BENICIA CITY COUNCIL
CITY COUNCIL MEETING AGENDA

April 7, 2026
6:00 PM

Benicia City Hall, Council Chambers
250 East L Street, Benicia, CA 94510

COURTESY ZOOM PARTICIPATION
https://us02web.zoom.us/j/88508047557?pwd=cHRsZlBrYlphU3pkODcycytmcFR2UT09
Meeting ID: 885 0804 7557
Password: 449303
Phone: 1 669 900 9128

1. **CALL TO ORDER (6:00 P.M.)**

2. **CONVENE OPEN SESSION**

3. **ROLL CALL**

4. **PLEDGE OF ALLEGIANCE**

5. **REFERENCE TO THE FUNDAMENTAL RIGHTS OF THE PUBLIC**
   The fundamental rights of each member of the public can be found in the municipal code posted on the City's website and on a plaque that is posted at the entrance to this meeting per section 4.04.030 of the City of Benicia's Open Government Ordinance.

6. **ANNOUNCEMENTS**

   6.A MAYOR'S OFFICE HOURS

   RECOMMENDED ACTION: Mayor Young maintains an open office on the first and third Mondays of the month (except holidays) in the Mayor's office of City Hall from 4:30 to 6:00 p.m. No appointment is necessary. Other meeting times may be scheduled through City Hall by calling 707-746-4200.

7. **PROCLAMATIONS**

8. **APPOINTMENTS**

9. **PRESENTATIONS**

10. **ADOPTION OF AGENDA**

11. **OPPORTUNITY FOR PUBLIC COMMENTS**
    How to Submit Public Comments for this City Council meeting:
    Besides appearing in person and offering public comments, members of the public may provide public comment via Zoom, or to the City Clerk by email at lwolfe@ci.benicia.ca.us. Any comment submitted to the City Clerk should indicate to

which item of the agenda the comment relates to. Specific information follows:

- Comments received by 2:00 pm on the day of the meeting will be electronically forwarded to the City Council and posted on the City's website.

12. WRITTEN COMMENT

13. PUBLIC COMMENT

14. CONSENT CALENDAR

Items listed on the Consent Calendar are considered routine and will be enacted, approved or adopted by one motion unless a request for removal or explanation is received from a Council Member, Staff or member of the public. Items removed from the Consent Calendar shall be considered immediately following the adoption of the Consent Calendar.

14.A MINUTES FROM THE FEBRUARY 19, 2026 AND MARCH 17, 2026, SPECIAL AND REGULAR MEETINGS

February 19, 2026 Special Meeting - Goal Setting Workshop Minutes
March 17, 2026 Special City Council Meeting Minutes
March 17, 2026 Regular City Council Meeting Minutes

14.B ACCEPTANCE OF THE INDUSTRIAL WAY SEWER REPLACEMENT PROJECT

RECOMMENDED ACTION: Adopt a resolution (Attachment 1) accepting the contract change orders (Exhibit A), accepting the Project, Project No. 25-05, as complete, authorizing the City Manager to sign the Notice of Completion (Attachment 2) and authorizing the City Clerk to file said notice with the Solano County Recorder.

Staff Report - Acceptance of Industrial Way Sewer Replacement Project
1. Resolution - Acceptance of Industrial Way Sewer Replacement Project
2. Notice of Completion

14.C ACCEPTANCE OF THE I-80/WATT COURT WATER LINE REPAIR PROJECT

RECOMMENDED ACTION: Adopt a resolution (Attachment 1), accepting the Project, Project No. 25-09, as complete, authorizing the City Manager to sign the Notice of Completion (Attachment 2) and authorizing the City Clerk to file said notice with the Solano County Recorder.

Staff Report - Acceptance of I-80 Watt Court Water Line Repair Project
1. Resolution - Acceptance of I-80 Watt Court Water Line Repair Project
2. Notice of Completion

14.D APPROVAL OF AGREEMENT WITH OPTERRA ENERGY SERVICES, LLC FOR SOLAR PREVENTATIVE MAINTENANCE, REPAIRS AND UPGRADES AND APPROVING BUDGET AMENDMENTS

RECOMMENDED ACTION: Move to adopt a resolution (Attachment 1) approving an agreement with Opterra Energy Services, LLC (Attachment 2) in the amount of $1,603,200 for Solar Preventative Maintenance Services, Repairs and Upgrades

for up to five years, authorizing the Finance Director to make the necessary budget amendments, and authorizing the City Manager and Finance Director to execute the agreement on behalf of the City.
Staff Report - Approval of Solar Agreement
1. Resolution - Approval of Solar Agreement
2. Agreement Opterra Energy Services

14.E APPROVAL OF PUBLICLY AVAILABLE SALARY SCHEDULES AND POSITION ALLOCATION CHANGE FOR THE FINANCE DEPARTMENT

RECOMMENDED ACTION: Adopt a resolution (Attachment 1) approving and adopting publicly available pay schedules (Exhibit A) in accordance with the California Code of Regulations, Title 2, Section 570.5, approving position allocation change, authorizing the Finance Director to make the necessary budget amendments, and authorizing the City Manager to take the necessary administrative steps to implement the actions.
Staff Report - Salary Schedules and Position Allocation Change
1. Resolution - Salary Schedules and Position Allocation Change

14.F AUTHORIZING THE CITY MANAGER TO ENTER THE CITY INTO A PUBLIC SAFETY COMMUNICATIONS SYSTEM LICENSING AGREEMENT WITH SOLANO COUNTY

RECOMMENDED ACTION: Approve a resolution (Attachment 1) that authorizes the City Manager to enter the City into a public safety communications system licensing agreement with Solano County at a fixed annual cost for an initial term of 5 years (Attachment 2).
Staff Report - P25 radio system with Solano County
Resolution - P25 radio system with Solano County
2. Solano County P25 Radio contract

14.G PUBLIC REVIEW OF ANNUAL REPORT OF MILITARY EQUIPMENT USE BY THE BENICIA POLICE DEPARTMENT

RECOMMENDED ACTION: Review AB481 Annual Report - 2025 (Attachment 1) and allow public opportunity to discuss information available in report.
Staff Report - AB481 2025 Annual Report
AB481 2025 Annual Report

14.H APPROVAL TO WAIVE THE READING OF ALL ORDINANCES INTRODUCED OR ADOPTED PURSUANT TO THIS AGENDA

15. BUSINESS ITEMS

15.A STATUS UPDATE ON DELIVERABLES 3 (DECARBONIZATION AND RESILIENCY PATHWAYS) AND 4 (CIP AND YARD EXPANSION FEASIBILITY ANALYSIS) FOR THE PORT OF BENICIA FACILITIES AND INFRASTRUCTURE MODERNIZATION PLAN

RECOMMENDED ACTION: Accept the status update on Deliverable 3

(Attachment 1) and Deliverable 4 (Attachment 2) for the Port of Benicia Facilities and Infrastructure Modernization Plan.

Staff Report - Port of Benicia Facilites and Infrastructure Modernization Plan Status Update

1. Port of Benicia Deliverable 3 - Decarbonization and Resiliency Pathways
2. Port of Benicia Deliverable 4 - CIP and Yard Expansion Feasibility Analysis

16. ADJOURNMENT (8:00 P.M.)

Public Participation

The City of Benicia welcomes your interest and involvement in the City's legislative process. Persons wishing to address the Council, Board, Commission or Committee (CBCC) are asked to voluntarily complete a speaker request form, available at the entrance of Council Chambers, and submit it to the meeting Secretary/City Clerk. Speakers, addressing the CBCC at the time the item is considered, are requested to restrict their comments to the item as it appears on the agenda and stay within the three-minute time limit. The Brown Act does not permit the CBCC to take action on items brought up during the Public Comment period.

