ROAD REPAIR AND ACCOUNTABILITY ACT OF 2017
PROJECT BASELINE AGREEMENT
Freight Intelligent Transportation System

Resolution TCEP-P-1819-05B
(will be completed by CTC)

1. FUNDING PROGRAM

- ☐ Active Transportation Programo
- ☐ Local Partnership Program (Competitive)o
- ☐ Solutions for Congested Corridors Programo
- ☐ State Highway Operation and Protection Programo
- ☒ Trade Corridor Enhancement Programo

2. PARTIES AND DATE

2.1 This Project Baseline Agreement (Agreement) for the *Freight Intelligent Transportation System*, effective on, October 17, 2018 (will be completed by CTC), is made by and between the California Transportation Commission (Commission), the California Department of Transportation (Caltrans), the Project Applicant, *Alameda County Transportation Commission (Alameda CTC)*, and the Implementing Agency, *Alameda CTC*, sometimes collectively referred to as the "Parties".

3. RECITAL

3.2 Whereas at its May 16, 2018 meeting the Commission approved the Trade Corridor Enhancement Program, and included in this program of projects the *Freight Intelligent Transportation System*, the parties are entering into this Project Baseline Agreement to document the project cost, schedule, scope and benefits, as detailed on the Project Programming Request Form attached hereto as Exhibit A and the Project Report attached hereto as Exhibit B, as the baseline for project monitoring by the Commission.

3.3 The undersigned Project Applicant certifies that the funding sources cited are committed and expected to be available; the estimated costs represent full project funding; and the scope and description of benefits is the best estimate possible.

4. GENERAL PROVISIONS

The Project Applicant, Implementing Agency, and Caltrans agree to abide by the following provisions:

4.1 To meet the requirements of the Road Repair and Accountability Act of 2017 (Senate Bill [SB] 1, Chapter 5, Statutes of 2017) which provides the first significant, stable, and on-going increase in state transportation funding in more than two decades.

4.2 To adhere, as applicable, to the provisions of the Commission:

- ☐ Resolution *Insert Number*, "Adoption of Program of Projects for the Active Transportation Program", dated
- ☐ Resolution *Insert Number*, "Adoption of Program of Projects for the Local Partnership Program", dated
- ☐ Resolution *Insert Number*, "Adoption of Program of Projects for the Solutions for Congested Corridors Program", dated
- ☐ Resolution *Insert Number*, "Adoption of Program of Projects for the State Highway Operation and Protection Program", dated
- ☒ Resolution TCEP-P-1718-01, "Adoption of Program of Projects for the Trade Corridor Enhancement Program", dated May 16, 2018

4.3 All signatories agree to adhere to the Commission's Guidelines. Any conflict between the programs will be resolved at the discretion of the Commission.

4.4 All signatories agree to adhere to the Commission's SB 1 Accountability and Transparency Guidelines and policies, and program and project amendment processes.

4.5 The Alameda CTC agrees to secure funds for any additional costs of the project.

4.6 The Alameda CTC agrees to report to Caltrans on a quarterly basis; after July 2019, reports will be on a semi-annual basis on the progress made toward the implementation of the project, including scope, cost, schedule, outcomes, and anticipated benefits.

4.7 Caltrans agrees to prepare program progress reports on a quarterly basis; after July 2019, reports will be on a semi-annual basis and include information appropriate to assess the current state of the overall program and the current status of each project identified in the program report.

4.8 The Alameda CTC agrees to submit a timely Completion Report and Final Delivery Report as specified in the Commission's SB 1 Accountability and Transparency Guidelines.

4.9 All signatories agree to maintain and make available to the Commission and/or its designated representative, all work related documents, including without limitation engineering, financial and other data, and methodologies and assumptions used in the determination of project benefits during the course of the project, and retain those records for four years from the date of the final closeout of the project. Financial records will be maintained in accordance with Generally Accepted Accounting Principles.

4.10 The Transportation Inspector General of the Independent Office of Audits and Investigations has the right to audit the project records, including technical and financial data, of the Department of Transportation, the Project Applicant, the Implementing Agency, and any consultant or sub-consultants at any time during the course of the project and for four years from the date of the final closeout of the project, therefore all project records shall be maintained and made available at the time of request. Audits will be conducted in accordance with Generally Accepted Government Auditing Standards.

5. SPECIFIC PROVISIONS AND CONDITIONS

5.1 Project Schedule and Cost
See Project Programming Request Form, attached as Exhibit A.

5.2 Project Scope
See Project Report or equivalent, attached as Exhibit B. At a minimum, the attachment shall include the cover page, evidence of approval, executive summary, and a link to or electronic copy of the full document.

5.3 Other Project Specific Provisions and Conditions

Attachments:

Exhibit A: Project Programming Request Form
Exhibit B: Project Report
Exhibit C: Environmental Document(s)

SIGNATURE PAGE
TO
PROJECT BASELINE AGREEMENT

Freight Intelligent Transportation System

Resolution TCEP-P-1819-05B

08/08/18
ARTHUR L. DAO Date
Executive Director
Alameda County Transportation Commission
Project Applicant and Implementing Agency

8/9/18
FOR JAMES E. DAVIS Date
Acting District Director
California Department of Transportation

9/13/18
for: LAURIE BERMAN Date
Director
California Department of Transportation

10/25/18
SUSAN BRANSEN Date
Executive Director
California Transportation Commission

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised Feb,20 2018 v7.07) *General Instructions*

Amendment (Existing Project) Y/N					Date:	9/12/18
District	**EA**	**Project ID**	**PPNO**	**MPO ID**	**Alt Proj. ID / prg.**	
04				ALA170087		

County	**Route/Corridor**	**PM Bk**	**PM Ahd**	**Project Sponsor/Lead Agency**	
ALA				Alameda County Transportation Commission	
				MPO	**Element**
				MTC	Local Assistance

Project Manager/Contact	**Phone**	**E-mail Address**
Trinity Nguyen	510-208-7441	tnguyen@alamedactc.org

Project Title

Freight Intelligent Transportation System

Location (Project Limits), Description (Scope of Work)

