SANDAG TransNet NORTH COUNTY TRANSIT DISTRICT Caltrans

LOSSAN Los Angeles San Diego San Luis Obispo
Coastal Rail Corridor
San Diego Segment

SD-LOSSAN Regional Rail Corridor Improvements Study Update

Del Mar City Council | May 3, 2021

KeepSanDiegoMoving.com

1 Study Background

Los Angeles – San Diego – San Luis Obispo (LOSSAN) Rail Corridor

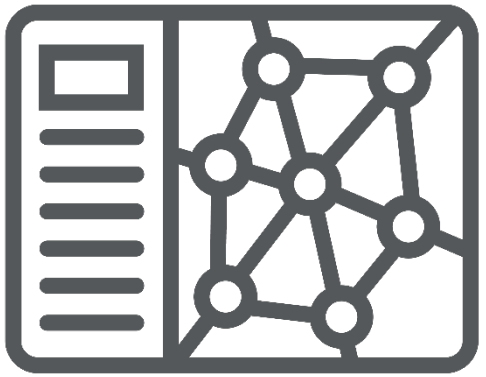
- Nation's second busiest intercity rail corridor behind the Northeast Corridor (8 million riders annually)
- Approximately $1 billion in goods carried
- San Diego Subdivision is the southernmost 60.1 miles in San Diego County
- Owned by NCTD and MTS
- Part of Strategic Rail Corridor Network (STRACNET)
- More than $1 billion identified for capital improvements (mainly capacity)

Expected Study Results

The study will result in:

Alternative Alignments

Proposed Improvements



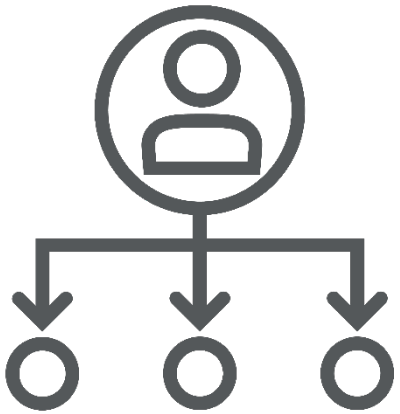
Supporting Analysis for Passenger and Freight Rail Services

Consistent with the 5 Big Moves, recommended improvements will support future investments to reduce travel times, increase capacity, and enhance safety

Scope of Work

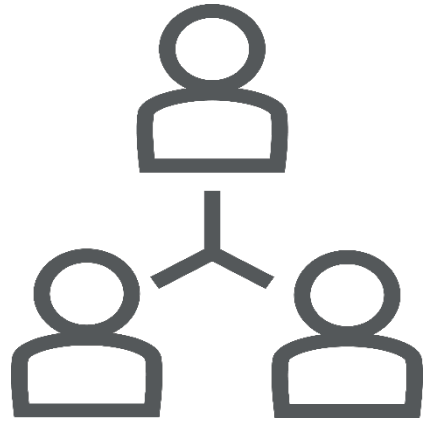
- Existing Conditions
- Corridor Resiliency
- Operational Feasibility –
  Sorrento Mesa Branch Analysis
- Basis of Design (Track)
- Basis of Design (Tunnel)
- Del Mar/Miramar Hill Alternatives Analysis
- Service Plans
- Corridor Wide Higher Speed Analysis
- Project Phasing/Implementation Plan
- Final Report

Reporting Structure



PROJECT DEVELOPMENT TEAM

SANDAG
NCTD
MTS
LOSSAN
Metrolink
BNSF Railway
FRA
Caltrans



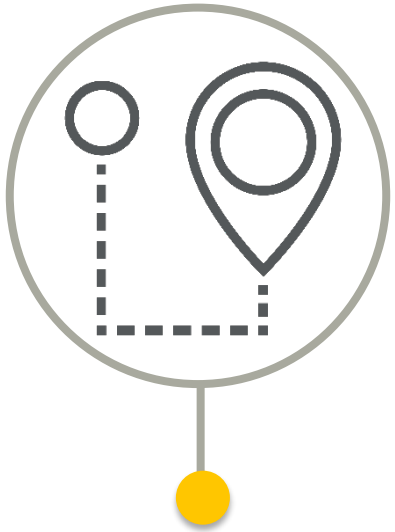
EXECUTIVE LEADERSHIP TASK FORCE

SANDAG BOARD OF DIRECTORS

2 Operational Feasibility

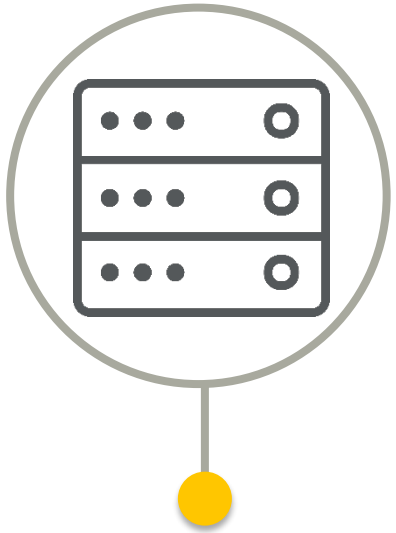
Objectives

Evaluate technology, including higher speed diesel locomotives and electrification



Identify freight and passenger service acceleration within context of LOSSAN Optimization Study