As a courtesy, and technology permitting, members of the public may participate remotely. Please be advised that those participating in the meeting remotely via Zoom do so at their own risk. Meetings will not be cancelled due to technical difficulties. The meeting can also be observed on Cable T.V. Broadcast - Check with your cable provider for your local government broadcast channel, or livestream online at www.ci.benicia.ca.us/agendas.

Americans with Disabilities Acts

The City of Benicia is committed to providing meeting facilities that are accessible to persons with disabilities. Meeting materials in alternative formats, a sign language interpreter, real-time captioning, assistive listening devices or other accommodations can be requested by calling (707) 746-4200 or by emailing ADACoordinator@ci.benicia.ca.us, at least four working days prior to a meeting. Assistive listening devices may be obtained at the meeting.

Meeting Procedures

Pursuant to Government Code Section 65009, if you challenge a decision of the CBCC in court, you may be limited to the issues raised during the meeting or in written correspondence delivered to the CBCC by the meeting. You may also be limited to a ninety (90) day statute of limitations when challenging certain administrative decisions, including any final decisions regarding planning or zoning.

The decision of the CBCC is final as of the date of its decision unless judicial review is initiated pursuant to Code of Civil Procedure Section 1094.5. Any such petition for judicial review is subject to the provisions of Code of Civil Procedure Section 1094.6

Public Records and Writings Received After Agenda Posting

A printed version of the agenda packet for this meeting is available at the Benicia Public Library during regular working hours. To the extent feasible, the agenda packet and any writing or documents related to an agenda item for this meeting provided to the CBCC, will be made available for public inspection on the City's web page at www.ci.benicia.ca.us under the heading "Agendas and Minutes." A complete recording of each meeting is available online at www.ci.benicia.ca.us/agendas.

Contact Your Council Members

Voicemail for Mayor and Council Members: (707) 746-4213
Mayor Steve Young: SYoung@ci.benicia.ca.us
Vice Mayor Trevor Macenski: TMacenski@ci.benicia.ca.us
Council Member Kari Birdseye: KBirdseye@ci.benicia.ca.us
Council Member Lionel Largaespada: LLargaespada@ci.benicia.ca.us
Council Member Terry Scott: TScott@ci.benicia.ca.us

DRAFT

MINUTES OF THE
SPECIAL MEETING: CITY COUNCIL
GOAL-SETTING WORKSHOP
FEBRUARY 19, 2026

Clock Tower, 1189 Washington Street, complete proceedings of which are recorded. These are action minutes; a full video is available online at www.ci.benicia.ca.us/agendas.

CALL TO ORDER

Mayor Young called the Special Meeting to order at 9:00 a.m.

ROLL CALL

All Council Members were present.

REFERENCE TO THE FUNDAMENTAL RIGHTS OF THE PUBLIC

ADOPTION OF THE AGENDA

On motion of Council Member Macenski, seconded by Council Member Birdseye, Council approved the Adoption of the Agenda, as presented, on a roll call by the following vote:

Ayes: Council Member Birdseye, Council Member Largaespada, Council Member Macenski, Council Member Scott, Mayor Young
Noes: (None)

OPPORTUNITY FOR PUBLIC COMMENT

Various members of the public spoke.

ANNUAL GOAL SETTING WORKSHOP

Mario Giuliani, City Manager, and various staff members and consultants reviewed the Annual Goal Setting Workshop.

ADJOURNMENT

Mayor Young adjourned the Special Meeting at 3:53 p.m.

_____
City Clerk

DRAFT

MINUTES OF THE
SPECIAL MEETING – CITY COUNCIL
MARCH 17, 2026
4:00 P.M.

City Council Chambers, City Hall, 250 East L Street, complete proceedings of which are recorded. These are action minutes; a full video is available online at www.ci.benicia.ca.us/agendas.

1) CALL SPECIAL MEETING TO ORDER

Mayor Young called the Special Meeting to order at 4:00 p.m.

2) CONVENE OPEN SESSION

3) ROLL CALL

All Council Members were present.

4) REFERENCE TO THE FUNDAMENTAL RIGHTS OF THE PUBLIC

5) PUBLIC COMMENT FOR CLOSED SESSION

None

6) ADJOURN TO CLOSED SESSION

6.A CONFERENCE WITH LABOR NEGOTIATORS

6.B CONFERENCE WITH LEGAL COUNSEL-ANTICIPATED LITIGATION

Mayor Young adjourned the meeting to Closed Session at 4:01 p.m.

7) RECONVENE OPEN SESSION

Mayor Young reconvened the Open Session at 6:00 p.m.

8) ANNOUNCEMENTS FROM CLOSED SESSION, IF ANY

Ben Stock, City Attorney, reported that Council met in Closed Session on two items and took no reportable actions.

9) ADJOURNMENT

Mayor Young adjourned the Special Meeting at 6:00 p.m.

_____
City Clerk

DRAFT

MINUTES OF THE
REGULAR MEETING – CITY COUNCIL
MARCH 17, 2026
6:00 P.M.

City Council Chambers, City Hall, 250 East L Street, complete proceedings of which are recorded. These are action minutes; a full video is available online at www.ci.benicia.ca.us/agendas.

1) CALL TO ORDER (6:00 P.M.)

Mayor Young called the meeting to order at 6:00 p.m.

2) CONVENE OPEN SESSION

3) ROLL CALL

All Council Members were present.

4) PLEDGE OF ALLEGIANCE

5) REFERENCE TO THE FUNDAMENTAL RIGHTS OF THE PUBLIC

6) ANNOUNCEMENTS

6.A MAYOR'S OFFICE HOURS

6.B CURRENT AND UPCOMING OPENINGS ON BOARDS, COMMISSIONS AND COMMITTEES

BCC Openings

7) PROCLAMATIONS

8) APPOINTMENTS

8.A A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BENICIA CONFIRMING THE MAYOR'S APPOINTMENT OF DR. BRETT NELSON TO SOLANO TRANSPORTATION AUTHORITYS BICYCLE ADVISORY COMMITTEE FOR A FULL-TERM ENDING MARCH 1, 2029

RESOLUTION NO. 26- 11 - A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BENICIA CONFIRMING THE MAYOR'S APPOINTMENT OF DR.

BRETT NELSON TO SOLANO TRANSPORTATION AUTHORITY'S BICYCLE ADVISORY COMMITTEE FOR A FULL-TERM ENDING MARCH 1, 2029

Public Comment:
None

Appointment - Dr. Brett Nelson - STA BAC

On motion of Mayor Young, Council approved the adoption of Resolution 26-11, as presented, on a roll call by the following vote:

Ayes: Council Member Birdseye, Council Member Largaespada, Vice Mayor Macenski, Council Member Scott, Mayor Young
Noes: (None)

9) PRESENTATIONS

9.A ECO AWARDS PRESENTATION

9.B VISIT BENICIA TOURISM MARKETING UPDATE

10) ADOPTION OF AGENDA

On motion of Vice Mayor Macenski, seconded by Council Member Birdseye, Council approved the Adoption of the Agenda, as presented, on a roll call by the following vote:

Ayes: Council Member Birdseye, Council Member Largaespada, Vice Mayor Macenski, Council Member Scott, Mayor Young
Noes: (None)

11) OPPORTUNITY FOR PUBLIC COMMENTS

12) WRITTEN COMMENT

13) PUBLIC COMMENT

1. Kathy Kerridge - Ms. Kerridge discussed concern regarding the grant proposal for the Bay Area Air District settlement funds.
2. Vice Mayor Macenski - Vice Mayor Macenski thanked the City Staff who have been working hard to get the sports facilities ready.

