Task 4.4:

Service Implementation Plan

Appendix A: Rail Operations Modeling Results

SLOCOG Coast Corridor Rail Service Study

March 26, 2021

CONTENTS

1 Introduction

This Appendix details methodology and results of the intercity rail operations modeling conducted for the Coast Corridor Rail Service Study, in support of the Service Implementation Plan.

Determining the most cost-effective approach to support increased passenger rail service in the region is critical to the ability to successfully implement the service and ensure its long-term success. Overestimating the infrastructure required to support both future freight and passenger service would negatively impact the ability to attract sufficient funding to support those improvements. Conversely, underestimating the infrastructure requirements may inhibit the new service from operating at the high service level needed to both attract and retain new customers.

Conducting a rail simulation analysis helps determine the optimal infrastructure level needed to support future freight and passenger rail services long before final design and construction commences. The simulation replicates, in a virtual environment, future train operations and infrastructure, and can test and validate whether proposed improvements provide the benefit intended. The simulation can also help compare various infrastructure scenarios to help determine the most cost-effective solution.

1.1 Rail Operations Modeling Methodology

There are several software products that perform rail simulation analysis, including the Viriato Timetable Planning Tool, developed by SMA, which is used by agencies and rail operators throughout California to determine existing and future schedules and infrastructure requirements. Another tool, Rail Traffic Controller (RTC), developed by Berkeley Simulation Systems LLC, also tests and validates service plans and infrastructure improvements and is used by the Federal Railroad Administration and most Class I railroads, including Union Pacific Railroad (UPRR). RTC excels at simulating random delay events that are representative of typical of day-to-day railroad operations.

UPRR has an RTC model of the project area and has graciously allowed the use of their model to assist in development of the SIP.

The assumptions and methodology used in the simulation process are summarized below:

1. Model limits are the UPRR Santa Barbara and Coast Subdivisions between Santa Barbara and Salinas.
2. The train consist used in the model, for both existing and proposed state-supported passenger services (including the Coast Daylight) is the standard Pacific Surfliner consist operated in 2021:
    a. One diesel-electric locomotive. For modeling purposes, an EMD F-59PH locomotive was used, because a model of the Siemens “Charger” locomotive was not available in the software suite.
    b. Six bi-level passenger cars
3. Test and validate the base model to ensure accuracy: Since the host railroad (UPRR) had provided the model, the test and validation process was condensed to:
    a. Making sure the model functions properly with HDR’s version of the RTC software.
    b. Performing runs of the existing model to ensure all trains and infrastructure operate as intended.
4. Develop mid-term model:
    a. Insert infrastructure improvements agreed upon by LOSSAN, CalSTA and UPRR between Santa Barbara and San Luis Obispo (SLO).
    b. Adjust existing passenger schedules to create clockface Pacific Surfliner schedules between Santa Barbara and SLO, consistent with the CSRP.

c. Extend one Surfliner train between Goleta and SLO, providing three total daily round trips.
d. Insert infrastructure improvements requested by UPRR between SLO and Salinas.
    i. Option A: Model a hypothetical train from the north operating between Salinas and SLO, providing a platform transfer option for passengers between this service and Pacific Surfliner trains. While the service was only modeled between Salinas and SLO, it is assumed to originate north of Salinas.
    ii. Option B, extend one of the Pacific Surfliner trains terminating in SLO to/from Salinas. Salinas is used as a terminus for analysis purposes, and should not be construed as a service recommendation.
    iii. Option C: the proposed Coast Daylight service between Los Angeles and San Jose/San Francisco would operate in the same schedule slot as the extended Surfliner.
e. Insert additional infrastructure improvements between SLO and Salinas, if required, into model.
f. Re-run model to gauge the effectiveness of the added infrastructure improvements.

5. Develop long-term model:
    a. Develop bi-hourly, clockface Pacific Surfliner schedules between Santa Barbara and SLO, using infrastructure developed in the mid-term model.
    b. Insert additional infrastructure improvements between Santa Barbara and SLO, if required, into model.
    c. Extend three of the SLO trains to/from Salinas. As mentioned above, Salinas is used as a terminus for analysis purposes, and should not be construed as a service recommendation. To generate a high-level assessment of necessary infrastructure investment, only one conceptual schedule was modeled, as it was assumed that all service options (A, B, and C) would use similar train slots. Differences in specific infrastructure requirements between the long-term options would be influenced by interaction with future schedules of the Coast Starlight, as well as Pacific Surfliner, Capitol Corridor, Metrolink, and High-Speed rail outside the Coast Corridor, which are unknown at this time.
    d. Insert additional infrastructure improvements between SLO and Salinas, if required, into model.
    e. Re-run model to gauge the effectiveness of the added infrastructure improvements.

For all simulations, the primary goal is to validate that the proposed infrastructure improvements not only support the new services, but also maintain on-time performance for Amtrak's Coast Starlight long-distance service and the ability of UPRR freight trains to serve industries along the corridor.

The analysis will include:

1. Hypothetical passenger train schedules for each model.
2. Time-distance (stringline) graphs for each modeling case.
3. High-level cost estimates for recommended infrastructure improvements.

2 Mid-Term Horizon

The mid-term rail service options analyzed are:

- Three clockface intercity rail frequencies between Santa Barbara and San Luis Obispo, in addition to Amtrak's Coast Starlight.

- One additional intercity rail service between Salinas and San Luis Obispo, in addition to Amtrak's Coast Starlight. Three options are analyzed:
  - Option A: A new train service operating between San Jose and SLO, providing a platform connection for passengers between this service and Pacific Surfliner trains
  - Option B: An extension of a Pacific Surfliner schedule from SLO to Salinas and return. While Salinas is assumed as a terminus for modeling purposes, it should not be construed as a service recommendation.
  - Option C: A "Coast Daylight"-type service between Los Angeles and San Jose or San Francisco

2.1 Santa Barbara to San Luis Obispo

2.1.1 Base Infrastructure

In 2018, the California State Transportation Agency (CalSTA) awarded LOSSAN funding for the LOSSAN North Improvement Program through the Transit and Intercity Rail Capital Program (TIRCP). The program consists of improvements to increase frequency and on-time performance between Los Angeles, Santa Barbara, and SLO, including enabling a third round trip to SLO. In 2020, LOSSAN, CalSTA, and UPRR reached agreement on infrastructure improvements between Santa Barbara and SLO. These improvements include:

- Complete installation of Centralized Traffic and Positive Train Control systems (105 miles)
- Powering selected sidings for train meets. Sidings converted to powered, controlled sidings include:
  - Callender, Milepost (MP) 266.3-268.1 (Callender is also extended to 9000 feet)
  - Guadalupe, MP 272.7-273.6
  - Waldorf, MP 276.7-277.5
  - Devon, MP 282.8-283.7
  - Narlon, MP 289.4-290.7
  - Tangair, MP 293.7-294.8
  - Honda, MP 303.4-304.8
  - Concepcion, MP 320.7-322.0

These improvements were incorporated into the Base infrastructure model. There are other improvements in the agreement, including replacing rail, ties, and corridor hardening (slope stabilization, fencing, etc.), but these improvements do not impact train performance or line capacity in the model.

The existing UPRR infrastructure between SLO and Salinas was unchanged for the Base model.

2.1.2 Proposed Clockface Schedules between Santa Barbara and SLO

The RTC model was used to determine hypothetical clockface schedules using the existing infrastructure while remaining somewhat consistent with pre-Covid Surfliner schedules. There are three proposed round trips between Santa Barbara and SLO: northbound trains 759, 765 and 777, and southbound trains 774, 790 and 796. Figures 4.1 and 4.2 show the proposed clockface schedules between Santa Barbara and SLO for Option C. In Options A and B, a third Pacific Surfliner would operate instead of the Coast Daylight (shown in yellow) with the same times from SLO to Santa Barbara.

Figure 2-1. Mid-Term Northbound Schedule (Santa Barbara – San Luis Obispo)

	Coast Daylight			Coast Starlight			
Train number	759	761	765	14	773	777	785
SANTA BARBARA	08:03	10:03	12:03	12:24	16:03	18:03	20:03
GOLETA	08:15	10:15	12:15	-	16:15	18:15	20:15
LOMPOC/SURF	09:21		13:21	-		19:21	
GUADALUPE	09:57		13:57	-		19:57	
GROVER BEACH	10:16		14:16	-		20:16	
SAN LUIS OBISPO	10:45		14:45	15:19		20:45	

Figure 2-2. Mid-Term Southbound Schedule (San Luis Obispo – Santa Barbara)

				Coast Daylight		Coast Starlight	
Train number	768	774	782	790	792	11	796
SAN LUIS OBISPO		06:33		12:33		15:45	16:33
GROVER BEACH		06:53		12:53		-	16:53
GUADALUPE		07:09		13:09		-	17:09
LOMPOC/SURF		07:49		13:49		-	17:49
GOLETA	06:55	08:55	10:55	14:55	16:55	-	18:55
SANTA BARBARA	07:13	09:13	11:13	15:13	17:13	18:27	19:13

It should be noted that our model did not analyze how these schedules interact with Metrolink, Pacific Surfliner or freight schedules south of Goleta. These schedules merely display workable clockface schedules within the project area and can be shifted to better integrate with Surfliner services between Goleta and San Diego and available train slots on the Metrolink route segment between Montalvo and Los Angeles Union Station.

2.2 San Luis Obispo to Salinas

2.2.1 Base Infrastructure

Amtrak's Coast Starlight is the only scheduled passenger service currently operating on this segment of the corridor. In order to accommodate additional passenger service, the UPRR requests some infrastructure improvements, in addition to other contractual conditions and operating/access fees that may be negotiated between UPRR and the operating agency. Improvements requested by UPRR include:

- Complete installation of Centralized Traffic and Positive Train Control systems
- Powering UPRR and signaling the Santa Margarita siding, MP229.5-233.2, and installation of a universal crossover near the center of the siding to facilitate freight and passenger operations.

UPRR has also asked the team to provide a high-level cost estimate of clearing the segment for operation of double-stack freight trains. There are 9 tunnels that would require some excavation of the tunnel

ceiling, or "notching", and one bridge that would require some modification to its structure. Although these improvements are not required to operate passenger trains, UPRR may make this task part of the value proposition it seeks to allow for additional passenger service.

Rail simulation modeling will help determine which existing sidings should be powered to facilitate passenger train meets.

2.2.2 Option A: Extension of Train Service from the North to San Luis Obispo

For this scenario, a hypothetical train departs Salinas at 9:12 AM and arrives at SLO at 12:10 PM. Passengers wishing to transfer to a Surfliner can connect with Train 790, departing SLO at 12:33 PM. An approximate 20-minute dwell time was used to provide a small cushion for connecting passengers if the southbound train was running late. The arrival time can be adjusted, as there are no opposing passenger train meets for this train in the morning.

The train lays over for slightly over an hour in SLO to allow for light cleaning and servicing of the consist and a platform transfer with northbound Surfliner Train 761, arriving SLO at 12:45 PM. For this exercise, Train 761 was extended to SLO (as opposed to Train 759 as in Options B and C) to allow for a northbound platform transfer between the Pacific Surfliner and the northern service. Figure 2-3 and Figure 2-4 show the proposed Mid-Term, clockface schedules between Salinas and SLO with the extension of one round trip from Salinas to SLO.

