

Cost Estimate Memo



January 29, 2021

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1. EXECUTIVE SUMMARY

This technical memo for the Monterey Bay Area Network Integration Study presents capital cost estimates for three service timeframes: Initial (short-term), Phased (mid-term), and Vision (long-term). The cost methodology involves identifying the required capital investments under each timeframe, and then calculating a construction cost by estimating quantities and applying unit costs for each element. The elements include trackway civil work, trackwork, grade crossings, stations, train controls and communications, mainline sidings, train equipment, and a maintenance facility. Capital costs for integrated bus service are not included.

An assumed contingency and markup are then applied to derive the total costs, which are provided in 2020 dollars. As this estimate is based on preliminary concepts without actual design plans, a graded approach to contingency is used. For items that can be quantified with a higher degree of confidence at this conceptual level, a 30 percent allocated contingency is applied, while a 40 percent allocated contingency is applied to items that can only be quantified at a lower degree of confidence. A markup of 32 percent is applied to account for soft costs, and an additional unallocated contingency of 25 percent is applied for each service phase or concept.

In the short-term Initial Service timeframe, three commute-oriented round trips to and from Gilroy would be extended to Salinas, connecting Monterey County with San Jose. New stations with island platforms would be constructed at Pajaro and Castroville, with parking for 400 and 200 vehicles, respectively. The estimated total capital cost for the Initial Service improvements is \$102.4 million.

In the mid-term timeframe, the Phased Service concept proposes hourly service between Salinas and San Jose, with through service to/from San Luis Obispo every four hours, operated with bi-modal, hybrid train equipment. New stations would be constructed in Soledad and King City, each with a side platform. A new passing siding would also be constructed south of Salinas. The estimated total capital cost for the Phased Service improvements, including new train equipment, is \$402.8 million.

In the long-term, the Vision Service concept would increase intercity service to/from San Luis Obispo to bi-hourly frequency and establish an entirely new regional rail service between Monterey and Santa Cruz. The increase to bi-hourly mainline service would require two new passing sidings and an additional trainset, at an estimated total capital cost of \$79.2 million. For the regional rail service, seven new stations would be constructed between Santa Cruz and Monterey, and the station in Pajaro would be expanded to accommodate timed, cross-platform connections between intercity and regional trains. The estimated total capital cost for the regional rail service, including new train equipment and a vehicle maintenance facility, is \$767.0 million.



2. OVERVIEW

The Transportation Agency for Monterey County (TAMC) has commissioned an analysis to estimate capital costs as part of the Rail Network Integration Study for the Monterey Bay Area/Central Coast. This technical memorandum presents capital cost estimates associated with each of the three service concepts (Initial, Phased, and Vision) for the region's future rail network. These cost estimates are for rail improvements only, and do not include the costs associated with connecting bus services.

The cost methodology involves identifying the required capital investments under each service concept into discrete elements (e.g., trackwork, stations, train controls and communications, train equipment), and then calculating a construction cost by estimating quantities and applying unit costs for each element. An assumed contingency and markup are then applied to derive the total estimated cost.

Section 2 briefly summarizes the three service concepts. Section 3 provides a high-level summary of the cost methodology and key assumptions. Section 4 presents the resulting costs for the three service concepts. **Appendix A** includes detailed information on the cost estimates, including quantity takeoffs and unit costs.

3. SERVICE CONCEPTS

3.1 Initial Service

The Initial Service concept involves extending rail service from Gilroy to Salinas via Pajaro and Castroville to connect Monterey County with San Jose. Prior to the COVID-19 pandemic, Caltrain operated three commute-oriented round trips to and from Gilroy each weekday. The Initial Service concept is achieved by extending these round trips to Salinas.

New stations would be constructed at Pajaro and Castroville. Though side platforms could suffice to serve the Initial Service concept, the stations would be designed with an island platform to avoid a stranded or redundant investment when the Phased and Vision Service concepts are implemented. Facilitating train meets in the Phased Service concept requires a double-tracked station at Pajaro, and cross-platform transfers in the Vision Service concept require island platforms.

The Initial Service concept also specifies the need for overnight storage tracks for three trainsets at Salinas, similar to the current storage accommodations at Gilroy. TAMC's current Monterey County Rail Extension Phase 1: Kick Start Project includes a six-train layover facility in Salinas that would meet this need.



3.2 Phased Service

The Phased Service concept builds off of the Initial Service concept to establish regular, all-day, bidirectional service along the Coast Subdivision south of Gilroy. Trains would operate hourly between Salinas and San Jose, with through service to/from San Luis Obispo every four hours. To accommodate the increased frequency and reduce travel times, the Phased Service is assumed to be operated with bimodal, hybrid train equipment that would be compatible with planned high-speed infrastructure between Gilroy and San Jose.

New stations would be constructed in Soledad and King City, each with a side platform. A new passing siding would also be constructed, located preliminarily between King City and Paso Robles (pending capacity analysis and negotiations with Union Pacific Railroad).

3.3 Vision Service

The Vision Service concept represents a long-term vision for rail service in the Monterey Bay Area and Central Coast. Trains would continue to operate hourly service between Salinas and San Jose, but through service to/from San Luis Obispo would be increased to bi-hourly service. Regional rail service between Monterey and Santa Cruz would also be implemented, with hourly, bi-directional service operated with multiple unit trains, providing timed, cross-platform connections to/from mainline service at the Castroville and Pajaro hub stations.

For mainline service on the Coast Subdivision, two additional sidings would be constructed—one just south of Salinas and another south of Paso Robles (pending capacity analysis and negotiations with Union Pacific Railroad)—to accommodate increased frequency to/from San Luis Obispo.

For the regional rail service, new stations would be constructed in Santa Cruz, Capitola, Aptos, Watsonville, Marina, Seaside, and Monterey. The stations in Capitola and Marina would each have an island platform to allow trains in opposing directions to meet and pass each other, while the remainder of the new stations would be served by side platforms only. In addition, the station in Monterey would be designed with storage tracks for three trains. To accommodate timed, cross-platform connections between intercity and regional trains, the station in Pajaro would also be expanded to a four-track station with the construction of a second island platform. The regional rail service would also require a vehicle maintenance facility.



4. METHODOLOGY

4.1 General Approach

Costs have been explicitly estimated for the following elements:

- Trackway civil work
- Trackwork
- Grade crossings
- Stations
- Train controls and communications
- Mainline sidings
- Train equipment
- Maintenance facility

As the Coast Subdivision is an active Union Pacific Railroad line currently used by both freight trains and Amtrak Coast Starlight passenger trains, investments on this route are assumed to be minimal outside of new stations and mainline sidings.

In contrast, the Santa Cruz Branch Line (Pajaro – Santa Cruz) is only lightly used by freight trains and is not used for passenger service, while the Monterey Branch Line (Castroville – Monterey) has not been in use in either capacity for several decades. Thus, the costs for these portions of the network include all the above elements except mainline sidings.

Only project elements directly associated with rail service under each service concept have been included in this analysis. Capital costs for integrated bus service are not included in these estimates.

All costs are estimated in 2020 dollars.

4.2 Contingency and Markups

As this estimate is based on preliminary concepts without actual design plans, a graded approach to contingency is used. For items that can be quantified with a higher degree of confidence at this conceptual level, such as trackwork, train controls and communications, a 30 percent allocated contingency is applied. For items that can only be quantified at a lower degree of confidence, such as the trackway civil work, stations, and right-of-way acquisition, a 40 percent allocated contingency is applied. Additionally, a markup of 32 percent has been applied uniformly to all construction costs to



account for the project development and implementation, including design, agency fees, program management, construction management and other miscellaneous fees. For each service phase or concept, an additional unallocated contingency of 25 percent (standard in Federal Transit Administration cost estimates) is also applied.

4.3 Element Costs

Additional details on specific cost assumptions for individual elements are provided in the following subsections.

4.3.1 Trackway Civil Work

Trackway civil work generally encompasses all civil engineering work to prepare the right-of-way (ROW) for subsequent trackwork, including the following elements:

- Earthwork (e.g., erosion control, grading, imported fill)
- Drainage
- Trackbed (sub-ballast and ballast)
- Walkway (e.g., sidewalk, shared-use public path or trail)

For segments where a shared-use public path or trail (e.g., Monterey Peninsula Coastal Trail) is currently present within or adjacent to the right-of-way, additional cost has been assumed for trail preservation, reconstruction and fencing.

A unit cost per route-foot was then developed for three typical segments:

- Replacement of existing track (no shared-use public path or trail)
- Replacement of existing track (with shared-use public path or trail)
- New siding track

Where applicable, a structural allowance (lump-sum construction cost of \$10 million, plus contingency) has also been included to account for potential costs to upgrade or replace existing bridges. A more precise estimate of the actual cost would require a detailed structural analysis.

Additional details on trackway civil work costs can be found in Appendix A.1.

4.3.2 Trackwork

Trackwork encompasses outfitting the right-of-way with the basic rail infrastructure to allow for train operation. Unit costs were developed for each of the following elements:

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- Removal of existing track
- Construction of new track (rail, ties, and ballast)
- Special trackwork and signals (turnouts, turnout signals, and signal houses)

4.3.3 Grade Crossings

Existing grade crossings along routes proposed for new rail service would need to be upgraded or replaced. Separate unit costs were assumed for public grade crossings and for private grade crossings, with additional cost variation depending on the level of investment required (upgrade vs. replacement).

4.3.4 Stations

Costs for individual stations were estimated as the aggregate of unit costs for the following elements:

- Platforms
- Platform access
- Parking

Platforms

Cost estimates for platforms include the platform structure and amenities, as well as lump-sum allowances for lighting, electrical, and communications and for civil work. Unit costs for these items were developed for four different station typologies, reflecting the four possible permutations of train type (multiple unit vs. intercity) and platform configuration (side vs. island). At side platform stations, such as Salinas, trains operating in both directions use the same track and platform. Trains are scheduled so that opposing trains do not meet at the station. At island platform stations, such as Castroville, trains operating in each direction have a separate track, with a platform in between. Thus, they can meet and pass one another at the station. Diagrams of each platform configuration are shown in Figure 1.



Figure 1 – Platform Configurations



Side platform station – Salinas

Island platform station – Castroville

Platform Access

Platform access considers any grade-separated access required to serve stations, such as pedestrian bridges (and associated touchdown structures) and elevators.

Parking

Cost estimates for parking facilities include civil site work as well as allowances for the following elements:

- Striping, marking, and signage
- Lighting, electrical, and communications
- Street modifications
- Civil work
- Landscaping
- Right-of-way acquisition

Three different station typologies are assumed for parking costs, with the approximate number of parking spaces and individual allowances varying by type:



- No parking assumed at stations in urbanized locations with connecting bus transit (Santa Cruz, Capitola, Aptos, Marina, Seaside).
- Small (200 parking spaces) assumed at the new mainline stations in Castroville, Soledad and King City. Though in urbanized locations with connecting bus transit, some parking is assumed for Monterey and Watsonville. Monterey is a terminus in the network, and the Watsonville station location is not adjacent to existing parking facilities.
- Large (400 parking spaces) assumed at Pajaro, a mainline hub station.