14) CONSENT CALENDAR

14.A MINUTES FROM THE FEBRUARY 10, 2026, SPECIAL AND REGULAR MEETING FEBRUARY 17, 2026 AND MARCH 3, 2026 SPECIAL AND REGULAR MEETINGS

February 10, 2026 Special City Council Meeting Minutes
February 10, 2026 State of the City Minutes
February 17, 2026 Regular City Council Meeting Minutes
March 3, 2026 Regular City Council Meeting Minutes

14.B APPROVAL OF AMENDMENT TO TASK ORDER NO. 1 WITH CONSOR NORTH AMERICA, INC. FOR MILITARY WEST PEDESTRIAN BRIDGE REPLACEMENT AND BARRIER REMOVAL PROJECT AND APPROVING A BUDGET AMENDMENT

Staff Report - Approval of Amendment to Task Order No. 1 Consor North America, Inc.
1. Resolution - Approval of Amendment to Task Order No. 1 Consor North America, Inc.
2. Amendment to Task Order No. 1 - Consor North America, Inc.
3. Task Order No. 1 and Original On-Call Master Professional Agreement - Consor North America, Inc.

RESOLUTION NO. 26- 12 - A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BENICIA APPROVING AN AMENDMENT TO TASK ORDER NO. 1 WITH CONSOR NORTH AMERICA, INC. FOR MILITARY WEST PEDESTRIAN BRIDGE REPLACEMENT AND BARRIER REMOVAL PROJECT AND APPROVAL OF A BUDGET AMENDMENT AUTHORIZING THE FINANCE DIRECTOR TO MAKE THE NECESSARY BUDGET AMENDMENT AND AUTHORIZING THE CITY MANAGER AND FINANCE DIRECTOR TO EXECUTE THE AMENDMENT ON BEHALF OF THE CITY

14.C APPROVAL OF SECOND AMENDMENT TO TASK ORDER NO. 2 WITH UNICO ENGINEERING, INC. FOR CONSTRUCTION MANAGEMENT SERVICES FOR THE FY 2025 CITYWIDE PAVEMENT REHABILITATION AND BICYCLE AND PEDESTRIAN IMPROVEMENTS PROJECT

Staff Report - Approval of Second Amendment to Task Order No. 2 with Unico Engineering, Inc.
1. Resolution - Approval of Second Amendment to Task Order No. 2 with Unico Engineering, Inc.
2. Second Amendment to Task Order No. 2 with Unico Engineering, Inc.
3. Task Order No. 2 and Original Master Professional Agreement with Unico Engineering, Inc.

RESOLUTION NO. 26- 13 - A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BENICIA APPROVING A SECOND AMENDMENT TO TASK ORDER NO. 2 WITH UNICO ENGINEERING, INC. FOR CONSTRUCTION MANAGEMENT SERVICES FOR THE 2025 CITYWIDE PAVEMENT REHABILITATION AND BICYCLE AND PEDESTRIAN IMPROVEMENTS

PROJECT AUTHORIZING THE CITY MANAGER TO EXECUTE THE AMENDMENT ON BEHALF OF THE CITY

14.D SECOND AMENDMENT TO THE MEMORANDUM OF UNDERSTANDING BETWEEN THE CITY OF FAIRFIELD AND CITY OF BENICIA FOR COST SHARING OF THE LOPES ROAD PIPELINE RECONSTRUCTION PROJECT AND BUDGET AMENDMENT

Staff Report - Approve Second Amendment to MOU with City of Fairfield
1. Resolution - Approve Second Amendment to MOU with City of Fairfield
2. Second Amendment to Lopes Road MOU with Fairfield with Exhibits 1,2,3

RESOLUTION NO. 26- 14 - A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BENICIA APPROVING A SECOND AMENDMENT TO THE MEMORANDUM OF UNDERSTANDING BETWEEN THE CITY OF FAIRFIELD AND CITY OF BENICIA FOR COST SHARING OF THE LOPES ROAD PIPELINE RECONSTRUCTION PROJECT, AND AUTHORIZING THE CITY MANAGER TO SIGN THE SECOND AMENDMENT ON BEHALF OF THE CITY

14.E AUTHORIZATION OF A GRANT APPLICATION AND RECEIPT OF PROHOUSING INCENTIVE PROGRAM FUNDS

Staff Report - Authorizing Grant Application
1. Resolution - Authoring Grant Application and Receipt of PIP Funds

RESOLUTION NO. 26- 15 - A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BENICIA AUTHORIZING APPLICATION FOR, AND RECEIPT OF, PROHOUSING INCENTIVE PROGRAM FUNDS

14.F APPROVAL TO WAIVE THE READING OF ALL ORDINANCES INTRODUCED OR ADOPTED PURSUANT TO THIS AGENDA

On motion of Vice Mayor Macenski, seconded by Council Member Birdseye, Council approved the adoption of the Consent Calendar, as presented, on a roll call by the following vote:

Ayes: Council Member Birdseye, Council Member Largaespada, Vice Mayor Macenski, Council Member Scott, Mayor Young
Noes: (None)

15) BUSINESS ITEMS

15.A 2025 GENERAL PLAN AND HOUSING ELEMENT ANNUAL PROGRESS REPORT

Staff Report - 2025 General Plan and Housing Element Annual Progress Report

Vivienne Togonon, Associate Planner, reviewed the staff report and PowerPoint presentation.

Council and Staff discussed the presentation.

Public Comment:
None

1. Benicia - 2025 GPHE APR

On motion of Vice Mayor Macenski, seconded by Council Member Birdseye, Council approved the acceptance of the 2025 General Plan and Housing Element Annual Progress Report, on a roll call by the following vote:

Ayes: Council Member Birdseye, Council Member Largaespada, Vice Mayor Macenski, Council Member Scott, Mayor Young
Noes: (None)

15.B FY 2025/26 MIDYEAR BUDGET REPORT

RESOLUTION NO. 26- 16 - A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BENICIA APPROVING THE NECESSARY BUDGET AMENDMENTS TO THE FY 2025/26 BUDGET

Jeff Tschudi, Finance Director, and Roxana Moradi, Budget Manager, reviewed the staff report and a PowerPoint presentation.

Council and Staff discussed the report.

Public Comment:
None

Staff Report - FY26 Midyear Report.pdf
1. Resolution - FY 2025-26 Midyear Budget Amendments
2. FY26 Carryforwards

On motion of Vice Mayor Macenski, seconded by Council Member Largaespada, Council approved by minute order, the acceptance of the FY 2025/26 Midyear Budget Report and the report on posted budget amendments based on delegated

authority related to contractual obligations and Capital Improvement Projects (CIP), on a roll call by the following vote:

Ayes: Council Member Birdseye, Council Member Largaespada, Vice Mayor Macenski, Council Member Scott, Mayor Young
Noes: (None)

On motion of Vice Mayor Macenski, seconded by Council Member Birdseye, Council approved the adoption of Resolution 26-16, as presented, on a roll call by the following vote:

Ayes: Council Member Birdseye, Council Member Largaespada, Vice Mayor Macenski, Council Member Scott, Mayor Young
Noes: (None)

16) CITY COUNCIL TASK FORCE GROUPS: ADVOCACY, COLLABORATION AND TRANSITION (ACT)

16.A AD HOC "ACT" TASK FORCE GROUPS UPDATES

Ad Hoc "ACT" Task Force Groups Updates

17) COUNCIL MEMBER COMMITTEE REPORTS

17.A COUNCIL MEMBER COMMITTEE REPORTS

Council Member Committee Reports

18) ADJOURNMENT (8:30 P.M.)