Figure 2-3. Mid-Term Southbound Schedule Option A (San Luis Obispo - Salinas)

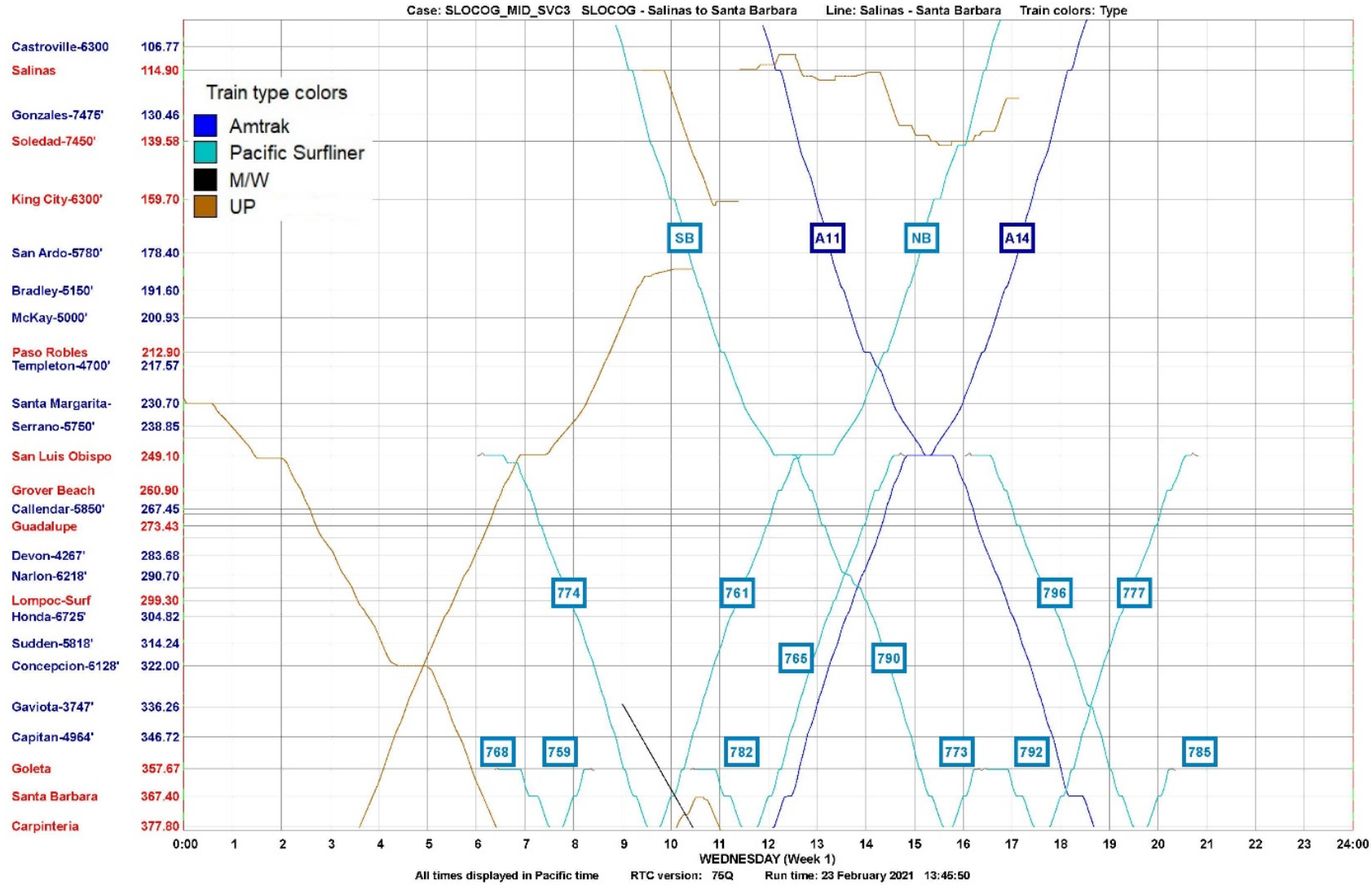
							Coast Starlight	
Train number	768	774	782	TAMC	790	792	11	796
SALINAS				09:12			12:13	
SOLEDAD				09:37			-	
KING CITY				10:04			-	
PASO ROBLES				11:05			14:03	
SAN LUIS OBISPO		06:33		12:10	12:33		15:45	16:33
GROVER BEACH		06:53			12:53		-	16:53
GUADALUPE		07:09			13:09		-	17:09
LOMPOC/SURF		07:49			13:49		-	17:49
GOLETA	06:55	08:55	10:55		14:55	16:55	-	18:55
SANTA BARBARA	07:13	09:13	11:13		15:13	17:13	18:27	19:13

Figure 2-4. Mid-Term Northbound Schedule Option A (San Luis Obispo - Salinas)

					Coast Starlight			
Train number	759	761	TAMC	765	14	773	777	785
SANTA BARBARA	08:03	10:03		12:03	12:24	16:03	18:03	20:03
GOLETA	08:15	10:15		12:15	-	16:15	18:15	20:15
LOMPOC/SURF		11:21		13:21	-		19:21	
GUADALUPE		11:57		13:57	-		19:57	
GROVER BEACH		12:16		14:16	-		20:16	
SAN LUIS OBISPO		12:45	13:20	14:45	15:19		20:45	
PASO ROBLES			14:26		16:21			
KING CITY			15:31		-			
SOLEDAD			16:02		-			
SALINAS			16:25		18:12			

Figure 2-1 shows the stringline diagram for the extension of one train from Salinas to SLO.

Figure 2-5. Stringline Diagram, Mid-Term Schedule Option A (Salinas - Santa Barbara)



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2.2.2.1 Recommended Infrastructure improvements for the extension of service from the north to SLO

Upgrade siding at Templeton

In order to facilitate an appropriate meet between the southbound Coast Starlight and the extension of service between Salinas and SLO, the existing UPRR siding at Templeton (MP 218.4) should be upgraded (signals, power switches, track) to support the meet.

The recommended improvement supports this proposed mid-term schedule alternative. One of UP's primary requirements is that the new trains have no negative impact on Coast Starlight performance. If the proposed service schedules or Coast Starlight schedules change, the meet location changes, and another siding could be substituted for one recommended in this study. Unpowered sidings on this segment that are not upgraded in this service alternative include:

- Gonzales, MP 131.2
- Soledad, MP 140.2
- King City, MP 160.3
- San Ardo, MP 179.5
- Bradley, MP 192.5
- McKay, MP 200.2
- Serrano, MP 238.8
- Chorro, MP 242.7

2.2.3 Options B and C: Through Service Between SLO and Salinas

The extension of one round trip to Salinas must make sense from a ridership standpoint, while mitigating any adverse operational impacts to existing Amtrak and UPRR services. Of the three northbound trains reaching SLO, 765 arrives within 34 minutes of the northbound Coast Starlight, which is not desirable from a ridership standpoint. Train 777 wouldn't arrive in Salinas until nearly midnight, also not desirable for ridership. For these reasons, it was decided to extend Train 759 to Salinas. Extending Train 761 to SLO and Salinas was also considered, but RTC modeling indicated that it would have a problem meeting the southbound Coast Starlight near Paso Robles while staying on a clockface schedule south of SLO.

For the southbound train, Train 790 was chosen for its reasonable morning departure time of 9:00 at Salinas and arrival at LAUS in the early evening.

Amtrak completed the Coast Daylight Study in 2016, two years before the California State Rail Plan was issued which stressed the importance of clockface schedules. For the purpose of this analysis, the same schedule slots used for the Surfliner extension to Salinas were used for the Coast Daylight schedule, which are the closest to the original schedule while providing clockface service. Figure 2-2 and Figure 2-3 show the proposed mid-term, clockface service schedules between Santa Barbara and SLO, with the extension of one round trip to Salinas.

Figure 2-6. Mid-Term Northbound Schedule Options B and C (Santa Barbara – San Luis Obispo - Salinas)

	Coast Daylight			Coast Starlight			
Train number	759	761	765	14	773	777	785
SANTA BARBARA	08:03	10:03	12:03	12:24	16:03	18:03	20:03
GOLETA	08:15	10:15	12:15	-	16:15	18:15	20:15
LOMPOC/SURF	09:21		13:21	-		19:21	
GUADALUPE	09:57		13:57	-		19:57	
GROVER BEACH	10:16		14:16	-		20:16	
SAN LUIS OBISPO	10:45		14:45	15:19		20:45	
PASO ROBLES	11:51			16:21			
KING CITY	12:56			-			
SOLEDAD	13:27			-			
SALINAS	13:50			18:12			

Figure 2-7. Mid-Term Southbound Schedule Options B and C (Salinas - San Luis Obispo – Santa Barbara)

				Coast Daylight		Coast Starlight	
Train number	768	774	782	790	792	11	796
SALINAS				09:10		12:13	
SOLEDAD				09:33		-	
KING CITY				10:00		-	
PASO ROBLES				11:05		14:03	
SAN LUIS OBISPO		06:33		12:33		15:45	16:33
GROVER BEACH		06:53		12:53		-	16:53
GUADALUPE		07:09		13:09		-	17:09
LOMPOC/SURF		07:49		13:49		-	17:49
GOLETA	06:55	08:55	10:55	14:55	16:55	-	18:55
SANTA BARBARA	07:13	09:13	11:13	15:13	17:13	18:27	19:13

Stringline diagrams depict the operation of all trains over a route for a specific time period.

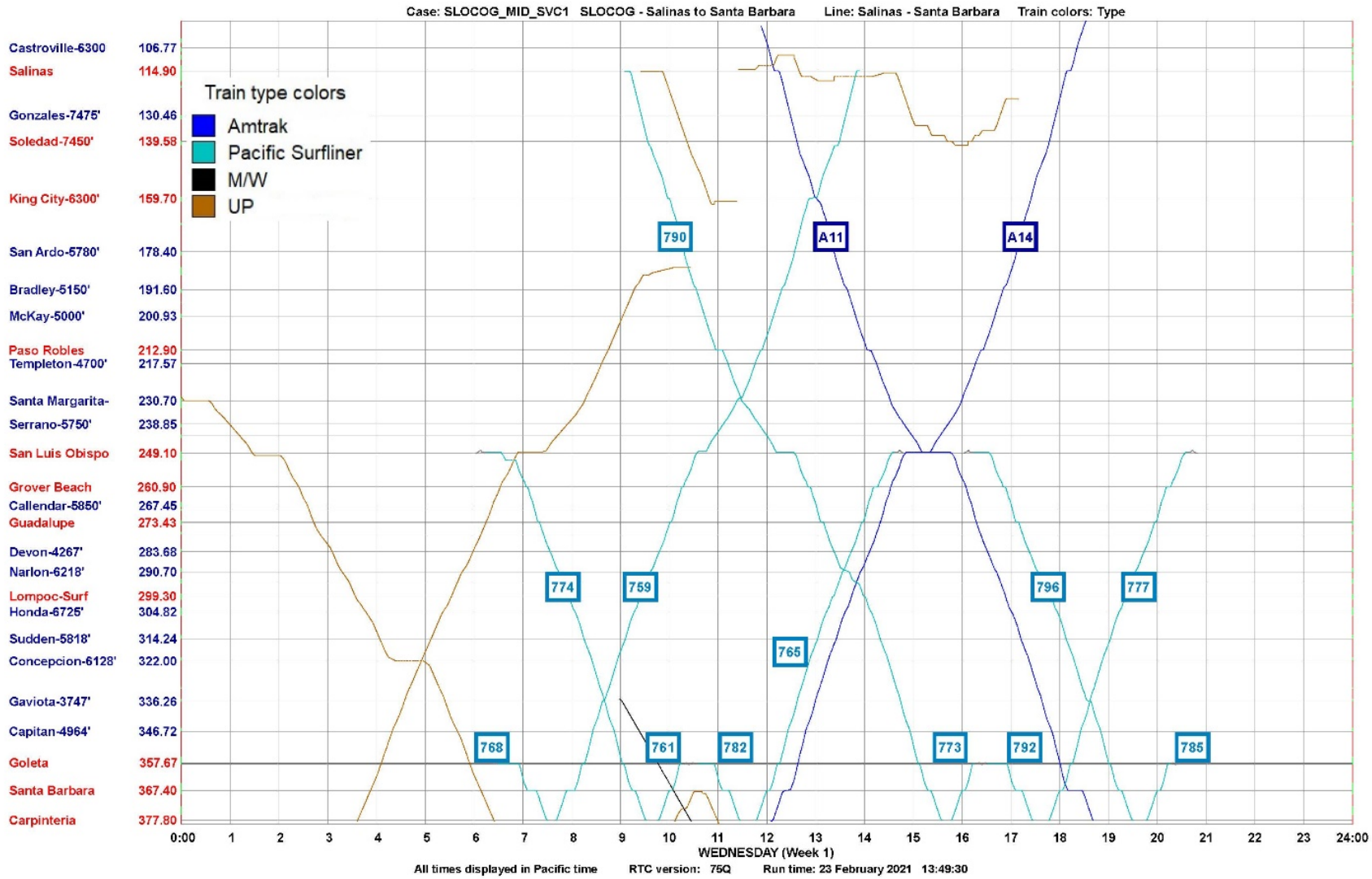
- The horizontal axis represents time of day
- The vertical axis portrays the stations (highlighted in red) and siding locations along the route
- Each line represents the operation of a single train.
    - When the lines cross it indicates the location where trains meet and pass each other. This indicates that the schedule must utilize a second track at this location.