In the City of Oakland, within the Port of Oakland's Seaport Facilities and adjacent areas in the City of Oakland (which is generally bounded by Interstate (I-) 880 to the east, the Charles P. Howard Terminal to the south, the San Francisco Bay to the west and southwest, and the San Francisco-Oakland Bay Bridge in the north) along W. Grand Avenue, Maritime Street, 7th Street, Adeline Street, Embarcadero West, Water Street, Middle Harbor Road, and near the vicinity of Jack London Square, apply Intelligent Transportation System (traffic management, incident management, traveler information), signal systems, and other technologies. [continued on Page 2]

Component	**Implementing Agency**
PA&ED	Alameda County Transportation Commission
PS&E	Alameda County Transportation Commission
Right of Way	Alameda County Transportation Commission
Construction	Alameda County Transportation Commission

Legislative Districts

Assembly:	18	**Senate:**	9	**Congressional:**	CA 13

Project Benefits

This project is included in the GoPort program of projects, which are intended to improve the efficiency, safety, and reliability of truck and rail access, and circulation within and near the Port, as well as provide improved truck traveler information and resources through advanced and innovative technology. In addition, they are anticipated to improve the competitiveness of the Port, [continued on page 2]

Purpose and Need

PURPOSE:The FITS Project is primarily aimed at traffic management and operations of arterial roadways in and near the Port environment, and regional traveler information dissemination to and from the Port. The improvements are centered towards an enhanced Traffic Management Center/Emergency Operations Center (TMC/EOC) operating at the Port that observes [continued on page 3]

Category	**Outputs/Outcomes**	**Unit**	**Total**
Local streets and roads	Operational improvements	Miles	3.5

ADA Improvements No	Bike/Ped Improvements No	Reversible Lane analysis No
Inc. Sustainable Communities Strategy Goals Yes	Reduces Greenhouse Gas Emissions Yes	

Project Milestone	**Existing**	**Proposed**
Project Study Report Approved	N/A	
Begin Environmental (PA&ED) Phase		08/19/01
Circulate Draft Environmental Document **Document Type** EIR		04/29/02
Draft Project Report		07/26/18
End Environmental Phase (PA&ED Milestone)		10/31/18
Begin Design (PS&E) Phase		11/01/18
End Design Phase (Ready to List for Advertisement Milestone)		03/31/19
Begin Right of Way Phase		11/01/18
End Right of Way Phase (Right of Way Certification Milestone)		12/31/18
Begin Construction Phase (Contract Award Milestone)		08/01/19
End Construction Phase (Construction Contract Acceptance Milestone)		12/31/21
Begin Closeout Phase		01/01/22
End Closeout Phase (Closeout Report)		12/31/22

Additional Information

LOCATION (PROJECT LIMITS), DESCRIPTION (SCOPE OF WORK) CONTINUED

The FITS project will install ITS elements such as RFID, queue detection sensors, supplemental side-fire radar detection sensors, and (non-intrusive) train detection video cameras. Traffic signals will be modified to enhance vehicle detection and controller hardware to provide adaptive control and signal priority for freight/emergency responses. CCTV's will be upgraded to HD, as well as, expand the fiber communication backbone to provide field equipment communications and ATMS software solutions to integrate all of the field devices communications to a retrofit joint transportation management center/emergency operation center (TMC/EOC). The Project will also provide WiFi backup communication, congestion relief through the implementation of a smart parking system and real-time traveler information, and emergency response from the joint TMC/EOC. Additional improvements include installation of WIM within the Port complex, and enhancement of C2C Communication with other local/regional public sector entities to improve the goods movement and emergency response coordination.

Multiple construction packages are likely to be issued at the end of project design for efficient project implementation.

BENEFITS, CONTINUED

while also generating benefits to the region, including job creation and reduced congestion and emissions. Key objectives and benefits of the ITS and technology elements of the FITS project are:

- Improved traffic information and management within the Port, its terminals, and access routes.
- Improved traffic observation, verification, and monitoring.
- Enhanced information sharing during an emergency or incident.
- Improved transportation communication with the City, Caltrans, MTC NextGen 511, and CHP.
- Development of an ITS communication network that serves future needs.
- TMC functionality at the Port for better traffic control, management, and monitoring.
- Increased speeds, throughput, and reliability of freight traffic.
- Reduced traffic congestion, bottlenecks, truck idling, and related emissions.
- Improved terminal wait time and turn time information.
- Improved traffic management during construction projects.
- Minimized conflicts between transportation modes.
- A system and data to facilitate improved terminal operations and efficiency.
- Improved goods movement along Port roadways and regional traffic routes, as well as interregional benefits from advanced truck traveler information.
- Improved safety and freight system efficiency and productivity using advanced information technologies such as WIM, Smart Parking, connected and automated vehicles, etc.
- Reduced community and environmental impacts, particularly for disadvantages and low-income communities in Oakland from reduced congestion, idling, and queues.
- Economic and job growth from improved productivity, reliability, and competitiveness of the drayage community and associated industries.
- Emissions impacts from the Cal-B/C analysis indicated the largest emissions benefits from the FITS project is CO2 (reflective of greenhouse gas emissions) with nearly 10,000 tons reduced annually at a benefit of over $6 million over the 20-year analysis period.
- Estimated savings in travel time: 364,000 hrs/year or 245,000 gal fuel saved, based on 2020 traffic forecast; 412000 hrs/year or 265,000 gal fuel saved, based on 2040 traffic forecast.
- Estimated savings by reduced primary and secondard crashes: $1,244,000/year, based on 2020 traffic forecast; $1,347,000/year, based on 2040 traffic forecast.

Additional Information

PURPOSE AND NEED, CONTINUED

monitors, and manages traffic and incidents on Port facilities and compiles, shares, and disseminates freight traveler information and data with stakeholders. Through stakeholder engagement, the following issues, challenges, and needs are: Port and traveler information, traffic and incident management, regional traffic congestion, rail traffic interaction, truck safety/roadway conditions, environment and emissions, and parking. The FITS Project's primary mission is centered on increasing the freight transportation efficiency of the Port, which in turn, will lead to benefits in the areas of efficiency and reliability, congestion relief, productivity, safety, mobility, energy, and environment.