Mayor Young adjourned the meeting at 8:56 p.m.

_____
City Clerk

AGENDA ITEM
CITY COUNCIL MEETING DATE – APRIL 7, 2026
CONSENT CALENDAR

TO : City Manager

FROM : Public Works Director

SUBJECT : **ACCEPTANCE OF THE INDUSTRIAL WAY SEWER REPLACEMENT PROJECT**

EXECUTIVE SUMMARY:

The Industrial Way Sewer Replacement Project (Project), Project No. 25-05, Munis Project No. 830029, consisted of replacing a single section of existing 10-inch sewer main between two existing manholes on Industrial Way within the city limits. The original construction budget was $454,207.20 (including contingency), adopted in Resolution Number 25-47 on May 6, 2025. Construction is now complete.

RECOMMENDATION:

Adopt a resolution (Attachment 1) accepting the contract change orders (Exhibit A), accepting the Project, Project No. 25-05, as complete, authorizing the City Manager to sign the Notice of Completion (Attachment 2) and authorizing the City Clerk to file said notice with the Solano County Recorder.

BUDGET INFORMATION:

The final construction cost, including two change orders, is $384,715.70, which is $69,491.50 under the $454,207.20 construction budget. Sufficient budget for this Project is available for the closeout and completion of the Project from Account No. 7108031-7088.

Construction Costs			
Construction (A3 Pipeline)	FY26	$	378,506.00
Change Orders (2) (A3 Pipeline)	FY26	$	6,209.70
Total			**$384,715.70**

BACKGROUND:

In February 2025, staff responded to a sewer overflow on Industrial Way, investigated the system using a Closed-Circuit Television video camera, and determined a portion of the gravity sewer main had collapsed. Staff installed a sewage bypass pump system to stop the overflow. Staff further investigated the sewer main and found additional collapse sections. Staff hired a contractor to perform exploratory digging at strategic

points to help determine the overall condition of the pipe. This work revealed large sections of the sewer pipe had failed and large voids had developed around the old pipe alignment under the roadway.

Staff engaged the City's on-call engineering firm, Coastland Engineering (Coastland) to assess the damage and possible repair or replacement options. Coastland recommended replacing the entire gravity sewer pipeline (480 feet) between manholes at 3820 Industrial Way and 3852 Industrial Way. Coastland assessed various replacement options, including pipe bursting, directional drilling, and open-cut trenching. Coastland recommended removing and replacing the entire pipeline section using open-cut trenching. Coastland was contracted under the existing on-call contract to design the sewer replacement.

Construction bids were solicited and received in April 2025. Council awarded the construction contract to A3 Pipeline on May 6, 2025, for $378,506 plus construction contingency of $75,701.20 for total construction budget of $454,207.20. Construction took place from June 2025 to August 2025. The final construction cost, including two change orders, is $384,715.70, which is $69,491.50 under the $454,207.20 construction budget.

NEXT STEPS:
If the Council adopts the resolution, the City manager will sign the Notice of Completion, which will be filed with the Solano County Recorder by the City Clerk.

ALTERNATIVE ACTIONS:
None.

CEQA Analysis	This Project is categorically exempt from the California Environmental Quality Act (CEQA) per Section 15302, which exempts the replacement or reconstruction of existing utility systems and/or facilities involving negligible or no capacity expansion.

ATTACHMENTS:
1. Resolution – Industrial Way Sewer Replacement Project
   Exhibit A – Summary of the Contract Change Orders
2. Notice of Completion

For more information, contact Danielle Bonham, Public Works Director
Phone: 707-746-4240
E-mail: PW@ci.benicia.ca.us

RESOLUTION NO. 26-

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BENICIA ACCEPTING THE INDUSTRIAL WAY SEWER REPLACEMENT PROJECT AS COMPLETE, AUTHORIZING THE CITY MANAGER TO SIGN THE NOTICE OF COMPLETION, AUTHORIZING THE CITY CLERK TO FILE SAME WITH THE SOLANO COUNTY RECORDER'S OFFICE

WHEREAS, on May 6, 2025, the City Council adopted Resolution No. 25-47 awarding the construction contract for the Industrial Way Sewer Replacement Project to A3 Pipeline in the amount of $378,506 plus construction contingency of $75,701.20 for total construction budget of $454,207.20; and

WHEREAS, the final, total construction cost is shown in the table below; and

Construction Costs				
	Construction (A3 Pipeline)	FY26	$	378,506.00
	Change Orders (2) (A3 Pipeline)	FY26	$	6,209.70
	Total			**$384,715.70**

WHEREAS, a summary of the Project change order is attached as Exhibit A; and

WHEREAS, A3 Pipeline has completed the work in accordance with the plans and specifications and to the satisfaction of the City Engineer.

NOW, THEREFORE, BE IT RESOLVED THAT the City Council of the City of Benicia does hereby accept the Industrial Way Sewer Replacement Project, Project No. 25-05, as complete, for a total construction cost of $384,715.70.

BE IT FURTHER RESOLVED that the City Manager is hereby authorized to sign the Notice of Completion and the City Clerk is authorized to file said Notice with the Solano County Recorder.

*****

On motion of Council Member , seconded by Council Member , the above Resolution was adopted by the City Council of the City of Benicia at a regular meeting of said Council held on the 7th day of April 2026 by the following vote:

Ayes:

Noes:

Absent:

Abstain:

_____
Steve Young, Mayor

Attest:

_____
Lisa Wolfe, City Clerk

_____
Date

Exhibit A
Summary of the Contract Change Order
[see next page]

EXHIBIT A—SUMMARY OF THE CONTRACT CHANGE ORDERS

Contract Change Order No.	Description	Amount
1	Eliminated need for builder's risk insurance	No Cost
2	Increased paving limits necessary to address repair work associated with roadway damage which occurred after completion of bid documents but prior to starting work.	$6,209.70
	Total Amount Approved by this Resolution:	**$6,209.70**

Recorded at the request of:
CITY OF BENICIA

After recording return to:
CITY OF BENICIA
ATTN: CITY CLERK'S OFFICE
250 EAST L STREET
BENICIA, CA 94510

NOTICE OF COMPLETION

NOTICE IS HEREBY GIVEN THAT:

1. The City of Benicia, 250 East L Street, Benicia, CA, 94510, is the owner of the construction project described as:

   Industrial Way Sewer Replacement Project, completed in the City of Benicia, County of Solano, State of California

   Nature of title as stated owner: In Fee.

2. A Capital Improvements Project known as the Industrial Way Sewer Replacement Project, located on Industrial Way (between manholes at 3820 Industrial Way and 3852 Industrial Way) in the City of Benicia, CA 94510 was completed in the amount of $384,715.70 and accepted by the City Council of the City of Benicia on April 7, 2026.

3. The name of the contractor for the improvement is **A3 Pipeline, San Francisco, CA.**

CITY OF BENICIA

Dated: _____ By: _____
Mario Giuliani, City Manager

Attest:

_____
Lisa Wolfe, City Clerk

The undersigned, being duly sworn, says: that she is the person signing the above document; that she has read the same and knows the contents thereof, and that the facts stated therein are true, under penalty of perjury.