- When a line is horizontal it indicates when a trainset is stopped at a location for a station stop, work event, or layover.
- If the horizontal line is dotted, it indicated unscheduled dwell or delay.

- Individual train types are color-coded by type (Amtrak long-distance, Pacific Surfliner, UPRR freight, and UPRR maintenance of way crews)

Figure 2-2 shows the stringline diagram for the proposed mid-term, clockface schedules between Santa Barbara and Salinas:

Figure 2-8. Stringline Diagram, Mid-Term Schedule Options B and C (Salinas - Santa Barbara)



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2.2.3.1 Recommended Infrastructure improvements for both the Coast Daylight and Pacific Surfliner Extension

Upgrade siding at King City

In order to facilitate appropriate train meets between the southbound Coast Starlight and the northbound Surfliner extension/Coast Daylight between SLO and Salinas, the existing UPRR siding at King City (MP 160.3) should be upgraded (signals, power switches, track) to support the meets.

2.2.3.2 Recommended Infrastructure improvements exclusively for the Pacific Surfliner Extension

Layover/light maintenance facility in Salinas

Given the long duration of the trip between Los Angeles Union Station (LAUS) and Salinas (8-plus hours), it was not possible to find schedules that would allow for a daytime turn of equipment at Salinas while offering reasonable departure and arrival times at either end of the route. Extending service further north would further impede the ability to schedule daytime equipment turns. Therefore, this service option would require a light layover/light maintenance facility for the overnight layover of the trainset.

This analysis includes a high-level cost estimate for a Salinas layover/light maintenance facility. However, TAMC has plans to build a layover facility in Salinas to facilitate their plans to extend either Caltrain or Capitol Corridor service to Salinas, and the construction of additional layover capacity may not be feasible. Extending the service to an alternative terminus further north, such as San Jose or Gilroy, may provide better locations for trains to lay over.

2.2.3.3 Infrastructure Summary

The recommended improvements support this proposed mid-term schedule alternative. The primary focus of these improvements is to facilitate train meets between the northbound and southbound Coast Starlight and the extended state-supported passenger train service between San Luis Obispo and Salinas. One of UPRR's requirements is that the new trains have no negative impact on Coast Starlight performance. If, in the future, the Coast Starlight schedule undergoes change, the infrastructure solutions that work for the Starlight and state-supported trains in this analysis may not work in the future. A siding recommended for upgrade may not materially support extended passenger service, while another siding may provide that support. If the proposed service schedules or Coast Starlight schedules change, the meet location changes, and another siding could be substituted for one recommended in this study. Unpowered sidings on this segment that are not upgraded in this service alternative include:

- Gonzales, MP 131.2
- Soledad, MP 140.2
- San Ardo, MP 179.5
- Bradley, MP 192.5
- McKay, MP 200.2
- Templeton, MP 217.6
- Serrano, MP 238.8
- Chorro, MP 242.7

2.3 Summary of Infrastructure by Option

Table 2-1 summarizes the improvements requested by UPRR or identified through operational modeling for each service option. Note that only the Santa Barbara to Salinas corridor was modelled, and service options travelling north of Salinas may require additional improvements subject to further study and negotiation with host railroads.

Table 2-1. Summary of Infrastructure by Service Option, Mid-Term Horizon

	A-Capitol Corridor Extension	B-Extend Pacific Surfliner	C-Coast Daylight
Santa Barbara-SLO	Additional service can be achieved with completion of ongoing LOSSAN North Improvement Program		
SLO-Salinas	• Complete centralized traffic control (CTC) and positive train control (PTC) installation • Power up Santa Margarita Siding and install universal crossover near center of siding • Notching of 9 tunnels • Upgrade siding at Templeton	• Complete CTC and PTC installation • Power up Santa Margarita Siding and install universal crossover near center of siding • Notching of 9 tunnels • Upgrade siding at King City • Layover/light maintenance facility in Salinas*	• Complete CTC and PTC installation • Power up Santa Margarita Siding and install universal crossover near center of siding • Notching of 9 tunnels • Upgrade siding at King City
North of Salinas	Subject to further study	N/A	Subject to further study

* Assumes service terminates in Salinas. Extending further north may allow equipment to lay over at an existing facility.

2.4 Impacts on UPRR Freight Service

UPRR freight trains were included in the model. For the most part, there are few conflicts between existing UPRR freight operations and the addition of one passenger train between Salinas and SLO. Some local trains may face minor delays, depending on the customers served that day, but overall freight operational flexibility will benefit from the installation of CTC and powering of sidings (Santa Margarita and King City for Options 1 and 2 or Santa Margarita and Templeton for Option 3) on the route segment.

2.5 Mid-Term Service Option Equipment Needs

2.5.1 Extend service from the North

Equipment requirements for extending service to SLO from the north depends upon several factors. The operator of the proposed service and their existing equipment pool would be a factor, as well as plans for fleet expansion to support extension of service from San Jose or Gilroy to Salinas. Extending one round trip from Salinas to SLO would add an additional 272 daily train miles to any fleet supporting the service. Given the fact that an existing Pacific Surfliner set averages 567 train miles per day, operating roughly half that number of train miles would likely require additional equipment to be added to that equipment pool. For the purpose of estimating capital costs, one additional trainset in daily service and one spare of each type of vehicle (locomotive, café car, etc) are assumed to be required.

2.5.2 Extend one Pacific Surfliner to San Luis Obispo

There are 9 full trainsets currently in the LOSSAN Pacific Surfliner equipment pool. In 2020, LOSSAN was planning on extending one train to SLO using the existing pool, creating three daily round trips between LA and SLO.

Extending one of those trains from SLO to Salinas would add 272 daily revenue train miles to the Pacific Surfliner service fleet. The average daily train miles for the 9 existing trainsets (including the third Goleta-SLO round trip) is 567 miles.

For this option, one trainset laying overnight at SLO would instead lay over at Salinas. It is possible that the existing 9 trainsets could support extending one train to Salinas, however given the fact that the fleet supports all services between San Diego and SLO, adding 272 daily train miles to the fleet's operation may require more equipment. Thus, it is assumed that one new trainset for daily service and one spare of each type of vehicle will be required for Option B. However, further analysis and consultation with LOSSAN is recommended.

2.5.3 Coast Daylight Service

The Coast Daylight Study did not estimate additional equipment required to support the service. Generally, an independent operation of an intercity train of this route length would require two trainsets, one operating in each direction every day, plus some spare equipment. At a minimum, the spare pool should include at least one type of each piece of equipment in order to replace damaged equipment and cycle all equipment for scheduled maintenance.

It is assumed that the Daylight would occupy an existing Pacific Surfliner slot, which would reduce daily train miles for the Surfliner fleet by anywhere from 444 to 700 miles, depending on whether the train's southern terminus is Los Angeles or San Diego. If the Daylight was part of the Surfliner pool, additional equipment would still be required to support the additional 400 to 500 (San Jose or San Francisco) daily train miles the equipment would be operating. Conversely, the Daylight could become part of another equipment pool such as the Capitol Corridor fleet.

Expansion of either fleet to include the Coast Daylight service would likely be more cost effective than operating an independent fleet. Joining an existing equipment pool would provide for a larger pool of spare equipment, reducing spare requirements, and reduced maintenance costs with equipment and parts interchangeability.

For the purpose of estimating capital costs, the service is assumed to require two trainsets in daily service plus one spare of each type of vehicle.

2.6 Estimated Capital Costs

Table 2-2 and Table 2-3 show the capital costs for infrastructure and equipment associated with each service option, respectively. Further detail on the estimates of infrastructure costs are provided in Appendix B. Note that, for the purpose of estimating equipment costs, 5-car trainsets are assumed for a potential extension of service from the north, and 6-car trainsets are assumed for other service options.

Table 2-2. Infrastructure Costs by Service Option, Mid-Term (2021 Dollars)

Project	Cost	A-Extend Capitol Corridor	B-Extend Surfliner	C-Coast Daylight
CTC/PTC Installation	$48,960,000	✓	✓	✓
Tunnel Notching and Bridge Replacement	$20,256,000	✓	✓	✓
Power up Santa Margarita Siding	$19,468,800	✓	✓	✓
Upgrade Siding at Templeton	$15,532,800	✓		
Upgrade Siding at King City	$10,142,400		✓	✓
Salinas Layover Facility	$5,046,480		✓*	**
Totals		$104,217,600	$103,873,680	$98,827,200

*Assumes the service terminates in Salinas. Continuing north may provide preferable layover locations options.
**Assumes a layover location is available in San Francisco or San Jose

Table 2-3. Rail Equipment Cost Estimates by Service Option, Mid-Term Horizon (2021 Dollars)

	A-Capitol Corridor Extension	B-Extend Surfliner	C-Coast Daylight
Trainsets in daily service	1	1	2
6-car	0	1	2
4-car	1	0	0
Spare ratio	20%	20%	20%
Vehicles Required			
Diesel-Electric Locomotive	2	2	3
Bi-Level Coach Car	3	3	5
Bi-Level Coach Café Car	2	2	3
Bi-Level Business Class Car	2	3	5
Bi-Level Coach Baggage Cab Car	2	2	3
Total Cost	**$56,170,000**	**$60,782,500**	**$95,530,000**

3 Long-Term Horizon

The Long-Term Horizon service goals in the corridor are:

- Integrated intercity rail and intercity bus every hour between Salinas and San Luis Obispo, including intercity rail at least every 4 hours
- Integrated intercity rail and intercity bus every hour between San Luis Obispo and Goleta/Santa Barbara, including at least bi-hourly intercity rail service

There are many potential schedules that fit these parameters. To generate a high-level assessment of necessary infrastructure investment, only one conceptual schedule was modeled, as it was assumed that all service options (A, B, and C) would use similar train slots. Differences in specific infrastructure requirements between the long-term options would be influenced by interaction with future schedules of

the Coast Starlight, as well as Pacific Surfliner, Capitol Corridor, Metrolink, and High-Speed rail outside the Coast Corridor, which are unknown at this time.

The clockface schedules between Goleta and SLO developed in Section 2.1 utilizes infrastructure improvements agreed upon by LOSSAN, CalSTA and UP. With the exception of the Amtrak Coast Starlight, all northbound and southbound passenger trains meet at the same siding locations. Adding additional trains does not necessarily require additional infrastructure, as long as each schedule fits within the clockface slot. The exception is the corridor between SLO and Salinas, where a meet with the Coast Starlight and Train 761 necessitates upgrading the siding at Soledad (MP 140.2) to accommodate this meet.