Additional details on station costs can be found in Appendix A.2.

4.3.5 Train Controls and Communications

Train controls and communications include costs for the following elements:

- Communications backbone
- Train control and signals
- Station systems
- Other equipment

The costs for communications backbone (fiber-optic) and for train controls and signals (e.g., wayside signals, cab signals, grade crossing warning devices, etc.) are based on unit costs per route mile.

The costs for station systems are unit costs per station, and include separate line-item costs for variable message signs (VMS), ticket vending machines (TVMs), public address (PA) systems, closed-circuit television (CCTV) systems, supervisory control and data acquisition (SCADA) equipment, and very high frequency (VHF) voice and data radio equipment.

The costs for other equipment include separate line-item costs for master clock, telephone, and primary control center (PCC) / backup control center (BCC) equipment.

4.3.6 Mainline Sidings

The costs for a typical mainline siding have also been estimated based on unit costs for trackway civil work (see Section 3.3.1) and trackwork (see Section 3.3.2) and reflect a 15,000-foot (2.84-mile) siding with a No. 20 turnout, signals, and a signal house at each end. The 15,000-foot length is currently the Union Pacific Railroad's standard specification for passenger service.

Additional details on the cost of a typical mainline siding can be found in Appendix A.3.



4.3.7 Train Equipment

Bi-modal, hybrid train equipment for the mainline intercity service has been estimated at a unit cost of approximately \$31.5 million per five-car train (approximately 450 passengers). Multiple unit equipment for the regional service between Monterey and Santa Cruz has been estimated at a unit cost of approximately \$12 million per three-car train (approximately 150 passengers).

4.3.8 Maintenance Facility

A cost estimate has also been developed for a new maintenance facility for the regional rail service between Monterey and Santa Cruz. This cost includes the following elements:

- Yard trackwork
- Facilities / shop
- Civil work
- Right-of-way acquisition
- Train controls and communications

Yard Trackwork

Cost estimates for yard trackwork includes storage tracks, shop tracks, and associated turnouts and signals.

Facilities / Shop

Cost estimates for the facilities / shop assume 40,000 square feet of building area for maintenance shops, storage, and related facilities.

Civil Work

Cost estimates for civil work for the maintenance facility include vegetation clearing and grubbing, earthwork / grading, parking, lighting, security (fencing and gates), access roads, drainage, and utilities.

Right-of-Way

Cost estimates of right-of-way acquisition assume a required site area of 215,000 square feet (5 acres).

Train Controls and Communications

Cost estimates for train controls and communications include fiber optic backbone switches and wide area network (WAN) access points, as well as a CCTV system. Additional allowances are assumed for a train control room and a yard train control system.



5. ESTIMATED COSTS

Estimated costs by service phase are summarized in the following subsections.

5.1 Initial Service

The estimated total capital cost for the Initial Service concept of three trains extended from Gilroy to Salinas with two new island platform stations in Pajaro and Castroville, assuming 400 parking spaces at Pajaro and 200 parking spaces at Castroville, is \$102.4 million, as summarized in **Table 1**. Additional cost details are provided in Appendix A.4.

Table 2 – Initial Service Capital Costs

	Cost (millions, rounded to nearest 100,000)						
Project Component	Construction	Allocated Contingency	Markup	Total			
Pajaro Station (Initial)	\$30.0	\$11.5	\$13.3	\$54.8			
Castroville Station	\$15.0	\$5.6	\$6.6	\$27.2			
Subtotal	\$44.9	\$17.1	\$19.9	\$81.9			
Unallocated contingency (25%)				\$20.5			
Total				\$102.4			

5.2 Phased Service

The estimated total capital cost for the Phased Service concept is \$402.8 million, as summarized in **Table 2**. Additional cost details are provided in Appendix A.5.

Table 3 – Phased Service Capital Costs

	Cost (millions, rounded to nearest 100,000)						
Project Component	Construction	Allocated Contingency	Markup	Total			
One (1) mainline siding	\$9.1	\$2.9	\$3.9	\$15.9			
Soledad Station	\$15.0	\$5.6	\$6.6	\$27.2			
King City Station	\$15.0	\$5.6	\$6.6	\$27.2			
Subtotal	\$39.0	\$14.2	\$17.0	\$70.2			
Train equipment (8 sets @ \$31.5 millio		\$252.0					
Unallocated contingency (25%)				\$80.6			
Total				\$402.8			



5.3 Vision Service

The estimated total capital cost for the Vision Service concept is \$79.2 million for intercity service and \$767.0 million for regional service, as summarized in **Table 3** and **Table 4**, respectively. Additional cost details are provided in Appendix A.6 (for intercity service) and Appendix A.7 (for regional service).

Table 4 – Vision Service Capital Costs – Intercity

	Cost (millions, rounded to nearest 100,000)						
Project Component	Construction	Allocated	Markup	Total			
	Construction	Contingency	маткир	TOLAT			
Two (2) mainline sidings	\$18.2	\$5.9	\$7.7	\$31.8			
Train equipment (1 set @ \$31.5 millior		\$31.5					
Unallocated contingency (25%)				\$15.8			
Total				\$79.2			

Table 5 – Vision Service Capital Costs – Regional

	Cost (millions, rounded to nearest 100,000)							
Project Component	Construction	Allocated Contingency	Markup	Total				
Santa Cruz – Pajaro segment	\$147.2	\$48.1	\$62.5	\$257.7				
Castroville – Monterey segment	\$127.2	\$41.5	\$54.0	\$222.7				
Pajaro Station (Vision)	\$16.6	\$6.1	\$7.3	\$29.9				
Maintenance Facility	\$23.6	\$9.1	\$10.5	\$43.3				
Subtotal	\$314.6	\$104.8	\$134.2	\$553.6				
Train equipment (5 sets @ \$12 million	\$60.0							
Unallocated contingency (25%)				\$153.4				
Total				\$767.0				



APPENDIX A – COST ESTIMATION WORKSHEETS

A.1 Unit Costs for Trackway Typical Sections



	Just Just Just Just Just	(ISTING GROUND			
Code	Description	Quantity		Unit Cost	Total
Section A 0156510 3131009 3484119 3484123 3341130 0384101	Typical Section - Replace Existing Track (Trackbed Civil) Erosion Control Grading Subballast Ballast Drainage Walkway	1,000 2,000 1,100 100 200 1,000 1,000 1,000	RF sy cy cy lf lf	\$19.00 \$10.00 \$37.00 \$48.00 \$19.00 \$31.00 \$31.00	\$38,000 \$11,000 \$3,700 \$9,600 \$19,000 \$31,000 \$31,000
			USE	<mark>\$1</mark> 12	/ RF

Code Description Quantity Unit Cost Total Section B Typical Section - Replace Existing Track (Trackbed Civil with Bike-Ped Trail) 1,000 RF 1,000 \$13100 \$19,00 \$38,00 0166510 Erosion Control Grading 2,000 rf \$19,00 \$38,00 3484119 Subbalast 200 rg \$10,00 \$35,00 3484123 Ballast 200 rg \$34,00 \$39,60 0334101 Drainage 1,000 if \$31,00 \$31,00 0331038 Aggregate Base 2,200 rg \$34,00 \$31,00 3131038 Aggregate Base 2,200 rg \$31,00 \$31,00 3131038 Aggregate Base 2,200 rg \$33,00 \$55,77 321124 rf AC Pavement 1,300 sg \$33,00 \$55,77 321124 rencing 1,000 if \$33,00 \$51,70 321124 rencing \$43,00 \$18,20 \$33,00 <th></th> <th>EXISTING UPBR TRACK EXIST TOR TYPICAL SECTION SHARED EXISTING UPPR TRACK</th> <th>KISTING GROUND</th> <th></th> <th></th>		EXISTING UPBR TRACK EXIST TOR TYPICAL SECTION SHARED EXISTING UPPR TRACK	KISTING GROUND		
Code Description Quantity Unit Cost Total Section B Typical Section - Replace Existing Track (Trackbed Civil with Bike-Ped Trail) 1,000 RF 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1<					
Code Description Quantity Unit Cost Total Section B Typical Section - Replace Existing Track (Trackbed Civil with Bike-Ped Trail) 1,000 RF - - 0156510 Erosion Control Grading Erosion Control Grading 2,000 rf \$19,00 \$22,00 3484123 Ballast 100 cy \$37,00 \$32,700 3484123 Ballast 200 cy \$48,00 \$9,60 3341130 Drainage 1,000 if \$19,00 \$19,00 0384101 Walkway 1,000 if \$19,00 \$19,00 0311038 Aggregate Base 2,500 cy \$31,00 \$31,00 3211234 4* AC Pavement 1,300 sy \$33,00 \$50,70 3284114 Fencing 1,000 if \$43,00 \$43,00					
Section B Typical Section - Replace Existing Track (Trackbed Civil with Bike-Ped Trail) 1,000 RF 0156510 Erosion Control 2,000 rf \$19.00 \$38.00 3131009 Grading 2,200 sy \$10.00 \$22,00 3484119 Subballast 100 cy \$370 \$3,70 3484123 Ballast 200 cy \$48.00 \$9,60 3341130 Drainage 1,000 If \$19.00 \$19,00 0384101 Walkway 1,000 If \$19.00 \$19,00 0231007 Pavement Demolition 1,300 sy \$31.00 \$31,00 3131038 Aggregate Base 2,500 cy \$33.00 \$77,50 3211234 4" AC Pavement 1,300 sy \$33.00 \$43,00 3284114 Fencing 1,000 If \$43.00 \$43,00 3284114 Fencing 1,000 If \$43.00 \$43,00					
Total Cost per Route Feet 1,000 RF \$313 \$312,70	Code	Description	Quantity	Unit Cost	Total
	Code Section B 0156510 3131009 3484119 3484123 3341130 0384101 0231007 3131038 3211234 3284114	Description Typical Section - Replace Existing Track (Trackbed Civil with Bike-Ped Trail) Erosion Control Grading Subballast Ballast Drainage Walkway Pavement Demolition Aggregate Base 4" AC Pavement Fencing	Quantity 1,000 RF 2,000 rf 2,200 sy 100 cy 200 cy 1,000 lf 1,000 lf 1,000 lf 1,300 sy 2,500 cy 1,000 lf 1,000 lf	Unit Cost \$19.00 \$10.00 \$37.00 \$48.00 \$19.00 \$31.00 \$31.00 \$31.00 \$39.00 \$43.00	Total \$38,000 \$22,000 \$3,700 \$9,600 \$19,000 \$31,000 \$18,200 \$77,500 \$50,700 \$43,000

	June	ISTING GROUND			
Code	Description	Quantity	,	Unit Cost	Total
		Quantity			TOTAL
0156510 3131009 3131017 3484119 3484123 3341130 0384101	Erosion Control Grading Imported Fill Subballast Ballast Drainage Walkway	2,000 1,100 750 100 200 0 1,000	rf sy cy cy cy lf lf	\$19.00 \$10.00 \$55.00 \$37.00 \$48.00 \$19.00 \$31.00	\$38,000 \$11,000 \$41,250 \$3,700 \$9,600 \$0 \$31,000
	Total Cost per Route Feet	1,000	RF USE	\$135 \$135	\$134,550 / RF