_____
Lisa Wolfe, City Clerk

AGENDA ITEM
CITY COUNCIL MEETING DATE – APRIL 7, 2026
CONSENT CALENDAR

TO : City Manager

FROM : Public Works Director

SUBJECT : **ACCEPTANCE OF THE I-80/WATT COURT WATER LINE REPAIR PROJECT**

EXECUTIVE SUMMARY:
The I-80/Watt Court Water Line Repair Project (Project), Project No. 25-09, Munis Project No. 822001, consisted of evaluating the constructability of the alternatives and performing the emergency repairs. The original construction budget was $960,000 (including 20% contingency), adopted in Resolution No. 25-135 on December 16, 2025. Construction is now complete.

RECOMMENDATION:
Adopt a resolution (Attachment 1), accepting the Project, Project No. 25-09, as complete, authorizing the City Manager to sign the Notice of Completion (Attachment 2) and authorizing the City Clerk to file said notice with the Solano County Recorder.

BUDGET INFORMATION:
The final construction cost is $790,673.68 and was funded from Account No. 7508021-7087 (Water Distribution – Preventative Maintenance) Project 822001. There were no change orders.

BACKGROUND:
On October 7, 2025, a water leak was confirmed exiting the protective pipe casing that contains the City's 24-inch raw water line under I-80. This line supplies raw water from the Putah South Canal (PSC) pump station to Benicia. The PSC line is one of the City's two primary raw water sources. The City's alternative long-term water source (North Bay Aqueduct) was scheduled to be shut down by the State for three to four weeks starting February 2026. Without prompt repair to the PSC line, the City would have been reliant on Lake Herman as its only source of water, which has limited supply.

In accordance with Benicia Municipal Code Section 3.09.050.C and Public Contract Code Section 22050(b)(1), Public Works took immediate action by entering into a contract with Weber General Engineering, Inc. to perform the emergency repairs, bypassing the standard competitive bidding process due to the urgent nature of the work.

Proceeding with competitive bidding under the Public Contract Code at that time would have resulted in delays that posed a serious risk of the City being without water. Accordingly, emergency procurement was fully justified. The City solicited and received three comparable Statements of Qualifications and selected the contractor, Weber General Engineering, Inc., with prior experience on this line.

On December 16, 2025, the Benicia City Council ratified the emergency declaration and related actions through City Resolution no. 25-135.

Work began on December 17, 2025, and was completed by January 30, 2026.

NEXT STEPS:
If the Council adopts the resolution, the City Manager will sign the Notice of Completion, which the City Clerk will file with the Solano County Recorder.

ALTERNATIVE ACTIONS:
None.

CEQA Analysis	This Project is categorically exempt from the California Environmental Quality Act (CEQA) per Section 15302, which exempts the replacement or reconstruction of existing utility systems and/or facilities involving negligible or no capacity expansion.

ATTACHMENTS:
1. Resolution - I-80/Watt Court Water Line Repair Project
2. Notice of Completion

For more information, contact Danielle Martinez, Public Works Director
Phone: 707-746-4240
E-mail: pw@ci.benicia.ca.us

RESOLUTION NO. 26-

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BENICIA ACCEPTING THE I-80/WATT COURT WATER LINE REPAIR PROJECT AS COMPLETE, AUTHORIZING THE CITY MANAGER TO SIGN THE NOTICE OF COMPLETION, AUTHORIZING THE CITY CLERK TO FILE SAME WITH THE SOLANO COUNTY RECORDER'S OFFICE

WHEREAS, on October 7, 2025, a water leak was confirmed from the City's 24-inch raw water line under Interstate 80 (I-80); and

WHEREAS, without prompt repair, the City would have lost access to its two primary water sources; and

WHEREAS, in accordance with Benicia Municipal Code Section 3.09.050.C and Public Contract Code Section 22050(b)(1), Public Works took immediate action by entering into a contract with Weber General Engineering Inc. to perform the emergency repairs, bypassing the standard competitive bidding process due to the urgent nature of the work; and

WHEREAS, on December 16, 2025, the City Council adopted Resolution No. 25-135 ratifying the emergency procurement declaration and approved a $960,000 budget amendment; and

WHEREAS, on February 3, 2026, the City Council adopted Resolution No. 26-5 terminating the declaration of emergency procurement as the repairs have been completed; and

WHEREAS, the final, total construction cost is $790,673.68; and

WHEREAS, Weber General Engineering has completed the work in accordance with the plans and specifications and to the satisfaction of the City Engineer.

NOW, THEREFORE, BE IT RESOLVED THAT the City Council of the City of Benicia does hereby accept the I-80/Watt Court Water Line Repair Project, Project No. 25-09, as complete, for a total construction cost of $790,673.68.

BE IT FURTHER RESOLVED that the City Manager is hereby authorized to sign the Notice of Completion and the City Clerk is authorized to file said Notice with the Solano County Recorder.

*****

On motion of Council Member , seconded by Council Member , the above Resolution was adopted by the City Council of the City of Benicia at a regular meeting of said Council held on the 7th day of April 2026 by the following vote:

Ayes:

Noes:

Absent:

Abstain:

_____
Steve Young, Mayor

Attest:

_____
Lisa Wolfe, City Clerk

_____
Date

Recorded at the request of:
CITY OF BENICIA

After recording return to:
CITY OF BENICIA
ATTN: CITY CLERK'S OFFICE
250 EAST L STREET
BENICIA, CA 94510

NOTICE OF COMPLETION

NOTICE IS HEREBY GIVEN THAT:

1. The City of Benicia, 250 East L Street, Benicia, CA, 94510, is the owner of the construction project described as:

   I-80/Watt Court Raw Water Transmission Line Repair Project, completed in the city of Fairfield, County of Solano, State of California

   Nature of title as stated owner: In Fee.

2. A Capital Improvements Project known as the I-80/Watt Court Water Line Repair Project, located under I-80 near Watt Court in Fairfield, CA 94510 was completed in the amount of $790,673.68 and accepted by the City Council of the City of Benicia on April 7, 2026.

3. The name of the contractor for the improvement is **Weber General Engineering, Dixon, CA.**

CITY OF BENICIA

Dated: _____ By: _____
Mario Giuliani, City Manager

Attest:

_____
Lisa Wolfe, City Clerk

The undersigned, being duly sworn, says: that she is the person signing the above document; that she has read the same and knows the contents thereof, and that the facts stated therein are true, under penalty of perjury.

_____
Lisa Wolfe, City Clerk

AGENDA ITEM
CITY COUNCIL MEETING DATE – APRIL 7, 2026
CONSENT CALENDAR

TO : City Manager

FROM : Public Works Director

SUBJECT : **APPROVAL OF AGREEMENT WITH OPTERRA ENERGY SERVICES, LLC FOR SOLAR PREVENTATIVE MAINTENANCE, REPAIRS AND UPGRADES AND APPROVING BUDGET AMENDMENTS**

EXECUTIVE SUMMARY:

The city has solar arrays at 10 facilities. All solar equipment requires annual operations and maintenance preventative service. Additionally, one-time solar repairs and upgrades are needed on all solar sites. City staff recommends entering into an agreement with Opterra Energy Services, LLC for an initial term of two years, with the option for three additional one-year terms, for a total of up to five years, for solar preventative maintenance, repairs and upgrades.

RECOMMENDATION:

Move to adopt a resolution (Attachment 1) approving an agreement with Opterra Energy Services, LLC (Attachment 2) in the amount of $1,603,200 for Solar Preventative Maintenance Services, Repairs and Upgrades for up to five years, authorizing the Finance Director to make the necessary budget amendments, and authorizing the City Manager and Finance Director to execute the agreement on behalf of the City.