The long-term schedule provides for seven daily round trips between Goleta and SLO, and three round trips extended north to Salinas. Figure 3-1 and Figure 3-2 show the proposed long-term schedules:

Figure 3-1. Long-term Northbound Schedule (Santa Barbara-Salinas)

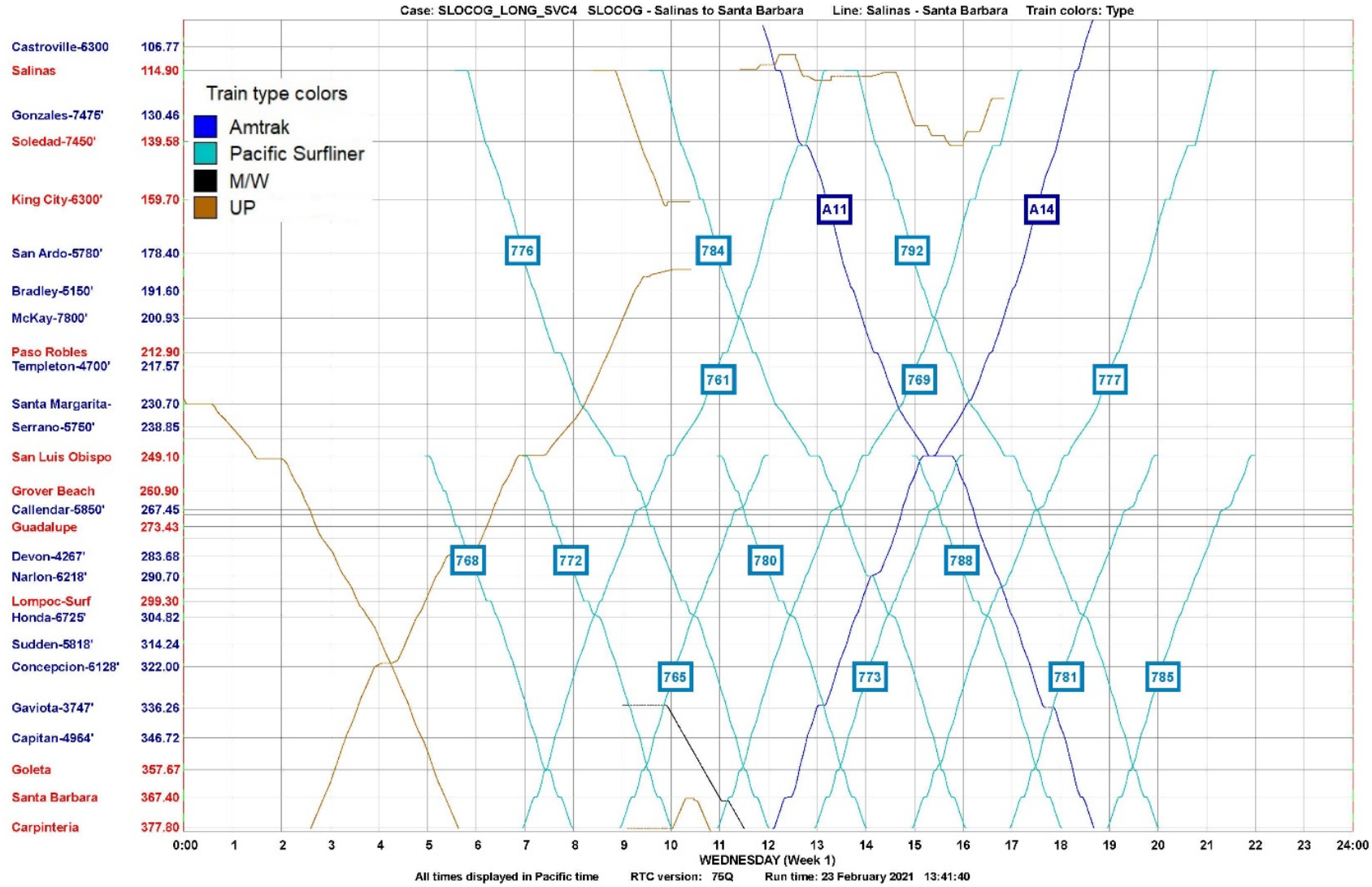
				Coast Starlight				
Train number	**761**	**765**	**769**	**14**	**773**	**777**	**781**	**785**
SANTA BARBARA	07:14	09:14	11:14	12:24	13:14	15:14	17:14	19:14
GOLETA	07:26	09:26	11:26	-	13:26	15:26	17:26	19:26
LOMPOC/SURF	08:34	10:34	12:34	-	14:34	16:34	18:34	20:34
GUADALUPE	09:10	11:10	13:10	-	15:10	17:10	19:10	21:10
GROVER BEACH	09:29	11:29	13:29	-	15:29	17:29	19:29	21:29
SAN LUIS OBISPO	10:03	12:03	14:03	15:19	16:03	18:03	20:03	22:03
PASO ROBLES	11:09		15:09	16:21		19:09		
KING CITY	12:14		16:14	-		20:14		
SOLEDAD	12:45		16:45	-		20:45		
SALINAS	13:08		17:08	18:12		21:08		

Figure 3-2. Long-term Southbound Schedule (Santa Barbara-Salinas)

							Coast Starlight	
Train number	**768**	**772**	**776**	**780**	**784**	**788**	**11**	**792**
SALINAS			05:49		09:49		12:13	13:49
SOLEDAD			06:12		10:12		-	14:12
KING CITY			06:39		10:39		-	14:39
PASO ROBLES			07:44		11:44		14:03	15:44
SAN LUIS OBISPO	05:02	07:02	09:02	11:02	13:02	15:02	15:45	17:02
GROVER BEACH	05:22	07:22	09:22	11:22	13:22	15:22	-	17:22
GUADALUPE	05:38	07:38	09:38	11:38	13:38	15:38	-	17:38
LOMPOC/SURF	06:18	08:18	10:18	12:18	14:18	16:18	-	18:18
GOLETA	07:24	09:24	11:24	13:24	15:24	17:24	-	19:24
SANTA BARBARA	07:39	09:39	11:39	13:39	15:39	17:39	18:27	19:39

Figure 3-3 shows the stringline diagram for long-term schedule:

Figure 3-3. Stringline Diagram, Long-Term Schedule (Salinas – Santa Barbara)



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3.1 Recommended Infrastructure improvements for the Long-Term Horizon

3.1.1 Santa Barbara to San Luis Obispo

As mentioned earlier in the report, LOSSAN, CalSTA and UPRR reached agreement in 2020 on infrastructure improvements between Santa Barbara and SLO to support a third round trip to/from SLO, and protect passenger on-time performance.

The proposed long-term clockface schedules utilize the Santa Barbara to SLO improvements. The increase in daily service from 6 to 16 daily passenger trains will incur far more train meets on a single-track rail section, increasing the possibility of trans being delayed with the potential to cascade delays further down the passenger schedule. Train meets that are scheduled at the Honda siding (MP 304), for example, may need to be performed at another siding if one of the trains is delayed enroute. For this particular example, the meet may need to occur at the next siding north (Surf, MP 299) or the next siding south (Sudden, MP 313.5). Neither sidings are included in the 2020 infrastructure improvement plan. Powering the remaining unpowered sidings on this route may be beneficial in improving operational flexibility, reliability and capacity for both passenger and freight traffic. Sidings not part of the 2020 improvement plan include:

- Grover, MP 260.34-261.61
- Surf, MP 298.8-299.9
- Sudden, MP 314.2-313.1
- Capitan, MP 346.7-345.7

3.1.2 San Luis Obispo to Salinas

In addition to the siding improvements recommended for the Mid-Term services, it is recommended that the sidings at Soledad (MP 139.58) and McKay (MP 200.2) be upgraded to powered, controlled sidings. There are currently two short sidings at McKay on either side of the main track. The improvement would include combination of the sidings to one siding and realignment of the main track.

3.1.3 Summary of Infrastructure Improvements and Costs

Table 3-1 summarizes the improvements requested by UPRR or identified through operational modeling for each service option. Note that only the Santa Barbara to Salinas corridor was modelled, and additional improvements subject to further study and negotiation with host railroads may be required for service north of Salinas.

Table 3-1. Summary of Infrastructure, Long-Term Horizon

Project	Cost
Combine McKay Sidings	$12,258,432
Upgrade Soledad Siding	$10,171,200
Total	$22,429,632

3.2 Impacts on UPRR Freight Service

The operation of eight daily passenger train round trips between Goleta and SLO, and four between SLO and Salinas, will reduce the availability of windows for freight trains to operate during daylight hours. Some freight operations could be potentially shifted to times of the day when passenger trains are not operating, while others serving online customers may not be able to do so. Depending on UPRR freight volumes and customer requirements in 2040, additional infrastructure improvements, such as powering

additional existing sidings, may be needed to support both long-term passenger schedules and UPRR freight services.

3.2.1 Equipment Needs and Costs

Determining, at a high level, the additional number of trainsets need to support 4 more daily round trips between Goleta and SLO and 3 round trips between SLO and Salinas is relatively straightforward if daily train miles are used as a measurement. Table 3-2 shows the additional train miles by service and the additional trainsets that may be required.

Total equipment needs were calculated by adding the number of additional trains in daily service for the mid-term and long-term horizons and applying a 20% spare ratio. Additional vehicles required reflect this total minus the number of vehicles previously acquired for mid-term service

Note that these estimates reflect train miles on the Central Coast and do not include the equipment requirements for increasing service frequencies between San Diego, Los Angeles and Santa Barbara or north of Salinas.

Table 3-2. Additional Rail Equipment Cost Estimates by Service Option, Long-Term Horizon (2021 Dollars)

	A-Capitol Corridor Extension	B-Extend Surfliner	C-Coast Daylight
Additional Daily Train Miles	1424	1424	1424
Santa Barbara-SLO (220 miles)	880	440	440
SLO-Salinas (272 miles)	544	0	0
Santa Barbara-Salinas (492 miles)	0	984	984
Additional trainsets in daily service	3	3	3
6-car	2	3	3
4-car	1	0	0
Additional Vehicles Required, including spares			
Diesel-Electric Locomotive	3	3	3
Bi-Level Coach Car	7	7	7
Bi-Level Coach Café Car	3	3	3
Bi-Level Business Class Car	6	7	7
Bi-Level Coach Baggage Cab Car	3	3	3
Total Cost	**$108,342,500**	**$112,955,000**	**$112,955,000**

Task 4.4:

Service Implementation Plan

Appendix B:

Infrastructure Improvements and High-Level Cost Estimate

SLOCOG Coast Corridor Rail Service Study

March 26, 2021

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Memo

Date:	Monday, March 15, 2021
Project:	San Luis Obispo Council of Governments (SLOCOG) Coast Corridor Rail Service Study
To:	Rick Degman
From:	Gerard Reminiskey
Subject:	Infrastructure Improvements and High-Level Cost Estimate Coast Corridor Rail Service Study Service Implementation Plan

Background

HDR is preparing a Service Implementation Plan (SIP) to develop of a phased implementation plan to achieve higher integrated intercity rail and bus service levels, providing bus connections to trains that terminate in Goleta, San Luis Obispo, Salinas, or San Jose.

Purpose

The contents of this memo are intended for use within an appendix to the SIP.

Proposed Title of the Appendix

Appendix B: Infrastructure Improvements and High-Level Cost Estimate

Infrastructure Improvements Evaluated for the SIP

The SIP includes the following infrastructure improvements projects (Infrastructure Projects). Infrastructure Project locations are indicated on Figure 1.

- Salinas Layover/Light Maintenance Facility
- Tunnel Notching Project and Bradley Bridge Replacement
- McKay Siding Combination Mile Post (MP) 200.2 to MP 201.8
- Centralized Traffic and Positive Train Control Systems MP 113.0 to MP 233.2
- Controlled Sidings Converted from Existing Sidings in Soledad, King City, Templeton and Santa Margarita

