Los Peñasquitos Lagoon, and then transition back to the existing railroad alignment. The existing railroad alignment within Los Peñasquitos Lagoon would be double-tracked, which would require raising and widening the existing berm in the lagoon to address flooding and sea level rise projections.	$3.3–$4.4

1.5 VA Study—Next Steps

SANDAG staff will consider the evaluation, feedback, and lessons learned during the VA Study to refine the alternative concepts for the SANDAG Board of Directors to consider. Key themes that will be considered during the refinement process include:

- Minimizing effects to private properties, including subsurface easements
- Minimizing disruptions to economic generators
- Demonstrating public stewardship by minimizing conflicts with prior and ongoing investments

SANDAG staff will also consider feedback from stakeholders, prior public comments including comments received on the Notice of Preparation, and lessons learned from prior studies. Refinements to alternative concepts will be consistent with the intent identified by the VA Team, while also considering the themes identified above, operational and maintenance costs, and performance of the alignment.

Additionally, SANDAG staff will continue to refine the revised draft objectives that were developed during the VA Study for application during the environmental clearance phase. Staff will also review and apply the additional ideas identified during the VA Study as applicable to the alternatives that advance into the environmental clearance phase. Staff recommendations and this report will be presented to the SANDAG Board of Directors for consideration.

2. BACKGROUND

The San Diego Subdivision spans approximately 60 miles of the 351-mile LOSSAN Rail Corridor, connecting San Diego, Los Angeles, and San Luis Obispo from the Orange County line to the Santa Fe Depot in Downtown San Diego. This corridor is the second busiest intercity passenger rail route in the U.S., serving commuter (COASTER), intercity (Pacific Surfliner), and freight (BNSF) rail services. This corridor is also the only rail connection between San Diego and the rest of the state and nation. Currently, about 75 percent of the San Diego Subdivision is double-tracked, resulting in approximately 15 miles of single track and 45 miles of double track.

Under the San Diego Regional Transportation Consolidation Act (Senate Bill [SB] 1703 Peace), SANDAG is designated as the agency responsible for planning, funding, project development, and construction for all transit projects in the region, including heavy rail. NCTD and MTS are responsible for the maintenance and operation of the rail services. Consequently, SANDAG serves as the California Environmental Quality Act (CEQA) Lead Agency for rail line construction projects within San Diego County. As the Metropolitan Planning Organization, SANDAG is also tasked with developing the Regional Transportation Plan and a Sustainable Communities Strategy. The Regional Transportation Plan outlines transportation infrastructure investments and funding over a 30-year period, aligning with projected economic and population growth. The 2021 Regional Plan integrates both the Regional Transportation Plan and Sustainable Communities Strategy to meet the greenhouse gas emissions reduction targets established by the California Air Resources Board. This plan was adopted by the SANDAG Board of Directors in December 2021, with an amendment approved in October 2023.

Consistent with the California State Rail Plan, the 2021 Regional Plan envisions enhancing passenger rail service along the San Diego Subdivision by increasing speeds, thereby reducing travel times and providing a competitive alternative to driving, while also facilitating goods movement across the region. The plan includes proposals to double-track the remaining single-track segments of the LOSSAN corridor in San Diego County, modify track configurations for higher speeds, and relocate tracks to more climate-resilient areas.

The segment of the San Diego Subdivision along the Del Mar bluffs is single-tracked and has faced temporary closures and speed reductions due to bluff collapses, erosion, and ongoing stabilization efforts. Since 2003, four bluff stabilization projects have been completed in Del Mar, with the latest (Phase 4) finishing in 2021. A fifth project (Phase 5) began construction in spring 2024, addressing seismic stability and installing additional support columns, as well as replacing aging drainage systems.

Despite these stabilization efforts, several emergency repairs have been necessary since 1996 due to bluff failures threatening rail operations. While the Phase 5 stabilization aims to ensure safety and operational reliability for the next 30 years, the stabilization projects and emergency repairs do not provide a long-term solution to the challenges posed by sea level rise and ongoing coastal erosion that create substantial safety and economic risks to the region. Bluff retreat is currently estimated at an average rate of 0.4 to 0.6 foot per year; however, large episodic bluff failures can result in more than 20 feet of retreat in a single event. During its permitting process for the bluffs stabilization efforts, the California Coastal Commission (CCC) required that SANDAG evaluate the relocation of the rail corridor away from the bluffs as a condition for approving Phase 4 and Phase 5 of the stabilization work. Further

stabilization and emergency repairs are likely to be necessary until the rail corridor can be relocated from the coastal bluffs.

Over the years, numerous planning and environmental studies have been undertaken by agencies, including FRA, Caltrans, and SANDAG, to analyze the potential for realigning the LOSSAN corridor away from the coastal bluffs. In concert with realignment, the studies have also considered double-tracking the alignment, which would increase system efficiency and service reliability, reduce travel times for passengers, facilitate goods movement, and allow for increased passenger and freight rail services in the future. The realignment and double-tracking would mitigate operational risks associated with bluff erosion while increasing track capacity and allowing for higher train speeds. This enhancement would support anticipated service increases and reduce conflicts with pedestrian traffic.

However, the portion of the LOSSAN corridor on the Del Mar bluffs is in an extremely constrained area, bounded by the bluffs and Pacific Ocean on the west; streets, communities, and varied topography to the east; and lagoons and communities on the north and south. Therefore, the identification of potential realignments must balance impacts to communities, biological and coastal resources, effects to rail service during and after construction, maintainability of the alignment, and climate resiliency. In addition, numerous infrastructure projects have been recently implemented or are under development for the LOSSAN corridor near the Del Mar bluffs, which require consideration when identifying potential realignments given the investments that have been made.

In 2017, SANDAG completed a conceptual alignment study to discover ways to improve speed, capacity, and safety of future rail service. This study was followed by an alternatives analysis that was released in 2023, subsequent public outreach and stakeholder coordination in 2023, and a screening report that was released in 2024. These planning efforts culminated with the June 2024 release of a NOP for an EIR for the SDLRR Project. The NOP identified three proposed build alternatives for consideration in an EIR, in addition to a No Project Alternative.

The scoping period for the NOP lasted through July 19, 2024, and sought to solicit public and stakeholder input on the alternatives identified. Approximately 1,500 submissions were received in response to the NOP.

In response to feedback received during the scoping period and feedback from the SANDAG Board of Directors, SANDAG initiated a VA Study comprised of representatives from potentially effected jurisdictions and SANDAG member agencies to gain additional input on the proposed alternatives included in the NOP and collaboratively brainstorm ideas for potential project alignments. While the NOP was originally focused on the portion of the LOSSAN alignment between Solana Beach and Sorrento Valley where the alignment is single tracked and along the Del Mar bluffs, the boundaries were expanded during the course of the VA Study so as not to constrain ideas.

3. VA STUDY

3.1 VA Study Overview

The VA Study employs a body of knowledge, referred to as the VM, which is defined as follows:

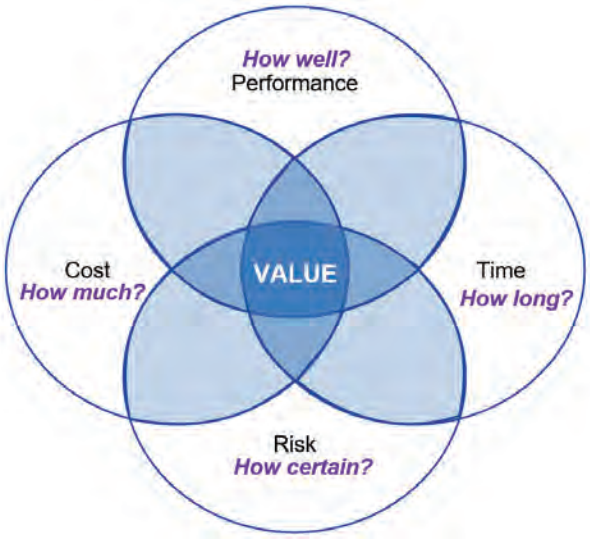
A **systematic process** used by a **multidisciplinary team**, led by a qualified VM Facilitator, to improve the **value** of a project, product, process, service, or organization through the analysis of **functions**.

The VA Study is defined as a structured effort to improve the value of a project, product, process, service, or organization through the application of the Value Methodology by a multidisciplinary team facilitated by one who is competent in VM techniques. The VA Study is comprised of eight distinct phases referred to as the VA Job Plan. The VA Job Plan guides the VA Team in their search to enhance value in the project or process. The phases are shown in Figure 2.

Figure 2. VA Study Phases

The primary purpose of a VA Study is to leverage the perspectives, knowledge, and experiences of a multidisciplinary team to generate, evaluate, and develop innovative ideas to address the key functions of a project. Value is defined as the synthesis of performance, cost, time, and risk, as illustrated in Figure 3.

Figure 3. The elements of value



3.2 Preparation Phase

The planning, organization, and coordination of the VA Study is the primary focus of this phase. Key activities include identifying the VA Study objectives, participants, schedule, and the key information needed to perform the VA Study.

The objectives for the VA Study were to engage with the VA Team to:

- Develop a better understanding of their perspectives and potential effects to their communities/jurisdictions
- Explore and develop additional alternative concepts based on achieving key project functions
- Identify potential alternatives for consideration in the Draft EIR via an amended NOP, if necessary

Participants for the VA Study were identified as part of this phase. The following SANDAG member agencies and potentially effected jurisdictions were invited to participate in the VA Study (listed in alphabetical order):

- 22nd District Agricultural Association (Del Mar Fairgrounds)
- Caltrans
- City of Carlsbad
- City of Del Mar
- City of Encinitas
- City of Oceanside
- City of San Diego
- City of Solana Beach

- NCTD
- MTS

MTS and the City of Oceanside opted not to participate in the VA Study; however, a representative from MTS attended the December 20, 2024, Feedback Meeting to observe discussions.

Within this report, VA Team refers to individuals who were directly involved in the various phases of the VA Study, including representatives from the 22nd District Agricultural Association; the Cities of Carlsbad, Del Mar, Encinitas, San Diego, and Solana Beach; Caltrans; and the NCTD. Subject matter experts representing a range of technical topics including, but not limited to, tunneling, civil engineering, and constructability were also part of the VA Team.

Letters received from the following VA Team entities in response to the NOP were provided to the VA Team to use as a resource:

- 22nd District Agricultural Association
- Caltrans
- City of Carlsbad
- City of San Diego
- City of Solana Beach
- NCTD

Additionally, the approximately 1,500 submissions received in response to the NOP during the CEQA scoping period were made available to the VA Team. The following resources were also shared with the VA Team:

- SDLRR NOP (dated June 2024)
- San Diego LOSSAN Rail Realignment Project Alignments Screening Report (SANDAG, May 2024)

Additionally, the following activities were performed as part of this phase, with each activity described in the sections that follow:

- Stakeholder Interviews
- Orientation Meeting
- Site Visit
- Project Objectives Workshop

3.2.1 Stakeholder Interviews

Virtual stakeholder interviews were conducted with representatives from the SANDAG member agencies and potentially effected jurisdictions who opted to participate in the VA Study. For those entities who submitted a formal response to the NOP, the interviews expanded on those comments. These interviews

also associated specific stakeholders, objectives, issues, and concerns with the proposed alternative alignments identified in the NOP and set the stage for the VA Study. In addition, general observations and any additional alignment suggestions the entities felt warranted further exploration during the VA Study were collected via the interviews. *Specific details related to the interviews are provided in Appendix A of this report.*

3.2.2 Orientation Meeting

An Orientation Meeting was facilitated on September 11, 2024, for the VA Team. The purpose of this meeting was to provide an overview of the VA Study, objectives, and ground rules, and to review information relative to the proposed alternatives included in the NOP. A summary of feedback received in response to the NOP during the CEQA scoping period was also provided. Representatives from each entity that participated in the VA Study presented remarks. During this meeting, several participants expressed interest in revisiting the project objectives identified in the NOP. In response, a workshop was held to elicit feedback and suggested revisions, as described in Section 3.2.4. *Please refer to Appendix B for the slides that were shared as part of this meeting.*

3.2.3 Site Visit

A site visit was conducted on September 12, 2024, for the VA Team. Participants were provided with a guided tour of the various proposed alternatives included in the NOP. The site visit included stops at the potential portal locations, the Fairgrounds, and along the railroad trench in Solana Beach. At each stop, the project team provided a high-level summary of some of the constraints and considerations identified to date during the development of the proposed NOP alternatives. Throughout the tour, VA Team members were able to ask questions and provide feedback, insights, and information for consideration during the VA Study.

3.2.4 Project Objectives Workshop

A two-hour workshop was conducted the morning of September 16, 2024, for the VA Team. In this workshop, the VA Team reviewed the original project objectives included in the NOP and provided their input regarding suggested changes. A “Function Analysis” was conducted during the workshop to help better distill and frame the project objectives. In the VA Study, functions are defined as two-word statements, comprised of a verb and a noun, that succinctly states the intent of the objective. The information gathered from this workshop was incorporated into a set of revised project objectives that were presented during the “Development Phase” of the VA Study for review and further, collaborative refinement by the VA Team. The revised draft objectives were then shared during the Outbrief meeting, and additional comments and edits were provided by attendees. The revised objectives, inclusive of edits received through and after the Outbrief meeting, are presented in Section 3.8. These objectives were further discussed during the December 20, 2024, Feedback Meeting. Collaborative edits were made to the objectives at various points during the VA Study. There was consensus on the objectives in general, although not all participants agreed on the wording shown in Section 3.8. *The content developed as part of these collaborative activities is included in Appendix C.*

The VA Team also reviewed strategies for developing evaluation criteria to help better evaluate the ideas generated during the VA Study. Additional thoughts and feedback were provided during this session. A list of the evaluation criteria used is listed in Section 3.6 of this report.

3.3 Information Phase

The VA Team initiated the Information Phase with a review of the feedback from the Stakeholder Interviews and a review of the proposed alternatives included in the NOP. The VA Team reviewed key project design criteria and assumptions with the SMEs, which was supplemented with a question-and-answer session to help clarify the rationale for the various design assumptions. Among the design criteria discussed was a maximum slope of 2 percent, which was an assumed requirement in order to maintain both passenger and freight train operations (*the 2 percent slope is depicted in the slides included in Appendix B*). Attendees also discussed the goal of accommodating 110 mile per hour (mph) speeds for passenger trains, consistent with the SANDAG 2021 Regional Plan.

3.4 Function Analysis Phase

Key to the VA Study is the function analysis techniques used during the Function Analysis Phase. In the VA Study, a function is defined as a two-word statement, comprised of a verb and a noun, that describes what something does rather than what it is. For example, the basic function of a water bottle might be defined as “Contain Liquid,” as this describes the essential purpose of this object. This process helps the VA Team to better understand the underlying intent of project elements (i.e., their functions) rather than to focus on the current approach or design. This phase serves as a priming activity as the key project functions identified in this phase are used during the subsequent Creativity Phase where creative ideas are generated.

The Function Analysis techniques used in this VA Study include:

- Random Function Identification: This technique creates a list of project elements, and the VA Team then brainstorms their related functions.
- Graphic Function Identification: This technique anchors to a visual image, in this case, the various NOP proposed alternatives, and then visually associates function statements with the project features. This technique allows the team to better visualize the functions and their relationships relative to the alignments.

These Function Analysis techniques were conducted to uncover key functional relationships within the project. Analyzing the functions of a project is essential to determine whether the project has been defined in a way that meets the stated criteria, objectives, and purpose. The analysis of these functions in terms of cost, performance, time, and risk is a primary focus in a VA Study and is used to identify areas within a project for value improvement. This procedure is beneficial to the VA Team as it enables the participants to think in terms of functions and their relative value in meeting the project’s criteria, objectives, and purpose. This facilitates a deeper understanding of the project. The key functions were then grouped and prioritized for use as brainstorming categories for the Creativity Phase. *Appendix D includes content from the Miro[1] board used to analyze the functions of one of the original NOP proposed alternatives (all of which shared the same common design elements).*

[1] Miro is a collaborative whiteboard platform that supports a variety of activities. This platform was used extensively to allow participants to share information visually.

3.5 Creativity Phase

The Creativity Phase involves identifying and listing creative ideas. The VA Team began the Creativity Phase by focusing on the key functions that were identified during the previous phase and organizing them into eight groupings that followed certain themes. The initial brainstorming categories and functions included:

- Alignment Concepts – Group A
  - Reduce Right-of-Way Impacts
  - Avoid Easements
  - Mitigate Geotechnical Risk
  - Mitigate Right-of-Way Impacts
  - Minimize Community Impacts
  - Transition Grades
  - Minimize Wetland Impacts
- Alignment Concepts – Group B
  - Realign Roadway
  - Avoid Wetlands
  - Avoid Geology
  - Mitigate Vibration
  - Mitigate Noise
  - Obtain Easements
- Alignment Concepts – Group C
  - Realign Roadway
  - Avoid Wetlands
  - Avoid Geology
  - Mitigate Vibration
  - Mitigate Noise
  - Obtain Easements
  - Maintain Hydraulics
  - Bypass Obstacles
  - Avoid Fill
  - Maintain Rail Operations

- Alignment Concepts – New Concepts
  - Increase Operational Capacity
  - Increase Environmental Resiliency
- Minimize Community Impact Concepts
  - Preserve Residences
  - Minimize Noise
  - Preserve Businesses
  - Maintain Traffic
  - Minimize Vibration
  - Maintain Air Quality
  - Maintain Quality of Life
- Minimize Ecological Impact Concepts
  - Preserve Culture
  - Preserve Wetlands
  - Maintain Recreation
  - Maintain Habitat
  - Preserve Ecology
- Refine Project Assumptions Concepts
  - Define Criteria
  - Improve Operational Reliability
- Community Betterment Concepts
  - Improve Community
  - Improve Quality of Life
  - Reuse Right-of-Way

During this phase, the VA Team participated in both individual and team brainstorming sessions to identify as many ideas as possible to address the project functions. The VA Team leveraged the Miro board to allow participants to identify their individual ideas and, where appropriate, associate them with images or sketches. After the VA Team had a chance to put their ideas on the Miro board individually, the facilitators walked through the ideas and expanded upon them with the group.

Judgment of the ideas was not permitted during this phase, as the evaluation of ideas occurred during the next phase of the VA Study. This resulted in the development of over 200 ideas. The idea list includes all the ideas suggested during the study. Each idea received an “idea code” based on the function statement

under which it was brainstormed (Table 2). In addition, the Creativity process resulted in the identification of numerous design review comments. *Both the idea lists and design review comments are included in Appendix E.*

Table 2. Idea Codes and Related Functions

Idea Code	Related Function
AW	Avoid Wetlands
DC	Define Criteria
IC	Improve Community
IOC	Increase Operational Capacity
MCI	Minimize Community Impacts
MEI	Minimize Ecological Impacts
MH	Maintain Hydraulics
MRI	Mitigate Right-of-Way Impacts

3.6 Evaluation Phase

The purpose of the Evaluation Phase is to systematically assess the potential effects of ideas generated during the Creativity Phase relative to their potential for value improvement. As discussed in Section 3.5, the VA Team generated over 200 ideas organized under eight function areas. Some ideas were substantially similar and therefore were grouped by the project team to streamline the screening process. These ideas were initially screened using the Nominal Group Technique tool within Miro. Using this technique, the VA Team members were given a number of votes that they distributed among the ideas they felt were the strongest candidates for potential development. The ideas receiving the most votes, usually five or more, were carried forward for further evaluation and discussion. Approximately two dozen ideas were discussed collectively among the VA Team. As part of this discussion, attendees also generally noted a desire to consider alternative or future technologies that could operate in the corridor. This theme came up during subsequent phases of the VA Study. Attendees also discussed deviating from the goal of accommodating 110 mph speeds for passenger rail and noted that design that accommodates 90 mph speeds could be a refined goal. If any one entity supported the idea, it was then advanced for further evaluation, resulting in the identification of 13 new alternative concepts in addition to the 3 proposed alternatives from the NOP.

More detailed evaluation was then performed on the top ideas using the following evaluation criteria that were identified and developed collaboratively by the VA Team, as mentioned previously in Section 3.2.4. Several of these criteria are also commonly used by Caltrans as part of its VA Study:

- **Rail Operations:** An assessment of the efficiency of rail operations. This criterion considers travel time, station access, operational flexibility, and system capacity.
- **Construction Impacts:** An assessment of the short-term effects to biological, ecological, cultural, recreational, historic, and socioeconomic resources occurring during construction. This criterion considers traffic, air, and noise quality.
- **Ecological Effects:** An assessment of the long-term effects to biological and ecological resources. This criterion considers air, water, and noise quality.
- **Community Effects:** An assessment of the long-term effects to cultural, historic, recreational, and socioeconomic resources. This criterion also considers air, noise, vibration, traffic, and business impacts to the communities. Short-term impacts during construction were also considered, but under “Construction Impacts.”
- **Maintainability:** An assessment of the total cost of ownership to maintain the infrastructure. The VA Team also considered what might be required to maintain the infrastructure, such as additional project features and/or approvals from other parties.
- **Resiliency/Reliability:** An assessment of the long-term reliability and climate resiliency of the infrastructure.
- **Cost:** A measure of the initial cost to deliver the project.

At the end of the Evaluation Phase, a Midpoint Review Meeting was conducted on September 23, 2024, with the VA Team to elicit feedback on the top ideas. This feedback was incorporated into the further development of the VA alternative concepts that occurred during the Development Phase. The following ideas were presented during this meeting (in addition to the three proposed alternatives from the NOP):

- **MRI-01** Maintain the new San Dieguito bridge at Fairgrounds. Try to avoid development, fire station, and public works building. South Portal – be mindful of impacts to upland habitat
- **MRI-04** Keep portals and tunnel profile above floodplain
- **MRI-06** Relocate the southern portal farther south to avoid impacts to the lagoon
- **AW-01** Grade Fill/Raise Portal area with slopes, realign Jimmy Durante Blvd. away from homes, raise above cut-and-cover
- **AW-02** Adjust alignment to cut-and-cover at Jimmy Durante Blvd. and Camino del Mar and start boring to avoid private property eminent domain
- **AW-05** Move alignment to Crest Canyon sooner for less easement acquisition and bridge over Carmel Valley Road
- **MH-01** Optimize tunnel vs. bridge or berm for C alignment
- **MH-02** Move alignment under Camino del Mar

- **MH-03** Shift south portal to the west to minimize property impacts
- **IOC-01** Align rail with I-5 from Oceanside where the rail starts in the center of I-5 to San Diego, consider boring to assist with grading issues and using right-of-way adjacent to I-5 (follow I-5 alignment south to Sorrento Valley Station)
- **IOC-02** Cut-and-cover at the old Del Mar train station
- **IOC-04** Remain on the bluffs with double track and seawalls
- **IOC-06** Relocate all heavy rail along I-15

The slides prepared for this meeting are included in Appendix F of this report.

3.7 Development Phase

During the Development Phase, the ideas that were presented during the Midpoint Review were further expanded and developed into 16 VA alternative concepts (13 new alternative concepts plus the 3 proposed alternatives from the NOP). The project team and SMEs prepared conceptual, high-level design exhibits that were used by the VA Team members to refine the evaluation of the alternative concepts using the evaluation criteria described in Section 3.6. Additionally, preliminary rough order of magnitude cost estimates were prepared for 14 of the alternative concepts (refer to Section 4 for additional information on cost estimates; cost estimates were not prepared for Alternative Concepts No. 4 and 7). The VA Team also evaluated the alternative concepts in terms of performance, cost, time (i.e., schedule), and risk, as applicable. The VA Team also reviewed the list of additional ideas to consider as the project evolves. The VA alternative concepts evaluated during this phase are summarized in Section 4.1, and the additional ideas are included in Section 4.2.

Toward the conclusion of this phase, the project team presented the proposed draft revised project objectives to the VA Team and further refinements were made collaboratively by participants.

3.8 Presentation Phase

On October 28, 2024, an Outbrief Meeting was held with the VA Team, during which a presentation of the VA Team's preliminary assessment of the project and VA alternative concepts was provided. The presentation provided an opportunity for attendees to preview the assessment of the alternative concepts and develop an understanding of the rationale behind them. Additionally, the revised project objectives were shared during the meeting and additional edits were received. Collaborative edits were made to the objectives at various points during the VA Study. There was consensus on the objectives in general, although not all participants agreed on the wording shown.

The proposed revised objectives, inclusive of edits received during and after the Outbrief Meeting are as follows, with underlined text indicating additions and strikethrough text indicating deletions:

- Improve rail service reliability by minimizing risks from climate change, including consideration of sea level rise, flooding, and the stability of the ~~relocating the existing railroad tracks away from the eroding~~ coastal bluffs ~~in Del Mar~~.

- Maintain passenger rail service to ~~the existing train stations serving~~ Solana Beach and Sorrento Valley and accommodate direct rail access to the 22nd District Agricultural Association (Del Mar Fairgrounds) while minimizing disruptions to passenger and freight service during construction.
- Minimize impacts ~~in the surrounding communities~~ to existing homes, businesses, tourism, and major economic generators, including the Del Mar Fairgrounds, and transportation facilities during and after construction.
- Avoid and/or minimize negative effects, and where possible enhance ~~impacts on~~ biological, cultural, and recreational resources of national, state, or local significance, including publicly owned parks, recreational trails, beaches, wetlands, ecological reserves, wildlife or waterfowl refuges, and any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places.
- Help meet the goals of the ~~2021~~ Regional Plan and the ~~2018~~ California State Rail Plan by increasing passenger and freight train capacity, further reducing travel times, improving reliability, and ~~accommodating additional rail service~~ considering existing and planned investments.
- Improve coastal access and safety by eliminating at-grade railroad crossings and minimizing ~~other pedestrian-rail~~ points of interaction between rail and all other modes of transportation.
- Demonstrate good public stewardship by delivering the project in a timely way that considers prior investments, construction, right-of-way, operations, and maintenance costs.

Please refer to Appendix G for the Outbrief Meeting slides that were shared.

3.9 Implementation Phase

The final phase of the VA Study is concerned with determining how the findings of the VA Study will be implemented. A Feedback Meeting was conducted on December 20, 2024, to receive feedback on the Draft VA Study Report. This Final VA Study Report incorporates feedback from the VA Team on the Draft VA Study Report and summarizes the Feedback Meeting.

At the meeting, feedback was solicited on the alternative concepts developed by the VA Team that could warrant further consideration. Specifically, input was requested on the alignments and portal locations associated with the alternative concepts summarized in Section 4.1. The Feedback Meeting is summarized further in Section 5.1. *Please refer to Appendix H for the slides that were shared as part of this meeting.*

4. VA ALTERNATIVE CONCEPTS

This section summarizes the VA alternative concepts (Section 4.1) and the additional ideas (Section 4.2) that were developed by the VA Team during the course of the VA Study. As noted in Section 3.5, over 200 ideas were identified, which were collaboratively narrowed down by the VA Team to 16 VA alternative concepts (13 developed by the VA Team members as part of the VA Study and the 3 proposed alternatives from the NOP). With the exception of the proposed alternatives from the NOP, alternative concepts were numbered in the order they were developed. Please note the following relative to the information included in this section:

- Construction schedules have not been developed for any of the alternative concepts. Construction durations for alternative concepts were generally compared to the durations of previously studied alternatives evaluated in the *San Dieguito to Sorrento Valley Double Track Del Mar Tunnels Alternatives Analysis Report* (SANDAG 2023).
- Neither a formal risk assessment nor a cost benefit analysis has been prepared for any of the alternative concepts at this early conceptual stage.
- The Performance Discussion section of each VA alternative concept includes two types of content.
    - The first is “Participant Feedback,” which includes comments developed by the VA Team during the VA Study. Note that in some cases, these comments may be contradictory in nature because they originated from different entities. Feedback is included verbatim or as revised through comments received during review of the Draft VA Study Report. Some “Participant Feedback” included acronyms that may be less common or familiar as part of their comments; these have been spelled out in brackets as needed for clarity.
    - The second type of content is identified as “Discussion,” which includes information regarding the technical aspects of the VA alternative concepts or provides additional considerations in response to participant feedback. This content was developed by the SMEs and the project team. The “Discussion” content is based on the information as developed and known during the course of the VA Study. However, given the high level conceptual plans that were developed in support of the study, and the overall duration of the study itself, some “Discussion” text notes that additional studies, design, and/or coordination would be needed to further determine potential effects and/or benefits of an alternative concept. In general, all alternative concepts would result in some degree of construction and/or operational impacts to communities; therefore, additional studies, design, and/or coordination would be completed as applicable during the environmental clearance phase for those alternative concepts that advance to further develop design, evaluate impacts, and identify mitigation if needed.

As part of the VA Study, preliminary rough order magnitude cost estimates were developed for the VA alternative concepts based on the conceptual information developed during the course of the study. Please note the following regarding these estimates:

- These preliminary rough order magnitude estimates are subject to change for any VA alternative concepts that move forward into the environmental clearance phase when additional design and studies are completed.
- The preliminary rough order magnitude cost estimates are provided as a range to account for the uncertainties and potential variations for each VA alternative concept given that detailed information is not available.
- The preliminary rough order magnitude project cost estimates include construction, right-of-way, soft costs, and cost escalation. The estimates reflect initial project costs and do not include ongoing operations or maintenance costs. The estimates also include cost escalation for the year of estimated completion of construction based on current market trends. VA alternative concepts with anticipated construction durations similar to the seven-year durations of previously studied alternatives are provided in year 2036 dollars. VA alternative concepts with anticipated construction durations that are substantially longer than seven years are provided in year 2044 dollars for VA Alternative Concept No. 10 and in year 2055 dollars for VA Alternative Concept No. 13.
- Preliminary rough order of magnitude cost estimates were not developed for VA Alternative Concept Nos. 4 and 7, as these alternative concepts could be incorporated into several of the other alternative concepts that are under consideration.

4.1 VA Alternative Concepts

Table 3 provides the title and preliminary rough order of magnitude cost for the 16 alternative concepts evaluated as part of the VA Study. In the sections that follow, each VA alternative concept consists of a summary of the alternative concept, including intent, a high-level technical narrative, an estimated preliminary rough order of magnitude cost, and a discussion of performance considerations for each of the evaluation criteria described in Section 3.6, as developed by the VA Team, SMEs, and the project team. Graphic exhibit(s) are also included at the end of each alternative concept section.

Table 3. Summary of VA Alternative Concepts

Alt. No.	Title	Estimated Cost ($ billions)
1	Locate North Portal at David Way following under Crest Canyon with 90 mph curves	$3.8–$5.0
2	Keep the tunnel profile above projected flooding elevations and provide positive drainage	$3.4–$4.6
3	Locate the Southern Portal south of existing pump station at Carmel Mountain Road	$4.5–$6.0
4	Realign intersection at Jimmy Durante Boulevard and Camino Del Mar	Not developed

Alt. No.	Title	Estimated Cost ($ billions)
5	Locate north portal within Camino Del Mar	$3.9–$5.2
6	Locate North Portal Under Jimmy Durante Boulevard following under Crest Canyon with 90 mph curves	$3.7–$4.9
7	Optimize the use of bridges and berms of Los Peñasquitos Lagoon	Not developed
8	Locate alignment under Camino Del Mar with 90 mph curves	$3.6–$4.8
9	Locate the bored tunnel transition south of Carmel Valley Road	$3.3–$4.4
10	Relocate LOSSAN corridor along I-5 from Oceanside to Sorrento Valley	$34–$45
11	Locate the bored tunnel transition at the old Del Mar Train Station	$4.1–$5.4
12	Stabilize bluffs and widen existing alignment to accommodate a second track	$1.9–$2.5
13	Relocate all freight rail along I-15 corridor	$118–$158
14	Locate North Portal in Solana Beach Trench to South Portal at I-5 Knoll with bored tunnel under Fairgrounds and I-5 (Proposed NOP Alternative Alignment A – I-5 Alignment)	$6.9–$9.2
15	Locate North Portal Under Jimmy Durante Blvd. to South Portal at I-5 Knoll (Proposed NOP Alternative Alignment B – Crest Canyon Alignment)	$3.7–$4.9
16	Locate North Portal at Under Jimmy Durante Blvd. to South Portal at Torrey Pines Road (Proposed NOP Alternative Alignment C – Camino Del Mar Alignment)	$3.3–$4.4

4.1.1 VA Alternative Concept No. 1 (MRI-01)

Locate North Portal at David Way following under Crest Canyon with 90 mph curves

Estimated Cost: $3.8 to $5.0 billion (assumes south portal is located at the I-5 Knoll Portal, which is the more expensive portal option for the alignment)

Description of Alternative Concept: The intent of this alternative concept is to minimize private subsurface easements by locating the bored tunnel segment of the alignment under the Crest Canyon Open Space Park and Torrey Pines State Natural Reserve Extension, to the extent practicable, using a maximum passenger operating speed of 90 mph within the tunnel.

This alternative concept is 5.1 miles in length and would descend immediately south of the rail bridge that spans over the San Dieguito Lagoon and enter a north tunnel portal that would be located northwest of the intersection of Jimmy Durante Boulevard and David Way. The portal infrastructure would cross underneath Jimmy Durante Boulevard, which would be raised. The portal structures could extend into commercial and residential properties. The tunnel alignment would continue southeast eventually running under Crest Canyon and the Torrey Pines State Natural Reserve.

This alternative concept was developed with two potential south portal locations that have been identified as the Portofino Portal and the I-5 Knoll Portal. The horizontal and vertical alignments would vary for each of the potential south portal locations.

The Portofino Portal would be located east of the intersection of Carmel Valley Road and at Portofino Drive. The portal's infrastructure would be located south of Portofino Drive within undeveloped privately owned property. The alignment would cross over the existing Carmel Valley Road on bridge structure and continue on a bridge across Los Peñasquitos Lagoon before transitioning onto a berm and connecting the existing rail alignment near Carmel Mountain Road.

The I-5 Knoll Portal would be located at the knoll south of Carmel Valley Road between I-5 and the segment of Sorrento Valley Road Trail that is closed to public vehicular traffic but open for bicycles, pedestrians, and authorized vehicles. The portal infrastructure would be within the undeveloped knoll and extend into the Los Peñasquitos Lagoon. The alignment transitions back to the existing rail alignment south of Carmel Mountain Road.

Performance Discussion

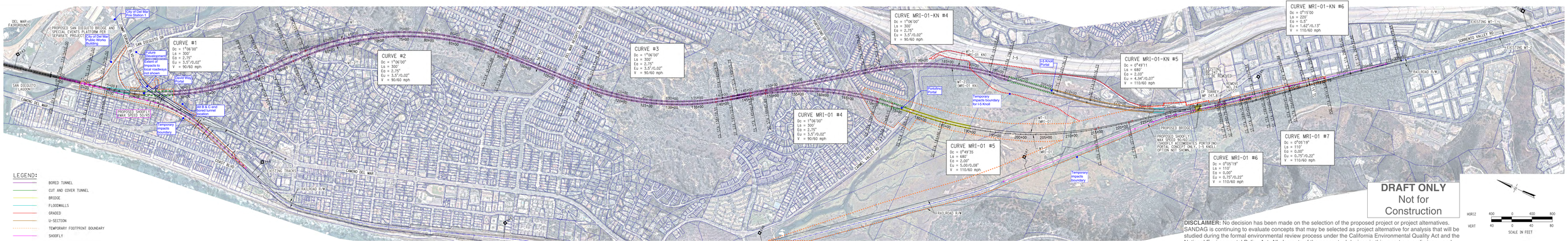
Performance Attribute	Discussion
Rail Operations	*Participant Feedback* – Additional design could improve the horizontal geometry and reduce or straighten some of the curves in the tunnel portion of the alignment. Reduces potential to increase speeds in the future beyond 90 mph. *Participant Feedback* – Sag profile for the full length of the tunnel makes the tracks vulnerable to flooding, if water surface elevation at either portal reaches the portal invert elevation. Consideration should be given to protect tunnel during flood events. Relying on flood gates to mitigate flood risk will shut down operations until flood waters recede. *Discussion* – The 90-mph curves on this alignment would increase travel time compared to planned 110-mph passenger operations in the corridor, identified in the 2021 Regional Plan. *Discussion* – Floodwalls and floodgates at the portals and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel are standard practice and proven solutions. *Discussion* – Operations beyond the tunnel alignment would be halted during events that exceed the anticipated flood levels and sea level rise.
Construction Impacts	*Participant Feedback* – After treatment, spoils in sandstone layers may be able to be placed on the beach. *Participant Feedback* – This alignment avoids the 50-unit multifamily project. *Participant Feedback* – Construction impacts along this alignment will be extensive particularly at the Portofino southern portal location; there will be impacts to Phase II of Los Peñasquitos Lagoon Restoration project, as well as impacts resulting from construction of shoofly at the transition to existing grade near Sorrento Valley Rd. *Participant Feedback* – At the north portal, there are several concerns, including noise, dust, vibrations, emergency response, traffic, utility impacts, access to streets (Jimmy Durante Blvd., David Way, Heather Ln., and Christy Ln.), and access to Public Works Facility.

Performance Attribute	Discussion
	Additionally, there are concerns with having to temporarily relocate residents along Jimmy Durante Blvd., as well as potential vibrations and settlement caused by tunneling. *Discussion* – The soil excavated during tunnel construction may be suitable for placement on beaches if it meets material standards. *Discussion* – The proposed 50-unit multifamily project at the corner of Jimmy Durante Boulevard and San Dieguito Drive, which includes deed-restricted low and very low-income affordable units, would be avoided in all alternative concepts that were considered. *Discussion* – The location of this north portal would affect residential properties to accommodate construction. Due to its proximity to David Way and the anticipated vertical separation between the rail alignment and roadway, it would be challenging to maintain existing driveway and local roadway (David Way) connections during construction and in the permanent configuration. This could result in effects to additional properties not already identified in the exhibit below. *Discussion* – Industry established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be implemented to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be implemented to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities. Utilities in the construction footprint would be relocated prior to commencement of portal construction or protected in place during construction. *Schedule* – Construction schedules have not been developed for any of the alternative concepts. It is anticipated that the construction duration for this alternative concept would be similar to the duration of previously studied alternatives, which would be approximately seven years.
Ecological Effects	*Participant Feedback* – Impacts to the Los Peñasquitos Lagoon would require a need to mitigate for temporary or permanent impacts. Options to mitigate within the Lagoon will be difficult as the City of San Diego will be in the process of, or will have already, restored the area into healthy salt marsh. The City will generate roughly 20 acres of credits as part of Los Peñasquitos Lagoon Restoration Phase I to be used to mitigate impacts on Los Peñasquitos Lagoon Restoration Phase II. Resource agencies may not allow SANDAG and City of San Diego to "double dip" on mitigation efforts. *Discussion* – This alternative concept could provide the opportunity to restore additional portions of the lagoon with the potential removal of the existing berm that supports the railroad. *Discussion* – The Portofino Portal would be located within an area identified as upland habitat with known cultural resources protected by an open space easement. This may require open space easement modifications and potential mitigation. The sections of bridge structure and berm to the south of the portal would be located within wetlands associated with Los Peñasquitos Lagoon. *Discussion* – SANDAG will continue to coordinate with the City of San Diego for the Los Peñasquitos Lagoon Restoration Project and resource agencies to identify and implement mitigation for the project as required if this alternative concept advances into the environmental clearance phase.
Community Effects	*Participant Feedback* – A benefit is the alignment reduces easement acquisition by aligning to Crest Canyon as compared to Alternative B and C. *Participant Feedback* – Proposed alignment capitalizes on public right-of-way lessening impacts to private property owners. *Participant Feedback* – At the north portal, there are concerns with long-term impacts to noise, vibrations, visual, dust, and private property impacts to residences and businesses. There are concerns with easement/property acquisition and eminent domain.

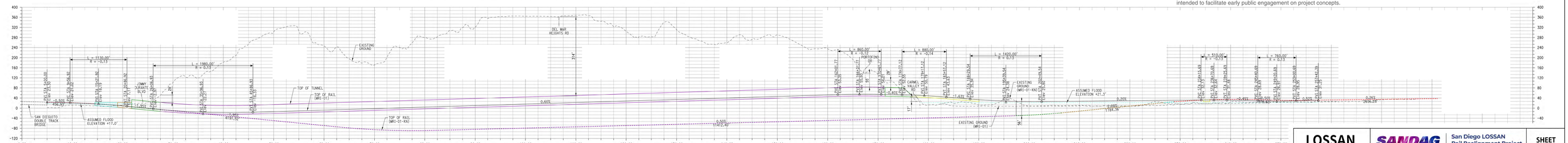
Performance Attribute	Discussion
	Participant Feedback – Potential impacts to the sea level rise adaptation planning efforts (Living Levee). *Participant Feedback* – Can the alignment be improved to avoid impacts if the San Dieguito Bridge does not remain? Concern with vibrations from tunnels. *Participant Feedback* – Potential to impact [San Diego] City-owned Parks and Recreation Department-managed parcels in Crest Canyon Open Space and Peñasquitos Lagoon and the Multi-Habitat Planning Area (MHPA) Preserve (part of the City's Multiple Species Conservation Program (MSCP) Subarea Plan). *Participant Feedback* – Concerns of temporary impacts to commuters, business owners, and residents located near the proposed portal above Carmel Valley Rd. and the tie into existing alignment near Sorrento Valley Rd. *Discussion* – Compared to VA Alternative Concepts No. 15 and 16 (NOP Alternatives B and C, respectively), this alternative concept would reduce the number of private subsurface easements; however, the location of this north portal would affect additional residential properties to accommodate construction. Due to its proximity to David Way and the anticipated vertical separation between the rail alignment and roadway, it would be challenging to maintain existing driveway and local roadway (David Way) connections both during construction and in the permanent configuration. This could result in effects to additional properties not already identified in the exhibit below. *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be implemented to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be implemented to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities. *Discussion* – Additional design work and coordination with the City of Del Mar would be required to better understand the extent of effects on local future sea level rise adaptation planning efforts, including living levees.
Maintainability	*Participant Feedback* – The sag profile raises concerns for damage to tunnel, tracks, and other systems caused by flooding. What is the impact to cost of ownership if tunnel is vulnerable to flooding? *Discussion* – Floodwalls and floodgates at the north and I-5 knoll portals and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution. Operations and maintenance costs would be further evaluated in coordination with NCTD.
Resiliency/ Reliability	*Participant Feedback* – Proposed vertical alignment keeps north and south portal entrances above the floodplain making for a more resilient design which lessens the need to make modifications in the future to account for sea level rise. *Participant Feedback* – North portal susceptible to flooding and sea level rise. *Discussion* – The north portal and south portal located at the I-5 Knoll location would be below the floodplain elevations. Floodwalls and floodgates would be located at these portals, and low point sump pumps are anticipated in the design for the alignments with a sag curve. The use of floodwalls and flood gates to address the potential of flood water entering the tunnel is standard practice and a proven solution. The south portal located at the Portofino Portal is above the floodplain elevations as noted.

Discussion of Additional Considerations: None noted.

Figure 4. VA Alternative Concept No. 1



PLAN



PROFILE

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DISCLAIMER: No decision has been made on the selection of the proposed project or project alternatives. SANDAG is continuing to evaluate concepts that may be selected as project alternative for analysis that will be studied during the formal environmental review process under the California Environmental Quality Act and the National Environmental Policy Act. All elements of the conceptual designs in this report are preliminary, and should not be construed as an announcement of the intent to acquire any private property. The images are intended to facilitate early public engagement on project concepts.

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SCALE IN FEET

LOSSAN VA STUDY

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VA ALTERNATIVE NO. 1 (MRI-01)

SHEET 1 OF 1

4.1.2 VA Alternative Concept No. 2 (MRI-04)

Keep the tunnel profile above projected flooding elevations and provide positive drainage

Estimated Cost: $3.4 to $4.6 billion

Description of Alternative Concept: The intent of this alternative concept is to provide a tunnel profile that would remain above projected flood levels and sea level rise and provide positive drainage in the tunnel. This design would not require floodwalls, flood gates, or sump pumps.

This alternative concept is 4.8 miles in length and would ascend immediately south of the rail bridge that spans over the San Dieguito Lagoon and cross underneath Jimmy Durante Boulevard, which would be raised. The alignment would then enter the north tunnel portal located east of Jimmy Durante Boulevard. The portal infrastructure would extend into residential properties.

This alignment continues southeast directly to the south portal located east of the intersection of Carmel Valley Road and Portofino Drive. The portal's infrastructure would be located south of Portofino Drive within undeveloped privately owned property. The alignment would cross over the existing Carmel Valley Road on bridge structure and continue on bridge across Los Peñasquitos Lagoon before transitioning onto a berm and connecting the existing rail alignment near Carmel Mountain Road.

Performance Discussion

Performance Attribute	Discussion
Rail Operations	*Participant Feedback* – Raising portal elevation could mitigate risk of extended rail closures caused by tunnel flooding. *Participant Feedback* – Benefits operations by reducing flooding risk. *Discussion* – This alternative concept would provide for a 110-mph rail alignment, which is consistent with the 2021 Regional Plan. *Discussion* – Operations within and beyond the tunnel alignment would be halted during events that exceed the anticipated flood levels and sea level rise.
Construction Impacts	*Participant Feedback* – The construction impacts to the community are greater for the north portal compared to the other option. At the north portal there are several concerns, including noise, dust, vibrations, emergency response, traffic, utility impacts, access to streets (Jimmy Durante Blvd., David Way, Heather Ln., Christy Ln., Luzon Ave., and Seaview Ave.), and access to Public Works Facility. There are concerns with having to temporarily relocate residents along Jimmy Durante Blvd. *Participant Feedback* – There are concerns about potential vibrations and settlement caused by tunneling. The tunnel profile will be closer to the surface. *Participant Feedback* – There are concerns about potential bluff failures along Jimmy Durante Blvd., especially considering the two failures in the past 5 years. *Discussion* – Compared to VA Alternative Concepts No. 15 and 16 (NOP Alternatives B and C, respectively), this alternative concept would locate the north portal farther up the hillside to remain above the anticipated flood and sea level rise projections and would increase surface impacts to private property and roadways not already identified in the exhibit below. Additionally, a new Jimmy Durante Boulevard bridge, approximately 30 feet above the new rail alignment would be necessary. This would require extended temporary impacts to support construction, and the permanent impacts would likely increase due to the height of the realignment of Jimmy Durante Boulevard and associated retaining walls to transition the roadway back to existing.

Performance Attribute	Discussion
	Discussion – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be implemented to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be implemented to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities. Utilities in the construction footprint would be relocated prior to commencement of portal construction or protected in place during construction. *Schedule* – Construction schedules have not been developed for any of the alternative concepts. It is anticipated that the construction duration for this alternative concept would be similar to the duration of previously studied alternatives, which would be approximately seven years.
Ecological Effects	*Participant Feedback* – Potential reuse of spoils on beach would benefit coastal ecology. *Discussion* – Potential benefit of spoils reuse would be common to all tunnel alternative concepts and would vary in applicability based on the extents of each alternative concept that are driven through favorable geology, such as the Torrey Sandstone and sandstone beds within the Delmar Formation. *Discussion* – The Portofino Portal would be located within an area identified as upland habitat with known cultural resources protected by an open space easement. This may require open space easement modifications and potential mitigation. The sections of bridge structure and berm to the south of the portal would be located within wetlands associated with Los Peñasquitos Lagoon. *Discussion* – This alternative concept could provide the opportunity to restore additional portions of the lagoon with the potential removal of the existing berm that supports the railroad.
Community Effects	*Participant Feedback* – The effect to the community is increased for the north portal as compared to the other option. At the north portal there are concerns with long-term impacts to noise, vibrations, visual, dust, and private property impacts to residential and businesses. There are concerns with easement/property acquisition and eminent domain. There is a concern with Jimmy Durante Blvd. being realigned significantly higher than existing condition. *Participant Feedback* – Potential impacts to the sea level rise adaptation planning efforts (Living Levee). *Participant Feedback* – Potentially increases impacts on private property. *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be developed to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be developed to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities. Utilities in the construction footprint would be relocated prior to commencement of portal construction or protected in place during construction. *Discussion* – Compared to VA Alternative Concepts No. 15 and 16 (NOP Alternatives B and C, respectively), this alternative concept would locate the north portal farther up the hillside to remain above anticipated flood and sea level rise projections and would increase the impacts to private property and roadways not yet identified. Additionally, a new Jimmy Durante Boulevard bridge, approximately 30 feet above the new rail alignment would be necessary. This would require extended temporary impacts to support construction, and the permanent impacts would likely increase due to the height of the realignment of Jimmy Durante Boulevard and associated retaining walls to transition the roadway back to existing.

Performance Attribute	Discussion
	Discussion – Additional design work and coordination with the City of Del Mar would be required to better understand the extent of effects on local future sea level rise adaptation planning efforts, including living levees.
Maintainability	*Participant Feedback* – Reduced risk of flooding would reduce major maintenance operations necessary to restore tunnel, tracks, and other systems after major flooding event. *Participant Feedback* – This is the only alternative concept that does not require dewatering. *Discussion* – This alternative concept would not require sump pumps to remove stormwater drainage from tunnel low points. *Discussion* – Raising the alignment above flood and sea level elevations would reduce maintenance of additional infrastructure implemented to address flooding events compared to VA Alternative Concepts No. 14, 15, and 16 (NOP Alternatives A, B, and C, respectively).
Resiliency/ Reliability	*Participant Feedback* – Raising portal elevations above flood projections would reduce the risk of flooding and improve resiliency and reliability of the rail corridor. *Discussion* – Raising the alignment above flood and sea level elevations would reduce reliance on additional infrastructure implemented to address flooding events compared to VA Alternative Concepts No. 14, 15, and 16 (NOP Alternatives A, B, and C, respectively).

Discussion of Additional Considerations:

This alternative concept, as shown in Figure 7, illustrates one of two south portal locations that could be paired with this north portal. A south portal near Torrey Pines Road and Carmel Valley Road could also meet the intent of the alternative concept.

Figure 5. FEMA Flood Map

Source: 2024 FEMA National Flood Hazard Layer dataset

Figure 6. State of California Sea-Level Rise Guidance

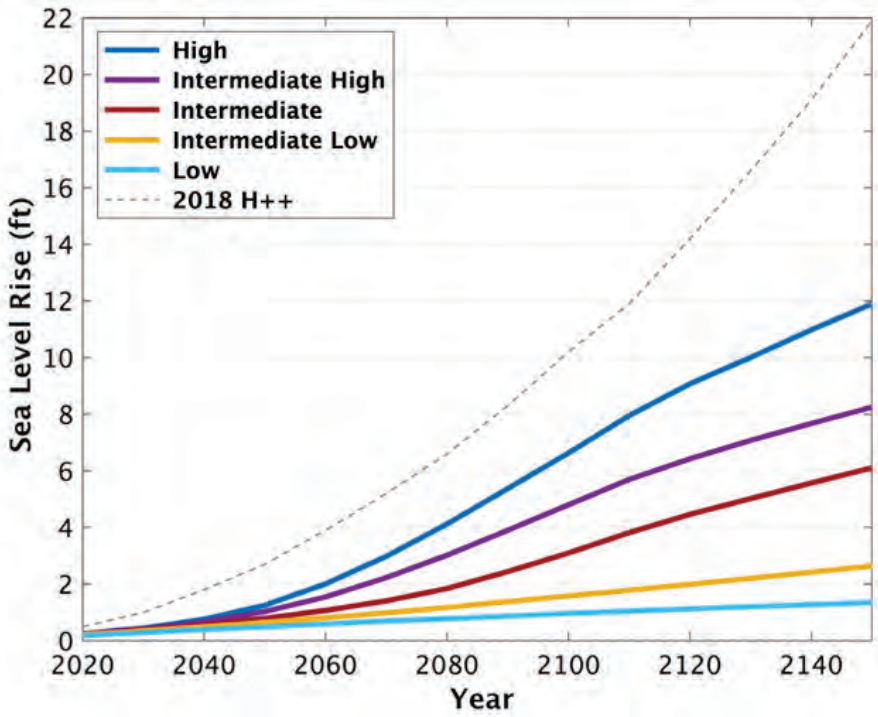
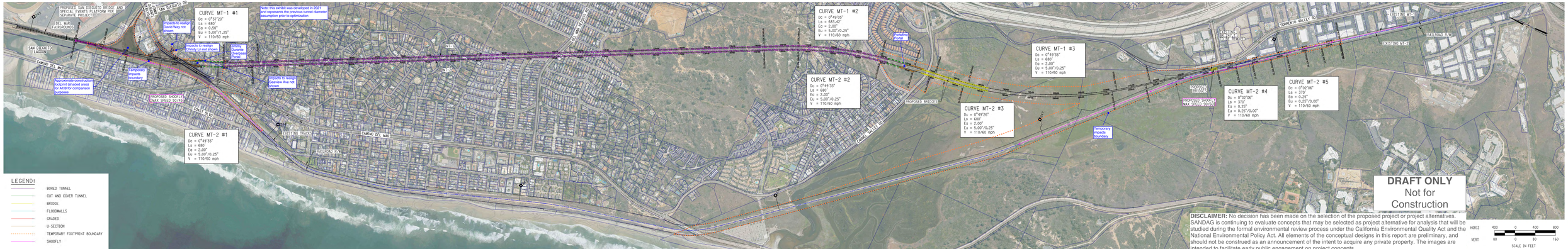
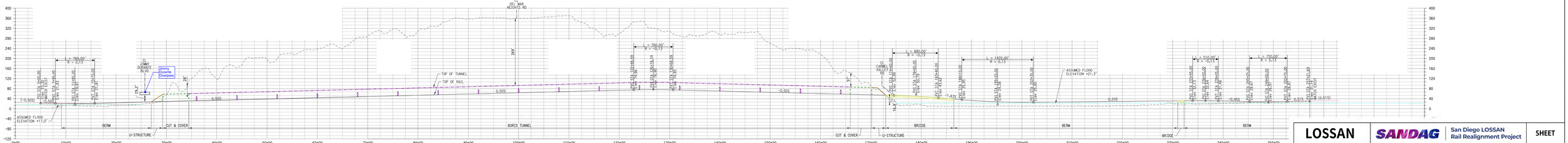


FIGURE 2.3. *Sea Level Scenarios from 2020 to 2150, in feet, with a baseline of 2000. For comparison, the H++ from the 2018 California Sea-Level Guidance is included illustrating that this scenario is above scientifically plausible sea level rise for all dates.*

Source: State of California Seal-Level Rise Guidance 2024 Science and Policy Update

Figure 7. VA Alternative Concept No. 2





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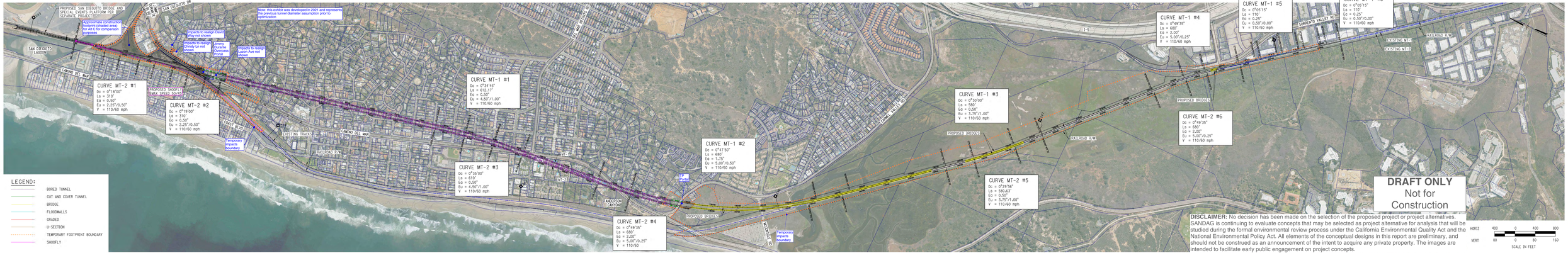
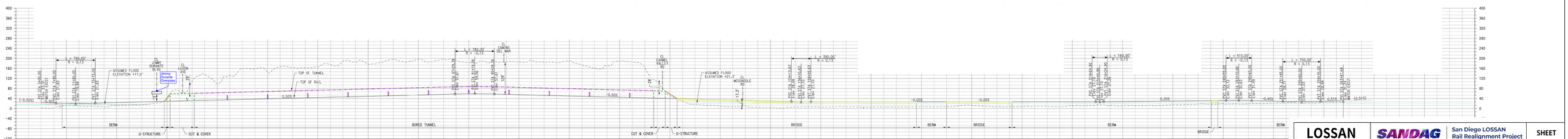
SANDAG San Diego LOSSAN Rail Realignment Project

VA ALTERNATIVE NO. 2 (MRI-04)

SHEET 1 OF 2





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VA ALTERNATIVE NO. 2 (MRI-04)

SHEET 2 OF 2

4.1.3 VA Alternative Concept No. 3 (MRI-06)

Locate the South Portal south of existing pump station at Carmel Mountain Road

Estimated Cost: $4.5 to $6.0 billion

Description of Alternative Concept: The intent of this alternative concept is to minimize permanent effects to the existing wetlands by locating the southern portal south of Los Peñasquitos Lagoon.

This alternative concept is approximately 5.0 miles in length and would descend immediately south of the rail bridge that spans over the San Dieguito Lagoon and enter a north portal located north of the intersection of Camino Del Mar and Jimmy Durante Boulevard. The portal's infrastructure would cross underneath Jimmy Durante Boulevard, which would be raised. The portal structures could extend into commercial and residential properties.

The alignment continues south and exits at the south portal. The south portal would be located between Sorrento Valley Road and the existing railroad right-of-way south of Carmel Mountain Road. The cut-and-cover and portal structure would extend into commercial property and would require temporary realignment and reconfiguration of Carmel Mountain Road and Sorrento Valley Road. The alignment would then transition back into the existing railroad alignment.

Performance Discussion

Performance Attribute	Discussion
Rail Operations	*Participant Feedback* – The alignment south of the new south portal is more subject to flooding. *Discussion* – The use of floodwalls and floodgates at the portals to address the potential of flood water entering the tunnel is standard practice and a proven solution. *Discussion* – This alternative concept would provide for a 110-mph rail alignment, which is consistent with the 2021 Regional Plan.
Construction Impacts	*Participant Feedback* – This alignment would impact City of San Diego utilities (water, sewer, and pump station) and infrastructure. Temporarily realigning Carmel Mountain Rd. and Sorrento Valley Rd. will be a lengthy phase of construction with extensive impacts to roadway operations, private properties, and businesses. With the final configuration of the intersection, utility relocations must be considered. *Participant Feedback* – Significant impact on several commercial buildings on Sorrento Valley Road. *Participant Feedback* – Moves construction staging further south into a narrower part of the Sorrento Valley with limited staging areas. *Participant Feedback* – May impact sewage pump station piping into and out of pump station. *Discussion* – Any potential impacts to pump station facilities would be coordinated with the City of San Diego. *Discussion* – Temporary and permanent roadway impacts would be coordinated with the City of San Diego. *Schedule* – Construction schedules have not been developed for any of the alternative concepts. It is anticipated that the construction duration for this alternative concept would be similar to the duration of previously studied alternatives, which would be approximately seven years.

Performance Attribute	Discussion
Ecological Effects	*Participant Feedback* – May reduce wetlands impact along tunnel, but may increase impacts south of the South Portal. *Participant Feedback* – Impacts to the Los Peñasquitos Lagoon would require a need to mitigate for temporary or permanent impacts. Options to mitigate within the Lagoon will be difficult as the City of San Diego will be in the process of, or will have already, restored the area into healthy salt marsh. The City will generate roughly 20 acres of credits as part of Los Peñasquitos Lagoon Restoration Phase I to be used to mitigate for impacts on Los Peñasquitos Lagoon Restoration Phase II. Resource agencies may not allow SANDAG and City of San Diego to "double dip" on mitigation efforts. *Discussion* – It is anticipated that permanent impacts to wetlands would be reduced with the alternative concept compared to VA Alternative Concepts No. 14, 15, and 16 (NOP Alternatives A, B, and C, respectively). *Discussion* – SANDAG will continue to coordinate with the City of San Diego for the Los Peñasquitos Lagoon Restoration Project and resource agencies to identify and implement mitigation for the project as required if this alternative concept advances into the environmental clearance phase. *Discussion* – This alternative concept could provide the opportunity to restore additional portions of the lagoon with the potential removal of the existing berm that supports the railroad.
Community Effects	*Participant Feedback* – With the intersection of Carmel Mountain Rd. and Sorrento Valley Rd. being impacted, there is an opportunity to address existing flooding in the area by elevating the intersection out of the floodplain. *Participant Feedback* – This alignment would directly impact businesses located within the proposed realignment footprint with a possibility of full take. Temporarily realigning Carmel Mountain Rd. and Sorrento Valley Rd. will be a lengthy phase of construction with extensive impacts to roadway operations, private properties, and businesses. *Discussion* – Temporary and permanent roadway impacts would be coordinated with the City of San Diego.
Maintainability	*Participant Feedback* – Extends tunnel infrastructure needed to be maintained. *Discussion* – Floodwalls and floodgates at the portals and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.
Resiliency/ Reliability	*Participant Feedback* – This portal location may be subject to flood risks. *Discussion* – Floodwalls and floodgates at the portals and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.