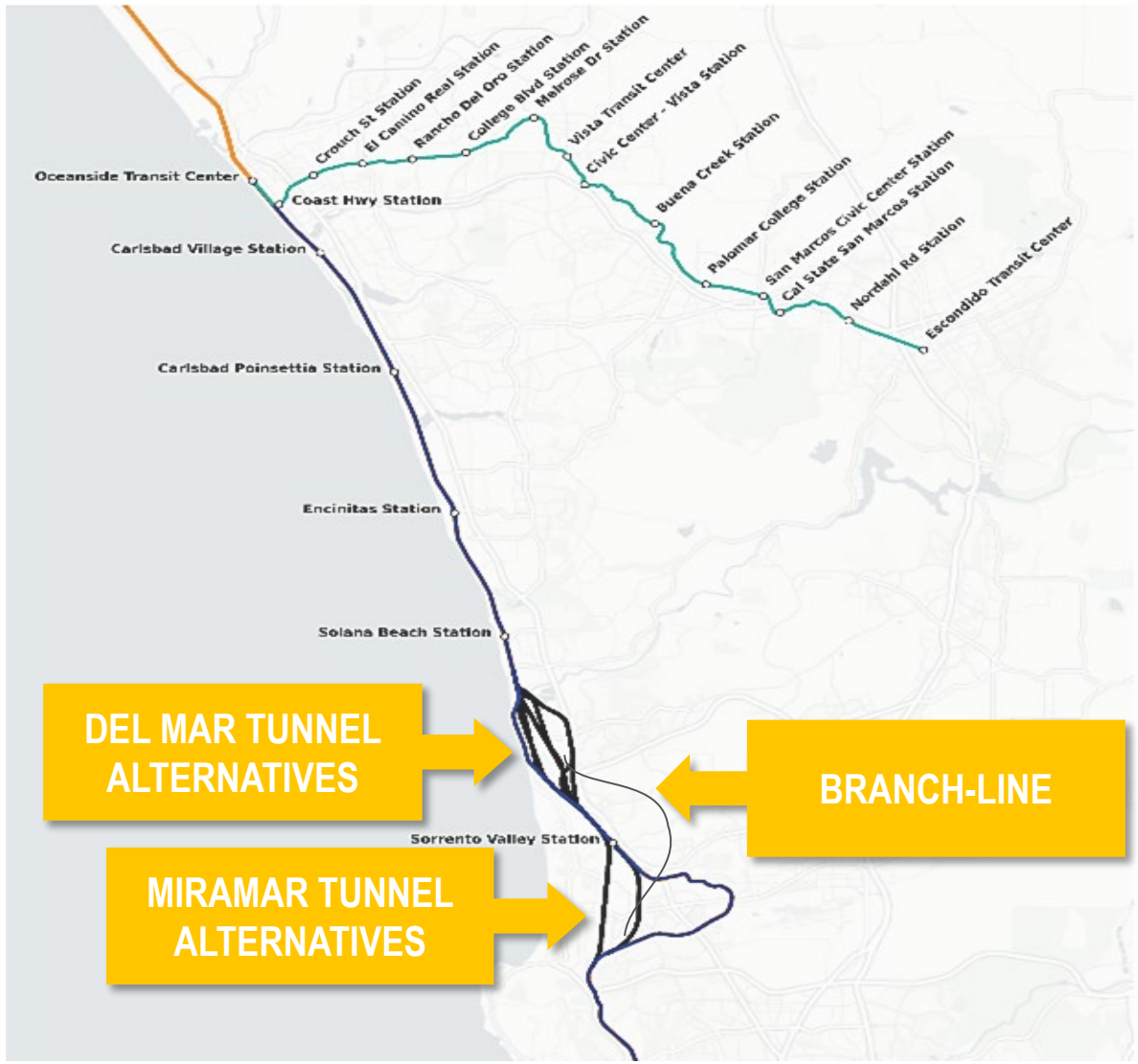
Assess changes to communications and signaling system and risks to current and near-term operations



Test a planning-level service concept for future service to proposed Sorrento Mesa Mobility Hub (in coordination with South Bay to Sorrento CMCP)

Infrastructure Assumptions

SANDAG's Infrastructure Development Plan[1]



New stations at

- **Del Mar Events platform**
- **UTC/Nobel Station**
- **San Diego International Airport**

Double track rail corridor from the County Line to Downtown San Diego. The preliminary results assume Del Mar and Miramar Hill tunnels

Upgraded line speeds to support 110 mph operations

(1) Also recommended in the LOSSAN Optimization Study

Equipment Tested

NEW DIESEL

Key Parameters	Speed [mph]
Siemens Charger	125
Pacific Surfliner (Limited Stop) service	110
COASTER (All Stop) service	90

Operating speeds are limited by trailer car design speeds

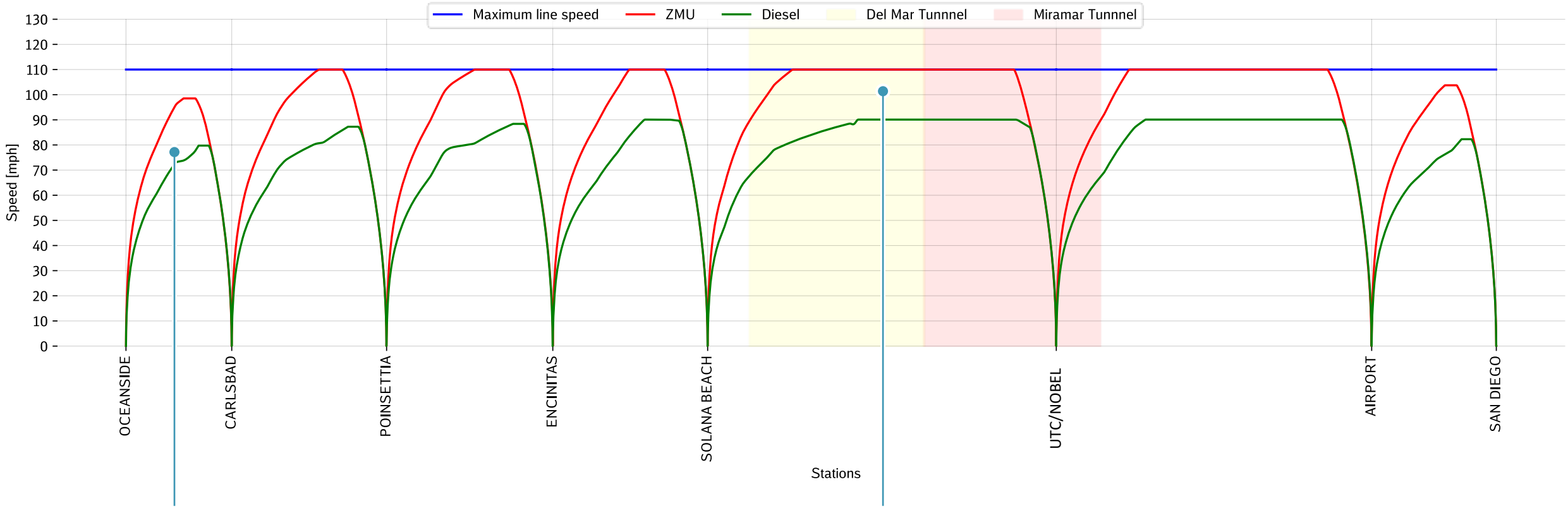
ZERO EMISSIONS

Key Parameters	Speed [mph]
Stadler KISS	110

Equipment Performance

Oceanside to San Diego
All-stop service speed-distance diagram using Track Class 6 (110 mph)