NEED: The Port is expected to experience substantial growth in import and export volumes; marine terminal import and export volumes are expected to cumulatively increase by approximately 70 percent from 2.37 million twenty-foot equivalent units (TEUs) in 2016 to 4.05 million TEUs in 2040, resulting in a significant increase in intermodal railyard demand and daily truck and intermodal trips. Truckers and passenger vehicles within the Port currently experience roadway queues, intersection delays, recurring congestion, and parking issues. In addition, trucks traveling to and from the Port from within the Greater San Francisco Bay Area, as well as Central Valley, face significant peak-period congestion and unpredictable traffic congestion that reduces truck travel time efficiency and reliability. These challenges cannot be readily managed as Port operations staff have a limited set of tools and information systems to address traffic and incidents. Moreover, trucking company dispatchers, truck drivers, terminal operators, railroad operations personnel, and Beneficial Cargo Owner (BCO) logistics planners do not have a common platform to get critical information on Port road conditions, queue lengths, and incident alerts.

Collectively, these constraints reduce the efficiency of the Port, causing wasted time in truck traffic delays, unnecessary queuing/idling, inefficient responsiveness to traffic incidents, illegal truck parking, and missed appointment windows for container pickups and deliveries. These inefficiencies result in economic losses which reduces the competitiveness of the Port on the global market. Additionally, these conditions result in diminished air quality due to increases in greenhouse gases (GHG) and particulates from consistent truck idling from traffic congestion delays.

Additional Information

Milestone Dates

The End Environmental Phase (PA&ED Milestone) was delayed three months due to the need to do additional cultural resource studies, which were required for NEPA compliance and completion of the NEPA document. This three month delay in the Environmental Phase subsequently resulted in a three month delay to the beginning of the design phase (a.k.a. Begin Design or PS&E Phase), as shown in the Milestone. The Begin Right of Way Phase date Milestone was updated to be consistent with the Begin Design Milestone date.

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised Feb,20 2018 v7.07)

Date: 9/12/18

District	County	Route	EA	Project ID	PPNO	Alt. ID
04	ALA	, ,				
Project Title:	Freight Intelligent Transportation System					

Existing Total Project Cost ($1,000s)									
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	**Implementing Agency**
E&P (PA&ED)									Alameda County Transportation
PS&E									Alameda County Transportation
R/W SUP (CT)									Alameda County Transportation
CON SUP (CT)									Alameda County Transportation
R/W									Alameda County Transportation
CON									Alameda County Transportation
TOTAL									
Proposed Total Project Cost ($1,000s)									**Notes**
E&P (PA&ED)	2,500							2,500	
PS&E	4,100							4,100	
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON		24,000						24,000	
TOTAL	6,600	24,000						30,600	

Fund No. 1:	**Local Transportation Sales Tax**								**Program Code**
Existing Funding ($1,000s)									
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	**Funding Agency**
E&P (PA&ED)									Alameda CTC
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									**Notes**
E&P (PA&ED)	2,500							2,500	Measure BB funds
PS&E	4,100							4,100	allocated 03/2016
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL	6,600							6,600	

Fund No. 2:	**FY 2017 Port Security Grant Program**								**Program Code**
Existing Funding ($1,000s)									
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	**Funding Agency**
E&P (PA&ED)									US Dept of Homeland Security
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									**Notes**
E&P (PA&ED)									Awarded 09/2017
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON		1,824						1,824	
TOTAL		1,824						1,824	

Fund No. 3:	FY 2017 ATCMTD								Program Code
Existing Funding ($1,000s)									
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									FHWA
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									Advanced Transportation and Congestion Management Technologies Deployment [ATCMTD]. Awarded 10/2017
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON		9,720						9,720	
TOTAL		9,720						9,720	

Fund No. 4:	Trade Corridor Enhancement Program								Program Code
Existing Funding ($1,000s)									
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									CTC
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									Programming approved on 05/2018
PS&E									
R/W SUP (CT)									Regional share
CON SUP (CT)									
R/W									
CON		12,456						12,456	
TOTAL		12,456						12,456	

Fund No. 5:									Program Code
Existing Funding ($1,000s)									
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Exhibit B

DRAFT

PROJECT REPORT (EQUIVALENT)

FOR

7TH STREET GRADE SEPARATION AND PORT ARTERIAL IMPROVEMENTS – FREIGHT INTELLIGENT TRANSPORTATION SYSTEM (FITS) PROJECT

Prepared for Alameda County Transportation Commission (ACTC)

July 26, 2018

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1. Introduction

The Alameda County Transportation Commission (Alameda CTC), in cooperation with the Port of Oakland (Port) proposes to construct the 7th Street Grade Separation and Port Arterial Improvements Project (GoPort), a package of landside transportation improvements within the Port, which would support a mode shift from truck to rail and also enable smart solutions to manage operations and improve safety. As one of the busiest container ports in the United States, these improvements would help to maintain and expand the Port's global competitiveness, sustain its future growth potential and operational efficiency, and support regional economic development and growth strategies.

The GoPort improvements include the 7th Street Grade Separation West (7SGSW) project, the 7th Street Grade Separation East (7SGSE) project, the Port Utility Relocation (PUR) project, and the Oakland Freight Intelligent Transportation System (FITS) project, consistent with the Intelligent Transportation Systems and Technology (ITST) Master Plan. Improvements have been organized into projects with independent utility and logical termini, and can be constructed and financed on their own timelines.

The FITS Project is described in the Port FITS Master Plan. The FITS project consists of non-ground disturbing, system-based improvements in addition to ground disturbing construction such as trenching for fiber optics, upgrading interconnecting signals, constructing foundations, the removal of vegetation and trees, as well as further installations that maximize the operation of the Port's overall roadway system that will provide traffic management benefits. This includes the implementation of transportation management technologies and applications, traveler information systems, safety systems, transportation performance data collection and dissemination. Technologies and devices would include:

- Changeable message signs (CMS's)
- Camera surveillance
- Fiber-optic communications
- Joint Traffic Management Center/Emergency Operations Center (TMC/EOC) including interior upgrades to the existing Harbor Facilities Center (HFC) building
- Traffic signal enhancements
- Vehicle/train detection.