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A.2 Typical Station Costs



TAMC

Monterey Bay Area Network Integration Study Future Service Vision Stations Breakdown

	EM DESCRIPTION		QUANTITY		BASED	COMMENT
1.00	Typical Side DMU Platform (Platform A)					
1.01	Platform Structure DMU 15'x300'	4,500	SF	\$300	\$1,350,000	
1.02	Platform Amenities	4,500	SF	\$120	\$540,000	
1.03	Lighting, Electrical & Communication Allowance	1	LS	\$300,000	\$300,000	
1.04	Civilwork Allowance	1	LS	\$300,000	\$300,000	
	TOTAL				\$2,490,000	
2.00	Typical Center DMU Platform (Platform B)					
2.01	Platform Structure DMU 20'x300'	6,000	SF	\$300	\$1,800,000	
2.02	Platform Amenities	6,000	5F	\$120	\$720,000	
2.03	Civilwork Allowance	1	LS	\$400,000	\$400,000	
	TOTAL				\$3,320,000	
3.00	Typical Side Intercity Platform (Platform C)					
3.01	Platform Structure Intercity 15'x600'	9,000	SF	\$300	\$2,700,000	
3.02	Platform Amenities	9,000	SF	\$120	\$1,080,000	
3.03	Lighting, Electrical & Communication Allowance	1	LS	\$500,000	\$500,000	
3.04	Civilwork Allowance	1	LS	\$500,000	\$500,000	
	TOTAL				\$4,780,000	
4.00	Typical Center Intercity Platform (Platform D)	10.000	05			
4.01	Platform Structure Intercity 30'x600'	18,000	SF	\$300	\$5,400,000	
4.02	Lighting, Electrical & Communication Allowance	18,000	LS	\$800.000	\$800.000	
4.04	Civilwork Allowance	1	LS	\$800,000	\$800,000	
	TOTAL				\$9,160,000	
5.00	Grade-Separated Platform Access FUTURE					
5.01	Pedestrian Bridge Structure	100	LF	\$7,000	700,000	
5.02	Pedestrian Bridge - Touchdown Structure	2	EA	\$850,000	1,700,000	
5.03	Elevator	2	EA	\$500,000	1,000,000	
	TOTAL				\$3,400,000	
	O(st) an Dashin n (Omall O(st) an)					
6.00	Station Parking (Small Station)	200	SPACE	\$3 500	700.000	
6.02	Strining Marking and Signage Allowance	200	IS	\$200,000	200,000	
6.03	Lighting, Electrical & Communication Allowance	. 1	LS	\$350,000	350.000	
6.04	Street Modifications	1	LS	\$300,000	300.000	
6.05	Civilwork Allowance	1	LS	\$500,000	500,000	
6.06	Landscape Allowance	1	LS	\$350,000	350,000	
6.07	ROW	1	LS	\$4,000,000	4,000,000	
	TOTAL				\$6,400,000	
6.00	Station Parking (Large Station)					
6.01	Parking Lot Civil Site Work	400	SPACE	\$3,500	1,400,000	
6.02	Striping, Marking and Signage Allowance	1	LS	\$300,000	300,000	
6.04	Street Modifications	1	LS	\$400,000	400.000	
6.05	Civilwork Allowance	1	LS	\$650,000	650,000	
6.06	Landscape Allowance	1	LS	\$500,000	500,000	
6.07	ROW	1	LS	\$8,000,000	8,000,000	
	TOTAL				\$11.750.000	

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A.3 Typical Mainline Siding Costs



TAMC Monterey Bay Area Network Integration Study Future Service Vision

Segment: Typical Mainline Siding

		OUANTI				CO	NTINGENCY	TOTAL	COMMENT	
NO.		QUANT		COST	AMOUNT	%	AMOUNT	AMOUNT	COMMENT	
1.00	Trackway Civilwork									
1.01	Section A: Replace Existing Track (Trackbed Civil)		LF	\$112	\$0	40%	\$0	\$0		
1.02	Section B: Replace Existing Track (Trackbed Civil with Bike-Ped Trail)	-	LF	\$313	\$0	40%	\$0	\$0		
1.03	Section C: New Siding Track (Trackbed Civil)	15,000	LF	\$135	\$2,018,250	40%	\$807,300	\$2,825,550		
1.04	Structures									
1.05	Structural Allowance	-	LS	\$10,000,000	\$0	40%	\$0	\$0		
	SUBTOTAL	15,000	LF		\$2,018,250		\$807,300	\$2,825,550		
2.00	Trackwork - Ballast / Ties / Rail / T.O.									
2.01	Track (Rail-Ties-Ballast)	15,000	TF	\$350	\$5,250,000	30%	\$1,575,000	\$6,825,000		
2.02	Remove Existing Track		TF	\$40	\$0	30%	\$0	\$0		
2.03	Turnout No. 11		EA	\$300,000	\$0	30%	\$0	\$0		
2.04	Turnout No. 15		EA	\$350,000	\$0	30%	\$0	\$0		
2.05	Turnout No. 20	2	EA	\$400,000	\$800,000	30%	\$240,000	\$1,040,000		
2.06	Turnout Signals	2	EA	\$325,000	\$650,000	30%	\$195,000	\$845,000		
2.07	Signal House	2	EA	\$200,000	\$400,000	30%	\$120,000	\$520,000		
	SUBTOTAL				\$7,100,000		\$2,130,000	\$9,230,000		
3.00	Grade Crossings									
3.01	Replace Public Grade Crossing		EA	\$950,000	\$0	30%	\$0	\$0		
3.02	Upgrade Public Grade Crossing		EA	\$350,000	\$0	30%	\$0	\$0		
3.03	Replace Private Grade Crossing		EA	\$230,000	\$0	30%	\$0	\$0		
	SUBTOTAL				\$0		\$0	\$0		
4.00	Stations								For details see station estimate worksheet	
4.00	Station		15	\$0	\$0	40%	\$0	\$0		
1.01	SUBTOTAL		20	ţ.	\$0	1070	\$0	\$0		
							• •			
5.00	Train Controls & Communications									
5.01	Communications - FO Backbone	-	MILE	\$200,000	\$0	30%	\$0	\$0	2 FO Cables 48str, 4 conduit 2x2 ductbank	
5.02	Station Enclosures		EA	\$162,500	\$0	30%	\$0	\$0	NEMA5 Cabinets, UPS & Batteries	
5.03	VMS (2 per station)	-	EA	\$44,741	\$0	30%	\$0	\$0	Readend Controls and Station Signs, Labor	
5.04	TVM (2 per station)	-	EA	\$67,857	\$0	30%	\$0	\$0	Station TVM & Headend Servers	
									PCC & BCC PA Headends, Station Equipment, Interfaces with VMS &	
5.05	PA System		EA	\$186,414	\$0	30%	\$0	\$0	Signals AVL, Labor	
5.06	SCADA - Station	-	EA	\$35,630	\$0	30%	\$0	\$0	PCC & BCC PA Headends, SCADA shelves at Stations	
5.07	20121 D. P. C.			A05.000		0001		6 0	DCC & DCC DA Llandarda, CCADA shakara Dadia Citar	
5.07	VNE V&D Radio		EA	\$35,630	\$0	30%	\$0	\$U \$0	8 channel VHE Radio, Tower, Antennas Cabinet LIPS, Batteries, DAS	
5.00	VIN Vab Radio	-	LA	\$31,500	ψU	3070	40	ψŰ	PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and	
5.09	CCTV	-	EA	\$93,111	\$0	30%	\$0	\$0	Wall Displays	
5.40	Master Clark		F 4	£00.000	¢0	2004	¢0		CPS Satallita Radia & Astanza	
5.10	Waster Clock		EA	\$60,000	\$0	30%	\$0	\$0		
5.11	Telephone	-	LS	\$169,479	\$0	30%	\$0	\$0	2 Headend IP PBXs, Help Pole IP Phones	
5.12	PCC & BCC	-	LS	\$265,000	\$0	30%	\$0	\$0		
5.13	Train Control & Signals		MILE	\$2,050,000	\$0	30%	\$0	\$0	Wayside signals, cab signal / speed, grade crossing warning, etc.	
	SUBTOTAL				\$0		\$0	\$0		
SUBTO	ΓAL				\$9,118,250		\$2,937,300	\$12,055,550		
8.00	Markups			32.00%				\$3,857,776		
	FOR Segment: Typical Mainline Siding							\$15,913,326	2020 Dollars	
- OFAL	on organismin , prodi indifinite ording							\$10,010,020		

DATE: Dec 2020

Cost Estimate Memo January 29, 2021



A.4 Initial Service Costs



TAMC

Monterey Bay Area Network Integration Study

Future Service Vision

Summary Cost Estimate - Intercity Initial Service

D MARKUP TOT

DATE: Dec 2020

DESCRIPTION	CONSTRUCTION (\$)	ALLOCATED CONTINGENCY (\$)	MARKUP (\$)	TOTAL (\$)
Station: Pajaro (Initial)	\$29,992,371.29	\$11,496,091.39	\$13,276,308.06	\$54,764,770.73
Station: Castroville	\$14,955,031.29	\$5,620,655.39	\$6,584,219.74	\$27,159,906.41
SUBTOTAL CONSTRUCTION & ROW COST	\$44,947,402.58	\$17,116,746.77	\$19,860,527.79	\$81,924,677.15
Train Equipment				\$0.00
UNALLOCATED CONTINGENCY (25%)				\$20,481,169
TOTAL COST INTERCITY INITIAL SERVICE 2020 Dolla	ars			\$102,405,846

ТАМС

Monterey Bay Area Network Integration Study Future Service Vision Station: Pajaro (Initial)