PRELIMINARY RESULTS

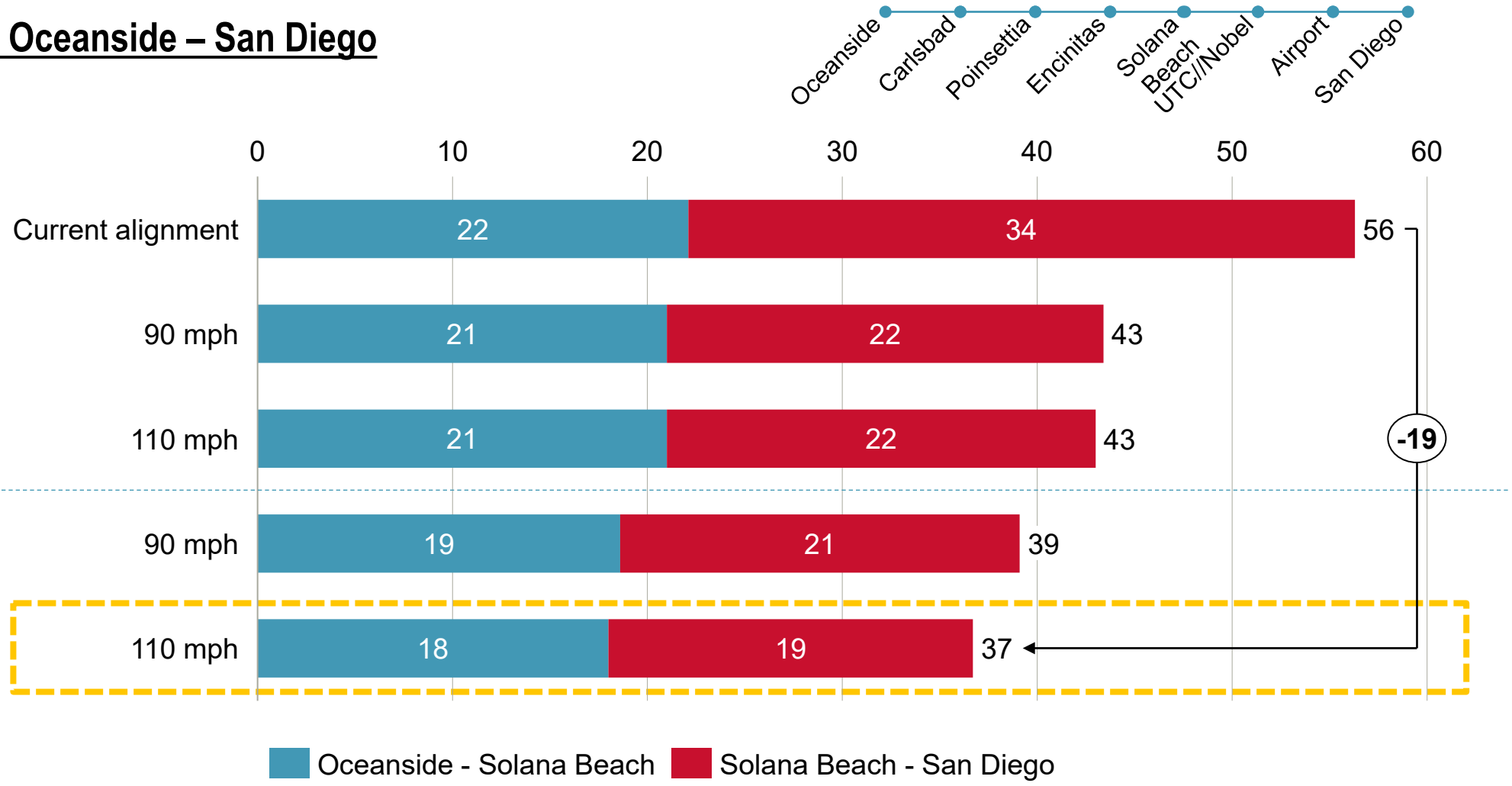


ZMU has better acceleration characteristics and performs better than diesel on gradients