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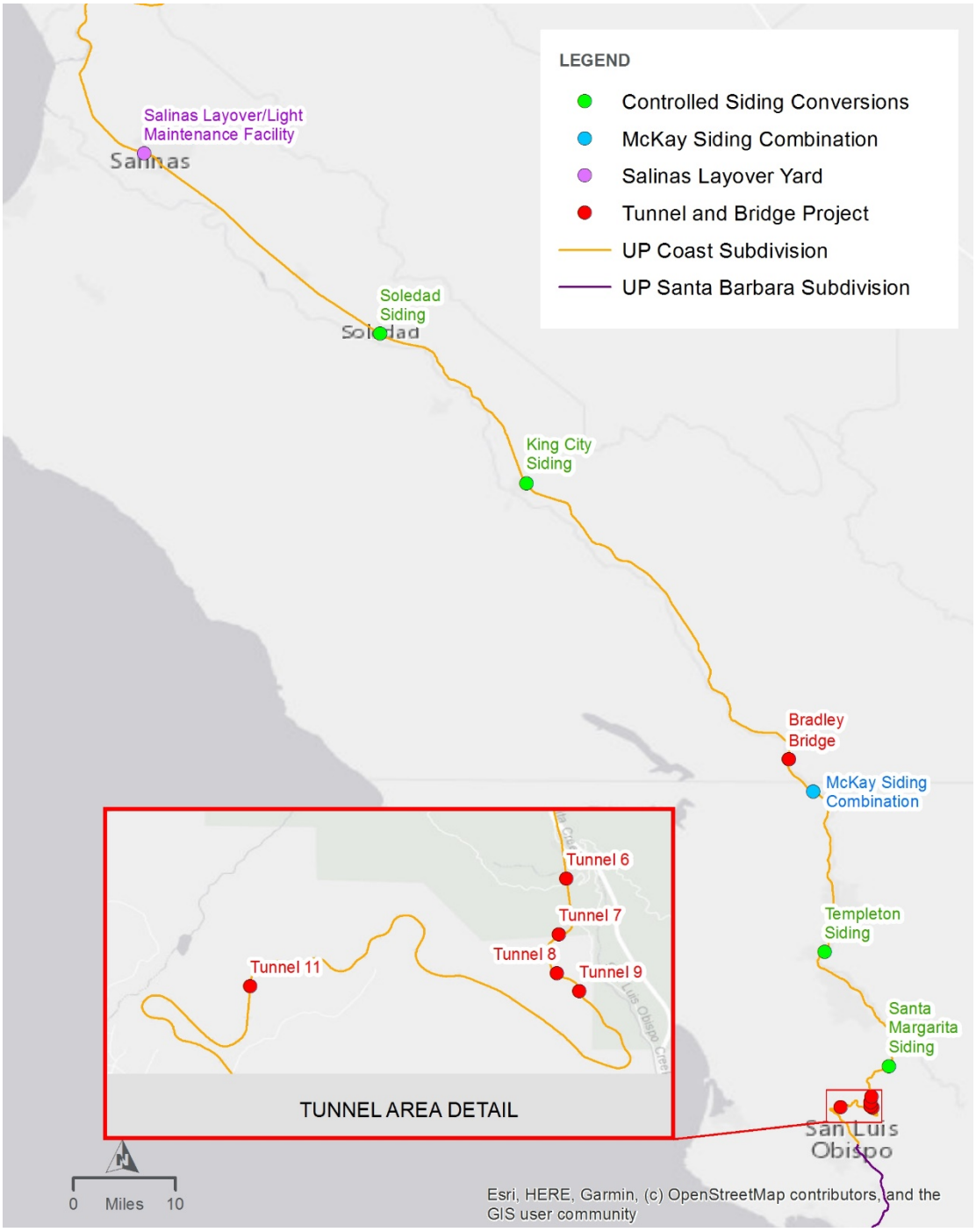

Figure 1 - Vicinity Map

Assumptions and Features per Infrastructure Project

Salinas Layover/Light Maintenance Facility

- All improvements would be contained within existing Union Pacific Railroad (UP) right-of-way as shown on Figure 2
- Access to the site would be available from New Street
- Site improvements would provide for the following functionality:
    - One storage track with the capacity for one 10-car Amtrak train consist
    - Site lighting
    - Security fencing
    - Fueling pad
    - Oil-water separator system

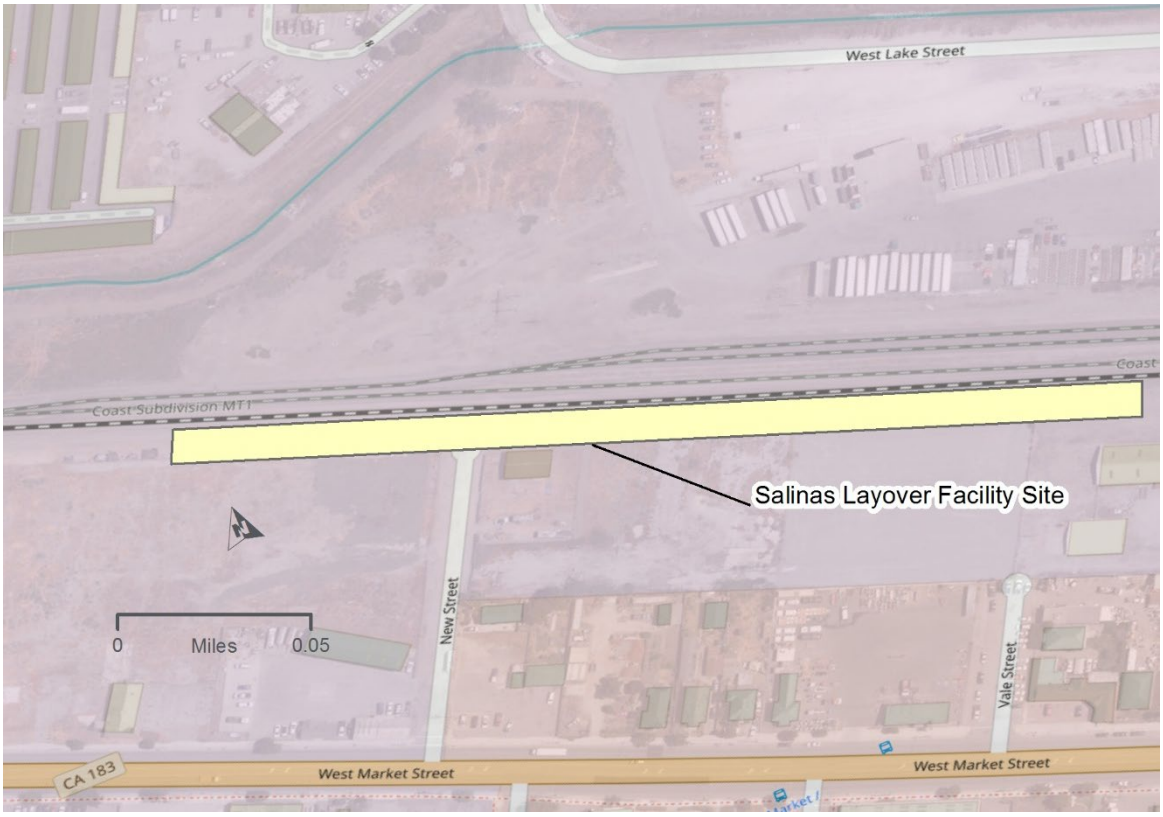

Figure 2 - Proposed Site for the Salinas Layover Yard

Tunnel Notching Project and Bradley Bridge Replacement

- The total cost for this Infrastructure Project was provided by UP based on a separate study by others.

McKay Siding Combination

- Preservation of the spur track to the Camp Roberts US Government facility was held as a constraint.
- The concept combines Tracks 130 and 131 while shifting the existing main line track as shown in Figure 3.
- Track improvements are contained within UP right-of-way.
- Existing billboards may require removal.

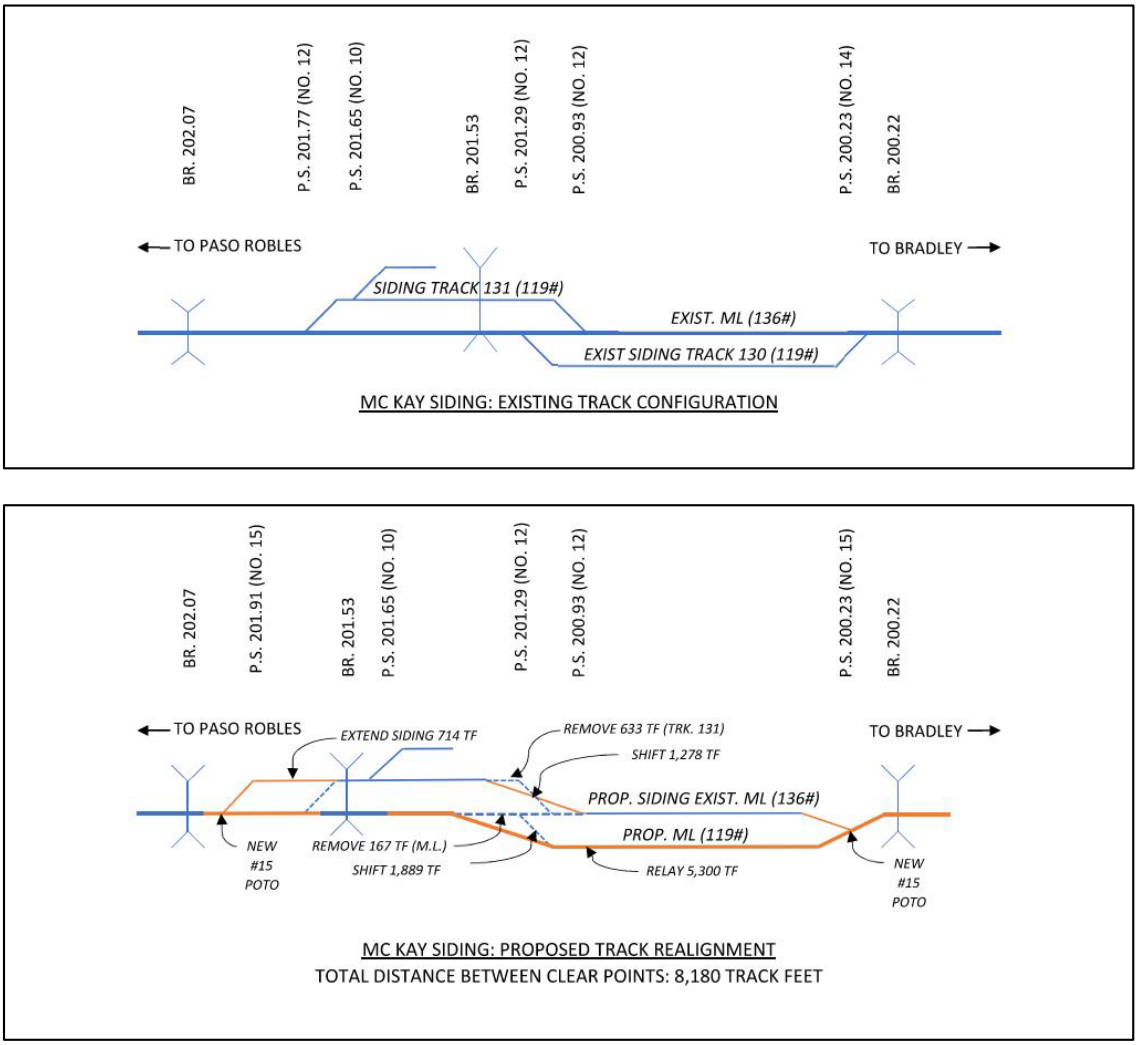

Figure 3 – McKay Siding Combination Concept

Centralized Traffic Control (CTC) and Positive Train Control (PTC) Systems

- Provides CTC and PTC for a 120-mile segment of the Coast Subdivision between MP 113.1 North Salinas and MP 233.1 South Santa Margarita.
- CTC unit costs are based on a per signal basis
- Route-miles (RM) that include a CP received a higher unit cost than RM without a CP

- PTC costs are stated as a lump sum derived from a 2018 Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program grant application; the lump sum cost is escalated to a 2021 value

Controlled Sidings Converted from Existing Sidings

- Existing sidings on the Coast Subdivisions would receive new No. 15 turnouts and control point signaling at each existing end-of-siding location.
- Four sidings are included in this Infrastructure Project:
    - Soledad Siding MP 139.58 to MP 141.14
    - King City Siding, MP 159.31 to MP 160.65
    - Templeton Siding, MP 217.57 to MP 218.58
    - Santa Margarita Siding, MP 229.51 to MP 233.19
- A No. 15 universal crossover would be installed within the limits of Santa Margarita Siding.
- Track rehabilitation for the sidings is not included.

Other Projects

In addition to the five Infrastructure Projects included in this cost estimate, other projects being developed by LOSSAN, Caltrans, and UP. Eight sidings on the Santa Barbara Subdivision are considered for conversion to controlled sidings. These sidings are considered part of the baseline infrastructure and therefore not included as Infrastructure Projects to accommodate the service levels proposed in the Coast Corridor Rail Service Study Service Implementation Plan. The location of the eight sidings are listed as follows and shown on Figure 4.