The FITS Project is located along the eastern shore of San Francisco Bay (Bay) generally within the Port's Seaport Facilities and adjacent areas in the City of Oakland. This area extends from the east end of the San Francisco-Oakland Bay Bridge in the north to the urban commercial center of Jack London Square to the southeast. The FITS Project includes physical improvements along West Grand Avenue, Maritime Street, 7th Street, Middle Harbor Road, Adeline Street, Embarcadero West, Water Street, and near the vicinity of Jack London Square as shown in **Figure 1**.

Figure 1:FITS Project Vicinity Map

The Alameda CTC has identified local, state, and federal funding sources for the Project. Funding includes $12.456 million in Senate Bill 1 (SB 1) Trade Corridor Enhancement Program (TCEP), $6.6 million in local sales tax Measure BB funds, $1.82 million in Department of Homeland Security Port Security Grant Program 2017 (PSGP2017), and $9.72 million in Federal Highway Administration (FHWA) Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) grant.

2. Background

The Port is expected to experience substantial growth in import and export volumes; marine terminal import and export volumes are expected to cumulatively increase by approximately 70% from 2.37 million twenty-foot equivalent units (TEUs) in 2016 to 4.05 million TEUs in 2040, resulting in a significant increase in intermodal railyard demand and daily truck and intermodal trips. Truckers and passenger vehicles within the Port currently experience roadway queues, intersection delays, recurring congestion, and parking issues. In addition, trucks traveling to and from the Port from within the Greater San Francisco Bay Area, as well as Central Valley, face significant peak-period congestion and unpredictable traffic congestion that reduces truck travel time efficiency and reliability. These challenges cannot be readily managed as Port operations staff has a limited set of tools and information systems to address traffic and incidents. Moreover, trucking company dispatchers, truck drivers, terminal operators, railroad operations personnel, and Beneficial Cargo Owner (BCO) logistics planners do not have a common platform to get critical information on Port road conditions, queue lengths, and incident alerts.

Collectively, these constraints reduce the efficiency of the Port, causing wasted time in truck traffic delays, unnecessary queuing/idling, inefficient responsiveness to traffic incidents and missed appointment windows for container pickups and deliveries. These inefficiencies result in economic losses which reduces the competitiveness of the Port on the global market. Additionally, these conditions result in diminished air quality due to increases in greenhouse gases (GHG) and particulates from consistent truck idling from traffic congestion delays.

Alameda CTC's proposed GoPort program will significantly improve the efficiency and reliability of both truck and rail access to and from the Port, manage a major truck-rail chokepoint and conflicts between trucks, and modernize roadways to accommodate existing and anticipated future truck volumes. The GoPort program will also support a mode shift from truck to rail and also enable smart solutions to manage operations and improve safety on the Primary Highway Freight System (PHFS) within the vicinity of the Port of Oakland's Seaport area and the connecting PHFS routes on the National Highway Freight Network. Furthermore, the GoPort program is included in the Metropolitan Transportation Commission's (MTC) 2017 Regional Transportation Improvement Plan.

7th Street is one of three Port roadway entrances that, in combination with railroad lines and bicycle and pedestrian facilities, provide goods movement and public access to and from the Port.

The GoPort program consists of a realignment and grade separation of the 7th Street entrance into the Port in order to meet current design standards for multi-modal transportation infrastructure, as well as provide FITS improvements that maximize the operation of the Port's overall roadway system. FITS improvements for this Project include the implementation of transportation technologies such as changeable message signs (CMS's), camera surveillance, fiber communications, a traffic management center, traffic signal enhancements and vehicle detection.

The Alameda CTC allocated $33 million of Measure BB funds to the GoPort program in March 2016 and an additional $20.02 million of Measure BB funds in February 2018 (See **Table 1**).

Table 1: GoPort Measure BB Funding Breakdown

Project Phase	FITS (In Thousands)	7SGSE, 7SGSW, PUR, (In Thousands)	Total (In Thousands)
Project Approval & Environmental Document (PA&ED)[1]	**$2,500**	$12,500	$15,000
Plans, Specifications & Estimate (PS&E)[1]	**$4,100**	$13,900	$18,000
PA&ED / PS&E[2]	**$0**	$20,020	$20,020
Total	**$6,600**	$46,420	$53,020

[1] Funds allocated by Alameda CTC Commission in March 2016

[2] Funds allocated by Alameda CTC Commission in February 2018

2.1 Existing Conditions

Roadway access into and out of the Port is limited to three roadways: West Grand Avenue/Maritime Street to the north, 7th Street to the east, and Adeline Street/Middle Harbor Road to the south. According to traffic counts performed in 2016 as presented in the 7th Street Grade Separation and Port Arterial Improvements Project Traffic Study Report, the 7th Street gateway carries a total of 8,576 average daily traffic (ADT), approximately 36% of the average daily traffic entering the Port and 40% exiting the Port (see **Table 2**). Daily traffic volumes show an approximate daily volume of 22,552 vehicles per day entering and exiting the Project Study Area from count locations 1, 3, and 6. The three count locations located at the Port gateways indicate that there are approximately 11,346 vehicles per day entering and 11,206 exiting the Port area on a typical weekday. The total volume entering and exiting the Port from these locations is comprised overall of approximately 49.5% trucks, and 50.2% automobiles, and 0.3% buses. The traffic into and out of the Port is distributed among the three gateway locations as follows:

- Inbound: 36% at 7th Street, 22% at Maritime Street/Grand Avenue, and 42% at Adeline Street
- Outbound: 40% at 7th Street, 19% at Maritime Street/Grand Avenue, and 41% at Adeline Street

In addition, 7th Street provides bicycle and pedestrian access for West Oakland residents to the Port of Oakland.