ZMU can utilize maximum line speeds

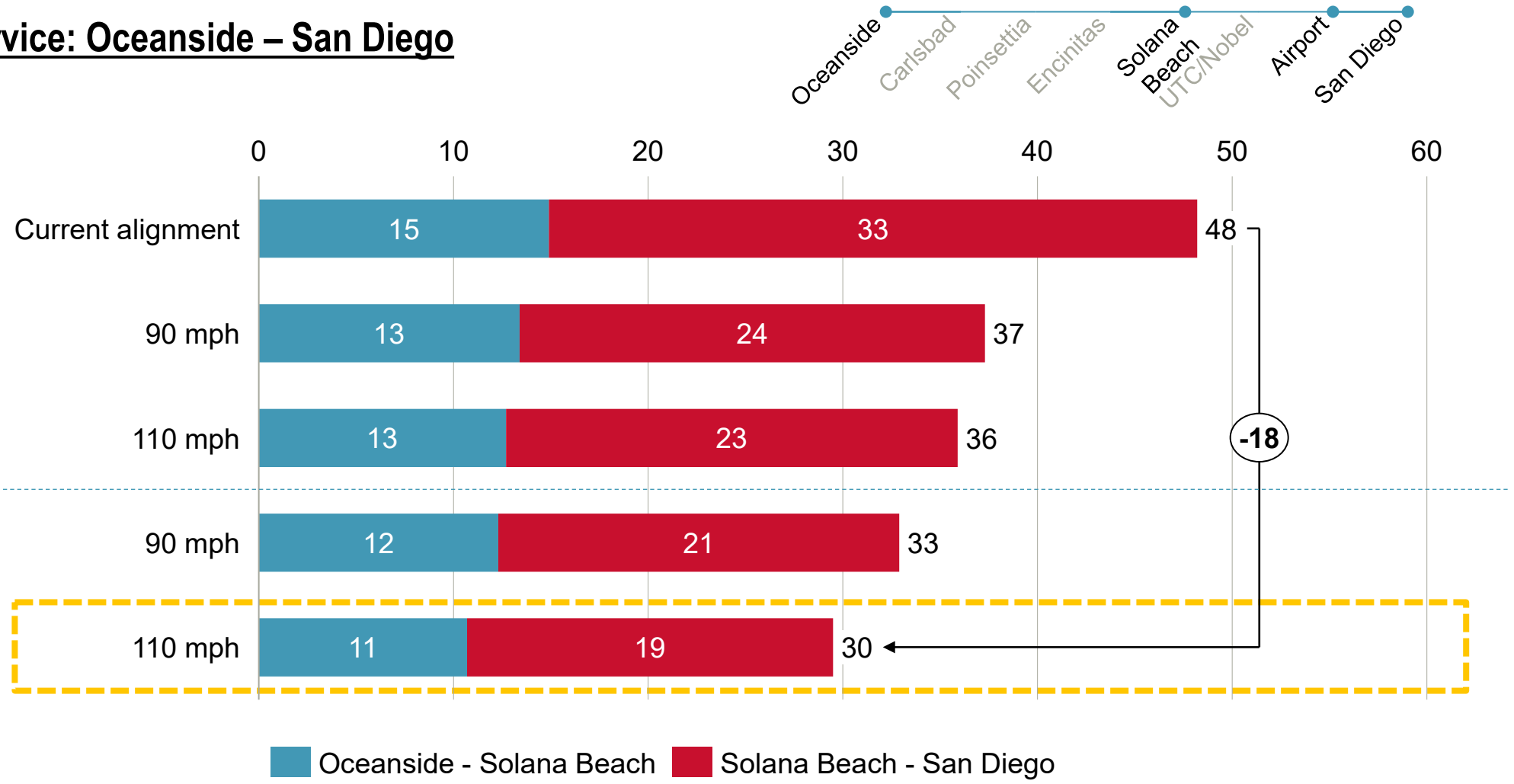
Preliminary Travel Time
(IN MINUTES)

All-stop service: Oceanside – San Diego

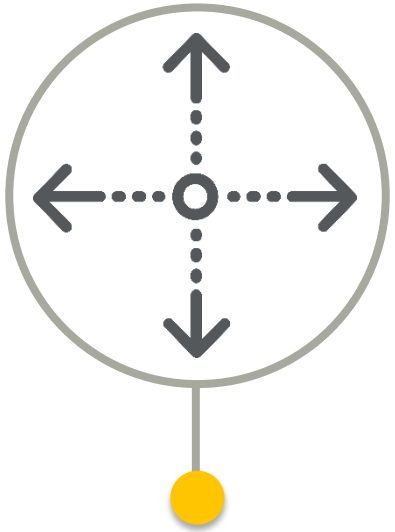


Preliminary Travel Time
(IN MINUTES)

Limited-stop service: Oceanside – San Diego



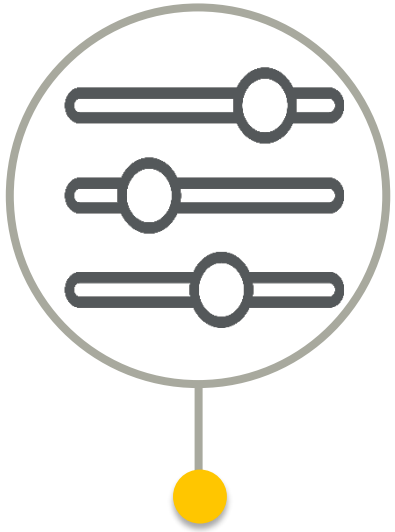
Preliminary Operational Findings



No measurable benefits for running 125 mph over 110mph due to station spacing

ZMU offers acceleration and braking benefits over diesel locomotive

Freight service safety concerns for running in shared corridor at more than 110 mph



Speed improvements in SD County highlight critical infrastructure constraints at San Clemente

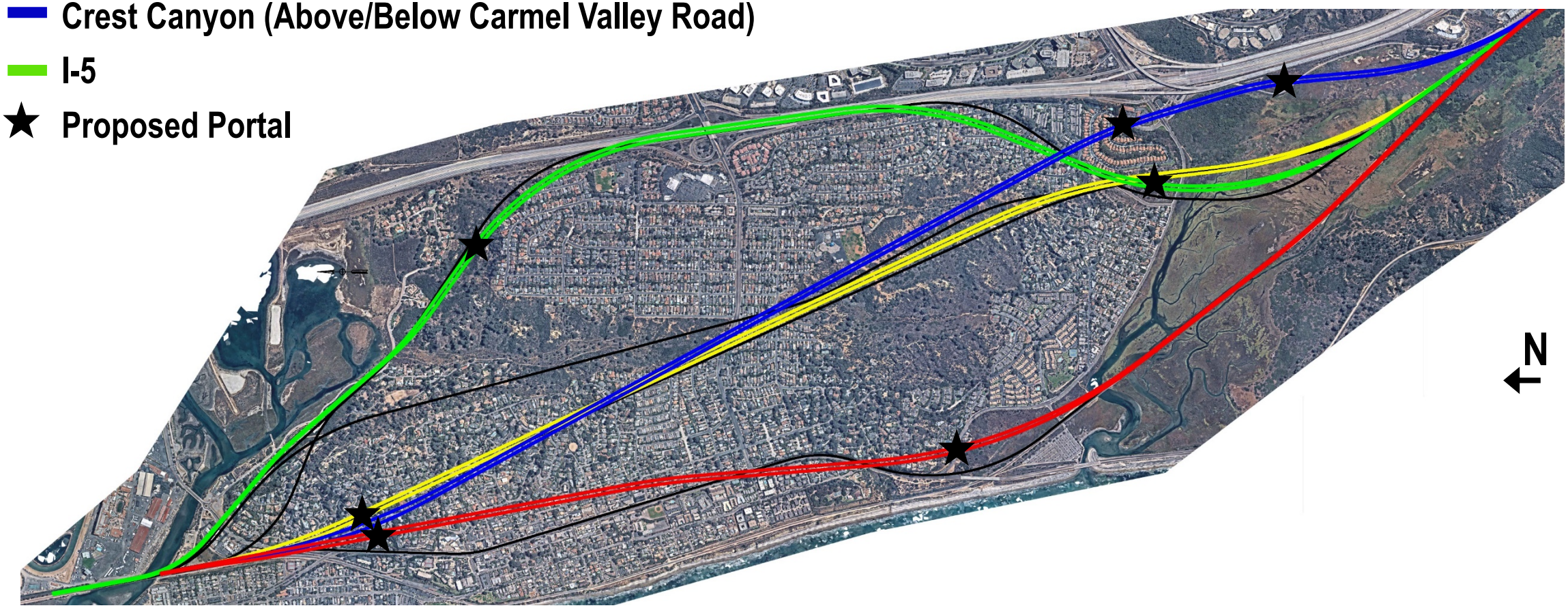
Existing fleet cannot operate beyond 90 mph due to coach restrictions