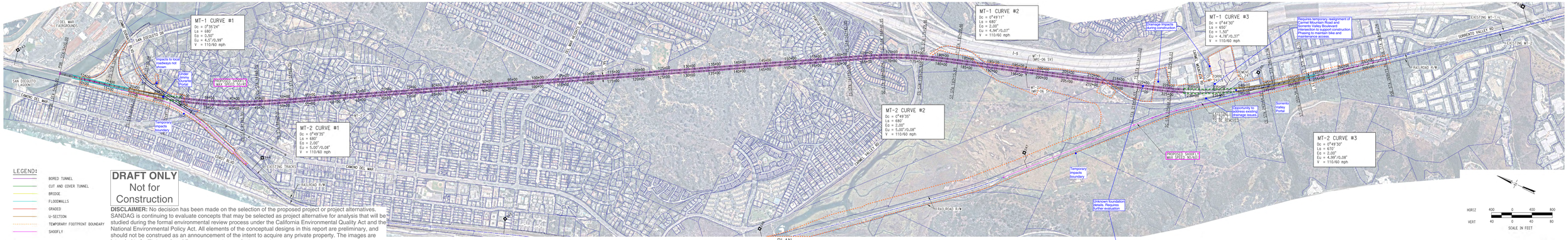
Discussion of Additional Considerations:

This alternative concept, as shown in Figure 9, illustrates one of several north portal locations that could be paired with this south portal.

Figure 8. FEMA Flood Map

Source: 2024 FEMA National Flood Hazard Layer dataset

Figure 9. VA Alternative Concept No. 3



PLAN

LEGEND:
- BORED TUNNEL
- CUT AND COVER TUNNEL
- BRIDGE
- FLOODWALLS
- GRADED
- U-SECTION
- TEMPORARY FOOTPRINT BOUNDARY
- SHOOFLY

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Not for Construction

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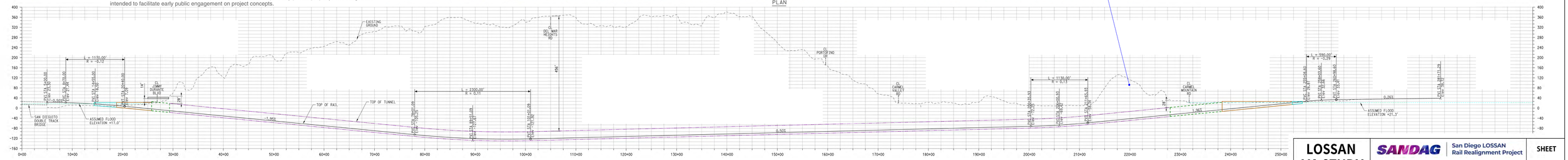

PROFILE

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VA ALTERNATIVE NO. 3 (MRI-06)

SHEET 1 OF 1

4.1.4 VA Alternative Concept No. 4 (AW-01)

Realign intersection at Jimmy Durante Boulevard and Camino Del Mar

Estimated Cost: Not developed as part of VA Study as this alternative concept could be incorporated into several of the other alternative concepts that are under consideration and would not be implemented as a standalone alternative.

Description of Alternative Concept: The intent of this alternative concept is to reduce property effects and acquisitions, and improve local traffic circulation by realigning Jimmy Durante Boulevard to the west over the existing rail alignment with a new roundabout intersection at Camino Del Mar.

This alternative concept consists of local roadway improvements. The Jimmy Durante Boulevard realignment would begin north of the intersection with David Way and extend south of the Camino Del Mar intersection. The Camino Del Mar realignment would begin at the intersection with Coast Boulevard and extend south of the Jimmy Durante Boulevard connection. The roadway improvements would include modified intersection connections with local adjacent streets and driveways along the alignments.

Performance Discussion

Performance Attribute	Discussion
Rail Operations	*Participant Feedback* – There is a concern that this portal location would have a higher flood risk than other alternatives. *Discussion* – The staging and phasing to support construction would require temporary roadway conditions to support and maintain rail operations, including the use of a track shoofly. The proposed roadway realignments are located within the existing railroad right-of-way. This would require a significant and lengthy track shoofly to maintain rail operations if the roadway improvements were constructed prior to a track relocation. *Discussion* – Increasing the utilization of the existing railroad right-of-way for roadway improvements would increase construction impacts on existing rail operations compared to VA Alternative Concepts No. 15 and 16 (NOP Alternatives B and C, respectively).
Construction Impacts	*Participant Feedback* – Concerns regarding maintaining traffic ingress/egress based on construction phasing. *Participant Feedback* – This concept would likely require a shoofly track to accommodate construction. Single track shoofly (in place of double track built by San Dieguito project) with tighter curves would reduce rail capacity and train speeds. *Participant Feedback* – Difficult to construct while maintaining rail and road traffic. *Discussion* – It is anticipated that this alternative concept would require a track shoofly to support construction. Temporary roadway configurations could be considered through various construction phases with permanent roadway configuration to follow the cutover to the new rail service through the tunnel. The temporary track shoofly would likely be located outside of the current railroad right-of-way and potentially affect commercial and residential properties. *Discussion* – This alternative concept would require complex construction staging of traffic on Jimmy Durante Boulevard and Camino Del Mar to maintain traffic and rail operations throughout construction. Compared to VA Alternative Concepts No. 15 and 16 (NOP Alternatives B and C, respectively), the construction footprint would likely increase and affect additional properties located along these two roadways during construction. Traffic management and reconfiguration of local roads would be developed to address impacts on local traffic and access for emergency response would be maintained and coordinated with the City of Del Mar. *Schedule* – Construction schedules have not been developed for any of the alternative concepts. A reconfiguration of existing roadways would not significantly impact the overall

Performance Attribute	Discussion
	project schedule. Therefore, it is anticipated that the construction duration for this alternative concept would be similar to the duration of previously studied alternatives, which would be approximately seven years.
Ecological Effects	*Participant Feedback* – No comments provided. *Discussion* – None noted.
Community Effects	*Participant Feedback* – In the long term the roundabout enhances traffic flow and access to the City [Del Mar], especially the Beach Colony from Jimmy Durante Blvd. Reduces impacts to private properties fronting Jimmy Durante Blvd. *Participant Feedback* – Can the road be aligned to avoid impacts to businesses on Jimmy Durante Blvd.? This site has been identified for potential future housing that could include affordable units. *Participant Feedback* – There are concerns with visual impacts of retaining walls. *Discussion* – This alternative concept would require complex construction staging of traffic on Jimmy Durante Boulevard and Camino Del Mar to maintain traffic and rail operations throughout construction. Compared to VA Alternative Concepts No. 15 and 16 (NOP Alternatives B and C, respectively), the construction footprint would likely increase and affect additional properties located along these two roadways during construction. Traffic management and reconfiguration of local roads would be developed to address impacts on local traffic and access for emergency response would be maintained and coordinated with the City of Del Mar. *Discussion* – This alternative concept could improve circulation and coastal access for vehicles, pedestrians, and bicycles. It may also improve access to and from the Del Mar fire station.
Maintainability	*Participant Feedback* – This concept potentially increases the risk of flooding for the tunnel which increases the maintenance obligations. *Discussion* – The use of a roundabout as the final roadway concept is assumed to be a concept viable for alternative concepts with a northern portal within Jimmy Durante Boulevard or Camino Del Mar, as is the primary intent of this alternative concept. However, floodwalls at the portals are anticipated. The use of floodwalls to address the potential of flood water from entering the tunnel is standard practice and an effective solution.
Resiliency/ Reliability	*Participant Feedback* – This portal location may be subject to flood risks. *Discussion* – The use of a roundabout as the final roadway concept is assumed to be a concept viable for alternative concepts with a northern portal within Jimmy Durante Boulevard or Camino Del Mar, as is the primary intent of this alternative concept. However, floodwalls at the portals are anticipated. The use of floodwalls to address the potential of flood water from entering the tunnel is standard practice and an effective solution.

Discussion of Additional Considerations:

This roadway alternative concept could be accommodated in all alternative concepts with a northern portal within Jimmy Durante Boulevard or Camino Del Mar which would include VA Alternative Concept Nos. 1, 2, 3, 5, 6, 8, 9, 11, 15, 16, and potentially 13.

Figure 10. VA Alternative Concept No. 4

Potential Portal with more northern location.

Opportunity to reduce impacts to private property

Major Roadway impacts to Jimmy Durante Blvd and Camino Del Mar to support construction

JIMMY DURANTE BLVD

MT-1

MT-2

Temporary impacts boundary

Requires shoofly to support construction

Opportunity to reconfigure roadways post tunnel construction, This concept could apply to most northern portal locations near Jimmy Durante and Camino Del Mar

RAILROAD R/W

EXISTING TRACKS

Requires new access to Grand Avenue

CAMINO DEL MAR

DRAFT ONLY
Not for Construction

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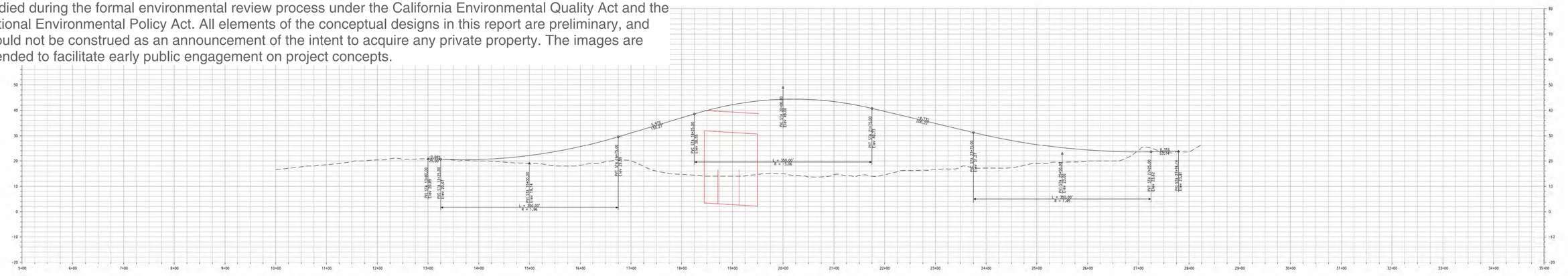

LEGEND:

- BORED TUNNEL
- CUT AND COVER TUNNEL
- BRIDGE
- FLOODWALLS
- GRADED
- U-SECTION
- TEMPORARY FOOTPRINT BOUNDARY

HORIZ 300 0 300 600
VERT 20 0 20 40
SCALE IN FEET

LOSSAN VA STUDY

SANDAG | San Diego LOSSAN Rail Realignment Project

VA ALTERNATIVE NO. 4 (AW-01)

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9/27/2024
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4.1.5 VA Alternative Concept No. 5 (AW-02)

Locate north portal within Camino Del Mar

Estimated Cost: $3.9 to $5.2 billion

Description of Alternative Concept: The intent of this alternative concept is to minimize permanent effects on private properties by locating the transition from cut-and-cover to bored tunnel to be within public right-of-way of the existing roads.

This alternative concept is approximately 5.3 miles in length and would descend immediately south of the rail bridge that spans over the San Dieguito Lagoon and enter a north portal located north of Jimmy Durante Boulevard, adjacent to the tennis courts. A cut-and-cover structure would run parallel to Jimmy Durante Boulevard until it transitions to a bored tunnel at the south end of the Camino Del Mar railroad overpass bridge. The portal's infrastructure would cross underneath Camino Del Mar and Jimmy Durante Boulevard. The existing Camino Del Mar overpass bridge and Jimmy Durante Boulevard would need to be reconstructed and realigned to accommodate the cut-and-cover tunnel segment. The roadway realignments and reconstruction could extend into commercial and residential properties.

The alignment continues south and exits at the south portal. The south portal would be located at a knoll south of Carmel Valley Road between I-5 and the segment of Sorrento Valley Road Trail that is closed to public vehicular traffic but open for bicycles, pedestrians, and authorized vehicles. The portal infrastructure would be within the undeveloped knoll and extend into the Los Peñasquitos Lagoon. The alignment would then transition back into the existing railroad alignment.

Performance Discussion

Performance Attribute	Discussion
Rail Operations	*Participant Feedback* – No comments provided. *Discussion* – The proposed shoofly would likely necessitate reduced operating speeds compared to existing conditions due to the available space and the resulting rail alignment. *Discussion* – This alternative would provide for a 110-mph rail alignment, which is consistent with the 2021 Regional Plan. *Discussion* – Floodwalls and floodgates at the portals and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.
Construction Impacts	*Participant Feedback* – Reduces constructions impacts to residents on Jimmy Durante Blvd. and David Wy as compared to Alternative B by moving portal under Camino Del Mar. *Participant Feedback* – At the north portal, there are concerns with noise, dust, vibrations, emergency response, traffic, utility impacts, access to streets (Jimmy Durante Blvd., David Way, Heather Ln., and Christy Ln.), and access to Public Works Facility. There is a concern with having to temporarily relocate residents along Jimmy Durante Blvd. Also, there are concerns with potential bluff failure along Jimmy Durante Blvd. (two bluff failures with last 5 years). Need more information on new access to Grand Avenue. *Participant Feedback* – This concept would likely require a shoofly track to accommodate construction. Single track shoofly (in place of double track built by San Dieguito project) with tighter curves would reduce rail capacity and train speeds. *Discussion* – The north portal structure could extend into commercial and residential properties, and the temporary construction area may be expanded. A temporary bridge to

Performance Attribute	Discussion
	replace the existing Camino Del Mar bridge is anticipated, along with effects to adjacent local roadways to provide the necessary footprint to construct the portal facilities. Compared to VA Alternative Concepts No. 15 and 16 (NOP Alternatives B and C, respectively), this would increase the effects to properties along Jimmy Durante Boulevard and Camino Del Mar with the potential to eliminate access to some properties during construction. Additionally, a new roadway to provide access to Grand Avenue would be necessary. *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be implemented to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be implemented to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities. Utilities in the construction footprint would be relocated prior to commencement of portal construction or protected in place during construction. *Discussion* – The proposed shoofly would likely require impacts to private properties and necessitate reduced operating speeds compared to existing conditions. *Schedule* – Construction schedules have not been developed for any of the alternative concepts. It is anticipated that the construction duration for this alternative concept would be similar to the duration of previously studied alternatives, which would be approximately seven years.
Ecological Effects	*Participant Feedback* – No comments provided. *Discussion* – None noted.
Community Effects	*Participant Feedback* – Reduces long-term portal impacts and eminent domain compared to Alternative B. *Participant Feedback* – At the north portal, there are concerns with long-term impacts to noise, vibrations, visual, dust, and private property impacts to residential and businesses. There are concerns with easement/property acquisition and eminent domain. *Participant Feedback* – Potential impacts to the sea level rise adaptation planning efforts (Living Levee). Need more information on new access to Grand Avenue (temporary or long-term)? *Discussion* – The portal structures could extend into commercial and residential properties. Due to the north portal structure's location within the roadway, new temporary roads east of the existing roadway could be necessary to provide the needed temporary construction area. *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be developed to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be developed to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities. *Discussion* – Additional design work and coordination with the City of Del Mar would be required to better understand the extent of effects on local future sea level rise adaptation planning efforts, including living levees. *Discussion* – The new access to Grand Avenue is anticipated to require a temporary roadway connecting to a point along Coast Boulevard to the south.
Maintainability	*Participant Feedback* – No comments provided. *Discussion* – Floodwalls and floodgates at the portals and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.

Performance Attribute	Discussion
Resiliency/ Reliability	*Participant Feedback* – No comments provided. *Discussion* – Floodwalls and floodgates at the portals and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.

Discussion of Additional Considerations:

This alternative concept, as shown in Figure 11, illustrates one of several south portal locations that could be paired with this north portal.

Figure 11. VA Alternative Concept No. 5

PLAN

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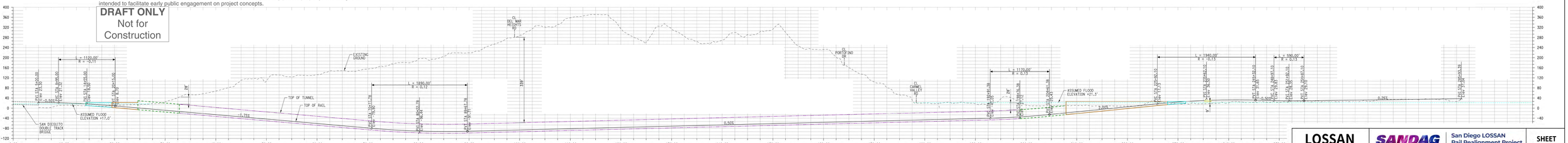

PROFILE

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VA ALTERNATIVE NO. 5 (AW-02)

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4.1.6 VA Alternative Concept No. 6 (AW-05)

Locate North Portal Under Jimmy Durante Boulevard following under Crest Canyon with 90 mph curves

Estimated Cost: $3.7 to $4.9 billion (assumes south portal is located at the I-5 Knoll Portal, which is the more expensive portal option for the alignment)

Description of Alternative Concept: The intent of this alternative concept is to minimize private subsurface easements by locating the bored tunnel segment of the alignment under Crest Canyon Open Space Park and Torrey Pines Natural Reserve Extension, to the extent practicable using maximum passenger operations speeds for 90 mph within the tunnel.

This alternative concept is 5.1 miles in length and would descend immediately south of the rail bridge that spans over the San Dieguito Lagoon and enter a north tunnel portal located north of the intersection of Camino Del Mar and Jimmy Durante Boulevard. The portal infrastructure would cross underneath Jimmy Durante Boulevard, which would be raised. The portal structures could extend into commercial and residential properties. The tunnel alignment would continue southeast, eventually running under Crest Canyon and Torrey Pines State Natural Reserve.

This alternative concept was developed with two potential south portal locations that have been identified as the Portofino Portal and the I-5 Knoll Portal. The horizontal and vertical alignments would vary for each of the potential south portal locations.

The Portofino Portal located the south portal east of the intersection of Carmel Valley Road and at Portofino Drive. The portal's infrastructure would be located south of Portofino Drive within undeveloped privately owned property and is not expected to displace existing buildings. The alignment would cross over the existing Carmel Valley Road on bridge structure and continue on bridge across Los Peñasquitos Lagoon before transitioning onto a berm and connecting the existing rail alignment near Carmel Mountain Road.

The I-5 Knoll Portal located the south portal at the knoll south of Carmel Valley Road between I-5 and the segment of Sorrento Valley Road Trail that is closed to public vehicular traffic but open for bicycles, pedestrians, and authorized vehicles. The portal infrastructure would be within the undeveloped knoll and extend into the Los Peñasquitos Lagoon. The alignment transitions back to the existing rail alignment south of Carmel Mountain Road.

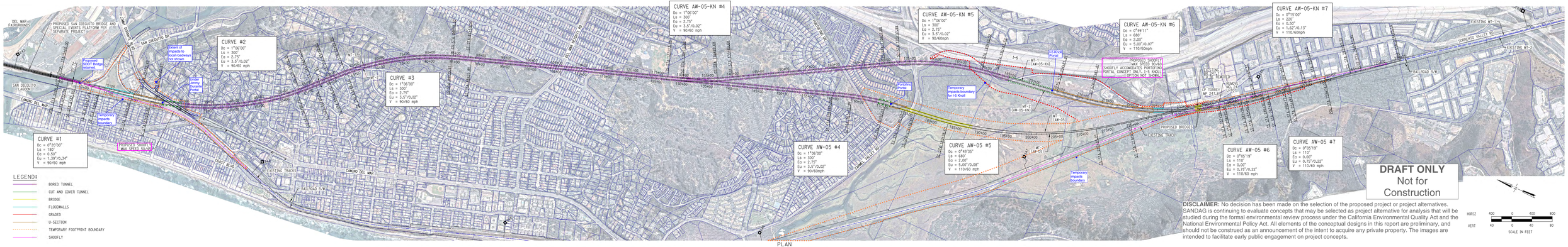
Performance Discussion

Performance Attribute	Discussion
Rail Operations	*Participant Feedback* – Straighter alignment with less curves allows for enhanced rail operations/ increased design speed. *Participant Feedback* – 90 mph curves on this alignment increases travel time as compared to 110 mph alternatives. Reversing curves accelerates rail wear. *Discussion* – The 90-mph curves on this alignment would increase travel time compared to planned 110-mph passenger operations in the corridor identified in the 2021 Regional Plan. *Discussion* – Floodwalls and floodgates at the portals and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.
Construction Impacts	*Participant Feedback* – At the north portal, there are concerns with noise, dust, vibrations, emergency response, traffic, utility impacts, access to streets (Jimmy Durante Blvd., David Way, Heather Ln., and Christy Ln.), and access to Public Works Facility. *Participant Feedback* – There is a concern with having to temporarily relocate residents along Jimmy Durante Blvd. Also, there are extra concerns with potential bluff failure along Jimmy Durante Blvd. (two bluff failures in the last 5 years). Concern with vibrations from tunnels. *Discussion* – This alternative concept's construction effects at the north portal are anticipated to be less than the other alternative concepts. *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be implemented to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be implemented to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities. Utilities in the construction footprint would be relocated prior to commencement of portal construction or protected in place during construction. *Schedule* – Construction schedules have not been developed for any of the alternative concepts. It is anticipated that the construction duration for this alternative concept would be similar to the duration of previously studied alternatives, which would be approximately seven years.
Ecological Effects	*Participant Feedback* – Impacts to the Los Peñasquitos Lagoon would require a need to mitigate for temporary or permanent impacts. Options to mitigate within the Lagoon will be difficult as the City of San Diego will be in the process of, or will have already, restored the area into healthy salt marsh. The City will generate roughly 20 acres of credits as part of Los Peñasquitos Lagoon Restoration Phase I to be used to mitigate impacts on Los Peñasquitos Lagoon Restoration Phase II. Resource agencies may not allow SANDAG and City of San Diego to "double dip" on mitigation efforts. *Discussion* – The Portofino Portal would be located within an area identified as upland habitat with known cultural resources protected by an open space easement. This may require open space easement modifications and potential mitigation. The sections of bridge structure and berm to the south of the portal would be located within wetlands associated with Los Peñasquitos Lagoon. *Discussion* – SANDAG will continue to coordinate with the City of San Diego for the Los Peñasquitos Lagoon Restoration Project and resource agencies to identify and implement mitigation for the project, as required, if this alternative concept advances into the environmental clearance phase. *Discussion* – This alternative concept could provide the opportunity to restore additional portions of the lagoon with the potential removal of the existing berm that supports the railroad.

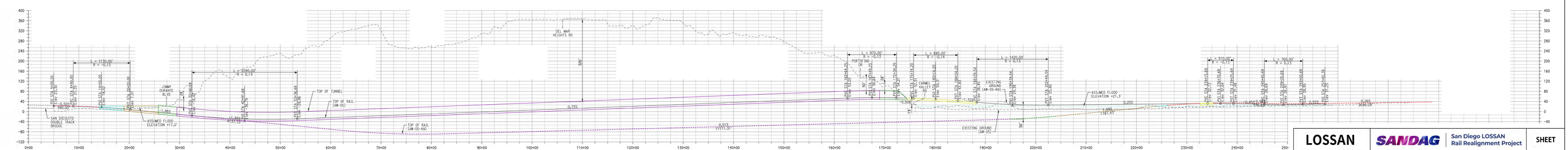
Performance Attribute	Discussion
Community Effects	*Participant Feedback* – Proposed alignment capitalizes on public right-of-way lessening impacts to private property owners. *Participant Feedback* – Potential to impact [San Diego] City-owned Parks and Recreation Department-managed parcels in Crest Canyon Open Space and Peñasquitos Lagoon and the Multi-Habitat Planning Area (MHPA) Preserve (part of the City's Multiple Species Conservation Program (MSCP) Subarea Plan) *Participant Feedback* – The City of San Diego has concern of temporary impacts to commuters, business owners, and residents located near the proposed portal above Carmel Valley Rd. and the tie into existing alignment near Sorrento Valley Rd. *Participant Feedback* – At the north portal, there are concerns with long-term impacts to noise, vibrations, visual, dust, and private property impacts to residential and businesses. There are concerns with easement/property acquisition and eminent domain. Concern with vibrations from tunnels. *Participant Feedback* – Can the alignment be improved to avoid impacts if the San Dieguito Bridge does not remain? *Participant Feedback* – Potential impacts to the sea level rise adaptation planning efforts (Living Levee). *Discussion* – Compared to VA Alternative Concepts No. 15 and 16 (NOP Alternatives B and C, respectively), this alternative concept would reduce the number of private subsurface easements, and the surface impacts at the north portal location would be less than the other alternative concepts. *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be developed to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be implemented to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities. *Discussion* – Additional design work and coordination with the City of Del Mar would be required to better understand the extent of effects on local future sea level rise adaptation planning efforts, including living levees.
Maintainability	*Participant Feedback* – No comments provided. *Discussion* – The north portal and south portal located at the I-5 Knoll location would be below the floodplain elevations. Floodwalls and floodgates would be located at these portals, and low point sump pumps are anticipated in the design for the alignments with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.
Resiliency/ Reliability	*Participant Feedback* – Proposed vertical alignment keeps north and south portal entrances above the floodplain making for a more resilient design which lessens the need to make modifications in the future to account for sea level rise. *Discussion* – Floodwalls and floodgates would be located at these portals, and low point sump pumps are anticipated for the alignments with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution. The south portal located at the Portofino Portal is above the floodplain elevations as noted.

Discussion Additional Considerations: None noted.

Figure 12. VA Alternative Concept No. 6



PLAN



PROFILE

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4.1.7 VA Alternative Concept No. 7 (MH-01)

Optimize the use of bridges and berms in Los Peñasquitos Lagoon

Estimated Cost: A cost was not developed as part of the VA Study as the optimization of bridges and berms would be considered during the environmental clearance phase for any alternative concept that advances.

Description of Alternative Concept: The intent of this alternative concept is to optimize the locations and lengths of bridges and berms along the alignment passing through the lagoon. This alternative concept would include analysis to consider the necessary hydraulic openings to maintain or improve flows within the wetlands and to accommodate projected flooding while minimizing impacts to habitat.

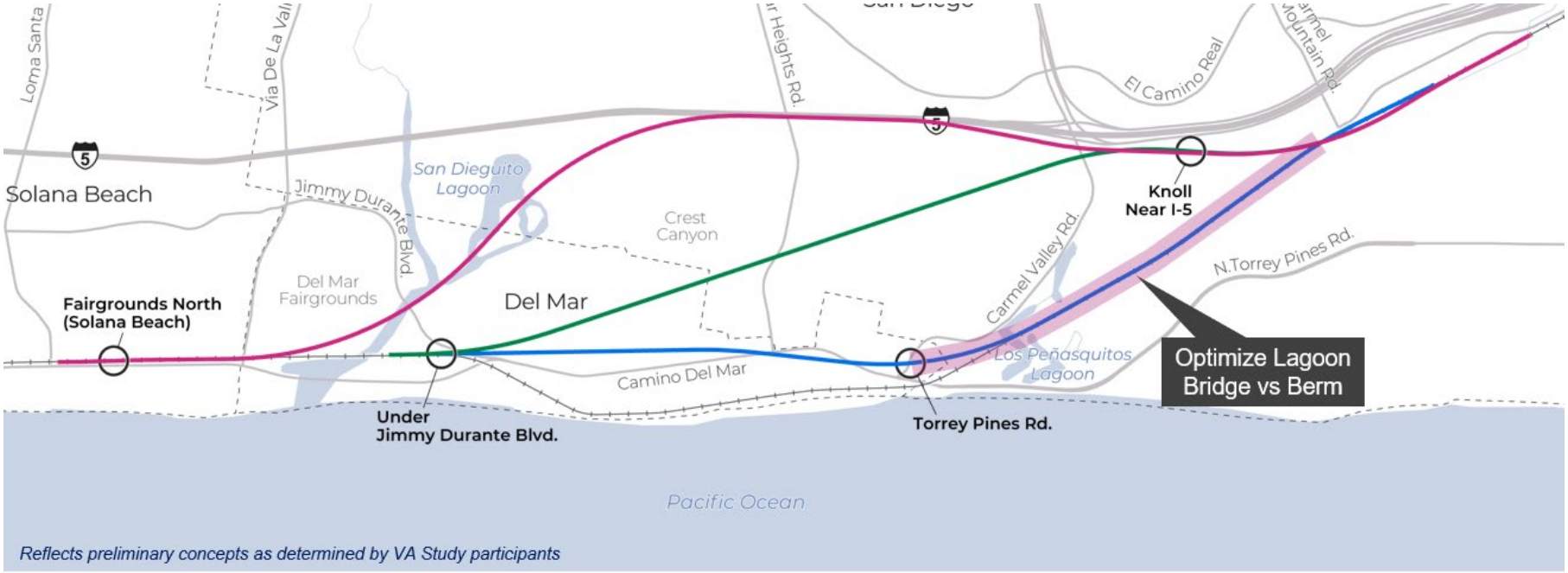
Performance Discussion

Performance Attribute	Discussion
Rail Operations	*Participant Feedback* – No comments provided. *Discussion* – None noted.
Construction Impacts	*Participant Feedback* – This will impact the restoration work within the Lagoon (Phases I and II) being done by the City of San Diego. Continued coordination is necessary between the City of San Diego and SANDAG to ensure cohesion between assumptions/models. *Discussion* – This alternative concept may impact the City of San Diego's Los Peñasquitos Lagoon Restoration Project. Potential impacts and mitigation options would need to be coordinated with the City of San Diego. *Schedule* – Construction schedules have not been developed for any of the alternative concepts. A reduction in the overall length of bridge over the lagoon would not significantly impact the overall project schedule. Therefore, it is anticipated that the construction duration for this alternative concept would be similar to the duration of previously studied alternatives, which would be approximately seven years.
Ecological Effects	*Participant Feedback* – Reduction in the length of bridge over the lagoon vs. additional fill may reduce restoration opportunities. *Participant Feedback* – Beneficial to determine optimal amount of bridge. *Participant Feedback* – Optimizing bridge within Lagoon would be less impactful to wildlife and promote tidal flow into the Lagoon. *Participant Feedback* – Impacts to the Los Peñasquitos Lagoon would require a need to mitigate for temporary or permanent impacts. Options to mitigate within the Lagoon will be difficult as the City of San Diego will be in the process of, or will have already, restored the area into healthy salt marsh. The City will generate roughly 20 acres of credits as part of Los Peñasquitos Lagoon Restoration Phase I to be used to mitigate for impacts on Los Peñasquitos Lagoon Restoration Phase II. Resource agencies may not allow SANDAG and City of San Diego to "double dip" on mitigation efforts. *Participant Feedback* – Keeping the alignment in its existing condition, while optimizing bridge or berm, will further complicate identifying mitigation opportunities. *Discussion* – This alternative concept may impact the City of San Diego's Los Peñasquitos Lagoon Restoration Project. Potential impacts and mitigation options would need to be coordinated with the City of San Diego. *Discussion* – SANDAG will continue to coordinate with the City of San Diego for the Los Peñasquitos Lagoon Restoration Project and resource agencies to identify and implement mitigation for the project, as required, if this alternative concept advances into the environmental clearance phase.

Performance Attribute	Discussion
Community Effects	*Participant Feedback* – No comments provided. *Discussion* – None noted.
Maintainability	*Participant Feedback* – Bridges require more inspection and maintenance than berms. If the optimized solution increases the overall length of bridges, this will increase maintenance activities and cost. *Discussion* – None noted.
Resiliency/ Reliability	*Participant Feedback* – No comments provided. *Discussion* – None noted.

Discussion of Additional Considerations: None noted.

Figure 13. VA Alternative Concept No. 7



4.1.8 VA Alternative Concept No. 8 (MH-02)

Locate alignment under Camino Del Mar with 90 mph curves

Estimated Cost: $3.6 to 4.8 billion

Description of Alternative Concept: The intent of this alternative concept is to minimize private subsurface easements by locating the bored tunnel segment of the alignment directly under Camino Del Mar, to the extent practicable, using a maximum passenger operating speed of 90 mph.

This alternative concept is 4.9 miles length and would descend immediately south of the rail bridge that spans over the San Dieguito Lagoon and enter the north portal located north of Jimmy Durante Boulevard, adjacent to the tennis courts. A cut-and-cover structure would run parallel to Jimmy Durante Boulevard until it transitions to a bored tunnel at the south end of the Camino Del Mar railroad overpass bridge. The existing Camino Del Mar overpass bridge would need to be reconstructed and realigned to accommodate the cut-and-cover tunnel segment. The bored tunnel would continue under Camino Del Mar to Del Mar Heights Road where the alignment would need to deviate from the roadway to accommodate the 90-mph passenger operating speeds.

This alternative concept would continue south and exit the south portal located near the intersection of Carmel Valley Road and North Torrey Pines Road. The portal infrastructure would cross underneath Carmel Valley Road and potentially extend into residential properties on the north side of Carmel Valley Road. The alignment would continue on bridge structure over the Los Peñasquitos Lagoon where the alignment would transition back to the existing railroad alignment. The existing railroad alignment within Los Peñasquitos Lagoon would be double tracked, which would require raising and widening the existing berm in the lagoon to address flooding and sea level rise projections.

Performance Discussion

Performance Attribute	Discussion
Rail Operations	*Participant Feedback* – No comments provided. *Discussion* – The 90 mph curves on this alignment would increase travel time compared to planned 110 mph passenger operations in the corridor, identified in the 2021 Regional Plan. *Discussion* – Floodwalls and floodgates at the portals and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.
Construction Impacts	*Participant Feedback* – This option reduces construction impacts on residents along Jimmy Durante Blvd. and David Way compared to Alternative B by placing the portal beneath Camino Del Mar. *Participant Feedback* – At the portals, there are several concerns, including noise, dust, vibrations, emergency response, traffic, utility impacts, access to streets (Jimmy Durante Blvd., Camino Del Mar, David Way, Heather Ln., Christy Ln., and Carmel Valley Road), and access to Public Works Facility. *Participant Feedback* – There are concerns with having to temporarily relocate residents along Jimmy Durante Blvd. *Participant Feedback* – There are concerns about potential vibrations and settlement caused by tunneling.

Performance Attribute	Discussion
	Participant Feedback – This concept would likely require a shoofly track to accommodate construction. Single track shoofly (in place of double track built by San Dieguito project) with tighter curves would reduce rail capacity and train speeds. *Discussion* – The north portal structure could extend into commercial and residential properties. A temporary bridge to replace the existing Camino Del Mar bridge is anticipated, along with effects to adjacent local roadways to provide the necessary footprint to construct the portal facilities. Compared to VA Alternative Concepts No. 15 and 16 (NOP Alternatives B and C, respectively), this would increase the effects to properties along Jimmy Durante Boulevard and Camino Del Mar with the potential to eliminate access to some properties during construction. Additionally, a new roadway to provide access to Grand Avenue would be necessary. *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be implemented to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be implemented to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities. Utilities in the construction footprint would be relocated prior to commencement of portal construction or protected in place during construction. *Discussion* – The proposed shoofly could extend into private properties and necessitate reduced operating speeds compared to existing conditions. *Schedule* – Construction schedules have not been developed for any of the alternative concepts. It is anticipated that the construction duration for this alternative concept would be similar to the duration of previously studied alternatives, which would be approximately seven years.
Ecological Effects	*Participant Feedback* – No comments provided. *Discussion* – None noted.
Community Effects	*Participant Feedback* – This option reduces long-term portal impacts, the need for eminent domain, and easement acquisition compared to Alternatives B and C. *Participant Feedback* – At the north portal, there are concerns about the long-term impacts of noise, vibrations, visual disturbances, dust, and impacts on private properties for both residents and businesses. *Participant Feedback* – There are concerns about easement and property acquisitions/eminent domain. *Participant Feedback* – There may be potential impacts on sea level rise adaptation planning efforts (Living Levee). *Participant Feedback* – There are concerns about potential vibrations from the tunnel. *Discussion* – Compared to VA Alternative Concepts No. 15 and 16 (NOP Alternatives B and C, respectively), this alternative concept would reduce the number of private subsurface easements; however, the portal structure could extend into commercial and residential properties. Due to the portal structure's location within the roadway, new temporary roads east of the existing roadway could be necessary to provide the needed temporary construction area. *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be developed to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be developed to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities.

Performance Attribute	Discussion
	Discussion – Additional design work and coordination with the City of Del Mar would be required to better understand the extent of effects on local future sea level rise adaptation planning efforts, including living levees. *Discussion* – The new access to Grand Avenue is anticipated to require a temporary roadway connecting to a point along Coast Boulevard to the south.
Maintainability	*Participant Feedback* – No comments provided. *Discussion* – Floodwalls and floodgates at the north portal and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.
Resiliency/ Reliability	*Participant Feedback* – No comments provided. *Discussion* – Floodwalls and floodgates at the north portal and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.

Discussion of Additional Considerations: None noted.

Figure 14. VA Alternative Concept No. 8

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LOSSAN VA STUDY	SANDAG San Diego LOSSAN Rail Realignment Project VA ALTERNATIVE NO. 8 (MH-02)	SHEET 1 OF 1

4.1.9 VA Alternative Concept No. 9 (MH-03)

Locate the bored tunnel transition south of Carmel Valley Road

Estimated Cost: $3.3 to 4.4 billion

Description of Alternative Concept: The intent of this alternative concept is to minimize private property effects by locating the cut-and-cover tunnel segment at the south portal to the south of Carmel Valley Road and locating it west toward North Torrey Pines Road.

This alternative concept is 4.9 miles in length and would descend immediately south of the rail bridge that spans over the San Dieguito Lagoon and enter the north portal. This portal would be located north of the intersection of Camino Del Mar and Jimmy Durante Boulevard. The portal's infrastructure would cross underneath Jimmy Durante Boulevard, which would be raised. The portal structures could extend into commercial and residential properties.

This alternative concept would continue south and exit the south portal near the intersection of Carmel Valley Road and North Torrey Pines Road. The portal infrastructure would be located immediately south of Carmel Valley Road. The alignment would continue on a bridge structure over the Los Peñasquitos Lagoon. Where the bridge structure passes over McGonigle Road (which provides access to the Torrey Pines North Beach parking lot) the vertical clearance would not meet current clearance criteria and would be less than the existing clearance. Roadway modifications may be required at McGonigle Road to maintain the existing grade separation and access to the North Beach parking lot area. South of McGonigle Road, the alignment would transition back to the existing railroad alignment. The existing railroad alignment within Los Peñasquitos Lagoon would be double-tracked, which would require raising and widening the existing berm in the lagoon to address flooding and sea level rise projections.

Performance Discussion

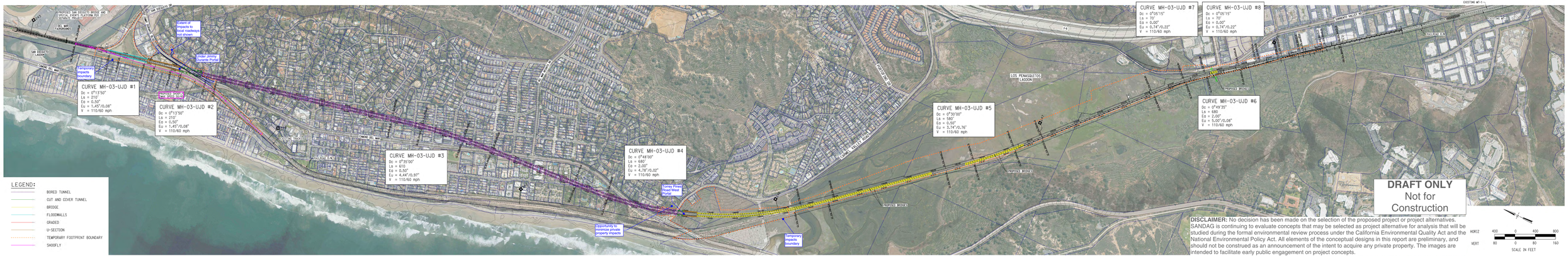
Performance Attribute	Discussion
Rail Operations	*Participant Feedback* – No comments provided. *Discussion* – This alternative concept would provide for a 110-mph rail alignment, which is consistent with the 2021 Regional Plan. *Discussion* – Floodwalls and floodgates at the portals and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.
Construction Impacts	*Participant Feedback* – This option reduces construction impacts on residents at the south portal. *Participant Feedback* – At the south portal there are several concerns, including noise, dust, vibrations, emergency response, traffic, utility impacts, and access to streets. *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be implemented to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be implemented to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities. Utilities in the construction footprint would

Performance Attribute	Discussion
	be relocated prior to commencement of portal construction or protected in place during construction. *Schedule* – Construction schedules have not been developed for any of the alternative concepts. It is anticipated that the construction duration for this alternative concept would be similar to the duration of previously studied alternatives, which would be approximately seven years.
Ecological Effects	*Participant Feedback* – No comments provided. *Discussion* – None noted.
Community Effects	*Participant Feedback* – This option reduces long-term community effects on residents at the south portal. *Participant Feedback* – At the south portal there are concerns about the long-term impacts of noise, vibrations, visual disturbances, dust, and impacts on private properties for both residents and businesses. *Participant Feedback* – There are concerns about easement and property acquisitions/eminent domain. *Participant Feedback* – There are concerns about potential vibrations from the tunnel. *Discussion* – Because the bored tunnel transition would be located south of Carmel Valley Road, the potential for the portal infrastructure to extend into residential property would be reduced at the south portal compared to VA Alternative Concept No. 16 (NOP Alternative C). *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be developed to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be developed to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities.
Maintainability	*Participant Feedback* – No comments provided. *Discussion* – Floodwalls and floodgates at the north portal and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.
Resiliency/ Reliability	*Participant Feedback* – No comments provided. *Discussion* – Floodwalls and floodgates at the north portal and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.

Discussion of Additional Considerations:

This alternative concept, as shown in Figure 15, illustrates one of several north portal locations that could be paired with this south portal.

Figure 15. VA Alternative Concept No. 9



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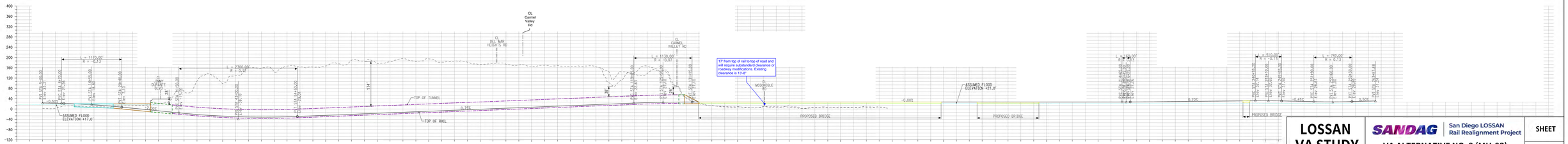

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VA ALTERNATIVE NO. 9 (MH-03)

SHEET 1 OF 1

4.1.10 VA Alternative Concept No. 10 (IOC-01)

Relocate LOSSAN corridor along I-5 from Oceanside to Sorrento Valley

Estimated Cost: $34 to $45 billion

Description of Alternative Concept: The intent of this alternative concept is to explore relocating the rail corridor and operations from the existing alignment to a new location along I-5 between Oceanside and Sorrento Valley. The design for the alternative concept includes the horizontal and vertical geometry needed to support freight and passenger rail. The existing grades and the constrained right-of-way of the I-5 corridor require the double-tracked alignment to be located either in a tunnel or on an aerial structure for the entire length. Further, north of the Agua Hedionda Lagoon in the City of Carlsbad, the rail alignment would need to transition from side to side and across the I-5 median to maintain a minimum 90 mph design speed, although 110 mph is desirable. South of the lagoon, the alignment would transition to the west side of the freeway and stay along the west to Sorrento Valley where it would connect with the existing rail alignment.

The resulting 25-mile alignment would consist of tunnel segments on the north and south ends of the alignment with primarily aerial structure in between. The aerial structure may reach heights of up to 60 feet in certain locations. New stations, including a new special events platform to serve the Del Mar Fairgrounds, would need to be constructed; all of these stations would be on aerial structures. This alternative concept would require extensive right-of-way to accommodate the guideways, stations, and parking facilities. This alternative concept assumes that all rail service along the existing rail alignment would shift to the new I-5 rail corridor.

Freight access to local customers would be maintained on the Escondido subdivision from the Stuart Mesa yard. The SPRINTER rail line would remain, and the location of the relocated Oceanside Transit Center identified under this alternative concept would provide a connection to the SPRINTER.

Performance Discussion

Performance Attribute	Discussion
Rail Operations	*Participant Feedback* – Concern regarding impacts to passenger services associated with relocated stations. Alternatives need to consider how the communities are served by the relocated stations. *Participant Feedback* – This alternative would need to consider preservation of the connection to the Escondido subdivision and potential impacts to Camp Pendleton. *Discussion* – The 90-mph curves on this alignment would increase travel time as compared to the planned 110-mph passenger operations in the corridor identified in the 2021 Regional Plan. *Discussion* – Floodwalls and floodgates and low point sump pumps are anticipated for tunnels with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.
Construction Impacts	*Participant Feedback* – Reduces construction impacts on the City of Del Mar. *Discussion* – There would be significant design and constructability challenges related to supporting two freight rail lines on aerial structure for over 20 miles. The foundations and sub-structure needed to support an approximately 42-foot-wide superstructure would be substantial and create significant construction access issues. Significant freeway reconstruction would be required where the alignment travels within the median. Acquisitions

Performance Attribute	Discussion
	would be required for the station footprint, transit park-and-ride lots, and to accommodate local roadway access. Construction activities would occur within six cities and Camp Pendleton. Construction activities in Del Mar would still be required to support track relocation. *Schedule* – Construction schedules have not been developed for any of the alternative concepts. This alternative concept would require significant construction activities and complex construction phasing along a 25-mile corridor. It is anticipated that the construction duration for this alternative concept would be substantially longer than the previously studied alternatives, which were estimated to be approximately seven years.
Ecological Effects	*Participant Feedback* – The project footprint would increase to 25 miles and would require seven lagoon crossings, four of which have undergone restoration projects. *Discussion* – None noted.
Community Effects	*Participant Feedback* – This alternative would introduce impacts to the cities of Carlsbad, Encinitas, and Oceanside. Visual impacts along the I-5 corridor would be significant. *Participant Feedback* – Communities served by existing stations would have reduced access to rail transit. *Participant Feedback* – This alignment results in the least amount of impact to private property if it stays within the Caltrans right-of-way. *Participant Feedback* – Consideration should be given to ridership impacts when placing stations next to the freeway. *Participant Feedback* – There should be a balance between using aerial structures and tunneling to reduce the overall height of the aerial profile. *Discussion* – Relocating existing transit stations serving the downtown areas of the coastal communities could result in effects to existing businesses along the existing alignment. The development of replacement stations along the I-5 corridor would need to consider how to connect to the locations served by the existing alignment. *Discussion* – This alternative concept could result in long-term community effects related to the tall aerial structure and relocated stations and associated traffic. These effects would occur over approximately 17.3 miles through 5 cities/communities (Camp Pendleton, Oceanside, Carlsbad, Encinitas, Solana Beach, and San Diego).
Maintainability	*Participant Feedback* – This alternative concept would likely include mostly aerial or underground track. Both options would require increased maintenance as compared to existing at-grade corridor. *Discussion* – Sufficient emergency egress along the aerial structure would require vertical access every 2,500 feet requiring vertical circulation elements. Additionally, maintenance access would need to be provided to meet current rail operational requirements. This would include the provision of high rail access ramps to allow inspection and maintenance of the track and switchgear. The tunnel segments would require cross passages, ventilation, and maintenance access facilities. *Discussion* – Floodwalls and floodgates and low point sump pumps are anticipated in the design for tunnels with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution. *Discussion* – The ability to restore operations if there were an incident on the alignment would be significantly more difficult and of a longer duration given the length and height of the aerial alignment compared to all other alternative concepts. This would consequently affect other rail services along the alignment.
Resiliency/ Reliability	*Participant Feedback* – No comments provided. *Discussion* – Floodwalls and floodgates and low point sump pumps are anticipated in the design for tunnels with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.

Discussion of Additional Considerations:

The magnitude of challenges in delivering a project of this nature would be significant. Numerous approvals from a variety of third parties would be required, including, but not limited to, the FRA, the U.S. Department of Defense, existing freight operators, the Federal Highway Administration, and potentially the Surface Transportation Board. Caltrans would need to approve co-locating active freight rail above or near highway traffic.

The anticipated time it would take to plan, coordinate, approve, permit, design, and construct a project of this size, including advancing it through the environmental process, could take decades. Securing funding sufficient to pay for this alternative concept would also be a major challenge, and the alternative concept could not be easily implemented in phases given the need to maintain rail access between Oceanside and Sorrento Valley. This alternative concept would result in the loss of over a billion dollars in investment along the existing rail corridor. Abandoning recent investments that have been made through state and/or federal funding may introduce a risk that the investment would need to be repaid. This could also affect SANDAG's standing and fiscal responsibility with funding sources.

Figure 16. VA Alternative Concept No. 10

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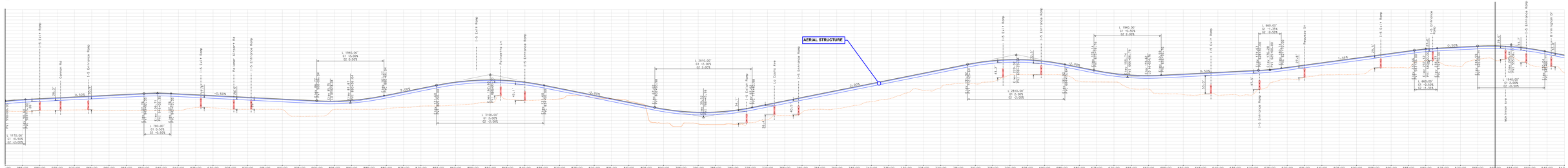
LOSSAN VA STUDY	SANDAG San Diego LOSSAN Rail Realignment Project VA ALTERNATIVE NO. 10 (IOC-01)	1 OF 3

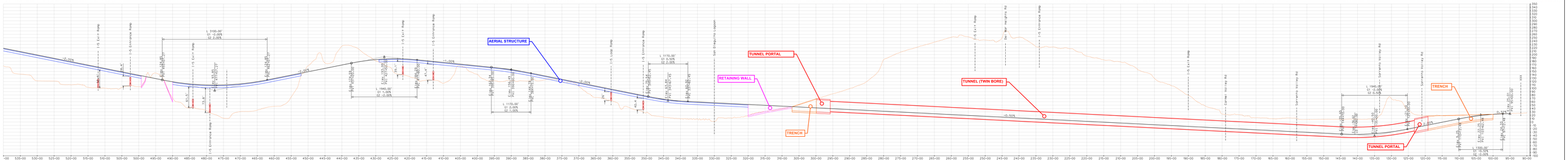


LOSSAN VA STUDY

SANDAG San Diego LOSSAN Rail Realignment Project

VA ALTERNATIVE NO. 10 (IOC-01)

2 OF 3



LOSSAN VA STUDY	SANDAG San Diego LOSSAN Rail Realignment Project	3 OF 3
	VA ALTERNATIVE NO. 10 (IOC-01)	

4.1.11 VA Alternative Concept No. 11 (IOC-02)

Locate the bored tunnel transition at the old Del Mar Train Station

Estimated Cost: $4.1 to $5.4 billion

Description of Alternative Concept: The intent of this alternative concept is to minimize private property effects by using the site of the old Del Mar train station and parking lots for construction staging areas and locating the bored tunnel transition to cut-and-cover at the north end within the railroad right-of-way.

This alternative concept is 5.0 miles in length and would descend immediately south of the rail bridge that spans over the San Dieguito Lagoon and enter the north portal. The track geometry would require a 75-mph curve to stay within the existing railroad right-of-way. The north portal would be located north of the intersection of Camino Del Mar and Jimmy Durante Boulevard. The cut-and cover tunnel would cross underneath Camino Del Mar, which would require reconstructing the existing Camino Del Mar bridge. Reconstruction of the roadway bridge would also require reconfiguration of Jimmy Durante Boulevard and adjacent local roadways. The portal structures, bridge replacement, and roadway reconfigurations at the north portal could extend into commercial and residential properties.

This alternative concept would continue south, running parallel to the existing coastline. Where the alignment crosses Anderson Canyon, earthwork fill would need to be placed within the natural ravine to provide sufficient cover over the bored tunnel segment. The alignment would exit the south portal located near the intersection of Carmel Valley Road and North Torrey Pines Road. The portal infrastructure would cross underneath Carmel Valley Road and potentially extend into residential properties. The alignment would transition back to the existing railroad alignment. The existing railroad alignment within Los Peñasquitos Lagoon would be double tracked, which would require raising and widening the existing berm in the lagoon to address flooding and sea level rise projects.

Performance Discussion

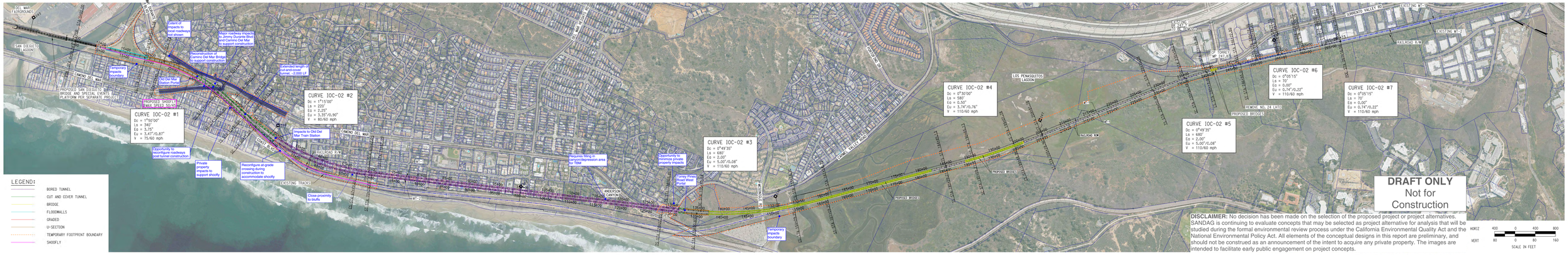
Performance Attribute	Discussion
Rail Operations	*Participant Feedback* – No comments provided. *Discussion* – The 75 mph and 80 mph curves on this alignment would increase travel time as compared to the planned 110 mph passenger operations in the corridor identified in the 2021 Regional Plan. *Discussion* – The shoofly anticipated to support this alternative concept requires a lengthy temporary alignment that includes a new at-grade crossing at Coast Boulevard and would impact additional private property along the shoofly alignment to the west to provide the footprint needed to construct and operate the shoofly outside of the current railroad right-of-way compared to VA Alternative Concepts No. 15 and 16 (NOP Alternatives B and C, respectively). *Discussion* – Increasing the utilization of the existing railroad alignment and right-of-way would increase construction impacts on existing rail operations compared to VA Alternative Concepts No. 15 and 16 (NOP Alternatives B and C, respectively). *Discussion* – Floodwalls and floodgates at the portals and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.

Performance Attribute	Discussion
Construction Impacts	*Participant Feedback* – At the north portal, there are several concerns, including noise, dust, vibrations, emergency response, traffic, utility impacts, and access to streets (Jimmy Durante Blvd., Camino Del Mar, and Coast Blvd.). *Participant Feedback* – There are concerns about coastal access and parking for residents and visitors, as well as potential impacts on parking revenue for the City [Del Mar]. *Participant Feedback* – This concept would likely require a shoofly track to accommodate construction. Single-track shoofly (in place of double-track built by San Dieguito project) with tighter curves would reduce rail capacity and train speeds. *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be implemented to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be implemented to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities. Utilities in the construction footprint would be relocated prior to commencement of portal construction or protected in place during construction. *Discussion* – Compared to VA Alternative Concepts No. 15 and 16 (NOP Alternatives B and C, respectively), the proposed shoofly would require additional impacts to private properties on the west side of the railroad right-of-way, a new at-grade crossing at Coast Blvd., and reduced operating speeds. Additionally, this alternative concept would require reconstruction of the Camino Del Mar overpass bridge to accommodate the cut-and-cover tunnel construction. *Schedule* – Construction schedules have not been developed for any of the alternative concepts. It is anticipated that the construction duration for this alternative concept would likely take longer than the previously studied alternatives, which were estimated to be approximately 7 years due to the addition of 2,000 feet of cut-and-cover and 1,000 feet of trench structure required.
Ecological Effects	*Participant Feedback* – No comments provided. *Discussion* – Filling in a portion of Anderson Canyon would create habitat impacts and drainage challenges that would have to be addressed.
Community Effects	*Participant Feedback* – At the north portal, there are concerns about the long-term impacts of noise, vibrations, visual disturbances, dust, and impacts on private properties for both residents and businesses. *Participant Feedback* – There are concerns with impacts to the historic Del Mar Train Station. *Participant Feedback* – There are concerns about easement and property acquisitions/eminent domain. *Participant Feedback* – There are concerns about potential vibrations from the tunnel. *Discussion* – The shoofly anticipated to support this alternative concept requires a lengthy temporary alignment that includes a new at-grade crossing at Coast Boulevard and would impact additional private property to the west to provide the footprint needed to construct and operate the shoofly outside of the current railroad right-of-way where the cut-and-cover tunnel would be constructed compared to VA Alternative Concepts No. 15 and 16 (NOP Alternatives B and C, respectively). *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be implemented to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be implemented to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities. *Discussion* – The current concept as shown would impact the historic Del Mar Train Station. Additional engineering would be necessary to limit effects to the train station.

Performance Attribute	Discussion
Maintainability	*Participant Feedback* – No comments provided. *Discussion* – Floodwalls and floodgates at the north portal and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.
Resiliency/ Reliability	*Participant Feedback* – No comments provided. *Discussion* – The new alignment would be approximately 84 feet from the existing bluffs. Future erosion could bring the shoreline closer to the bored tunnel alignment. *Discussion* – Floodwalls and floodgates at the north portal and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.

Discussion of Additional Considerations: None noted.

Figure 17. VA Alternative Concept No. 11



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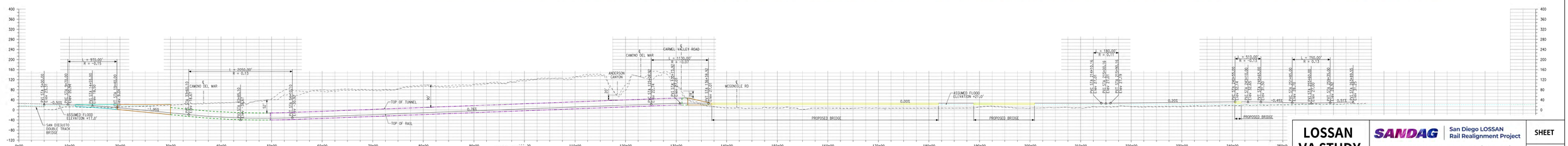

LOSSAN VA STUDY	SANDAG San Diego LOSSAN Rail Realignment Project VA ALTERNATIVE NO. 11 (IOC-02)	SHEET 1 OF 1

4.1.12 VA Alternative Concept No. 12 (IOC-04)

Stabilize bluffs and widen existing alignment to accommodate a second track

Estimated Cost: $1.9 to $2.5 billion

Description of Alternative Concept: The intent of this alternative concept is to maintain the location of the existing rail alignment and add a second track to the east of the existing tracks within the railroad right-of-way. The second track would pass under the existing Torrey Pines Overhead bridge.

This alternative concept is approximately 4.1 miles in length and would begin south of the Camino Del Mar roadway bridge and travel at-grade along the existing railroad alignment to the south. Coast Boulevard would be raised to grade separate the existing at-grade roadway crossing. The alignment would continue south along the existing tracks with grading and drainage improvements. This segment would require retaining walls along the eastern boundary and approximately 1.5 miles of sea walls up to 18 feet in height along the western beach frontage. The existing Torrey Pines Overhead Bridge at the southern end of the bluffs may require modifications to accommodate the additional track. South of the bridge, the existing at-grade alignment would be widened and elevated to include a series of bridges and bermed sections through the Los Peñasquitos Lagoon to accommodate water flows through wetlands and flooding. The alignment would continue south until reaching the existing double-track section south of Carmel Mountain Road.