Table 2: Existing (2016) ADT Counts for Port of Oakland

		1. Maritime Street South of Burma Road	2. Middle Harbor Road West of OICT West Gate	4. Market Street South of Third Street		3. Middle Harbor Road East of Matson Gate	5. Embarcadero West, to the East of Market Street	6. Seventh Street West of I-880 Southbound On-Ramp
Northbound	Total	2,093	1,651	1,840	Westbound	4,803	130	4,044
	Automobile	1,245	744	1,085		2,012	70	2,182
	Medium Truck	326	370	537		836	33	477
	Heavy Truck	503	531	184		1,945	19	1,380
	Bus	19	6	34		10	8	5
Southbound	Total	2,499	2,595	1,603	Eastbound	4,581	401	4,532
	Automobile	1,668	1,140	1,073		1,932	218	2,294
	Medium Truck	281	469	286		873	77	588
	Heavy Truck	548	980	232		1,760	97	1,630
	Bus	2	6	12		16	9	20
Total	Total	4,592	4,246	3,443	Total	9,384	504	8,576
	Automobile	2,913	1,884	2,158		3,944	288	4,476
	Medium Truck	607	839	823		1,709	110	1,065
	Heavy Truck	1,051	1,511	416		3,705	116	3,010
	Bus	21	12	46		26	17	25

Source: CHS Consulting Group, 2017.

Between December 2012 and November 2016, 60 traffic collisions were reported along the Port's primary and secondary roadways, including some roadways outside the Port area, according to the data obtained from the Statewide Integrated Traffic Records System (SWITRS). This is an average of approximately 15 collisions per year with:

- 13 collisions along Adeline Street (at 3rd Street and 7th Street)
- 19 collisions on Maritime Street (at 7th Street, Bataan Avenue and 14th Street)
- 19 collisions on Middle Harbor Road (at Maritime Street, 7th Street and 3rd Street) and
- 9 collisions on 7th Street at Maritime Street.

The majority of total collisions at major intersections within the Study Area were reported to be by unsafe speeds (33%), improper turning (22%) or improper automobile yielding (13%). Of the reported collisions, 41% of the total involved a medium or heavy truck.

Between 1982 and 2016, the Federal Railroad Administration (FRA) reported eight collisions at the at-grade railroad crossings within the Project Study Area. This accounts for the most at-grade rail crossing collisions within Alameda County. Two of the collisions occurred at 7th Street, four collisions occurred on Maritime Street, one occurred on Middle Harbor Road and one occurred at a private crossing, as shown in the table below. Each of the incidents involved a truck stopped on or not stopping at the at-grade rail crossing, causing the crossing train to collide with the truck, except for one incident in 1982 at the private crossing for the Southern Pacific Company.

3. Project Purpose and Need

The development of the FITS project followed a comprehensive Systems Engineering Process recommended by Caltrans and the Federal Highway Administration (FHWA). This included an intensive stakeholder engagement effort to identify the issues and challenges to ensure the Intelligent Transportation System (ITS) and technology improvements are designed to meet user needs. More detail on stakeholder engagement is in **Section 7**. The issues, challenges, and needs are summarized below:

- **Port and Traveler Information.** Signage on Port property for traveler information and traffic control is severely lacking. The stakeholders who do look online for information that can help them better coordinate trips have to go to multiple traveler information sources (e.g., 511, Port email newsletters, marine terminals' websites, Google Maps, etc.). While the daily email newsletter from the Port provides information regarding vessels berthed, it does not give a good indication of real-time operational conditions at the Port. Truckers, dispatchers, and operations staff need real-time Port information, regardless if they are still at the distribution center, en-route to the Port, or already in queue. Real time information will allow them to better manage their pick-ups and deliveries, and their customers' expectations. Google and most travel time apps do not list travel times for trucks nor take into account Port-specific activity. Performance metrics also are needed for trend analyses. Additionally, there are time lags in getting container availability information. Lastly, information on truck queues on the public roads in front of the terminals, as well as information on terminal turn times for trucks are generally not accurate and are not in real time.
- **Traffic and Incident Management.** While increases in container volumes at the Port indicate economic growth, it also adds additional pressure to streamline freight operations wherever possible to maintain economic competitiveness. Several truck transportation challenges need to be addressed in order to maintain and improve operational efficiency:

- Delays caused by long gate queues were among the most cited inefficiencies reported by stakeholders. At some terminal gates, trucks have reported two-hour wait periods in many cases, and in extreme cases, four-hour wait periods.
- Chassis lot searches and at-grade rail crossings in the Port further slowdown trucks.
- Motor carriers do not have a reliable way to view CCTV (Closed-Circuit Television) video streams of arterial conditions while in the Port. Currently, only about 25 percent of the CCTV cameras are high definition (HD). This is not sufficient for effective traffic management and incident detection.
- Lack of signal coordination hinders the movement of goods on major truck arterial routes.
- Currently, Port staff uses ad-hoc methods for incident management and they have rudimentary means of gaining situational awareness of Port activities. There are no common incident clearance protocols or information on detour options.

- **Regional Traffic Congestion.** In addition to the congestion at Port gates, there is significant congestion on major freeways and arterials in the dense area around the Port. While real-time freeway travel times are provided through CMS's (Changeable Message Signs) and other sources, there is no information on arterials. Existing CMS messages are focused on general traffic, and do not provide travel time for truckers (e.g., Port exit closures, Port incidents). The highly congested regional freeway system also can cause significant delays for freight traffic traveling to and from areas outside the region via Interstate 80 (I-80), I-238, I-580, and I-880. Trucks approaching from the Central Valley or other areas outside the region require frequent updates on traffic conditions, as congestion can emerge quickly on these interstates and result in unexpected delays.
- **Rail Traffic Interaction.** The at-grade railroad crossings in the Port, specifically on Maritime Street, where three at-grade crossings (two near 7th Street and the other near Middle Harbor Road) can occasionally be simultaneously blocked by one train, which in turn creates queues, modal conflict concerns, and can impact safety. A train blockage at the at-grade crossing of Maritime Street near 7th Street also results in significant truck queues that can extend onto I-880.
- **Truck Safety/Roadway Conditions.** Stakeholders indicated that there are occasions when the truck weight listed on shipping paperwork is inconsistent with the actual container or item. Overweight trucks pose safety risks to themselves and other vehicles on the road, and also result in damage to roadway surfaces and bridges. Weigh in Motion (WIM) is needed 24x7 to accommodate this issue.
- **Environment and Emissions.** Technology and operational strategies can reduce impacts of goods movement activity on the health, safety, and quality of life in neighboring communities. Addressing environmental justice issues while reducing GHG emissions is a major focus of the Alameda County Goods Movement Plan (2016).