3 Realignment Alternatives Analysis

Del Mar Realignment

REVISED ALTERNATIVES

- Camino Del Mar
- Crest Canyon Higher Speed
- Crest Canyon (Above/Below Carmel Valley Road)
- I-5
- ★ Proposed Portal



Del Mar Realignment

REVISED ALTERNATIVES

ALIGNMENT	PASSENGER/ FREIGHT MAX SPEED (MPH)	CAPITAL COSTS COMPARISONS	TRAVEL TIMES (MINUTES) Solana Beach to Old Town			
			All Stop		Limited Stop	
			Charger + 5 Coaches	ZMU	Charger + 7 Coaches	ZMU
Today	90/60	-	31	-	32	-
Camino Del Mar	110/60	Base	28.2	26.9	27.3	25.2
Crest Canyon Higher Speed	110/60	+5%	28.2	26.9	27.4	25.2
Crest Canyon (Above CVR)	110/60	+5%	28.2	26.9	27.4	25.2
Crest Canyon (Below CVR)	110/60	+10%	28.2	26.9	27.4	25.2
I-5	80/60	+30%	29.6	28.9	28.6	27.3

Del Mar Realignment

REVISED EVALUATION CRITERIA

Evaluation Criteria	Weight (%)
Travel Time	**14**
Environmental Consequences	9
ROW Impacts and Acquisitions	6
Connectivity and Travel Demand	**13**
Safety Improvements	**15**
Constructability, Construction Impacts, and Duration	7
Capital Costs (includes construction, right-of-way, and design)	8
Railroad Operation Impacts (during construction)	5
Operational Complexity (post-construction)	9
O&M Costs	**10**
Community Acceptance	4

Del Mar Realignment

REVISED COMPARATIVE ANALYSIS

Evaluation Criteria	Weight (%)	Camino Del Mar	Crest Canyon			I-5
			Higher Speed	*Above Carmel Valley Rd.*	*Below Carmel Valley Rd.*	
Travel Time	14	5	5	5	4	1
Environmental Consequences	9	1	4	4	3	2
ROW Impacts and Acquisitions	6	4	3	1	3	1
Connectivity and Travel Demand	13	3	3	3	3	2
Safety Improvements	15	5	5	5	4	5
Constructability, Construction Impacts, and Duration	7	2	4	1	2	1
Capital Costs (includes construction, right-of-way, and design)	8	5	4	3	2	1
Railroad Operation Impacts (during construction)	5	2	4	4	4	1
Operational Complexity (post-construction)	9	4	4	4	1	4
O&M Costs	10	2	3	3	1	2
Community Acceptance	4	2	3	1	3	1
	Total Score	**345**	**396**	**347**	**281**	**223**

RATING 5 4 3 2 1

Best ——— Worst

Del Mar Realignment

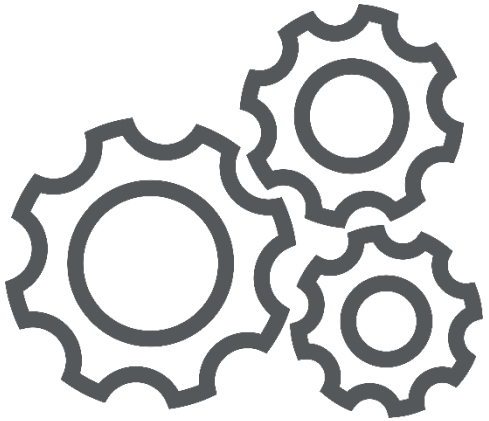
Preliminary Summary

Issue Area	Camino Del Mar	Crest Canyon			I-5
		Higher Speed	Above Carmel Valley Road	Below Carmel Valley Road	
Total Cost	Base	+5%	+5%	+10%	+30%
Total Length (mi)	4.9	4.8	4.5	4.5	5
Tunnel Length (mi)	1.8	2.5	2.5	3.1	2.2
Tunnel Depth (ft)*	35 - 120	35 - 275	35 - 365	35 - 480	35 - 210
Elevated Structure (ft)	8,000	4,800	4,600	130	5,300