Performance Discussion

Performance Attribute	Discussion
Rail Operations	*Participant Feedback* – Maybe the least disruptive to rail operations as the existing line would remain. *Participant Feedback* – Grade separation of Coast Blvd. would improve reliability. *Participant Feedback* – This alternative would not make any improvements to overall trip times. Discussion – The 55 mph curves on this alignment would increase travel times as compared to the planned 110 mph passenger operations in the corridor and would not improve travel time compared to existing (2024) conditions.
Construction Impacts	*Participant Feedback* – This may be the least impactful to properties. *Participant Feedback* – May be the shortest construction duration. *Participant Feedback* – May be the least impacts to the surrounding communities from noise, traffic, air quality, and other construction related issues. *Participant Feedback* – There will be significant impacts on the Del Mar community related to noise, dust, vibrations, and coastal access. *Participant Feedback* – The construction of the seawall will affect both coastal access and the usability of the beach. *Participant Feedback* – The construction of sea walls on Del Mar Bluff 5 (DMB5) had minimal effect on coastal access. *Discussion* – Construction of this alternative concept would require maintaining existing rail operations during construction. The constrained space between the existing tracks and bluffs would be a significant challenge to maintaining operations while also advancing construction of the new tracks. Access to the site during construction would need to occur from the shore on the west side and through residential areas along the east. *Schedule* – Construction schedules have not been developed for any of the alternative concepts. It is anticipated that the construction duration for this alternative concept could be

Performance Attribute	Discussion
	shorter than the duration of previously studied alternatives, which were estimated to be approximately seven years.
Ecological Effects	*Participant Feedback* – Limited to no ecological effects on the bluff portions of this alternative. *Participant Feedback* – The lower bluff in the Del Mar formation is not beach quality material. *Participant Feedback* – Sea walls have a minor impact on beach area. Any reduction would be mitigated in Coastal Consistency Certification. *Discussion* –The CCC imposes a fee for lost sand resources associated with sea walls. Without periodic beach replenishment, the beach would likely be completely lost in the future. This is likely to occur anyway with sea level rise, but perhaps not as quickly. Beach loss would impact grunion runs and other marine life and birds that use the beach environment. *Discussion* – Coastal access would need to be provided via steps or ramps.
Community Effects	*Participant Feedback – Significant long-term impacts to Del Mar community with regards to noise, vibrations, visual disturbances, dust, and impacts on private properties for both residents and businesses.* *Participant Feedback – This option removes the Del Mar Bluff 5 coastal access improvements. (The DMB5 improvements could be modified).* *Participant Feedback – The seawall has long-term impacts on marine life and sand retention.* *Participant Feedback – Long-term accessibility to the coast will be limited.* *Participant Feedback – The regional plan requires that the rail be moved off the bluff by 2035. The bluffs will not be returned to their natural state as mandated by the CCC [California Coastal Commission] permit, since the rail and seawalls will remain in place.* *Participant Feedback – This alternative would stabilize bluffs which would protect both rail and residential/public spaces from bluff erosion and sea level rise.* *Participant Feedback – This alternative could be enhanced to include new pedestrian access points to the beach.* *Participant Feedback – This alternative can include design of pedestrian crossings along bluff corridor to improve pedestrian safety and provide greater accessibility to the beach.* *Participant Feedback – This alternative could also be designed to address the existing bluff drainage issues.* *Participant Feedback – After construction operational noise, vibration, and dust impacts and nuisances would be minimal in comparison to existing conditions.* *Participant Feedback – This alternative may be constructed within the existing NCTD's right-of-way. While it would impact limited number of properties due to encroachments of private improvements into the right of way, it is commonly accepted that dealing with properties that had encroached into the existing right-of-way is easier that acquiring new right-of-way.* *Discussion – The most constrained section of the existing alignment is along the north end of the bluffs north of 11th Street through Seagrove Park. The improvements may impact homes and extend into residential backyards. Sea Grove Park would also be affected to accommodate the additional track.* *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be implemented to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be implemented to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities.

Performance Attribute	Discussion
Maintainability	*Participant Feedback* – Residential property owners adjacent to the rail ROW [right-of-way] may contribute to BRD [bluff retention devices] sand replenishment and recreation fees as the properties will also benefit from the BRD. *Participant Feedback* – This option would need to consider design life of all improvements. Constructing sea walls protects against wave impacts, but it does not address all factors contributing to bluff retreat. *Discussion* – Keeping the tracks on the bluffs, even with taller permanent sea walls, would require ongoing maintenance.
Resiliency/ Reliability	*Participant Feedback – The regional plan requires that the rail be moved off the bluff by 2035. The bluffs will not be returned to their natural state as mandated by the CCC [California Coastal Commission] permit, since the rail and seawalls will remain in place.* *Participant Feedback – Residential property owners adjacent to the rail ROW [right-of-way] may contribute to BRD [bluff retention devices] sand replenishment and recreation fees, as the properties will also benefit from the BRD.* *Participant Feedback – Bluff Retreat would be reduced significantly by addition of more seawalls extending the service life of the tracks on the bluffs.* *Participant Feedback – Provides long-term protection, for properties east of the tracks, from coastal erosion.* *Discussion* – Seawalls and associated shoreline protection infrastructure would reduce the likelihood of bluff erosion/retreat but would not eliminate this hazard from consideration. Over the long-term, the seawall would be subject to greater hydrodynamic forces with sea level rise, in addition to scour at the foundation of the wall. Increased static and dynamic forces in combination with typical corrosion and deterioration of seawalls in a coastal environment would decrease the resiliency/reliability over the service life.

Discussion of Additional Considerations:

This alternative concept is not consistent with prior approvals that require the tracks to be removed from the bluffs and sea walls to be removed. Additionally, CCC staff have expressed serious concerns with a concept explored in the past that would maintain the location of the existing rail alignment on the bluffs as it would hamper efforts to plan for sea level rise and erosion. Therefore, coordination and approval by the CCC would be required for the addition of a second track, the installation of new sea walls, and additional retaining structure along the Del Mar Bluffs. Specifically, a new federal consistency determination would need to be submitted to CCC for its concurrence.

Figure 18. VA Alternative Concept No. 12

DISCLAIMER:

No decision has been made on the selection of the proposed project or project alternatives. SANDAG is continuing to evaluate concepts that may be selected as project alternative for analysis that will be studied during the formal environmental review process under the California Environmental Quality Act and

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4.1.13 VA Alternative Concept No. 13 (IOC-06)

Relocate all freight rail along the I-15 corridor

Estimated Cost: $118 to $158 billion

Description of Alternative Concept: The intent of this alternative concept is to maintain passenger rail service near the current alignment and shift freight rail service to the I-15 corridor. The shift of freight to the I-15 corridor would allow passenger rail alignment modifications to achieve an increase in grade from 2.0 to 3.0 percent.

This alternative concept is approximately 75 miles in length and would begin at the existing freight rail tracks in Perris and travel south along the I-215 and I-15 to San Diego. The conceptual alignment would be similar to the potential California High-Speed Rail Los Angeles to San Diego alignments. The existing Escondido Branch line could tie into this new freight alignment. The alignment would continue south and tie into the existing tracks near the Miramar Curve in San Diego just north of the Miramar Wye.

This alternative concept assumes the alignment would include variations of at-grade, aerial, and tunnel segments. Freight service to existing customers served by the existing Coastal Line and Escondido Branch Line would need to be maintained. This may require additional extensions of existing branch lines or new branch lines needed to maintain freight service.

This alternative concept only addresses freight. Maintaining passenger rail service on the existing rail corridor would require addressing slope stabilization issues along the Del Mar Bluffs. Further, freight rail service would need to be maintained until the new I-15 rail corridor is completed.

Performance Discussion

Performance Attribute	Discussion
Rail Operations	*Participant Feedback* – No comments provided. *Discussion* – This alternative concept only addresses freight and service. Additional efforts would be needed to determine an alignment for passenger rail within the LOSSAN corridor. *Discussion* – The development of a new freight rail alignment on I-15 is not compatible with the California State Rail Plan and SANDAG's Regional Plan. *Discussion* – BNSF Railway has a legal right to operate freight trains along the LOSSAN corridor per its Shared Use Agreement with NCTD.
Construction Impacts	*Participant Feedback* – This option could potentially reduce construction impacts on the City of Del Mar, if the LOSSAN alignment allows for more flexible design requirements focused solely on passenger use without freight. For example, the vertical profile can be improved without the 2% design requirement. *Discussion* – Removing freight from the LOSSAN alignment would allow a potential increase in grade from 2.0 to 3.0 percent. *Discussion* – The footprint of construction impacts would be enlarged along the I-215 and I-15 corridors for approximately 75 miles. *Schedule* – Construction schedules have not been developed for any of the alternative concepts. This alternative concept would require significant planning, environmental clearance, funding, and construction activities and complex construction phasing along a 75-mile corridor. It is anticipated that the construction duration for this alternative concept would be substantially longer than the duration of previously studied alternatives, which were estimated to be approximately seven years.

Performance Attribute	Discussion
Ecological Effects	*Participant Feedback* – No comments provided. *Discussion* – Introduces potential ecological impacts over a 75-mile-long area.
Community Effects	*Participant Feedback* – This option could potentially reduce community effects, including impacts on private properties in the City of Del Mar, if the LOSSAN alignment allows for more flexible design requirements focused solely on passenger use. It would also remove freight operations away from private property. *Discussion* – Introduces community impacts over a 75-mile-long area.
Maintainability	*Participant Feedback* – No comments provided. *Discussion* – Ownership and maintenance of the I-15 freight alignment would need to be determined.
Resiliency/ Reliability	*Participant Feedback* – No comments provided. *Discussion* – None noted.

Discussion of Additional Considerations:

The magnitude of challenges in delivering an alternative concept of this nature would be significant. A project of this size and cost would take decades to plan, coordinate, approve, permit, design, and construct, including advancing it through the environmental clearance process. Securing funding sufficient to pay for this alternative concept would be a major challenge, and the concept could not be easily implemented in phases. During this time, existing rail service would have to be maintained until freight service could begin on the new I-15 corridor. California High-Speed Rail's planned I-15 corridor is incompatible with freight usage. The high-speed rail corridor in this region is envisioned as dedicated for high-speed rail. Designed to meet California High-Speed Rail Authority standards, the corridor can accommodate significantly higher design speeds and steeper grades than freight trains can safely operate on. Therefore, coordination would be required to identify suitable locations where the corridors could be parallel, separated by crash walls resulting in wide cross sections.

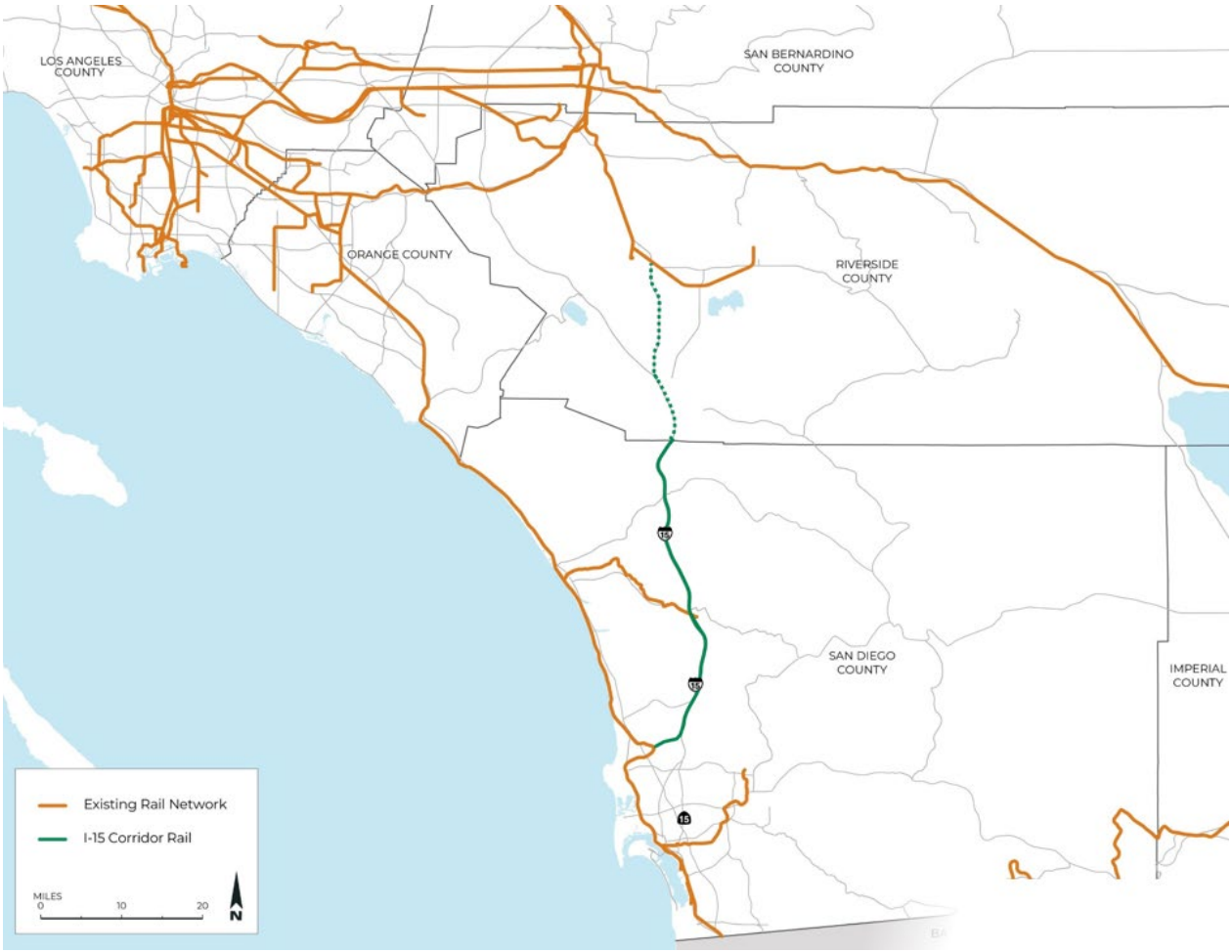
A number of items would need to be further explored if this alternative concept were to advance into the environmental clearance phase. As developed during the course of this study, this alternative concept only identifies the relocation of freight service to the I-15 corridor. Maintaining passenger rail service on the existing rail corridor would need to be addressed through other capital projects that address the slope stabilization issues along the Del Mar Bluffs or identify an alternative concept that relocates and double tracks passenger rail service. As such, relocating freight to the I-15 corridor would likely require two separate capital projects and, therefore, separate environmental clearance processes—one to relocate freight to the I-15 corridor and a separate process to address climate resiliency risks and double-track passenger rail service along the Del Mar Bluffs—given that each component would have different purposes and vastly different study areas.

Additionally, further efforts would be needed to determine:

- How to maintain freight service to existing customers served by the existing Coastal Line and Escondido Branch Line.
- The entity that would have responsibility to own and maintain the new I-15 freight alignment.

The development of a new freight rail alignment on I-15 is not compatible with the California State Rail Plan and SANDAG's Regional Plan. This alternative concept would also require coordination with jurisdictions and agencies outside the LOSSAN corridor, including the Riverside County Transportation Commission and Riverside County. Implementation of the new freight alignment would also be outside SANDAG's jurisdiction. However, SANDAG is exploring potential future planning efforts that would study regional freight multimodal resiliency gaps and multiple corridors would be considered as part of those efforts.

Figure 19. VA Alternative Concept No. 13



4.1.14 VA Alternative Concept No. 14

Locate North Portal in Solana Beach Trench to South Portal at I-5 Knoll with bored tunnel under Fairgrounds and I-5 (Proposed NOP Alternative Alignment A – I-5 Alignment)

Estimated Cost: $6.9 to $9.2 billion

Description of Alternative Concept: VA Alternative Concept 14 is the same as Alternative A from the NOP issued in June 2024. This alternative concept is approximately 6.6 miles in length and would descend immediately south of the Solana Beach Station toward the north portal. The north portal would be located north of the fairgrounds within the railroad trench in Solana Beach. The portal's infrastructure would start south of the existing Solana Beach Station. The alignment would continue south into the fairgrounds, where there would be a new underground special events platform. The alignment would continue under the San Dieguito Lagoon and turn to follow under the I-5 freeway, then continue south and exit at the Knoll Near I-5 South Portal. The southern portal would be located at a knoll south of Carmel Valley Road between I-5 and the segment of Sorrento Valley Road Trail that is closed to public vehicular traffic but open for bicycles, pedestrians, and authorized vehicles. The portal infrastructure would be within the undeveloped knoll and extend into the Los Peñasquitos Lagoon. The alignment would then rise above ground as it transitions back into the existing railroad alignment north of the Sorrento Valley Station.

Performance Discussion

Performance Attribute	Discussion
Rail Operations	*Participant Feedback* – *Would all riders for special event platform require tickets to event at Fairgrounds?* *Participant Feedback* – Per the drawings, the shoofly could be accommodated within the existing CRT [Coastal Rail Trail], which is both NCTD ROW [right-of-way] and City of SB [Solana Beach] ROW. Can the access ramp down into the cut and cover also be accommodated within the existing ROW, or would it encroach into Hwy 101? *Participant Feedback* – Concerns about continued rail services during construction and the shoofly proposed to facilitate continuous rail service during construction (see other topic areas). *Participant Feedback* – South end of the double-tracked area within SB [Solana Beach] would be below sea level according to the drawings; concern with inundation from San Dieguito Lagoon/Rivermouth and Stevens Creek following realignment from the double-tracking project. *Participant Feedback* – Based on technical discussions during the VA study, this alternative may result in a slower travel time between SB [Solana Beach] and SV [Sorrento Valley] than existing condition. *Participant Feedback* – Based on technical discussions during the VA study, this alternative results in greater rail length than existing condition. *Participant Feedback* – Significant length of tunnel will be located below sea level, requiring pumping of water from intrusion. *Discussion* – It is assumed that additional access into the trench may be necessary for construction equipment outside of the railroad right-of-way. *Discussion* – Maintaining equivalent rail service would be challenging. The shoofly would reduce the length of available double tracking by more than approximately one mile and would reduce operating speeds compared to existing conditions for passenger and freight trains.

Performance Attribute	Discussion
	Discussion – The north portal would be above the anticipated flood elevations. However, the proposed aboveground plaza features and vertical circulation (e.g., escalators, stairs) for the special events platform would require measures to protect against flooding. *Discussion* – This alternative concept would provide for a 110-mph rail alignment, which is consistent with the 2021 Regional Plan. This alternative concept alternative is not anticipated to increase travel time between Solana Beach and Sorrento Valley as it is similar in length to the existing alignment, but it can accommodate higher operating speeds. *Discussion* – All tunnel segments (precast rings) have gaskets that prevent water intrusion. These gaskets would be required even if the tunnel were above the static water table. The gaskets are effective in preventing water intrusion; any water ingress through the tunnel segments would be incidental and would be addressed. *Discussion* – Floodwalls and floodgates at the portals and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.
Construction Impacts	*Participant Feedback* – Construction timeline increased to accommodate Fair/Races. *Participant Feedback* – Construction footprint is the entire area of the rides/games for the fair; all of the Green lot parking; all of Red Lot parking. *Participant Feedback* – Storm water treatment building would be impacted if not demolished. Alters ability to meet storm water requirements and ability to host fall race met and Breeders Cup. Bldg. and internal equipment estimated at $3.5 million. *Participant Feedback* – Infrastructure associated with storm water treatment building, sewer force main, electrical, and water impacted. *Participant Feedback* – Exhibit Hall useable during cut/cover and boring? Potential additional impacts to Fairgrounds. *Participant Feedback* – Traffic and events conflicts from construction traffic and access. *Participant Feedback* – Shallow ground water; there is a need to dewater. *Participant Feedback* – Soil and other spoils from lowering the track would need to be trucked out to the north in area of construction. *Participant Feedback* – Duration of construction would compound impacts on the residents and businesses that are impacted by the double-tracking/bridge replacement project. *Participant Feedback* – Construction of the shoofly would impact CRT [Coastal Rail Trail] in its entirety from LSF [Loma Santa Fe], south to Via de la Valle. *Participant Feedback* – High-pressure recycled water line along Via de la Valle (VDLV) bridge would be impacted during construction and replacement of the VDLV bridge. *Participant Feedback* – Concern with how the VDLV [Via de la Valle] bridge would be replaced; will it be possible to demolish and reconstruct half width at a time? This is one of two E-W [east-west] connections for the City of SB [Solana Beach] and an emergency evacuation route for both DM [Del Mar] and SB. *Participant Feedback* – Per the drawings the shoofly could be accommodated within the existing CRT [Coastal Rail Trail], which is both NCTD ROW [right-of-way] and City of SB ROW. Can the access ramp down into the cut and cover also be accommodated within the existing ROW, or would it encroach into Hwy 101? *Participant Feedback* – Potential to impact [San Diego] City-owned Parks and Recreation Department-managed parcels in Crest Canyon Open Space and Peñasquitos Lagoon and the Multi-Habitat Planning Area (MHPA) Preserve (part of the City's Multiple Species Conservation Program (MSCP) Subarea Plan). *Participant Feedback* – This option reduces construction impacts and the footprint on private property and Del Mar, while also minimizing effects on emergency response. *Discussion* – It is anticipated that a significant portion of the western parking (beyond the Exhibit Hall) area used for events would be utilized for construction as outlined in the exhibit for this alternative concept.

Performance Attribute	Discussion
	Discussion – Evaluating and developing engineered solutions for utility impacts, such as the noted stormwater treatment facility and its need to remain in use, as well as noted recycled water lines, would be addressed and coordinated with the Fairgrounds and affected cities. *Discussion* – It is anticipated that access and use of the Exhibit Hall could be maintained during construction. *Discussion* – Traffic management plans would be implemented to address effects to local and special event traffic, as well as emergency response, and would be coordinated with the Fairgrounds and the affected cities. *Discussion* – It is assumed that additional access into the trench may be necessary for construction equipment outside of the railroad right-of-way. *Discussion* – The sequencing to demolish and reconstruct the Via de la Valle Bridge would be further evaluated in coordination with the City of Solana Beach. *Discussion* – The Jimmy Durante Boulevard Bridge over the San Dieguito River could be impacted by the tunnel alignment and could require reconstruction. *Discussion* – While the Coastal Rail Trail would be impacted in order to construct the cut-and-cover tunnel while maintaining single-track operations with a shoofly, it is anticipated the trail would be reconstructed prior to completion of the project. *Schedule* – Construction schedules have not been developed for any of the alternative concepts. It is anticipated that the construction duration for this alternative concept would be longer than the previously studied alternatives, which were estimated to be approximately seven years.
Ecological Effects	*Participant Feedback* – Concerns of the impact of tunneling under San Dieguito Lagoon due to potential for liquefaction known to be present in proximity to the lagoon. *Discussion* – Potential for liquefaction would be evaluated through further studies, and industry-established construction practices would be implemented as applicable based on those studies. *Discussion* – This alternative concept could provide the opportunity to restore additional portions of the lagoon with the potential removal of the existing berm that supports the railroad. *Discussion* – Stevens Creek would be located within the limits of the cut-and-cover tunnel along the northern portion of the alignment and may be affected.
Community Effects	*Participant Feedback* – Least amount of eminent domain and easement acquisition. *Participant Feedback* – Least amount of long-term impacts to private property, reduces visual impacts to scenic resources, and does not affect Jimmy Durante Blvd. and Camino Del Mar, which are vital access points for the City. *Participant Feedback* – There may be potential modifications (positive or negative) to the sea level rise adaptation planning efforts (Living Levee). *Participant Feedback* – If demolished, storm water treatment building would need to go back in the same location. Relocation could cause other impacts. *Participant Feedback* – What amount of space/area is needed for elevators, air shafts, emergency egress, entrances, etc.? Above ground structures impact/reduce space for Fairgrounds uses. *Participant Feedback* – At conclusion of this project construction, SB would have a vacant undeveloped, vegetated (?) area over the rail corridor. No plan for usage of this area is proposed as part of this project. *Participant Feedback* – Homes and businesses along Cedros [Solana Beach] would likely be impacted from construction noise and air emissions during construction and would be additive to similar construction activities from the double-tracking project. *Discussion* – Traffic management plans would be developed to address effects to local and special event traffic, as well as emergency response, and would be coordinated with the Fairgrounds and affected cities. The potential exists that the Jimmy Durante Boulevard bridge would need to be replaced due to the tunnel alignment.

Performance Attribute	Discussion
	Discussion – Evaluating and developing engineered solutions for utility impacts, such as the noted stormwater treatment facility and its need to remain in its current location, would be coordinated with the Del Mar Fairgrounds. *Discussion* – The overall surface effects due to the special events platform have not been fully determined; however, the platform is anticipated to include an aboveground plaza and vertical circulation elements (e.g., escalators, stairs) within the permanent impact footprint. *Discussion* – The proposed use of the area above the cut-and-cover tunnel would need to be further evaluated and coordinated with NCTD and the City of Solana Beach. *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction. Design measures for the track and portal structures would be implemented to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be implemented to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities. *Discussion* – Additional design work and coordination with the City of Del Mar would be required to better understand the extent of effects on local future sea level rise adaptation planning efforts, including living levees.
Maintainability	*Participant Feedback* – Ongoing elevator maintenance for special event platform/station may be costly. *Participant Feedback* – Area with cut and cover would need O&M [operations and maintenance]; while it could be maintained by the City [Solana Beach] (at additional cost), or maintained by NCTD. *Participant Feedback* – The replacement of Rosa Street Bridge for cut and cover would need to be coordinated with SB [Solana Beach] to ensure O&M by City. *Participant Feedback* – Pumped and filtered/purified water would require connection to stormwater systems at both south (SD) and north (SB) ends of the tunnel. *Participant Feedback* – Maintenance of the underground platform in the coastal/below sea level environment will degrade metal at a greater rate. *Participant Feedback* – Dewatering system and water filtration/purification system will be required in compliance with RWQCB [Regional Water Quality Control Board] requirements. *Participant Feedback* – Easements likely needed to support ongoing access needs for maintenance on Faig [Fairgrounds]. *Discussion* – The need to replace the pedestrian bridge near Rosa Street would need to be further evaluated and coordinated with the City of Solana Beach. *Discussion* – The features of the special events platform have not been fully determined; however, the cost of maintaining an underground station, inclusive of vertical circulation elements such as stairs, elevators, and/or escalators would be more expensive than a station located on a bridge. *Discussion* – Floodwalls and floodgates at the south portal and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution. It is anticipated these features would incorporate stormwater conveyance requirements to comply with standards.
Resiliency/ Reliability	*Participant Feedback* – Cut and cover area could (?) have trees planted for carbon sequestration. (NCTD to confirm this is acceptable). *Participant Feedback* – Could provide sand for beach nourishment projects in the future. *Participant Feedback* – Tracks at the south end of SB [Solana Beach] would be below sea level and could be impacted in a high precipitation and high tide event; presently they are above sea level. *Participant Feedback* – Places an underground “platform” in a floodplain, a floodway, and an area subject to sea level rise.

Performance Attribute	Discussion
	Discussion – The proposed use of the area above the cut-and-cover tunnel would need to be further evaluated and coordinated with NCTD and the City of Solana Beach. *Discussion* – The tracks at the southern end of Solana Beach would be located within a cut-and-cover tunnel. Floodwalls and floodgates at the southern portal and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution. The aboveground station features are anticipated to be constructed above potential sea level rise and flood elevation. *Discussion* – The soil excavated during tunnel construction may be suitable for placement on beaches if it meets material standards.

Discussion of Additional Considerations:

This alternative concept would result in the loss of investments made for the San Dieguito Double Track and Special Events Platform Project. Abandoning recent investments that have been made through state and/or federal funding may introduce a risk that the investment would need to be repaid. This could also affect SANDAG's fiscal good standing and limit the ability to compete for future state and federal funding programs.

Figure 20. VA Alternative Concept No. 14

DISCLAIMER: No decision has been made on the selection of the proposed project or project alternatives. SANDAG is continuing to evaluate concepts that may be selected as project alternative for analysis that will be studied during the formal environmental review process under the California Environmental Quality Act and the National Environmental Policy Act. All elements of the conceptual designs in this report are preliminary, and should not be construed as an announcement of the intent to acquire any private property. The images are intended to facilitate early public engagement on project concepts.

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LOSSAN VA STUDY	SANDAG San Diego LOSSAN Rail Realignment Project	SHEET
	VA ALTERNATIVE NO. 14 (ALT. A)	1 of 1

4.1.15 VA Alternative Concept No. 15

Locate North Portal Under Jimmy Durante Boulevard to South Portal at I-5 Knoll (Proposed NOP Alternative Alignment B – Crest Canyon Alignment)

Estimated Cost: $3.7 to $4.9 billion

Description of Alternative Concept: VA Alternative Concept 15 is the same as Alternative B from the June 2024 NOP. This alternative concept is approximately 5.3 miles in length and would descend immediately south of the rail bridge that spans over the San Dieguito Lagoon and enter the north portal. The north portal would be located north of the intersection of Camino Del Mar and Jimmy Durante Boulevard. The portal's infrastructure would cross underneath Jimmy Durante Boulevard, which would be raised. The portal structures could extend into commercial and residential properties. The south portal would be located at a knoll south of Carmel Valley Road between I-5 and the segment of Sorrento Valley Road Trail that is closed to public vehicular traffic but open for bicycles, pedestrians, and authorized vehicles. The portal infrastructure would be within the undeveloped knoll and extend into the Los Peñasquitos Lagoon. The tracks would then rise as they transition back into the existing railroad alignment north of the Sorrento Valley Station.

Performance Discussion

Performance Attribute	Discussion
Rail Operations	*Participant Feedback* – No comments provided. *Discussion* – This alternative concept would provide for a 110-mph rail alignment, which is consistent with the 2021 Regional Plan. *Discussion* – Floodwalls and floodgates at the portals and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.
Construction Impacts	*Participant Feedback* – Public Safety circulation during construction will be a priority for interjurisdictional service (e.g. fire). *Participant Feedback* – Potential to impact [San Diego] City-owned Parks and Recreation Department-managed parcels in Crest Canyon Open Space and Los Peñasquitos Lagoon and the Multi-Habitat Planning Area (MHPA) Preserve (part of the City's Multiple Species Conservation Program (MSCP) Subarea Plan). *Participant Feedback* – Adjustments to Alternative B have been developed which should be incorporated as options with reduced impacts. *Participant Feedback* – At the north portal, there are several concerns, including noise, dust, vibrations, emergency response, traffic, utility impacts, access to streets (Jimmy Durante Blvd., David Way, Heather Ln., and Christy Ln.), and access to Public Works Facility. *Participant Feedback* – There are concerns with having to temporarily relocate residents along Jimmy Durante Blvd. *Participant Feedback* – There are concerns about potential vibrations and settlement caused by tunneling. *Participant Feedback* – There are concerns about potential bluff failures along Jimmy Durante Blvd., especially considering the two failures in the past 5 years. *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be implemented to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this

Performance Attribute	Discussion
	alternative were to advance. Traffic management and reconfiguration of the roads would be implemented to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities. Utilities in the construction footprint would be relocated prior to commencement of portal construction or protected in place during construction. *Discussion* – This alternative concept's construction effects at the north portal are anticipated to be less than other alternative concepts. *Schedule* – Construction schedules have not been developed for any of the alternative concepts. It is anticipated that the construction duration for this alternative concept would be similar to the duration of previously studied alternatives, which would be approximately seven years.
Ecological Effects	*Participant Feedback* – No comments provided. *Discussion* – This alternative concept could provide the opportunity to restore additional portions of the lagoon with the potential removal of the existing berm that supports the railroad.
Community Effects	*Participant Feedback* – At the north portal, there are concerns about the long-term impacts of noise, vibrations, visual disturbances, dust, and impacts on private properties for both residents and businesses. *Participant Feedback* – Concerns about easement and property acquisitions/eminent domain. *Participant Feedback* – Adjustments to Alternative B have been developed and should be incorporated as options with reduced impacts. *Participant Feedback* – There may be potential impacts on sea level rise adaptation planning efforts (Living Levee). *Participant Feedback* – There are concerns about potential vibrations from the tunnel. *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be developed to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be implemented to address effects on local traffic and access for emergency response would be maintained and coordinated with the affected cities. *Discussion* – Additional design work and coordination with the City of Del Mar would be required to better understand the extent of effects on local future sea level rise adaptation planning efforts, including living levees. *Discussion* – It is anticipated the surface impacts at the north portal location would be less than the other alternative concepts.
Maintainability	*Participant Feedback* – No comments provided. *Discussion* – Floodwalls and floodgates at the portals and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.
Resiliency/ Reliability	*Participant Feedback* – Could provide sand for beach nourishment projects in the future. *Discussion* –The soil excavated during tunnel construction may be suitable for placement on beaches if it meets material standards. *Discussion* – Floodwalls and floodgates at the portals and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.

Discussion of Additional Considerations: None noted.

Figure 21. VA Alternative Concept No. 15

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PROFILE

LOSSAN VA STUDY	SANDAG San Diego LOSSAN Rail Realignment Project — VA ALTERNATIVE NO. 15 (ALT. B)	SHEET 1 of 1

4.1.16 VA Alternative Concept No. 16

Locate North Portal at Jimmy Durante Boulevard to South Portal at Torrey Pines Road (Proposed NOP Alternative Alignment C – Camino Del Mar Alignment)

Estimated Cost: $3.3 to $4.4 billion

Description of Alternative Concept: VA Alternative 16 is the same as Alternative C from the June 2024 NOP. This alternative concept is approximately 4.9 miles in length and would descend immediately south of the rail bridge that spans over San Dieguito Lagoon and enter the north portal, which would be located north of the intersection of Camino Del Mar and Jimmy Durante Boulevard. The portal's infrastructure would cross underneath Jimmy Durante Boulevard, which would be raised. The portal structures could extend into commercial and residential properties. This alternative concept would continue south and exit at the south portal located near the intersection of Carmel Valley Road and North Torrey Pines Road. The portal infrastructure would cross underneath Carmel Valley Road and potentially extend into residential properties. The alignment would continue south on bridge and berm over Los Peñasquitos Lagoon, and then transition back to the existing railroad alignment. The existing railroad alignment within Los Peñasquitos Lagoon would be double tracked, which would require raising and widening the existing berm in the lagoon to address flooding and sea level rise projections.

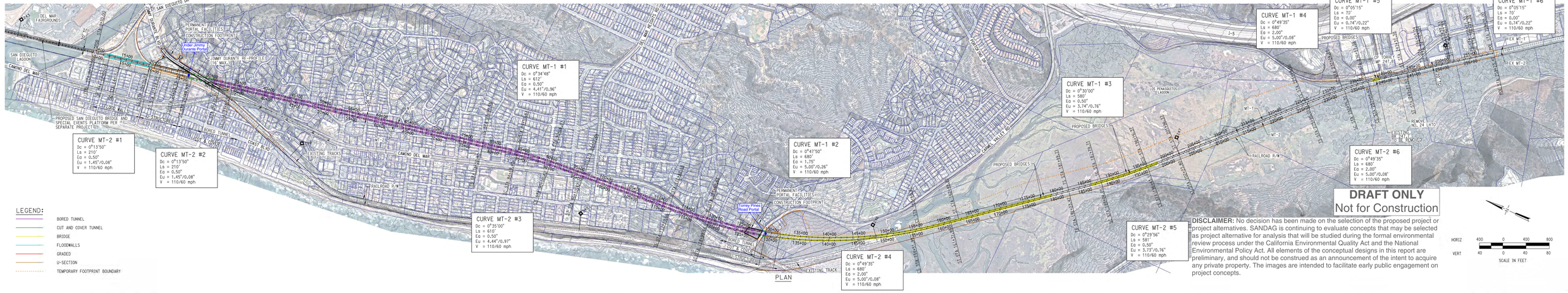
Performance Discussion

Performance Attribute	Discussion
Rail Operations	*Participant Feedback* – No comments provided. *Discussion* – This alternative concept would provide for a 110-mph rail alignment, which is consistent with the 2021 Regional Plan. *Discussion* – Floodwalls and floodgates at the north portal and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.
Construction Impacts	*Participant Feedback* – Public Safety circulation during construction will be a priority for interjurisdictional service (e.g. fire). *Participant Feedback* – At the portals, there are several concerns, including noise, dust, vibrations, emergency response, traffic, utility impacts, access to streets (Jimmy Durante Blvd., David Way, Heather Ln., Christy Ln., and Carmel Valley Road), and access to Public Works Facility. *Participant Feedback* – Adjustments to Alternative C have been developed which should be incorporated as options with reduced impacts. *Participant Feedback* – There are concerns with having to temporarily relocate residents along Jimmy Durante Blvd. *Participant Feedback* – There are concerns about potential vibrations and settlement caused by tunneling. *Participant Feedback* – There are concerns about potential bluff failures along Jimmy Durante Blvd., especially considering the two failures in the past 5 years. *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be implemented to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. Traffic management and reconfiguration of the roads would be implemented to address effects on local traffic and access for emergency response would be

Performance Attribute	Discussion
	maintained and coordinated with the affected cities. Utilities in the construction footprint would be relocated prior to commencement of portal construction or protected in place during construction. *Discussion* – This alternative concept's construction effects at the north portal are anticipated to be less than other alternative concepts. *Schedule* – Construction schedules have not been developed for any of the alternative concepts. It is anticipated that the construction duration for this alternative concept would be similar to the duration of previously studied alternatives, which would be approximately seven years.
Ecological Effects	*Participant Feedback* – No comments provided. *Discussion* – None noted.
Community Effects	*Participant Feedback* – At the portals, there are concerns about the long-term impacts of noise, vibrations, visual disturbances, dust, and impacts on private properties for both residents and businesses. *Participant Feedback* – There are concerns about easement and property acquisitions/eminent domain. *Participant Feedback* – Adjustments to Alternative C have been developed and should be incorporated as options with reduced impacts. *Participant Feedback* – There may be potential impacts on sea level rise adaptation planning efforts (Living Levee). *Participant Feedback* – There are concerns about potential vibrations from the tunnel. *Discussion* – Industry-established construction practices would be implemented to address potential effects of settlement, noise, vibration, and dust during construction at the portal sites. Design measures for the track and portal structures would be implemented to minimize noise and vibration caused by rail operation based on comprehensive noise and vibration assessments that would be conducted during the environmental clearance phase if this alternative were to advance. *Discussion* – Additional design work and coordination with the City of Del Mar would be required to better understand the extent of effects on local future sea level rise adaptation planning efforts, including living levees. *Discussion* – It is anticipated the surface impacts at the north portal location would be less than with other alternative concepts.
Maintainability	*Participant Feedback* – No comments provided. *Discussion* – Floodwalls and floodgates at the north portal and low point sump pumps are anticipated in the design for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.
Resiliency/ Reliability	*Participant Feedback* – Could provide sand for beach nourishment projects in the future. *Discussion* – The soil excavated during tunnel construction may be suitable for placement on beaches if it meets material standards. *Discussion* – Floodwalls and floodgates at the north portal and low point sump pumps are anticipated for the alignment with a sag curve. The use of floodwalls and floodgates to address the potential of flood water entering the tunnel is standard practice and a proven solution.

Discussion of Additional Considerations: None noted.

Figure 22. VA Alternative Concept No. 16



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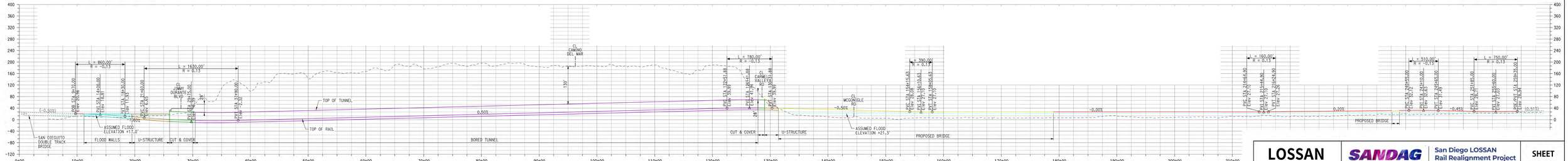


PROFILE

LOSSAN VA STUDY	SANDAG San Diego LOSSAN Rail Realignment Project **VA ALTERNATIVE NO. 16 (ALT. C)**	SHEET 1 of 1

4.2 Additional Ideas to Consider

The VA Team identified numerous other ideas that may be considered for inclusion in the project as the design evolves. These ideas focus primarily on minimizing effects to communities and the environment, refining project assumptions, or community betterments. These ideas are summarized below and could be applicable to many of the alternative concepts presented in this report. Similar to Section 4.1, "Participant Feedback" indicates content developed by the VA Team during the VA Study, whereas "Discussion" indicates content developed by the SMEs and the project team.

4.2.1 Minimize Community Impacts

4.2.1.1 MCI-01 Optimize location of tunnel exhaust vents to minimize air quality concerns

This idea seeks to identify strategies that would locate tunnel exhaust vents/tunnel ventilation shafts farther from residences and businesses. As the design progresses during the environmental clearance phase, consideration will be given to extending underground horizontal vent ducts/small size tunnels to emit exhaust to the sides of slopes or roadways.

- *Participant Feedback* – This could also reduce noise impacts to surrounding residents/business.
- *Participant Feedback* – There is the potential that relocation of the exhaust vents could increase impacts to wetland and native habitats.
- *Participant Feedback* – Extending exhaust vents would have potential for increased costs, increased easement needs.
- *Participant Feedback* – Would bring the exhaust discharge points farther away from community, hence reducing impacts.

4.2.1.2 MCI-07 Turn existing rail right-of-way in Los Peñasquitos Lagoon into an extension of Coastal Rail Trail

This idea would seek to convert the existing rail alignment through Los Peñasquitos Lagoon into part of the Coastal Rail Trail if the current rail right-of-way through the lagoon is not needed once the new LOSSAN alignment is in operation.

- *Participant Feedback* – This idea could still be compatible with restoration efforts by the City of San Diego; the existing berm could be removed and replaced with a lower-impact bridge structure design to support multi-use nature trail designed for far less weight.
- *Participant Feedback* – This idea could limit the use of the right-of-way for wetland mitigation. There may not be another mitigation option.
- *Participant Feedback* – This idea may require new bridges to clear future tidal and floodwaters.
- *Participant Feedback* – The introduction of people within the lagoon environment may be harmful to habitats and species.
- *Participant Feedback* – Resource agencies have expressed a desire to restore the Los Peñasquitos lagoon to the extent practical.

- *Discussion* – Use of the right-of-way in Los Peñasquitos Lagoon would require coordination with NCTD, MTS, and the applicable resource agencies (e.g., U.S. Fish and Wildlife Service).

4.2.1.3 MCI-12 Develop fund for businesses impacted during construction

This idea would develop a fund to offset effects to affected businesses due to project construction activities. This idea has been implemented during construction by other jurisdictions on other major transit capital projects, including the Los Angeles County Metropolitan Transportation Authority and the City of Albuquerque.

- *Participant Feedback* – Positive for impacted businesses in Del Mar.
- *Participant Feedback* – Demonstrates that SANDAG/cities/agencies stand with community.
- *Participant Feedback* – An acceptable set-aside amount for this fund would need to be established. The source of the funding would also have to be identified (i.e., local or could it be state/federal?). There is a potential for creep and use of funds restrictions.

4.2.1.4 MCI-10 Revise project objectives to include maintaining multi-modal circulation

Bicycling is a critical mode of transportation in proximity of the project. It is important that maintaining all active transportation modes be considered in the development of the project objectives.

- *Participant Feedback* – This would reflect SANDAG's multimodal vision.
- *Participant Feedback* – Supports vehicle miles traveled reductions during/after project by encouraging use of alternative modes.
- *Discussion* – Opportunities to support and incorporate SANDAG's plan to improve overall connectivity could be further evaluated during the environmental clearance phase. The provision of such facilities would provide consistency with the CCC's policies in the North Coast Corridor Public Works Plan.

4.2.1.5 MCI-15 Have NCTD state what uses are not allowed on top of cut-and-cover alignment

Some members of the VA Team stated a desire for NCTD to provide further guidance on what types of uses would, or would not be, allowed on top of the cut-and-cover tunnel portions of the alignment. This information could be used to better inform the public about what potential uses could be considered once the project is completed.

- *Participant Feedback* – Benefits the public's understanding of community impacts.
- *Participant Feedback* – Allows for conceptual land uses to be considered with the project.

4.2.1.6 MCI-05 Improve coastal access on bluffs to develop a safe undercrossing

Some stakeholders suggested that if an alternative concept that maintains the existing alignment along the bluffs advances, the alternative should include consideration of improving coastal access.

- *Participant Feedback* – Coastal access from the bluff to the beach is a critical community benefit for Del Mar.
- *Participant Feedback* – Not needed if tracks are relocated off the bluffs.

4.2.2 Minimize Ecological Impacts

4.2.2.1 MEI-13 Coordinate project with Los Peñasquitos Lagoon restoration

The VA Team suggested that the project be coordinated with the Los Peñasquitos Lagoon restoration project to optimize activities and/or improvements between the two projects.

- *Participant Feedback* – SANDAG is already doing this.
- *Participant Feedback* – Ensures no duplicative or wasted efforts will occur between the projects.
- *Participant Feedback* – Demonstrates commitment to shared regional priorities.
- *Discussion* – Alternative concepts selected to continue into the environmental clearance phase would consider the current and planned restoration projects within Los Peñasquitos Lagoon with continued coordination with the City of San Diego and resource agencies.

4.2.2.2 MEI-01/MEI-04 Elevate train when crossing over wetlands to ensure the function of the wetland is maintained

Some alternative concepts (Alternative C, for example) locate the alignment across Los Peñasquitos Lagoon. These alternative concepts include long bridges to reduce the amount of fill in the wetlands. This idea is substantially similar to VA Alternative Concept No. 7. Refer to Section 4.1.7 for the evaluation of that alternative concept.

- *Participant Feedback* – Consider preparing an optimization study for lagoon hydrology to determine the best solution for bridge and berm. Similar to what was done for the San Elijo Lagoon.
- *Participant Feedback* – The use of bridges would still result in impacts from columns, shading, and noise.
- *Participant Feedback* – Bridges require more maintenance and inspection than berms.
- Participant Feedback – Less flood impact.

4.2.2.3 MEI-03 Plant trees around tunnel portals to minimize visual footprint and (partially) alleviate greenhouse gas (GHG) impacts at tunnel openings

The north and south tunnel portals, depending upon their final design and configuration, may lend themselves to having trees or other vegetation planted around them to provide some visual screening.

- *Participant Feedback* – This strategy may address community aesthetic concerns.
- *Participant Feedback* – With enough volume, trees may provide natural sound dampening.
- *Participant Feedback* – Trees require maintenance.

- *Participant Feedback* – Trees may introduce safety concerns through sightline challenges.
- *Participant Feedback* – Trees may increase fire risk adjacent to the project.
- *Participant Feedback* – Consider using native trees.

4.2.2.4 MEI-05 When designing the rail ROW, habitat corridors (undercrossings) for deer and other wildlife should be considered in and around lagoons

Consideration should be given to maintaining wildlife crossings in affected habitats throughout the project limits.

- *Participant Feedback* – State Parks wants a wildlife corridor connecting Los Peñasquitos Lagoon with the Portofino Parcel. Likely requires raising Carmel Valley Road.
- *Participant Feedback* – Potential increased cost.

4.2.3 Refine Project Assumptions

4.2.3.1 DC-01 Consider changing project limits to begin on the south side of new San Dieguito Bridge to Sorrento Valley Station

The northern limit for several VA alternative concepts would begin south of the future San Dieguito rail bridge. Doing so has several pros and cons.

- *Participant Feedback* – Utilizes the $330 million San Dieguito Double Track and Special Events Platform funding.
- *Participant Feedback* – Maintains funding obligations and aids in securing future project funding.
- *Participant Feedback* – Maintains integrity of past investments, community amenities, and planning efforts north of San Dieguito Lagoon.
- *Participant Feedback* – Limits the ability to consider above-ground alignments at the north end.
- *Participant Feedback* – Aerial alignments that begin north of San Dieguito Double Track bridge with bridge columns in Fairgrounds property would be less impactful (than underground station) and reduce tunneling.
- Participant Feedback – Lowest cost.

4.2.3.2 DC-08 Minimize tunnel separation at portals

Track centers are currently specified at a minimum of 15-foot track centers on tangent outside of tunnels and a minimum of 56-foot track centers inside bored tunnels. This idea would reduce track spacing within the tunnels, which could reduce the footprint of the portals, thereby potentially minimizing right-of-way acquisitions. Comments related to this approach include:

- *Participant Feedback* – Minimizes the portal structure footprint.
- *Participant Feedback* – Reduces the length of cross passages between the two tunnels (15–20 cross passages depending on the selected alternative concept).

- *Participant Feedback* – Potential ecological benefits from smaller temporary and permanent impact footprint.
- *Participant Feedback* – Some advanced analysis needs to be performed at the early stage of design to confirm.
- *Participant Feedback* – Need to verify if smaller cross-passages are acceptable per National Fire Protection Association.
- *Discussion* – Reducing cross-passage lengths occurs if the tunnels are brought closer together along their full length; however, it is more common to maintain the desired one-diameter separation and only bring the tunnels closer together near the portals.
- *Discussion* – The distance between tunnels would not affect the size of the cross passages, which are sized based on minimum dimensions for walkway height and width and other emergency egress requirements as required per National Fire Protection Association 130.

4.2.3.3 DC-09 Layout Alternatives A, B, and C with a 3% maximum grade and move freight elsewhere

The current design criteria have set the maximum grade for the alignment at 2.0 percent, which is currently the maximum grade for freight rail at other locations within the existing corridor. A grade of 3.0 percent was identified during the VA Study as the maximum grade for passenger rail. The VA Team generated a few ideas that considered separating passenger and freight rail onto different alignments with different grades; however, none of these made it through the initial idea evaluation. For example, having a separate freight and passenger rail tunnel at different grades was considered. Comments related to this approach included:

- *Participant Feedback* – Could reduce surface impact by allowing a steeper grade at portals.
- *Participant Feedback* – Separated tunnel alignments increase the number of portals and number of underground easements required.
- *Participant Feedback* – Increases maintenance obligations for two tunnels and ventilation systems.
- *Participant Feedback* – Greatest cost and greatest footprint. Does loosening of on-site criteria open up anywhere near the funding that would be necessary to construct new track?

4.2.3.4 DC-13 Minimize ground cover requirement of one tunnel diameter at portal

The latest design criteria indicate that one tunnel diameter of cover is required above each tunnel. Currently, the proposed tunnel internal diameter is assumed at 28 feet for a twin-bore tunnel. This idea looked at the possibility of reducing the minimum one tunnel diameter depth of cover, which could reduce surface effects. Comments related to this approach included:

- *Participant Feedback* – Would reduce length of cut and cover structure which is typically more expensive than bored tunnel.
- *Participant Feedback* – Would reduce real estate costs due to reduced footprint of cut and cover.

- *Participant Feedback* – Some advanced analysis would need to be performed at the early stage of design to confirm.
- *Participant Feedback* – Performing limited investigation would help provide better understanding of ground conditions and the potential extend of ground improvements needed for each portal alternative.
- *Discussion* – The alternative concepts assume one tunnel diameter of cover as a best practice for conceptual design. The depth of cover required would be further explored in subsequent phases of the project development process.

4.2.4 Community Betterment

4.2.4.1 IC-17 Enhanced coastal access from the bluff to the beach after relocation of the tracks

This idea is similar to MCI-05 ("improve coastal access on bluffs to develop a safe undercrossing") but may consider the development of additional coastal access as a local improvement to offset impacts created by the project for some communities. Comments related to this approach included:

- *Participant Feedback* – Improved coastal access would benefit the residents.
- *Participant Feedback* – Gives the most impacted communities something to look forward to with the project.
- *Participant Feedback* – Is there a concern for future bluff failure impacting beach users below the bluffs?
- *Discussion* – Use of the right-of-way would require coordination with NCTD.

4.2.4.2 IC-01 Regional beach renourishment opportunities from the spoils of the project

An opportunity exists to place suitable excavated materials from the large cuts and/or tunnel boring spoils on the coastline to renourish beaches. Comments related to this approach included:

- *Participant Feedback* –This is dependent on issues including grain size and contamination.
- *Participant Feedback* – Would reduce material movement costs, associated vehicle miles traveled and greenhouse gas impacts of extra truck/train trips.
- *Participant Feedback* – Beach nourishment is preferred to transporting spoils offsite, but spoils would need to be analyzed to confirm suitability as beach sand.
- *Discussion* – The potential benefit of spoils reuse for beach sand replenishment is common to most alternative concepts but varies in applicability based on the extent to which each alternative concept would excavate or tunnel through favorable geology. Analysis on the potential reuse will be evaluated during the environmental clearance phase.

5. OUTCOMES

5.1 Feedback Meeting

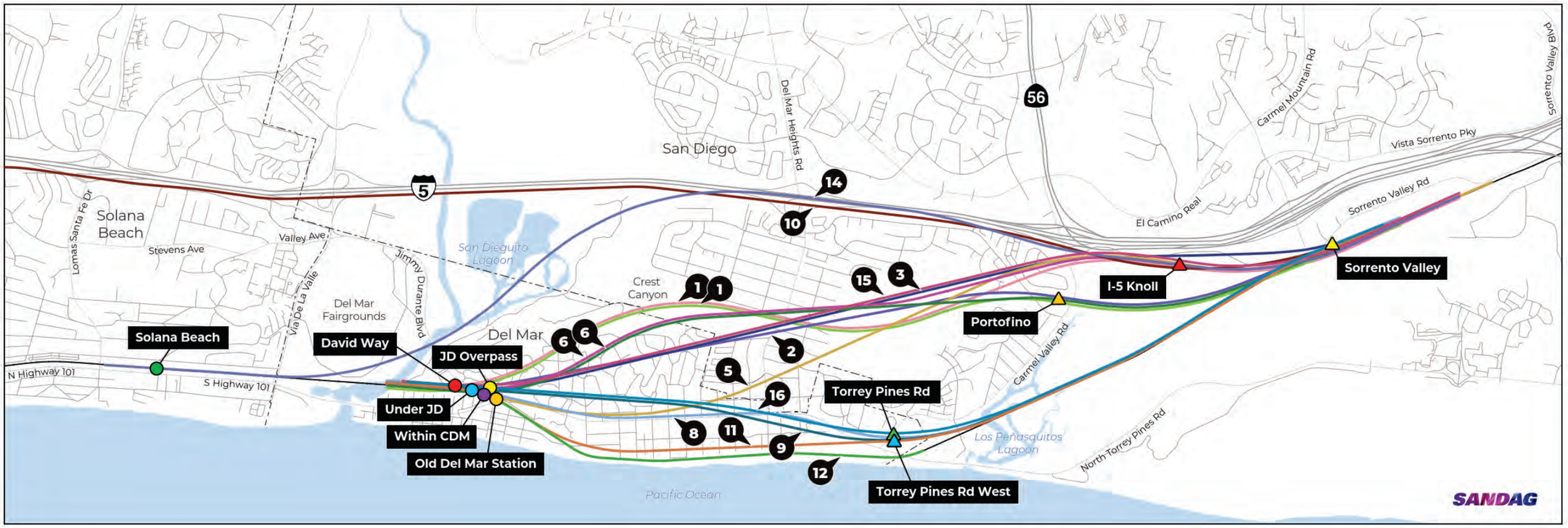
A Feedback Meeting was conducted on December 20, 2024, for the VA Team. The objective for this meeting was to solicit feedback on the Draft VA Study Report and receive input from the VA Team on which alternative concepts warrant further consideration. This section of the report summarizes this feedback. The meeting was attended by the representatives of the eight entities who participated in the VA Study to date; additionally, a representative from MTS attended the meeting to observe the discussions. *Please refer to Appendix H for the slides that were shared as part of this meeting.*

Attendees discussed the revised project objectives that were presented in Section 3.8 of the Draft VA Study Report. There was consensus on the objectives in general, although not all participants agreed with the wording shown. Participants also provided input on the alternative concepts developed by the VA Team regarding which ones warranted further consideration or modifications (refer to Section 4.1 for a description of the alternative concepts discussed during the meeting). The portals and alignments that comprise the alternative concepts are shown on Figure 23.

Regarding portals, more interest was received in exploring select south portals (i.e., I-5 Knoll or Torrey Pines Road West) than any of the north portal options. Among the south portal options, interest was also noted for the Portofino and Sorrento Valley portals, with no interest noted for the Torrey Pines Road portal. Among the north portals, interest was noted for the Solana Beach, Under Jimmy Durante, and Within Camino Del Mar portals and no interest was noted for the David Way, Old Del Mar Station, or Jimmy Durante Overpass portals. Participants were interested in considering “no portal” options for both the north and south, which would mean the corresponding alignment would not have any sections that would be underground.

Regarding alignments, the “Crest Canyon—90 [mile per hour]” alignment appeared to garner the most interest; however, this result contradicts the feedback received on portals, as the north portal for that alignment (David Way) did not garner any interest. No interest was noted for the “Stratford Court—80 [mile per hour]” alignment while various levels of interest were noted for all other alignments.

Figure 23. Conceptual Portal and Alignment Options



Conceptual Alignments
(Slightly Offset for Illustration Purposes)

North & South Conceptual Portal Locations

Existing LOSSAN Corridor Track Alignment

Municipal Boundary

MILES
0 0.25 0.5

N

1. Crest Canyon 90
2. Crest Canyon 110
3. Crest Canyon 110
4. Realign Jimmy Durante/Camino Del Mar (Not Mapped)
5. Crest Canyon 110
6. Crest Canyon Improved 90
7. Optimize Bridges and Berms (Not Mapped)
8. Camino Del Mar 90
9. Camino Del Mar 110
10. I-5 Oceanside to Sorrento Valley
11. Stratford Court 80
12. Double Track Bluffs
13. Freight to I-15 (Not Mapped)
14. I-5 110
15. Crest Canyon 110
16. Camino Del Mar 110

5.2 What Did We Learn?

The VA Study was a collaborative process leveraging the knowledge of the multidisciplinary VA Team, including SMEs and stakeholders, to allow for a fresh look at the project objectives and alternative concepts, as well as identify other ideas and design refinements. Throughout this process, the VA Team stressed the desire to minimize: property acquisitions, including subsurface easements from private properties; risks from climate change; and negative effects on biological resources, communities, and economic generators including the Del Mar Fairgrounds. The VA Team also stressed the importance of public stewardship, including preserving prior and ongoing investments in the LOSSAN corridor and considerations on the cost of constructing and maintaining the project. Collectively, these themes and input were incorporated into the draft revised objectives and the alternative concepts developed as part of the VA Study and presented in this report.

Regarding the location of project elements, interest was noted for alignments located under Crest Canyon or Camino Del Mar, with a focus on minimizing subsurface easements from private properties. Additionally, there was interest in exploring alignments that did not require portals, including an option that would keep the railroad tracks on the bluffs. There was also interest, consistent with feedback received during outreach efforts in 2023, to continue to study an I-5 alignment that is similar to alignments identified in prior studies (e.g. 2007 LOSSAN Programmatic EIR/EIS, 2023 Alternatives Analysis). Related to a potential I-5 alignment, feedback was received during the VA Study regarding minimizing or avoiding impacts to the Del Mar Fairgrounds and to prior and ongoing investments related to the San Dieguito Double Track project.

Additionally, a number of design refinements and other ideas were identified by the VA Team, as described in Section 4.2. Many of these ideas are applicable during the environmental clearance phase as design is advanced, environmental analyses are completed, and mitigation is identified to address impacts under the National Environmental Policy Act and/or CEQA for those alternatives that advance. The alternative concepts and additional ideas reflect the knowledge and experience of the VA Team and will help shape SANDAG staff considerations.

5.3 Next Steps

SANDAG staff will consider the evaluation, feedback, and lessons learned during the VA Study to refine the alternative concepts for the SANDAG Board of Directors to consider. Key themes that will be considered during the refinement process include:

- Minimizing effects to private properties, including subsurface easements
- Minimizing disruptions to economic generators
- Demonstrating public stewardship by minimizing conflicts with prior and ongoing investments

SANDAG staff will also consider feedback from stakeholders, prior public comments including comments received on the Notice of Preparation, and lessons learned from prior studies. Refinements to alternative concepts will be consistent with the intent identified by the VA Team, while also considering the themes identified above, operational and maintenance costs, and performance of the alignment.

Additionally, SANDAG staff will continue to refine the revised draft objectives that were developed during the VA Study for application during the environmental clearance phase. Staff will also review and apply

the additional ideas identified during the VA Study as applicable to the alternatives that advance into the environmental clearance phase. Staff recommendations and this report will be presented to the SANDAG Board of Directors for consideration.

Appendices

APPENDIX A: STAKEHOLDER INTERVIEW FEEDBACK

Virtual stakeholder interviews were conducted with representatives from the following potentially effected jurisdictions and SANDAG Board of Directors member agencies who opted to participate in the VA Study (listed in alphabetical order):

- 22nd District Agricultural Association (Del Mar Fairgrounds)
- California Department of Transportation
- City of Carlsbad
- City of Del Mar
- City of Encinitas
- City of San Diego
- City of Solana Beach
- North County Transit District

It should be noted that the San Diego Metropolitan Transit System and the City of Oceanside were invited to participate in the VA Study but opted not to participate.

For those entities who submitted a formal response to the NOP, the interviews expanded on those comments. These interviews associated specific stakeholders, objectives, issues, and concerns with the proposed alternatives identified in the NOP and set the stage for the VA Study. In addition, general observations and any additional alignment suggestions the entities felt warranted further exploration during the VA Study were collected via the interviews.

The feedback gathered from each entity is detailed in the pages that follow, organized by general comments and then by the proposed alternatives included in the NOP. A note with a green outline represents positive comments, yellow represents neutral comments, red represents negative comments, and blue represents suggested changes. These comments are also distinguishable via the labeled column they appear in.