- **Parking.** Illegally parked trucks are a common occurrence on Port property and nearby neighborhoods and are not efficiently enforced. Trucks parking on Adeline Street (among other illegal locations) add risk and liability to motor carriers, pedestrians, and bicyclists. While truck parking is available at the Port, the current operating structure is designed for monthly use and not hourly or daily use.

The deficiencies identified above reduce the efficiency of freight movement in and out of the region, reduce the safety of the facilities and neighboring communities, and increase congestion and emissions. This results in significant impact (negative) impact to regional economic vitality and Port's competitiveness in Global Market place. As described in the following subsections, the GoPort Freight ITS has been carefully conceptualized and designed to respond to these challenges, with its primary mission centered on increasing the freight transportation efficiency of the Port, which in turn, will lead to benefits in the areas of efficiency and reliability, congestion relief, productivity, safety, mobility, energy, and environment.

4. Design Elements

4.1 Joint TMC/EOC

The Port joint Transportation Management Center/Emergency Operation Center (TMC/EOC) will be the hub for all the other projects. A video wall and operation stations will be built to provide situational awareness of traffic conditions at the Port. It will be the main integration point between the different ITS elements, the back-end hardware terminals and field devices, and to the City and Caltrans. At the TMC/EOC, the operators will have remote access and control of all the field elements being deployed. TMC/EOC operators will be able to use and integrate information to and from the City and Caltrans, and communicate with the City, Caltrans, MTC, and CHP.

4.2 RFID Readers

The Radio Frequency Identifier (RFID) system will be composed of RFID exciters and RFID sensors. These will generally be deployed around the terminal gates, but also in key areas on Port property. They would also need to be installed in areas leased to the terminal operators. The installation of this system will allow highly accurate measurements of terminal turn times and origin-destination times between key points on the Port property. The RFID exciters would activate the RFID tags that are currently installed on drayage trucks already deployed as part of the Comprehensive Truck Management Program (CTMP) and Secure Truck Enrollment Program (STEP) to address California Air Resources Board (CARB) emissions requirements. These exciters would be installed on an overhead structure between 8 feet to 24 feet above a travel lane entering or exiting a terminal facility. The RFID sensors would be located within 100 feet of the exciter and configured to read the particular assigned lane entry or exit information providing

a time stamped reading during that gate event. The sensors would be connected to the Port network through the existing and expanded fiber optic cable infrastructure.

4.3 ATMS

The centrally controlled signal system will include the installation of National Transportation Communications for ITS Protocol (NTCIP)-compliant traffic signal controller equipment and vehicle detection equipment to allow for interconnectivity between the intersection signal controllers to develop an interconnected actuated traffic signal system. The controllers will be timed in the field and operate under a master-slave relationship (i.e. two or more fully- or semi-actuated local controllers acting as a system master and controlling cycle length for the other controllers) while also allowing capabilities for the Port to have control of the traffic signals from the TMC/EOC through a computer software platform. Providing the ability to program offset timings to maintain green phasing along the main street approach will reduce the number of stops and subsequent truck idling occurring at existing intersections.

Included with the ATMS will be a software platform with graphical user interface to control the traffic management field devices such as traffic signals, CMS's, and CCTVs, etc. It provides centralized control for incident management and information dissemination. Traffic signals that will be interconnected to each other and to the ATMS will be upgraded to the latest 2070 controllers.

The adaptive signal system which expands on the base installation of the ATMS software interfaces with the upgraded traffic signal controllers and vehicle detection equipment to provide real-time adjustments to the cycle lengths, splits and offsets timings in response to traffic demand. The vehicle detection equipment provides the traffic flow data that is gathered and processed to the central computer which is then pushed back to the local controller for timing updates. This central computer server housing the adaptive signal system could be located at HFC. The signal timing updates will be implemented automatically based on a real-time condition.

4.4 Communications (Fiber)

The backbone of the systems is the existing network infrastructure. It is mainly composed of existing fiber cabling between the Port buildings and Port property facilities and field elements. There is also existing fiber cabling between the Port and the City. This infrastructure will be expanded to provide more fiber coverage on Port property, close fiber gaps, and provide connectivity to Port devices, Caltrans TMC, and City TMC.

4.5 CCTV Upgrade to High Definition (HD)

The Port security camera system is currently a mix of standard definition (SD) and HD CCTV cameras deployed around the Port. SD cameras will be replaced with HD cameras and additional new HD cameras will also be deployed to provide additional coverage. With new HD cameras, a camera

communications junction box will also have to be installed to connect the camera to the fiber optic cable infrastructure.

4.6 Queue Detection

Queue detection will be composed video-based equipment installed in key locations around the Port. This equipment will detect vehicles and/or vehicle speed. This equipment will utilize the fiber optic communications pathways.

4.7 Changeable Message Signs

CMS's are electronic visual notification signs. They will be deployed in key locations on the Port property to provide notifications to the public in advance of key decisions points and to provide situational awareness of traffic conditions both on the Port property and the vicinity. The CMS's will connect to the fiber optic cable infrastructure so that they can be remotely controlled. The signs are placed in advance of key decision points on the arterial network so that drivers can receive real-time information prior to making travel route decisions.

4.8 GoPort App

The GoPort app will allow the Port to disseminate information to the public. On the front-end it will be composed of a website and mobile app. On the back-end it will need to run on either a local server system installed in a Port building or over a cloud computing network. Access to the app would be through the Internet. This application will allow users of the Port to go to one comprehensive site to obtain real-time traveler and other pertinent Port information.

4.9 C2C Communication

The design and construction of a Port TMC/EOC forms a basis for the planned center-to-center (C2C) communications systems. Bay Area transportation agencies will be able to exchange information and effectively work together to manage city and regional traffic operations in major incident or emergency situations impacting the Port or goods movement utilizing the TMC/EOC, field devices, and data available from the fully developed GoPort Freight ITS system. In addition, the improvements can provide additional communications means when traditional communications (e.g. landline and cellular phone) are not available. The exchange of this real-time management information is critical to maintain near real-time dissemination of traffic and incident information that occurs within the Port and major trucking routes to and from the Port.

4.10 Supplemental Vehicle Detection

Supplemental vehicle detection will be placed at free flow areas not covered by the queue detection system to provide free flow speeds and vehicle counts and classifications.