* top of tunnel to existing ground; minimum – maximum depth

4 Tunneling and Fire Life Safety (FLS)

Tunneling and Fire Life Safety



TUNNELING CONSIDERATIONS

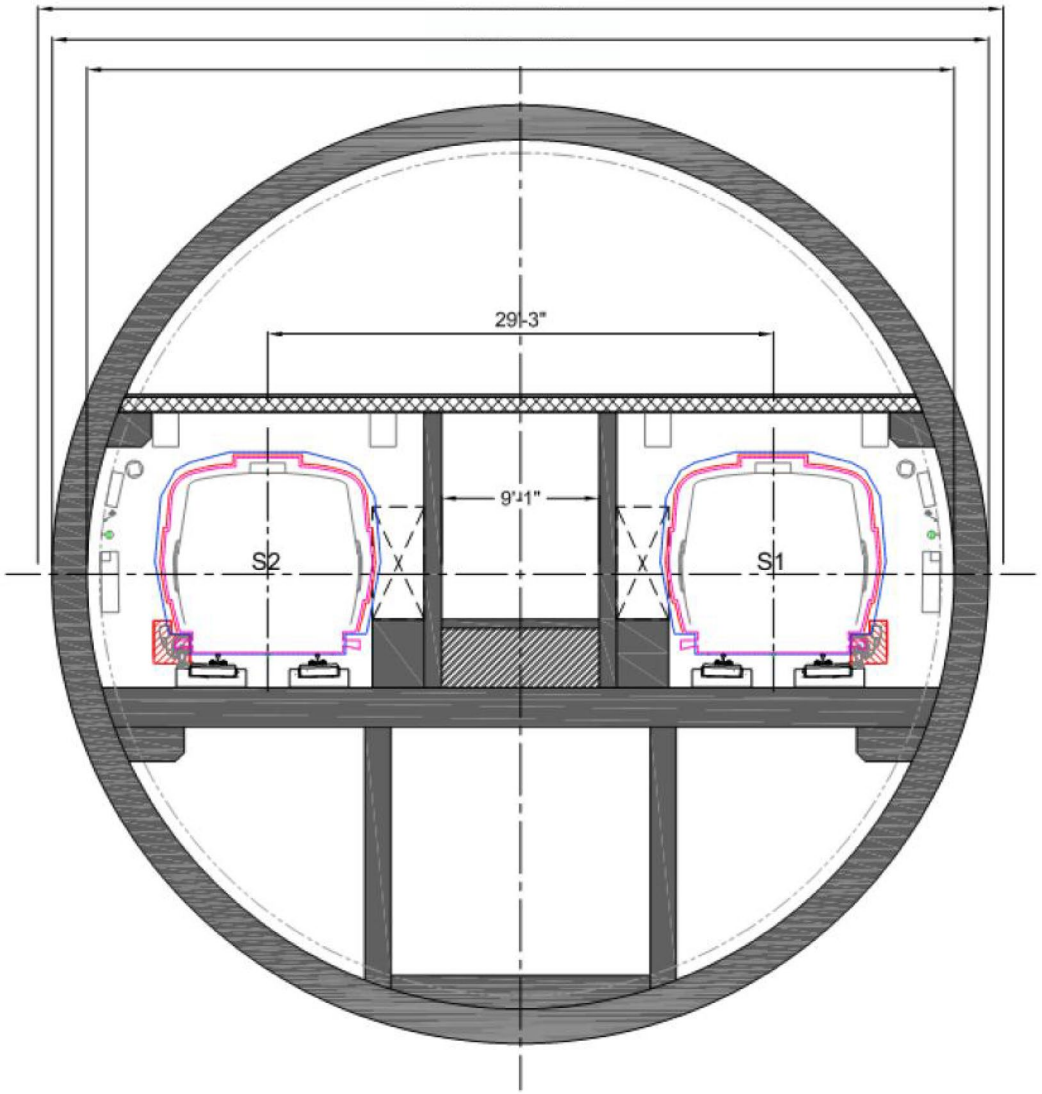
- Tunnel Configurations
- Tunnels in Similar Ground Conditions