- Callender Siding MP 266.3 to MP 268.1
- Guadalupe Siding MP 272.7 to MP 273.6
- Waldorf Siding MP 276.7 to MP 277.5
- Devon Siding MP 282.8 to MP 283.7
- Narlon Siding MP 289.4 to MP 290.7
- Tangair Siding MP 293.7 to MP 294.8
- Honda Siding MP 303.4 to MP 304.8
- Concepcion Siding MP 320.7 to MP 322.0

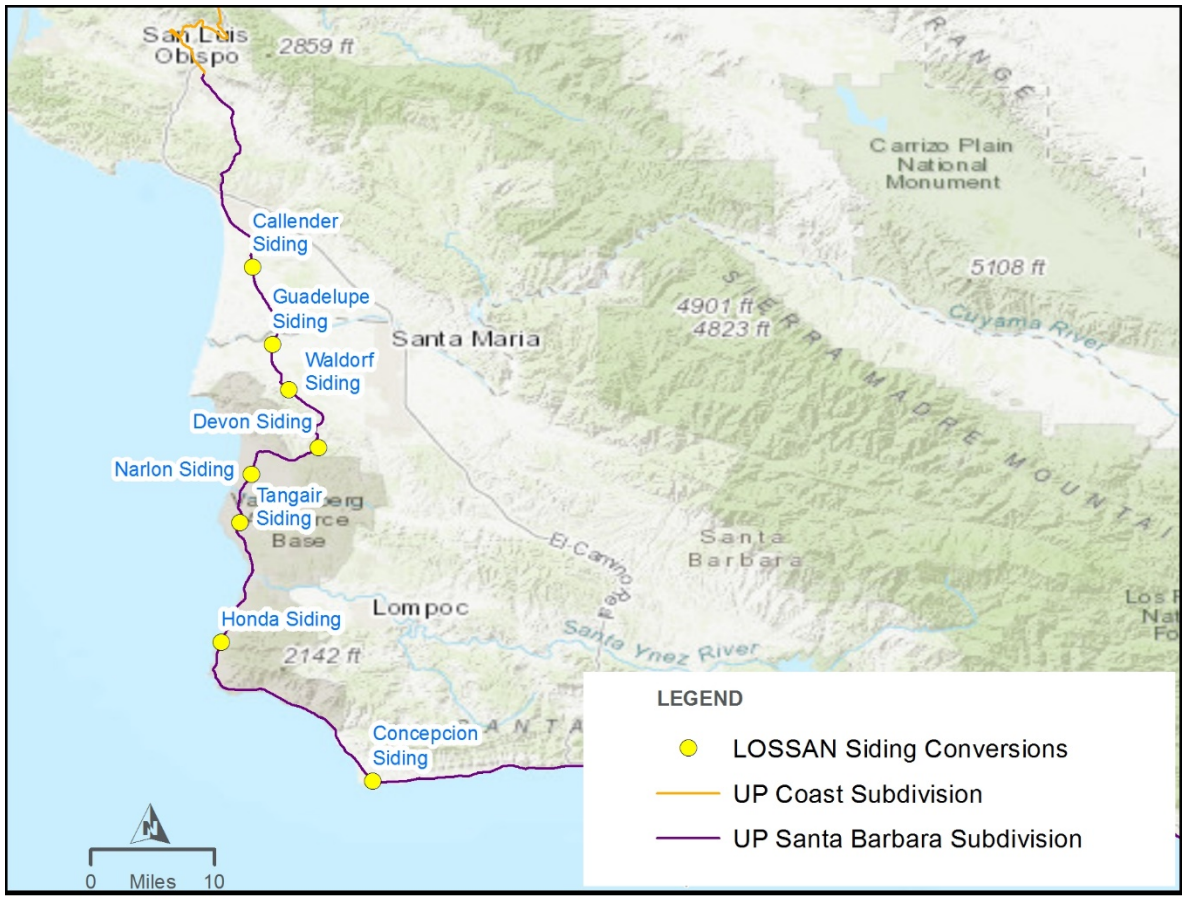

Figure 4 - LOSSAN Siding Project Locations

Cost Data

The following pages provide high-level cost estimates for each Infrastructure Project.

INFRASTRUCTURE PROJECT COST ESTIMATE

Project Name:	San Luis Obispo Council of Governments (SLOCOG) Coast Corridor Rail Service Study
Design Level:	Infrastructure Improvements and High-Level Cost Estimate Coast Corridor Rail Service Study Service Implementation Plan
Last Updated:	15-Mar-21

Infrastructure Project	**Total**
Salinas Layover/Light Maintenance Facility	5,046,480
Tunnel Notching Project and Bradley Bridge Replacement	20,256,000
McKay Siding Combination	12,258,432
Controlled Sidings Converted from Existing Sidings - UP Coast Subdivision	55,315,200
Centralized Traffic Control and Positive Train Control Systems	48,960,000
ESTIMATED TOTAL, ALL INFRASTRUCTURE PROJECTS	**141,836,112**

INFRASTRUCTURE PROJECT COST ESTIMATE

Infrastructure Improvement Project

Salinas Layover/Light Maintenance Facility

Project Name:	San Luis Obispo Council of Governments (SLOCOG) Coast Corridor Rail Service Study
Design Level:	Infrastructure Improvements and High-Level Cost Estimate Coast Corridor Rail Service Study Service Implementation Plan
Last Updated:	15-Mar-21

ITEM	DESCRIPTION	QUANTITY		UNIT COST	TOTAL COST	NOTES
1	**TRACK (Layover)**					
	Install Track	1220	TF	265.00	$323,300	Layover Track - 136#, Wood Ties
	Site Grading - 6" Gravel	611	CY	75.00	$45,825	Fuel Truck and Maintenance Truck Access
	Track Grading - Cut	680	CY	75.00	$51,000	Assumed Average of 6" Deep x 30' Wide
	Track Subballast	660	CY	100.00	$66,000	6" x 30' Wide
	Install No. 15 RH HTTO	1	EA	400,000.00	$400,000	Left Hand Hand Throw
	Install Signals	1	LS	425,000.00	$425,000	Leaving Signal, DPSS, PTC
	Install Derail	1	EA	35,000.00	$35,000	Double Switch Point
	Remove No. 15 Track Elements	1	EA	25,000.00	$25,000	
	Fencing	2205	LF	50.00	$110,250	6' High Chain Link
	Sliding Gate (50'wide)	1	EA	7,500.00	$7,500	New Street Enterance
	Swing Gate (20' wide)	1	EA	5,000.00	$5,000	Layover Track Entrance
	Lighting, Wayside Power and Electrical	1	LS	400,000.00	$400,000	
	Compressed Air System	1		72,000.00	$72,000	
	Fueling Pad (Fuel Truck)	1	LS	2,500.00	$2,500	
	Drip Pans (Locomotives)	1	LS	1,500.00	$1,500	
	Oil-Water Separator	1	LS	78,000.00	$78,000	
	HD Bumper	1	EA	5,500.00	$5,500	
	SUB-TOTAL: TRACK CONSTRUCTION COSTS				$2,053,375	
2	**CIVIL (Layover Track)**					
	Site Mitigation -SWPP	1	LS	25,000.00	$25,000	
	Clearing/Grubbing	1	LS	50,000.00	$50,000	
	SUB-TOTAL: CIVIL CONSTRUCTION COSTS				$75,000	
3	**Other Infrastructure Costs**					
	Property Considerations				$500,000	
	SUB-TOTAL: OTHER COSTS				$500,000	
	SUB-TOTAL: INFRASTRUCTURE COSTS				$2,628,375	
	%					
	CONSTRUCTION CONTINGENCY 15%				$394,256	
	CIVIL DESIGN 9%				$236,554	
	CIVIL DESIGN SUPPORT DURING CONST. 3%				$78,851	
	S&C DESIGN 3%				$78,851	
	S&C DESIGN SUPPORT DURING CONST. 2%				$52,568	
	PROJECT MANAGEMENT 4%				$105,135	
	CONSTRUCTION MANAGEMENT 8%				$210,270	
	FLAGGING 6%				$157,703	
	AGENCY COSTS 10%				$262,838	
	SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS				$1,577,025	
	%					
	PROJECT RESERVE/CONTINGENCY 20%				$841,080	
	INFLATION Rate:	0	ǂ Years	0.00	TBD	
	TOTAL INFRASTRUCTURE PROJECT COSTS				**$5,046,480**	

INFRASTRUCTURE PROJECT COST ESTIMATE

Infrastructure Improvement Project
Tunnel Notching Project and Bradley Bridge Replacement

Project Name:	San Luis Obispo Council of Governments (SLOCOG) Coast Corridor Rail Service Study
Design Level:	Infrastructure Improvements and High-Level Cost Estimate Coast Corridor Rail Service Study Service Implementation Plan
Last Updated:	15-Mar-21

ITEM	DESCRIPTION	QUANTITY		UNIT COST	TOTAL COST	NOTES
1	**BRIDGE/TUNNELS**					
	Bridge No. 197.17	1	LS	1,000,000.00	$1,000,000	1085'
	Tunnel - MP 235.89 - 236.57	1	LS	3,500,000.00	$3,500,000	Cuesta - Tunnel # 6 - 3610'
	Tunnel - MP 236.72 - 236.89	1	LS	2,000,000.00	$2,000,000	Tunnel # 7 - 1360'
	Tunnel - MP 237.22 - 237.31	1	LS	1,000,000.00	$1,000,000	Tunnel # 8 - 482'
	Tunnel - MP 237.47 - 237.57	1	LS	1,000,000.00	$1,000,000	Tunnel # 9 - 529'
	Tunnel - MP 242.51 - 242.63	1	LS	1,000,000.00	$1,000,000	Tunnel# 11 -624'
SUB-TOTAL: TRACK AND SIGNAL CONSTRUCTION COSTS					$9,500,000	
2	**CIVIL**					
	Site Mitigation -SWPP	6	LS	100,000.00	$600,000	
	Clearing/Grubbing	6	LS	75,000.00	$450,000	
	SUB-TOTAL: CIVIL CONSTRUCTION COSTS				$1,050,000	
3	**Other Infrastructure Costs**					
	None					
	SUB-TOTAL: OTHER COSTS				$0	
	SUB-TOTAL: INFRASTRUCTURE COSTS				$10,550,000	
	%					
	CONSTRUCTION CONTINGENCY 15%				$1,582,500	
	CIVIL DESIGN 9%				$949,500	
	CIVIL DESIGN SUPPORT DURING CONST. 3%				$316,500	
	S&C DESIGN 3%				$316,500	
	S&C DESIGN SUPPORT DURING CONST. 2%				$211,000	
	PROJECT MANAGEMENT 4%				$422,000	
	CONSTRUCTION MANAGEMENT 8%				$844,000	
	FLAGGING 6%				$633,000	
	AGENCY COSTS 10%				$1,055,000	
SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS					$6,330,000	
	%					
	PROJECT RESERVE/CONTINGENCY 20%				$3,376,000	
	INFLATION Rate:	0	ǂ Years	0.00	TBD	
TOTAL INFRASTRUCTURE PROJECT COSTS					**$20,256,000**	

INFRASTRUCTURE PROJECT COST ESTIMATE

Infrastructure Improvement Project

McKay Siding Combination

Project Name:	San Luis Obispo Council of Governments (SLOCOG) Coast Corridor Rail Service Study
Design Level:	Infrastructure Improvements and High-Level Cost Estimate Coast Corridor Rail Service Study Service Implementation Plan
Last Updated:	15-Mar-21

ITEM	DESCRIPTION	QUANTITY		UNIT COST	TOTAL COST	NOTES
1	**TRACK AND SIGNALS**					
	Install No. 15 POTO	2	EA	400,000.00	$800,000	1 - LHPO and 1-RHPO
	Remove No. 14 HTTO	2	EA	35,000.00	$70,000	Track 130
	Remove No. 12 HTTO	2	EA	30,000.00	$60,000	Track 131
	Install No. 14 Track Elements	1	EA	22,500.00	$22,500	Track 130
	Install No. 12 Track Elements	1	EA	20,000.00	$20,000	Track 131
	Remove No. 15 Track Elements	1	EA	25,000.00	$25,000	Track 130
	Install Track (Track 131 Extension)	4770	TF	265.00	$1,264,050	136# RE - Wood Ties
	Track Relay With 50% Tie Renewal	4930	TF	210.00	$1,035,300	Track 131 - 119# to 136# - Wood
	Remove Track 130	6583	TF	100.00	$658,300	119# - Wood
	Grading	1046	CY	75.00	$78,450	Assume 12" Fill x 12' Wide
	Subballast	1060	CY	100.00	$106,000	Assume 6" Deep x 12' Wide
	Remove Derail	4	EA	7,500.00	$30,000	
	Remove Bill Board	1	EA	35,000.00	$35,000	
	Install Double Point Derail	2	EA	35,000.00	$70,000	
	Control Points	2	EA	1,000,000.00	$2,000,000	
	SUB-TOTAL: TRACK AND SIGNAL CONSTRUCTION COSTS				$6,274,600	
2	**CIVIL**					
	'Site Mitigation -SWPP	1	LS	65,000.00	$65,000	
	'Clearing/Grubbing	1	LS	45,000.00	$45,000	
	SUB-TOTAL: CIVIL CONSTRUCTION COSTS				$110,000	
3	**Other Infrastructure Costs**					
	None					
	SUB-TOTAL: OTHER COSTS				$0	
	SUB-TOTAL: INFRASTRUCTURE COSTS				$6,384,600	
	%					
	CONSTRUCTION CONTINGENCY 15%				$957,690	
	CIVIL DESIGN 9%				$574,614	
	CIVIL DESIGN SUPPORT DURING CONST. 3%				$191,538	
	S&C DESIGN 3%				$191,538	
	S&C DESIGN SUPPORT DURING CONST. 2%				$127,692	
	PROJECT MANAGEMENT 4%				$255,384	
	CONSTRUCTION MANAGEMENT 8%				$510,768	
	FLAGGING 6%				$383,076	
	AGENCY COSTS 10%				$638,460	
	SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS				$3,830,760	
	%					
	PROJECT RESERVE/CONTINGENCY 20%				$2,043,072	
	INFLATION Rate:	0	# Years:	0.00	TBD	
	TOTAL INFRASTRUCTURE PROJECT COSTS				**$12,258,432**	