BUDGET INFORMATION:

The cost of the full five-year potential term of the Agreement, including the three Optional Terms, is $1,603,200. A budget amendment, in the amount of $697,500, is needed to fund the first year of the solar agreement in Account No. 6452900-7011 (Solar ISF – Professional Services) for the repair, upgrades, and maintenance costs funded by $200,000 from Solar Fund balance (Fund 645), $279,800 from Water Fund balance (Fund 750), and $217,700 from a transfer from the General Fund. The transfers from the Water Fund and the General Fund represent a cost share of each fund's related equipment. An additional budget amendment is being recommended to add $100,000 in utility budget (6452900-7210 Electricity) from fund balance which was inadvertently not budgeted during budget development.

One-time repair and upgrade costs are included only in year one. Annual preventative maintenance and additional services are in all five years. Each year, $150,000 has been allocated for unforeseen additional services. Breakout by year is shown below:

Solar Service	Year 1	Year 2	Year 3	Year 4	Year 5	Total
One-Time Repairs/Upgrades	$480,000	$0	$0	$0	$0	$480,000
Annual Maintenance	$67,500	$70,900	$74,500	$78,200	$82,100	$373,200
Additional Services	$150,000	$150,000	$150,000	$150,000	$150,000	$750,000
Total	**$697,500**	**$220,900**	**$224,500**	**$228,200**	**$232,100**	**$1,603,200**

If the City does not exercise the Optional Terms, total compensation under this Agreement shall not exceed $918,400 for the initial term (year 1 and year 2).

BACKGROUND:
The city owns solar photovoltaic at the following ten facilities, which were installed between 2010-2012.

1. City Hall
2. Community Center
3. Community Park
4. Corporation Yard
5. Fire Station #12
6. James Lemon Swim Center
7. Water Treatment Plant
8. Water Pump Station P-1
9. Water Pump Station P-2
10. Water Pump Station P-3

Annual preventative maintenance (e.g. panel washing and electrical preventative maintenance), along with one-time repairs and upgrades are needed. The following one-time repairs/upgrades are needed in 2026.

[This space intentionally left blank]

Solar Site	One-Time Repairs and Upgrades	Cost
1. City Hall	Upgrade meter and upgrade monitoring service	$7,000
2. Community Center	Upgrade monitoring service	$2,000
3. Community Park	Upgrade monitoring service	$2,000
4. Corporation Yard	Replace inverter/AC/Aux power supply and upgrade monitoring service	$19,000
5. Fire Station #12	Upgrade monitoring service	$2,000
6. James Lemon Swim Center	Replace inverter and upgrade monitoring service	$87,000
7. Water Treatment Plant	Upgrade two meters and upgrade monitoring service	$11,000
8. Water Pump Station P-1	Upgrade two meters and upgrade monitoring service	$11,000
9. Water Pump Station P-2	Upgrade meter, replace inverter, and upgrade monitoring service	$82,000
10. Water Pump Station P-3	Upgrade meter, replace two inverters and appurtenances, and upgrade monitoring service	$257,000
TOTAL		**$480,000**

This procurement is being conducted through a competitively solicited cooperative purchasing agreement available through Omnia Partners for Opterra Energy Services, LLC (Contract No. R221501), in accordance with Benicia Municipal Code Section 3.10.060. The cooperative contract remains effective through June 30, 2027.

NEXT STEPS:
If approved, the agreement will be routed for signatures and work will commence.

ALTERNATIVE ACTIONS:
If Council chooses not to approve the agreement or budget amendments, the solar facilities will not be repaired/upgraded/maintained, and the city will be out of compliance with the purchasing and budget control policy.

CEQA Analysis	Staff has determined that this Project is Categorically Exempt per CEQA Section 15301 (c), which applies to repair and maintenance of existing facilities.

ATTACHMENTS:
1. Resolution – Approval of Solar Agreement
2. Proposed Agreement - Approval of Solar Agreement

For more information, contact: Danielle Martinez, Public Works Director
Phone: 707-746-4240
E-mail: PW@ci.benicia.ca.us

RESOLUTION NO. 26-

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BENICIA APPROVING AN AGREEMENT WITH OPTERRA ENERGY SERVICES, LLC FOR SOLAR PREVENTATIVE MAINTENANCE, REPAIRS AND UPGRADES, AUTHORIZING A BUDGET AMENDMENT, AND AUTHORIZING THE CITY MANAGER AND FINANCE DIRECTOR TO EXECUTE THE AGREEMENT ON BEHALF OF THE CITY

WHEREAS, the city owns solar photovoltaic on ten facilities; and

WHEREAS, annual operations and maintenance preventative maintenance and repairs and upgrades are needed on all ten solar sites; and

WHEREAS, Opterra Energy Services, LLC submitted a proposal to conduct this work and this is a sole source procurement due to Opterra's cooperative agreement through Omnia Partners for Opterra Energy in accordance with BMC 3.10.060 and the Omnia Partners contract (#R221501), which has been renewed through June 30, 2027; and

WHEREAS, City Staff recommends approving an agreement with Opterra Energy Services, LLC in the amount of $1,603,200 for up to five years; and

WHEREAS, a budget amendment for Fiscal Year 2026, in the amount of $697,500, is necessary to increase expense appropriations in Account No. 6452900-7011 for the repair, upgrades, and maintenance costs funded by $200,000 from Solar Fund balance (Fund 645), $279,800 from Water Fund balance (Fund 750), and $217,700 from a transfer from the General Fund; and

WHEREAS, an additional budget amendment is being recommended to add $100,000 in utility budget (6452900-7210 Electricity) from fund balance which was inadvertently not budgeted during budget development; and

WHEREAS, the City's purchasing policy requires Council approval when a Public Works contract for services exceeds $200,000 (Benicia Municipal Code: 3.10.030 Procurement of Services); and

NOW, THEREFORE, BE IT RESOLVED THAT the City Council of the City of Benicia does hereby approve the agreement with Opterra Energy Services, LLC for Solar Preventative Maintenance, Repairs and Upgrades and authorizes the City Manager and Finance Director to execute the agreement on behalf of the City.

BE IT FURTHER RESOLVED THAT the Finance Director is authorized to make the necessary budget amendments.

*****

On motion of Council Member, seconded by Council Member, the above Resolution was adopted by the City Council of the City of Benicia at a regular meeting of said Council held on the 7th day of April 2026 by the following vote:

Ayes:

Noes:

Absent:

Abstain:

_____

Steve Young, Mayor

Attest:

_____

Lisa Wolfe, City Clerk

_____

Date

Contract ID # 26-198

DIR # TBA

PROFESSIONAL MAINTENANCE OR REPAIRS SERVICES AGREEMENT

(OVER $50,000)

BETWEEN

CITY OF BENICIA AND

Opterra Energy Services, LLC

This Professional Services Agreement (the "Agreement") is dated March 18, 2026, and is by and between the City of Benicia, a political subdivision of the State of California ("City") and Opterra Energy Services, LLC, a California Limited Liability Company, licensed to do business in California, ("Consultant") relating to Solar Preventative Maintenance, Repairs and Upgrades (“Services").

Recitals

WHEREAS, City wishes to retain Consultant to provide Solar Preventative Maintenance, Repairs and Upgrades services and related services;

WHEREAS, Consultant was selected by means of City's consultant selection process, and represents that they possess all necessary training, licenses and permits to perform the services required by City as set forth in this Agreement, and that their performance of such services will conform to the standard of practice consistent with a firm having experience and expertise in performing professional services of like nature and complexity working on similar, successfully completed projects;

WHEREAS, Government Code section 53060 permit the City to enter into agreements for professional temporary services with individuals specially trained and experienced and competent to perform those services; and

WHEREAS, the services proposed in this Agreement are professional and temporary in nature.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, stipulated and agreed, the parties agree as follows:

1. Agreement

1.1. Definitions

Where any word or phrase defined below, or a pronoun used in place thereof, is used in any part of this Agreement, it shall have the meaning herein set forth.