ITEM	ITEM DESCRIPTION		QUANTITY		CONSTRUCTION	CONTINGENCY		TOTAL	COMMENT	
NO.	DESCRIPTION	QUANTI		COST	AMOUNT	%	AMOUNT	AMOUNT	COMMENT	
1.00	Trackway Civilwork			A						
1.01	Section A: Replace Existing Track (Trackbed Civil)	6,000	LF	\$112	\$673,800	40%	\$269,520	\$943,320		
1.02	Section B: Replace Existing Track (Trackbed Civil With Bike-Ped Trail)	-	LF	\$313	\$0	40%	\$0	\$U \$0		
1.03	Structures		LF	\$133	φυ	40%	φU	φU		
1.04	Structures Structural Allowance		15	\$10,000,000	\$0	40%	\$0	\$0		
1.05	SUBTOTAL	6.000	LF	\$10,000,000	\$673.800	4070	\$269.520	\$943.320		
2.00	Trackwork - Ballast / Ties / Rail / T.O.	.,					,			
2.01	Track (Rail-Ties-Ballast)	6,000	TF	\$350	\$2,100,000	30%	\$630,000	\$2,730,000		
2.02	Remove Existing Track	6,000	TF	\$40	\$240,000	30%	\$72,000	\$312,000		
2.03	Turnout No. 11		EA	\$300,000	\$0	30%	\$0	\$0		
2.04	Turnout No. 15	1	EA	\$350,000	\$350,000	30%	\$105,000	\$455,000		
2.05	Turnout No. 20	-	EA	\$400,000	\$0	30%	\$0	\$0		
2.06	Turnout Signals	1	EA	\$325,000	\$325,000	30%	\$97,500	\$422,500		
2.07	Signal House	1	EA	\$200,000	\$200,000	30%	\$60,000	\$260,000		
	SUBTOTAL				\$3,215,000		\$964,500	\$4,179,500		
3.00	Grade Crossings									
3.01	Replace Public Grade Crossing		EA	\$950,000	\$0	30%	\$0	\$0		
3.02	Upgrade Public Grade Crossing	1	EA	\$350,000	\$350,000	30%	\$105,000	\$455,000		
3.03	Replace Private Grade Crossing		EA	\$230,000	\$0	30%	\$0	\$0		
	SUBTOTAL				\$350,000		\$105,000	\$455,000		
4.00	Stations								For details see station estimate worksheet	
4.01	Paiaro Station (Platform D + Large Parking + Grade-Separated Access Structure)	1	LS	\$24.310.000	\$24.310.000	40%	\$9.724.000	\$34.034.000		
	SUBTOTAL				\$24,310,000		\$9,724,000	\$34,034,000		
5.00	Train Controls & Communications									
5.01	Communications - FO Backbone	•	MILE	\$200,000	\$0	30%	\$0	\$0	2 FO Cables 48str, 4 conduit 2x2 ductbank	
5.02	V/MS (2 per station)	1	EA	\$162,500	\$162,500	30%	\$48,750	\$211,250	NEMAS Cabinets, UPS & Batteries	
5.05		2	LA	\$44,741	<i>4</i> 09,403	30%	\$20,0 4 3	\$110,320	riedend Controls and Station Signs, Labor	
5.04	TVM (2 per station)	2	EA	\$67,857	\$135,714	30%	\$40,714	\$176,429	Station TVM & Headend Servers	
5.05				* ****		0001	055.004	ê0 40 000	PCC & BCC PA Headends, Station Equipment, Interfaces with VMS &	
5.05	PA System	1	EA	\$186,414	\$186,414	30%	\$55,924	\$242,338	Signals AVL, Labor	
5.06	SCADA - Station	1	EA	\$35,630	\$35,630	30%	\$10,689	\$46,319	PCC & BCC PA Headends, SCADA shelves at Stations	
5.07	SCADA - Radio Site	1	FA	\$35,630	\$35,630	30%	\$10,689	\$46.319	PCC & BCC PA Headends, SCADA shelves Radio Sites	
5.08	VNF V&D Radio	1	EA	\$97,500	\$97,500	30%	\$29,250	\$126,750	8 channel VHF Radio, Tower, Antennas Cabinet, UPS, Batteries, DAS	
									PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and	
5.09	CCTV	2	EA	\$93,111	\$186,222	30%	\$55,867	\$242,089	Wall Displays	
5.10	Master Clock	1	EA	\$80,000	\$80,000	30%	\$24,000	\$104,000	GPS Satellite Radio & Antenna	
5.11	Telephone	1	LS	\$169,479	\$169,479	30%	\$50,844	\$220,323	2 Headend IF PBXs, Help Pole IP Phones	
5.12	Train Control & Signals	1	LS MILE	\$265,000	\$265,000 ¢o	30%	\$79,500	\$344,500 ¢0	Waveide signals, cab signal / speed, grade crossing worsing, sto	
0.13	SUBTOTAL		WILE	φ2,000,000	\$0 \$1,443,571	30%	\$0 \$433.071	\$0 \$1.876.643	mayorue organico, cab organar / opeeu, grade crossing walfilling, etc.	
					¥1,110,071		<i></i> ,511	\$.,0. 0,040		
SUBTO	FAL				\$29,992,371		<mark>\$11,496,091</mark>	<mark>\$41,488,463</mark>		
8.00	Markups			32.00%				\$13,276,308		
TOTAL	FOR Station: Pajaro (Initial)							\$54,764,771	2020 Dollars	

DATE: Dec 2020

ТАМС

Monterey Bay Area Network Integration Study Future Service Vision Station: Castroville

ITEM	DESCRIPTION	QUANTITY		UNIT		CO	NTINGENCY	TOTAL	COMMENT	
NO.	DESCRIPTION	QUANTI		COST	AMOUNT	%	AMOUNT	AMOUNT	COMMENT	
1.00	Trackway Civilwork									
1.00	Section A: Replace Evicting Track (Trackhod Civil)		LE	\$110	\$0	40%	¢0	¢0		
1.01	Section A: Replace Existing Track (Trackbed Civil)		LF	\$112 \$212	\$0 \$0	40%	30 \$0	30 \$0		
1.02	Section C: New Siding Track (Trackbed Civil Will Dike-Fed Trail)	1 200	LF	\$313 \$135	پې 161 /60	40%	\$64 584	\$226.044		
1.03	Structures	1,200		\$155	\$101,400	4070	φ04,504	\$220,044		
1.01	Structural Allowance		15	\$10,000,000	\$0	40%	\$0	\$0		
1.00	SUBTOTAL	1.200	LF	\$10,000,000	\$161,460	1070	\$64.584	\$226.044		
		-,=						+;- · · ·		
2.00	Trackwork - Ballast / Ties / Rail / T.O.									
2.01	Track (Rail-Ties-Ballast)	1,200	TF	\$350	\$420,000	30%	\$126,000	\$546,000		
2.02	Remove Existing Track		TF	\$40	\$0	30%	\$0	\$0		
2.03	Turnout No. 11		EA	\$300,000	\$0	30%	\$0	\$0		
2.04	Turnout No. 15	2	EA	\$350,000	\$700,000	30%	\$210,000	\$910,000		
2.05	Turnout No. 20	-	EA	\$400,000	\$0	30%	\$0	\$0		
2.06	Turnout Signals	2	EA	\$325,000	\$650,000	30%	\$195,000	\$845,000		
2.07	Signal House	2	EA	\$200,000	\$400,000	30%	\$120,000	\$520,000		
	SUBTOTAL				\$2,170,000		\$651,000	\$2,821,000		
3.00	Grade Crossings									
3.01	Replace Public Grade Crossing		EA	\$950,000	\$0	30%	\$0	\$0		
3.02	Upgrade Public Grade Crossing		EA	\$350,000	\$0	30%	\$0	\$0		
3.03	Replace Private Grade Crossing		EA	\$230,000	\$0	30%	\$0	\$0		
	SUBTOTAL				\$0		\$0	\$0		
4.00	Stations								For details see station estimate worksheet	
4.01	Castroville Station (Platform D + Small Parking + Grade-Separated Access Structure)	1	LS	\$18,960,000	\$11,180,000	40%	\$4,472,000	\$15,652,000		
	SUBTOTAL				\$11,180,000		\$4,472,000	\$15,652,000		
5.00	Train Controls & Communications									
5.01	Communications - FO Backbone	-	MILE	\$200,000	\$0	30%	\$0	\$0	2 FO Cables 48str, 4 conduit 2x2 ductbank	
5.02	Station Enclosures	1	EA	\$162,500	\$162,500	30%	\$48,750	\$211,250	NEMA5 Cabinets, UPS & Batteries	
5.03	VMS (2 per station)	2	EA	\$44,741	\$89,483	30%	\$26,845	\$116,328	Headend Controls and Station Signs, Labor	
5.04	TVM (2 per station)	2	FA	\$67.857	\$135.714	30%	\$40.714	\$176.429	Station TVM & Headend Servers	
0.01		-	271	¢01,001	\$100,111	0070	\$10,711	\$110,120	PCC & BCC PA Headends, Station Equipment, Interfaces with VMS &	
5.05	PA System	1	EA	\$186,414	\$186,414	30%	\$55,924	\$242,338	Signals AVL, Labor	
5.06	SCADA - Station	1	EA	\$35,630	\$35,630	30%	\$10,689	\$46,319	PCC & BCC PA Headends, SCADA shelves at Stations	
5.07	SCADA - Radio Site	1	E۵	\$35,630	\$35,630	30%	\$10.689	\$46.310	PCC & BCC PA Headends, SCADA shelves Radio Sites	
5.08	VNF V&D Radio	1	EA	\$97,500	\$97,500	30%	\$29,250	\$126,750	8 channel VHF Radio. Tower, Antennas Cabinet, UPS, Batteries, DAS	
							,		PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and	
5.09	CCTV	2	EA	\$93,111	\$186,222	30%	\$55,867	\$242,089	Wall Displays	
5 10	Mastar Clack	4	EA	\$90.000	\$90.000	20%	\$24.000	\$104.000	GPS Satellite, Padio & Antenna	
5.10	Master Clock	1	EA	\$60,000	\$80,000	30%	\$24,000	\$104,000	GFS Satellite Radio & Aliternia	
5.11	Telephone	1	LS	\$169,479	\$169,479	30%	\$50,844	\$220,323	2 Headend IP PBXs, Help Pole IP Phones	
5.12	PCC & BCC	1	LS	\$265,000	\$265,000	30%	\$79,500	\$344,500		
5.13	Train Control & Signals	-	MILE	\$2,050,000	\$0	30%	\$0	\$0	Wayside signals, cab signal / speed, grade crossing warning, etc.	
	SUBTOTAL				\$1,443,571		\$433,071	\$1,876,643		
SUBTO	TAL CONTRACT OF				\$14,955,031		\$5,620,655	\$20,575,687		
8.00	Markups			32.00%				\$6,584,220		
TOTAL	FOR Station: Castroville							\$27,159,906	2020 Dollars	

DATE: Dec 2020

Cost Estimate Memo January 29, 2021



A.5 Phased Service Costs



AECOM												
Monterey Bay Area Network Integration Study					DATE: Dec 2020							
Future Service Vision PREP. BY: DSH Summary Cost Estimate - Intercity Phased Service												
			ALLOCATED									
DESCRIPTION		(\$)	CONTINGENCY (\$)	(\$)	(\$)							
Segment: Typical Mainline Siding 2.84	Miles	\$9,118,250	\$2,937,300	\$3,857,776	\$15,913,326							
Station: Soledad		\$14,955,031	\$5,620,655	\$6,584,220	\$27,159,906							
Station: King City		\$14,955,031	\$5,620,655	\$6,584,220	\$27,159,906							
SUBTOTAL CONSTRUCTION & ROW COST 2.84	Miles	\$39,028,313	\$14,178,611	\$17,026,215	\$70,233,139							
Train Equipment (8 sets @ \$31.5M each)					\$252,000,000							
UNALLOCATED CONTINGENCY (25%)					\$80,558,285							
TOTAL COST INTERCITY PHASED SERVICE 2020 Do	ollars				\$402,791,424							