FIRE LIFE SAFETY (FLS) CONSIDERATIONS

- Egress
- Ventilation

Tunnel Configurations

SINGLE BORE

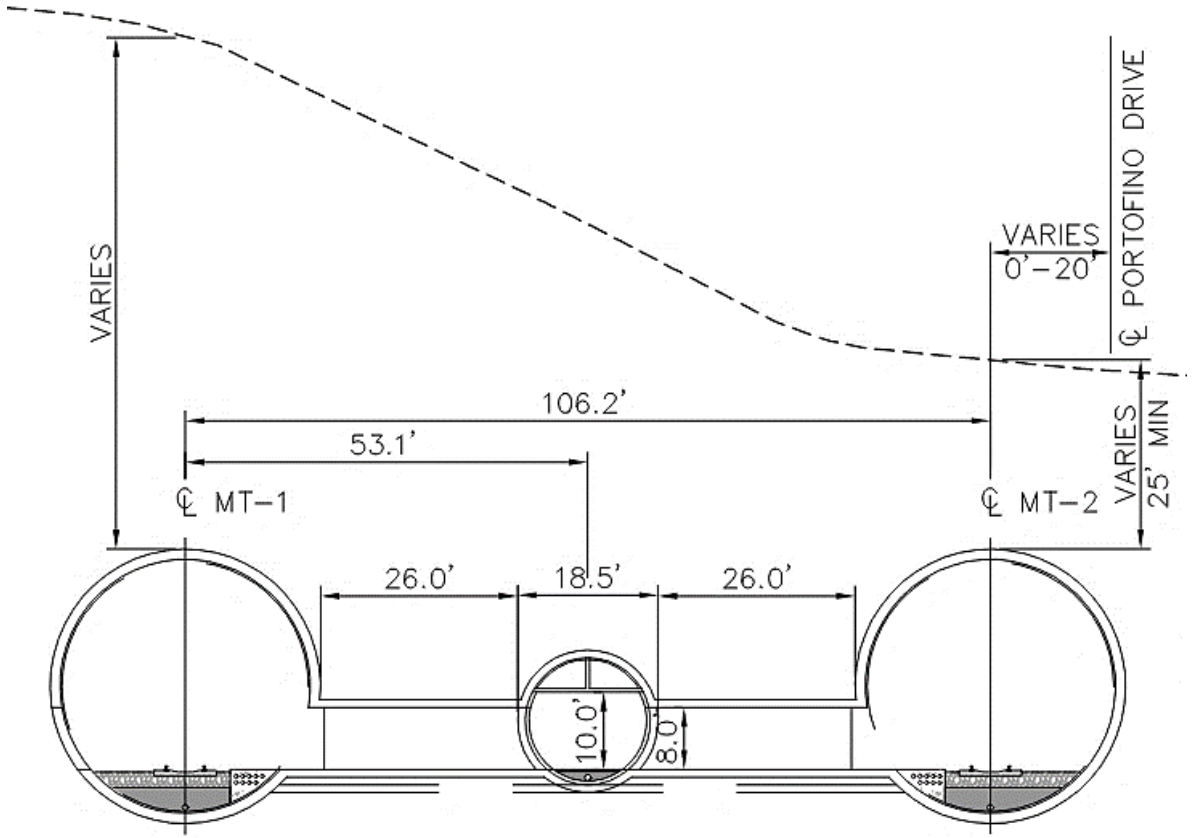


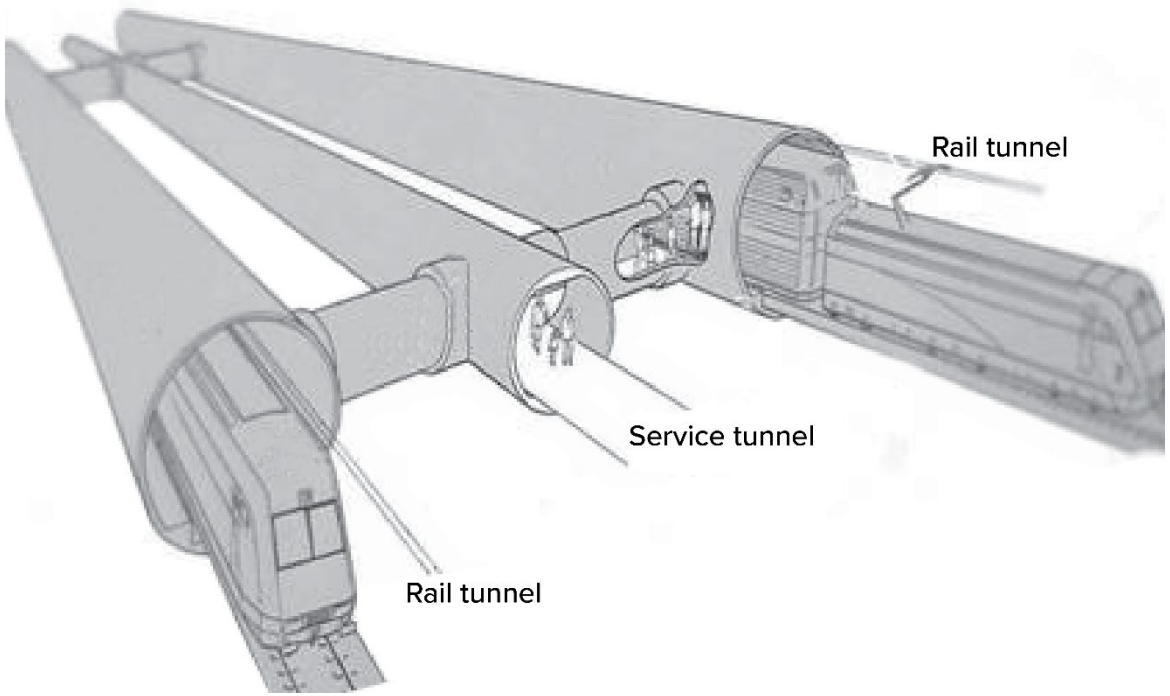
Tunnel Configurations

TWIN BORE

Tunnel Configurations

TRIPLE BORE





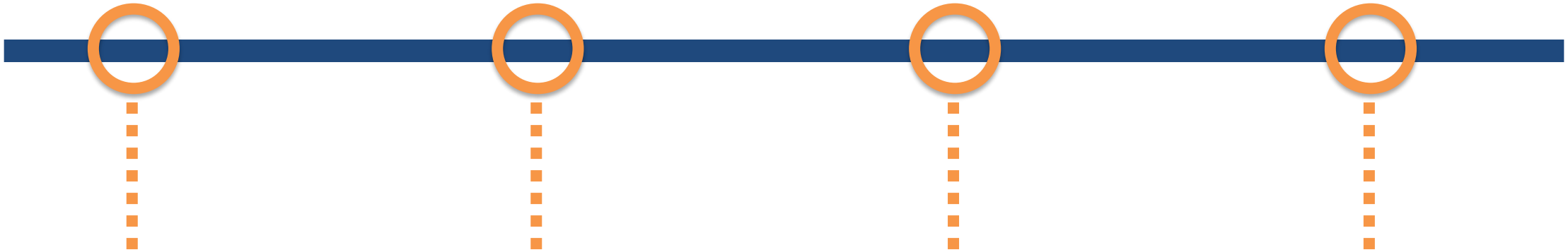
Tunnels in Similar Ground Conditions

- **Mission Valley East Tunnel** – *San Diego, CA*
- **Courthouse Commons Tunnel** – *San Diego, CA*
- **Regional Connector** – *Los Angeles, CA*
- **Channel Tunnel – Between England and France**
- **Alaskan Way Viaduct – Seattle, WA**
- **BART to Silicon Valley Phase 2** (design in progress) – **San Jose, CA**

Tunnels in Similar Ground Conditions

Fire Life Safety Egress

REASONS FOR EGRESS



Escaping from a fire on train or in tunnel

Leaving train during power outage

Derailment

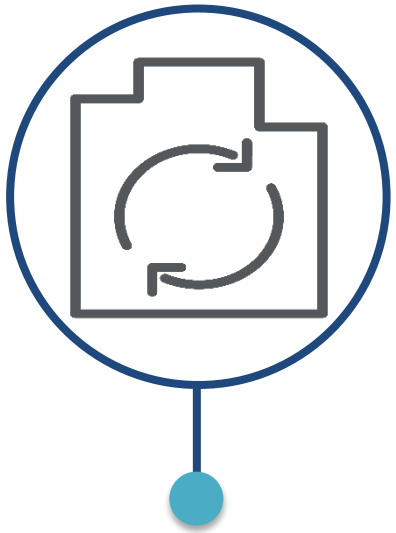
Train breakdown

Fire Life Safety Egress

MEANS OF EGRESS

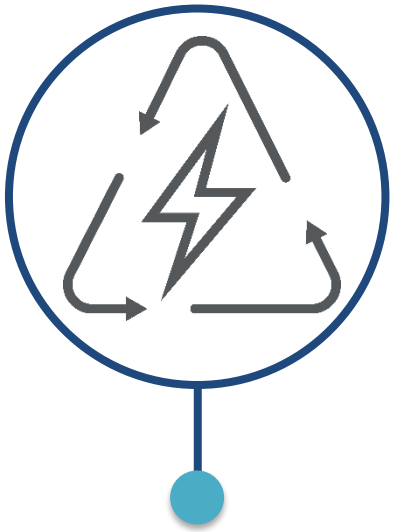
- Cross-passages
- Or an exit to the surface
- Walkways
- Emergency signage and markings.