General Comments

Positive | 3

- B and C seem like viable options
- project is definitely needed with state of the bluffs
- Appreciative that VA process is being done

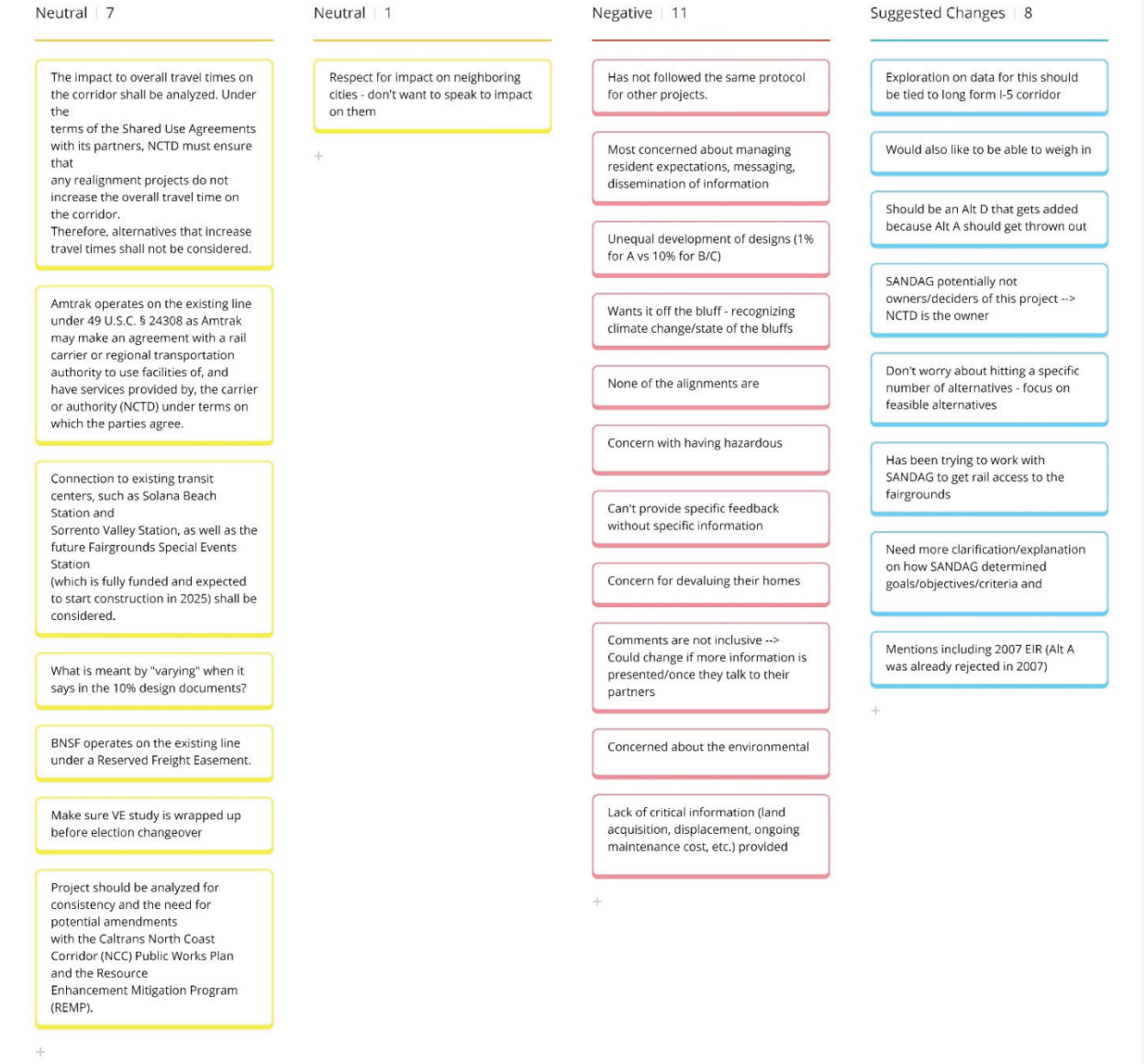
Neutral | 8

- Fairgrounds receives similar visits as Petco Park
- What is the current value of the alignment based on fraction of goods movement and people?
- Cost analyses of all alternatives shall consider the life cycle cost of the Project, to include anticipated operation and maintenance costs for the expected life of the constructed assets. Information on the expected useful life of each proposed alignment should also be included.
- As a representative of NCTD, SANDAG will need approval from STB under 49 U.S.C. § 10901 to construct a new rail line.
- NCTD and BNSF will need approval from the STB to abandon the existing line and discontinue rail operations under 49 U.S.C. § 10903 on the existing line if such abandonment is determined to be in the best interests of the railroads.
- The project proposed alternatives need to address impacts of alternatives on hydrology/drainage within the state highway.
- Operational and safety analysis for potential impacts such as access from state R/W for rail maintenance and operational impacts to I-5, SR-56 and I-805 during proposed project construction.
- Project scope is completely outside of oceanside

Neutral | 7

- SANDAG must consider and minimize the impacts of each alignment on rail operations during construction. Amtrak Pacific Surfliner, COASTER commuter rail and BNSF freight service operate through the Project area. NCTD, as the owner of the majority of the railroad right-of-way impacted by the Project, is contractually obligated to maintain use of the corridor for Amtrak and BNSF.
- The San Dieguito Lagoon Restoration project was important mitigation for several regional projects, including I-5. Please address any impacts that may occur to the San Dieguito Lagoon.
- The San Diego Regional Transportation Plan identifies four managed lanes for I-5 from SR-52 to SR-56, and from Via de La Valle to La Costa.
- The operational complexity of the Project's elements, including, but not limited to, the tunnel, ventilation systems, and train control systems, must be considered and operational feasibility for all forms of rail transportation must be included in the design and construction.
- Appreciates that there should be 3 alternatives that should be explored
- What are the projection numbers for this alignment? Is it a viable commuter experience?
- Current alignment also not able to be used for military (Pendleton)

General Comments



Alignment A

Positive | 4

- Goal of this alignment citizens have
- South portal: if there is going to be a portal they think that where it is here is where it should be (away from
- Parallels I-5 so this may be a piece of an alternative that runs along I-5 entirely
- Less environmental impact to lagoons

Neutral/Negative | 6

- Hydraulic implications need to be explored
- A & B seem to have similar alignments at the end (going south)
- Can the space be used with the cut and cover portion?
- SANDAG must clarify the impacts of the project on the future of planned and existing rail stations.
- Potential impacts to six-acre park that is rumored to be constructed above the northern cut-and-cover section of Alternative A in Solana Beach.
- SANDAG must clarify the impacts of the project on the future of planned and existing rail stations.

Negative | 9

- The tunnels will trap concentrated diesel exhaust and other emissions from freight and other trains that will eventually vent out of portals into surrounding areas. This concern is particularly acute under Alternative A
- Alternative A is not adequately described and risks more potential adverse environmental impacts as compared to either of the other two alternatives presented in the NOP.
- Noise and pollution concerns with tunnel
- Alternative A would have significant cultural, recreational, economic, environmental, socioeconomic impacts on the 22nd DAA, on neighboring communities, and on the county.
- 556 interchange project + widening improvements + future expansion on I-5 that is already approved may not be accommodated by this alignment
- Very deep columns so coming back up in the 556 area could be challenging
- Compounded impacts of construction fatigue for residents with current double tracking project already underway
- Increased commuter time from north of the segment to south of the segment
- Potential shut down of the line would kill project operations

Negative | 9

- Alternative A would require permanent occupation of portions of the Fairgrounds, impact Stevens Creek, and destroy the Solana Beach Coastal Rail Trail.
- Extremely expensive (~4 billion dollars & (financial consideration of the DAA owning the land)
- Alternative A would affect not only San Dieguito Lagoon, but would also impact Stevens Creek and require temporary
- SANDAG conducted inadequate public outreach that failed to engage with the 22nd DAA, a Responsible Agency under CEQA, among others in the preparation of the NOP to understand the wide array of potential impacts to the Fairgrounds operations, to the region, and to the environment.
- Uses VA property that limits fairground useage
- Not feasible path forward due to lawsuits/appeals for touching homes
- community buy-in for this alignment seems challening
- (SWD) is pursuing a wetland mitigation project in this vicinity. Project Alternative Route A would bring the rail line closer to our proposed mitigation site which is currently in the design phase. San Dieguito Lagoon East (SDLE) is an approximate 25-acre site.
- Negative impacts to cycling routes

Alignment A

Negative | 8

- Alternative A, would affect many sources of the City of Solana Beach's sales tax revenue, such as the Fairgrounds, the recreational areas surrounding the Fairgrounds, and the businesses along Cedros Avenue. (a previous project took 2 years to separate grade and
- Alternative A would impact Via de la Valle, Lomas Santa Fe Drive, South Highway 101, and South Cedros Avenue, and that Fairgrounds event access would be affected at Via de la Valle and Jimmy Durante Boulevard.
- Need to consider already ongoing new San Dieguito double track project which would be wiped out by this
- Adds time to their trips on the headway/slows the rail down
- Would have to go under some residential houses and unclear
- Cut and cover (north) would impact
- Alternative A of the proposed project will have major adverse impacts on operations at the Fairgrounds, and the 22nd DAA is concerned that Alternative A conflicts with the existing land use at the Fairgrounds.
- Alternative A does not meet the CEQA requirements for a viable and feasible project alternative and only meets four of the six objectives identified for the realignment Project.

Negative | 8

- Not enough information to make a determination about consequences (1% design compared to 10% designs for B and C)
- Twice as long to construct (7-10 years is underestimated)
- Negative economic impact to the del mar fairgrounds which would impact
- Alternative A will generate almost 547,000 one-way construction truck trips—over one million round-trip truck trips.
- Alternative A will result in slower rail operating speeds than current conditions.
- The Fairgrounds North portal would be most disruptive to the surrounding community. This portal would require construction of a new underground special events platform to maintain passenger rail service to the fairgrounds.
- Significant portions of the fairgrounds southwest parking lot and access to the surrounding area would have restricted use. Note: This statement also omits the fact that this "southwest parking lot" serves as event space, including as the San Diego County Fair's Carnival Midway.
- The basis for including Alternative A in the NOP is unfounded based on SANDAG's objectives and fails to meet basic objectives of the project, such as minimizing environmental impacts and impacts to surrounding communities

Negative | 9

- Emissions will concentrate in the underground special events platform beneath the Fairgrounds and the San Dieguito Lagoon under Alternative A.
- Fairgrounds is not traditional state
- Significant portions of the fairgrounds southwest parking lot and access to the surrounding area would have restricted use. Note: This statement also omits the fact that this "southwest parking lot" serves as event space, including as the San Diego County Fair's Carnival Midway.
- Alignment A threatens both existing multi-family residential units in Solana Beach, as well as affordable homes under proposal by Del Mar on the Fairgrounds property.
- Emissions will concentrate in the underground special events platform beneath the Fairgrounds and the San Dieguito Lagoon under Alternative A.
- Operationally problematic
- Seems wasteful of taxpayer dollars
- Due to the proximity to the MHPA, construction noise will need to be avoided, if possible, during the breeding season of the California gnatcatcher (3/1-8/15), least Bell's vireo (3/15-9/15), southwestern willow flycatcher (5/1-8/30).
- Waste of seasonal track planning

Negative | 8

- Could cause shutdown during construction and/or permeant shut down of original line (which they own)
- Alternative A would have the "greatest construction complexity" of the proposed options (disrupts fairgrounds operations)
- A has most issues (should get thrown out)
- If alternatives encroach into conserved Open Space and/or the MHPA, an MHPA boundary line adjustment may be required to ensure the City's conserved Open Space and MHPA preserve are made "whole".
- Would put new work at fairgrounds to waste
- Potential to impact City-owned Parks and Recreation Department-managed parcels in Crest Canyon Open Space and Peñasquitos Lagoon and the Multi-Habitat Planning Area (MHPA) Preserve (part of the City's Multiple Species Conservation Program (MSCP) Subarea Plan)
- Alternative Routes A, B, and C all appear to cross City-owned property. The areas these routes cross have been identified as having potential wetland mitigation value to the City and are considered potential future options for City mitigation projects.
- Cultural resources (archaeological and tribal) have been recorded or have the potential to be encountered during ground disturbing activities associated with project implementation. These areas are known to local archaeologists and the Kumeyaay community because of their proximity to the San Dieguito Lagoon and Los Peñasquitos Lagoon.

Alignment B

Positive | 11

- Makes a lot of sense as long as it can go as far south as the knoll
- Presents more mobility options
- Acknowledges a limited perspective but does like this one the best
- Only service disruption will be at the tie in when its completed so more minimal
- Better than Alt A for cost
- Alternative B maintains current rail operating speeds and results in the fewest impacts to transportation infrastructure of all alignments considered.
- This does not have impact to the fairgrounds directly
- South portal: if there is going to be a portal they think that where it is here is where it should be (away from
- Operationally okay for NCTD
- Not as many negative impacts to Solana Beach itself
- Alternative B is well within the middle range of length of all alternatives considered by SANDAG and is almost 8,000 feet shorter than Alternative A.

Positive/Neutral | 11

- Doesn't touch as many homes as alignment c
- Shorter tunnel so theoretically smaller impacts to residents/businesses
- Closest alignment option to the alternative of moving the tunnel through Crest Canyon to avoid homes.
- Still allows for the seasonal rail platform
- Alternative B results in the least impact to sensitive resources and to public lands of the three alternatives in the NOP.
- Straighter alignment = quicker commute times
- Has opportunity to eliminate embankment that runs across Los Penasquitos lagoon
- Wants to make sure there is concern for bluffs on south side of San Dieguito river
- Have a little more info than Alignment A but still many unknowns/hard to evaluate how
- A & B seem to have similar alignments at the end (going south)
- More detailed studies early on to actually study whether we can exit that far south (the knoll) because if they cant than it is not as viable of an option

Negative | 9

- Cost to secure easement and rights to move forward with this alignment
- Environmental impacts with entries and exits near homes
- They would need capital funding source for any stretch in the tunnel
- Management for long term infrastructure (capital cost for tunnel is much more)
- Due to the proximity to the MHPA, construction noise will need to be avoided, if possible, during the breeding season of the California gnatcatcher (3/1-8/15), least Bell's vireo (3/15-9/15), southwestern willow flycatcher (5/1-8/30).
- Potential to impact City-owned Parks and Recreation Department-managed parcels in Crest Canyon Open Space and Peñasquitos Lagoon and the Multi-Habitat Planning Area (MHPA) Preserve (part of the City's Multiple Species Conservation Program (MSCP) Subarea Plan)
- Not feasible path forward due to lawsuits/appeals for touching homes (middle of purple)
- North portal: concerned the area is not flat enough nor large enough for
- Cultural resources (archaeological and tribal) have been recorded or have the potential to be encountered during ground disturbing activities associated with project implementation. These areas are known to local archaeologists and the Kumeyaay community because of their proximity to the San Dieguito Lagoon and Los Peñasquitos Lagoon.

Negative | 11

- Alot of instability in bluffs -->
- Traffic may increase during construction
- Commuter time from north of the segment to south of the segment
- If fairgrounds are impacted so could Solana Beach
- Potential impacts to newly created bike path
- Very disruptive to city of del mar and their businesses
- If alternatives encroach into conserved Open Space and/or the MHPA, an MHPA boundary line adjustment may be required to ensure the City's conserved Open Space and MHPA preserve are made "whole".
- Alternative Routes A, B, and C all appear to cross City-owned property. The areas these routes cross have been identified as having potential wetland mitigation value to the City and are considered potential future options for City mitigation projects.
- Homes would be negatively affected
- Del Mar experienced 2 major bluff
- Potential impact to local businesses

Alignment C

Positive | 13

- Follows existing rail line
- Inland to get away from sensitive bluffs
- No concerns with this one as it pertains to Caltrans infrastructure
- Shorter tunnel so theoretically smaller impacts to residents/businesses
- Doesn't impact fairground operations
- Would be able to give them the most amount of speed
- Operationally okay for NCTD
- Says this one is a winner and best one hands down
- Alternative C is the cheapest of three alternatives presented in the NOP at an estimated cost of $1.85 billion.
- Easier logistically and economically because it is shorter
- This does not have impact to the fairgrounds directly
- Shortest alignment
- Still allows for the seasonal rail platform

Positive/Neutral/Change | 4

- Only service disruption will be at the tie in when its completed so more minimal
- Have a little more info than Alt A but still many unknowns
- What are the right of ways for cut and cover needed in Del Mar where it would be cut and cover?
- Could you put the tunnel underneath the road (Camino del Mar) instead of the houses

Negative | 11

- Could impact more businesses/ houses with the shallowest of the tunnels being underneath them
- Not feasible path forward due to lawsuits/appeals for touching homes
- Portal development could impact bluffs (eastern side of Camino del
- Commuter time from north of the segment to south of the segment
- Imminent domain concerns
- Alternative Routes A, B, and C all appear to cross City-owned property. The areas these routes cross have been identified as having potential wetland mitigation value to the City and are considered potential future options for City mitigation projects.
- If alternatives encroach into conserved Open Space and/or the MHPA, an MHPA boundary line adjustment may be required to ensure the City's conserved Open Space and MHPA preserve are made "whole".
- Could bankrupt city of Del Mar and
- Transportation impact because
- Construction impacts
- Negative impacts to cycling routes

Negative | 9

- Potential to impact City-owned Parks and Recreation Department-managed parcels in Crest Canyon Open Space and Peñasquitos Lagoon and the Multi-Habitat Planning Area (MHPA) Preserve (part of the City's Multiple Species Conservation Program (MSCP) Subarea Plan)
- Alternative C would require construction of a bridge structure over Los Peñasquitos Lagoon
- Cultural resources (archaeological and tribal) have been recorded or have the potential to be encountered during ground disturbing activities associated with project implementation. These areas are known to local archaeologists and the Kumeyaay community because of their proximity to the San Dieguito Lagoon and Los Peñasquitos Lagoon.
- Los Pen lagoon would also be impacted (protected habitat there) --> restoration efforts already been happening there
- Tourist impact (+3 million people
- Management for long term infrastructure (capital cost for tunnel is much more)
- Most direct impact to city of san diego
- They would need capital funding source for any stretch in the tunnel
- Due to the proximity to the MHPA, construction noise will need to be avoided, if possible, during the breeding season of the California gnatcatcher (3/1-8/15), least Bell's vireo (3/15-9/15), southwestern willow flycatcher (5/1-8/30).

Other Alignment Concepts

Suggested Changes | 10

- Realign the tunnel under Crest Canyon to minimize the number of homes it goes under, then emerge from the hill side as a bridge above ground near Carmel Valley
- Align this project with the existing double track project
- Consider an I-15 alignment/move freight to I-15
- Explore analysis of ridership to fairgrounds (removing cars off the road - last study was 2009)
- Moving portal between Jimmy Durante and former Del Mar train station (Coast Blvd) - Mile Marker 244
- East from Jimmy Durante Blvd. above ground as opposed to tunneled until it gets to I-5 and take that to the new knoll portal
- Elevated train that turns off at the Y and gets to I-5 (instead of tunneling)
- Instead of a seasonal rail station at fairgrounds, become permanent and close the Solana Beach to free up space for recreational space
- Move entire corridor to either I-5 or I-15
- Explore the relative merits or impacts associated with constructing bridge structures over lagoons as compared to constructing tunnels under lagoons.

+

Suggested Changes | 10

- Hybrid arrangement - retrofit existing track for one-way double track and build another track along another alignment (maintain current alignment of one track)
- Study flexible fleet along the I-5 commuter lanes to replace the LOSSAN commuter option.
- Getting the alignment more towards
- Alignment along I-15 that is high speed
- if no freight could do a bridge through the fairgrounds and use
- Above grade that would follow the river to bend east then follow the I-5 alignment
- Double tracking through del mar
- Could it be one bore if it's only for goods movement?
- Creating pedestrian friendly routes (NEVs)
- Cut and cover at the old Del Mar train station for double track where it changes to single track.

+

Suggested Changes | 4

- Need to look at north of San Clemente to south of Sorrento Valley to see if this is a viable corridor
- Moving corridor away from pedestrians (high rates of ped fatalities)
- Start route along I-5 up in Oceanside so it comes out north of 78 and goes
- Recommendation to reconsider inclusion of Alignment P1-A (the I-5 Alignment)

+

APPENDIX B: ORIENTATION MEETING SLIDES

An Orientation Meeting was facilitated on September 11, 2024, for the VA Team. The purpose of this meeting was to provide an overview of the VA Study, objectives, ground rules, and to review information relative to the proposed alternatives included in the NOP. Representatives from each entity that participated in the VA Study presented remarks. The following slides were presented at the Orientation Meeting.

LOSSAN Rail Realignment Project

Value Analysis Study Orientation Meeting
September 11, 2024

1

Importance of LOSSAN Corridor

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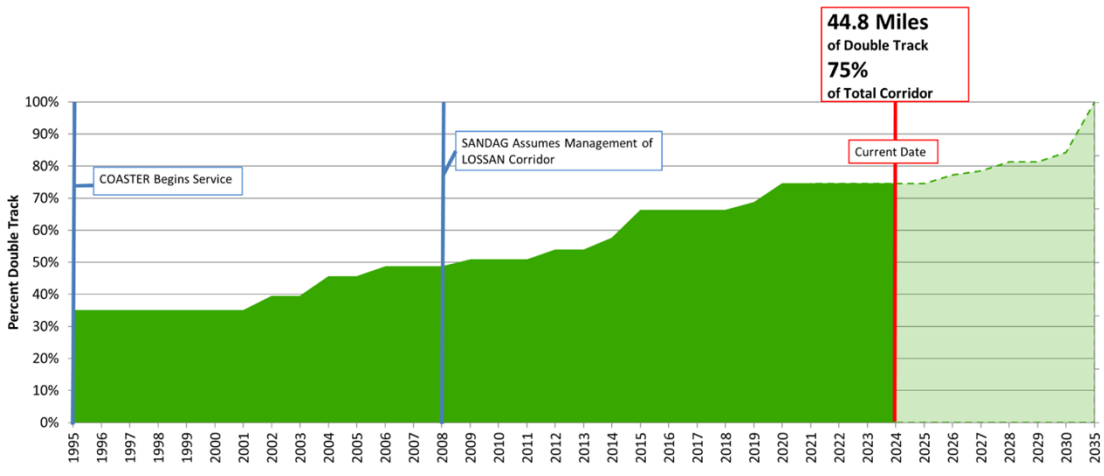
Double Track Progress



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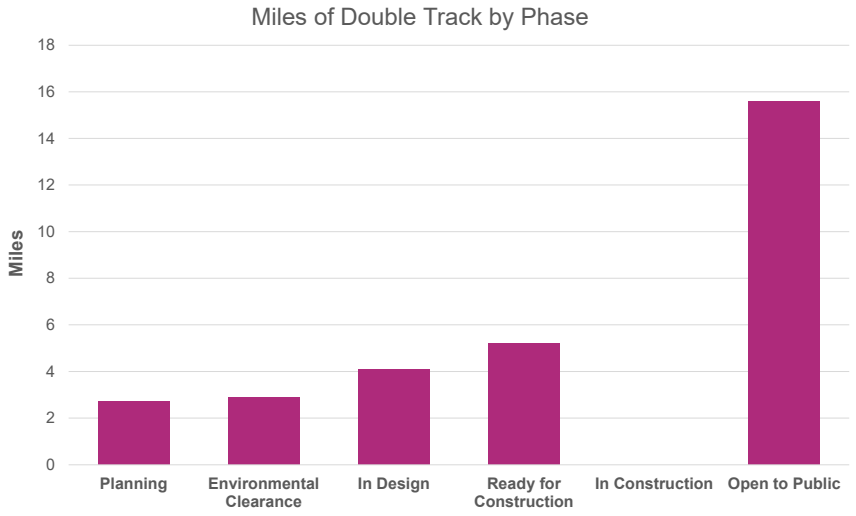
Corridor investments

20
Projects Open

16
Projects in Development



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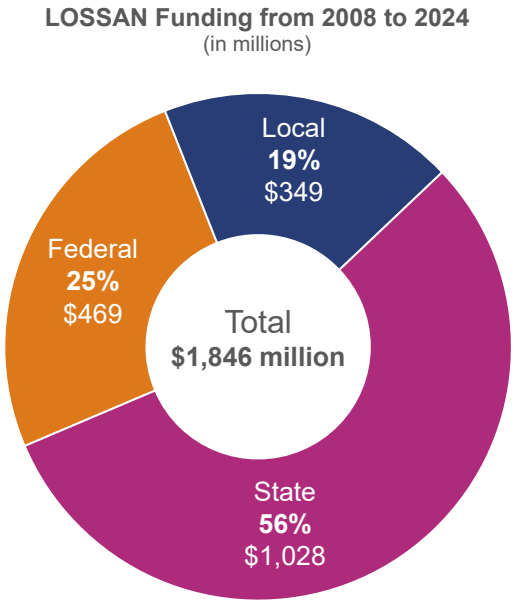
LOSSAN Funding



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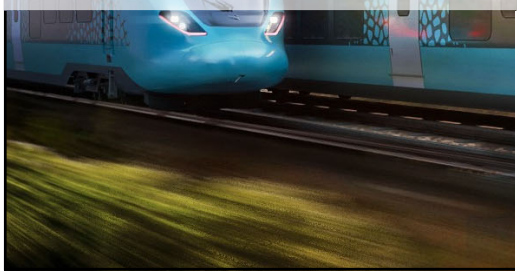
Future of the LOSSAN Corridor

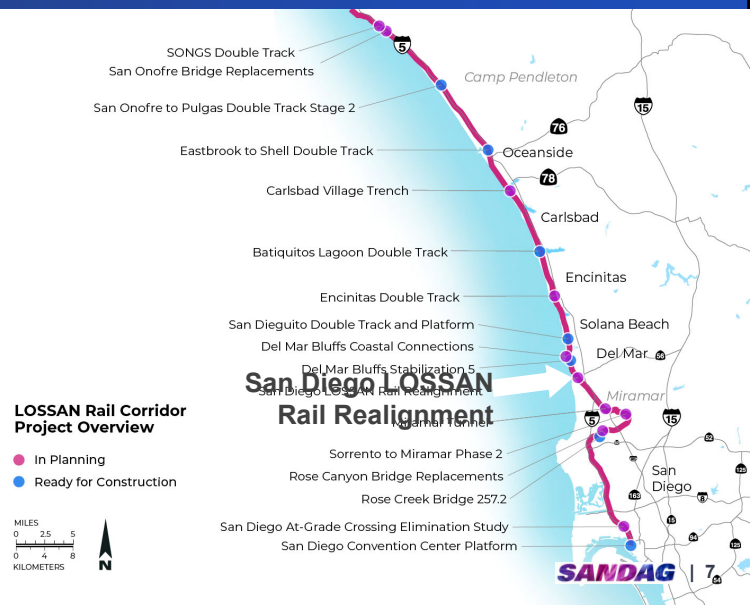
Safe, Resilient, Reliable

1 Pacific Surfliner train/hour

3 COASTER trains/hour

33 Minutes travel time from Oceanside to Downtown





Past Planning Efforts for Del Mar Realignment

- **2000** – 2000 Regional Transporation Plan (SANDAG)
- **2007** – LOSSAN Programmatic EIR/EIS (Caltrans and FRA)
- **2014** – North Coast Corridor Public Works Plan (CCC)
- **2017** – Conceptual Engineering and Environmental Study (SANDAG)
- **2018** – State Rail Plan (Caltrans)
- **2021** – 2021 Regional Plan (SANDAG)
- **2022** – Del Mar Bluffs V Stabilization Project (CCC)
- **2023** – SDLRR Alternatives Analysis (SANDAG)

Project Goals

1. Relocate from Bluffs
2. Minimize Community Impacts
3. Improve Travel Times
   - Straighten Curves
   - Double Track
4. Coastal Access & Safety
5. Preserve Wetlands

Why a Tunnel?

11

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How are Alignments Selected?

12

12

Definitions of Alignment Structures

Bridge

Aerial structure carrying the rail tracks over roadways, canyons, or water

Graded

Rail tracks constructed on flat ground, earthen berms, or cuts into hillsides

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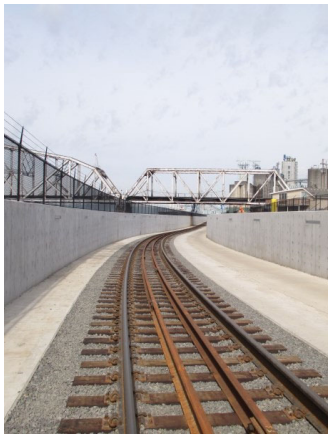
13

Definitions of Alignment Structures

U-Structure

A rectangular-shaped structure with only three sides that is excavated from the surface and leaves an opening in the surface to allow the track to transition from a tunnel to the surface level.



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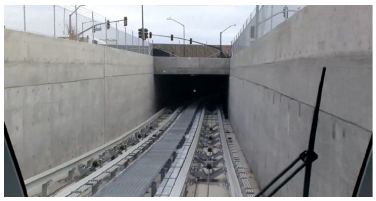
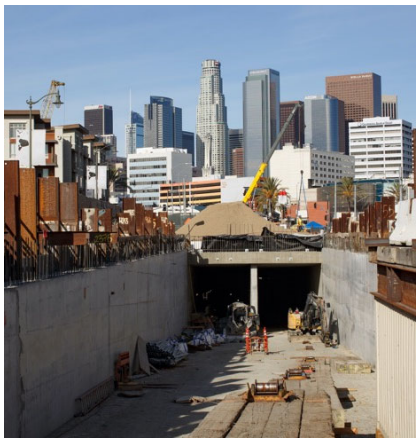
14

Definitions of Alignment Structures

Cut & Cover

A rectangular-shaped tunnel that is constructed within a trench that is excavated from the surface and then covered after it is constructed.





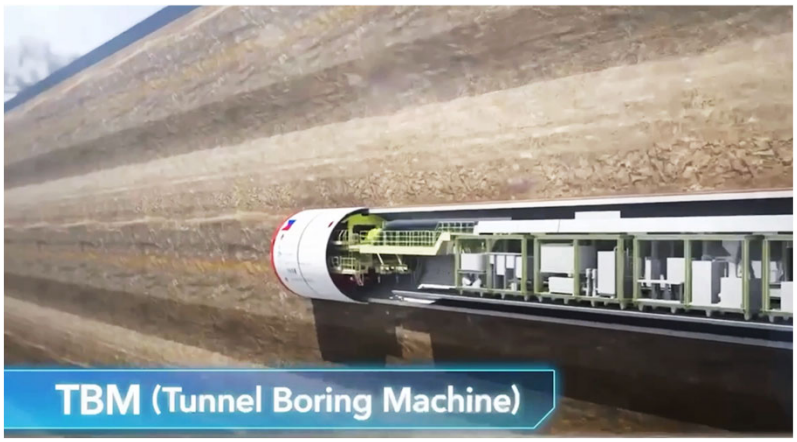
SANDAG | 15

15

Definitions of Alignment Structures

Bored Tunnel

A circular-shaped tunnel that is constructed using a tunnel boring machine that digs or bores through the earth without removing the ground above



SANDAG | 16

16

Definitions of Alignment Structures

Portal
Entrance to the tunnel

Berm
A segment of track that is on raised ground.

Floodwalls
A freestanding structure built along a shore or bank to prevent encroachment of floodwaters

How Do We Design Alignments?

- All alignments **must** meet design criteria and engineering standards
- Basis of Design:
  - LOSSAN Design Criteria Manual, Volume III, Draft 4, augmented for FRA Class 6
  - FRA Track Safety Standards, primarily Title 49 Code of Federal Regulations (CFR) Parts 213 Subpart G, 214, 234, and 236.
  - CPUC General Orders (GOs)
  - American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering
  - Amtrak Engineering Track Design Specification – Spec No. 63 (Rev. 2020)

Source: LOSSAN Rail Realignment Alternatives Analysis (2023), Appendix J.

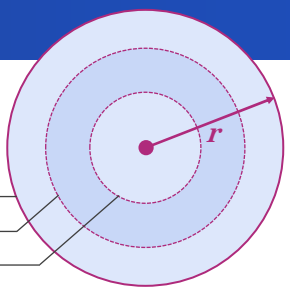
How Do We Design Alignments?

Horizontal

- Gradual Curves = Faster Travel Time
- Class VI 110 mph radius 6,929’

(Class VI)

Passenger Speed (mph)	Min. Curve Radius (ft)
110	**6,929**
100	5,345
90	3,711

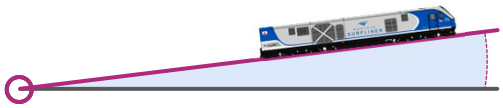


mph

Vertical

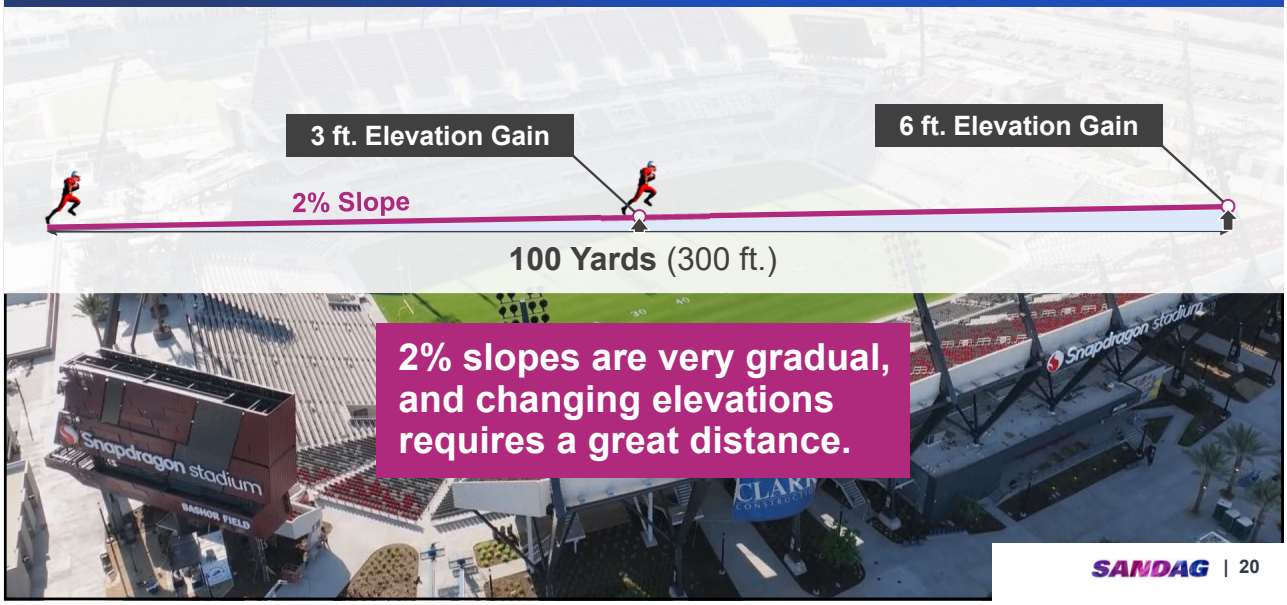
- Maximum Slope 2%
- Topography
- Minimum Vertical Clearance 26’ above top of rail
- Minimum Clearance over roadway 16.5’

2%



Note: Alignments also subject to BNSF shared-use agreement

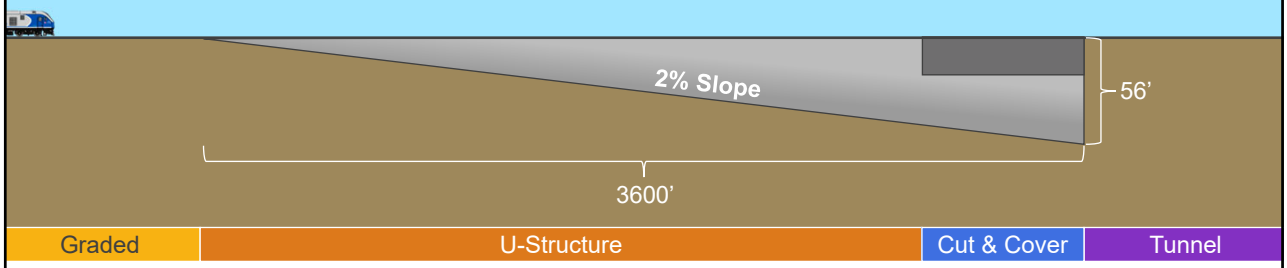
Visualizing a 2% Slope



Design Constraint: 2% Maximum Slope

NOT TO SCALE (illustrative)

Tunnel Portal Example:
Flat Topography

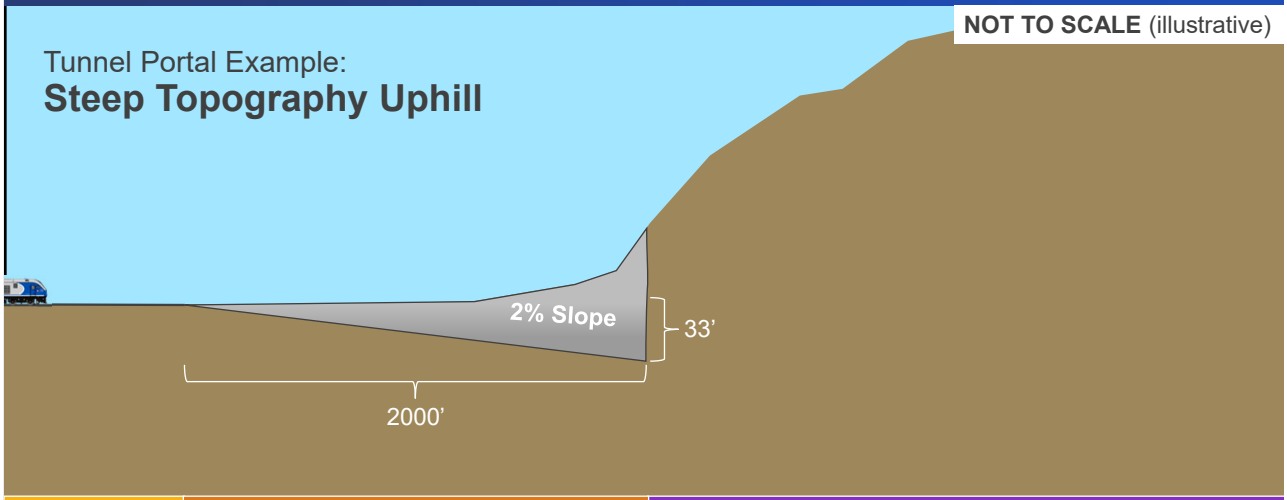


Graded | U-Structure | Cut & Cover | Tunnel

Design Constraint: 2% Maximum Slope

NOT TO SCALE (illustrative)

Tunnel Portal Example:
Steep Topography Uphill

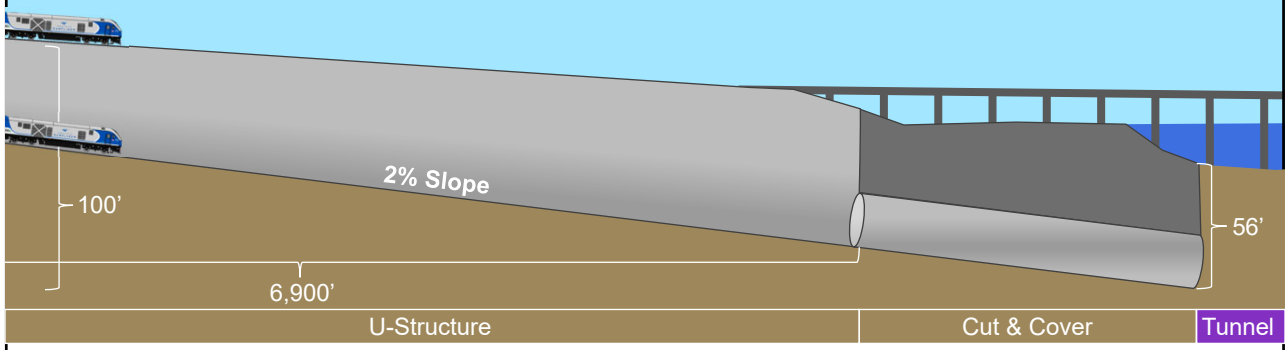


Graded | U-Structure | Tunnel

Design Constraint: 2% Maximum Slope

NOT TO SCALE (illustrative)

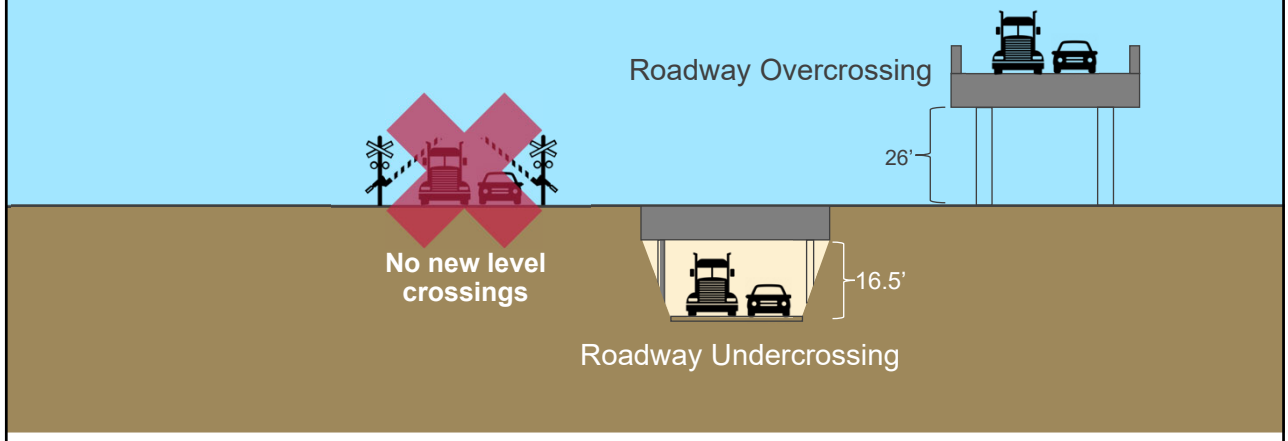
Tunnel Portal Example:
Steep Topography Downhill



Design Constraint: Vertical Clearances

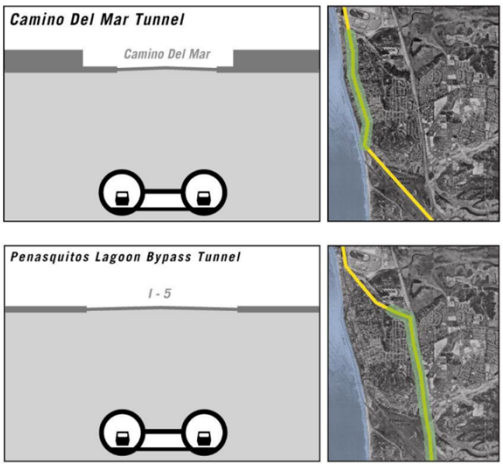
NOT TO SCALE (illustrative)

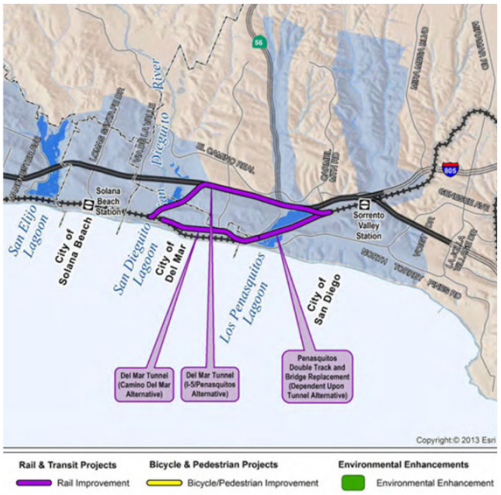
Grade Separations



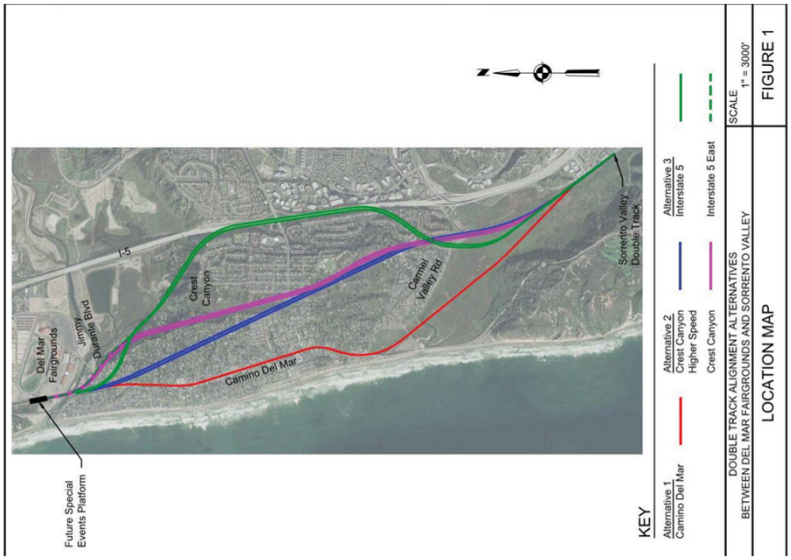
2007 LOSSAN Programmatic EIR/EIS
2014 Public Works Plan

Figure 2.5.1-4
Options to be Retained for Further Study in Del Mar

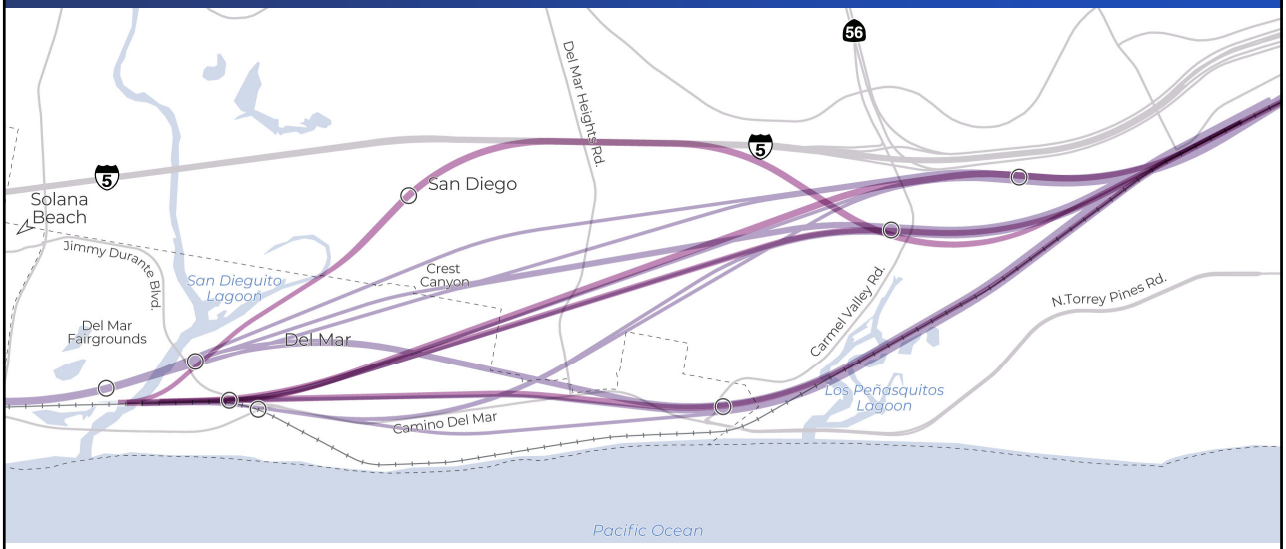




2017 Alignment Alternatives Study

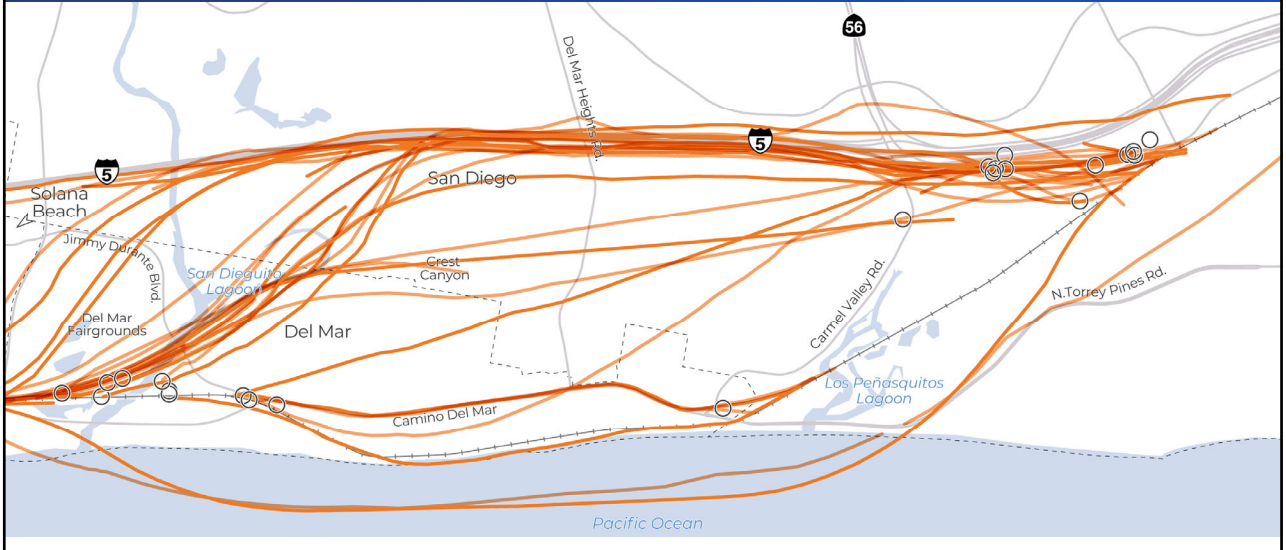


2023 Preliminary Alignments Studied



DISCLAIMER: *No decision has been made on the selection of the proposed project or project alternatives. SANDAG is continuing to evaluate concepts that may be selected as project alternatives for analysis that will be studied during the formal environmental review process under the California Environmental Quality Act and the National Environmental Policy Act. All elements of the conceptual designs are preliminary and should not be construed as an announcement of the intent to acquire any private property. The images are intended to facilitate early public engagement on project concepts.*

2023 Alignments from Preliminary Public Input



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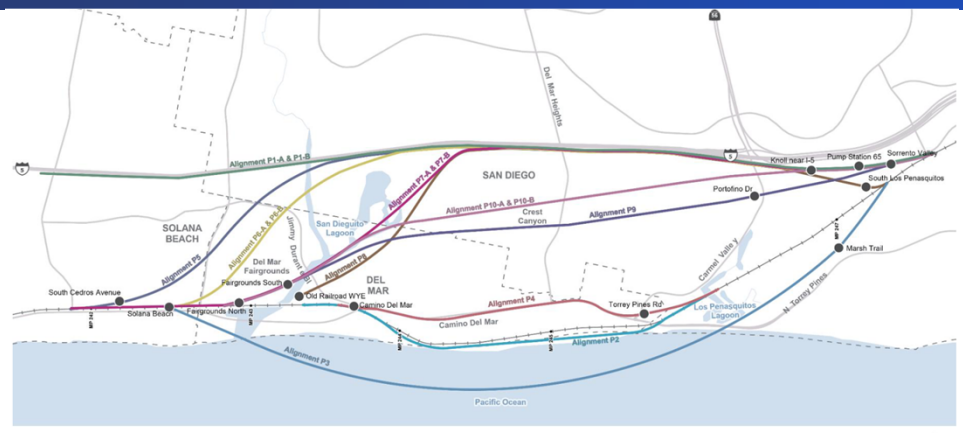
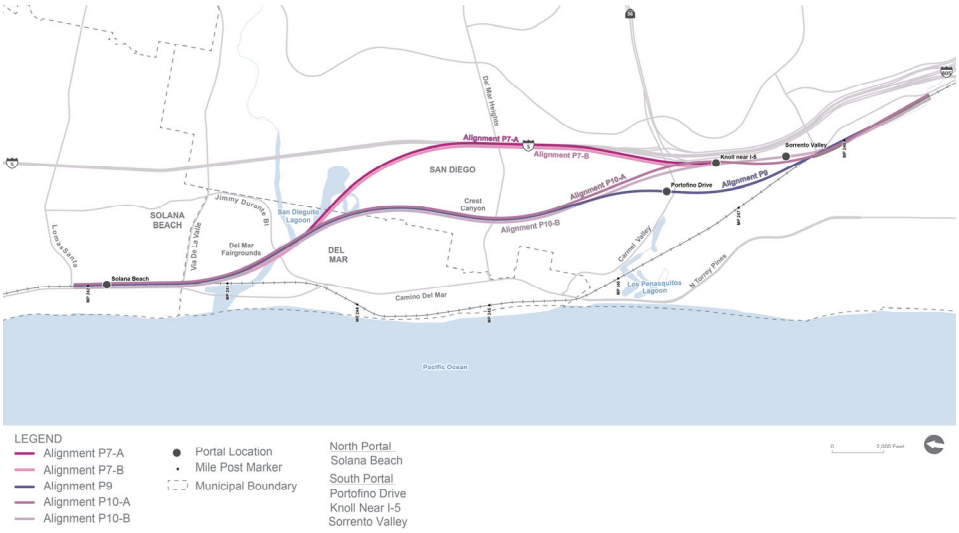
2024 Screening Report

2024 Screening Report
Stakeholder and Outreach Alignments



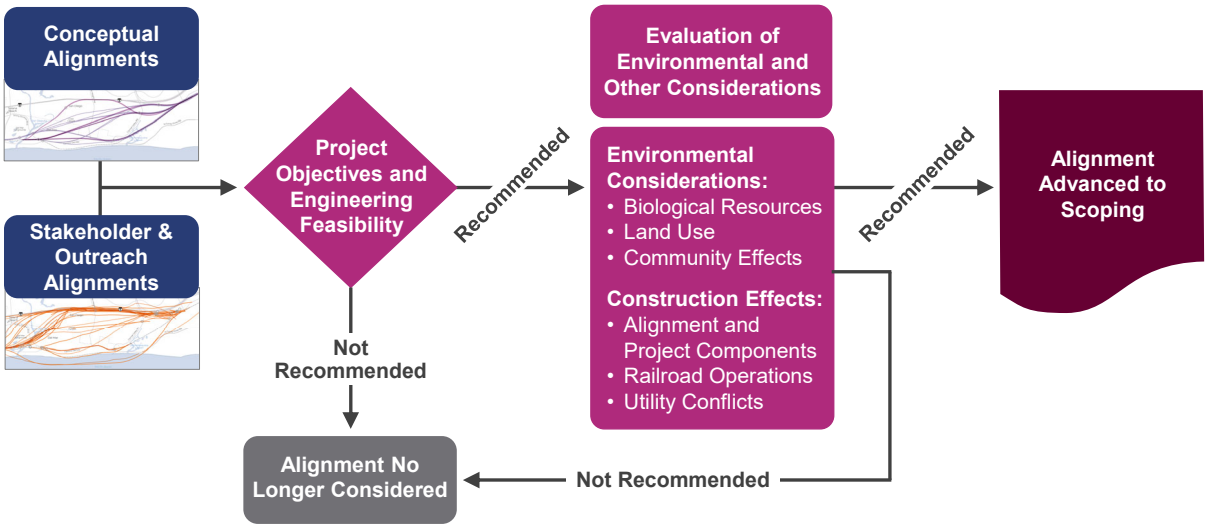
2024 Screening Report
Stakeholder and Outreach Alignments Advanced



CEQA Project Objectives

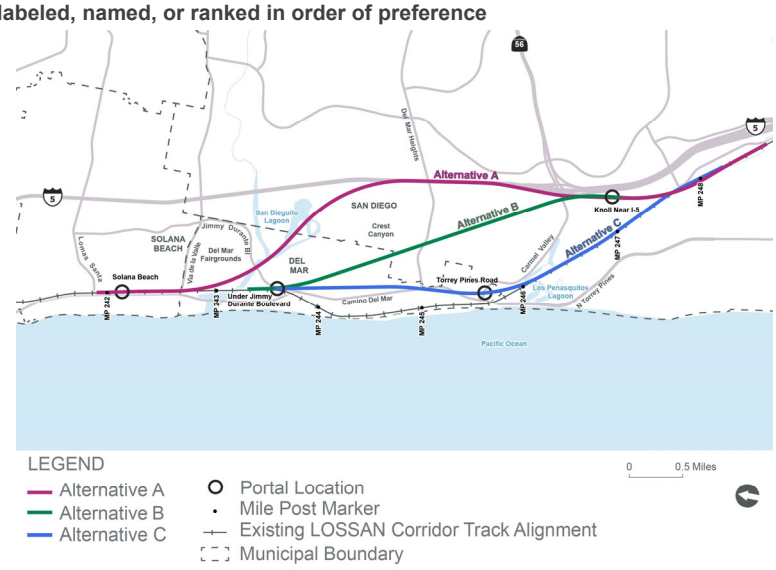
- Improve **rail service reliability** by relocating the existing railroad tracks away from the eroding coastal bluffs in Del Mar.
- Maintain passenger rail service to train stations serving **Solana Beach** and **Sorrento Valley** and accommodate direct rail access to the 22nd Agriculture District/**Del Mar Fairgrounds.**
- **Minimize impacts on the surrounding communities** during and after construction.
- **Avoid** and/or **minimize impacts** on biological, cultural, and recreational resources of national, state, or local significance, including publicly owned parks, beaches, wetlands, ecological reserves, wildlife or waterfowl refuges, and any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places.
- **Help meet the goals** of the 2021 Regional Plan and the 2018 California State Rail Plan by reducing travel times, increasing reliability, and accommodating additional rail service.
- **Improve coastal access and safety** by eliminating at-grade railroad crossings and minimizing other pedestrian-rail points of interaction.