INFRASTRUCTURE PROJECT COST ESTIMATE

Infrastructure Improvement Project

Controlled Sidings Converted from Existing Sidings - UP Coast Subdivision

Project Name:	San Luis Obispo Council of Governments (SLOCOG) Coast Corridor Rail Service Study
Design Level:	Infrastructure Improvements and High-Level Cost Estimate Coast Corridor Rail Service Study Service Implementation Plan
Last Updated:	15-Mar-21

Location	
Soledad Siding MP 139.58 to MP 141.14	10,171,200
King City Siding, MP 159.31 to MP 160.65	10,142,400
Templeton Siding, MP 217.57 to MP 218.58	15,532,800
Santa Margarita Siding, MP 229.51 to MP 233.19	19,468,800

TOTAL INFRASTRUCTURE PRC	**$55,315,200**	

INFRASTRUCTURE PROJECT COST ESTIMATE

Infrastructure Improvement Project

Controlled Sidings Converted from Existing Sidings - Soledad Siding, UP Coast Subdivision

Project Name:	San Luis Obispo Council of Governments (SLOCOG) Coast Corridor Rail Service Study
Design Level:	Infrastructure Improvements and High-Level Cost Estimate Coast Corridor Rail Service Study Service Implementation Plan
Last Updated:	15-Mar-21

ITEM	DESCRIPTION	QUANTITY		UNIT COST	TOTAL COST	NOTES
1	**TRACK AND SIGNAL**					
	CP - Soledad Siding - MP 139.58 - 141.14	1	LS	2,250,000.00	$2,250,000	Track 155 (7,450')
	No. 15 POTO	2	EA	400,000.00	$800,000	Replace Existing No. 14s, 12s & 10 with No. 15s
	Remove No. 14 HTTO	1	EA	35,000.00	$35,000	Soledad (1)
	Remove No. 12 HTTO	1	EA	32,500.00	$32,500	Soledad (1)
	Remove Existing Intermediate Signals	2	EA	50,000.00	$100,000	Soledad
	Control Points	2	EA	1,000,000.00	$2,000,000	
SUB-TOTAL: TRACK AND SIGNAL CONSTRUCTION COSTS					$5,217,500	
2	**CIVIL**					
	Site Mitigation -SWPP	1	LS	50,000.00	$50,000	
	Clearing/Grubbing	1	LS	30,000.00	$30,000	
SUB-TOTAL: CIVIL CONSTRUCTION COSTS					$80,000	
3	**Other Infrastructure Costs**					
	None					
SUB-TOTAL: OTHER COSTS					$0	
SUB-TOTAL: INFRASTRUCTURE COSTS					$5,297,500	
	%					
	CONSTRUCTION CONTINGENCY 15%				$794,625	
	CIVIL DESIGN 9%				$476,775	
	CIVIL DESIGN SUPPORT DURING CONST. 3%				$158,925	
	S&C DESIGN 3%				$158,925	
	S&C DESIGN SUPPORT DURING CONST. 2%				$105,950	
	PROJECT MANAGEMENT 4%				$211,900	
	CONSTRUCTION MANAGEMENT 8%				$423,800	
	FLAGGING 6%				$317,850	
	AGENCY COSTS 10%				$529,750	
SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS					$3,178,500	
	%					
	PROJECT RESERVE/CONTINGENCY 20%				$1,695,200	
	INFLATION Rate:	0	ǂ Years	0.00	TBD	
TOTAL INFRASTRUCTURE PROJECT COSTS					**$10,171,200**	

INFRASTRUCTURE PROJECT COST ESTIMATE

Infrastructure Improvement Project

Controlled Siding Converted from Existing Siding - King City Siding, UP Coast Subdivision

Project Name:	San Luis Obispo Council of Governments (SLOCOG) Coast Corridor Rail Service Study
Design Level:	Infrastructure Improvements and High-Level Cost Estimate Coast Corridor Rail Service Study Service Implementation Plan
Last Updated:	15-Mar-21

ITEM	DESCRIPTION	QUANTITY		UNIT COST	TOTAL COST	NOTES
1	**TRACK AND SIGNAL**					
	CP - King City Siding - MP 159.31 - 160.65	1	LS	2,000,000.00	$2,000,000	Track 120 (6,300')
	No. 15 POTO	2	EA	400,000.00	$800,000	Replace Existing No. 14s, & 12s with No. 15s
	Remove No. 12 HTTO	1	EA	32,500.00	$32,500	King City (1)
	Remove No. 10 HTTO	1	EA	30,000.00	$30,000	King City (1)
	Remove Existing Intermediate Signals	2	EA	50,000.00	$100,000	King City
	Control Points	2	EA	1,000,000.00	$2,000,000	
	SUB-TOTAL: TRACK AND SIGNAL CONSTRUCTION COSTS				$4,962,500	
2	**CIVIL**					
	Site Mitigation -SWPP	4	LS	50,000.00	$200,000	
	Clearing/Grubbing	4	LS	30,000.00	$120,000	
	SUB-TOTAL: CIVIL CONSTRUCTION COSTS				$320,000	
3	**Other Infrastructure Costs**					
	None					
	SUB-TOTAL: OTHER COSTS				$0	
	SUB-TOTAL: INFRASTRUCTURE COSTS				$5,282,500	
		%				
	CONSTRUCTION CONTINGENCY	15%			$792,375	
	CIVIL DESIGN	9%			$475,425	
	CIVIL DESIGN SUPPORT DURING CONST.	3%			$158,475	
	S&C DESIGN	3%			$158,475	
	S&C DESIGN SUPPORT DURING CONST.	2%			$105,650	
	PROJECT MANAGEMENT	4%			$211,300	
	CONSTRUCTION MANAGEMENT	8%			$422,600	
	FLAGGING	6%			$316,950	
	AGENCY COSTS	10%			$528,250	
	SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS				$3,169,500	
		%				
	PROJECT RESERVE/CONTINGENCY	20%			$1,690,400	
	INFLATION	Rate:	0	ǂ Years	0.00	TBD
	TOTAL INFRASTRUCTURE PROJECT COSTS				**$10,142,400**	

INFRASTRUCTURE PROJECT COST ESTIMATE

Infrastructure Improvement Project
Controlled Siding Converted from Existing Siding - Templeton Siding, UP Coast Subdivision

Project Name:	San Luis Obispo Council of Governments (SLOCOG) Coast Corridor Rail Service Study
Design Level:	Infrastructure Improvements and High-Level Cost Estimate Coast Corridor Rail Service Study Service Implementation Plan
Last Updated:	15-Mar-21

ITEM	DESCRIPTION	QUANTITY		UNIT COST	TOTAL COST	NOTES
1	**TRACK AND SIGNAL**					
	CP - Templeton Siding - MP217.57 - 218.58	1	LS	1,550,000.00	$1,550,000	Track 137 (4,700')
	CP - Santa Margarita Siding - MP 229.51 - 232.42	1	LS	3,250,000.00	$3,250,000	Track 140 (19,015')
	No. 15 POTO	2	EA	400,000.00	$800,000	Replace Existing No. 14s with No. 15s
	Remove No. 14 HTTO	2	EA	35,000.00	$70,000	Templeton (2)
	Remove Existing Intermediate Signals	2	EA	50,000.00	$100,000	Templeton
	Control Points	2	EA	1,000,000.00	$2,000,000	
	SUB-TOTAL: TRACK AND SIGNAL CONSTRUCTION COSTS				$7,770,000	
2	**CIVIL**					
	Site Mitigation -SWPP	4	LS	50,000.00	$200,000	
	Clearing/Grubbing	4	LS	30,000.00	$120,000	
	SUB-TOTAL: CIVIL CONSTRUCTION COSTS				$320,000	
3	**Other Infrastructure Costs**					
	None					
	SUB-TOTAL: OTHER COSTS				$0	
	SUB-TOTAL: INFRASTRUCTURE COSTS				$8,090,000	
		%				
	CONSTRUCTION CONTINGENCY	15%			$1,213,500	
	CIVIL DESIGN	9%			$728,100	
	CIVIL DESIGN SUPPORT DURING CONST.	3%			$242,700	
	S&C DESIGN	3%			$242,700	
	S&C DESIGN SUPPORT DURING CONST.	2%			$161,800	
	PROJECT MANAGEMENT	4%			$323,600	
	CONSTRUCTION MANAGEMENT	8%			$647,200	
	FLAGGING	6%			$485,400	
	AGENCY COSTS	10%			$809,000	
	SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS				$4,854,000	
		%				
	PROJECT RESERVE/CONTINGENCY	20%			$2,588,800	
	INFLATION	Rate:	0	ǂ Years	0.00	TBD
	TOTAL INFRASTRUCTURE PROJECT COSTS				**$15,532,800**	

INFRASTRUCTURE PROJECT COST ESTIMATE

Infrastructure Improvement Project
Controlled Siding Converted from Existing Siding - Santa Margarita Siding UP Coast Subdivision

Project Name:	San Luis Obispo Council of Governments (SLOCOG) Coast Corridor Rail Service Study
Design Level:	Infrastructure Improvements and High-Level Cost Estimate Coast Corridor Rail Service Study Service Implementation Plan
Last Updated:	15-Mar-21

ITEM	DESCRIPTION	QUANTITY		UNIT COST	TOTAL COST	NOTES
1	**TRACK AND SIGNAL**					
	CP - Santa Margarita Siding - MP 229.51 - 232.42	1	LS	3,250,000.00	$3,250,000	Track 140 (19,015')
	CP - Universal X-Overs at Santa Margarita Siding	1	LS	2,500,000.00	$2,500,000	2 X-over at MP 230.70-230.78 & 230.79-230.82
	No. 15 POTO	2	EA	400,000.00	$800,000	Replace Existing No. 14s with No. 15s
	Remove No. 15 Track Element	4	EA	25,000.00	$100,000	Remove Track & Replace with No. 15 T.O. (X-Overs)
	Remove No. 14 HTTO	2	EA	35,000.00	$70,000	Santa Margarita (2)
	Remove Existing Intermediate Signals	2	EA	50,000.00	$100,000	Santa Margarita
	Control Points	3	EA	1,000,000.00	$3,000,000	
	SUB-TOTAL: TRACK AND SIGNAL CONSTRUCTION COSTS				$9,820,000	
2	**CIVIL**					
	Site Mitigation -SWPP	4	LS	50,000.00	$200,000	
	Clearing/Grubbing	4	LS	30,000.00	$120,000	
	SUB-TOTAL: CIVIL CONSTRUCTION COSTS				$320,000	
3	**Other Infrastructure Costs**					
	None					
	SUB-TOTAL: OTHER COSTS				$0	
	SUB-TOTAL: INFRASTRUCTURE COSTS				$10,140,000	
	%					
	CONSTRUCTION CONTINGENCY 15%				$1,521,000	
	CIVIL DESIGN 9%				$912,600	
	CIVIL DESIGN SUPPORT DURING CONST. 3%				$304,200	
	S&C DESIGN 3%				$304,200	
	S&C DESIGN SUPPORT DURING CONST. 2%				$202,800	
	PROJECT MANAGEMENT 4%				$405,600	
	CONSTRUCTION MANAGEMENT 8%				$811,200	
	FLAGGING 6%				$608,400	
	AGENCY COSTS 10%				$1,014,000	
	SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS				$6,084,000	
	%					
	PROJECT RESERVE/CONTINGENCY 20%				$3,244,800	
	INFLATION Rate:	0	ǂ Years	0.00	TBD	
	TOTAL INFRASTRUCTURE PROJECT COSTS				**$19,468,800**	