4.11 Advanced Train Detection System

The advanced train detection system will be a detection based system that monitors the trains and rail crossings in the Port. When there are trains approaching a crossing, the system provides a notification that the crossing is active. This indication provides potential train crossing delay information to truckers and the public on the CMS's and the GoPort app and can also provide an interface to the traffic controller to allow train preemption (i.e. extended green time at the signal(s) at and near the crossing to minimize trucks being trapped by the train at the crossing).

4.12 Basic Smart Parking System

A Basic Smart Parking System will be composed of entry control equipment and vehicle sensors that would be deployed in a parking lot, and control equipment that would be deployed in one of the Port buildings. The Port does not intend to directly operate truck parking but rather have the system be provisioned and operated privately.

4.13 Weigh-In-Motion (WIM) Technology

WIM scales will be composed of scales and measurement equipment designed to weigh trucks while in motion within the Port property. This would allow truckers to weigh their load before leaving the Port.

4.14 Communications (WiFi)

Wireless fidelity (WiFi) access points are a piece of networking hardware that will be deployed throughout the Port property. It will connect to the fiber optic cable infrastructure and provide a wireless network in addition to the wired network, and also provides coverage in cellular dead spots. This system will allow Port users ubiquitous coverage to the Internet. It will also allow last mile connectivity for the Port to future elements that require connectivity to the Port network.

4.15 Project Cost Estimate

The cost of the project including environmental clearance, final plans, specifications and estimate, construction capital and construction engineering is estimated at $30.6 million. See table below:

Table 3: Project Cost Estimate

	PA&ED	PS&E	Construction	Total
Phase Total Cost (in millions):	$2.5	$4.1	$24.0	$30.6

4.16 Benefit-Cost Assessment Results

In January 2018, the application for TCEP funds was submitted for the Project which analyzed the benefit-cost analysis for the Project. Based on the cost and benefit analysis results using Cal-B/C, the estimated benefit-cost ratio for the FITS project is shown in Table 4. As a reference, a benefit-cost analysis conducted for the FITS project using the FHWA's Tool for Operations Benefit Cost Analysis (TOPS-BC) resulted in benefit-cost ratios of 10.6 to 1 for Year 2020 and 12.0 to 1 for Year 2040.

Table 4: FITS Project Benefit-Cost Ratio

20-Year Life-Cycle Benefits ($ Millions)	20-Year Life-Cycle Costs ($ Millions)	Benefit-Cost Ratio
$260.5	$41.8	6.2 to 1

5. Design Impacts

5.1 Right of Way Impacts

There are currently no anticipated impacts to right of way. Majority of the work will happen over the public right of way, mainly above ground utilizing existing structures. When conflicts are unavoidable, minor utility relocations are expected under franchise agreement. A fiber trunk line proposes to connect the I-880/7th Street signals with the rest of the signals which may require an agreement with UPRR traversing through UPRR right of way.

5.2 Utility Impacts

Current and historical utility records and field information that were received from utility owners who could have facilities within the Project area were mapped to identify locations where the existing utilities could be in potential conflict with the proposed FITS Project elements. It is recommended to pothole all the proposed pole locations and identify the exact location with GPS coordinates to confirm clearance of the proposed poles and foundations from existing utilities.

6. Design Criteria

Design, procurement, evaluation and operations of the FITS project will follow the system engineering methodology, as recommended by Caltrans and the FHWA. A Systems Engineering Process is a structured way of defining and designing a complex system. The Systems Engineering Process is an iterative approach to technical management, procurement, system design, product realization, and technical evaluation at each level of the system, beginning at the top and propagating those processes through a series of steps which eventually lead to a preferred system solution, and then continue

through detailed design, deployment and initial operations. **Figure 2** shows a representation of the Systems Engineering Process called the VEE diagram. Note here that the top of the VEE diagram in **Figure 2** relates each of the systems engineering categories in the figure to the ITS engineering program effort showing at the top of the diagram (e.g., preliminary engineering, construction, etc.).

The Systems Engineering Management Plan (SEMP) is a systems engineering document that was developed for FITS. This document provides overarching guidance on how FITS will be developed using the system engineering approach.