A. **Agreement:** This Agreement consists of this Agreement, together with all exhibits and appendices and other documents incorporated herein by reference.

B. **Consultant:** Opterra Energy Services, LLC

C. **City:** City of Benicia

D. **Project:** Solar Preventative Maintenance, Repairs and Upgrades, 26-198

E. **Services:** All work, labor, materials and services required under the terms and conditions of this Agreement, provided pursuant to the terms and conditions of this Agreement, including without limitation architectural, engineering, building information modeling, coordination, and administrative services. Services that may be required, dependent on Project needs, are further described in the appendices.

F. **Subconsultants:** Consultant's subconsultants, contractors and subcontractors, of any tier.

1.2. Term of Agreement

A. The term of this Agreement shall commence on March 18, 2026 and shall continue for two (2) years ("Initial Term"), unless earlier terminated in accordance with this Agreement.

B. At the City's sole discretion, the Agreement may be extended for three (3) additional one (1) year terms (each an "Optional Term") by written notice to Consultant prior to expiration of the then-current term. Exercise of each Optional Term is subject to annual budget appropriation.

1.3. Services Consultant Agrees to Perform

A. Consultant shall perform all O&M Annual Preventative Maintenance Services described in Exhibit A attached hereto and incorporated by reference as though fully set forth herein. Consultant and City will meet within 30 days of the commencement of this Agreement to prioritize and plan for the sequencing of the T&M Repair Projects outlined in Exhibit A. City and Consultant will agree on a schedule for the first T&M Repair Project and Consultant agrees to diligently pursue that repair project providing budget and schedule updates to City no less frequently than monthly. Subsequent T&M Repair Projects will follow a similar pattern of agreement on priority, schedule, and reporting. If the costs of the T&M Repair Projects outlined in Exhibit A exceed the estimate provided, the additional costs will be included within the existing contract authority and annual not to exceed allowance included for Year 1 miscellaneous repairs listed below in Section 1.4 A and described in Exhibit A. If T&M Repair Projects not included in Exhibit A are necessary, City must contact Consultant and submit a request for quotation. Consultant will inspect the damage and provide a written quotation and complete scope of work to City. Before proceeding with repairs, Consultant and City must scope the additional work and Consultant must provide a quotation amount. If it is determined that such additional work is within the existing contract authority and annual not to exceed allowance of the contract listed below in Section 1.4 A, then City must execute a Work Order, on Consultant's form attached hereto as Exhibit B, for the agreed scope of work and quotation amount. If such additional T&M Repair Projects exceeds the authority annual not to exceed

allowance listed below in Section 1.4 A, City shall amend this Agreement as described herein in Section 1.5 B prior to executing the Work Order.

B. Consultant will recover compensation for T&M Repair Projects as set forth in Exhibit A, in conformance with the City's Purchasing Policy and Benicia Municipal Code.

C. Should the progress of the Services under this Agreement at any time fall behind schedule for any reason other than Excusable Delays, Consultant shall apply such additional manpower and resources as necessary without Additional Services Compensation to bring progress of the Services under this Agreement back on schedule and consistent with the standard of professional skill and care required by this Agreement. Time is of the essence in the performance of this Agreement. Excusable Delays include acts of God, acts of the public enemy, and delays beyond Consultant's reasonable control as determined at the sole discretion of City.

1.4. Compensation

A. Consultant/Contractor shall be compensated for services performed under this Agreement in an amount not to exceed One Million Six Hundred Three Thousand Two Hundred Dollars ($1,603,200) over the full five-year potential term of the Agreement, including the three (3) Optional Terms, if exercised.

Compensation shall be allocated as follows:

Year 1: Not to exceed $697,500 (includes O&M Annual Maintenance Services fixed fee of $67,500 and a $630,000 not to exceed allowance for T&M Repair Projects)

Year 2: Not to exceed $220,900 (includes O&M Annual Maintenance Services fixed fee of $70,900 and a $150,000 not to exceed allowance for T&M Repair Projects)

Year 3 (Optional): Not to exceed $224,500 (includes O&M Annual Maintenance Services fixed fee of $74,500 and a $150,000 not to exceed allowance for T&M Repair Projects)

Year 4 (Optional): Not to exceed $228,200 (includes O&M Annual Maintenance Services fixed fee of $78,200 and a $150,000 not to exceed allowance for T&M Repair Projects)

Year 5 (Optional): Not to exceed $232,100 (includes O&M Annual Maintenance Services fixed fee of $82,100 and a $150,000 not to exceed allowance for T&M Repair Projects)

If the City does not exercise the Optional Terms, total compensation under this Agreement shall not exceed Nine Hundred Eighteen Thousand Four Hundred Dollars ($918,400) for the Initial Term which is the sum of Years 1 and 2.

B. For O&M Annual Preventative Maintenance, billing will occur quarterly in advance. Payment is expected within 30 days. Any amount not paid when due will, from and after the due date, bear Interest. Accrued and unpaid Interest on past due amounts (including Interest on past due Interest) will be due and payable upon demand.

C. For T&M Repair Project work, billing will occur monthly with invoices reflecting costs incurred during the month, and an updated estimation of the total cost to complete the project. Payment is expected within 30 days. Consultant has the option to invoice for services or reimbursables no more than once a month. Payment shall be in accordance with the project-specific scope of work for work performed, not a retainer or equal monthly payments. Statement will generally describe the services performed and applicable rate or rates. Statements for reimbursement should include a reasonable itemization of requested compensation. If more than one T&M Repair Project is in progress simultaneously, Consultant will provide separate billing for each T&M Repair Project.

D. City shall not be liable for, and Consultant shall not be entitled to, any payment for Services performed before this Agreement's execution.

E. City will not withhold entire payment if a questioned amount is involved, but will issue payment in the amount of the total invoice less any questioned amount(s). City will make payment for questioned amounts(s) upon City's receipt of any requested documentation verifying the claimed amount(s) and City's determination that the amount is due under the terms of this Agreement. City shall advise Consultant, in writing, within 15 calendar days of receipt of the requested documentation.

F. Invoices furnished by Consultant under this Agreement must be in the form attached hereto as Exhibit C. All amounts paid by City to Consultant shall be subject to audit by City. Payment shall be made by City to Consultant at the address stated in Section 1.6, Qualified Personnel below.

G. City may set off against payments due Consultant under this Agreement any sums that City determines that Consultant owes to City because of their errors, omissions, breaches of this Agreement, delays or other acts that caused City monetary damages. Prior to exercising such right, City must demand and attend mediation pursuant to Section 1.21, Disputes: Paragraph C below of this Agreement, to be attended by City, Consultant, and any applicable insurance carriers; such mediation to occur within 30 calendar days of demand. If the parties cannot agree upon the time, place, and mediator, within one week of the City's demand, then the Solano City Superior Court may upon application by any party make such selection for the parties. If a party other than City refuses to mediate under this Compensation: Paragraph E, then City shall have satisfied its obligations under this Paragraph.