TAMC Monterey Bay Area Network Integration Study Future Service Vision

Segment: Typical Mainline Siding

ITEM	ITEM DESCRIPTION		QUANTITY			CO	NTINGENCY	TOTAL	COMMENT	
NO.		QUANT			AMOUNT	%	AMOUNT	AMOUNT	COMMENT	
1.00	Trackway Civilwork									
1.01	Section A: Replace Existing Track (Trackbed Civil)		LF	\$112	\$0	40%	\$0	\$0		
1.02	Section B: Replace Existing Track (Trackbed Civil with Bike-Ped Trail)	-	LF	\$313	\$0	40%	\$0	\$0		
1.03	Section C: New Siding Track (Trackbed Civil)	15,000	LF	\$135	\$2,018,250	40%	\$807,300	\$2,825,550		
1.04	Structures									
1.05	Structural Allowance	-	LS	\$10,000,000	\$0	40%	\$0	\$0		
	SUBTOTAL	15,000	LF		\$2,018,250		\$807,300	\$2,825,550		
2.00	Trackwork - Ballast / Ties / Rail / T.O.									
2.01	Track (Rail-Ties-Ballast)	15,000	TF	\$350	\$5,250,000	30%	\$1,575,000	\$6,825,000		
2.02	Remove Existing Track		TF	\$40	\$0	30%	\$0	\$0		
2.03	Turnout No. 11		EA	\$300,000	\$0	30%	\$0	\$0		
2.04	Turnout No. 15		EA	\$350,000	\$0	30%	\$0	\$0		
2.05	Turnout No. 20	2	EA	\$400,000	\$800,000	30%	\$240,000	\$1,040,000		
2.06	Turnout Signals	2	EA	\$325,000	\$650,000	30%	\$195,000	\$845,000		
2.07	Signal House	2	EA	\$200,000	\$400,000	30%	\$120,000	\$520,000		
	SUBTOTAL				\$7,100,000		\$2,130,000	\$9,230,000		
3.00	Grade Crossings									
3.01	Replace Public Grade Crossing		EA	\$950,000	\$0	30%	\$0	\$0		
3.02	Upgrade Public Grade Crossing		EA	\$350,000	\$0	30%	\$0	\$0		
3.03	Replace Private Grade Crossing		EA	\$230,000	\$0	30%	\$0	\$0		
	SUBTOTAL				\$0		\$0	\$0		
4.00	Stations								For details see station estimate worksheet	
4.00	Station		15	\$0	\$0	40%	\$0	\$0		
1.01	SUBTOTAL		20	ţ.	\$0	1070	\$0	\$0		
							• •			
5.00	Train Controls & Communications									
5.01	Communications - FO Backbone	-	MILE	\$200,000	\$0	30%	\$0	\$0	2 FO Cables 48str, 4 conduit 2x2 ductbank	
5.02	Station Enclosures		EA	\$162,500	\$0	30%	\$0	\$0	NEMA5 Cabinets, UPS & Batteries	
5.03	VMS (2 per station)	-	EA	\$44,741	\$0	30%	\$0	\$0	Readend Controls and Station Signs, Labor	
5.04	TVM (2 per station)	-	EA	\$67,857	\$0	30%	\$0	\$0	Station TVM & Headend Servers	
									PCC & BCC PA Headends, Station Equipment, Interfaces with VMS &	
5.05	PA System		EA	\$186,414	\$0	30%	\$0	\$0	Signals AVL, Labor	
5.06	SCADA - Station	-	EA	\$35,630	\$0	30%	\$0	\$0	PCC & BCC PA Headends, SCADA shelves at Stations	
5.07	20121 D. F. O'			A05.000		0001		6 0	DCC & DCC DA Llandarda, CCADA shakara Dadia Citar	
5.07	VNE V&D Radio		EA	\$35,630	\$0	30%	\$0	\$U \$0	8 channel VHE Radio, Tower, Antennas Cabinet LIPS, Batteries, DAS	
5.00	VIN Vab Radio	-	LA	<i>431,300</i>	ψU	3070	40	ψŰ	PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and	
5.09	CCTV	-	EA	\$93,111	\$0	30%	\$0	\$0	Wall Displays	
5.40	Master Clark		F 4	£00.000	¢0	2004	¢0		CPS Satallita Radia & Astanza	
5.10	Waster Clock		EA	\$60,000	\$0	30%	\$0	\$0		
5.11	Telephone	-	LS	\$169,479	\$0	30%	\$0	\$0	2 Headend IP PBXs, Help Pole IP Phones	
5.12	PCC & BCC	-	LS	\$265,000	\$0	30%	\$0	\$0		
5.13	Train Control & Signals		MILE	\$2,050,000	\$0	30%	\$0	\$0	Wayside signals, cab signal / speed, grade crossing warning, etc.	
	SUBTOTAL				\$0		\$0	\$0		
SUBTO	ΓAL				\$9,118,250		\$2,937,300	\$12,055,550		
8.00	Markups			32.00%				\$3,857,776		
	FOR Segment: Typical Mainline Siding							\$15,913,326	2020 Dollars	
- OFAL	on organismin , prodi indinino ording							\$10,010,020		

DATE: Dec 2020

ТАМС

Monterey Bay Area Network Integration Study Future Service Vision Station: Soledad

ITEM	DESCRIPTION	QUANTITY		UNIT		CONTINGENCY		TOTAL	COMMENT
NO.		QUANT		COST	AMOUNT	%	AMOUNT	AMOUNT	COMMENT
1.00	Trackway Civilwork								
1.01	Section A: Replace Existing Track (Trackbed Civil)		LF	\$112	\$0	40%	\$0	\$0	
1.02	Section B: Replace Existing Track (Trackbed Civil with Bike-Ped Trail)	-		\$313	\$0	40%	\$0	\$0	
1.03	Structures	1,200	LF	\$133	\$101,400	40%	\$04,384	\$220,044	
1.04	Structures Structures		15	\$10,000,000	\$0	40%	\$0	\$0	
1.00	SUBTOTAL	1.200	LF	\$10,000,000	\$161.460	1070	\$64.584	\$226.044	
2.00	Trackwork - Ballast / Ties / Rail / T.O.							• • • • •	
2.01	Track (Rail-Ties-Ballast)	1,200	TF	\$350	\$420,000	30%	\$126,000	\$546,000	
2.02	Remove Existing Track		TF	\$40	\$0	30%	\$0	\$0	
2.03	Turnout No. 11		EA	\$300,000	\$0	30%	\$0	\$0	
2.04	Turnout No. 15	2	EA	\$350,000	\$700,000	30%	\$210,000	\$910,000	
2.05	Turnout No. 20	-	EA	\$400,000	\$0	30%	\$0	\$0	
2.06	Turnout Signals	2	EA	\$325,000	\$650,000	30%	\$195,000	\$845,000	
2.07	Signal House	2	EA	\$200,000	\$400,000	30%	\$120,000	\$520,000	
	SUBTUTAL				\$2,170,000		\$651,000	\$2,821,000	
3.00	Grade Crossings								
3.01	Replace Public Grade Crossing		EA	\$950,000	\$0	30%	\$0	\$0	
3.02	Upgrade Public Grade Crossing		EA	\$350,000	\$0	30%	\$0	\$0	
3.03	Replace Private Grade Crossing		EA	\$230,000	\$0	30%	\$0	\$0	
	SUBTOTAL				\$0		\$0	\$0	
	Ct-ti								For the Western station of the state of the
4.00	Stations		10	Ê0 460 000	£11.100.000	40%	£4.470.000	\$45 CEO 000	For details see station estimate worksneet
4.01	Subtotal		Lð	\$9,160,000	\$11,180,000	40%	\$4,472,000	\$15,652,000	
	00010172				\$11,100,000		<i>\\\\\\\\\\\\\</i>	\$13,032,000	
5.00	Train Controls & Communications								
5.01	Communications - FO Backbone	-	MILE	\$200,000	\$0	30%	\$0	\$0	2 FO Cables 48str, 4 conduit 2x2 ductbank
5.02	Station Enclosures	1	EA	\$162,500	\$162,500	30%	\$48,750	\$211,250	NEMA5 Cabinets, UPS & Batteries
5.03	VMS (2 per station)	2	EA	\$44,741	\$89,483	30%	\$26,845	\$116,328	Headend Controls and Station Signs, Labor
5.04	TVM (2 per station)	2	EA	\$67,857	\$135,714	30%	\$40,714	\$176,429	Station TVM & Headend Servers
5.05	RA Sustam	1	EA	\$10C /1/	\$10C /1/	20%	\$55 024	\$242.220	PCC & BCC PA Headends, Station Equipment, Interfaces with VMS & Signals AVI Labor
5.05	PA System		LA	\$100,414	\$100,414	30%	\$33,924	<i>\$</i> 242,330	olginais AVE, Eabor
5.06	SCADA - Station	1	EA	\$35,630	\$35,630	30%	\$10,689	\$46,319	PCC & BCC PA Headends, SCADA shelves at Stations
5.07	SCADA - Padio Site	1	F۵	\$35,630	\$35,630	30%	\$10.689	\$46.310	PCC & BCC PA Headends, SCADA shelves Radio Sites
5.08	VNF V&D Radio	1	EA	\$97,500	\$97,500	30%	\$29,250	\$126,750	8 channel VHF Radio, Tower, Antennas Cabinet, UPS, Batteries, DAS
									PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and
5.09	CCTV	2	EA	\$93,111	\$186,222	30%	\$55,867	\$242,089	Wall Displays
5.10	Master Clock	1	EA	\$80,000	\$80,000	30%	\$24,000	\$104,000	GPS Satellite Radio & Antenna
5.11	Telephone	1	LS	\$169,479	\$169,479	30%	\$50,844	\$220,323	2 Headend IP PBXs, Help Pole IP Phones
5.12	PUL & BUL Train Control & Signala	1	LS	\$265,000	\$265,000	30%	\$79,500	\$344,500	Waynida signala, ant signal (anada, grada arassing warning, sta
5.13	Train Control & Signais SUBTOTAL		WILE	\$2,050,000	\$0 \$1.443.571	30%	\$433.071	\$0 \$1.876.643	wayside signais, cab signai / speed, grade crossing warning, etc.
					÷.,,or i		,511		
SUBTOT	AL				<mark>\$14,955,031</mark>		\$5,620,655	\$20,575,687	
8.00	Markups			32.00%				\$6,584,220	
	OR Station: Soledad							\$27,159,906	2020 Dollars

DATE: Dec 2020

ТАМС

Monterey Bay Area Network Integration Study Future Service Vision Station: King City