INFRASTRUCTURE PROJECT COST ESTIMATE

Infrastructure Improvement Project
Centralized Traffic Control and Positive Train Control Systems

Project Name:	San Luis Obispo Council of Governments (SLOCOG) Coast Corridor Rail Service Study
Design Level:	Infrastructure Improvements and High-Level Cost Estimate Coast Corridor Rail Service Study Service Implementation Plan
Last Updated:	15-Mar-21

ITEM	DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST	NOTES
1	**Centralized Traffic Control**				
	(Upgrade from TWC)				
	Limits				
	MP 113.1 North Salinas (CO 113)				
	MP 233.1 South Santa Margarita (CO 233)				
	Does not include the cost of new Control Points at the five sidings; see individual cost worksheets for those sidings				
	Intermediate Signals	45	300,000.00	$13,500,000	
2	**Positive Train Control**				
	Estimate from CRISI Grant Application, stated in 2021 dollars	1 LS	12,000,000.00	$12,000,000	
	Overlay system to CTC; communication backbone				
	Grade crossings not connected to PTC at this phase				
SUB-TOTAL: TRACK AND SIGNAL CONSTRUCTION COSTS				$25,500,000	
	CIVIL				
	SUB-TOTAL: CIVIL CONSTRUCTION COSTS			$0	
	Other Infrastructure Costs				
	None				
	SUB-TOTAL: OTHER COSTS			$0	
	SUB-TOTAL: INFRASTRUCTURE COSTS			$25,500,000	
	%				
	CONSTRUCTION CONTINGENCY 15%			$3,825,000	
	CIVIL DESIGN 9%			$2,295,000	
	CIVIL DESIGN SUPPORT DURING CONST. 3%			$765,000	
	S&C DESIGN 3%			$765,000	
	S&C DESIGN SUPPORT DURING CONST. 2%			$510,000	
	PROJECT MANAGEMENT 4%			$1,020,000	
	CONSTRUCTION MANAGEMENT 8%			$2,040,000	
	FLAGGING 6%			$1,530,000	
	AGENCY COSTS 10%			$2,550,000	
SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS				$15,300,000	
	%				
	PROJECT RESERVE/CONTINGENCY 20%			$8,160,000	
	INFLATION Rate:	0 ǂ Years	0.00	TBD	
TOTAL INFRASTRUCTURE PROJECT COSTS				**$48,960,000**	

Task 4.4:

Service Implementation Plan

Appendix C: Communications and Engagement Plan

SLOCOG Coast Corridor Rail Service Study

March 26, 2021

CONTENTS

1 Introduction

Due to the regional size and community diversity of the study area, implementation of a comprehensive, strategic communications and public outreach program was essential to understanding needs and creating feasible plans to meet those needs for future rail travel. The Engagement Program focused on development of effective communications tools and strategies to build awareness, understanding and active engagement in the Study. The Program included development and implementation of traditional tools and activities like information materials, survey distribution, blended with digital communications and engagement strategies including social media, media, interactive websites and virtual meetings. A critical component of the Program was the stakeholder engagement which includes two key committees, the Technical Advisory Committee and the Community Working Group. These committees allowed the team to directly engage with community representatives and leaders to foster relationships and share timely information and input at key milestones within the development of the Draft SIP.

2 Property Owner/Stakeholder Database

HDR worked in collaboration with SLOCOG to develop a property owner/stakeholder contact database to ensure all interested parties, specifically those in disadvantaged communities, were appropriately informed of the project. The stakeholder list included diverse regional representatives from business, residential, advocacy, educational, and medical communities. Following are the parameters of the searches, which produced 11,659 parcels:

- 500 ft. of rail line from Paso Robles station to Guadalupe station (5,271 parcels)
- Atascadero: 0.25-mile radius down center of disadvantaged area (540 parcels)
- Paso Robles (west side): 0.25-mile radius down center of disadvantaged area (1,751 parcels)
- Paso Robles (east side): two disadvantaged areas closest to rail line (317 parcels)
- Grover Beach: 0.25-mile radius of rail line (1,384 parcels)
- San Miguel: 0.25-mile radius down center of disadvantaged area (954 parcels)
- Nipomo: 0.25-mile radius of Highway 101 within disadvantaged areas (767 parcels)
- San Luis Obispo: 0.25-mile radius down center of largest disadvantaged cluster (675 parcels)

3 Project Branding & Messaging

A unique Study brand was developed to set the Study apart from other regional planning efforts. The brand complimented the SLOCOG brand and creates consistency in look and feel of all communications and information distributed about the study. The branding also includes clear, concise and consistent messaging.

4 Project-Specific Website

A project-specific website (coastrailstudy.com) has been developed as the main source of information for the public to obtain study updates. This interactive website is linked back to SLOCOG's parent site and provides resources and alerts as well as opportunity to share input. Inquiries and comments submitted through the website are documented and addressed as appropriate.

- **Website Visits:** 5,537 users
- **Average time on site:** 1:55
- **Total sessions by device**
  - Desktop: 48%
  - Mobile: 48%
  - Tablet: 4%
- **Acquisition by channel**
  - Direct: 59%
  - Referral: 18%
  - Via Social: 11%
  - Via Search: 9%
  - Via Emails: 3%

4.1 Fact Sheet

A bilingual fact sheet serves as an effective educational tool, is housed on the website and downloadable for distribution. The fact sheet provides general information about the study background, goals, responsible parties, milestones, funding and how to participate/engage.

4.2 Electronic Notifications

As an additional means to broadly disseminate information and keep the public informed, a project email (info@coastrailstudy.com) is being utilized to communicate with project stakeholders and interested public.

5 Social Media & Media Relations

SLOCOG's existing Facebook account is a critical communication tool for building public awareness and timely notification of Study news and events. As project milestones occur, social media posts are disseminated to SLOCOG's channels. In addition, press releases are distributed to garner input from the adjacent counties.

Two press releases have been distributed to date:

- SLOCOG Awarded $2.2 Million in Funding to Expand Rail Service on the Central Coast (March 2019)
- New study looks at increasing rail options for the Central Coast (Sept. 2020)

As a result of media coordination, two articles have been published, including:

- New Times: SLOCOG to host virtual meeting on commuter rail transit study (Sept. 2020)
- Paso Robles Daily News: New study looks at increasing rail options for the Central Coast (Sept. 2020)

6 Survey

An online survey was conducted from mid-June to early-October 2020 through SurveyMonkey to gather demographics and public input into the study options. A total of 451 participants completed the survey and one lucky participant won a $100 Amazon gift card. Below is a breakdown of top results:

Table 6-1. Survey Results

Question	Results		
Location		Home	Work/School
	SLO County	377	365
	Santa Barbara County	29	29
	Santa Cruz County	7	6
	Monterey County	11	13
	Other/Out of State	27	38
Age	65+ (14%) 50-64 (30%) 40-49 (15%) 25-39 (22%) 18-24 (4%) N/A (15%)		
Gender	Female (47%) Male (37%) N/A (16%)		
Most desirable station	SLO (32%) Paso Robles (21%) Grover Beach (16%) Atascadero (15%) Santa Maria (12%) Guadalupe (4%)		
Reasons for using public transit	Carbon footprint (17%) Stress relief (13%) Inexpensive option (11%) Accessible (11%)		
Commuter stats (would consider using if…)	Bi-directional (40%) Connected between Paso Robles and SLO (38%) Linked Santa Maria, Guadalupe to SLO (22%)		
Intercity Rail Stats	Would consider if direct connect between SF & SLO (55%) More trains daily to SoCal (53%) Travel on train took less time (50%) More trains daily to Bay Area (46%)		

7 Stakeholder & Public Meetings

7.1 Board Meeting

The study team presented to the SLOCOG Board at their December 2, 2020 meeting (item A-1 Coast Rail Corridor Study Update). The presentation included:

- Overview of the Study (study area map, goals, and implementation strategy)
- Engagement, Analysis Activities and Key Milestones
- Initial Range of Options (Intercity Rail/Bus)
- Initial Range of Options (Commuter Rail)
- Modeling Analysis

7.2 Coast Rail Coordinating Council (CRCC)

The Study was also presented to the CRCC twice on July 17, 2020 and March 19, 2020.

7.3 Technical Advisory Committee (TAC)

The Technical Advisory Committee was established to create timely and direct engagement with critical partners on the development of the SIP. The TAC has met virtually a total of three times on July 29, 2020, December 17, 2020 and March 4, 2021 and consists of representatives from the following agencies:

- California State Transportation Agency (CalSTA)
- Caltrain
- Caltrans District 5
- Caltrans Division of Rail and Mass Transportation (DRMT)
- Cities of Grover Beach, King, Paso Robles, San Luis Obispo, and Santa Maria
- Coast Rail Coordinating Council (CRCC)
- Guadalupe Transit
- LOMPOC Transit
- LOSSAN Rail Corridor Agency
- Monterey-Salinas Transit (MST)
- San Luis Obispo Council of Governments (SLOCOG)
- Santa Barbara County Association of Governments (SBCAG)
- Santa Barbara Metropolitan Transit District (MTD)
- Santa Maria Valley Railroad (SMVRR)
- SLO Regional Rideshare
- SLO Regional Transportation Authority (RTA)
- SLO Transit
- Transportation Agency of Monterey County (TAMC)
- Union Pacific Railroad (UPRR)

7.4 Community Working Group (CWG)

The Community Working Group was developed to directly engage with diverse community-based representatives at key milestones and has met virtually twice to date (July 29, 2020 and December 16, 2020) with a third and final meeting scheduled for April 20, 2021. The CWG consists of representatives from the following community groups and organizations:

- Atascadero State Hospital
- Atascadero Chamber of Commerce
- BikeSLO County
- California Polytechnic State University
- City of SLO Bicycle Advisory Committee
- Coalition for Sustainable Transportation (COAST)
- Coalition of Labor Agriculture & Business of San Luis Obispo County (COLAB)
- Community Action Partnership of San Luis Obispo (CAPSLO)
- Economic Vitality Corporation (EVC)
- Environmental Center of San Luis Obispo (ECOSLO)
- Friends of 40 Prado
- Healthy Communities Work Group
- Home Builders Association of the Central Coast

- Hourglass Project/REACH
- Land Conservancy of SLO County
- San Luis Obispo Council of Commerce
- San Luis Obispo Council of Governments (SLOCOG)
- Santa Barbara Bicycle Coalition
- Santa Barbara County Association of Governments (SBCAG)
- Santa Maria Valley Chamber of Commerce
- SLO Bike Coalition
- SLO County Air Pollution Control District (APCD)
- SLO County Commission on Aging
- SLO Railroad Museum
- SLO Regional Rideshare
- South County Chambers of Commerce
- U.S. Representative Salud Carbajal's Office
- Visit SLOCal

Also invited to participate include:

- Community Foundation
- County Real Property Services
- Cuesta College
- Downtown SLO
- Go831 Smart Commute Rideshare Program
- Healthy Eating Active Living SLO (HEALSLO)
- IQMS
- Latino Outreach Council
- National Association for the Advancement of Colored People (NAACP)
- Northern Chumash Tribal Council
- Paso Robles Chamber of Commerce
- San Luis Obispo Regional Transit Authority (SLO RTA)
- SLO Farm Bureau
- The Nature Conservancy

7.5 Virtual Public Meeting

An initial public meeting was conducted virtually via Webex on Sept. 30, 2020 from 5:30-7 p.m. The meeting was intended to build awareness about the study and seek initial input from the larger public. To promote the meeting a postcard invitation was mailed to the contact database, promoted on the website, via social media and media as well as through electronic emails. A total of 42 participants attended the meeting, including project team staff and consultants.

The meeting was recorded and available on the website along with the presentation. A second public meeting will occur in late spring/early summer to present the draft SIP and Passenger Rail Improvements Study (PRIS or Commuter Rail Study).