Need for Ventilation Systems

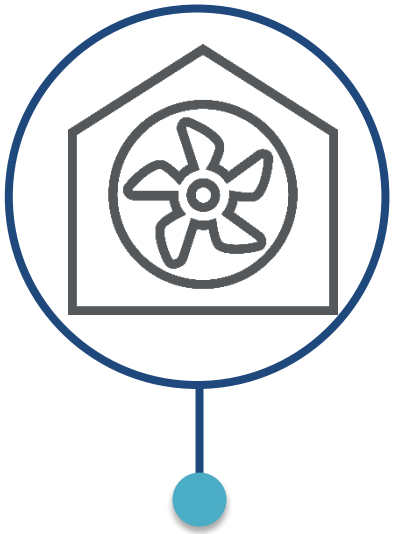


Acceptable temperatures

Decrease pollutants



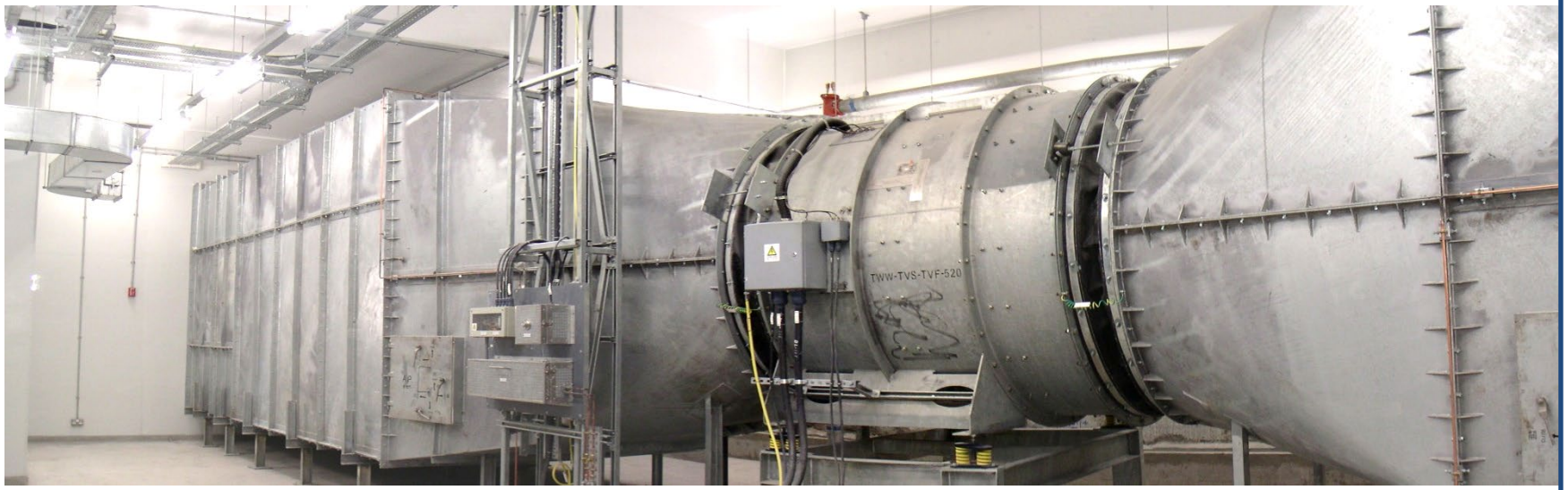
Control smoke

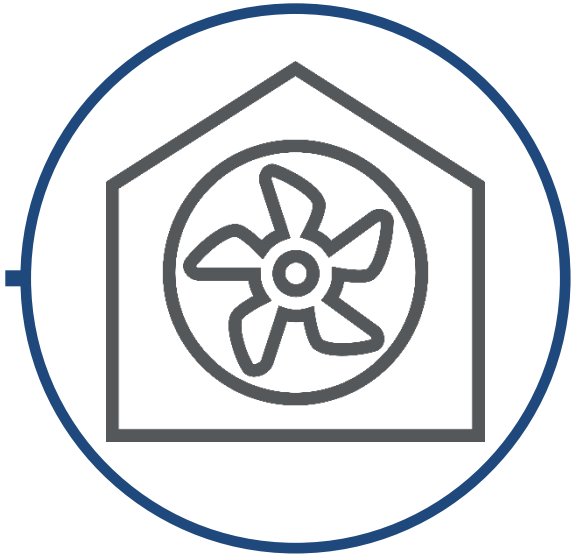


Code Requirement

Ventilation System Components

- Ventilation fans
- Sound attenuators





5 Operations

Operations

TUNNELS WITH SIMILAR OPERATIONS

O&M FOR RAIL TUNNELS

Tunnels with Similar Operations

US Tunnels

- Moffat Tunnel – Colorado
- B&P Tunnel – Maryland
- Cascade Tunnel – Washington
- Flathead Tunnel - Montana

International Tunnels

- Channel Tunnel – between England and France
- Gotthard Base Tunnel – Switzerland
- Brenner Pass Tunnel – between Austria and Italy (under construction)
- Loetschberg Tunnel - Switzerland

O&M for Rail Tunnels

Key Operations Considerations

- Operating tunnel lighting
- Operating fans for ventilation
- Operating pumps for track drains

Key Maintenance Considerations

- Water ingress (leaks)
- Checking and maintaining track
- Checking and maintaining train control and systems

Study Schedule

Baseline Documents*	Del Mar Tunnel Alternatives Analysis	Miramar Hill Tunnel Alternatives Analysis	Corridor Wide Higher Speed Evaluation	Cost Estimates, Phasing and Implementation Plan
Summer 2021	Summer 2021	Fall 2021	Fall 2021	Spring 2022
Public Outreach				

**Baseline Documents are Existing Conditions, Higher Speed Operational Feasibility, Track and Tunnel Basis of Design, Corridor Resiliency*

Study to conclude in April 2022

Future phases of development are pending funding