ITEM	EM DESCRIPTION		QUANTITY		CONSTRUCTION	CONTINGENCY		TOTAL	COMMENT
NO.		QUAIT			AMOUNT	%	AMOUNT	AMOUNT	COMMENT
1.00	Trackway Civilwork								
1.01	Section A: Replace Existing Track (Trackbed Civil)		LF	\$112	\$0	40%	\$0	\$0	
1.02	Section B: Replace Existing Track (Trackbed Civil With Bike-Ped Trail)	- 1 200		\$313 \$125	\$U \$161.460	40%	\$U \$64.694	\$0	
1.03	Structures	1,200	LF	\$135	\$101,400	40%	φ0 4 ,004	\$220,044	
1.04	Structural Allowance		LS	\$10,000,000	\$0	40%	\$0	\$0	
1.00	SUBTOTAL	1.200	LF	\$10,000,000	\$161.460	1070	\$64.584	\$226.044	
2.00	Trackwork - Ballast / Ties / Rail / T.O.							,.	
2.01	Track (Rail-Ties-Ballast)	1,200	TF	\$350	\$420,000	30%	\$126,000	\$546,000	
2.02	Remove Existing Track		TF	\$40	\$0	30%	\$0	\$0	
2.03	Turnout No. 11		EA	\$300,000	\$0	30%	\$0	\$0	
2.04	Turnout No. 15	2	EA	\$350,000	\$700,000	30%	\$210,000	\$910,000	
2.05	Turnout No. 20	-	EA	\$400,000	\$0	30%	\$0	\$0	
2.06	Turnout Signals	2	EA	\$325,000	\$650,000	30%	\$195,000	\$845,000	
2.07	Signal House	2	EA	\$200,000	\$400,000	30%	\$120,000	\$520,000	
	SUBIOTAL				\$2,170,000		\$651,000	\$2,821,000	
3.00	Grade Crossings								
3.01	Replace Public Grade Crossing		EA	\$950,000	\$0	30%	\$0	\$0	
3.02	Upgrade Public Grade Crossing		EA	\$350,000	\$0	30%	\$0	\$0	
3.03	Replace Private Grade Crossing		EA	\$230,000	\$0	30%	\$0	\$0	
	SUBTOTAL				\$0		\$0	\$0	
4 00	Stations								For details see station estimate worksheet
4.00	King City Station (Platform C + Small Parking)	1	LS	\$9 160 000	\$11 180 000	40%	\$4 472 000	\$15,652,000	
	SUBTOTAL		20	\$0,100,000	\$11.180.000	1070	\$4.472.000	\$15.652.000	
							., , ,		
5.00	Train Controls & Communications								
5.01	Communications - FO Backbone	•	MILE	\$200,000	\$0	30%	\$0	\$0	2 FO Cables 48str, 4 conduit 2x2 ductbank
5.02	VMS (2 por station)	1	EA	\$162,500	\$162,500	30%	\$48,750	\$211,250	NEMAS Cabinets, UPS & Ballenes Headend Controls and Station Signs Labor
5.05	Vivio (2 per station)	2	LA	\$44,741	409,403	30%	φ20,0 4 3	\$110,328	rieadend Controls and Claudin Oigns, Labor
5.04	TVM (2 per station)	2	EA	\$67,857	\$135,714	30%	\$40,714	\$176,429	Station TVM & Headend Servers
5.05	På System	1	FΔ	\$186.414	\$186.414	30%	\$55.024	\$242 338	PCC & BCC PA Headends, Station Equipment, Interfaces with VMS & Signals AVL Labor
5.05	1 A Oyacin		LA	\$100,414	\$100,414	3070	φ 3 3,324	\$2 42,00 0	
5.06	SCADA - Station	1	EA	\$35,630	\$35,630	30%	\$10,689	\$46,319	PCC & BCC PA Headends, SCADA shelves at Stations
5.07	SCADA - Radio Site	1	FA	\$35,630	\$35.630	30%	\$10.689	\$46 319	PCC & BCC PA Headends, SCADA shelves Radio Sites
5.08	VNF V&D Radio	1	EA	\$97,500	\$97,500	30%	\$29,250	\$126,750	8 channel VHF Radio, Tower, Antennas Cabinet, UPS, Batteries, DAS
									PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and
5.09	CCTV	2	EA	\$93,111	\$186,222	30%	\$55,867	\$242,089	Wall Displays
5.10	Master Clock	1	EA	\$80,000	\$80,000	30%	\$24,000	\$104,000	GPS Satellite Radio & Antenna
5 11	Telephone	1	15	\$169.479	\$169.479	30%	\$50 844	\$220 323	2 Headend IP PBXs. Help Pole IP Phones
5.12	PCC & BCC	1	IS	\$265.000	\$265,000	30%	\$79,500	\$344,500	
5.13	Train Control & Signals	-	MILE	\$2,050,000	\$0	40%	\$0	\$0	Wayside signals, cab signal / speed, grade crossing warning, etc.
	SUBTOTAL				\$1,443,571		\$433,071	\$1,876,643	
	FAL				\$14,955,031		\$5,620,655	\$20.575.687	
					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,,.,,,	
8.00	Markups			32.00%				\$6,584,220	
TOTAL	FOR Station: King City							\$27,159,906	2020 Dollars

DATE: Dec 2020



Cost Estimate Memo January 29, 2021

A.6 Vision Service Costs – Intercity



TAMC

Monterey Bay Area Network Integration Study

Future Service Vision

Summary Cost Estimate - Intercity Vision Service

ALLOCATED **CONSTRUCTION** MARKUP TOTAL DESCRIPTION CONTINGENCY (\$) (\$) (\$) (\$) Segment: Typical Mainline Siding 2.84 Miles \$9,118,250 \$2,937,300 \$3,857,776 \$15,913,326 Segment: Typical Mainline Siding 2.84 Miles \$9,118,250 \$2,937,300 \$3,857,776 \$15,913,326 SUBTOTAL CONSTRUCTION & ROW COST 5.68 Miles \$18,236,500 \$5,874,600 \$7,715,552 \$31,826,652 Train Equipment (1 set @ \$31.5M each) \$31,500,000 **UNALLOCATED CONTINGENCY (25%)** \$15,831,663 TOTAL COST INTERCITY VISION SERVICE 2020 Dollars \$79,158,315

PREP. BY: DSH

DATE: Dec 2020

TAMC Monterey Bay Area Network Integration Study Future Service Vision

Segment: Typical Mainline Siding

ITEM	ITEM DESCRIPTION		QUANTITY			CO	NTINGENCY	TOTAL	COMMENT	
NO.		QUANT			AMOUNT	%	AMOUNT	AMOUNT	COMMENT	
1.00	Trackway Civilwork									
1.01	Section A: Replace Existing Track (Trackbed Civil)		LF	\$112	\$0	40%	\$0	\$0		
1.02	Section B: Replace Existing Track (Trackbed Civil with Bike-Ped Trail)	-	LF	\$313	\$0	40%	\$0	\$0		
1.03	Section C: New Siding Track (Trackbed Civil)	15,000	LF	\$135	\$2,018,250	40%	\$807,300	\$2,825,550		
1.04	Structures									
1.05	Structural Allowance	-	LS	\$10,000,000	\$0	40%	\$0	\$0		
	SUBTOTAL	15,000	LF		\$2,018,250		\$807,300	\$2,825,550		
2.00	Trackwork - Ballast / Ties / Rail / T.O.									
2.01	Track (Rail-Ties-Ballast)	15,000	TF	\$350	\$5,250,000	30%	\$1,575,000	\$6,825,000		
2.02	Remove Existing Track		TF	\$40	\$0	30%	\$0	\$0		
2.03	Turnout No. 11		EA	\$300,000	\$0	30%	\$0	\$0		
2.04	Turnout No. 15		EA	\$350,000	\$0	30%	\$0	\$0		
2.05	Turnout No. 20	2	EA	\$400,000	\$800,000	30%	\$240,000	\$1,040,000		
2.06	Turnout Signals	2	EA	\$325,000	\$650,000	30%	\$195,000	\$845,000		
2.07	Signal House	2	EA	\$200,000	\$400,000	30%	\$120,000	\$520,000		
	SUBTOTAL				\$7,100,000		\$2,130,000	\$9,230,000		
3.00	Grade Crossings									
3.01	Replace Public Grade Crossing		EA	\$950,000	\$0	30%	\$0	\$0		
3.02	Upgrade Public Grade Crossing		EA	\$350,000	\$0	30%	\$0	\$0		
3.03	Replace Private Grade Crossing		EA	\$230,000	\$0	30%	\$0	\$0		
	SUBTOTAL				\$0		\$0	\$0		
4.00	Stations								For details see station estimate worksheet	
4.00	Station		15	\$0	\$0	40%	\$0	\$0		
1.01	SUBTOTAL		20	ţ.	\$0	1070	\$0	\$0		
							• •			
5.00	Train Controls & Communications									
5.01	Communications - FO Backbone	-	MILE	\$200,000	\$0	30%	\$0	\$0	2 FO Cables 48str, 4 conduit 2x2 ductbank	
5.02	Station Enclosures		EA	\$162,500	\$0	30%	\$0	\$0	NEMA5 Cabinets, UPS & Batteries	
5.03	VMS (2 per station)	-	EA	\$44,741	\$0	30%	\$0	\$0	Readend Controls and Station Signs, Labor	
5.04	TVM (2 per station)	-	EA	\$67,857	\$0	30%	\$0	\$0	Station TVM & Headend Servers	
									PCC & BCC PA Headends, Station Equipment, Interfaces with VMS &	
5.05	PA System		EA	\$186,414	\$0	30%	\$0	\$0	Signals AVL, Labor	
5.06	SCADA - Station	-	EA	\$35,630	\$0	30%	\$0	\$0	PCC & BCC PA Headends, SCADA shelves at Stations	
5.07	20121 D. P. C.			A05.000		0001		6 0	DCC & DCC DA Llandarda, CCADA shakara Dadia Citar	
5.07	VNE V&D Radio		EA	\$35,630	\$0	30%	\$0	\$U \$0	8 channel VHE Radio, Tower, Antennas Cabinet LIPS, Batteries, DAS	
5.00	VIN Vab Radio	-	LA	\$31,500	ψU	3070	40	ψŰ	PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and	
5.09	CCTV	-	EA	\$93,111	\$0	30%	\$0	\$0	Wall Displays	
5.40	Master Clark		F 4	£00.000	¢0	2004	¢0		CPS Satallita Radia & Astanza	
5.10	Waster Clock		EA	\$60,000	\$0	30%	\$0	\$0		
5.11	Telephone	-	LS	\$169,479	\$0	30%	\$0	\$0	2 Headend IP PBXs, Help Pole IP Phones	
5.12	PCC & BCC	-	LS	\$265,000	\$0	30%	\$0	\$0		
5.13	Train Control & Signals		MILE	\$2,050,000	\$0	30%	\$0	\$0	Wayside signals, cab signal / speed, grade crossing warning, etc.	
	SUBTOTAL				\$0		\$0	\$0		
SUBTO	ΓAL				\$9,118,250		\$2,937,300	\$12,055,550		
8.00	Markups			32.00%				\$3,857,776		
	FOR Segment: Typical Mainline Siding							\$15,913,326	2020 Dollars	
- OFAL	on organismin , prodi indifinite ording							\$10,010,020		

DATE: Dec 2020

Cost Estimate Memo January 29, 2021



A.7 Vision Service Costs – Regional



AECOM TAMC Monterey Bay Area Network Integration Study Future Service Vision Summary Cost Estimate - Regional Vision Service				DATE: Dec 2020 PREP. BY: DSH
DESCRIPTION	CONSTRUCTION (\$)	ALLOCATED CONTINGENCY (\$)	MARKUP (\$)	TOTAL (\$)
Segment: Santa Cruz to Pajaro 19.70 Miles	\$147,179,689	\$48,056,973	\$62,475,732	\$257,712,394
Segment: Castroville to Monterey 14.94 Miles	\$127,178,575	\$41,533,838	\$53,987,972	\$222,700,385
Station: Pajaro (Vision)	\$16,587,771	\$6,072,251	\$7,251,207	\$29,911,230
Regional Service Maintenance Facility	\$23,638,777	\$9,143,633	\$10,490,371	\$43,272,782
SUBTOTAL CONSTRUCTION & ROW COST 34.64 Miles	\$314,584,813	\$104,806,696	\$134,205,283	\$553,596,791
Train Equipment (5 sets @ \$12M each)				\$60,000,000
UNALLOCATED CONTINGENCY (25%)				\$153,399,198
TOTAL COST REGIONAL VISION SERVICE 2020 Dollars				\$766,995,989

Note: Assumes no other project upgrades to existing track from Santa Cruz to Pajaro.