Alignment Screening Process

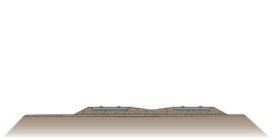


Proposed NOP Alternatives*

*Alternatives are not labeled, named, or ranked in order of preference



Features of the Alternatives



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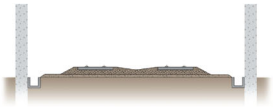
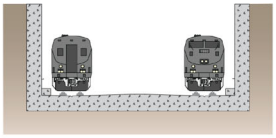
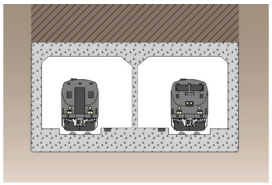


Floodwalls

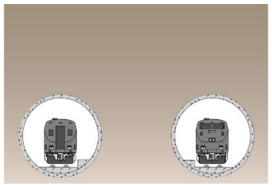
Berm



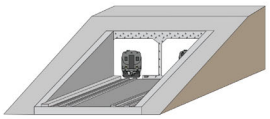
U-Structure



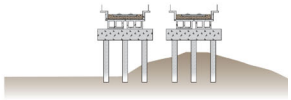
Cut-and-Cover Tunnel



Bored Tunnel



Portal



Bridge

SANDAG 35

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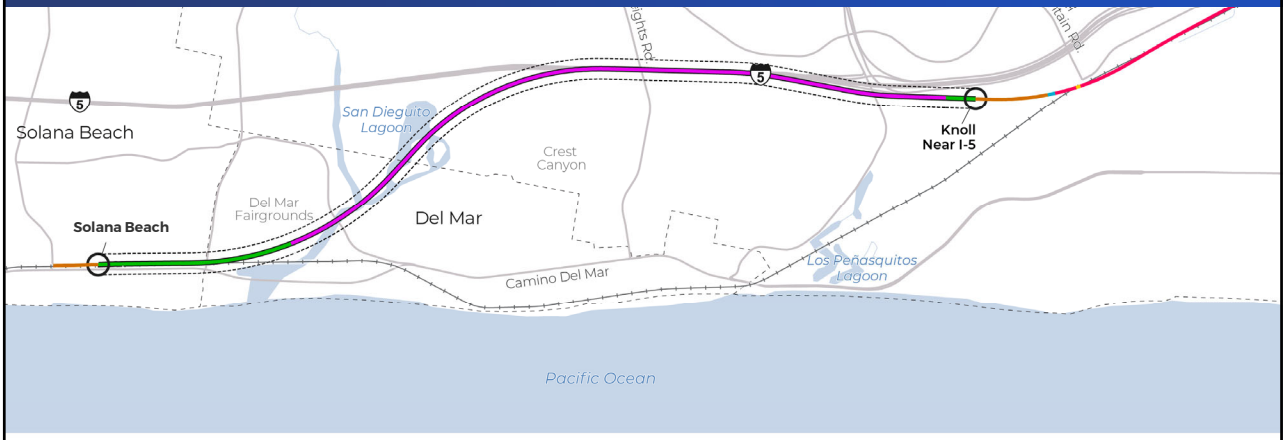
Proposed NOP Alternative Alignment A



San Diego LOSSAN Rail Realignment - Alternative A

- Bored Tunnel
- Cut-and-Cover Tunnel
- Bridge
- Floodwalls
- Graded
- U-Section
- Tunnel Segment
- Portal Location
- Existing LOSSAN Corridor Track Alignment
- Municipal Boundary

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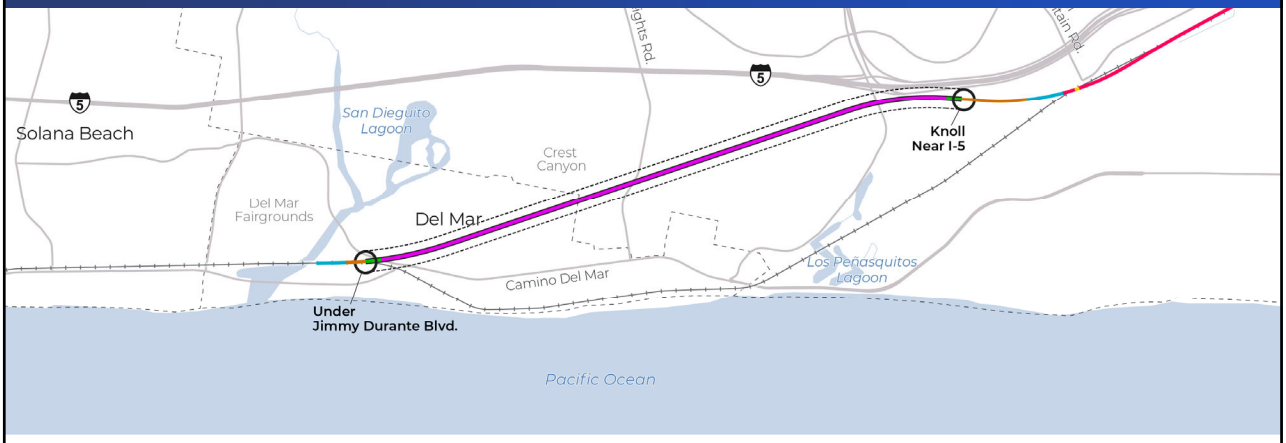
NOP Proposed Alternative Alignment B



San Diego LOSSAN Rail Realignment - Alternative B

- Bored Tunnel
- Cut-and-Cover Tunnel
- Bridge
- Floodwalls
- Graded
- U-Section
- Tunnel Segment
- Portal Location
- Existing LOSSAN Corridor Track Alignment
- Municipal Boundary

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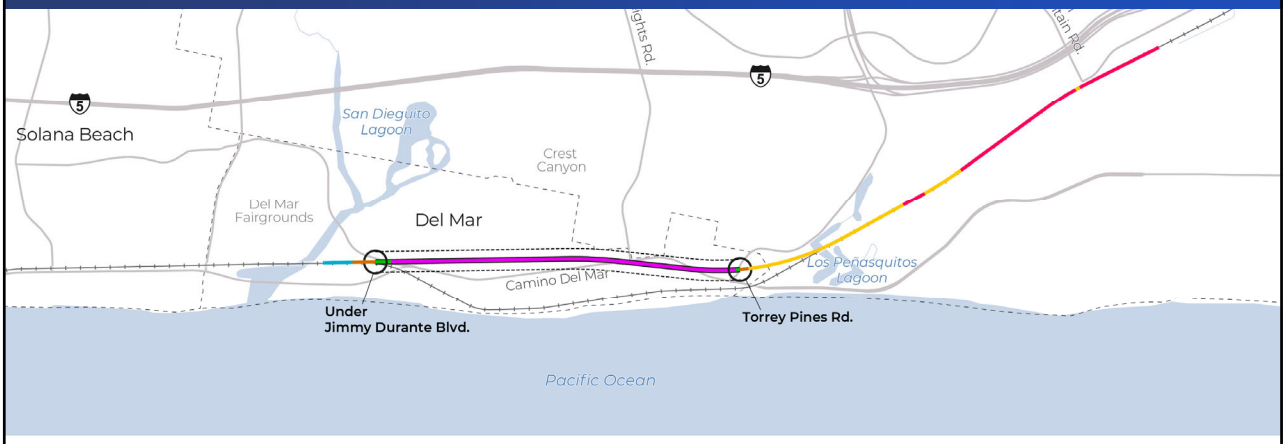
NOP Proposed Alternative Alignment C



San Diego LOSSAN Rail Realignment - Alternative C

- Bored Tunnel
- Cut-and-Cover Tunnel
- Bridge
- Floodwalls
- Graded
- U-Section
- Tunnel Segment
- Portal Location
- Existing LOSSAN Corridor Track Alignment
- Municipal Boundary

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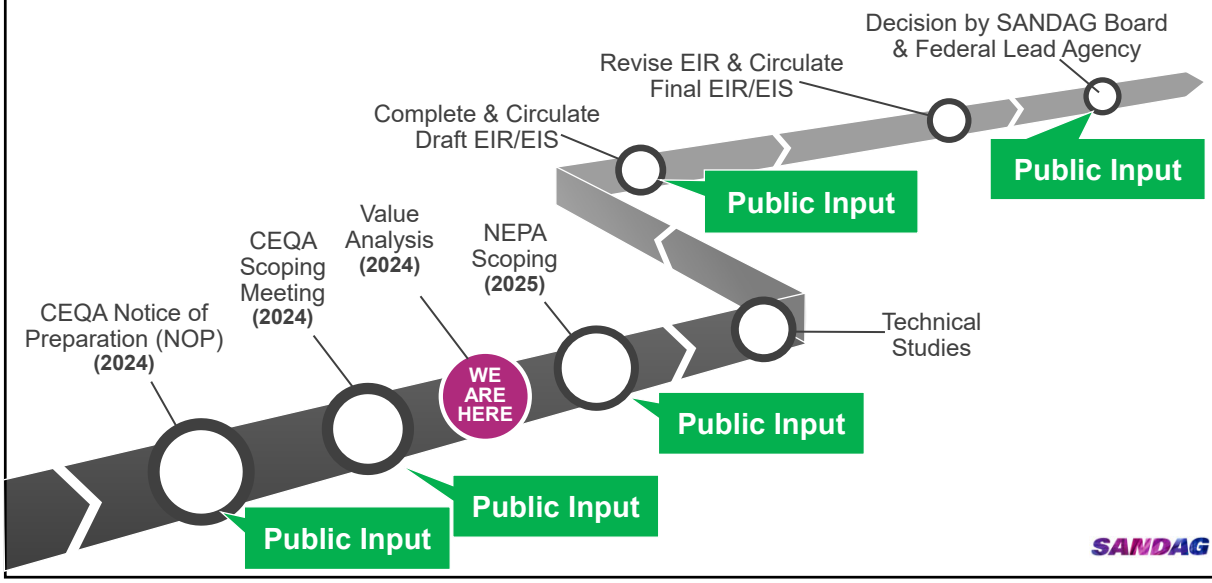
Environmental Process
(CEQA/NEPA)



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I-5 Alignment?

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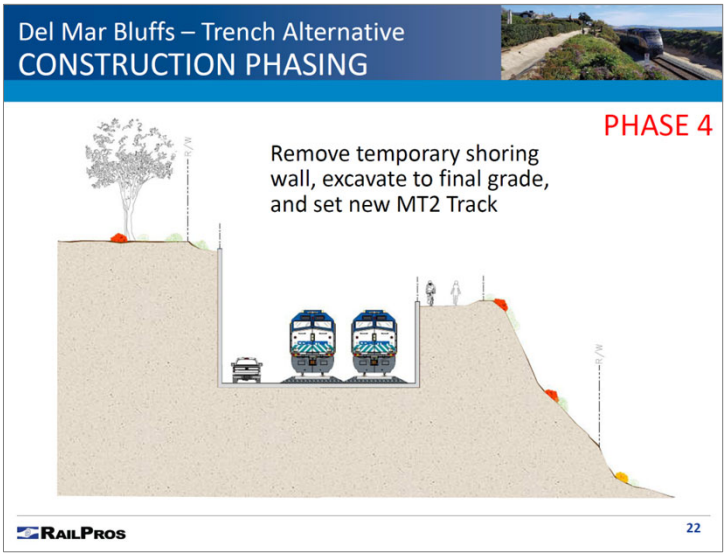
RailPros Trench Option?



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Agenda

- Welcome Remarks & Introductions
- Value Analysis Study Overview
- Project Overview
- Review Public Feedback
- Stakeholder Remarks
- Q & A

Welcoming Remarks

Mario Orso

Chief Executive Officer

San Diego Association of Governments

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Value Analysis Study Overview

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Value Analysis Facilitation

Rob Stewart

Lead Facilitator
VMS, Inc.

Joey Nespoli

Facilitator
VMS, Inc.

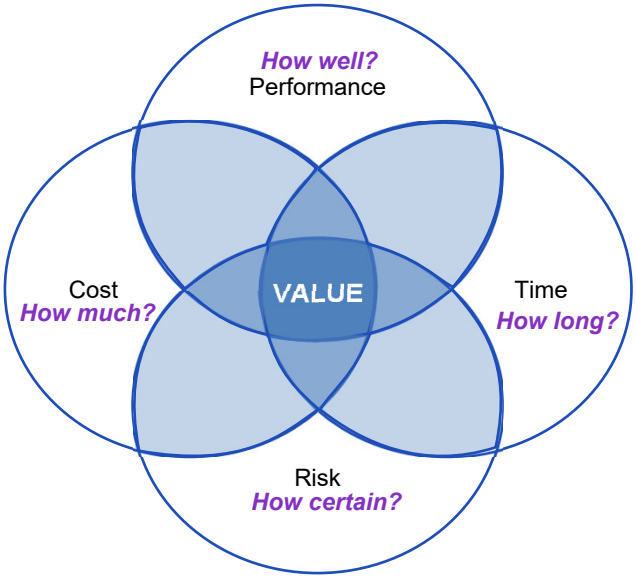
Alexis Rivkin

Facilitator
VMS, Inc.

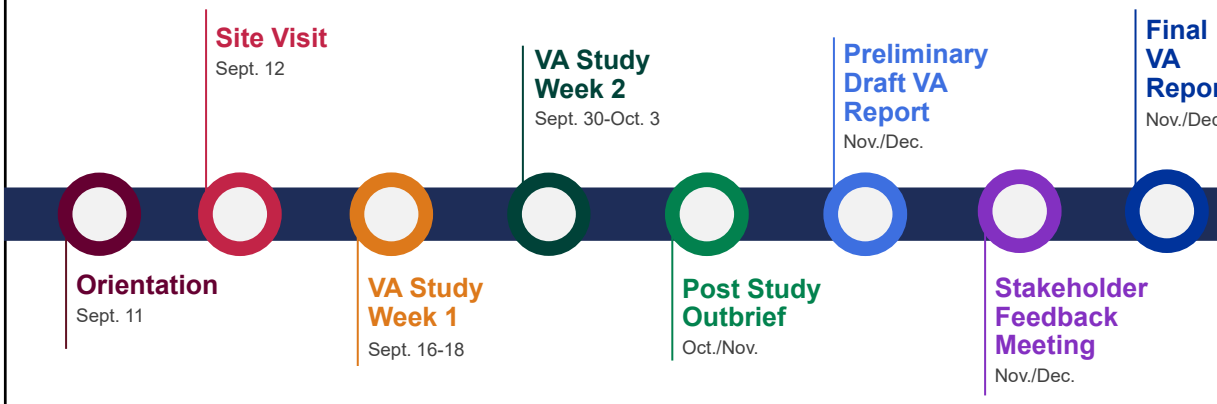
The Value Methodology

A **systematic process** used by a **multidisciplinary team**, led by a qualified VM Facilitator, to improve the **value** of a project, product, process, service, or organization through the analysis of **functions**.

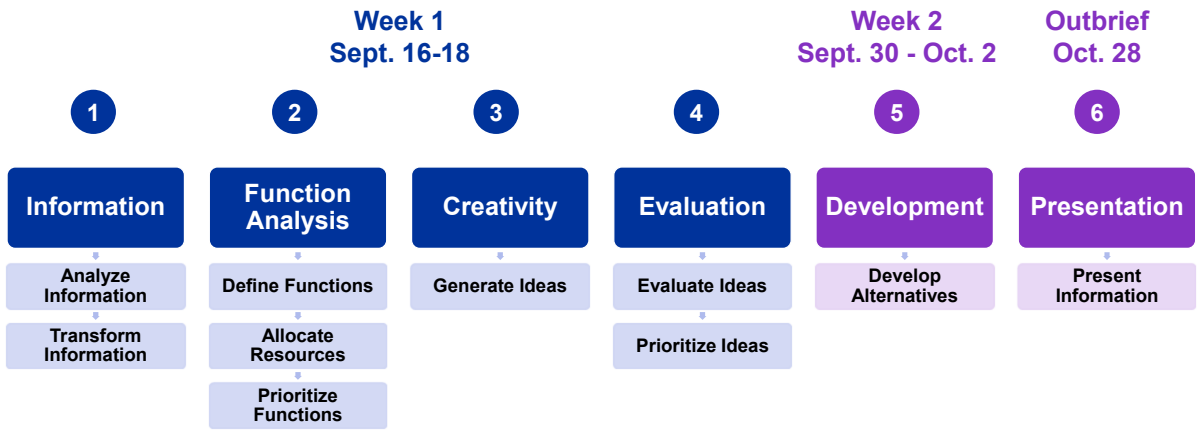
How will we think about value?



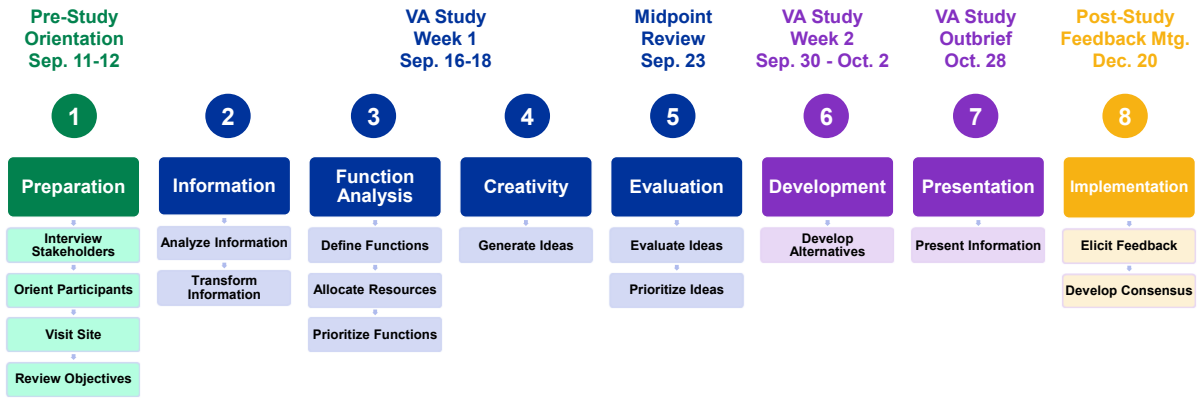
Value Analysis Activities



VA Study Process



VA Study Process



VA Study Ground Rules

- Be present. Be here.
- Assume positive intent.
- Take space. Make space.
- Share from your own perspective.
- Listen with the intent to learn and understand.
- Respect the agenda, the group's time, and the input of others.
- Maintain confidentiality.
  - *Please do not share content from the VA process; official content will be released via reports.*

VMS Value Management Strategies

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Project Overview

Review Public Feedback

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Break

Please return in 15 minutes.

If you have not done so, please scan QR code to sign-in.

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Site Visit Logistics

Site Visit Logistics

Tomorrow, September 12, 2024
8:30AM – 12:30PM

Transit Center
105 N Cedros Avenue
Solana Beach, CA 92075

- Please meet outside the main entrance promptly at 8:30AM.
- Buses will depart no later than 8:45AM.
- Please wear comfortable walking shoes and bring water to stay hydrated.

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APPENDIX C: PROJECT OBJECTIVES FEEDBACK

During the Orientation Meeting that was held on September 11, 2024, several participants expressed interest in revisiting the project objectives identified in the NOP. In response, a two-hour workshop was conducted the morning of September 16, 2024. In this workshop, the VA Team reviewed the original project objectives included in the NOP and provided their input regarding suggested changes. A "Function Analysis" was conducted during the workshop to help better distill and frame the project objectives. This process involves developing concise, two-word statements known as functions that describe the purpose / intent of the objective. The information gathered from this workshop was incorporated into a set of revised project objectives that were presented during the "Development Phase" of the VA Study for review and further, collaborative refinement. Some attendees at the meeting also proposed new objectives for consideration.

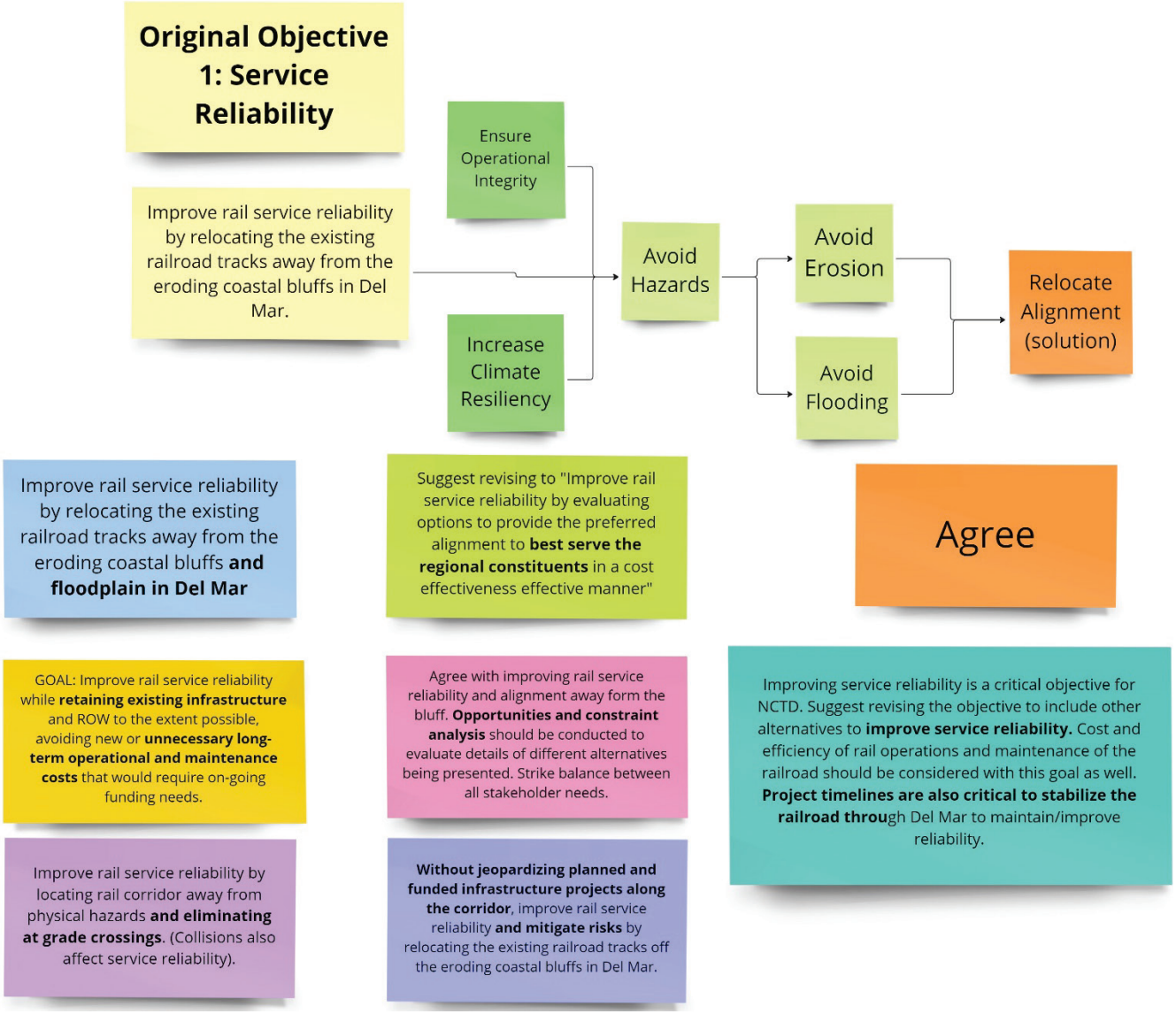
The project team reviewed all feedback received from the Project Objectives Workshop to identify potential edits to the objectives that were included in the NOP. The project team also considered the new objectives proposed. In response, edits were made to the objectives from the NOP and one new objective was added. The project team presented the draft revised objectives to the VA Team during the Development Phase of the VA Study and further refinements were made collaboratively by participants. The revised draft objectives were shared with the VA Team during the Outbrief meeting and additional edits were received during the course of that meeting. The text that follows presents the proposed revised objectives, with underlined text indicating additions and strikethrough text indicating deletions. The text reflects all edits received from the VA Team through and including the Outbrief meeting.

- Improve rail service reliability by minimizing risks from climate change, including consideration of sea level rise, flooding, and the stability of the ~~relocating the existing railroad tracks away from the eroding~~ coastal bluffs ~~in Del Mar~~.
- Maintain passenger rail service to ~~the existing train stations serving~~ Solana Beach and Sorrento Valley and accommodate direct rail access to the 22nd District Agricultural Association (Del Mar Fairgrounds) while minimizing disruptions to passenger and freight service during construction.
- Minimize impacts ~~in the surrounding communities~~ to existing homes, businesses, tourism, and major economic generators, including the Del Mar Fairgrounds, and transportation facilities during and after construction.
- Avoid and/or minimize negative effects, and where possible enhance ~~impacts on~~ biological, cultural, and recreational resources of national, state, or local significance, including publicly owned parks, recreational trails, beaches, wetlands, ecological reserves, wildlife or waterfowl refuges, and any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places.
- Help meet the goals of the ~~2021~~ Regional Plan Regional Plan and the ~~2018~~ California State Rail Plan by increasing passenger and freight train capacity, further reducing travel times, improving

reliability, and ~~accommodating additional rail service~~ considering existing and planned investments.

- Improve coastal access and safety by eliminating at-grade railroad crossings and minimizing ~~other pedestrian-rail~~ points of interaction between rail and all other modes of transportation.
- Demonstrate good public stewardship by delivering the project in a timely way that considers prior investments, construction, right-of-way, operations, and maintenance costs.

The functions related to each objective and the VA Participant and VA Team feedback for each objective is presented below in the Miro board format. Objective 7 as shown in the Miro board format reflects the new proposed objective that was developed during the course of the VA Study. All suggestions received are organized in a tabular format for ease of comparing the suggested revisions.


Original Objective 1: Service Reliability
Improve rail service reliability by relocating the existing railroad tracks away from the eroding coastal bluffs in Del Mar.
Ensure Operational Integrity
Increase Climate Resiliency
Avoid Hazards
Avoid Erosion
Avoid Flooding
Relocate Alignment (solution)
Improve rail service reliability by relocating the existing railroad tracks away from the eroding coastal bluffs and floodplain in Del Mar
Suggest revising to "Improve rail service reliability by evaluating options to provide the preferred alignment to best serve the regional constituents in a cost effectiveness effective manner"
Agree
GOAL: Improve rail service reliability while retaining existing infrastructure and ROW to the extent possible, avoiding new or unnecessary long-term operational and maintenance costs that would require on-going funding needs.
Agree with improving rail service reliability and alignment away form the bluff. Opportunities and constraint analysis should be conducted to evaluate details of different alternatives being presented. Strike balance between all stakeholder needs.
Improving service reliability is a critical objective for NCTD. Suggest revising the objective to include other alternatives to improve service reliability. Cost and efficiency of rail operations and maintenance of the railroad should be considered with this goal as well. Project timelines are also critical to stabilize the railroad through Del Mar to maintain/improve reliability.
Improve rail service reliability by locating rail corridor away from physical hazards and eliminating at grade crossings. (Collisions also affect service reliability).
Without jeopardizing planned and funded infrastructure projects along the corridor, improve rail service reliability and mitigate risks by relocating the existing railroad tracks off the eroding coastal bluffs in Del Mar.

Original Objective 2: Maintain Access

Maintain passenger rail service to the existing train stations serving Solana Beach and Sorrento Valley and accommodate direct rail access to the 22nd District Agricultural Association (Del Mar Fairgrounds).

Connect Modes

Access Destinations

→ Maintain Access

Maintain passenger and freight rail service from Oceanside to San Diego with appropriate station locations

Maintain passenger and freight rail service, with minimal interruptions/absolute work windows, during and after construction.

Ensure the passenger transportation system connects users to destinations. Consider microtransit or other last mile service.

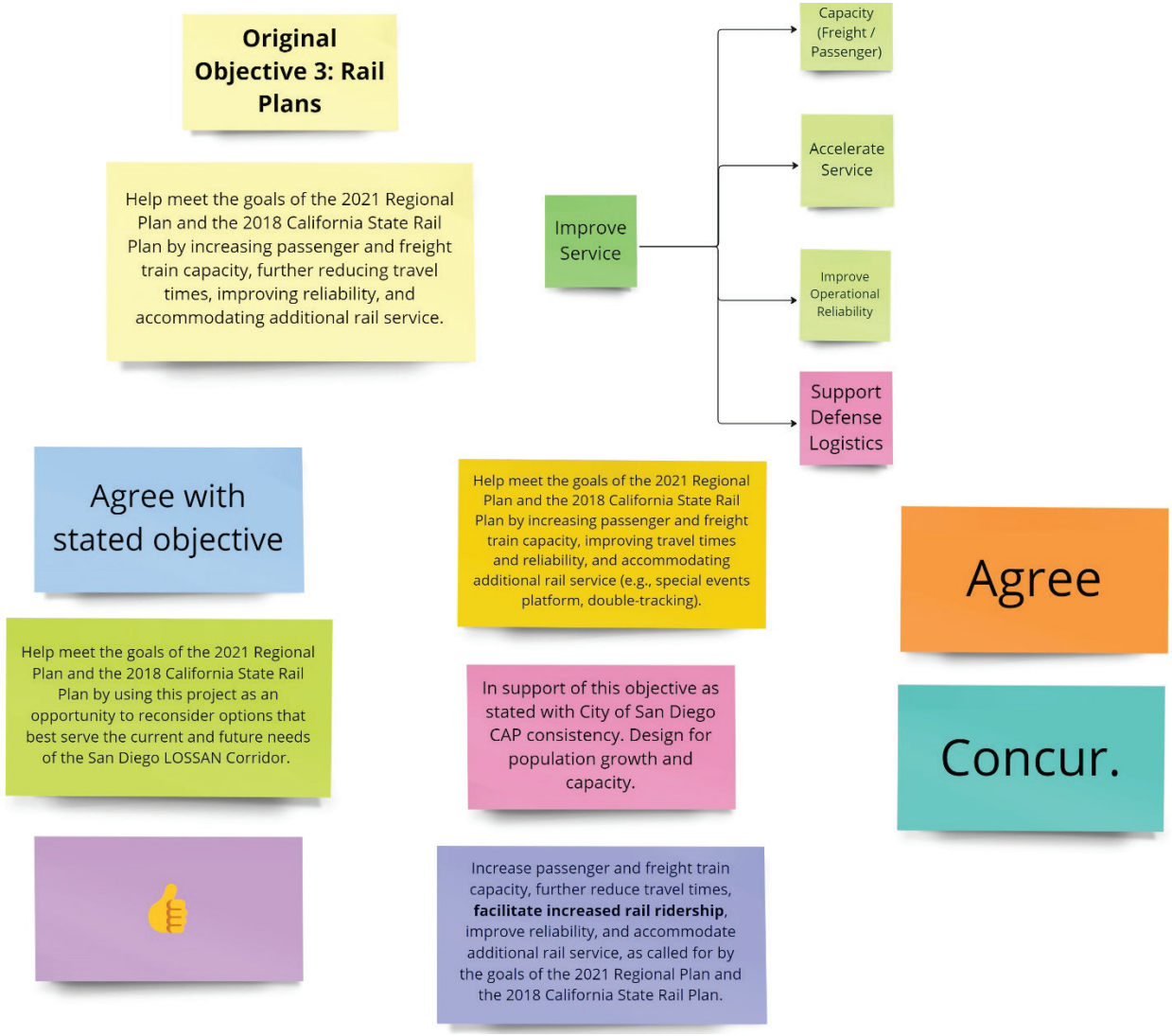
Consider overall goals of a viable San Diego LOSSAN Corridor. How would the additional stop impact service and ridership.. Consider an evaluation of the optimal number of stops for the entire corridor.

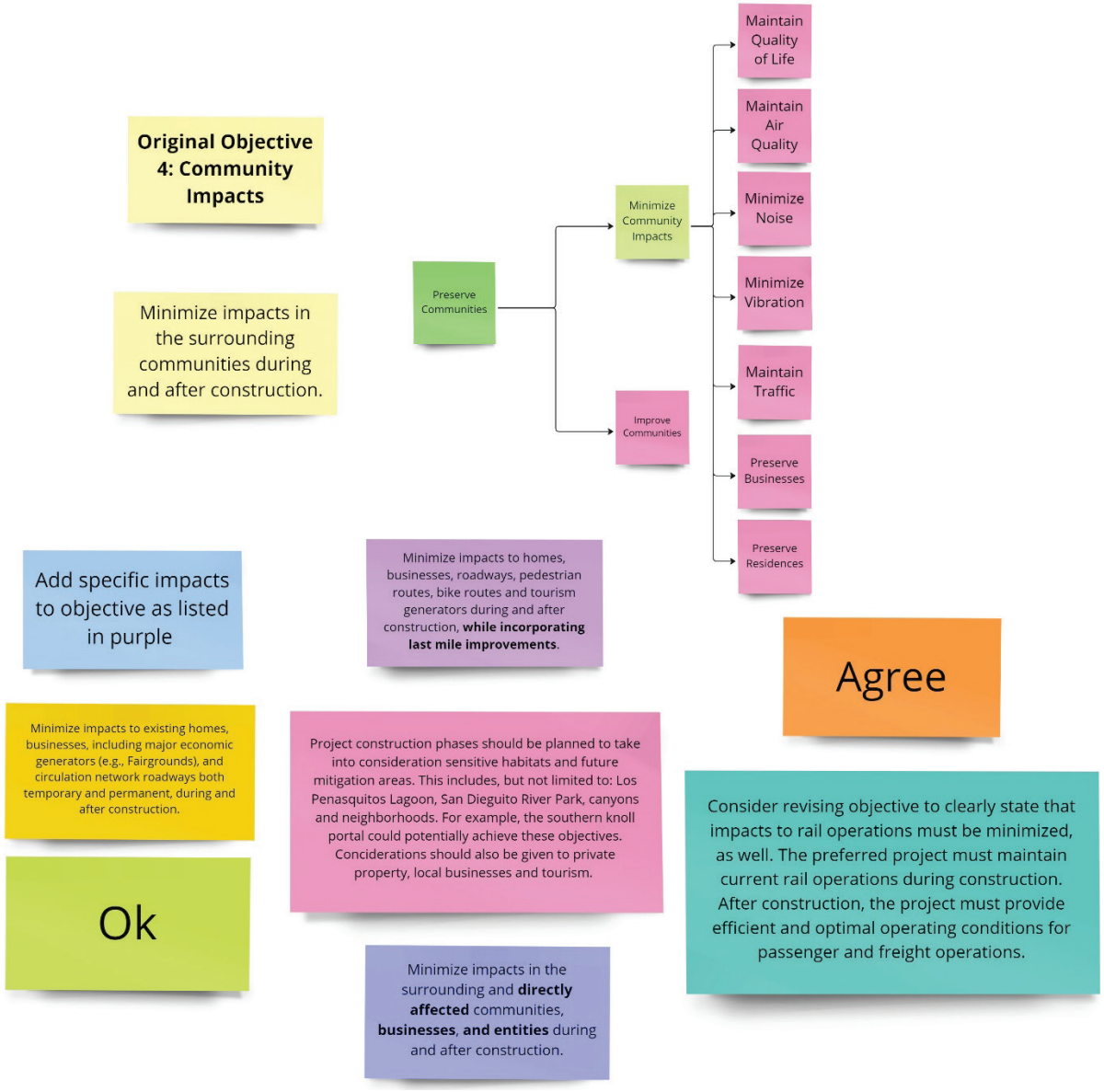
Agree with the stated objective. Additionally, maintain continuity in service and adequate accessibility.

Good as written.

Agree

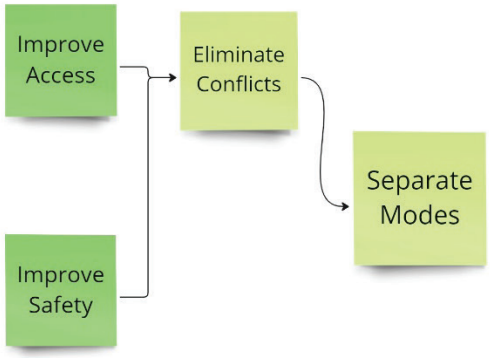
Maintaining passenger rail service between the communities of Solana Beach and Sorrento Valley is critically important for NCTD. The fully funded special events platform at the Del Mar Fairgrounds will provide benefits to the San Diego region and connectivity to this station should be maintained, as well. Should the objective be revised to remove "existing", **analysis should be completed to determine the feasibility of relocated stations.**


Original Objective 3: Rail Plans
Help meet the goals of the 2021 Regional Plan and the 2018 California State Rail Plan by increasing passenger and freight train capacity, further reducing travel times, improving reliability, and accommodating additional rail service.
Improve Service
Capacity (Freight / Passenger)
Accelerate Service
Improve Operational Reliability
Support Defense Logistics
Agree with stated objective
Help meet the goals of the 2021 Regional Plan and the 2018 California State Rail Plan by using this project as an opportunity to reconsider options that best serve the current and future needs of the San Diego LOSSAN Corridor.
Help meet the goals of the 2021 Regional Plan and the 2018 California State Rail Plan by increasing passenger and freight train capacity, improving travel times and reliability, and accommodating additional rail service (e.g., special events platform, double-tracking).
In support of this objective as stated with City of San Diego CAP consistency. Design for population growth and capacity.
Increase passenger and freight train capacity, further reduce travel times, facilitate increased rail ridership, improve reliability, and accommodate additional rail service, as called for by the goals of the 2021 Regional Plan and the 2018 California State Rail Plan.
Agree
Concur.


Original Objective 4: Community Impacts
Minimize impacts in the surrounding communities during and after construction.
Preserve Communities
Minimize Community Impacts
Improve Communities
Maintain Quality of Life
Maintain Air Quality
Minimize Noise
Minimize Vibration
Maintain Traffic
Preserve Businesses
Preserve Residences
Add specific impacts to objective as listed in purple
Minimize impacts to homes, businesses, roadways, pedestrian routes, bike routes and tourism generators during and after construction, while incorporating last mile improvements.
Agree
Minimize impacts to existing homes, businesses, including major economic generators (e.g., Fairgrounds), and circulation network roadways both temporary and permanent, during and after construction.
Project construction phases should be planned to take into consideration sensitive habitats and future mitigation areas. This includes, but not limited to: Los Penasquitos Lagoon, San Dieguito River Park, canyons and neighborhoods. For example, the southern knoll portal could potentially achieve these objectives. Conciderations should also be given to private property, local businesses and tourism.
Consider revising objective to clearly state that impacts to rail operations must be minimized, as well. The preferred project must maintain current rail operations during construction. After construction, the project must provide efficient and optimal operating conditions for passenger and freight operations.
Ok
Minimize impacts in the surrounding and directly affected communities, businesses, and entities during and after construction.

Original Objective 5: Access Improvement

Improve coastal access and safety by eliminating at-grade railroad crossings and minimizing other pedestrian-rail points of interaction.



Agree with stated objective

Improve safety along the existing rail corridor and at at-grade railroad crossings; where new ROW or alignments would exist, grade separation (i.e., above, under, tunnel, etc.) should be implemented.

Agree, should be highest priority goals for the entire San Diego LOSSAN corridor.

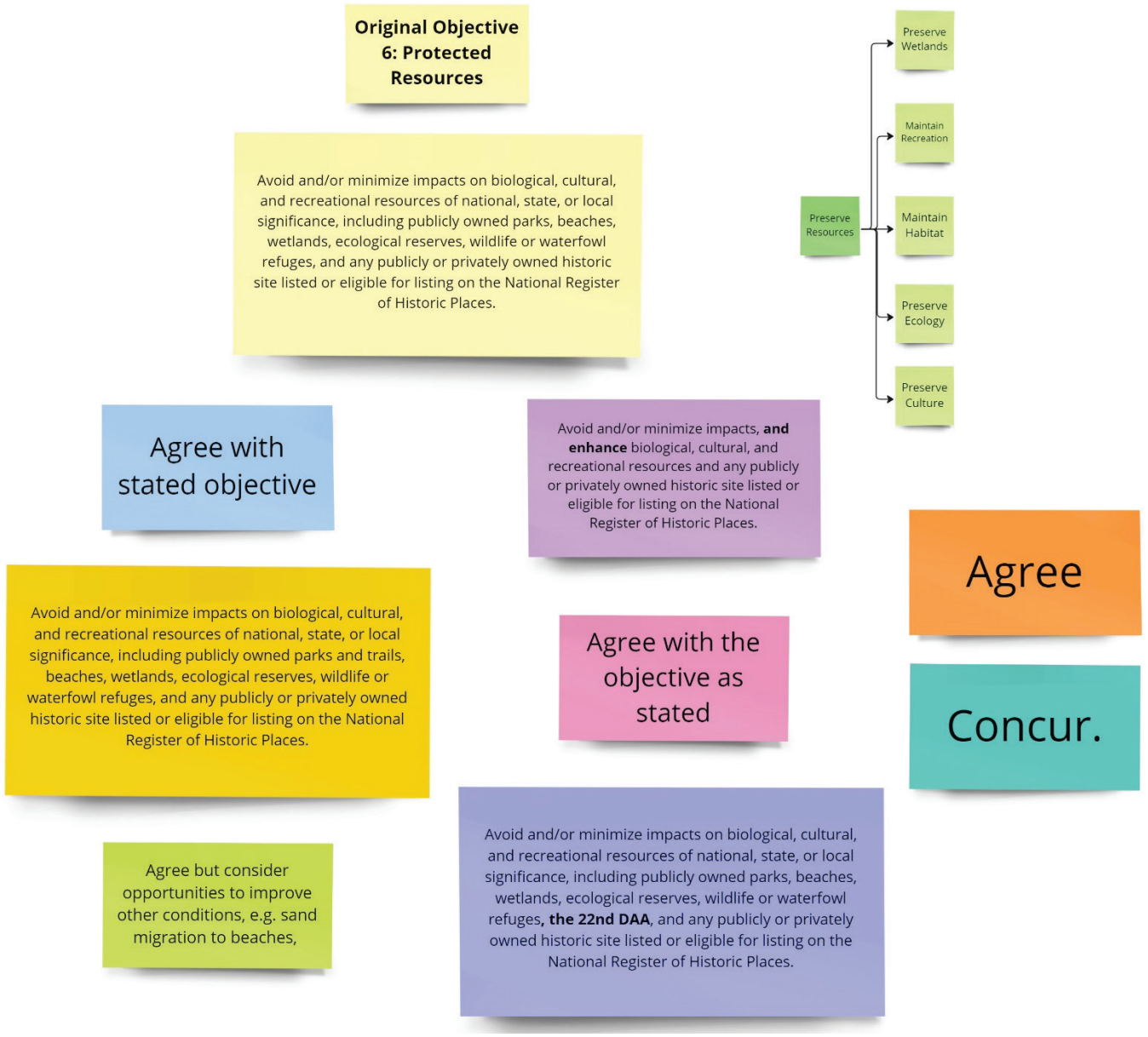
Improve safety and coastal access by eliminating at grade crossings, **addressing sea level rise, and implementing SSMs at rail stations.**

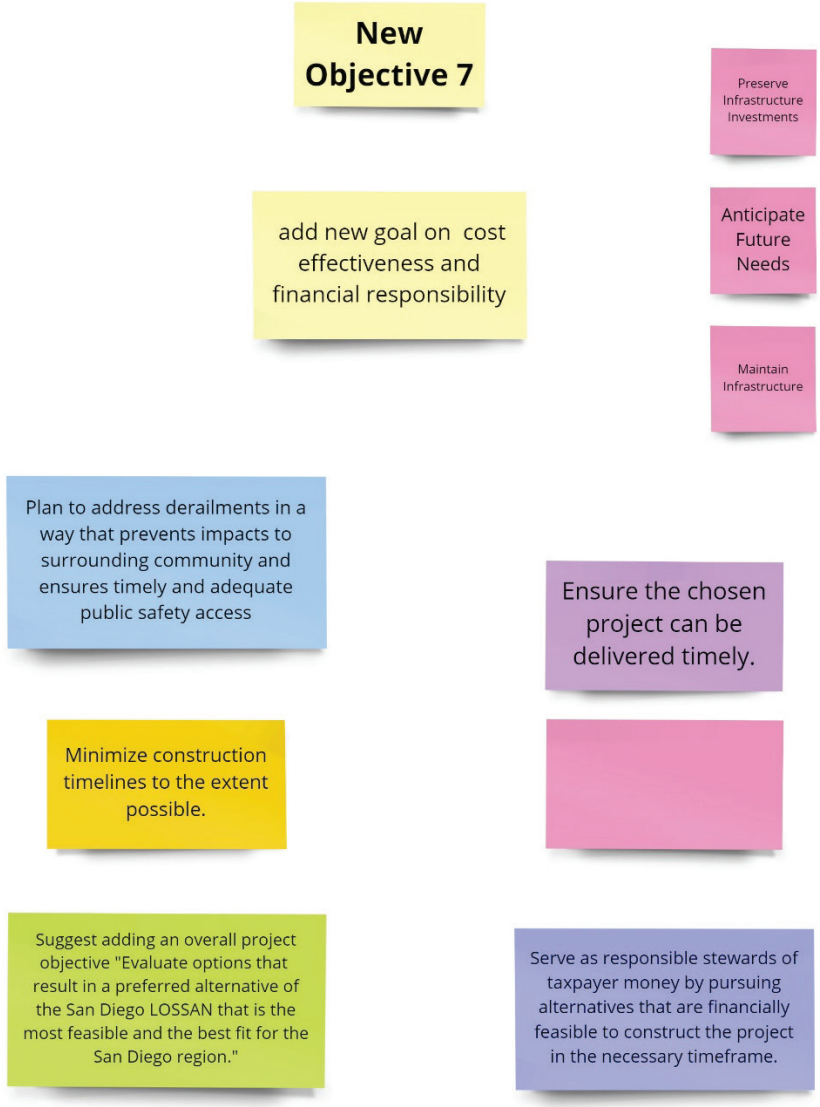
Alternatives should take into consideration all modes of Transporation at crossing points with the objective of minimizing conflicts where feasible.

OK as written.

No comment

Concur.


Original Objective 6: Protected Resources
Avoid and/or minimize impacts on biological, cultural, and recreational resources of national, state, or local significance, including publicly owned parks, beaches, wetlands, ecological reserves, wildlife or waterfowl refuges, and any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places.
Preserve Resources
Preserve Wetlands
Maintain Recreation
Maintain Habitat
Preserve Ecology
Preserve Culture
Agree with stated objective
Avoid and/or minimize impacts, and enhance biological, cultural, and recreational resources and any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places.
Agree
Avoid and/or minimize impacts on biological, cultural, and recreational resources of national, state, or local significance, including publicly owned parks and trails, beaches, wetlands, ecological reserves, wildlife or waterfowl refuges, and any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places.
Agree with the objective as stated
Concur.
Agree but consider opportunities to improve other conditions, e.g. sand migration to beaches,
Avoid and/or minimize impacts on biological, cultural, and recreational resources of national, state, or local significance, including publicly owned parks, beaches, wetlands, ecological reserves, wildlife or waterfowl refuges, the 22nd DAA, and any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places.


New Objective 7
Preserve Infrastructure Investments
add new goal on cost effectiveness and financial responsibility
Anticipate Future Needs
Maintain Infrastructure
Plan to address derailments in a way that prevents impacts to surrounding community and ensures timely and adequate public safety access
Ensure the chosen project can be delivered timely.
Minimize construction timelines to the extent possible.
Suggest adding an overall project objective "Evaluate options that result in a preferred alternative of the San Diego LOSSAN that is the most feasible and the best fit for the San Diego region."
Serve as responsible stewards of taxpayer money by pursuing alternatives that are financially feasible to construct the project in the necessary timeframe.

APPENDIX D: FUNCTION ANALYSIS

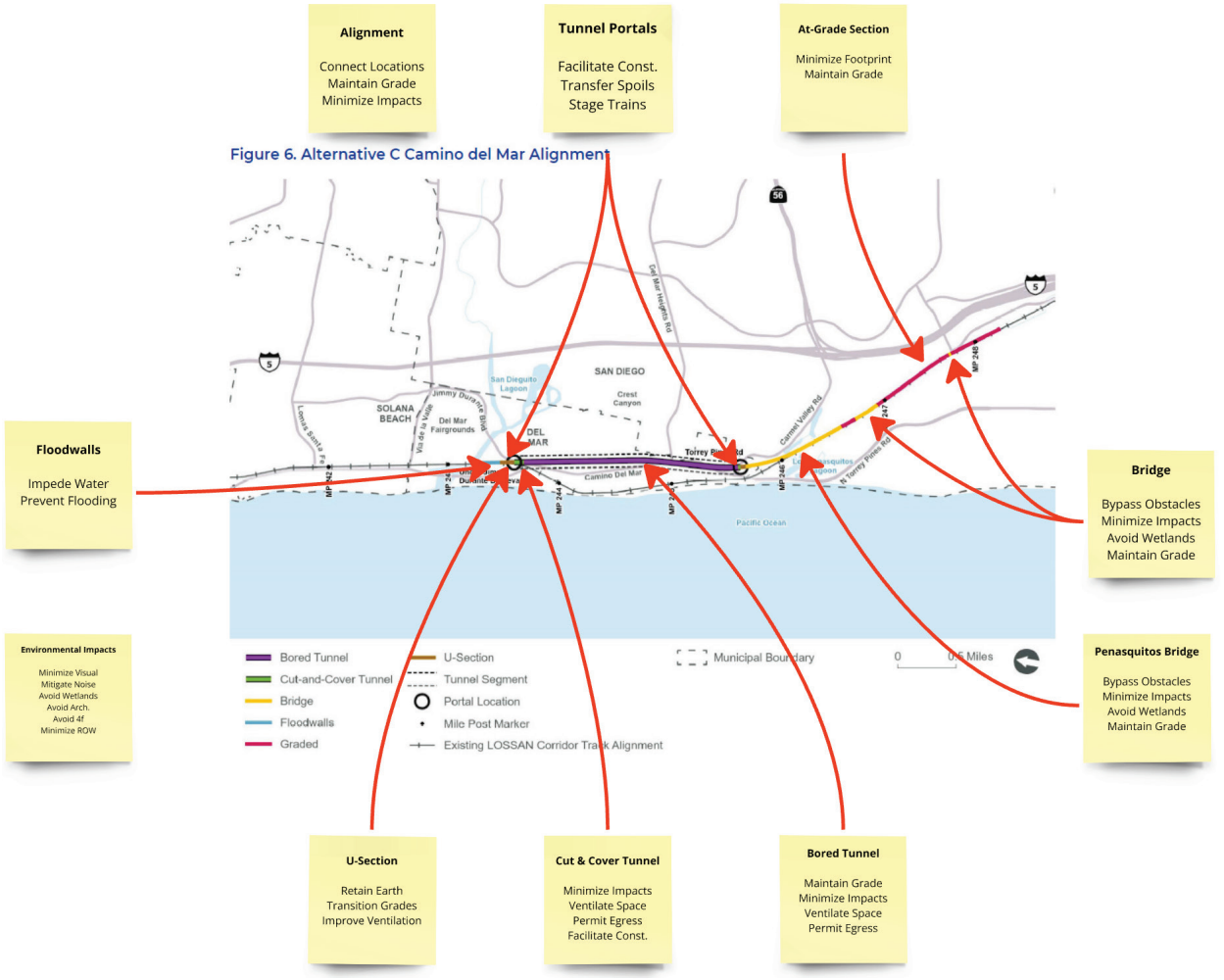
Key to the VA Study is the function analysis techniques used during the Function Analysis Phase. In Value Analysis, a function is defined as a two-word statement, comprised of a verb and a noun, that describes what something does rather than what it is. For example, the basic function of a water bottle might be defined as “Contain Liquid,” as this describes the essential purpose of this object. This process helps the VA Team to better understand the underlying intent of project elements (i.e., their functions) rather than to focus on the current approach or design. This serves as a priming activity as the key project functions identified in this phase are used during the subsequent Creativity Phase where alternative ideas are generated.

The Function Analysis techniques used in this VA Study include:

- Random Function Identification – This technique creates a list of project elements, and the VA Team then brainstorms their related functions.
- Graphic Function Identification – This technique anchors to a visual image, in this case, the various NOP proposed alternatives, and then visually associates function statements with the project features. This technique allows the team to better visualize the functions and their relationships relative to the alignments.

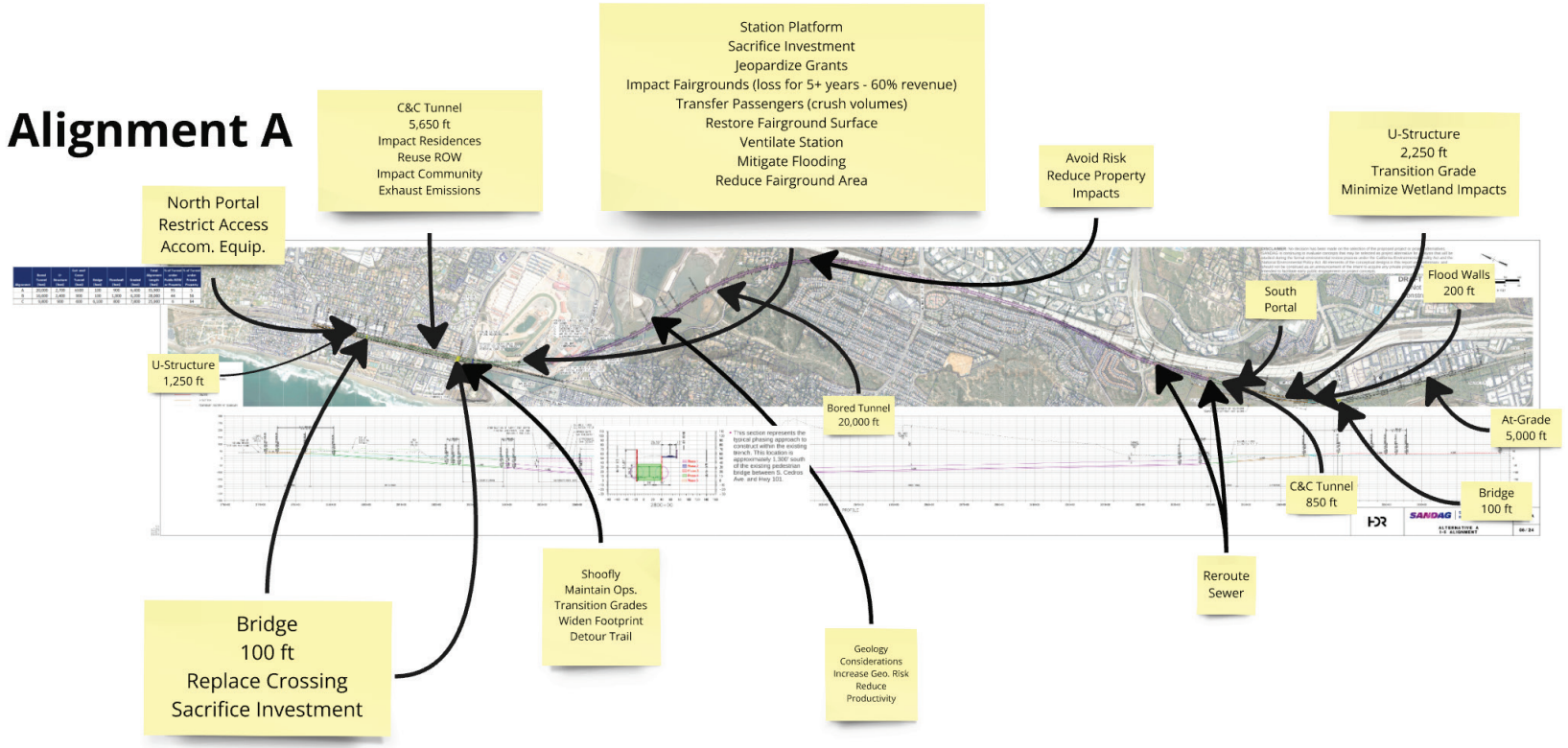
These Function Analysis techniques were conducted to uncover key functional relationships within the project. Analyzing the functions of a project is essential in determining whether the project has been defined in a way that meets the stated criteria, objectives, and purpose. The analysis of these functions in terms of cost, performance, time, and risk is a primary focus in a VA Study and is used to identify areas within a project for value improvement. This procedure is beneficial to the VA Team as it enables the participants to think in terms of functions and their relative value in meeting the project’s criteria, objectives, and purpose. This facilitates a deeper understanding of the project. The key functions were then grouped and prioritized for use as brainstorming categories for the Creativity Phase. This appendix includes content from the Miro board used to analyze the functions of one of the proposed NOP alternatives (all of which shared the same common design elements).

Graphic Function Identification



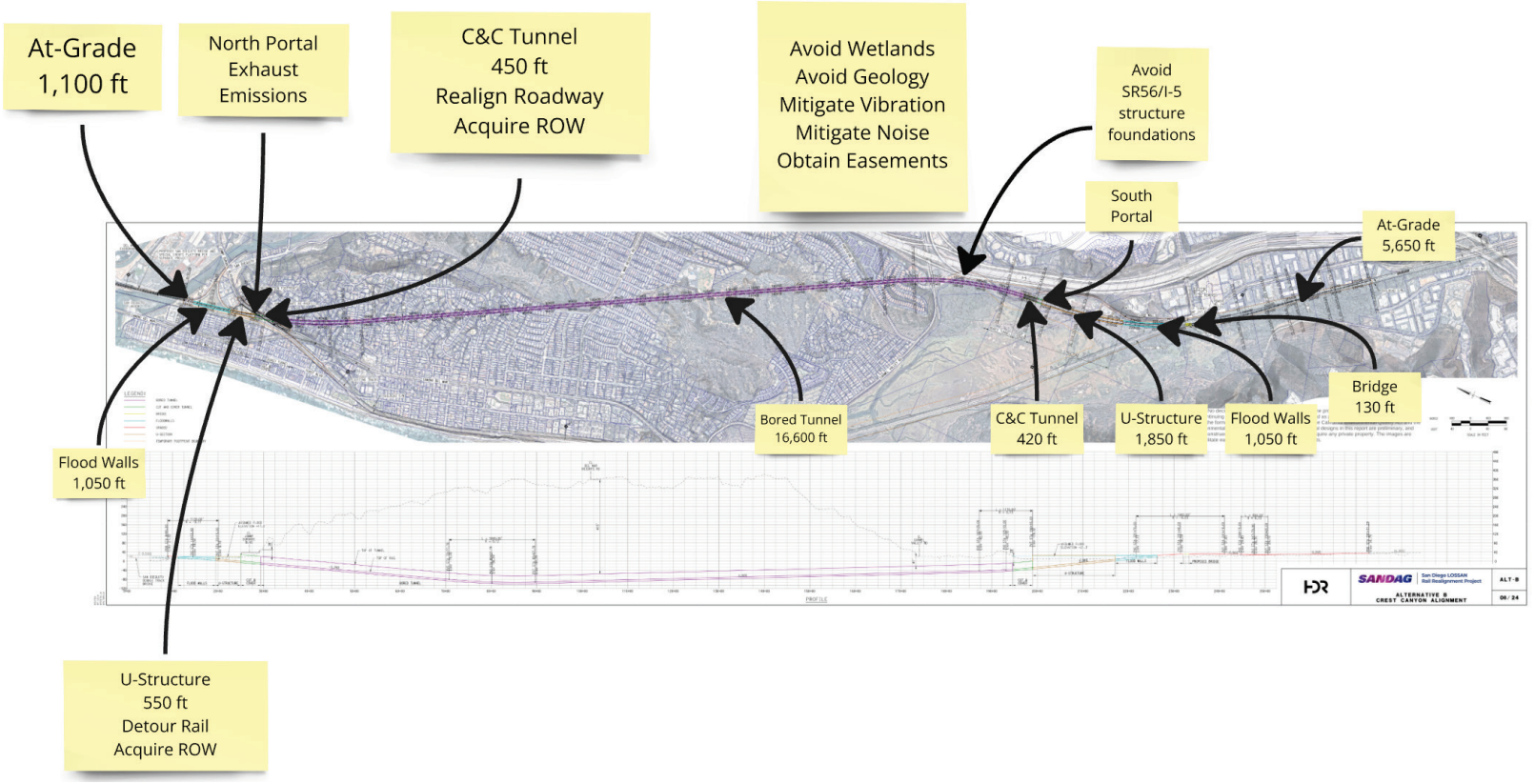
Functions Related to Common Project Elements and Features

Alternative A – Random / Graphic Function Identification

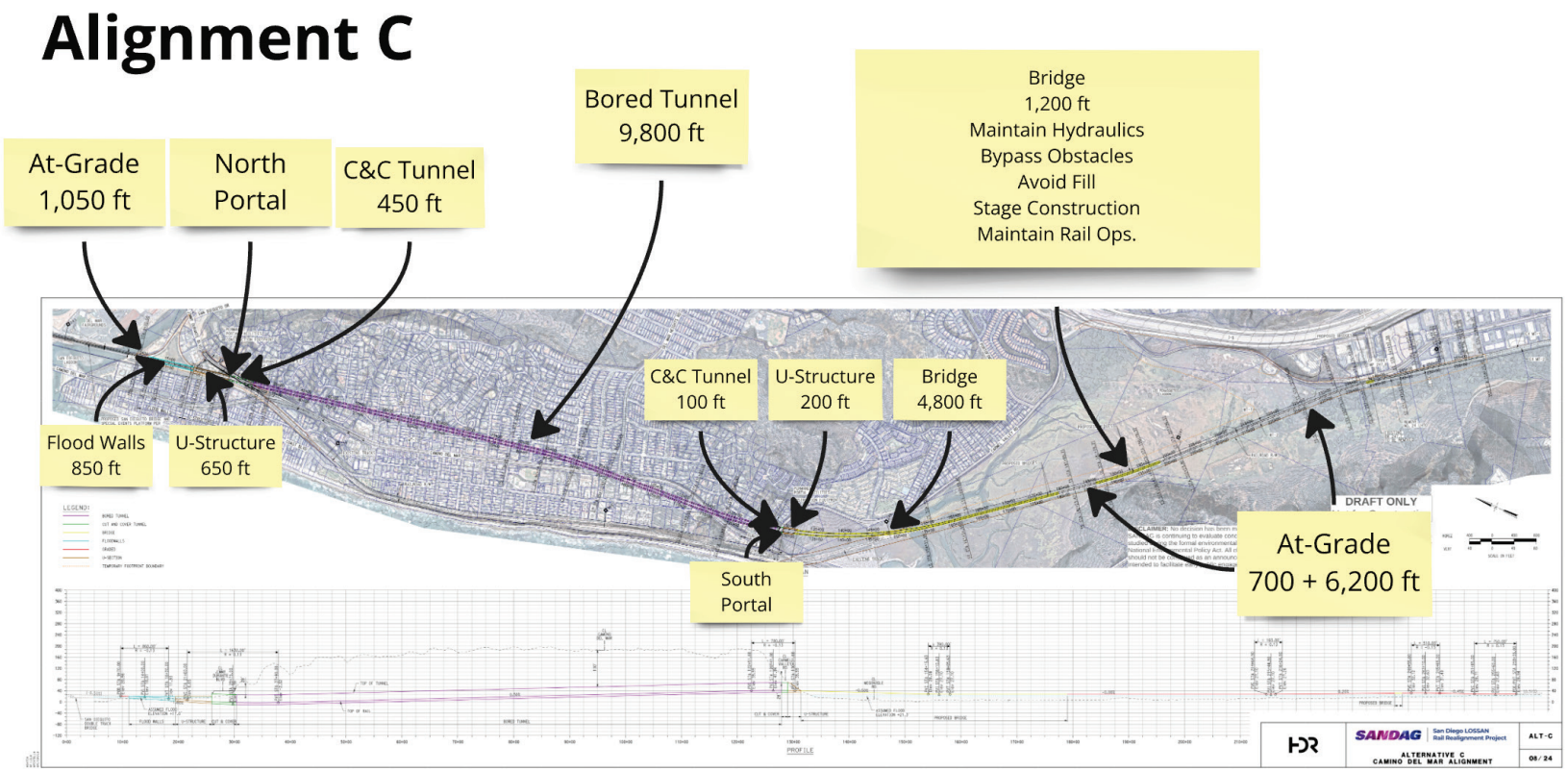


Alternative B – Random / Graphic Function Identification

Alignment B



Alternative C – Random / Graphic Function Identification



APPENDIX E: CREATIVE IDEAS AND DESIGN REVIEW COMMENTS

The Creativity Phase involves identifying and listing creative ideas. During this phase, the VA Team participated in both individual and team brainstorming sessions to identify as many ideas as possible to address the project functions. The judgement of the ideas was not permitted during this phase, as evaluation of the ideas occurred during the next phase of the VA Study. This allowed for the development of over 200 ideas. The idea list that follows includes all the ideas suggested during the study. In addition, the Creativity process also resulted in the identification of numerous design review comments. Both the idea lists and design review comments are included in this appendix.

The VA Team collaboratively created and evaluated ideas using Miro. Each idea received an “idea code” based on the function statement under which it was brainstormed. The following table indicates the functions related to each idea code.