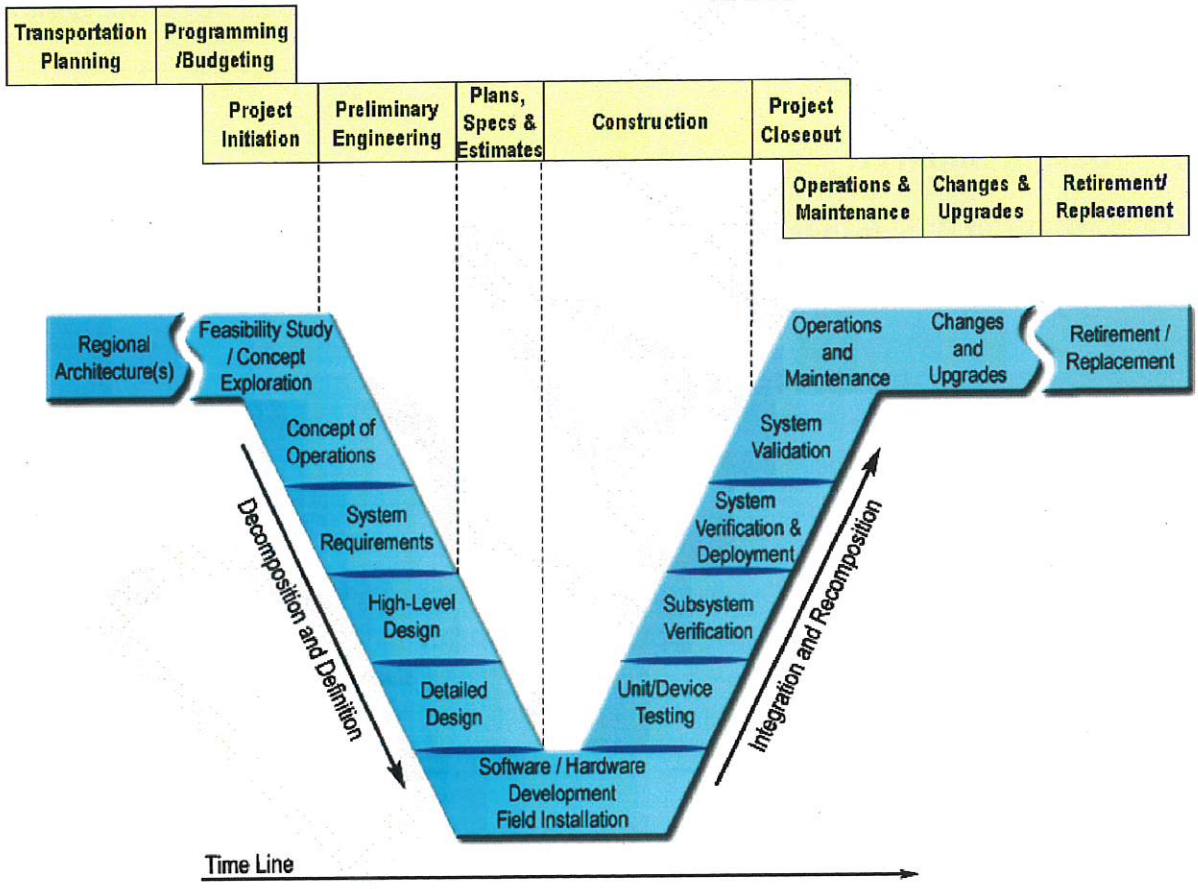

Figure 2: System Engineering Process

The design will also comply with the requirements and standards set by the City of Oakland. The design complies with applicable Port design criteria and standards and other applicable standards of the affected owner agencies, CPUC regulations, policies, procedures, manuals and ITS standards, including compliance with FHWA requirements, and Caltrans standards/procedures for work within Caltrans jurisdiction.

7. Stakeholder Coordination

Key stakeholders for the FITS project include Alameda CTC, Port of Oakland, Caltrans, and City of Oakland. The ConOps Advisory Committee was developed as a forum to obtain public sector agency stakeholder input. Members include the key stakeholders and the MTC. In-person working sessions were held to provide a platform for stakeholders to review and expand upon the user needs identified through the sources above and provide input on recommended potential ITS and technology improvements and solutions. Moving forward agencies such as FHWA and Department of Homeland Security (DHS) will be invited to join.

8. Environmental Determination and Clearance

The Project will have federal involvement with the inclusion of federal funds. The Project has state-level California Environmental Quality Act (CEQA) environmental clearance through the 2002 OAB Redevelopment Environmental Impact Report (EIR) and the 2012 OAB EIR Addendum with the City of Oakland as the Lead Agency and the Port of Oakland as the Responsibly Agency. The 2002 OAB EIR and2012 OAB EIR Addendum can be found at:

http://www2.oaklandnet.com/oakca1/groups/ceda/documents/webcontent/oak036432.pdf and

http://www2.oaklandnet.com/oakca1/groups/ceda/documents/report/oak035061.pdf.

The Project is pursuing a Categorical Exclusion (CE) as part of the NEPA clearance with Caltrans as the Lead Agency. As of July 2018, most environmental technical studies are with Caltrans for review and approval. MTC's Air Quality Conformity Task Force (AQCTF) determined the FITS Project is exempt as an example of a project employing traffic control devices and operating assistance (40 CFR 93.126) and is not a Project of Air Quality Concern. The consultation and subsequent action date was May 24, 2018.

Agenda and meeting materials can be found on MTC's website at:

https://mtc.ca.gov/whats-happening/meetings/meetings-archive/air-quality-conformity-task-force-34.

NEPA clearance is anticipated by October 2018.

Category	Study	Submitted to Caltrans Date	Approval Date
Air Quality[3]	Air Quality PM 2.5 Email	7/12/2018	7/12/2018
Hazardous Materials/Waste	Initial Site Assessment (Phase 1)	7/9/2018	TBD
Water Quality	Water Quality Technical Memorandum	7/9/2018	8/3/2018

Biology	Biological Technical Memorandum	7/5/2018	8/3/2018
Visual Resources	Visual Resources Technical Memorandum	7/9/2018	TBD
Construction	Construction Equipment Staging Memorandum	7/19/2018	TBD
Traffic	Traffic Technical Memorandum	7/9/2018	8/3/2018
Cultural Resources	Area of Potential Effects map, Historic Property Survey Report, and Archaeological Survey Report. Historical Resources Evaluation Report and FOE if necessary.	8/7/2018	TBD

[3] MTC AQCTF determined Project is exempt per CFR 93.126 and is not a project of air quality concern (Date of Consultation: 5/24/2018, Date of Action: 5/24/2018)

9. COST ESTIMATE

Preliminary plans have been completed and are the basis of the $30.6 million project estimate, with a total construction value of $24 million, as shown in **Table 3** and **Table** .

Table 5: Cost/Funding Summary

Phase	Cost Estimate (In Thousands)	Programmed Funds (In Thousands)			
		Local (Measure BB)	State (SB1 TCEP)	Federal (Port Security Grant)	Federal (ATCMTD)
PA&ED	$2,500	$2,500			
PS&E	$4,100	$4,100			
Construction	$24,000		$12,456	$1,824	$9,720
Total:	**$30,600**	**$6,600**	**$12,456**	**$1,824**	**$9,720**

10. Funding and Scheduling

The project funding plan and project delivery schedule are outlined in the Project Programming Request (PPR) and as follows:

Table 6: Project Funding Plan

Funding Source	Amount
Trade Corridor Enhancement Program (SB1)	**$12,456,000**
Advanced Transportation and Congestion Management Technologies Deployment	**$9,720,000**
Measure BB	**$6,600,00**
Port Security Grant	**$1,824,000**
Total	**$30,600,00**

The project delivery schedule is as follows:

Table 7: Project Delivery Schedule

Phase	Begin	End
Project Approval and Environmental Document (PA&ED)		
- CEQA		6/22/2012
- NEPA	11/6/2017	10/31/2018
Plans, Specifications, and Estimate (PS&E)	11/1/2018	3/31/2019
Right of Way (ROW)	11/1/2018	3/31/2019
Construction	8/1/2019	12/31/2021