ТАМС Monterey Bay Area Network Integration Study Future Service Vision Segment: Santa Cruz to Pajaro

ITEM	M DESCRIPTION		QUANTITY		CONSTRUCTION	со	NTINGENCY	TOTAL	COMMENT
NO.					AMOUNT	%	AMOUNT	AMOUNT	
1.00	Trackway Civilwork								
1.01	Section A: Replace Existing Track (Trackbed Civil)	104,000	LF	\$112	\$11,679,200	40%	\$4,671,680	\$16,350,880	
1.02	Section B: Replace Existing Track (Trackbed Civil with Bike-Ped Trail)	-	LF	\$313	\$0	40%	\$0	\$0	
1.03	Section C: New Siding Track (Trackbed Civil)	1,200	LF	\$135	\$161,460	40%	\$64,584	\$226,044	Capitola Station siding and Santa Cruz Station storage track
1.04	Structures								
1.05	Structural Allowance	1	LS	\$10,000,000	\$10,000,000	40%	\$4,000,000	\$14,000,000	Pending structural analysis of existing bridges
	SUBTOTAL	105,200	LF		\$21,840,660		\$8,736,264	\$30,576,924	
2.00	Trackwork - Ballast / Ties / Bail / T O								
2.00	Track (Rail-Ties-Ballast)	105 200	TE	\$350	\$36,820,000	30%	\$11.046.000	\$47 866 000	Including sidings
2.07	Remove Existing Track	104,000	TE	\$40	\$4 160 000	30%	\$1 248 000	\$5 408 000	nordang olango.
2.02	Turpout No. 11	2	FA	\$300.000	\$600,000	30%	\$180,000	\$780,000	
2.04	Turnout No. 15	2	FA	\$350.000	\$700.000	30%	\$210,000	\$910.000	
2.05	Turnout No. 20		EA	\$400.000	\$0	30%	\$0	\$0	
2.06	Turnout Signals	4	EA	\$325.000	\$1,300,000	30%	\$390.000	\$1.690.000	
2.07	Signal House	4	EA	\$200,000	\$800,000	30%	\$240,000	\$1,040,000	
	SUBTOTAL				\$44,380,000		\$13,314,000	\$57,694,000	
3.00	Grade Crossings								
3.01	Replace Public Grade Crossing	12	EA	\$950,000	\$11,400,000	30%	\$3,420,000	\$14,820,000	
3.02	Upgrade Public Grade Crossing	5	EA	\$350,000	\$1,750,000	30%	\$525,000	\$2,275,000	
3.03	Replace Private Grade Crossing	9	EA	\$230,000	\$2,070,000	30%	\$621,000	\$2,691,000	
	SUBTOTAL				\$15,220,000		\$4,566,000	\$19,786,000	
4.00	Stations								For details see station estimate worksheet
4.00	Santa Cruz Station (Platform A + No Parking)	1	15	\$2.490.000	\$2.400.000	40%	\$996.000	\$3.486.000	Tor details see station estimate worksheet
4.07	Capitals Station (Platform B + No Parking)	1	1.5	\$3,320,000	\$3,320,000	40%	\$1 328 000	\$4,648,000	
4.02	Antos Station (Platform A + No Parking)	1	1.5	\$2,490,000	\$3,320,000	40%	\$996.000	\$3,486,000	
4.00	Apros station (Franching A + No Franking)		10	\$2,430,000	\$2,430,000	40%	\$330,000	\$3,400,000	
4.04	Downtown Watsonville (Platform A + Small Parking)	1	LS	\$8,890,000	\$8,890,000	40%	\$3,556,000	\$12,446,000	
5.00	Train Controls & Communications				¢11,100,000		\$0,010,000	42 1,000,000	
5.01	Communications - FO Backbone	19.70	MILE	\$200.000	\$3,939,394	30%	\$1.181.818	\$5,121,212	2 FO Cables 48str, 4 conduit 2x2 ductbank
5.02	Station Enclosures	4	EA	\$162,500	\$650,000	30%	\$195,000	\$845,000	NEMA5 Cabinets, UPS & Batteries
5.03	VMS (2 per station)	8	EA	\$44,741	\$357,931	30%	\$107,379	\$465,311	Headend Controls and Station Signs, Labor
5.04	TVM (2 per station)	8	EA	\$67,857	\$542,857	30%	\$162,857	\$705,714	Station TVM & Headend Servers
5.05	PA System	4	EA	\$186,414	\$745,654	30%	\$223,696	\$969,351	PCC & BCC PA Headends, Station Equipment, Interfaces with VMS & Signals AVL, Labor
5.06	SCADA - Station	4	EA	\$35.630	\$142.519	30%	\$42.756	\$185.274	PCC & BCC PA Headends, SCADA shelves at Stations
5.07	SCADA - Radio Site	4	F۵	\$35,630	\$1/2 519	30%	\$42.756	\$185.274	PCC & BCC PA Headends SCADA shelves Radio Sites
5.08	VNE V&D Radio	4	EA	\$97,500	\$390,000	30%	\$117,000	\$507.000	8 channel VHE Radio, Tower, Antennas Cabinet, UPS, Batteries, DAS
				\$ 01,000	+,			4 000,000	PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and
5.09	CCTV	8	EA	\$93,111	\$744,888	30%	\$223,466	\$968,354	Wall Displays
5.10	Master Clock	1	EA	\$80,000	\$80,000	30%	\$24,000	\$104,000	GPS Satellite Radio & Antenna
5.11	Telephone	1	LS	\$169,479	\$169,479	30%	\$50,844	\$220,323	2 Headend IP PBXs, Help Pole IP Phones
5.12	PCC & BCC	1	LS	\$265,000	\$265,000	30%	\$79,500	\$344,500	
5.13	Train Control & Signals	19.70	MILE	\$2,050,000	\$40,378,788	30%	\$12,113,636	\$52,492,424	Wayside signals, cab signal / speed, grade crossing warning, etc.
	SUBTOTAL				\$48,549,029		\$14,564,709	\$63,113,738	
SUBTO	FAL				<mark>\$147,179,689</mark>		\$48,056,973	\$195,236,662	
8.00	Markups			32.00%				\$62,475,732	
TOTAL	FOR Segment: Santa Cruz to Pajaro							\$257,712,394	2020 Dollars

DATE: Dec 2020

PREP. BY: DSH

Note: Assumes no other project upgrades to existing track.

ТАМС

Monterey Bay Area Network Integration Study Future Service Vision Segment: Castroville to Monterey

ITEM	DESCRIPTION		QUANTITY		CONSTRUCTION	CONTINGENCY		TOTAL	COMMENT
NO.				COST	AMOUNT	%	AMOUNT	AMOUNT	
1.00	Trackway Civilwork								
1.01	Section A: Replace Existing Track (Trackbed Civil)	78,900	LF	\$112	\$8,860,470	40%	\$3,544,188	\$12,404,658	
1.02	Section B: Replace Existing Track (Trackbed Civil with Bike-Ped Trail)	-	LF	\$313	\$0	40%	\$0	\$0	
1.03	Section C: New Siding Track (Trackbed Civil)	1,800	LF	\$135	\$242,190	40%	\$96,876	\$339,066	Marina Station siding and Monterey Station storage track
1.04	Structures								
1.05	Structural Allowance	1	LS	\$10,000,000	\$10,000,000	40%	\$4,000,000	\$14,000,000	Pending structural analysis of existing bridges
	SUBTOTAL	80,700	LF		\$19,102,660		\$7,641,064	\$26,743,724	
2.00	Trackwork - Ballast / Ties / Rail / T.O.								
2.01	Track (Rail-Ties-Ballast)	80.700	TF	\$350	\$28,245,000	30%	\$8,473,500	\$36,718,500	Includina sidinas.
2.02	Remove Existing Track	64,300	TF	\$40	\$2,572,000	30%	\$771,600	\$3,343,600	
2.03	Turnout No. 11	2	EA	\$300,000	\$600,000	30%	\$180,000	\$780,000	
2.04	Turnout No. 15	3	EA	\$350,000	\$1,050,000	30%	\$315,000	\$1,365,000	
2.05	Turnout No. 20	-	EA	\$400,000	\$0	30%	\$0	\$0	
2.06	Turnout Signals	5	EA	\$325,000	\$1,625,000	30%	\$487,500	\$2,112,500	
2.07	Signal House	5	EA	\$200,000	\$1,000,000	30%	\$300,000	\$1,300,000	
	SUBTOTAL				\$35,092,000		\$10,527,600	\$45,619,600	
2.00	Crade Creesings								
3.00	Panlace Public Grade Crossing	22	E۵	\$950.000	\$20,900,000	30%	\$6.270.000	\$27 170 000	
3.02	Lingrade Public Grade Crossing		EA	\$350,000	\$0 \$0	30%	\$0,210,000	\$27,170,000	
3.03	Replace Private Grade Crossing	2	EA	\$230,000	\$460,000	30%	\$138,000	\$598,000	
	SUBTOTAL				\$21,360,000		\$6,408,000	\$27,768,000	
4.00	Stations								For details see station estimate worksheet
4.01	Marina Station (Platform B + No Parking)	1	LS	\$3,320,000	\$3,320,000	40%	\$1,328,000	\$4,648,000	
4.02	Seaside Station (Platform A + No Parking)	1	LS	\$2,490,000	\$2,490,000	40%	\$996,000	\$3,486,000	
4.03	Monterey (Platform A + Small Parking)	1	LS	\$8,890,000	\$8,890,000	40%	\$3,556,000	\$12,446,000	
	SUBTOTAL				\$14,700,000		\$5,880,000	\$20,580,000	
5.00	Train Controls & Communications								
5.01	Communications - FO Backbone	14.94	MILE.	\$200.000	\$2,988,636	30%	\$896.591	\$3,885,227	2 FO Cables 48str. 4 conduit 2x2 ductbank
5.02	Station Enclosures	3	EA	\$162,500	\$487,500	30%	\$146,250	\$633,750	NEMA5 Cabinets, UPS & Batteries
5.03	VMS (2 per station)	6	EA	\$44,741	\$268,449	30%	\$80,535	\$348,983	Headend Controls and Station Signs, Labor
5.04	TVM (2 per station)	6	EA	\$67,857	\$407,143	30%	\$122,143	\$529,286	Station TVM & Headend Servers
									PCC & BCC PA Headends, Station Equipment, Interfaces with VMS &
5.05	PA System	3	EA	\$186,414	\$559,241	30%	\$167,772	\$727,013	Signals AVL, Labor
5.06	SCADA - Station	3	EA	\$35,630	\$106,889	30%	\$32,067	\$138,956	PCC & BCC PA Headends, SCADA shelves at Stations
5.07	004D4 D- F- 01-			005 000	\$100.000	0.004	\$00.007	\$100.0F0	DCC & DCC DA Llandarda CCADA shakara Dadia Citar
5.07	SCADA - Radio Site	3	EA	\$35,630	\$106,889	30%	\$32,067	\$138,956	PCC & BCC PA Headends, SCADA sherves Radio Sites 8 channel VHE Radio, Tower, Antennas Cabinet, LIPS, Batteries, DAS
5.00	VINF V&D Radio	3	LA	\$97,300	\$292,500	30%	\$61,150	\$380,230	PCC_BCC_Badio Sites_Yard Cameras NVR_Video Management and
5.09	CCTV	6	EA	\$93,111	\$558,666	30%	\$167,600	\$726,266	Wall Displays
5.10	Master Clock	1	FA	\$80.000	\$80.000	30%	\$24.000	\$104.000	GPS Satellite Radio & Antenna
				+			+= .,	••••	
5.11	Telephone	1	LS	\$169,479	\$169,479	30%	\$50,844	\$220,323	2 Headend IP PBXs, Help Pole IP Phones
5.12	PCC & BCC	1	LS	\$265,000	\$265,000	30%	\$79,500	\$344,500	
5.13	Train Control & Signals	14.94	MILE	\$2,050,000	\$30,633,523	30%	\$9,190,057	\$39,823,580	Wayside signals, cab signal / speed, grade crossing warning, etc.
	SUBTOTAL				\$36,923,915		\$11,077,174	\$48,001,089	
SUBTO	TAL				\$127,178,575		\$41,533,838	\$168,712,413	
8.00	Markups			32.00%				\$53,987,972	
TOTAL	FOR Segment: Castroville to Monterey							\$222,700,385	2020 Dollars