Table E-1: Idea Code Functions

Idea Code	Related Function
AW	Avoid Wetlands
DC	Define Criteria
IC	Improve Community
IOC	Increase Operational Capacity
MCI	Minimize Community Impacts
MEI	Minimize Ecological Impacts
MH	Maintain Hydraulics
MRI	Mitigate Right-of-Way Impacts

Creative Ideas

Mitigate RW Impacts (MRI) | 6

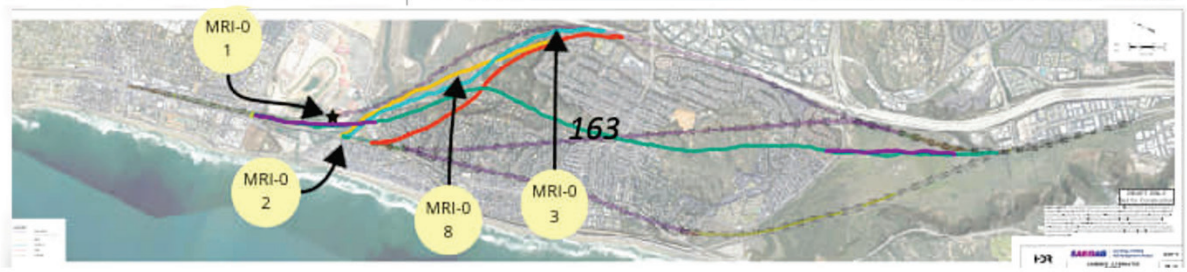
- MRI-01 New bridge over San Dieguito Lagoon and develop new tunnel running under canyon
- MRI-02 Explore tying into San Dieguito Double Track south end and following existing wye to east with bridge structure over lagoon
- MRI-03 Revise Alternative A to start south of the replacement San Dieguito Bridge project, and realign to at or above grade to the I-5
- MRI-04 Keep the entire tunnel profile above any possible flooding elevation to prevent a catastrophic flooding event
- MRI-05 Living levee - on berm from SDDT to JDB, enter tunnel south of JDB
- MRI-06 Relocate the southern portal more south to avoid impacts to the lagoon

Mitigate RW Impacts (MRI) | 7

- MRI-07 Start lowering the rail profile further north to avoid cut and cover at fairgrounds
- MRI-08 East from Jimmy Durante Blvd. above ground as opposed to tunneled until it gets to I-5 and take that to the new knoll portal
- MRI-09 Run alignment next to I-5 and then at grade along San Dieguito Dr. (south side of lagoon)
- MRI-10 Move tie-in further north to avoid cut and cover at fairgrounds
- MRI-11 Limit construction at fairgrounds to end of fair and cleanup to beginning of fair next year.....24 hour work cycle
- MRI-12 Coordinate efforts with living levee or even install as community betterment. Build new rail alignment on top of levee
- MRI-13 Expand coast rail trail on cut and cover (expanded passive park)

Mitigate RW Impacts (MRI) | 6

- MRI-14 Implement flood mitigation for the fairgrounds.
- MRI-15 Reduce Impacts to fairgrounds: Develop staged construction and decking systems to allow traffic/parking on top while excavation and construction being carried out underneath. SEM?
- MRI-16 Keep profile in the sandy soil so that the excavated soil can be placed on the beach. Saves hauling the material away
- MRI-17 Vertical transportation at fairgrounds: Use highspeed elevators. LA Metro has a deep underground station of about 85 ft deep where a system of 6 high speed elevators is used to bring people in and out station
- MRI-18 Consider moving station platform further north, perhaps north of Via De La Valle to reduce impacts to fair ground operations
- MRI-19 Fairgrounds carnival area (and more) with SDLRR spoils to provide resiliency



Mitigate RW Impacts (MRI) | 6

MRI-20 Move midway activities to elsewhere on the property

MRI-21 Build parking structure on east overflow lot or elsewhere on fairgrounds property (could also go below ground)

MRI-22 Northern portal in bluff at S end of San Elijo Lagoon, continue in tunnel to new underground Solana Beach Station then use Alt A alignment, avoiding cut/cover impacts to Fairgrounds

MRI-23 Reduce speeds at fairground to minimize impacts from wider curve alignment

MRI-24 Compensating 22nd ag for loss of revenue during construction

MRI-25 Reexamine I-5 Alt from 2017 Alternative Analysis report --> provide bridge over JDB

Mitigate RW Impacts (MRI) | 4

MRI-26 Make sharper curve and follow I-5

MRI-27 Move elevator banks to the sides of the fairgrounds property

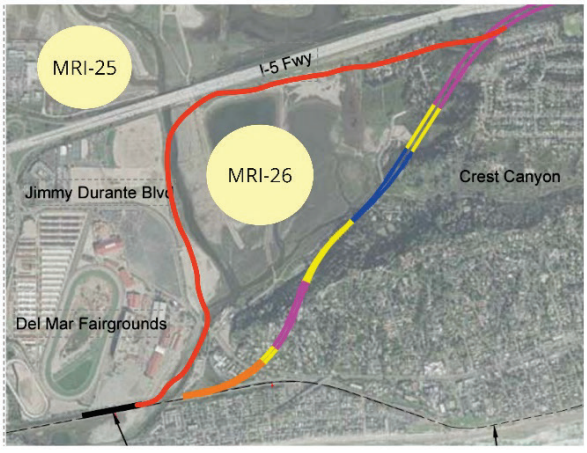
MRI-28 Combine elevator banks and ventilation structures

MRI-29 Alt A - shift station and start tunnel north of Del Mar race track under Via De La Valle to reduce geotech and venue usage concerns. This would create a tighter curve and slower speeds, but this is common south Sorrento Valley station anyway. Events station with some shuttling could still be implemented. New San Diegito Lagoon rail bridge could be cancelled or shifted to use for pedestrian trail/overlook of the ocean and be connected to the fairgrounds via a new ped bridge

Mitigate RW Impacts (MRI) | 2

MRI-30 Alt A -Potential to start alignment modifications further north (say Chesterfield) and convert Solana Station to aerial. Aerial configuration may allow profile to reach I-5 at 2%. Change A to aerial guideway following same alignment. Consider hillside viaduct along I-5. Modifications may resolve flood plain issues and eliminate need for tunneling

MRI-31 To help determine feasible alternatives should conduct benefit/cost analysis similar to the attached



Avoid Wetlands (AW) | 5

AW-01
1) Grade Fill/Raise Portal area with slopes
2) Realign Jimmy D away from homes, raise above cut and cover
3) Replace highway style interchange with roundabout
4) Add active transportation connections
5)Improve Ped Connections east/west across corridor
6) Fill area will allow for staggered portal openings and push portals farther north away from adjacent homes

AW-02 Adjust alignment to cut and cover at JDB & CDM and start boring. Thus avoiding private property eminent domain

AW-03 Bifurcate freight and passenger lines. Separate portals. Consider 3% grade for passenger line

AW-04 Shift southern portal further south and move alignment west to straighten curve for increased speeds

AW-05 move alignment to Crest Canyon sooner for less easement acquisition

Avoid Wetlands (AW) | 3

AW-06 Bore tunnel under existing rail alignment under bluffs

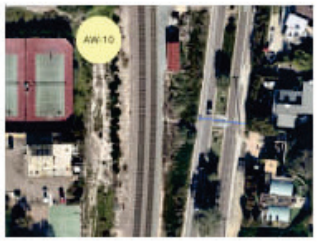
AW-07 Evaluate southern portal to eliminate wetland impacts and flooding of portal

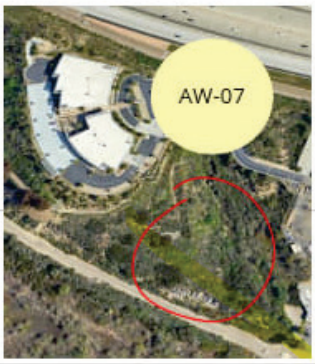
AW-08 Increase radius for Crest Canyon alternative

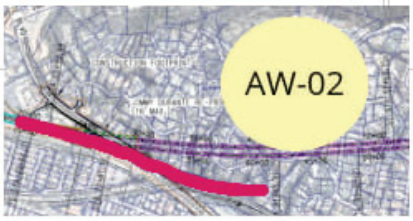
Avoid Wetlands (AW) | 2

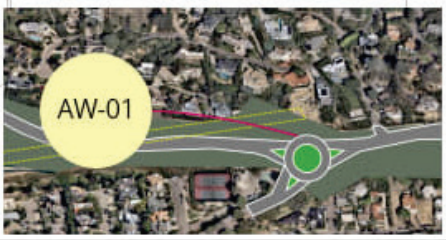
AW-09 Currently the tie-in for the south end is at the San Dieguito Double Track Project. Consider starting sooner to avoid cut and cover into bluff and properties. Cut and cover can be limited to JDB reprofile

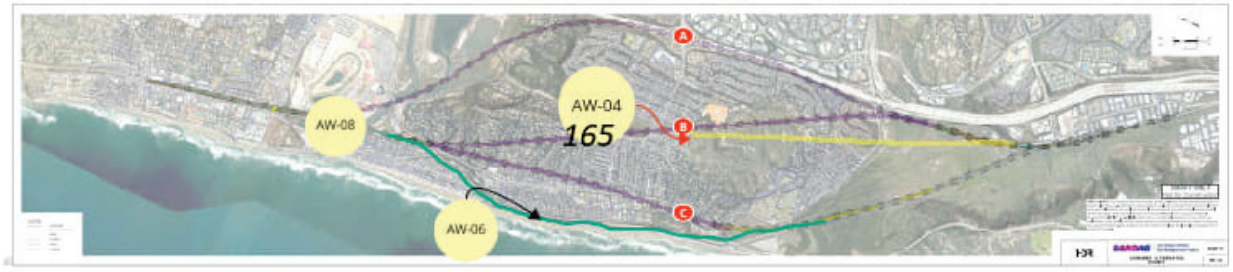
AW-10 Realign utilities and use minimal roadway section for Jimmy Durante











Avoid Wetlands (AW) | 5

AW-11 Move the north portal south to where the bluff is taller with existing retaining walls to minimize property impacts

AW-12 Potential for moving the staging to the commercial parking lots to avoid acquisition at north portal

AW-13 Realign Jimmy Durante Boulevard to connect to 101 further north (Coast to Crest Trail ROW? 28th St?) and open up different portal footprint options. Maintain property access south of David Way at existing grade with dead-end street

AW-14 Maintain existing track as freight-only, use Alt B as passenger-only to loosen design criteria, potentially limit noise/vibration

AW-15 Move northern portal further north along the existing alignment to minimize impacts to private property

Avoid Wetlands (AW) | 5

AW-16 Mitigation to exhaust emissions: Build horizontal tunnel/duct to extend the emission discharge point to the sides of the slopes/bluff, further away from residential areas

AW-17 Vibration mitigation: Use high attenuation direct fixation fasteners to reduce noise and vibration. LA Metro has implemented this mitigation measures for their projects

AW-18 Reduce design speed to avoid crossing over existing alignment

AW-19 Shift Jimmy Durante Road to the west to and extend driveways. Minimize roadway width to minimize ROW impacts

AW-20 Shift Jimmy D to the west to keep a lower profile for properties that need to be acquired anyway

Avoid Wetlands (AW) | 6

AW-21 Shift Jimmy D to the west to minimize residential impacts

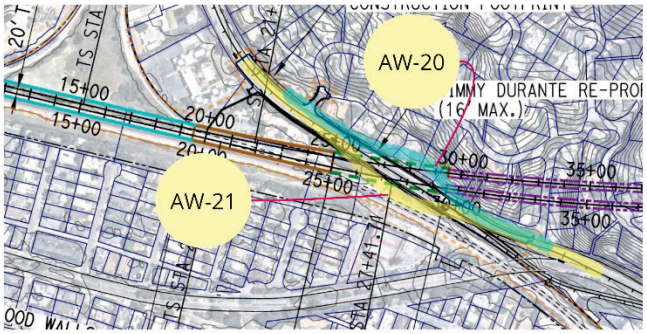
AW-22 Avoid tunneling in liquefiable soil in Penasquitos lagoon

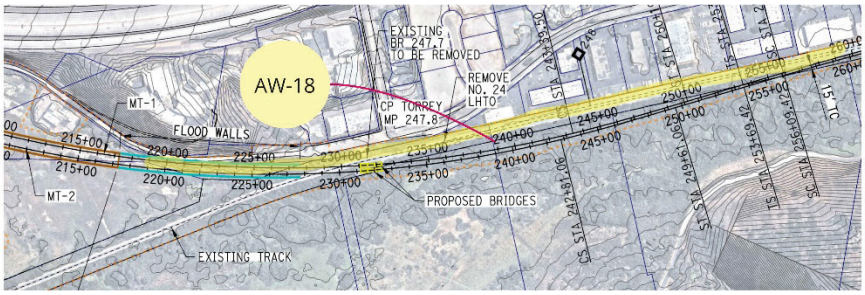
AW-23 Evaluate use of berms or earthen/vegetated levees rather than concrete flood walls where room exists for less visual and environmental impact

AW-24 Take the profile higher into the sandy soils so the spoils can be pumped to the beach

AW-25 Bridge across the liquefiable soils rather than tunnel in them.

AW-26 Place a bike and pedestrian trail on the old railway ROW across the lagoon and connect to Roselle Street





Avoid Wetlands (AW) | 8

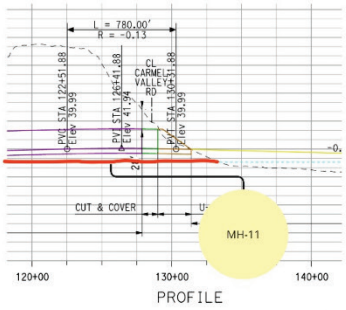
- AW-27 Move south portal to higher ground to minimize flooding impacts
- AW-28 Raise north portal above flooding limits and keep profile above sea level
- AW-29 Move tunnel west of the large trunk sewer on SV bike trail
- AW-30 Minimize property driveway impacts from JDB reprofile
- AW-31 Maintain access to City of Del Mar Public Works Facility
- AW-32 Minimize short and long term impacts to the commercial/office at JDB at the north portal
- AW-33 If Jimmy Durante bridge is replaced, then the old bridge pilings should be removed in their entirety if the tunnel crown is near them. The same goes for the original bridge pilings that are likely located subparallel to the existing JD bridge
- AW-34 Avoid impacts to commercial on JDB south of lagoon because these properties are identified for future housing in Del Mar's housing element

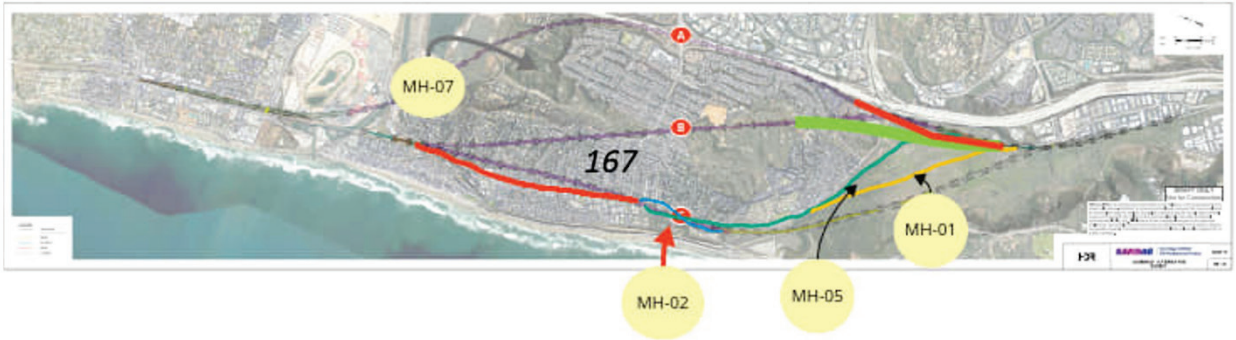
Maintain Hydraulics (MH) | 10

- MH-01 Optimize tunnel vs. bridge or berm for C alignment
- MH-02 Introduce reversing curve to move alignment under Camino del Mar
- MH-03 Shift south Portal to the west to minimize property impacts
- MH-04 Align line under Camino del Mar the whole time with reduced speed requirements
- MH-05 Run alignment on perimeter of lagoon on fill - eliminate bridge
- MH-06 Bored Tunnel
  Remove sag from tunnel to prevent flooding
- MH-07 Alignment remain under CDM the whole time with reduced speed requirements
- MH-08 Consider a reversing curve that would move the alignment under Camino Del Mar to minimize need for R/W
- MH-09 North portal adjustments proposed for Alternative B apply to Alternative C
- MH-10 Run original alignment in tunnel to portal at pump station

Maintain Hydraulics (MH) | 6

- MH-11 Lower Alt C Profile to match 100 yr flood
- MH-12 under CDM alt - look at a cut and cover alternative that maintains 2-way traffic at all times
- MH-13 Raise tracks at north portal to prevent flooding
- MH-14 Either chase the curve back or lower the design speed
- MH-15 Move portal to the west
- MH-16 Use Torrey Pines Beach parking area for laydown





Maintain Hydraulics (MH) | 8

MH-17 Lower elevation of southern portal which would move the enterance into the hill further south and posibly reduce impact to private property situated above Carmel Valley Rd

MH-18 Consider use of shorter bridges with earth causeways and increase wetland restoration enhancement

MH-19 Move southern portal to Sorrento Valley (under second knoll beyond pump station)

MH-20 Tunnel under Camino del Mar and avoid as much private property as possible

MH-21 Straight-line tunnel under Stratford Court instead of CDM to limit private ROW impacts, portal under old Del Mar station

MH-22 Low point is very close to portal, modify so low point is closer to portal entry, easier for locating pumps and outleting

MH-23 The separation between two tunnels at the portal should be reduced as it will reduce the cut-and-cover structure footprint; hence reducing real estate and construction costs. For the anticipated soil condition, a minimum clear separation of less than 10 feet may work; however, it needs to be verified using numerical modeling analysis

MH-24 Keep tunnel in sandy soil layers so that spoils can be placed on beach

Maintain Hydraulics (MH) | 5

MH-25 Bored tunnel should be extended as close to the portal as possible to reduce the cut and cover structure length, which is typically more costly to build than tunnel. The one tunnel diameter ground cover is a rule of thumb and can be reduced depending on the ground conditions and whether there are existing structures immediately on top or not. It can be confirmed using more sophisticated analysis such as numerical modeling. This will reduce construction costs of the cut and cover structures at the portals

MH-26 Bridge in Soledad Canyon extremely long and may have impact to flood plain. Evaluate placement next to Carmel Valley Road, adjacent to middle of floodway for less impact

MH-27 The separation between two tunnels along the alignment should be reduced as well. This will reduce the construction costs of the crosspassages, which are significant cost items as they will be built with SEM methods

MH-28 Impacts to lagoon will require extensive permitting effort from resource agencies. Areas of impact will be newly restored by City of San Diego, without a guarantee of available mitigation credits to be used by SANDAG. Consider mitigation opportunities outside of lagoon

MH-29 Remove the tracks from the lagoon and and add a bike trail

Increase Operational Cap... | 5

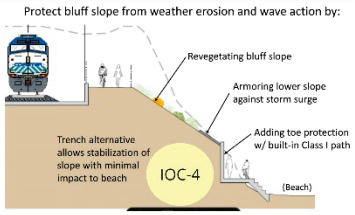
IOC-01 Align rail with I-5 from Oceanside where the rail starts in the center of I-5 to San Diego, consider boring to assist with grading issues and using right-of-way adjacent to I-5 (follow I-5 alignment south to Sorrento Valley Station)

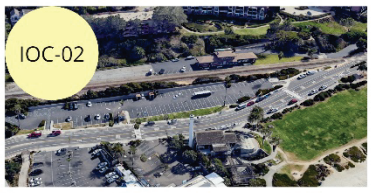
IOC-02 Cut and cover at the old Del Mar train station for double track where it changes to single track

IOC-03 Bifurcate lines with two separate north portals with bored tunnel under Camino Del Mar and Stratford

IOC-04 Remain on the bluffs with double track

IOC-05 Layout Alt. A, B, and C with 90 mph curves





Increase Operational Capacit... | 5

- IOC-06 Relocate all heavy rail along I-15. Replace current heavy rail with electrified light rail, flexible fleets or other future tech. This will provide faster, more efficient, quieter and cleaner
- IOC-07 Two separate north portals with bored tunnel under CDM and Stratford
- IOC-08 Aerial guideway version of Alt. A starting at san elijo lagoon and then increase to appropriate aerial view
- IOC-09 Hybrid arrangement - retrofit existing track for one-way double track and build another track along another alignment (maintain current alignment of one track); use sand for beach nourishment at base of bluffs
- IOC-10 Consider separate alignments for freight and passenger service

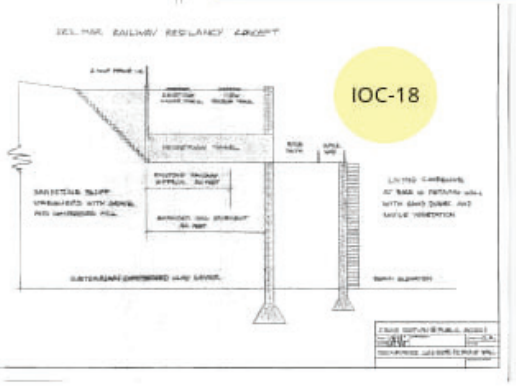
Increase Operational Capacit... | 5

- IOC-11 I-5 alignment from Oceanside where the rail starts in the center of I-5 to San Diego. Consider boring to assist with grading issues. Consider using right-of-way adjacent to I-5. Follow I-5 alignment south to Sorrento Valley Station
- IOC-12 south portal move to south of Miramar
- IOC-13 address connection with OC future alignment for north tie-in
- IOC-14 I-5 alignment above.

  To preserve Carlsbad and Encinitas stations consider transition to I-5 via San Elijo Lagoon as opposed to San Diequito and Penasquitos Lagoons
- IOC-15 Consider improving the existing single track alignment along the bluff and developing a new single track alignment similar to alternative C

Increase Operational Capacit... | 8

- IOC-16 Build more seawalls along the bluffs to stop the bluff retreat
- IOC-17 Bridge or similar "permanent" stabilization of the existing Bluff alignment
- IOC-18 Double track and separate use on existing bluff
- IOC-19 Relocate entire to I-15 from south of Sorento Valley to north of TBD to support 2050 regional plan. (Develop light rail or flex fleets along existing LOSSAN alignment)
- IOC-20 Construct double-track bridge on top of bluffs, eliminate grade crossings by bridging over conflicts
- IOC-21 explore something similar but maintaining higher design speed
- IOC-22 Consider partial aerial version of alignment A9 over Jimmy Durante Blvd, and along the west side of San Dieguito Drive. Special events platform would be on aerial structure
- IOC-23 Give consideration to the I-5 alignment included in the 2022 alignment alternatives analysis report



Increase Operational Capacit... | 6	Increase Operational Capacit... | 3	Minimize Community Impact... | 8
IOC-24 Consider an alignment which goes along San Dieguito Lagoon to Crest Canyon to minimize property impacts	IOC-30 Maintain and stabilize existing rail along the bluff with second rail tunnel along other alignment options	MCI-01 Optimize location of tunnel exhaust vents to minimize air quality impacts
IOC-25 Move existing alignment inland, acquire first row of homes along bluff	IOC-31 Consider higher profiles in the Terraced deposits layer of Torrey sandstone so that excavated soils can be placed on the beach	MCI-02 Can tunneling be stacked (on top) versus side by side?
IOC-26 Consider tunneling along the existing alignment, directly below the trench alternative	IOC-32 Freestanding bridge. Restore bluffs around bridge columns to mimic existing slope	MCI-03 Delay double tracking until it is needed
IOC-27 Bifurcate the double track tunnels (could follow two different alignments and minimize footprint)		MCI-04 Leave track on bluffs
IOC-28 use existing alignment but use a hillside viaduct in bluffs - similar to Santa Monica/PCH area instead of tunnel. May block view for some residents but would be withing NCTD ROW		MCI-05 Improve coastal access on bluffs with safe undercrossing
IOC-29 Relocate LOSSAN corridor to I-5 from Sorrento Valley to Camp Pendleton. Would allow connections to SAN Airport, allow for 200mph+ commuter service with freight parallel. This alt would provide lower ROW costs as already within state ROW		MCI-06 Build full extent of project as early as possible to avoid future construction impacts (rip the band-aid off once, and quickly)
		MCI-07 Turn ROW in Los Penasquitos lagoon into extension of Coastal Rail Trail
		MCI-08 Minimize noise and vibration: Use high attenuation direct fixation fasteners or floating slab system. Comments: Floating slabs are VERY expensive and not likely to be needed, Ballast mats would likely be sufficient for mitigation


Minimize Community Impact... | 8
MCI-09 Cap U-section to move portal openings farther from sensitive areas
MCI-10 Revise "Maintain Traffic" to Maintain multi-modal circulation; bicycling is a critical mode in the proximity of the project
MCI-11 Make tunnels as deep as possible
MCI-12 Business impact fund for businesses impacted during construction (EX: Metro/ABQ Rapid Transit)
MCI-13 Grade separation at all the crossings with all options
MCI-14 Develop additional mid-block ped. overcrossings at Solana Beach over trench
MCI-15 Have NCTD state what uses are not allowed on top of cut and cover alignment (for public info)
MCI-16 Locate tunnel exhaust port off alignment with a connecting lateral duct
Minimize Ecological Impacts (... | 9
MEI-01 elevate train when crossing over wetlands to ensure the function of the wetland is maintained
MEI-02 retain trails as recreational resources
MEI-03 Plant trees around portals to minimize visual footprint and (partially) alleviate GHG impacts at tunnel openings
MEI-04 Remove all berms through lagoon, only use bridge structure
MEI-05 When designing the rail ROW, habitat corridors (undercrossing) for deer and other wildlife should be considered in and around lagoons
MEI-06 Offset of impacts to Fairgrounds recreational uses financially
MEI-07 Preserve wetlands
Do not place tunnels under wetlands
MEI-08 Advance railroad electrification efforts to align with project timeline to limit post-build project emissions
MEI-09 Electrify the entire LOSSAN corridor, less emissions, quieter, more efficient
Minimize Ecological Impacts... | 8
MEI-10 Consider overhead catenary in tunnels
MEI-11 Look at options for electric trains that allow for smaller tunnels
MEI-12 Open up river mouths for biological, sand, and flood control
MEI-13 Coordinate with Penasquitos Lagoon restoration
MEI-14 Coordinate construction activities with funding Phase 2 of the Penasquitos Lagoon restoration
MEI-15 Include additional off-site wetlands mitigation as part of project as a trade-off for maintaining some berm/fill in wetland
MEI-16 Consider different alignments through lagoon - bridge along flow path could be more impactful to existing wetlands
MEI-17 Preserve wetlands area --> avoid lagoons completely

Define Criteria (DC) | 13

- DC-01 Consider South side of new San Dieguito Bridge to Sorrento Valley Station
- DC-02 What year will it be needed based on state rail plan and growth in passenger and freight trains?
- DC-03 Shorter travel time could be achieved with shorter alignments maintaining existing corridor design speeds
- DC-04 What is cost benefit of increasing speed from 90mph to 110mph? What is a competitive cost benefit ratio?
- DC-05 Add overhead electrification to accommodate future electrification
- DC-06 Coast Blvd can be grade separated with a trench
- DC-07 Layout Alternatives A, B, and C with 90 mph curves
- DC-08 Minimize tunnel separation at portals. Settlement wouldn't be an issues for this project even near the tunnel portal
- DC-09 Layout A/B/C with 3% grade and move freight elsewhere
- DC-10 Seawall the rest of the bluffs (~1 mile)
- DC-11 Tunnel deeper where possible for perception
- DC-12 BFE + SLR too conservative in LP lagoon
- DC-13 Minimize ground cover requirement of one tunnel diameter at portal

Improve Community (IC) | 13

- IC-01 Regional beach renourishment opportunities from the spoils of the project
- IC-02 Abandoned rail ROW could connect coastal rail trail in Solana Beach to City bike path in Sorrento Valley
- IC-03 Park/trail on Del Mar Bluffs after tracks are (potentially) removed
- IC-04 Focus on interesting portal architecture to make them a community icon or art piece in addition to a functional structure
- IC-05 Murals on seawalls
- IC-06 Add rail trail on cantilevered structure adjacent to San Dieguito Double Track bridge to continue Coastal Rail Trail south from Solana Beach
- IC-07 Jimmy Durante Boulevard/ CDM roundabout to improve JDB connectivity to north Del Mar
- IC-08 Add public viewing platform at south portal facility for ocean/ lagoon views
- IC-09 sand and soil removed for projects should be planned for programmatically as part of this project for beach nourishment along the bluffs
- IC-10 Connect fairgrounds to coast/natural resources through multi-use trails, nature trails, etc.
- IC-11 Park on cut and cover portions of alternatives
- IC-12 Consider improving the existing drainage system near Solana Beach sewer pumpstation.
- IC-13 Build affordable housing on former railroad ROW

Improve Community (IC) | 14

- IC-14 Underground overhead utilities at impacted locations.
- IC-15 Cell tower repeaters in tunnel
- IC-16 Repurpose old San Dieguito bridge beams for public sculpture near project
- IC-17 Enhanced coastal access from the bluff to the beach after relocation of the tracks
- IC-18 Consider Improving the existing unimproved portion of the Stevens creek downstream of the concrete double box culvert discharge point in the Fairground
- IC-19 Consider new connections across rail corridor. Vehicle and/or bike+Ped
- IC-20 Consider reconfiguration of the Jimmy Durante/Camino Del Mar Intersection. Potential to tie CDM perpendicular to Jimmy Durante. May improve safety for cyclists and pedestrians
- IC-21 Public arts projects for impacted communities
- IC-22 Increase frequency of passenger train service
- IC-23 additional traffic enhancements, such as shuttle services during construction
- IC-24 offer discounted transit services during construction
- IC-25 repurpose of construction staging areas
- IC-26 Improve active transportation for impacted and surrounding roadways
- IC-27 Compensate businesses for impact

Improve Community (IC) | 13

- IC-28 Hold educational events before and during construction
- IC-29 Have tent at farmers markets to promote awareness and education
- IC-30 Hold regular public meetings on updates at local businesses during construction
- IC-31 Encourage contractor and employee use of local businesses during construction (consider subsidies)
- IC-32 Improve bike storage facilities at existing station to support enhanced ridership
- IC-33 Co-locate bike/ped facilities with at-grade / or bridge segments
- IC-34 Implement long term bluff stabilization measures at portals
- IC-35 Incorporate noise baffles and other architectural sound deadening into portal structures to limit surface noise
- IC-36 Add RGB LED lighting in tunnel to make journey interesting, partially make up for lack of views
- IC-37 improve recreational parks and active transportation improvements to better the cities
- IC-38 roadway and active transportation enhancements for roadways used for access during construction
- IC-39 Provide regular updates to city councils of impacted areas during construction
- IC-40 Widen flood channel as a community betterment

Design Review Comments

The following is a list of design review comments developed during the Creativity Phase. The list documents the ideas as they were documented on the Miro board.

1. Alternative A
   - 1.1. The Exhibit Hall at the Del Mar Fair Grounds is likely support of deep pile foundations that could interfere with tunnel construction
   - 1.2. Will require buy off from private utility companies as they will need to relocate utilities to accommodate alignment. Utility conflicts are often a big barrier to not only construction timelines, but also design
   - 1.3. Keep in mind the existing interceptor gravity sewer north of Pump Station 65
   - 1.4. Note that horse racing, festivals, and other events occur at the Fairgrounds from July-May, outside of the Fair
   - 1.5. Lagoon water is saline and very corrosive compared to normal non-saline groundwater found in areas above sea level
   - 1.6. Ongoing train operations should not create further impacts to CRT or businesses on Cedros Avenue
   - 1.7. Consider southern impacts to ensure that footprint does not impact previously mitigated areas where mitigation ratios would be higher
   - 1.8. Technical opinions expressed in appendices to the main report. Create potential for differing site conditions and increase in project cost
2. A TBM exiting the Tertiary soft rock and entering young loose saturated lagoon sediments consisting of clean micaceous sands may have difficulty transitioning from a competent material to an incompetent material
   - 2.1. Consider early and frequent outreach to impacted property owners to reduce the risk of eminent domain
   - 2.2. How does construction impact the Brigantine at Via de la Valle and Coast Highway
   - 2.3. Pause surface-impacting construction during peak fairgrounds activity season
   - 2.4. Consider all costs of interruptions to Fairgrounds events, operations, and activities, as well as the right-of-way acquisition from the property owner, the 22nd DAA
   - 2.5. Buoyancy conditions of a deep tunnel in saturated lagoon sediments may be of considerable concern with respect to the tendency for flotation
   - 2.6. Critical to obtain geotechnical data early
   - 2.7. If ground improvement (i.e., just grouting, deep soil mixing...) are required in alluvial sediments of the lagoon, then it may be required to perform remedial activities at the ground surface in an environmentally sensitive area
   - 2.8. Strong vibrations induced by diesel locomotives in the tunnel segment within the lagoon alluvial deposits may induce liquefaction and cause settlement or flotation of the affected tunnel segment
   - 2.9. The proposed below ground seasonal station at fairground would require continues and costly dewatering system and permitting from regional board
   - 2.10. Consider impacts to low-cost visitor serving uses
   - 2.11. Minimize any staging or permanent construction in floodway of San Dieguito
   - 2.12. Public may not take kindly to loss of grant funding for bridge. Could create PR nightmare and negatively impact public opinion on overall project
   - 2.13. May not be feasible to tunnel in the liquefiable soils

2.14. Consider potential costs of acquisition in lagoon - much of the land is owned by river park JPA
2.15. Avoid impacts to Del Mar Public Works facility
2.16. Providing site infrastructure
2.17. Considering the other entity involved (state lands)

3. Alternative B
   3.1. Review assumptions regarding flooding at both portals and ensure sufficient factor of safety is used. Refinements to tunnel profile could mitigate some flood risk
4. Alternative C
   4.1. Geology concerns: The modern TBM technology would be able to cope with the anticipated ground conditions. The soil liquefaction issue can be mitigated with ground improvement from below ground surface without impacting the lagoon
   4.2. Avoid impacts to City of San Diego Phase 1 lagoon restoration project
   4.3. As part of lagoon restoration, beach nourishment was considered by the City of San Diego but was difficult to get permitted through the USACE due to high percentage of fines. May encounter same scenario with this alignment if looking to replenish beaches with excavated material
   4.4. Relocate Utilities at south portal: If they are not in direct conflicts with the tunnel, they can be protected in place. There are many techniques that can be used such as ground improvement or retrofit in advance.
   4.5. Avoid foundation at south portal: the bridge foundation can be retrofitted if needed. This has been done on many tunneling projects and can be engineered out in the later phase of the project
5. New Alternatives
   5.1. Reduce ROW impacts: We should coordinate with the related entities to allow joint development of space on top of C&C tunnel and portal. This is typically done for subway systems. LA Metro design subway station structures that allow building high-rise structure on top. It just needs proper coordination to allow the anticipated loads to be incorporated into the design. This applies to all alternatives
   5.2. Construction risk analysis
   5.3. Issues related to Design-Build, project delivery, or Design-Bid-Build delivery
   5.4. Number of underground utilities and their potential for leak (EX: LA Metro Hollywood tunnel and Portland CSO tunnel)
   5.5. Include in appendices field drilling logs on each boring and lobatory tests
   5.6. Number of above ground utilities and their impact to the community
   5.7. Geology concerns: The modern TBM technology would be able to cope with the anticipated ground conditions. The soil liquefaction issue can be mitigated with ground improvement from below ground surface without impacting the lagoon
   5.8. Avoid impacts to City of San Diego Phase 1 lagoon restoration project
   5.9. Vertical profile issues (soft soils, flowing sands, soft rock, hard rock) à Need dual operation (open face and closed face operations) but TBM is very expensive
   5.10. Schedule for Geotech baseline report (GBR)
   5.11. As part of lagoon restoration, beach nourishment was considered by the City of San Diego but was difficult to get permitted through the USACE due to high percentage of fines. May encounter same scenario with this alignment if looking to replenish beaches with excavated material
   5.12. Allow for construction of special events rail platform at the Fairgrounds, as planned and funded

5.13. Explore the relative merits or impacts associated with constructing bridge structures over lagoons as compared to constructing tunnels under lagoons
5.14. New alignment concepts must be realistic from a cost and timeline perspective. Funding must be able to be secured from outside sources – alignments must consider the availability of local, state, and federal resources

6. Minimize Community Impact Concepts
6.1. Locations of air emissions vents from enclosed rail ROW should be vented in a manner that does not result in concentrated emissions near residences without carbon absorption (e.g. Madrid road tunnels)
6.2. Avoid prolonged construction in business areas
6.3. Locate portals as far from residential as feasible
6.4. Provide internet access for passengers
6.5. Ensure major arterials (east/west and north/south) for each city are maintained during construction
6.6. Pre-evaluate abandoned water and sewer lines, leakage during tunnel mining can create major change order (EX: LA Metro Tunnel-Hollywood and CSO Tunnel-Portal OR)
6.7. Provide cell phone coverage in tunnel
6.8. Ensure coordination with Fairgrounds events – creation of traffic control plan to improve flows
6.9. Reduce/avoid sudden and loud noises
6.10. Identify above ground utilities (power, cable, telephone). Avoid damage during construction.

7. Minimize Ecological Impact Concepts
7.1. Reduce/minimize impacts to existing restoration efforts
7.2. Berm construction within a wetland should be limited to when the rail is running in parallel (generally) with the flow of water
7.3. Revise “Preserve Culture” to “Preserve Cultural Resources – Historic, Prehistoric, Archaeological, Native American”
7.4. Minimize work in floodplains. Check floodway boundary and align to avoid floodway as much as possible

8. Challenge Design Criteria Concepts
8.1. Flooding - Update design criteria for sea level rise
8.2. Tunnel Drainage - Protect against catastrophic flooding by raising invert
8.3. Track Elevation needs to be above flooding elevations.
8.4. Design Speed - How much will ridership increase with higher design speed?
8.5. Flood Elevations - Update flooding criteria from storms considering climate change
8.6. Community Betterment Concepts
8.7. Develop risk analysis for the alignment
8.8. Document and analyze benefits of removing rail. Reduced noise, vibration, safety benefits, etc.

APPENDIX F: MIDPOINT REVIEW SLIDES

At the end of the Evaluation Phase, a Midpoint Review Meeting was conducted on September 23, 2024, with the VA Team to review the refined short list of ideas. Included in this appendix are the slides that were presented during this meeting.

LOSSAN Value Analysis Study

Mid-Point Review

September 23, 2024

1

Project Objectives

- Input received included revisions to existing objectives and recommendations for new objectives
  - Many of the comments heard aligned with existing objectives
  - Feedback used to guide VA discussions for idea generation
    - Review underway to determine final revisions from VA
  - Review and revisions will also consider comments received on the NOP related to the objectives (1500+ scoping submissions)
  - CEQA compliance legal review required for any revised or new objectives
  - Input received could also inform other elements of the CEQA process, including considerations for the preferred alternative as the Draft EIR is being prepared

2

The Value Methodology

A **systematic process** used by a **multidisciplinary team**, led by a qualified VM Facilitator, to improve the **value** of a project, product, process, service, or organization through the analysis of **functions**.

VMS Value Management Strategies

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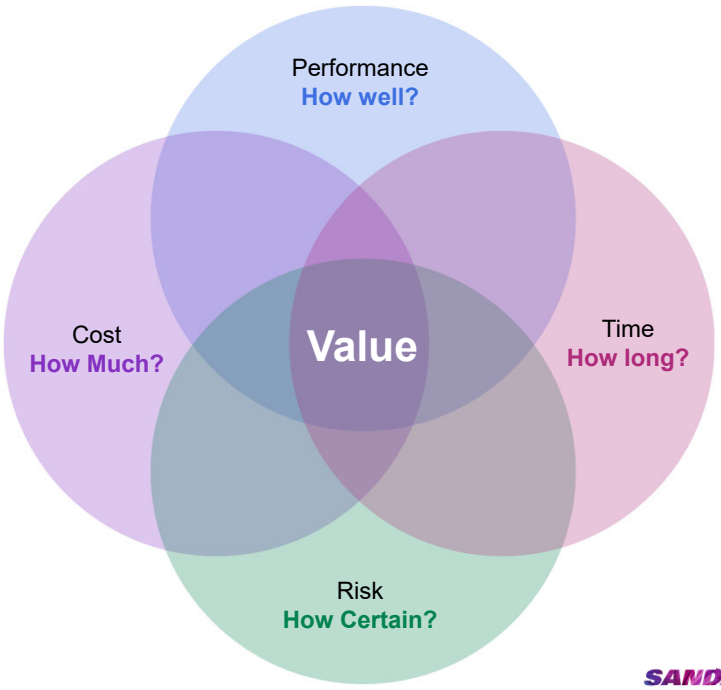
3

How will we think about value?



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4

VA Study Process

Week 1
Sept. 16-18

Week 2
Sept. 30 – Oct. 2

1	2	3	4	5
Information	**Function Analysis**	**Creativity**	**Evaluation**	**Development**
Analyze Information	Define Functions	Generate Ideas	Evaluate Ideas	Develop Alternatives
Transform Information	Allocate Resources		Prioritize Ideas	
	Prioritize Functions			

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5

Function Analysis

A non-specific, 2-3 word abstraction, consisting of a verb and noun, that describes what an element of a project does.

- Avoid Wetlands (AW)
- Define Criteria (DC)
- Improve Community (IC)
- Increase Operational Capacity (IOC)
- Maintain Hydraulics (MH)
- Minimize Community Impacts (MCI)
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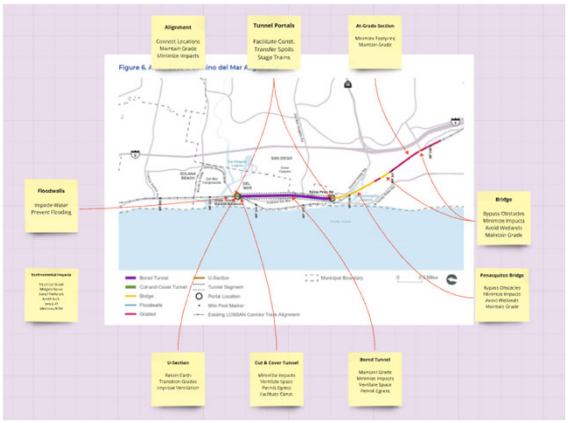
- Minimize RoW Impacts (MRI)



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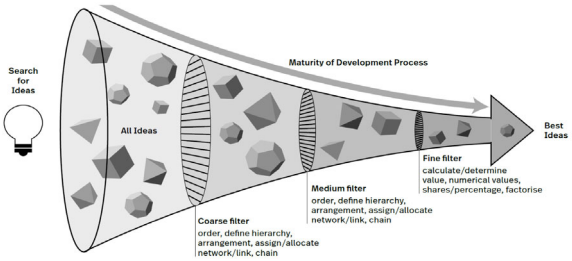
6

Alignment Ideas Generated

** Results based on work by VA Study participants*



205 initial ideas
Brainstormed based on functions to consider other alignments and improvements

26 preliminary evaluated concepts
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16 alternatives advance
13 new alignment alternatives plus the 3 alignments will advance to Week 2 of the study to develop

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7

Additional Design Ideas Generated

** Results based on work by VA Study participants*

Community Impacts
7 ideas advance

Ecological Impacts
6 ideas advance

Challenge Design Criteria
7 ideas advance

Community Betterment
8 ideas advance

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8

Evaluation Criteria*

** Revised based on feedback from stakeholders at VA orientation*

- **Rail Operations:** An assessment of the efficiency of rail operations. This considers travel time, station access, operational flexibility, and system capacity.
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- **Cost:** A measure of the initial cost to deliver the project.

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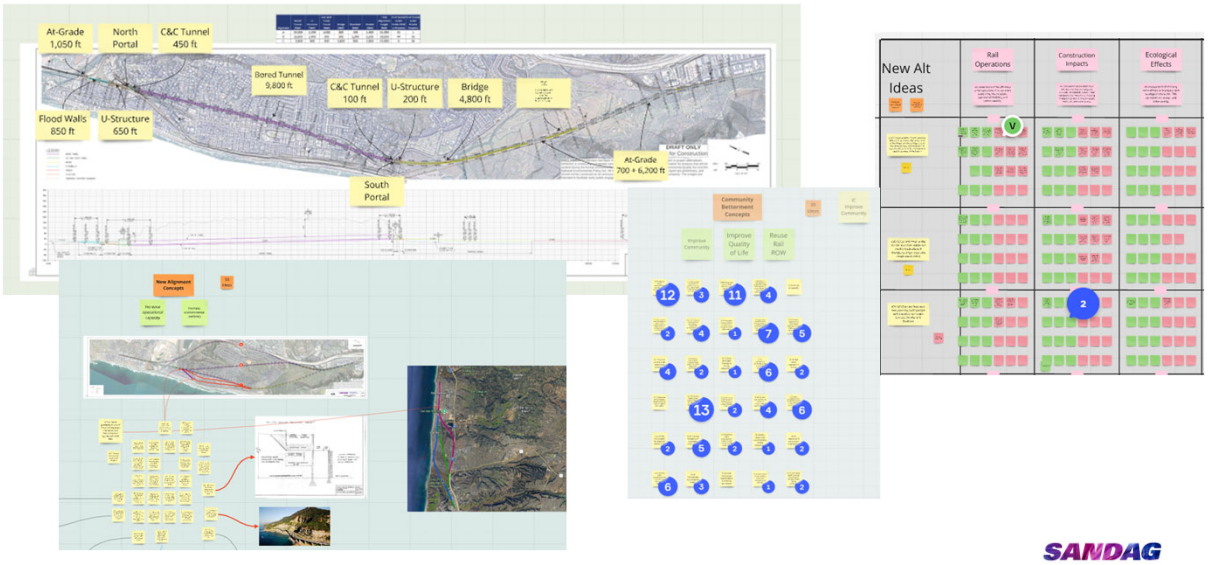
9

Miro Process

** Results based on work by VA Study participants*



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10

Preliminary Alignment Concepts

Results based on work by VA Study participants

11

Preliminary Alignment Concepts

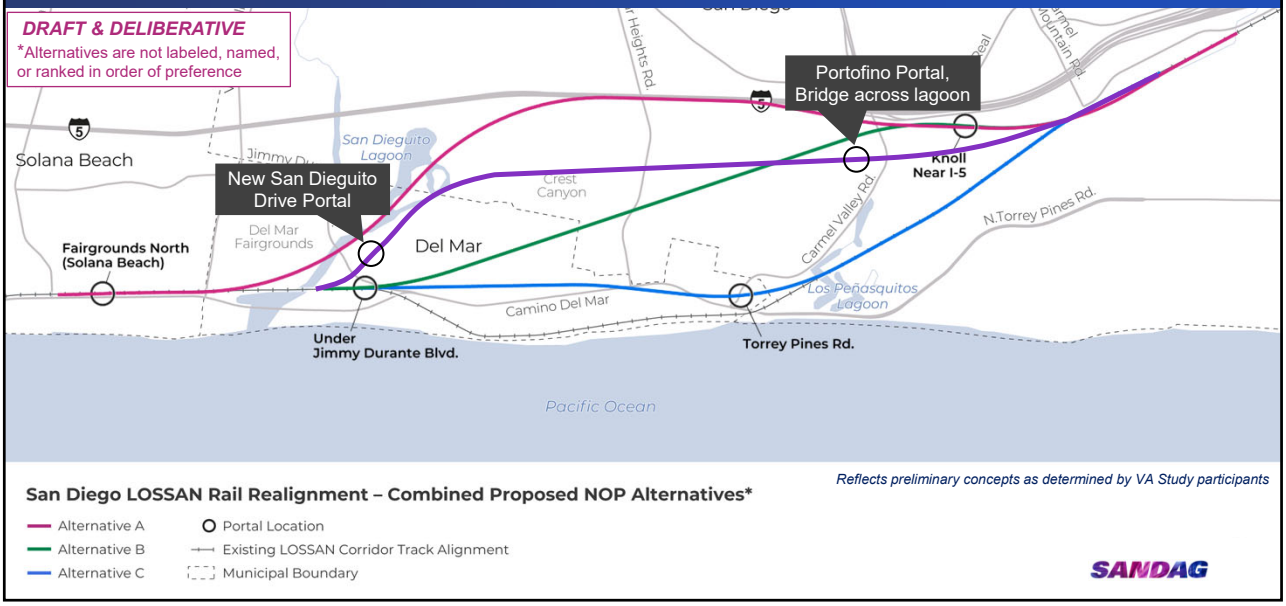
** Results based on work by VA Study participants and are listed in no particular order*

1. **MRI-01** Maintain the new San Dieguito bridge at Fairgrounds. Try to avoid development, fire station, and public works building. South Portal – be mindful of impacts to upland habitat
2. **MRI-04** Keep portals and tunnel profile above flood plain
3. **MRI-06** Relocate the southern portal further south to avoid impacts to the lagoon
4. **AW-01** Grade Fill/Raise Portal area with slopes, Realign Jimmy Durante Blvd. away from homes, raise above cut and cover
5. **AW-02** Adjust alignment to cut and cover at Jimmy Durante Blvd. and Camino del Mar and start boring to avoid private property eminent domain
6. **AW-05** Move alignment to Crest Canyon sooner for less easement acquisition and bridge over Carmel Valley Road
7. **MH-01** Optimize tunnel vs. bridge or berm for C alignment
8. **MH-02** Move alignment under Camino del Mar
9. **MH-03** Shift south portal to the west to minimize property impacts
10. **IOC-01** Align rail with I-5 from Oceanside where the rail starts in the center of I-5 to San Diego, consider boring to assist with grading issues and using right-of-way adjacent to I-5 (follow I-5 alignment south to Sorrento Valley Station)
11. **IOC-02** Cut and cover at the old Del Mar train station
12. **IOC-04** Remain on the bluffs with double track and seawalls
13. **IOC-06** Relocate all heavy rail along I-15

12

1 | MRI-01

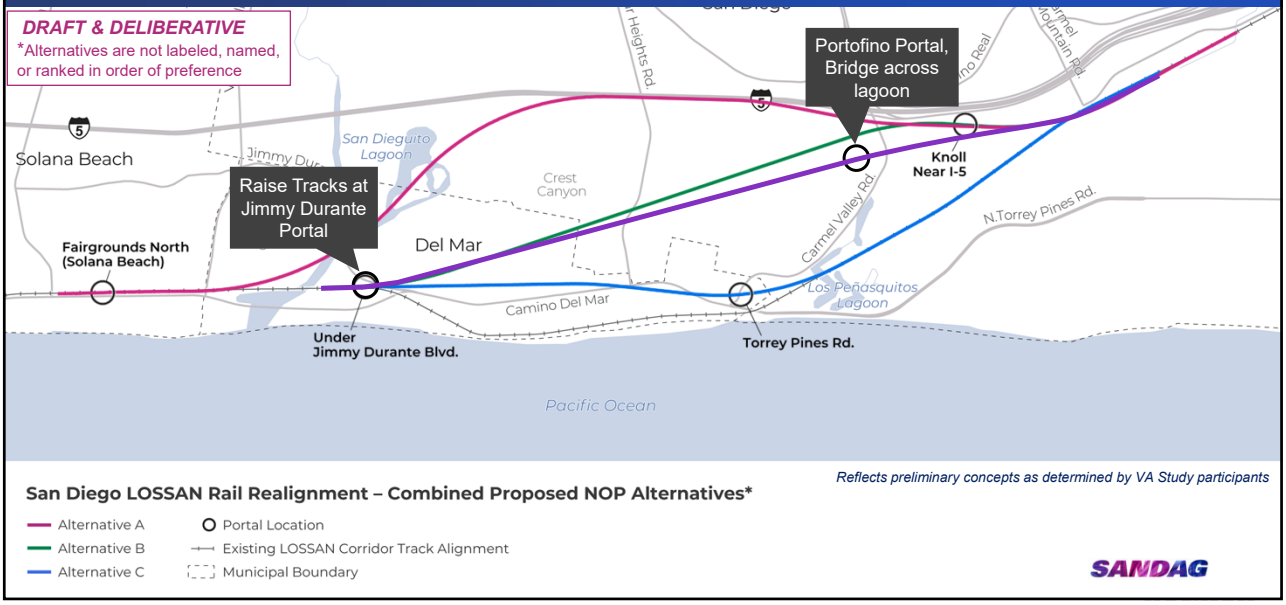
Maintain the new San Dieguito bridge at Fairgrounds. Try to avoid development, fire station, and public works building. South Portal – be mindful of impacts to upland habitat



13

2 | MRI-04

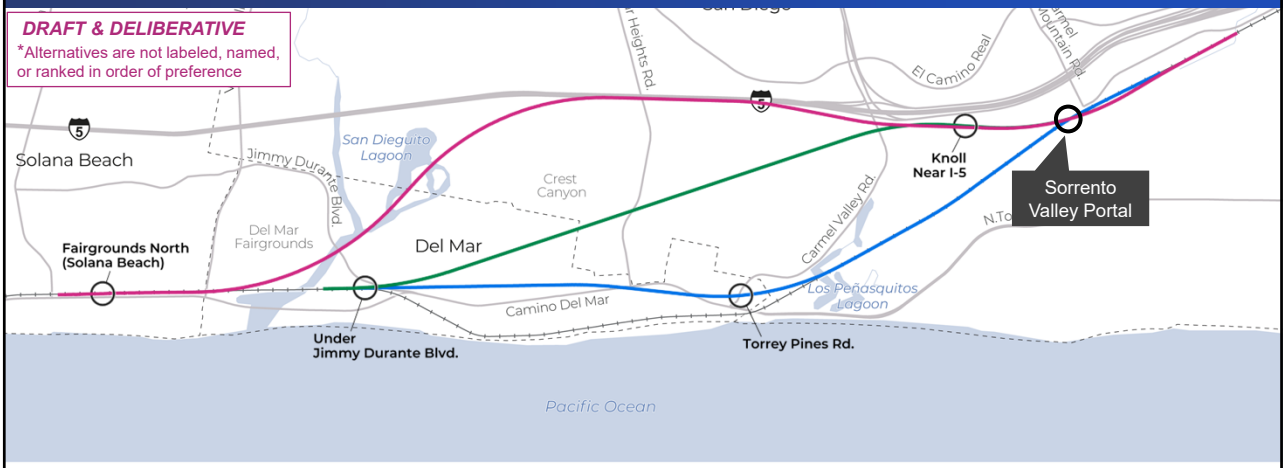
Keep portals and tunnel profile above flood plain



14

3 | MRI-06

Relocate the southern portal further south to avoid impacts to the lagoon



Reflects preliminary concepts as determined by VA Study participants

San Diego LOSSAN Rail Realignment – Combined Proposed NOP Alternatives*

- Alternative A
- Alternative B
- Alternative C
- Portal Location
- Existing LOSSAN Corridor Track Alignment
- Municipal Boundary

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15

4 | AW-01

Grade Fill/Raise Portal area with slopes, Realign Jimmy Durante Blvd. away from homes, raise above cut and cover

Reflects preliminary concepts as determined by VA Study participants

San Diego LOSSAN Rail Realignment – Combined Proposed NOP Alternatives*

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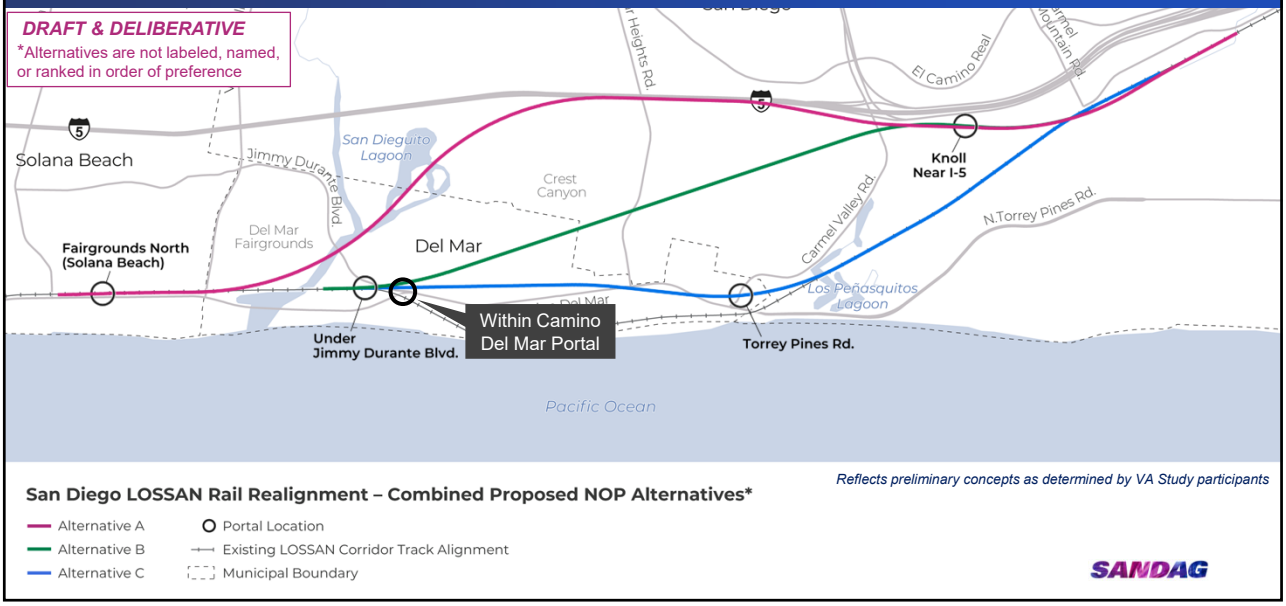
16

5 | AW-02

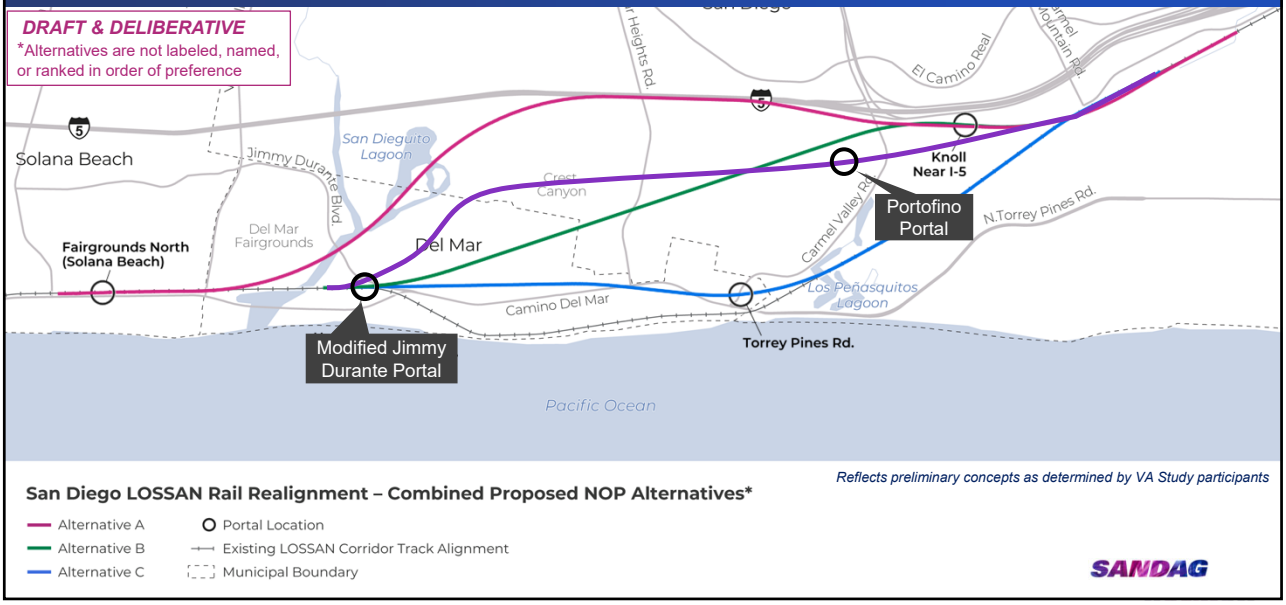
Adjust alignment to cut and cover at Jimmy Durante Blvd. and Camino del Mar and start boring to avoid private property eminent domain



17

6 | AW-05

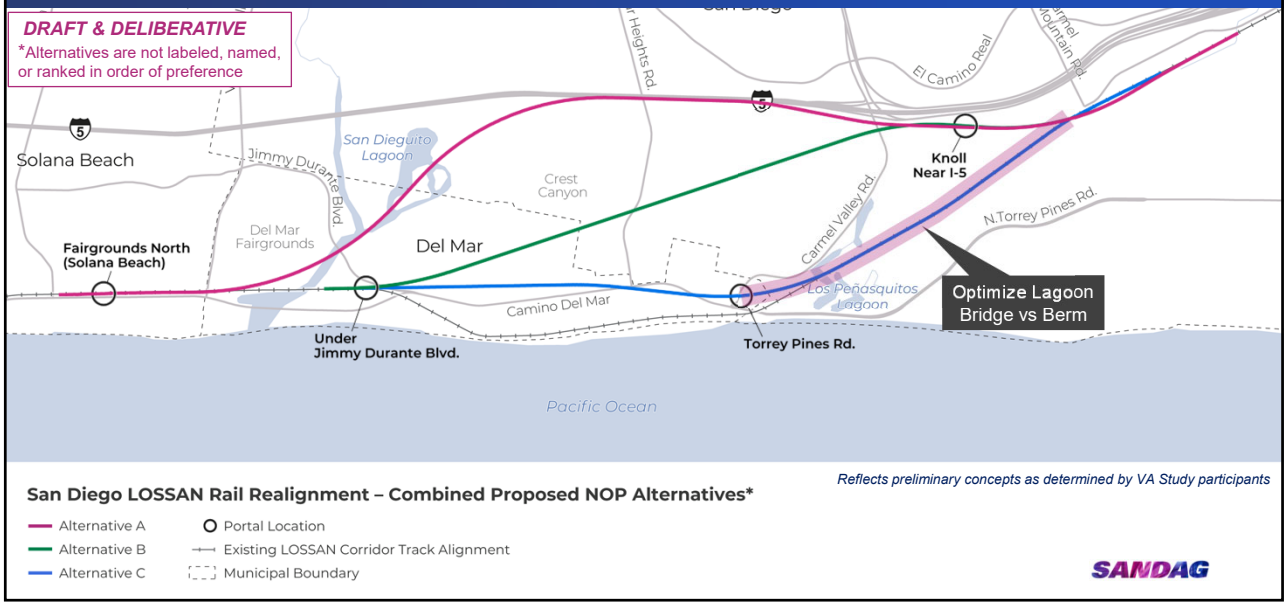
Move alignment to Crest Canyon sooner for less easement acquisition and bridge over Carmel Valley Road



18

7 | MH-01

Optimize tunnel vs. bridge or berm for C alignment



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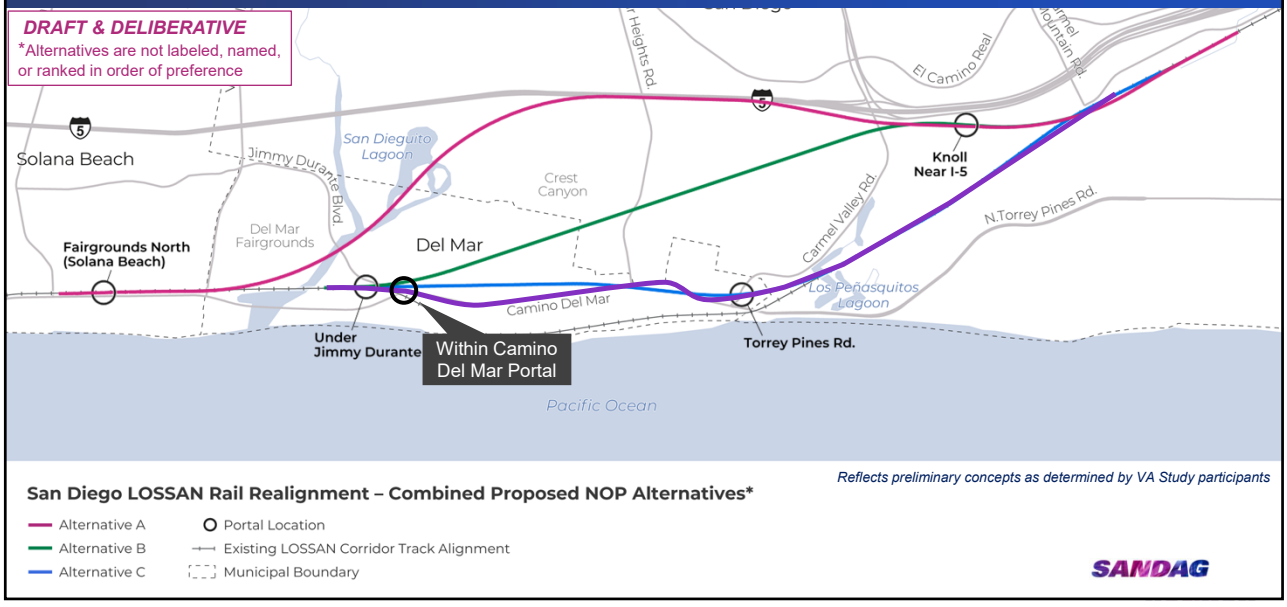
8 | MH-02

Move alignment under Camino del Mar



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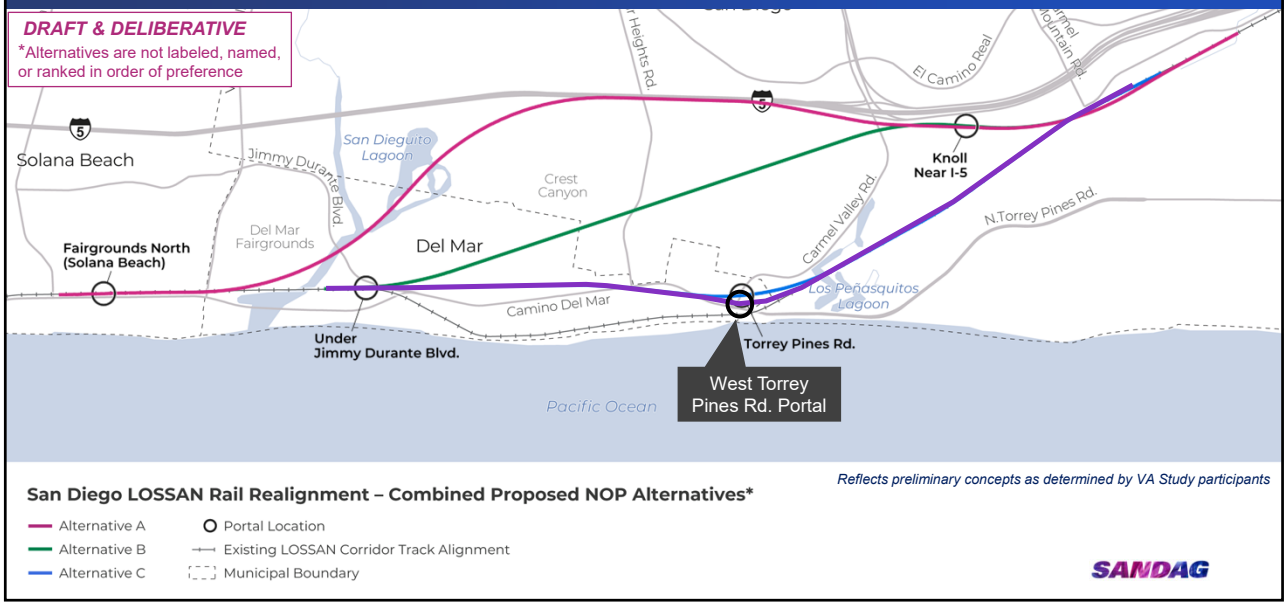
20

9 | MH-03

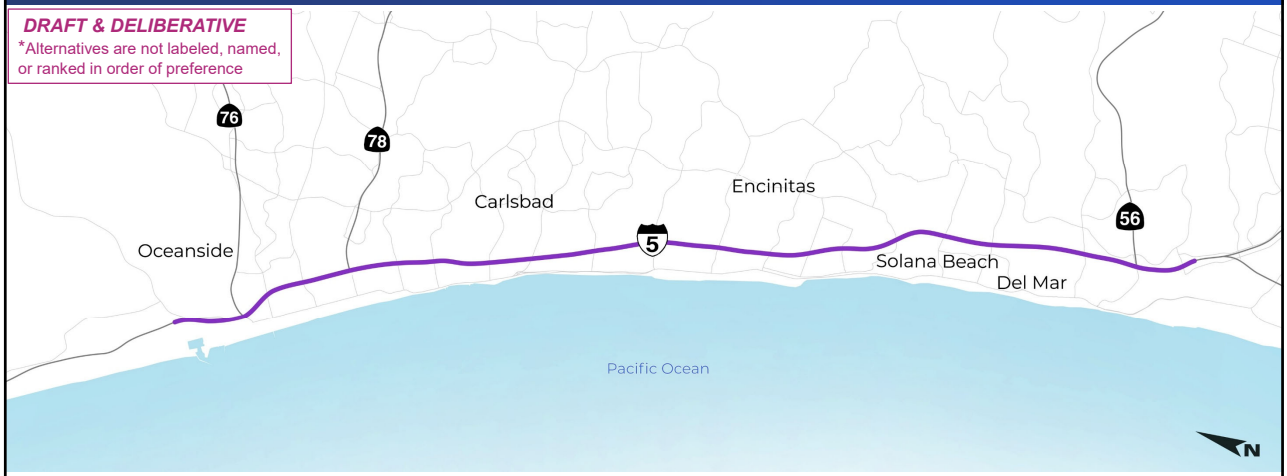
Shift south portal to the west to minimize property impacts



21

10 | IOC-01

Align rail with I-5 from Oceanside where the rail starts in the center of I-5 to San Diego, consider boring to assist with grading issues and using right-of-way adjacent to I-5 (follow I-5 alignment south to Sorrento Valley Station)



- Identify Station Locations
- Aerial alignment
- Side running alignment
- May include tunnel segments

22

11 | IOC-02

Cut and cover at the old Del Mar train station

Reflects preliminary concepts as determined by VA Study participants

San Diego LOSSAN Rail Realignment – Combined Proposed NOP Alternatives*

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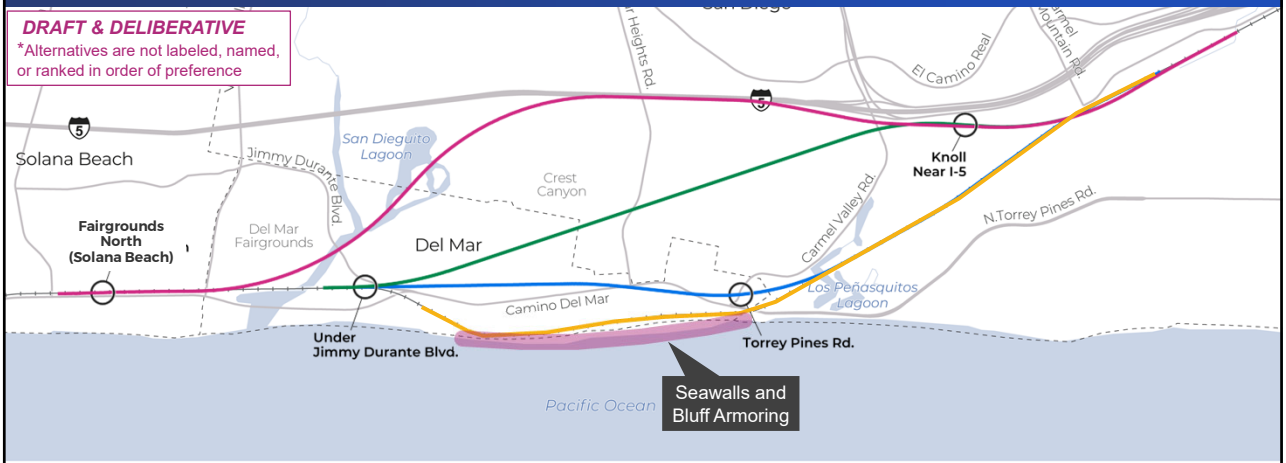
12 | IOC-04

Remain on the bluffs with double track and Seawalls



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San Diego LOSSAN Rail Realignment – Combined Proposed NOP Alternatives*

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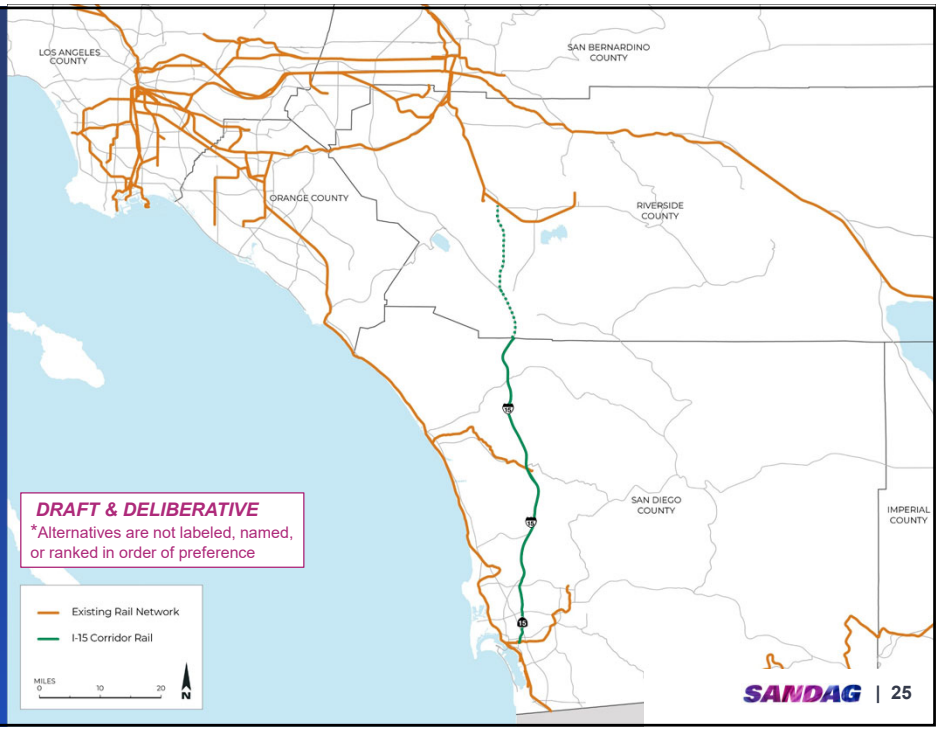
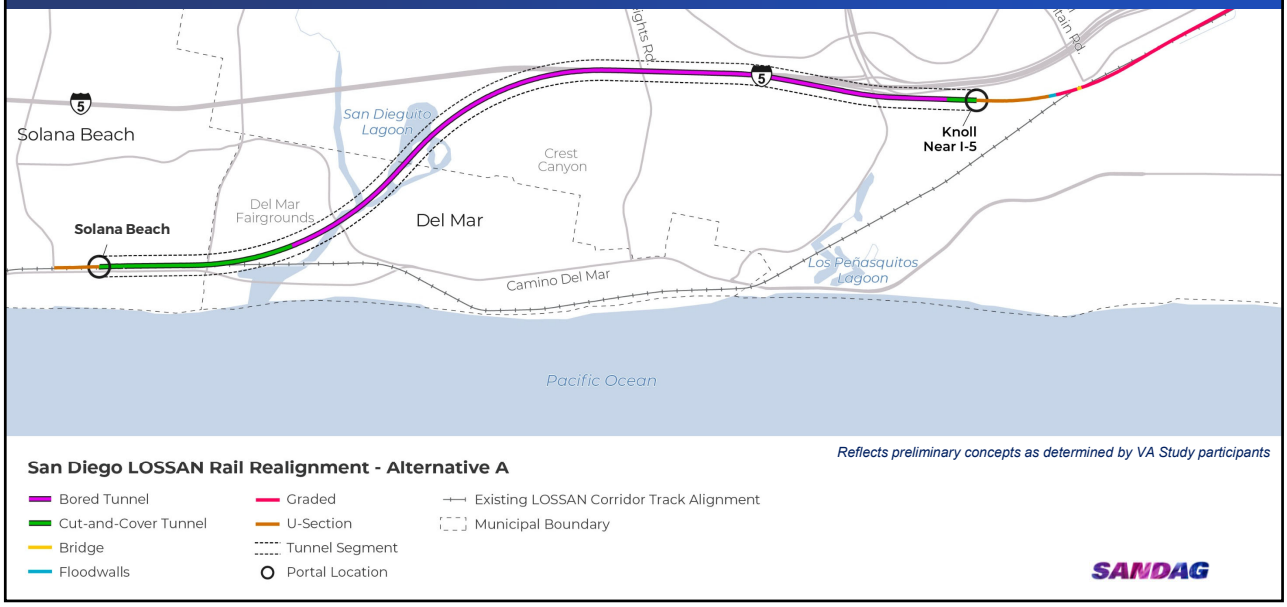
13 | IOC-06
Relocate all heavy rail along I-15

Reflects preliminary concepts as determined by VA Study participants



25

14 | Proposed NOP Alternative Alignment A



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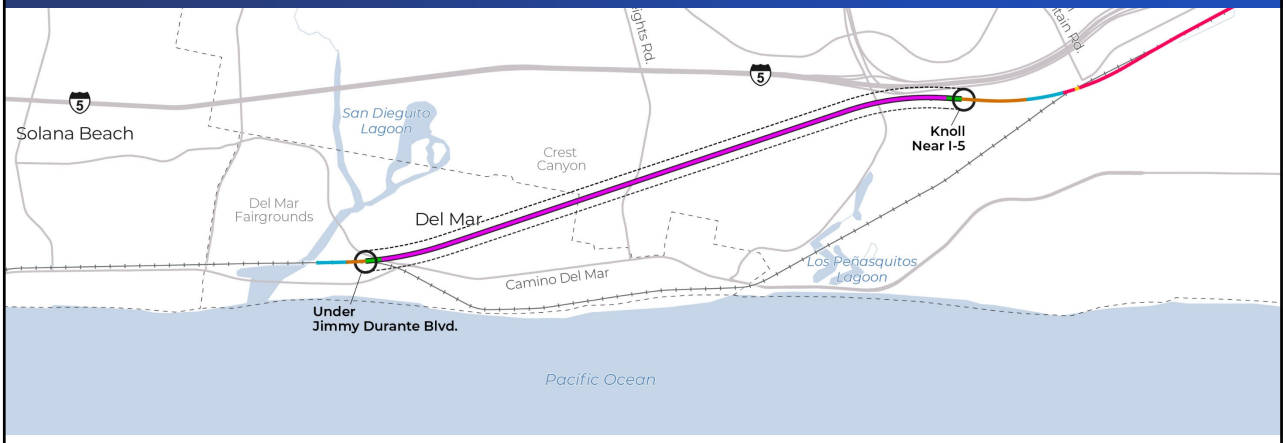
15 | NOP Proposed Alternative Alignment B



Reflects preliminary concepts as determined by VA Study participants

San Diego LOSSAN Rail Realignment - Alternative B

- Bored Tunnel
- Cut-and-Cover Tunnel
- Bridge
- Floodwalls
- Graded
- U-Section
- Tunnel Segment
- Portal Location
- Existing LOSSAN Corridor Track Alignment
- Municipal Boundary

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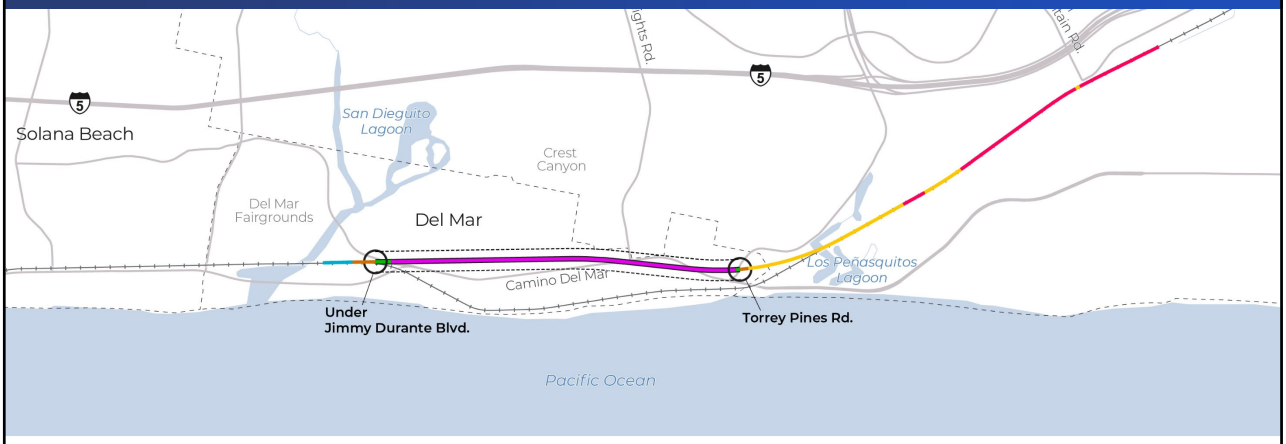
16 | NOP Proposed Alternative Alignment C



Reflects preliminary concepts as determined by VA Study participants

San Diego LOSSAN Rail Realignment - Alternative C

- Bored Tunnel
- Cut-and-Cover Tunnel
- Bridge
- Floodwalls
- Graded
- U-Section
- Tunnel Segment
- Portal Location
- Existing LOSSAN Corridor Track Alignment
- Municipal Boundary

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Additional Design Concepts

Results based on work by VA Study participants

29

Explore Variations of Design Criteria

** Comments based on discussion by VA Study participants*

- DC-01 Consider South side of new San Dieguito Bridge to Sorrento Valley Station
- DC-08 Minimize tunnel separation at portals
- DC-04 What is cost benefit of increasing speed from 90mph to 110mph? What is a competitive cost benefit ratio?
- DC-10 seawall the rest of the bluffs (~1 mile)
- DC-09 Layout Alternatives A, B, and C with 3% grade and move freight elsewhere
- DC-03 Shorter travel time could be achieved with shorter alignments maintaining existing corridor design speeds
- DC-13 Minimize ground cover requirement of one tunnel diameter at portal

30

Explore Mitigations to Potential Ecological Impacts

** Comments based on discussion by VA Study participants*

- MEI-13 Coordinate with Penasquitos Lagoon restoration
- MEI-01 Elevate train when crossing over wetlands to ensure the function of the wetland is maintained
- MEI-03 Plant trees around portals to minimize visual footprint and (partially) alleviate GHG impacts at tunnel openings
- MEI-02 Retain trails as recreational resources
- MEI-04 Remove all berms through lagoon, only use bridge structure
- MEI-05 When designing the rail ROW, habitat corridors (undercrossings) for deer and other wildlife should be considered in and around lagoons

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Explore Mitigations to Potential Community Impacts

** Comments based on discussion by VA Study participants*

- MCI-01 Optimize location of tunnel exhaust vents to minimize air quality impacts
- MCI-07 Turn ROW in Los Peñasquitos lagoon into extension of Coastal Rail Trail
- MCI-12 Business impact fund for businesses impacted during construction (EX: Metro/ABQ Rapid Transit)
- MCI-10 Revise "Maintain Traffic" to Maintain multi-modal circulation; bicycling is a critical mode in the proximity of the project
- MCI-15 Have NCTD state what uses are not allowed on top of cut and cover alignment (for public info)
- MCI-05 Improve coastal access on bluffs with safe undercrossing
- MCI-04 Leave track on bluffs

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Explore Community Betterments

** Comments based on discussion by VA Study participants*

- IC-17 Enhanced coastal access from the bluff to the beach after relocation of the tracks
- IC-01 Regional beach renourishment opportunities from the spoils of the project
- IC-03 Park/trail on Del Mar Bluffs after tracks are (potentially) removed
- IC-09 sand and soil removed for projects should be planned for programmatically as part of this project for beach nourishment along the bluffs
- IC-14 Underground overhead utilities at impacted locations
- IC-20 Consider reconfiguration of the Jimmy Durante/Camino Del Mar Intersection (potential to tie CDM perpendicular to Jimmy Durante. May improve safety for cyclists and pedestrians)
- IC-26 Improve active transportation for impacted and surrounding roadways
- IC-40 Widen flood channel as a community betterment

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Next Steps

Mid-point Review of VA Alternatives

- Date: September 23
- Location: Del Mar Fairgrounds
- Participants: All Stakeholders

Development of All Alternatives

- Date: September 30-October 2
- Participants: VA Team (technical and subject matter experts)

VA Outbrief of Developed Alternatives

- Date: October 28
- Location: Del Mar Fairgrounds
- Participants: All Stakeholders

Feedback Meeting

- Date: TBD
- Location: TBD
- Participants: All Stakeholders

SANDAG Board Update

- Date: TBD

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APPENDIX G: OUTBRIEF SLIDES

An Outbrief Meeting was held with the VA Team on October 28, 2024. This meeting included a preliminary presentation of the VA Team's assessment of the project and VA alternative concepts. The presentation provided an opportunity for the VA Team to preview the alternative concepts and develop an understanding of the rationale behind them. Included in this appendix are the slides that were presented during this meeting.

LOSSAN Value Analysis Study

Outbrief Presentation

Prepared by VMS Value Management Strategies

Draft, Confidential Deliberative Gov. Code, §§ 7920-7931 Exempt

October 28, 2024

1

Meeting Purpose

October 28, VA Study Outbrief of Developed Alternatives:

This meeting will provide an opportunity for the VA Team to brief meeting attendees, including elected officials, on the VA Alternative concepts developed. In addition, draft versions of the revised Project Objectives will be shared. This is an informational meeting – questions and clarifications are welcome but no decisions will be made.

Draft, Confidential Deliberative Gov. Code, §§ 7920-7931 Exempt

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2

Agenda

- Introductions
- VA Study Process Overview
- Project Objectives
- VA Alternatives
- Next Steps

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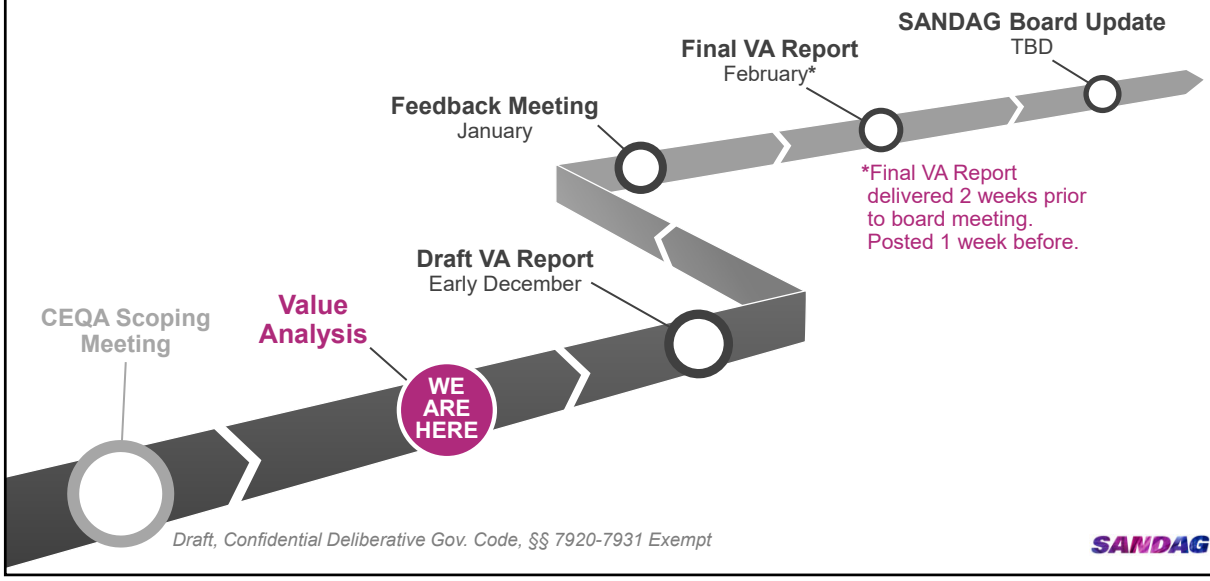
Next Steps



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4

VA Study Ground Rules

- Be present. Be here.
- Assume positive intent.
- Take space. Make space.
- Share from your own perspective.
- Listen with the intent to learn and understand.
- Respect the agenda, the group's time, and the input of others.
- Maintain confidentiality.
  - *Please do not share content from the VA process; official content will be released via reports.*

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5

VA Participants

- 22nd Agricultural District
- Caltrans
- City of Carlsbad
- City of Del Mar
- City of Encinitas
- NCTD
- City of San Diego
- City of Solana Beach
- SANDAG

*MTS & City of Oceanside were invited but decided not to participate

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6

The Value Methodology

A **systematic process** used by a **multidisciplinary team**, led by a qualified VM Facilitator, to improve the **value** of a project, product, process, service, or organization through the analysis of **functions**.

VMS Value Management Strategies

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7

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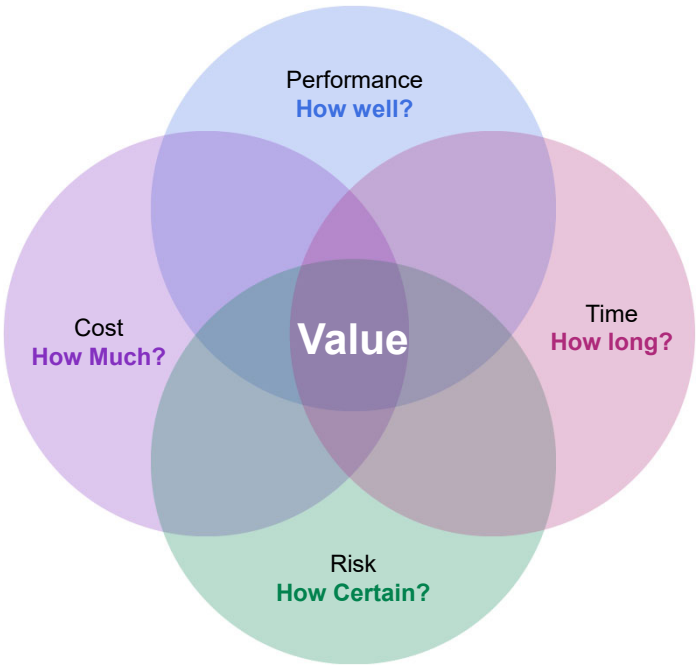

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8

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Draft, Confidential Deliberative Gov. Code, §§ 7920-7931 Exempt

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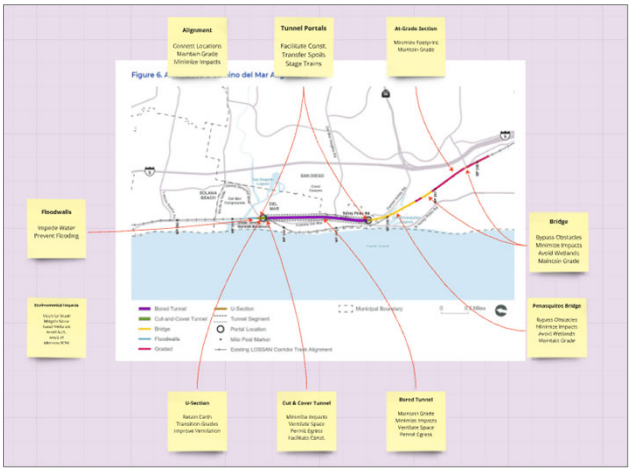

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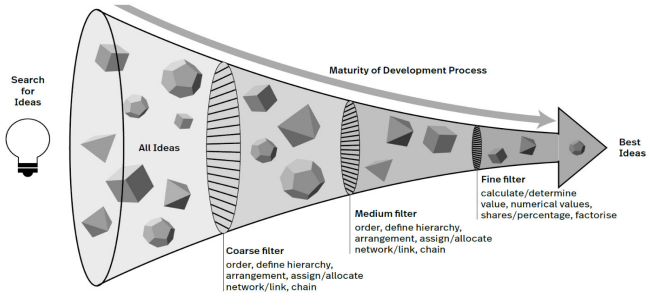
10

Alignment Ideas Generated

** Results based on work by VA Study participants*



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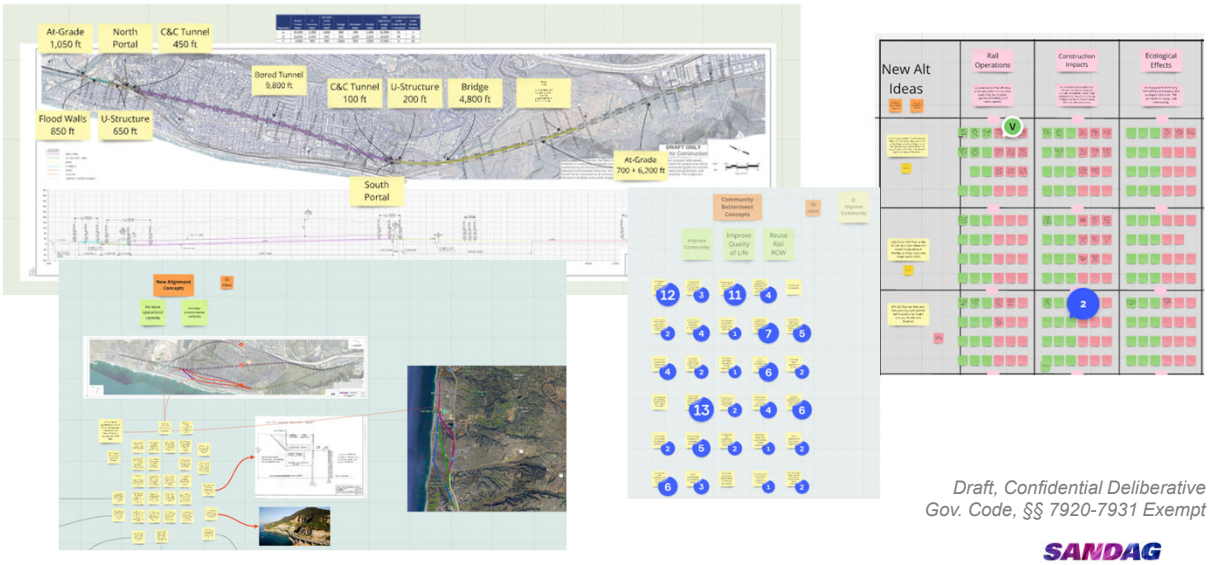
12

Miro Process

** Results based on work by VA Study participants*



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Project Objectives

Results based on feedback from stakeholders and refinements by SANDAG and VA Study participants

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Original Project Objectives – Per the NOP

- Improve rail service reliability by relocating the existing railroad tracks away from the eroding coastal bluffs in Del Mar.
- Maintain passenger rail service to the existing train stations serving Solana Beach and Sorrento Valley and accommodate direct rail access to the 22nd District Agricultural Association.
- Minimize impacts in the surrounding communities during and after construction.
- Avoid and/or minimize impacts on biological, cultural, and recreational resources of national, state, or local significance, including publicly owned parks, beaches, wetlands, ecological reserves, wildlife or waterfowl refuges, and any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places.
- Help meet the goals of the 2021 Regional Plan and the 2018 California State Rail Plan by increasing passenger and freight train capacity, further reducing travel times, improving reliability, and accommodating additional rail service.
- Improve coastal access and safety by eliminating at-grade railroad crossings and minimizing other pedestrian-rail points of interaction.

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Project Objectives – Review Process

- Comments were received from the public and stakeholders on the NOP
  - Many of the comments heard aligned with existing objectives
  - Review and revisions will also consider comments received on the NOP related to the objectives (1500+ scoping submissions)
  - CEQA compliance legal review required for any revised or new objectives
- Interviews were conducted with stakeholders to further expand on the comments and elicit additional feedback
- A facilitated workshop session was held the first day of the VA Study with stakeholders to elicit feedback on the project objectives
- SANDAG incorporated this feedback; prepared new project objectives; and then reviewed and revised these with the VA Study participants

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Revised Project Objective #1

- Original
  - Improve rail service reliability by relocating the existing railroad tracks away from the eroding coastal bluffs in Del Mar.
- Revised
  - Improve rail service reliability by **minimizing risks from climate change, including considerations of sea level rise, flooding, and stability of the coastal bluffs.**

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Revised Project Objective #2

- Original
  - Maintain passenger rail service to the existing train stations serving Solana Beach and Sorrento Valley and accommodate direct rail access to the 22nd District Agricultural Association.
- Revised
  - Maintain passenger rail service **to Solana Beach, Sorrento Valley** and accommodate direct rail access to the 22nd District Agricultural Association **(Del Mar Fairgrounds) while minimizing disruptions to passenger and freight service during construction.**

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Revised Project Objective #3

- Original
  - Minimize impacts in the surrounding communities during and after construction.
- Revised
  - Minimize impacts **to existing homes, businesses, tourism, and major economic generators, including the Del Mar Fairgrounds, and transportation facilities** during and after construction.

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Revised Project Objective #4

- Original
  - Avoid and/or minimize impacts on biological, cultural, and recreational resources of national, state, or local significance, including publicly owned parks, beaches, wetlands, ecological reserves, wildlife or waterfowl refuges, and any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places.
- Revised
  - Avoid, **minimize, and where possible enhance** biological, cultural, and recreational resources of national, state, or local significance. This includes publicly owned parks, **recreational trails,** beaches, wetlands, ecological reserves, wildlife or waterfowl refuges, and any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places.

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Revised Project Objective #5

- Original
  - Help meet the goals of the 2021 Regional Plan and the 2018 California State Rail Plan by increasing passenger and freight train capacity, further reducing travel times, improving reliability, and accommodating additional rail service.
- Revised
  - Help meet the goals of the 2021 Regional Plan and the 2018 California State Rail Plan by increasing passenger and freight train capacity, further reducing travel times, improving reliability, **and considering existing and planned investments.**

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Revised Project Objective #6

- Original
  - Improve coastal access and safety by eliminating at-grade railroad crossings and minimizing other pedestrian-rail points of interaction.
- Revised
  - Improve coastal access and safety by eliminating at-grade railroad crossings and minimizing points of interaction **from all other modes of transportation.**

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Revised Project Objective #7

- Original
  - *This project objective did not previously exist.*
- Revised
  - **Demonstrate good public stewardship by delivering the project in a timely way that considers prior investments, construction, right of way, operations, and maintenance costs.**

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VA Alternatives

Results based on work by VA Study participants

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VE Alternative Concepts

** Results based on work by VA Study participants and are listed in no particular order*

1. **MRI-01** Begin alignment south of San Dieguito bridge and run under Crest Canyon with 90 mph curves
2. **MRI-04** Keep the tunnel profile above projected flooding elevation and eliminate sag
3. **MRI-06** Relocate the southern portal south of existing pump station at Carmel Mt. Rd.
4. **AW-01** Realign intersection at Jimmy Durante Blvd. and Camino Del Mar
5. **AW-02** Shift north portal under Camino Del Mar
6. **AW-05** Begin alignment south of San Dieguito Bridge and run under Crest Canyon with improved geometry
7. **MH-01** Optimize the use of bridges and berms of Los Peñasquitos Lagoon
8. **MH-02** Shift alignment under Camino del Mar with 90 mph curves
9. **MH-03** Shift the original Torrey Pines Rd. portal to the west 100-feet
10. **IOC-01** Relocate LOSSAN corridor along I-5 from Oceanside to Sorrento Valley
11. **IOC-02** Shift North Portal to the Del Mar Train Station and run alignment parallel to Del Mar Bluffs
12. **IOC-04** Stabilize bluffs and widen existing alignment to accommodate a second track
13. **IOC-06** Relocate all freight rail along I-15 corridor
14. **Proposed NOP Alternative Alignment A**
15. **Proposed NOP Alternative Alignment B**
16. **Proposed NOP Alternative Alignment C**

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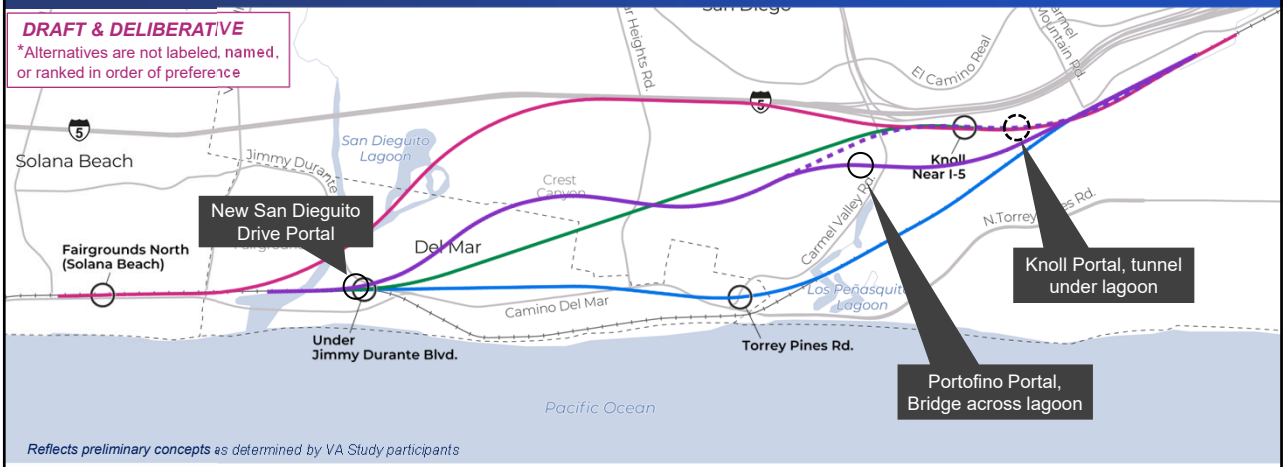
1 | MRI-01

Begin alignment south of San Dieguito bridge and *run under Crest Canyon with 90 mph curves*



San Diego LOSSAN Rail Realignment – Combined Proposed NOP Alternatives*

- Alternative A
- Alternative B
- Alternative C
- Portal Location
- Existing LOSSAN Corridor Track Alignment
- Municipal Boundary

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1 | MRI-01

Begin alignment south of San Dieguito bridge and run under Crest Canyon with 90 mph curves

Estimated Cost: $3.8B to $5.0B (South Portal at I-5 Knoll)

Rail Operations:	90 mph curves on this alignment increases travel time as compared to 110 mph alternatives.
Construction Impacts:	Primary construction impacts are at tunnel portals and along Jimmy Durante Blvd. and Carmel Mt. Rd.
Ecological Effects:	South Portal at Portofino is located in an area of upland habitat and includes bridge impacts across lagoon.
Community Effects:	Minimizes underground easements under private property. Requires realignment of Jimmy Durante Blvd.
Maintainability:	Requires pump station in tunnel to address drainage due to sag.
Resiliency / Reliability:	Sag profile in tunnel makes the tracks more reliant on floodwalls.
Schedule:	It is anticipated that the schedule would be comparable to Alignment Alternatives B & C.

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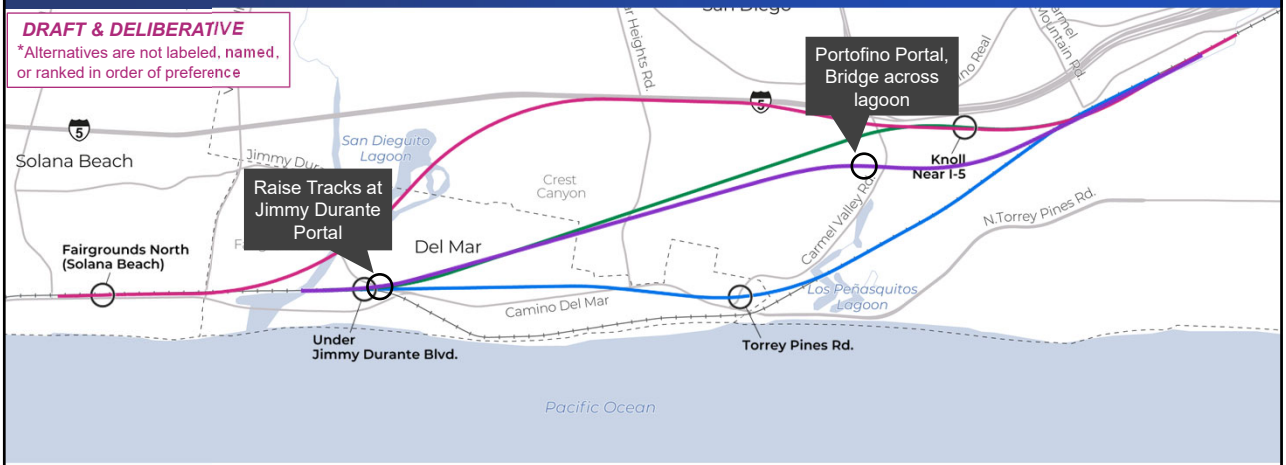
2 | MRI-04

Keep the tunnel profile above projected flooding elevation and eliminate sag



San Diego LOSSAN Rail Realignment – Combined Proposed NOP Alternatives*

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Reflects preliminary concepts as determined by VA Study participants

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2 | MRI-04

Keep the tunnel profile above projected flooding elevation and eliminate sag

Estimated Cost: $3.4B to $4.6B

Rail Operations:	Reduces operational risks related to tunnel flooding.
Construction Impacts:	Increases construction footprint at North Portal.
Ecological Effects:	South Portal at Portofino is located in an area of upland habitat and includes bridge impacts across lagoon.
Community Effects:	Increases right of way required at North Portal. May increase degree of realignment required for Jimmy Durante Blvd.
Maintainability:	Eliminates pump station in tunnel. Reduces potential for major maintenance in the event of tunnel flooding.
Resiliency / Reliability:	Increases resilience to climate change.
Schedule:	It is anticipated that the schedule would be comparable to Alignment Alternatives B & C.

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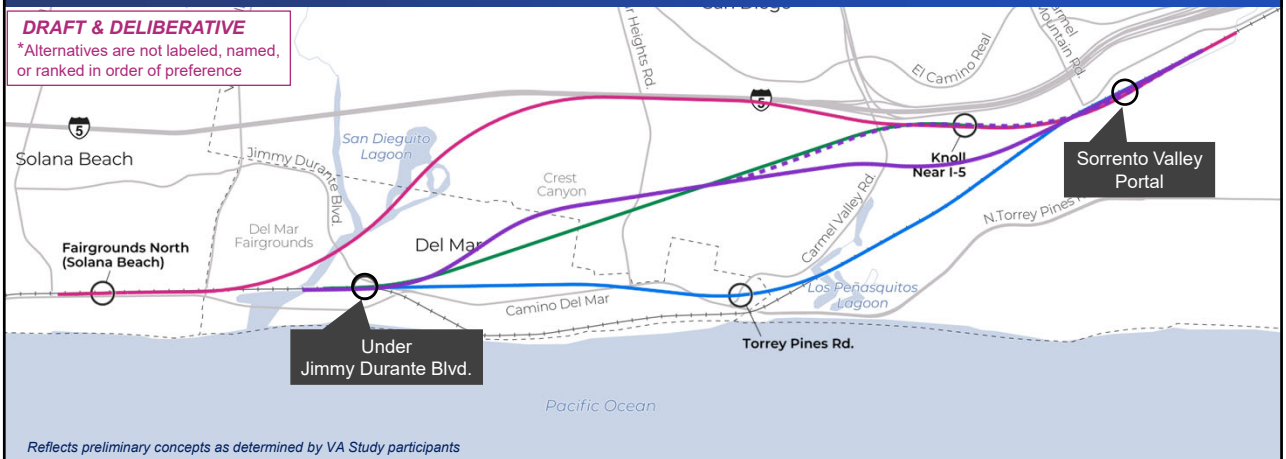
3 | MRI-06

Relocate the southern portal south of existing pump station at Carmel Mt. Rd.



San Diego LOSSAN Rail Realignment – Combined Proposed NOP Alternatives*

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3 | MRI-06

Relocate the southern portal south of existing pump station at Carmel Mt. Rd.

Estimated Cost: $4.5B to $6.0B

Rail Operations:	Provides a 110-mph rail alignment.
Construction Impacts:	May impact sewage pump station piping.
Ecological Effects:	May reduce wetlands impact along tunnel but may increase wetlands impacts south of the South Portal.
Community Effects:	Increases right of way needed. Requires realignment of Carmel Mt. and Sorrento Valley Roads.
Maintainability:	Extends tunnel infrastructure needed to be maintained.
Resiliency / Reliability:	Locates a segment of the alignment at a lower elevation in a flood zone requiring reliance on floodwalls.
Schedule:	It is anticipated that the schedule would be comparable to Alignment Alternatives B & C.

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4 | AW-01

Realign intersection at Jimmy Durante Blvd. and Camino Del Mar

San Diego LOSSAN Rail Realignment – Combined Proposed NOP Alternatives*

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4 | AW-01

Realign intersection at Jimmy Durante Blvd. and Camino Del Mar

Estimated Cost: NA

Rail Operations:	No change.
Construction Impacts:	This concept will be difficult to construct while maintaining rail and road traffic.
Ecological Effects:	No change.
Community Effects:	This concept may improve traffic flow and access between Jimmy Durante Blvd., Camino Del Mar, and Beach Colony. Reduces the overall right of way impacts relative to the original North Portal location.
Maintainability:	No change.
Resiliency / Reliability:	Sag profile in tunnel makes the tracks more reliant on floodwalls.
Schedule:	It is anticipated that the schedule would be comparable to Alignment Alternatives B & C.

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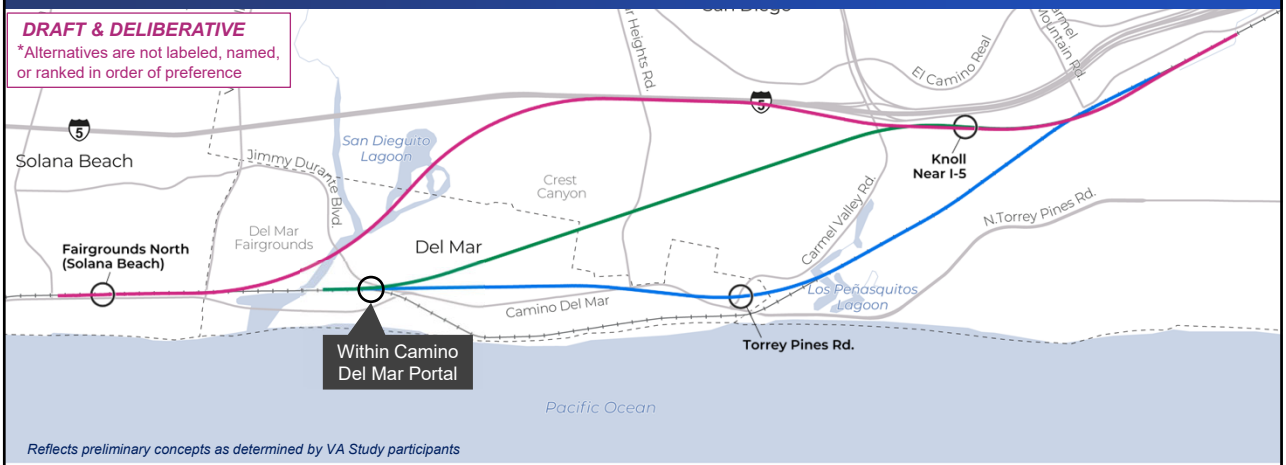
5 | AW-02

Shift north portal under Camino Del Mar



San Diego LOSSAN Rail Realignment – Combined Proposed NOP Alternatives*

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5 | AW-02

Shift north portal under Camino Del Mar

Estimated Cost: $3.9B to $5.2B

Rail Operations:	No change.
Construction Impacts:	Reduces constructions impacts to residents on Jimmy Durante Blvd. and David Way relative to the original North Portal location.
Ecological Effects:	No change.
Community Effects:	Reduces long-term portal impacts and right of way relative to the original North Portal location.
Maintainability:	No change.
Resiliency / Reliability:	Sag profile in tunnel makes the tracks more reliant on floodwalls.
Schedule:	It is anticipated that the schedule would be comparable to Alignment Alternatives B & C.

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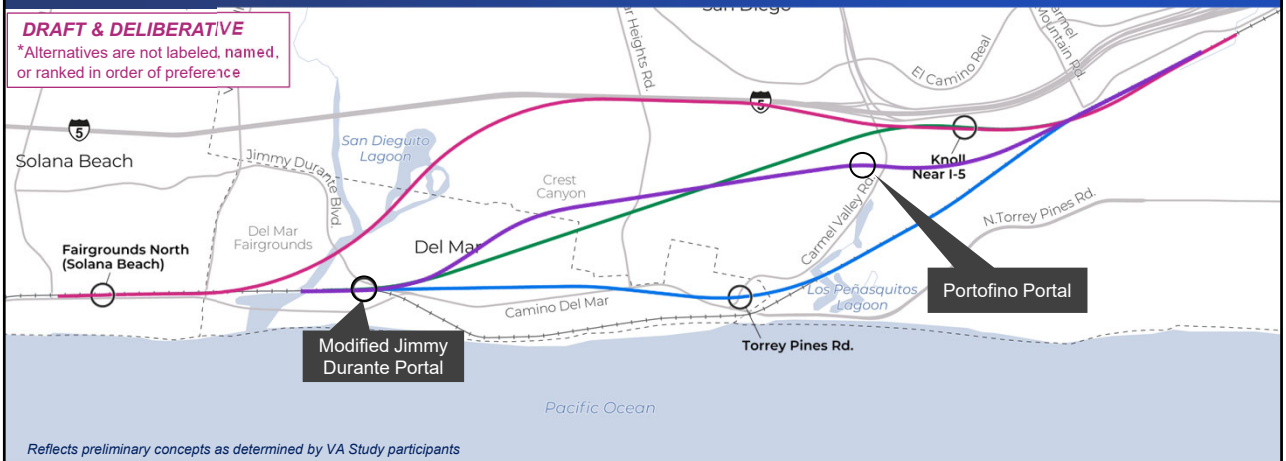
6 | AW-05

Begin alignment south of San Dieguito Bridge and run under Crest Canyon with improved geometry



San Diego LOSSAN Rail Realignment – Combined Proposed NOP Alternatives*

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6 | AW-05

Begin alignment south of San Dieguito Bridge and run under Crest Canyon with improved geometry

Estimated Cost: $3.7B to $4.9B

Rail Operations:	90 mph curves on this alignment increases travel time as compared to 110 mph alternatives.
Construction Impacts:	Primary construction impacts are at tunnel portals and along Jimmy Durante Blvd. and Carmel Mt. Rd.
Ecological Effects:	South Portal located in an area of upland habitat.
Community Effects:	Potential concern with having to temporarily relocate residents along Jimmy Durante Blvd.
Maintainability:	Requires pump station in tunnel to address drainage due to sag.
Resiliency / Reliability:	Sag profile in tunnel makes the tracks more reliant on floodwalls.
Schedule:	It is anticipated that the schedule would be comparable to Alignment Alternatives B & C.

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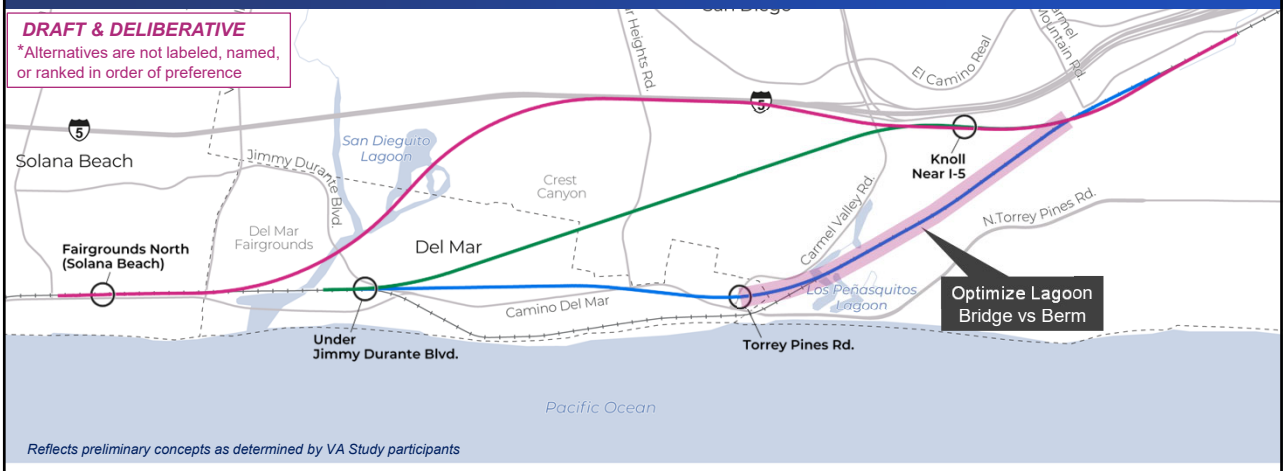
7 | MH-01

Optimize the use of bridges and berms in Los Peñasquitos Lagoon



San Diego LOSSAN Rail Realignment – Combined Proposed NOP Alternatives*

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7 | MH-01

Optimize the use of bridges and berms in Los Peñasquitos Lagoon

Estimated Cost: NA

Rail Operations:	No change.
Construction Impacts:	Potential to impact restoration work within the Lagoon (Phases I and II) being done by the City of San Diego.
Ecological Effects:	Requires additional analysis to balance ecological and hydraulic effects with infrastructure costs.
Community Effects:	No change.
Maintainability:	A reduction in bridge length will reduce future maintenance costs.
Resiliency / Reliability:	No change.
Schedule:	It is anticipated that the schedule would be comparable to Alignment Alternatives B & C.

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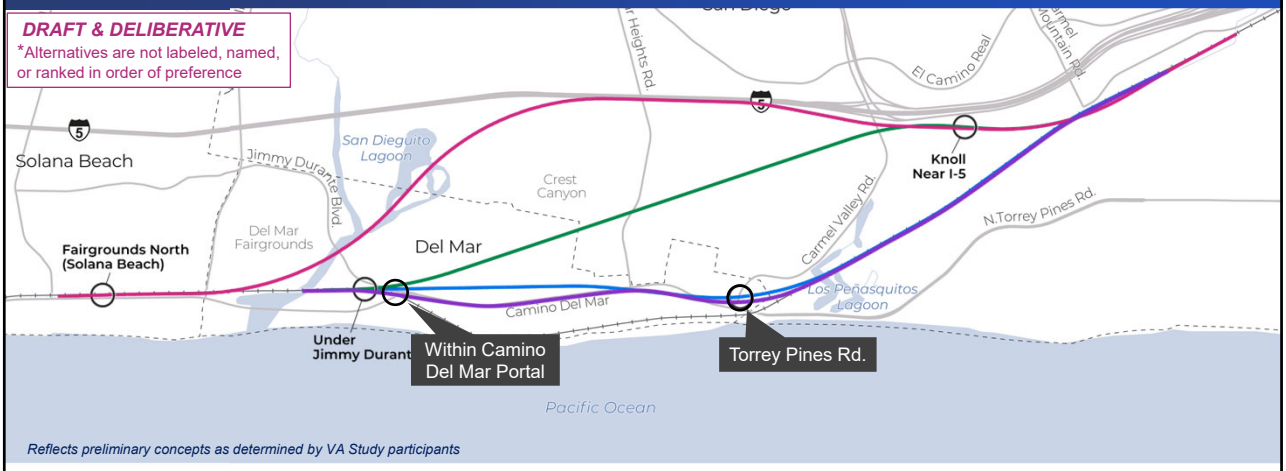
8 | MH-02

Shift alignment under Camino del Mar with 90 mph curves



San Diego LOSSAN Rail Realignment – Combined Proposed NOP Alternatives*

- Alternative A
- Alternative B
- Alternative C
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- Municipal Boundary

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8 | MH-02

Shift alignment under Camino del Mar with 90 mph curves

Estimated Cost: $3.6B to $4.8B

Rail Operations:	90 mph curves on this alignment increases travel time as compared to 110 mph alternatives.
Construction Impacts:	May reduce construction impacts to residents along Jimmy Durante Blvd and David Way. Potential concerns with having to temporarily relocate residents along Jimmy Durante Blvd.
Ecological Effects:	Locates long stretch of bridge and berm through wetlands area.
Community Effects:	Reduces long-term portal impacts, the need for right of way, and easement acquisition relative to the original North Portal. Reduces extent of underground easements under private property.
Maintainability:	Shortest tunnel to maintain but introduces long bridges over wetlands requiring maintenance.
Resiliency / Reliability:	Sag profile in tunnel makes the tracks more reliant on floodwalls.
Schedule:	It is anticipated that the schedule would be comparable to Alignment Alternatives B & C.

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9 | MH-03

Shift the original Torrey Pines Rd. portal to the west 100-feet

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9 | MH-03

Shift the original Torrey Pines Rd. portal to the west 100-feet

Estimated Cost: $3.3B to $4.4B

Rail Operations:	No change.
Construction Impacts:	Reduces construction impacts on residents at the South Portal.
Ecological Effects:	No change.
Community Effects:	Reduces long-term community effects on residents relative to the original South Portal.
Maintainability:	No change.
Resiliency / Reliability:	No change.
Schedule:	It is anticipated that the schedule would be comparable to Alignment Alternatives B & C.