DATE: Dec 2020

ТАМС

Monterey Bay Area Network Integration Study Future Service Vision Station: Pajaro (Vision)

ITEM	DESCRIPTION	QUANTITY		UNIT	CONSTRUCTION	CONTINGENCY		TOTAL AMOUNT	COMMENT
NO.	DESCRIPTION		QUANTIT		AMOUNT	%	AMOUNT		
1.00	Trackway Civilwork								
1.00	Section A: Replace Evicting Track (Trackhed Civil)	4 000	LE	\$112	\$449.200	10%	\$179.680	\$628.880	
1.01	Section A: Replace Existing Track (Trackbed Civil)	4,000	LE	\$112 \$212	\$0,200	40%	\$179,080	9020,080 ¢0	
1.02	Section C: New Siding Track (Trackbed Civil)		LF	\$135	\$0 \$0	40%	30 \$0	30 \$0	
1.00	Structures			¢100	ψū	1070	¢0	ψõ	
1.01	Structural Allowance		15	\$10,000,000	\$0	40%	\$0	\$0	
1.00	SUBTOTAL	4.000	LF	\$10,000,000	\$449.200	1070	\$179.680	\$628.880	
		.,			* · · · · , - · ·		,		
2.00	Trackwork - Ballast / Ties / Rail / T.O.								
2.01	Track (Rail-Ties-Ballast)	4,000	TF	\$350	\$1,400,000	30%	\$420,000	\$1,820,000	
2.02	Remove Existing Track	4,000	TF	\$40	\$160,000	30%	\$48,000	\$208,000	
2.03	Turnout No. 11		EA	\$300,000	\$0	30%	\$0	\$0	
2.04	Turnout No. 15	3	EA	\$350,000	\$1,050,000	30%	\$315,000	\$1,365,000	
2.05	Turnout No. 20	-	EA	\$400,000	\$0	30%	\$0	\$0	
2.06	Turnout Signals	3	EA	\$325,000	\$975,000	30%	\$292,500	\$1,267,500	
2.07	Signal House	3	EA	\$200,000	\$600,000	30%	\$180,000	\$780,000	
	SUBTOTAL				\$4,185,000		\$1,255,500	\$5,440,500	
2.00	Crade Crassings								
3.00	Baplace Bublic Grade Crossing		E۸	\$050.000	¢0.	200/	03	¢0	
3.01	Liporade Public Grade Crossing		EA	\$350,000	\$0 \$0	30%	30	30 \$0	
3.02	Replace Private Grade Crossing		FA	\$230,000	\$0 \$0	30%	30 \$0	30 \$0	
0.00	SUBTOTAL		2/1	\$200,000	\$0	0070	\$0	\$0	
							• •	• •	
4.00	Stations								For details see station estimate worksheet
4.01	Pajaro Station (Added Platform D + Added Access Structure)	1	LS	\$10,510,000	\$10,510,000	40%	\$4,204,000	\$14,714,000	
	SUBTOTAL				\$10,510,000		\$4,204,000	\$14,714,000	
E 00	Train Controlo & Communications								
5.00	Communications			£200.000	¢0	200/	¢0	¢0	2 EO Cables 48str. 4 conduit 3x2 duathank
5.01	Station Enclosures	- 1	FA	\$200,000	\$U \$162.500	30%	\$0 \$48.750	\$U \$211.250	NEMA5 Cabinets LIPS & Batteries
5.02	VMS (2 per station)	2	EA	\$44 741	\$89,483	30%	\$26,845	\$116 328	Headend Controls and Station Signs, Labor
0.00		-	271	Q 11,1 11	\$00,100	0070	¢20,010	\$110,020	
5.04	TVM (2 per station)	2	EA	\$67,857	\$135,714	30%	\$40,714	\$176,429	Station TVM & Headend Servers
5.05	Di Outra					0.004	055.004	60 10 000	PCC & BCC PA Headends, Station Equipment, Interfaces with VMS &
5.05	PA System	1	EA	\$186,414	\$186,414	30%	\$55,924	\$242,338	Signais AVL, Labor
5.06	SCADA - Station	1	FA	\$35,630	\$35.630	30%	\$10,689	\$46.319	PCC & BCC PA Headends, SCADA shelves at Stations
5.07	SCADA - Radio Site	1	EA	\$35,630	\$35,630	30%	\$10,689	\$46,319	PCC & BCC PA Headends, SCADA shelves Radio Sites
5.08	VNF V&D Radio	1	EA	\$97,500	\$97,500	30%	\$29,250	\$126,750	8 channel VHF Radio, Tower, Antennas Cabinet, UPS, Batteries, DAS
5.09	CCTV	2	EA	\$93,111	\$186.222	30%	\$55.867	\$242.089	Wall Displays
									,
5.10	Master Clock	1	EA	\$80,000	\$80,000	30%	\$24,000	\$104,000	GPS Satellite Radio & Antenna
5.11	Telephone	4	15	\$160.470	\$160.470	30%	\$50 944	\$220.222	2 Headend IP PRXs, Help Pole IP Phones
5.12		1	1.5	\$265,000	\$109,479	30%	\$30,844	\$220,525	2 Headend II + DX3, Help Fole II + Holles
5.12	Train Control & Signals		MILE	\$2,050,000	φ203,000 \$0	30%	\$13,500 \$0	900, ,500 \$0	Wayside signals, cab signal / speed, grade crossing warning, etc.
0.10	SUBTOTAL			φ <u></u> ,000,000	\$1,443,571	0070	\$433,071	\$1,876,643	
SUBTO	SUBTOTAL				\$16,587,771		\$6,072,251	\$22,660,023	
8.00	Markups			32.00%				\$7,251,207	
TOTAL	FOR Station: Pajaro (Vision)							\$29,911,230	2020 Dollars

DATE: Dec 2020

ТАМС

Monterey Bay Area Network Integration Study Future Service Vision Regional Service Maintenance Facility

ITEM	DESCRIPTION	QUANTITY		UNIT COST				TOTAL	COMMENT
NO.		QUARTIT	%			AMOUNT	AMOUNT	COMMENT	
1.00	Yard Trackwork								
1.01	Storage Track (Rail-Ties-Ballast)	2,400	TF	\$300	\$720,000	40%	\$288,000	\$1,008,000	
1.02	Shop Track	1,000	TF	\$400	\$400,000	40%	\$160,000	\$560,000	
1.03	# 15 Turnouts	3	EA	\$350,000	\$1,050,000	40%	\$420,000	\$1,470,000	
1.04	Turnout Yard Signals	3	EA	\$325,000	\$975,000	40%	\$390,000	\$1,365,000	
	SUBTOTAL	3,403	LF		\$3,145,000		\$1,258,000	\$4,403,000	
2.00	Facilities / Shop								
2.01	Operation / Maintenance Shop / Storage / Workshops	40,000	SF	\$300	\$12,000,000	40%	\$4,800,000	\$16,800,000	
	SUBTOTAL				\$12,000,000		\$4,800,000	\$16,800,000	
3.00	Civilwork								
3.01	Clearing & Grub Area	5	ACRE	\$5,000	\$22,957	30%	\$6,887	\$29,844	
3.02	Earthwork / Grading	25,000	SY	\$10	\$250,000	30%	\$75,000	\$325,000	
3.03	Parking Lot	30	SPACE	\$3,500	\$105,000	30%	\$31,500	\$136,500	
3.04	Yard Lighting	1	LS	\$500,000	\$500,000	30%	\$150,000	\$650,000	
3.05	Fencing	4,000	LF	\$65	\$260,000	30%	\$78,000	\$338,000	
3.06	Gates	3	EA	\$5,000	\$15,000	30%	\$4,500	\$19,500	
3.07	Access Roads	60,600	SF	\$8	\$484,800	30%	\$145,440	\$630,240	
3.08	Drainage	1,637,757	\$	5%	\$81,888	30%	\$24,566	\$106,454	
3.09	Utilities	1,637,757	\$	3%	\$49,133	30%	\$14,740	\$63,873	
	SUBTOTAL				\$1,768,777		\$530,633	\$2,299,411	
4.00	Right-of-Way								
4.01	ROW	215,000	SF	\$25	\$5,375,000	40%	\$2,150,000	\$7,525,000	
	SUBTUTAL				\$5,375,000		\$2,150,000	\$7,525,000	
5.00	Train Controlo & Communications								
5.00	FO Backhone Switches and WAN Access Pts	1	15	\$500.000	\$500.000	30%	\$150.000	\$650.000	PCC BCC Padio Sites Vard Transmission Equipment and NMS
5.02	CCTV	1	EA	\$100,000	\$100,000	30%	\$30,000	\$130,000	Wall Displays
5.02	Train Control Room Allowance	1	FA	\$500,000	\$500,000	30%	\$150,000	\$650,000	For Dispatch, SCADA, Central Control, etc.
5.04	Vard Train Control Sustan Allowance		18	\$250,000	\$350,000	201/	\$75,000	\$335.000	
3.04			L3	\$250,000	\$250,000	30%	\$10,000	\$323,000	
	3061014				\$1,330,000		\$403,000	\$1,755,000	
SUBTO	SUBTOTAL				\$23,638,777		\$9,143,633	\$32,782,411	
8.00	Markups			32.00%				\$10,490,371	
TOTAL I	FOR Regional Service Maintenance Facility							\$43,272,782	2020 Dollars

DATE: Dec 2020