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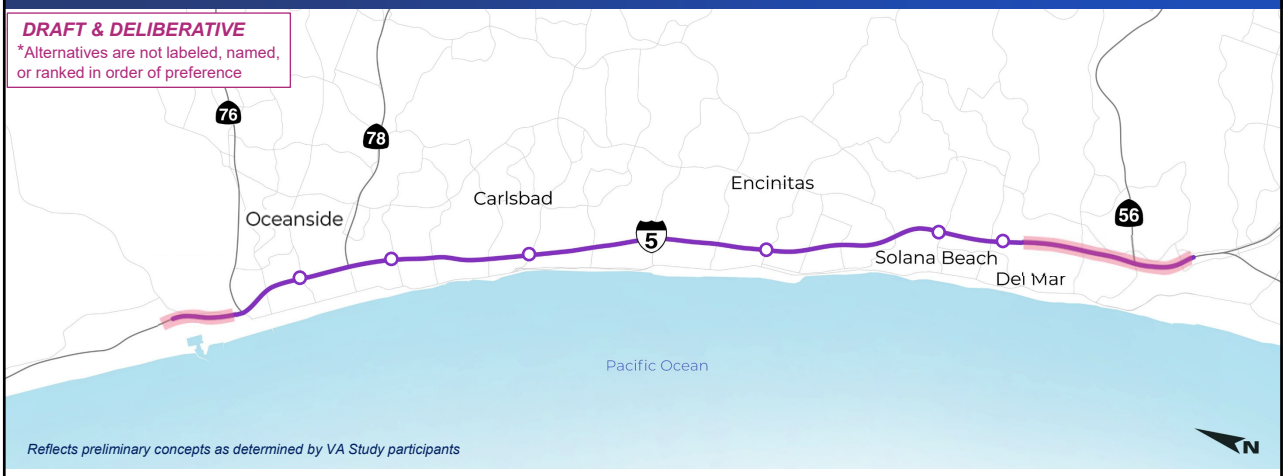
10 | IOC-01

Relocate LOSSAN corridor along I-5 from Oceanside to Sorrento Valley



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10 | IOC-01

Relocate LOSSAN corridor along I-5 from Oceanside to Sorrento Valley

Estimated Cost: $34B to $45B

Rail Operations:	Requires replacement of all existing stations with unknown impacts to passenger service. Must address connection to the Escondido subdivision and potential impacts to Camp Pendleton.
Construction Impacts:	Increases overall footprint of construction impacts significantly. Will impact traffic flow on I-5 and other local arterials throughout construction.
Ecological Effects:	Project footprint would increase to 25 miles and would require seven lagoon crossings, four of which have undergone restoration projects.
Community Effects:	This alternative would expand effects to all communities and roadway users located along the project footprint.
Maintainability:	Results in extensive tunnel and bridge maintenance.
Resiliency / Reliability:	Unknown.
Schedule:	It is anticipated that the schedule would be much longer than Alignment Alternatives B & C.

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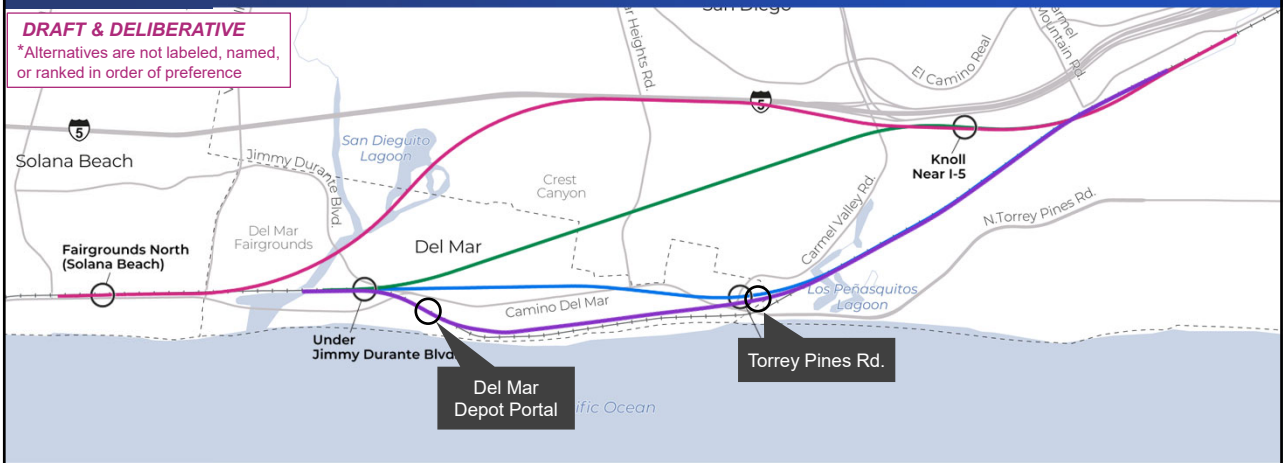
11 | IOC-02

Shift North Portal to the Del Mar Train Station and run alignment parallel to Del Mar Bluffs



Reflects preliminary concepts as determined by VA Study participants

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11 | IOC-02

Shift North Portal to the Del Mar Train Station and run alignment parallel to Del Mar Bluffs

Estimated Cost: $4.1B to $5.4B

Rail Operations:	75 and 80 mph curves on this alignment increases travel time as compared to 110 mph alternatives.
Construction Impacts:	Concerns about coastal access and parking for residents and visitors. Requires extensive temporary shoo-fly through private ROW.
Ecological Effects:	May require placement of fill in Anderson Canyon, depending on alignment selected, and related habitat mitigation.
Community Effects:	Impacts historic Del Mar Station property and requires additional trenching in Del Mar.
Maintainability:	Increases length of tunnel and related maintenance.
Resiliency / Reliability:	The new alignment may be only 84-feet from the existing bluffs. Future erosion could bring the shoreline in closer to the bored tunnel alignment. Sag in profiles increases reliance on floodwalls.
Schedule:	It is anticipated that the schedule would be longer compared to Alignment Alternatives B & C.

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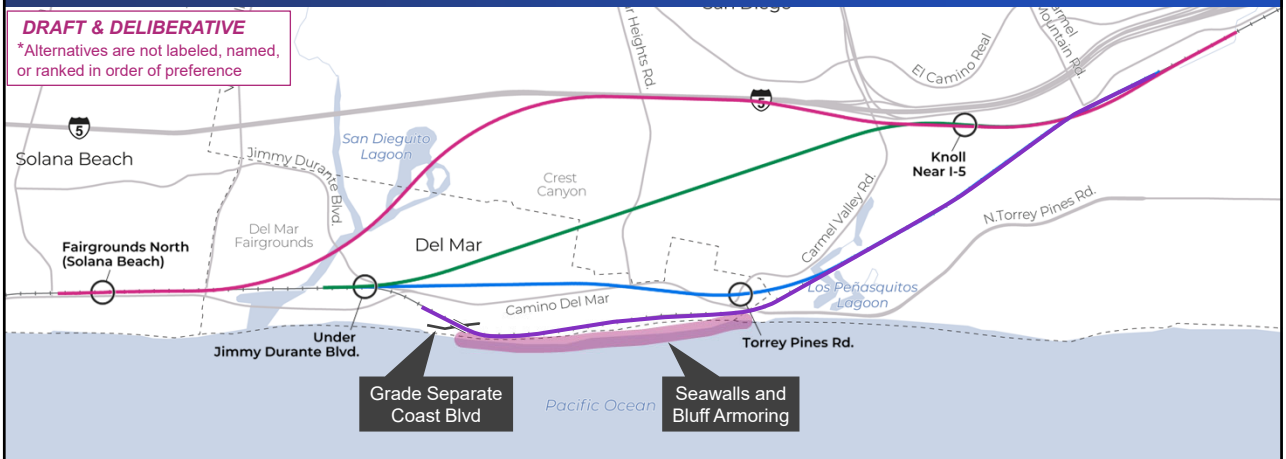
12 | IOC-04

Stabilize bluffs and widen existing alignment to accommodate a second track



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12 | IOC-04

Stabilize bluffs and widen existing alignment to accommodate a second track

Estimated Cost: $1.9B to $2.5B

Rail Operations:	55 mph curves on this alignment increases travel time as compared to 110 mph alternatives.
Construction Impacts:	There will be significant impacts on the community related to noise, dust, vibrations, and coastal access. Grade separation of Coast Blvd. will impact traffic.
Ecological Effects:	Requires construction of additional sea walls which will impact habitat. May conflict with regional plan mandate to move rail alignment off bluffs.
Community Effects:	Alternative may be constructed mostly within the existing NCTD right of way. Increases effects to adjacent residential properties on the bluff. May reduce coastal access.
Maintainability:	May not fully address concerns related to erosion of bluffs and require additional future maintenance projects.
Resiliency / Reliability:	Alignment is more exposed to climate change and sea level rise on the bluffs.
Schedule:	The schedule for this concept is difficult to estimate. It could take less time to construct than Alts. B & C but obtaining environmental clearance will be challenging and time consuming.

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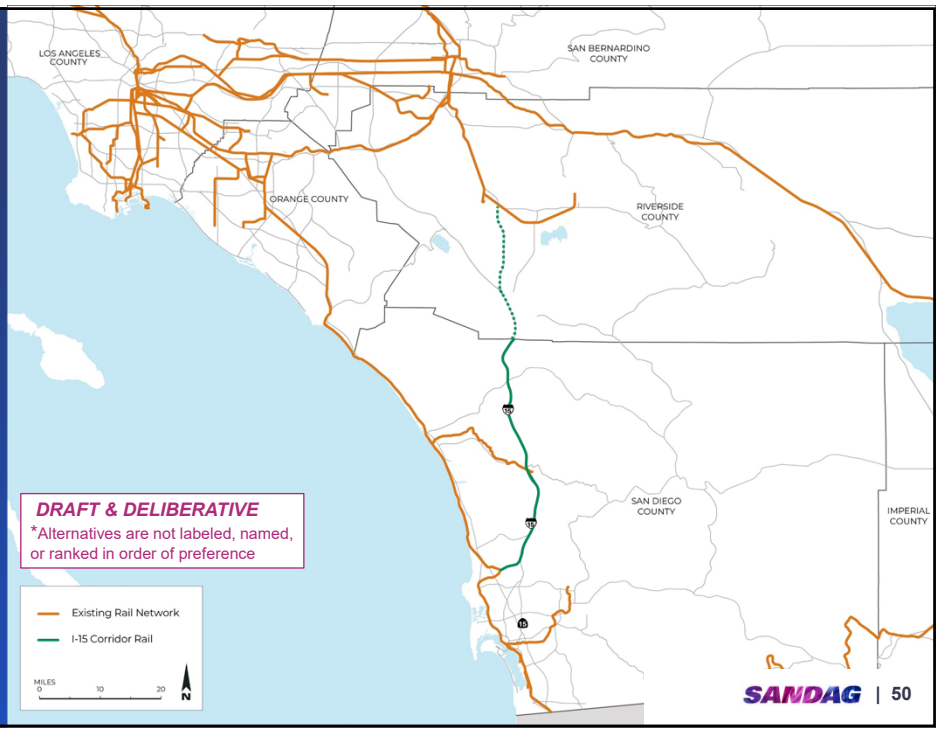
13 | IOC-06

Relocate all freight rail along the I-15 corridor

Reflects preliminary concepts as determined by VA Study participants



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13 | IOC-06

Relocate freight rail along the I-15 corridor

Estimated Cost: $118B to $158B

Rail Operations:	Addresses only freight and does not offer commuter rail and Amtrak solutions. Requires freight service to be maintained to existing customers.
Construction Impacts:	Enlarges footprint of construction impacts along the I-215 and I-15 corridors for 80-miles.
Ecological Effects:	Increases potential ecological impacts over an 80-mile-long area.
Community Effects:	Increases community impacts over an 80-mile-long area.
Maintainability:	Unclear who would own and maintain the I-15 freight realignment.
Resiliency / Reliability:	Unknown.
Schedule:	It is anticipated that the schedule would be much longer than Alignment Alternatives B & C. It will require many years of environmental process to reach construction.

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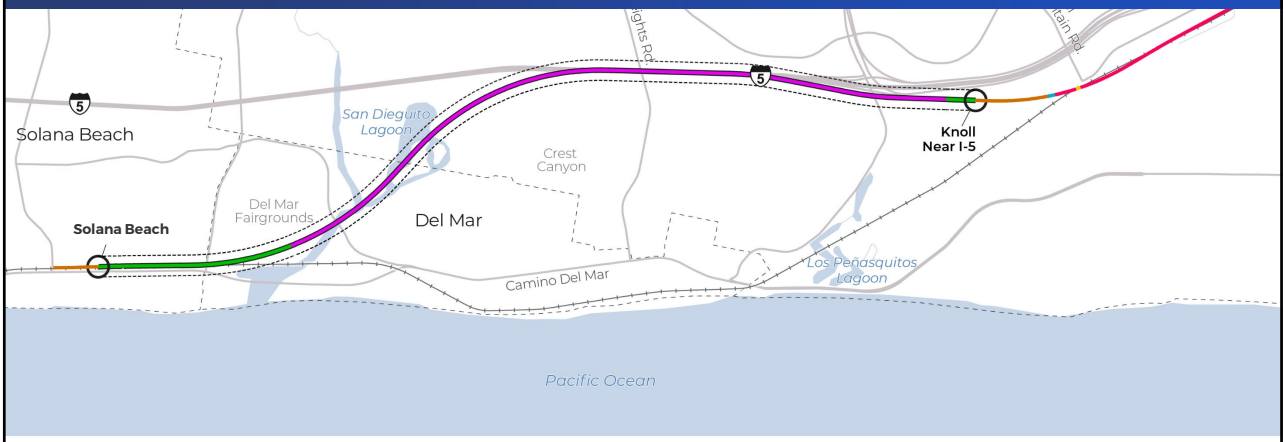
14 | Proposed NOP Alternative Alignment A



Reflects preliminary concepts as determined by VA Study participants

San Diego LOSSAN Rail Realignment - Alternative A

- Bored Tunnel
- Cut-and-Cover Tunnel
- Bridge
- Floodwalls
- Graded
- U-Section
- Tunnel Segment
- Portal Location
- Existing LOSSAN Corridor Track Alignment
- Municipal Boundary

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14 | Proposed NOP Alternative Alignment A

Estimated Cost: $6.9B to $9.2B

Rail Operations:	Provides a 110-mph rail alignment.
Construction Impacts:	Extends construction impacts through the Del Mar Fairgrounds and Solana Beach. Reduces impacts to Del Mar. Results in the loss of investment in the new San Dieguito rail bridge and platform.
Ecological Effects:	Largely avoids wetland impacts.
Community Effects:	Results in a station location for the Del Mar Fairgrounds the conflicts with existing operations. Avoids right-of-way takes in Del Mar. Avoids underground easements for private property.
Maintainability:	Extends length of tunnel to maintain. Underground rail station at Del Mar Fairgrounds will increase maintenance costs related to vertical circulation and ventilation.
Resiliency / Reliability:	Locates Del Mar Fairground station underground in a floodplain.
Schedule:	It is anticipated that the schedule would be comparable to, or longer than, Alignment Alternatives B & C.

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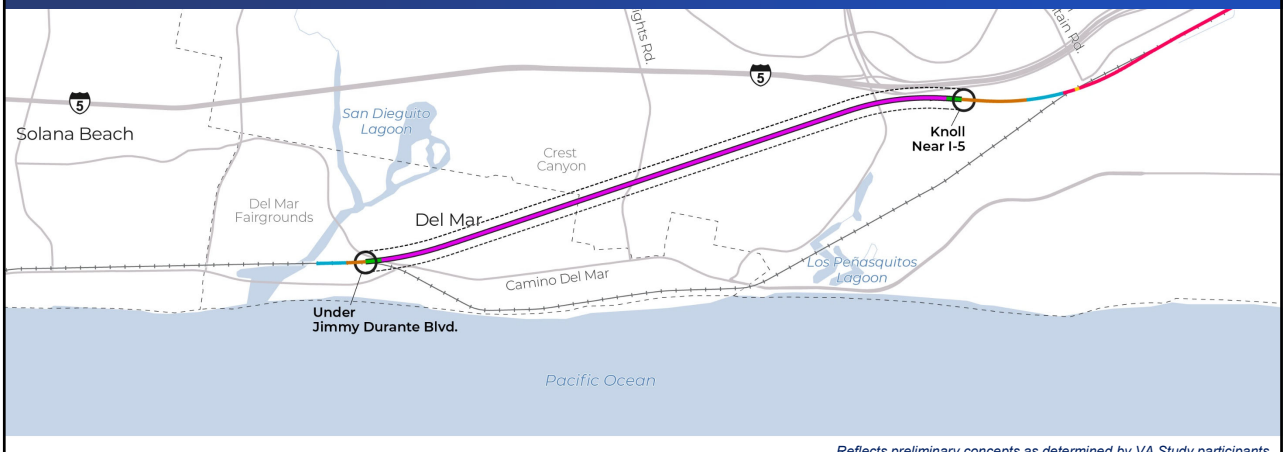
15 | NOP Proposed Alternative Alignment B



Reflects preliminary concepts as determined by VA Study participants

San Diego LOSSAN Rail Realignment - Alternative B

- Bored Tunnel
- Cut-and-Cover Tunnel
- Bridge
- Floodwalls
- Graded
- U-Section
- Tunnel Segment
- Portal Location
- Existing LOSSAN Corridor Track Alignment
- Municipal Boundary

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15 | NOP Proposed Alternative Alignment B

Estimated Cost: $3.7B to $4.9B

Rail Operations:	Provides a 110-mph rail alignment.
Construction Impacts:	Concerns about impacts to residents at North Portal including noise, vibration, dust, and maintaining driveway access.
Ecological Effects:	Largely avoids wetland impacts.
Community Effects:	Concerns about easement and property acquisitions at North Portal. Requires numerous underground easements under private property.
Maintainability:	Significant tunnel alignment segment required to be maintained.
Resiliency / Reliability:	Sag profile in tunnel makes the tracks more reliant on floodwalls.
Schedule:	It is anticipated that the schedule would be ~7 years of construction.

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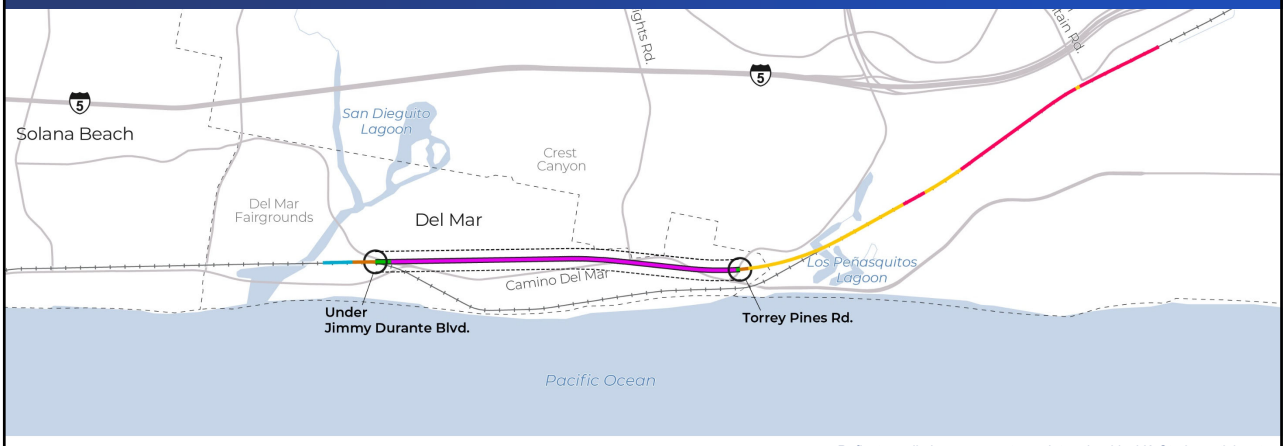
16 | NOP Proposed Alternative Alignment C



Reflects preliminary concepts as determined by VA Study participants

San Diego LOSSAN Rail Realignment - Alternative C

- Bored Tunnel
- Cut-and-Cover Tunnel
- Bridge
- Floodwalls
- Graded
- U-Section
- Tunnel Segment
- Portal Location
- Existing LOSSAN Corridor Track Alignment
- Municipal Boundary

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16 | NOP Proposed Alternative Alignment C

Estimated Cost: $3.3B to $4.4B

Rail Operations:	Provides a 110-mph rail alignment.
Construction Impacts:	Concerns about impacts to residents at North Portal including noise, vibration, dust, and maintaining driveway access.
Ecological Effects:	Locates long stretch of bridge and berm through wetlands area.
Community Effects:	Concerns about easement and property acquisitions at North Portal. Requires numerous underground easements under private property.
Maintainability:	Shortest tunnel to maintain but introduces long bridges over wetlands requiring maintenance.
Resiliency / Reliability:	Sag profile in tunnel makes the tracks more reliant on floodwalls.
Schedule:	It is anticipated that the schedule would be ~7 years of construction.

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Summary of VA Alternative Costs

Alt. No.	Title	Estimated Cost ($B)
1	Begin alignment south of San Dieguito bridge and run under Crest Canyon with 90 mph curves	$3.8 - $5.0
2	Keep the tunnel profile above projected flooding elevation and eliminate sag	$3.4 - $4.6
3	Relocate the southern portal south of existing pump station at Carmel Mt. Rd.	$4.5 - $6.0
4	Realign intersection at Jimmy Durante Blvd. and Camino Del Mar	TBD
5	Shift north portal under Camino Del Mar	$3.9 - $5.2
6	Begin alignment south of San Dieguito Bridge and run under Crest Canyon w/improved geometry	$3.7 - $4.9
7	Optimize the use of bridges and berms of Los Penasquitos Lagoon	TBD
8	Shift alignment under Camino del Mar with 90 mph curves	$3.6 - $4.8
9	Shift the original Torrey Pines Rd. portal to the west 100-feet	$3.3 - $4.4
10	Relocate LOSSAN corridor along I-5 from Oceanside to Sorrento Valley	$34 - $45
11	Shift North Portal to the Del Mar Train Station and run alignment parallel to Del Mar Bluffs	$4.1 - $5.4
12	Stabilize bluffs and widen existing alignment to accommodate a second track	$1.9 - $2.5
13	Relocate all freight rail along I-15 corridor	$118 - $158
14	Proposed NOP Alternative Alignment A	$6.9 - $9.2
15	Proposed NOP Alternative Alignment B	$3.7 - $4.9
16	Proposed NOP Alternative Alignment C	$3.3 - $4.4

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Additional Design Concepts

Results based on work by VA Study participants

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Additional Design Ideas to Consider

** Results based on work by VA Study participants*

Minimize Community Impacts	Minimize Ecological Impacts	Challenge Design Criteria	Improve Community
6 ideas	4 ideas	4 ideas	2 ideas

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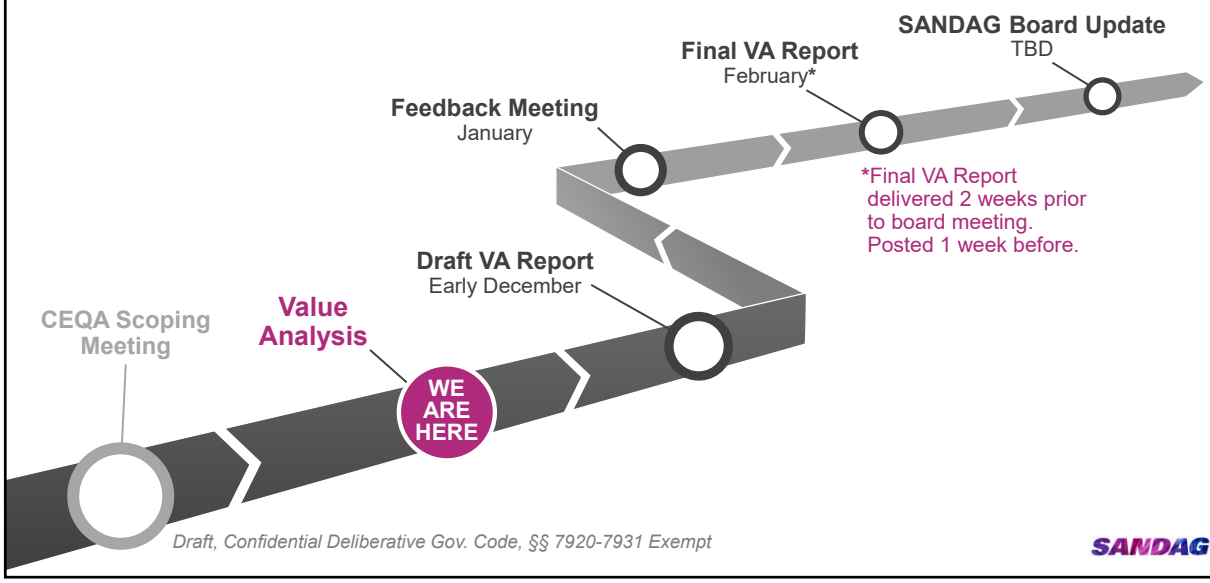
Next Steps



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Thank You!

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APPENDIX H: FEEDBACK MEETING SLIDES

A Feedback Meeting was held with the VA Team on December 20, 2024. The objective for this meeting was to receive feedback on the Draft VA Study Report and solicit input on the alternative concepts developed by the VA Team that warrant further consideration. Included in this appendix are the slides that were presented during this meeting and a table summarizing the VA alternative concepts that was provided as a handout during the meeting.

LOSSAN Rail Realignment

VA Study Feedback Meeting

December 20, 2024

1

Agenda

- Welcome Remarks, Intro, & VA Process Overview
- VA Alternative Concepts Summary & Materials
- Review of VA Study Goal, Objectives, & Evaluation Criteria
- Initial Stakeholder Feedback
- Feedback on VA Alternative Concepts
- VA Study Next Steps

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2

Welcoming Remarks

Mario Orso

Chief Executive Officer

San Diego Association of Governments

3

Value Analysis Study Process Overview

4

Value Analysis Study Process Overview

- Review of VA Study Process
- Feedback Meeting Goal

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5

The Value Methodology

A **systematic process** used by a **multidisciplinary team**, led by a qualified VM Facilitator, to improve the **value** of a project, product, process, service, or organization through the analysis of **functions**.

VMS Value Management Strategies

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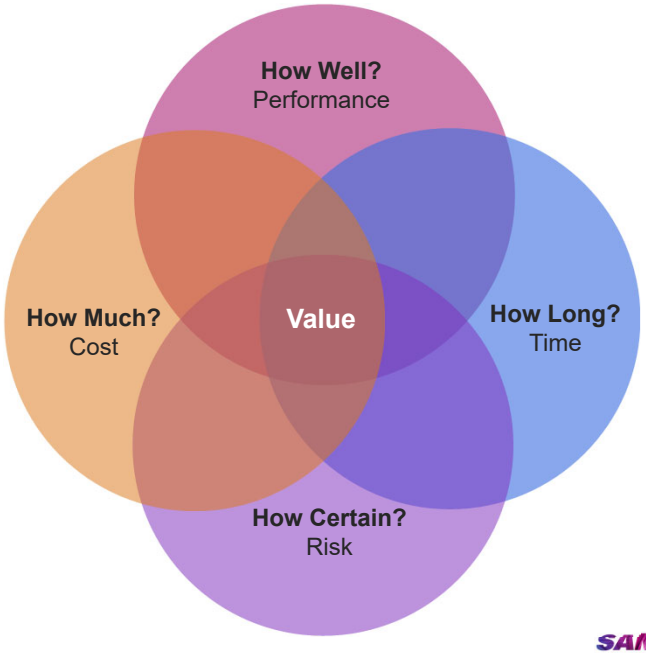
How will we think about value?



VMS Value Management Strategies

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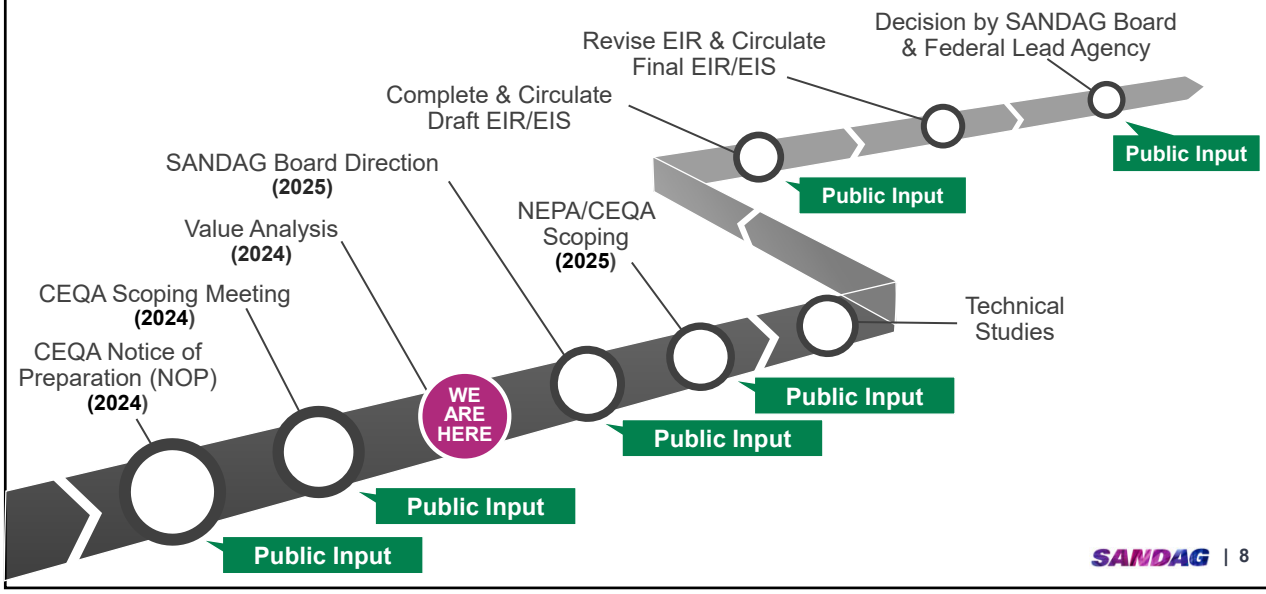
Environmental Process
(CEQA/NEPA)



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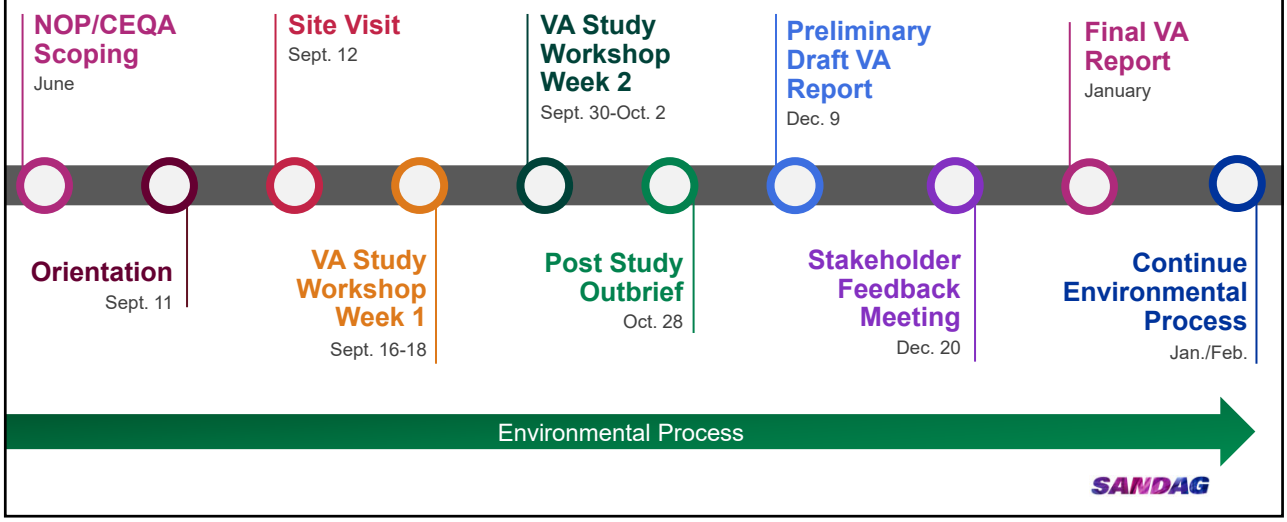
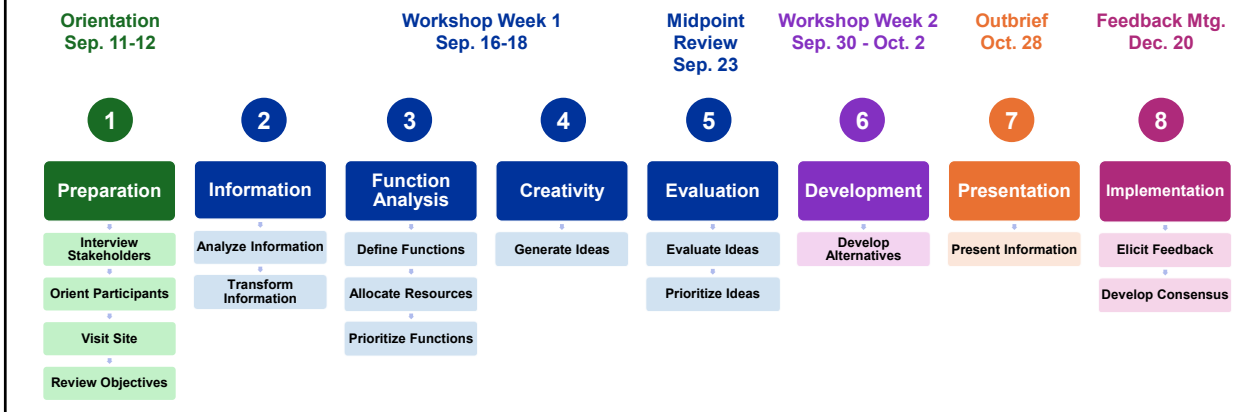
Value Analysis Activities



9

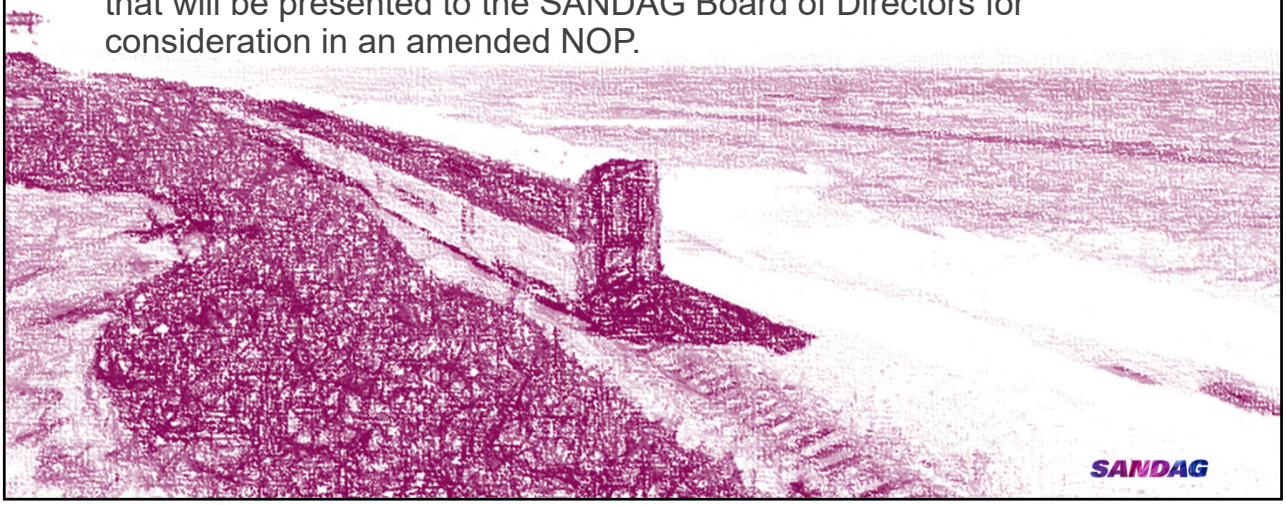
VA Study Process



10

Feedback Meeting Goal

Provide feedback that will be included in the Final VA Study Report that will be presented to the SANDAG Board of Directors for consideration in an amended NOP.



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VA Alternative Concepts Summary & Materials

12

Overview of VA Study Feedback Meeting Process

- Overview of VA Study Feedback Meeting Process
  - — Stakeholders provide general initial feedback
  - — Stakeholders provide specific feedback on VA Alternative Concepts
- Overview of VA Study Feedback Meeting Materials
  - — Draft VA Study Report
  - — Handouts
- Table Helpers
  - — Available to assist with questions or meeting materials
- Ground Rules
- VA Alternative Concepts

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VA Study Ground Rules

- Be present. Be here.
- Assume positive intent.
- Take space. Make space.
- Share from your own perspective.
- Listen with the intent to learn and understand.
- Respect the agenda, the group's time, and the input of others.
- Maintain confidentiality.
  - – *Please do not share content from the VA process; official content will be released via reports.*

VMS Value Management Strategies

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Overview of VA Alternative Concepts

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Summary of VA Alternative Concepts

#	Idea	VA Alternative Concept	Intent	Design Speed	Length	Estimated Cost ($B)	South Portal	North Portal	Alignment
1	MRI-01	Locate North Portal at David Way following under Crest Canyon with 90 mph curves	Minimize private subsurface easements by locating bored tunnel segment under Crest Canyon Open Space Park and Torrey Pines State Natural Reserve Extension.	90 mph	5.1 miles	$3.8 to $5.0	Portofino	David Way	Crest Canyon 90
							I-5 Knoll	David Way	Crest Canyon 90
2	MRI-04	Keep the tunnel profile above projected flooding elevations and provide positive drainage	Provide tunnel profile above flood levels and sea level rise and provide positive drainage in the tunnel.	110 mph	4.8 miles	$3.4 to $4.6	Portofino	Jimmy Durante Overpass	Crest Canyon 110
3	MRI-06	Locate the Southern Portal south of existing pump station at Carmel Mountain Road	Minimize permanent effects to the existing wetlands by locating the southern portal south of Los Penasquitos Lagoon.	110 mph	5 miles	$4.5 to $6.0	Sorrento Valley	Under Jimmy Durante	Crest Canyon 110
4	AW-01	Realign intersection at Jimmy Durante Boulevard and Camino Del Mar	Reduce property effects and acquisitions, and improve local traffic circulation by realigning Jimmy Durante Boulevard to the west over the existing rail alignment with a new roundabout intersection at Camino Del Mar.	N/A	N/A	Not Developed	N/A	N/A	N/A
5	AW-02	Locate north portal within Camino Del Mar	Minimize permanent effects on private properties by locating the transition from cut-and-cover to bored tunnel to be within public right-of-way of the existing roads.	110 mph	5.3 miles	$3.9 to $5.2	I-5 Knoll	Within Camino Del Mar	Crest Canyon 110
6	AW-05	Locate North Portal Under Jimmy Durante Boulevard following under Crest Canyon with 90 mph curves	Minimize private subsurface easements by locating bored tunnel segment under Crest Canyon Open Space Park and Torrey Pines State Natural Reserve Extension.	90 mph	5.1 miles	$3.7 to $4.9	I-5 Knoll	Under Jimmy Durante	Crest Canyon Improved 90
							Portofino	Under Jimmy Durante	Crest Canyon Improved 90
7	MH-01	Optimize the use of bridges and berms of Los Peñasquitos Lagoon	Optimize the locations and lengths of bridges and berms along the alignment passing through the lagoon.	N/A	N/A	Not Developed	N/A	N/A	N/A
8	MH-02	Locate alignment under Camino Del Mar with 90 mph curves	Minimize private subsurface easements by locating bored tunnel segment under Camino Del Mar roadway.	90 mph	4.9 miles	$3.6 to $4.8	Torrey Pines Rd	Within Camino Del Mar	Camino Del Mar 90
9	MH-03	Locate the bored tunnel transition south of Carmel Valley Road	Minimize private property effects by locating the cut-and-cover tunnel segment at the south portal to the south of Carmel Valley Road and locating it west toward North Torrey Pines Road.	110 mph	4.9 miles	$3.3 to $4.4	Torrey Pines Rd West	Under Jimmy Durante	Camino Del Mar 110
10	IOC-01	Relocate LOSSAN corridor along I-5 from Oceanside to Sorrento Valley	Explore relocating the rail corridor and operations from existing alignment to new location along I-5 between Oceanside and Sorrento Valley.	90 mph	25 miles	$34 to $45	N/A	N/A	I-5 Oceanside to Sorrento Valley
11	IOC-02	Locate the bored tunnel transition at the Old Del Mar Train Station	Minimize private property effects by using the site of the old Del Mar train station and parking lots for construction staging areas and locating the bored tunnel transition to cut-and-cover at the north end within the railroad right-of-way.	75 mph	5 miles	$4.1 to $5.4	Torrey Pines Rd West	Old Del Mar Station	Stratford Court 80
12	IOC-04	Stabilize bluffs and widen existing alignment to accommodate a second track	Maintain the location of the existing rail alignment and add a second track to the east of the existing tracks within the railroad right-of-way.	55 mph	4.1 miles	$1.9 to $2.5	N/A	N/A	Double Track Bluffs
13	IOC-06	Relocate all freight rail along I-15 corridor	Maintain passenger rail service near the current alignment and shift freight rail service to the I-15 corridor.	N/A	75 miles	$118 to $158	N/A	N/A	I-15 Freight Rail
14	NOP A	Locate North Portal in Solana Beach Trench to South Portal at I-5 Knoll with bored tunnel under Fairgrounds and I-5 (Proposed NOP Alternative Alignment A – I-5 Alignment)	Proposed NOP Alternative Alignment A – I-5 Alignment	110 mph	6.6 miles	$6.9 to $9.2	I-5 Knoll	Solana Beach	I-5 110
15	NOP B	Locate North Portal Under Jimmy Durante Blvd. to South Portal at I-5 Knoll (Proposed NOP Alternative Alignment B – Crest Canyon Alignment)	Proposed NOP Alternative Alignment B – Crest Canyon Alignment	110 mph	5.3 miles	$3.7 to $4.9	I-5 Knoll	Under Jimmy Durante	Crest Canyon 110
16	NOP C	Locate North Portal at Camino Del Mar to South Portal at Torrey Pines Road (Proposed NOP Alternative Alignment C – Camino Del Mar Alignment)	Proposed NOP Alternative Alignment C – Camino Del Mar Alignment	110 mph	4.9 miles	$3.3 to $4.4	Torrey Pines Rd	Under Jimmy Durante	Camino Del Mar 110

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Review of VA Study Goal, Objectives, & Evaluation Criteria

16

Review of VA Study Goal, Objectives, & Evaluation Criteria

- VA Study Project Goal
- VA Study Project Objectives
- VA Study Evaluation Criteria

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VA Study Project Goal

To maintain and enhance passenger and freight service along the San Diego segment of the LOSSAN rail corridor.

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VA Study Project Objective #1

Improve rail service reliability by minimizing risks from climate change, including consideration of sea level rise, flooding, and the stability of the ~~relocating the existing railroad tracks away from the eroding~~ coastal bluffs ~~in Del Mar~~.

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VA Study Project Objective #2

Maintain passenger rail service to ~~the existing train stations serving~~ Solana Beach and Sorrento Valley and accommodate direct rail access to the 22nd District Agricultural Association (Del Mar Fairgrounds) while minimizing disruptions to passenger and freight service during construction.

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VA Study Project Objective #3

Minimize impacts ~~in the surrounding communities~~ to existing homes, businesses, tourism, and major economic generators, including the Del Mar Fairgrounds, and transportation facilities during and after construction.

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VA Study Project Objective #4

Avoid and/or minimize negative effects, and where possible enhance ~~impacts on~~ biological, cultural, and recreational resources of national, state, or local significance, including publicly owned parks, recreational trails, beaches, wetlands, ecological reserves, wildlife or waterfowl refuges, and any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places.

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VA Study Project Objective #5

Help meet the goals of the ~~2021~~ Regional Plan and the ~~2018~~ California State Rail Plan by increasing passenger and freight train capacity, further reducing travel times, improving reliability, and ~~accommodating additional rail service~~ considering existing and planned investments.

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VA Study Project Objective #6

Improve coastal access and safety by eliminating at-grade railroad crossings and minimizing ~~other pedestrian-rail~~ points of interaction between rail and all other modes of transportation.

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VA Study Project Objective #7

Demonstrate good public stewardship by delivering the project in a timely way that considers prior investments, construction, right-of-way, operations, and maintenance costs.

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Evaluation Criteria*

** Revised based on feedback from stakeholders at VA orientation*

- **Rail Operations:** An assessment of the efficiency of rail operations. This considers travel time, station access, operational flexibility, and system capacity.
- **Construction Impacts:** An assessment of the short-term effects to biological, ecological, cultural, recreational, historic, and socioeconomic resources occurring during construction. This considers traffic, air, and noise quality.
- **Ecological Effects:** An assessment of the long-term effects to biological and ecological resources. This considers air, water, and noise quality.
- **Community Effects:** An assessment of the long-term effects to cultural, historic, recreational, and socioeconomic resources. This also considers air, noise, vibration, traffic, and business impacts to the communities. Short-term impacts during construction were also considered.
- **Maintainability:** An assessment of the total cost of ownership to maintain the infrastructure. The evaluation also considered what might be required to maintain the infrastructure, such as additional project features and/or approvals from other parties.
- **Resiliency / Reliability:** An assessment of the long-term reliability of the infrastructure and climate resiliency.
- **Cost:** A measure of the initial cost to deliver the project.

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Initial Stakeholder Feedback

22nd District Agricultural Association
Caltrans
City of Carlsbad
City of Del Mar
City of Encinitas
City of Oceanside
City of San Diego
City of Solana Beach
NCTD

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22nd District Agricultural Association

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29

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DEL MAR™

31

CITY OF Encinitas

32

CITY OF OCEANSIDE

33

The City of SAN DIEGO

34

CITY OF SOLANA BEACH, CALIFORNIA
1986

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NORTH COUNTY TRANSIT DISTRICT

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Feedback on VA Alternative Concepts

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Feedback on VA Alternative Concepts

- Feedback Process
- Review Initial Feedback Provided on VA Alternative Concepts
- Feedback on South Portals
- Feedback on North Portals
- Feedback on Alignments
- Feedback Summary

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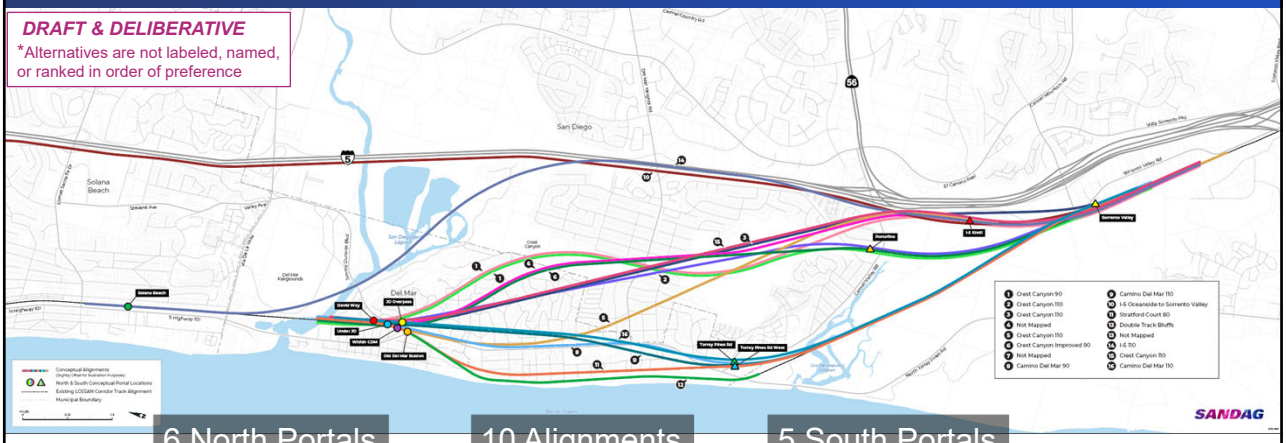
Portals and Alignments

DRAFT & DELIBERATIVE

*Alternatives are not labeled, named, or ranked in order of preference



6 North Portals | 10 Alignments | 5 South Portals

Reflects preliminary concepts as determined by VA Study participants

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Understanding Portals and Alignments

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Summary of VA Alternative Concepts

#	Idea	VA Alternative Concept	Intent	Design Speed	Length	Estimated Cost ($B)	South Portal	North Portal	Alignment
1	MRI-01	Locate North Portal at David Way following under Crest Canyon with 90 mph curves	Minimize private subsurface easements by locating bored tunnel segment under Crest Canyon Open Space Park and Torrey Pines State Natural Reserve Extension.	90 mph	5.1 miles	$3.8 to $5.0	Portofino	David Way	Crest Canyon 90
							I-5 Knoll	David Way	Crest Canyon 90
2	MRI-04	Keep the tunnel profile above projected flooding elevations and provide positive drainage	Provide tunnel profile above flood levels and sea level rise and provide positive drainage in the tunnel.	110 mph	4.8 miles	$3.4 to $4.6	Portofino	Jimmy Durante Overpass	Crest Canyon 110
3	MRI-06	Locate the Southern Portal south of existing pump station at Carmel Mountain Road	Minimize permanent effects to the existing wetlands by locating the southern portal south of Los Penasquitos Lagoon.	110 mph	5 miles	$4.5 to $6.0	Sorrento Valley	Under Jimmy Durante	Crest Canyon 110
4	AW-01	Realign intersection at Jimmy Durante Boulevard and Camino Del Mar	Reduce property effects and acquisitions, and improve local traffic circulation by realigning Jimmy Durante Boulevard to the west over the existing rail alignment with a new roundabout intersection at Camino Del Mar.	N/A	N/A	Not Developed	N/A	N/A	N/A
5	AW-02	Locate north portal within Camino Del Mar	Minimize permanent effects on private properties by locating the transition from cut-and-cover to bored tunnel to be within public right-of-way of the existing roads.	110 mph	5.3 miles	$3.9 to $5.2	I-5 Knoll	Within Camino Del Mar	Crest Canyon 110
6	AW-05	Locate North Portal Under Jimmy Durante Boulevard following under Crest Canyon with 90 mph curves	Minimize private subsurface easements by locating bored tunnel segment under Crest Canyon Open Space Park and Torrey Pines State Natural Reserve Extension.	90 mph	5.1 miles	$3.7 to $4.9	I-5 Knoll	Under Jimmy Durante	Crest Canyon Improved 90
							Portofino	Under Jimmy Durante	Crest Canyon Improved 90
7	MH-01	Optimize the use of bridges and berms of Los Peñasquitos Lagoon	Optimize the locations and lengths of bridges and berms along the alignment passing through the lagoon.	N/A	N/A	Not Developed	N/A	N/A	N/A
8	MH-02	Locate alignment under Camino Del Mar with 90 mph curves	Minimize private subsurface easements by locating bored tunnel segment under Camino Del Mar roadway.	90 mph	4.9 miles	$3.6 to $4.8	Torrey Pines Rd	Within Camino Del Mar	Camino Del Mar 90
9	MH-03	Locate the bored tunnel transition south of Carmel Valley Road	Minimize private property effects by locating the cut-and-cover tunnel segment at the south portal to the south of Carmel Valley Road and locating it west toward North Torrey Pines Road.	110 mph	4.9 miles	$3.3 to $4.4	Torrey Pines Rd West	Under Jimmy Durante	Camino Del Mar 110
10	IOC-01	Relocate LOSSAN corridor along I-5 from Oceanside to Sorrento Valley	Explore relocating the rail corridor and operations from existing alignment to new location along I-5 between Oceanside and Sorrento Valley.	90 mph	25 miles	$34 to $45	N/A	N/A	I-5 Oceanside to Sorrento Valley
11	IOC-02	Locate the bored tunnel transition at the Old Del Mar Train Station	Minimize private property effects by using the site of the old Del Mar train station and parking lots for construction staging areas and locating the bored tunnel transition to cut-and-cover at the north end within the railroad right-of-way.	75 mph	5 miles	$4.1 to $5.4	Torrey Pines Rd West	Old Del Mar Station	Stratford Court 80
12	IOC-04	Stabilize bluffs and widen existing alignment to accommodate a second track	Maintain the location of the existing rail alignment and add a second track to the east of the existing tracks within the railroad right-of-way.	55 mph	4.1 miles	$1.9 to $2.5	N/A	N/A	Double Track Bluffs
13	IOC-06	Relocate all freight rail along I-15 corridor	Maintain passenger rail service near the current alignment and shift freight rail service to the I-15 corridor.	N/A	75 miles	$118 to $158	N/A	N/A	I-15 Freight Rail
14	NOP A	Locate North Portal in Solana Beach Trench to South Portal at I-5 Knoll with bored tunnel under Fairgrounds and I-5 (Proposed NOP Alternative Alignment A – I-5 Alignment)	Proposed NOP Alternative Alignment A – I-5 Alignment	110 mph	6.6 miles	$6.9 to $9.2	I-5 Knoll	Solana Beach	I-5 110
15	NOP B	Locate North Portal Under Jimmy Durante Blvd. to South Portal at I-5 Knoll (Proposed NOP Alternative Alignment B – Crest Canyon Alignment)	Proposed NOP Alternative Alignment B – Crest Canyon Alignment	110 mph	5.3 miles	$3.7 to $4.9	I-5 Knoll	Under Jimmy Durante	Crest Canyon 110
16	NOP C	Locate North Portal at Camino Del Mar to South Portal at Torrey Pines Road (Proposed NOP Alternative Alignment C – Camino Del Mar Alignment)	Proposed NOP Alternative Alignment C – Camino Del Mar Alignment	110 mph	4.9 miles	$3.3 to $4.4	Torrey Pines Rd	Under Jimmy Durante	Camino Del Mar 110

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Feedback Exercise #1 | South Portals

- Select up to three south portal options you are interested studying further.
  - Select no more than three
  - Place only one sticker per option
- Map, summary table, and draft report are available for reference

▲ I-5 Knoll	▲ Torrey Pines Rd
▲ Sorrento Valley	▲ Torrey Pines Rd West
▲ Portofino	

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Feedback Exercise #2 | North Portals

- Select up to three north portal options you are interested studying further.
  - Select no more than three
  - Place only one sticker per option
- Map, summary table, and draft report are available for reference

● David Way	● Under Jimmy Durante
● Within Camino Del Mar	● Jimmy Durante Overpass
● Solana Beach	● Old Del Mar Station

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Feedback Exercise #3 | Alignments

- Select up to three alignment options you are interested in studying further.
  - Select no more than three
  - Place only one sticker per option
- Map, summary table, and draft report are available for reference

Camino Del Mar – 110 ●●● / ▲▲	Stratford Court – 80 ● / ▲
I-5 – 110 ● / ▲	Camino Del Mar – 90 ● / ▲
Crest Canyon – 90 ● / ▲▲	Double Track on Bluffs – 55
Crest Canyon Improved – 90 ● / ▲▲	I-15 Freight Rail – TBD
Crest Canyon – 110 ●●● / ▲▲▲	I-5 Oceanside to Sorrento Valley – 90

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Break

Please return in 15 minutes.

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Feedback Summary South Portals

Alternative Concepts
I-5 Knoll
Portofino
Sorrento Valley
Torrey Pines Rd
Torrey Pines Rd West
No Portal

45

Feedback Summary North Portals

Alternative Concepts
David Way
Old Del Mar Station
Jimmy Durante Overpass
Solana Beach
Under Jimmy Durante
Within Camino Del Mar
No Portal

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Feedback Summary Alignments

Alternative Concepts
Camino Del Mar – 110 (VA Alt #9)
Camino Del Mar – 90 (VA Alt #8)
Crest Canyon – 110 (VA Alt #15)
Crest Canyon – 90 (VA Alt #1)
Crest Canyon Improved – 90 (VA Alt #6)
Solana Beach / Fairgrounds / I-5 – 110 (VA Alt #14)
Stratford Court – 80 (VA Alt #11)
Double Track on Bluffs – 55 (VA Alt #12)
I-5 Oceanside to Sorrento Valley – 90 (VA Alt #10)
I-15 Freight Rail – TBD (VA Alt #13)

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VA Study Next Steps

VA Study Next Steps

- Prepare written summary of feedback
- Revise Draft Report based on comments and feedback
- Perform legal review and ADA compliance formatting
- Post Final VA Study Report to SANDAG website for public viewing (Jan)
- Outreach activities before SANDAG Board Meeting (Jan/Feb)
- SANDAG Board Meeting for direction (Feb 28th)
- NOP / NOI (Spring 2025)

**Dates subject to change*

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Summary of VA Alternative Concepts

#	Idea	VA Alternative Concept	Intent	Design Speed	Length	Estimated Cost ($B)	South Portal	North Portal	Alignment
1	MRI-01	Locate North Portal at David Way following under Crest Canyon with 90 mph curves	Minimize private subsurface easements by locating bored tunnel segment under Crest Canyon Open Space Park and Torrey Pines State Natural Reserve Extension.	90 mph	5.1 miles	$3.8 to $5.0	**Portofino** △	**David Way** ●	**Crest Canyon 90**
							I-5 Knoll ▲	**David Way** ●	**Crest Canyon 90**
2	MRI-04	Keep the tunnel profile above projected flooding elevations and provide positive drainage	Provide tunnel profile above flood levels and sea level rise and provide positive drainage in the tunnel.	110 mph	4.8 miles	$3.4 to $4.6	**Portofino** △	**Jimmy Durante Overpass** ●	**Crest Canyon 110**
3	MRI-06	Locate the Southern Portal south of existing pump station at Carmel Mountain Road	Minimize permanent effects to the existing wetlands by locating the southern portal south of Los Penasquitos Lagoon.	110 mph	5 miles	$4.5 to $6.0	**Sorrento Valley** △	**Under Jimmmy Durante** ●	**Crest Canyon 110**
4	AW-01	Realign intersection at Jimmy Durante Boulevard and Camino Del Mar	Reduce property effects and acquisitions, and improve local traffic circulation by realigning Jimmy Durante Boulevard to the west over the existing rail alignment with a new roundabout intersection at Camino Del Mar.	N/A	N/A	Not Developed	N/A	N/A	N/A
5	AW-02	Locate north portal within Camino Del Mar	Minimize permanent effects on private properties by locating the transition from cut-and-cover to bored tunnel to be within public right-of-way of the existing roads.	110 mph	5.3 miles	$3.9 to $5.2	**I-5 Knoll** ▲	**Within Camino Del Mar** ●	**Crest Canyon 110**
6	AW-05	Locate North Portal Under Jimmy Durante Boulevard following under Crest Canyon with 90 mph curves	Minimize private subsurface easements by locating bored tunnel segment under Crest Canyon Open Space Park and Torrey Pines State Natural Reserve Extension.	90 mph	5.1 miles	$3.7 to $4.9	**I-5 Knoll** ▲	**Under Jimmmy Durante** ●	**Crest Canyon Improved 90**
							Portofino △	**Under Jimmmy Durante** ●	**Crest Canyon Improved 90**
7	MH-01	Optimize the use of bridges and berms of Los Peñasquitos Lagoon	Optimize the locations and lengths of bridges and berms along the alignment passing through the lagoon.	N/A	N/A	Not Developed	N/A	N/A	N/A
8	MH-02	Locate alignment under Camino Del Mar with 90 mph curves	Minimize private subsurface easements by locating bored tunnel segment under Camino Del Mar roadway.	90 mph	4.9 miles	$3.6 to $4.8	**Torrey Pines Rd** △	**Within Camino Del Mar** ●	**Camino Del Mar 90**
9	MH-03	Locate the bored tunnel transition south of Carmel Valley Road	Minimize private property effects by locating the cut-and-cover tunnel segment at the south portal to the south of Carmel Valley Road and locating it west toward North Torrey Pines Road.	110 mph	4.9 miles	$3.3 to $4.4	**Torrey Pines Rd West** △	**Under Jimmmy Durante** ●	**Camino Del Mar 110**
10	IOC-01	Relocate LOSSAN corridor along I-5 from Oceanside to Sorrento Valley	Explore relocating the rail corridor and operations from existing alignment to new location along I-5 between Oceanside and Sorrento Valley.	90 mph	25 miles	$34 to $45	N/A	N/A	**I-5 Oceanside to Sorrento Valley**
11	IOC-02	Locate the bored tunnel transition at the Old Del Mar Train Station	Minimize private property effects by using the site of the old Del Mar train station and parking lots for construction staging areas and locating the bored tunnel transition to cut-and-cover at the north end within the railroad right-of-way.	75 mph	5 miles	$4.1 to $5.4	**Torrey Pines Rd West** △	**Old Del Mar Station** ●	**Stratford Court 80**
12	IOC-04	Stabilize bluffs and widen existing alignment to accommodate a second track	Maintain the location of the existing rail alignment and add a second track to the east of the existing tracks within the railroad right-of-way.	55 mph	4.1 miles	$1.9 to $2.5	N/A	N/A	**Double Track Bluffs**
13	IOC-06	Relocate all freight rail along I-15 corridor	Maintain passenger rail service near the current alignment and shift freight rail service to the I-15 corridor.	N/A	75 miles	$118 to $158	N/A	N/A	**I-15 Freight Rail**
14	NOP A	Locate North Portal in Solana Beach Trench to South Portal at I-5 Knoll with bored tunnel under Fairgrounds and I-5 (Proposed NOP Alternative Alignment A – I-5 Alignment)	Proposed NOP Alternative Alignment A – I-5 Alignment	110 mph	6.6 miles	$6.9 to $9.2	**I-5 Knoll** ▲	**Solana Beach** ●	**I-5 110**
15	NOP B	Locate North Portal Under Jimmy Durante Blvd. to South Portal at I-5 Knoll (Proposed NOP Alternative Alignment B – Crest Canyon Alignment)	Proposed NOP Alternative Alignment B – Crest Canyon Alignment	110 mph	5.3 miles	$3.7 to $4.9	**I-5 Knoll** ▲	**Under Jimmmy Durante** ●	**Crest Canyon 110**
16	NOP C	Locate North Portal at Camino Del Mar to South Portal at Torrey Pines Road (Proposed NOP Alternative Alignment C – Camino Del Mar Alignment)	Proposed NOP Alternative Alignment C – Camino Del Mar Alignment	110 mph	4.9 miles	$3.3 to $4.4	**Torrey Pines Rd** △	**Under Jimmmy Durante** ●	**Camino Del Mar 110**