H. Consultant shall pay prevailing wages to its employees on any contract in excess of $1,000.00. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California

Department of Industrial Relations, are on file at the City's Public Works Department and may be obtained from the California Department of Industrial Relations website [http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm]. Consultant shall comply with the 8-hours per day/40 hours per week/overtime/working hours restrictions for all employees, pursuant to the California Labor Code. Consultant and all subcontractors shall keep and maintain accurate employee payroll records for Work performed under the Agreement. The payroll records shall be certified and submitted as required by law, including Labor Code Sections 1771.4 (if applicable) and 1776, including to the Labor Commissioner no less frequently than monthly. Consultant shall comply fully with Labor Code Section 1777.5 in the hiring of apprentices for work relating to the Agreement. If the Agreement exceeds $2,000 and is funded with federal funds, then Consultant shall pay federal Davis Bacon wages and comply with applicable federal requirements.

I. Pursuant to Labor Code Section 1771(a), Consultant represents that it and all of its Subcontractors are currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5. Consultant covenants that any additional or substitute Subcontractors will be similarly registered and qualified.

1.5. Maximum Costs

A. City's obligation hereunder shall not at any time exceed the amount approved by City for payment to the Consultant pursuant to the terms of this Agreement.

B. Except as may be provided by applicable law governing emergency conditions, City has not authorized its City Council, supervisors, employees, officers and agents to request Consultant to perform Services or to provide materials, equipment and supplies that would result in Consultant performing Services or providing materials, equipment and supplies that exceed the scope of the Services, materials, equipment and supplies agreed upon in the Agreement unless the City amends the Agreement in writing and approves the amendment as required by law to authorize the additional Services, materials, equipment or supplies.

C. City shall not reimburse Consultant for Services, materials, equipment or supplies provided by Consultant beyond the scope of the Services, materials, and office equipment and supplies agreed upon in the Agreement and unless approved by a written amendment to the Agreement having been executed and approved in the same manner as this Agreement.

1.6. Qualified Personnel

For purposes of this Agreement, except for notices specified under Notices to the Parties below, City and Consultant shall direct all communications to each other as follows:

City:
Jeff Gregory
Deputy Public Works Director – Utilities

City of Benicia
250 East L Street
Benicia, CA 94510
Phone: (707) 746-4790
Email: jgregory@ci.benicia.ca.us

Consultant:
Jamal Aboueljoud
Director of Operations & Maintenance
500 12th Street, Suite 300, Oakland, CA 94607
Phone: (916) 358-0024
Email: jaboueljoud@opterraenergy.com

Services under this Agreement shall be performed only by qualified, competent personnel under the supervision of and/or in the employment of Consultant. Consultant shall conform with City's reasonable requests regarding assignment of personnel, but all personnel, including those assigned at City's request, shall be supervised by Consultant.

Consultant agrees that professional personnel assigned to the Project will be those listed in Exhibit A, and by this reference incorporated herein, and that the listed personnel will continue their assignments on the Project during the entire term of this Agreement. It is recognized that the listed personnel may in the future cease to be employed by Consultant and because of the termination of such employment no longer able to provide Services. However, Consultant agrees that replacement of any of the listed personnel during the Agreement period shall only be with other professional personnel who have equivalent experience and shall require the prior written approval of City, which shall not be unreasonably withheld. Any costs associated with replacement of personnel shall be borne exclusively by Consultant.

Consultant agrees that should the above personnel not continue their assignments on the Project during the entire term of this Agreement, then Consultant shall not charge City for the cost of training or "bringing up to speed" replacement personnel. City may condition its reasonable approval of substitution personnel upon a reasonable transition period wherein new personnel will learn the Project and get up to speed at Consultant's cost.

1.7. Representations

A. Consultant represents that it is qualified to perform the Services and it possesses, and will continue to possess at its sole cost and expense, the necessary licenses and/or permits required to perform the Services or will obtain such licenses and/or permits prior to time such licenses and/or permits are required. Consultant also represents that it has knowledge of, and will comply with, all applicable building codes, laws, regulations and ordinances.

B. Consultant represents that it possesses all necessary training, licenses and permits to perform the Services and that its performance of the Services will conform to the standards of practice of a professional having experience and expertise in performing professional services of like nature and complexity of the Services working on similar, successfully completed projects.

C. The granting of any progress payment by City, or the receipt thereof by Consultant, or any inspection, review, approval or oral statement by any representative of City or any other governmental entity, shall in no way waive or limit the obligations in this Representations or lessen the liability of Consultant for unsatisfactory Services, including but not limited to cases where the defective or below standard Services may not have been apparent or detected at the time of such payment, inspection, review or approval.

1.8. Indemnification and General Liability

A. To the fullest extent allowed by law (including without limitation California Civil Code Sections 2782 and 2782.8), Consultant shall defend, indemnify, and hold harmless City, its officers, City Council, directors, officials, agents employees, and volunteers(collectively "Indemnitees") from and against any and all claims, suit, action, loss, cost, damage, injury (including, without limitation, economic harm, injury to or death of an employee of Consultant or its Subconsultants) expense and liability of every kind, nature, and description, at law or equity, that arises out of, pertain to, or relate to (including without limitation, court costs, attorneys' fees, litigation expenses and fees of expert consultants or expert witnesses incurred in connection therewith and costs of investigation) any negligence, recklessness, or willful misconduct of Consultant, any Subconsultant, anyone directly or indirectly employed by them, or anyone that they control (collectively "Liabilities"). Such obligations to defend, hold harmless and indemnify an Indemnitee shall not apply to the extent that such Liabilities are caused in whole or in part by the sole negligence active negligence, or willful misconduct of such Indemnitee but shall apply to all other Liabilities.

B. Consultant shall defend (including providing legal counsel reasonably acceptable to City at no cost to City), indemnify and hold harmless the Indemnitees from all loss, cost, damage, expense, suit, liability or claims, in law or in equity, including attorneys' fees, court costs, litigation expenses and fees of expert consultants or expert witnesses, that may at any time arise for any infringement of the patent rights, copyright, trade secret, trade name, trademark, service mark or any other proprietary right of any person or persons in consequence of the use by City, or any of the other Indemnitees, of articles or Services to be supplied in the performance of this Agreement.

C. Notwithstanding any other provision of this Agreement, in no event shall either party be liable, regardless of whether any claim is based on contract, tort or otherwise, for any special, consequential, indirect or incidental damages, lost profits or revenue, arising out of or in connection with this Agreement, the Services, or the Project.

1.9. Liability of City

A. Except as provided in Exhibit A, City's obligations under this Agreement shall be limited to the payment of the compensation provided for in Services Consultant Agrees to Perform, Compensation, and Maximum Costs of this Agreement.

B. Notwithstanding any other provision of this Agreement, in no event shall City be liable, regardless of whether any claim is based on contract, tort or otherwise, for any special, consequential, indirect or incidental damages, lost profits or revenue, arising out of or in connection with this Agreement, the Services, or the Project.

C. City shall not be responsible for any damage to persons or property as a result of the use, misuse or failure of any equipment used by Consultant, or by any of its employees, even though such equipment be furnished, rented or loaned to Consultant by City. The acceptance or use of such equipment by Consultant or any of its employees shall be construed to mean that Consultant accepts full responsibility for and shall exonerate, indemnify, defend and save harmless City from and against any and all claims for any damage or injury of any type, including attorneys' fees, arising from the use, misuse or failure of such equipment, whether such damage be to the Consultant, its employees, City employees or third parties, or to property belonging to any of the above.

D. Nothing in this Agreement shall constitute a waiver or limitation of any right or remedy, whether in equity or at law, which City or Consultant may have under this Agreement or any applicable law. All rights and remedies of City or Consultant, whether under this Agreement or other applicable law, shall be cumulative.

1.10. Independent Contractor; Payment of Taxes and Other Expenses

A. Consultant shall be deemed at all times to be independent contractors and shall be wholly responsible for the manner in which Consultant perform the Services required by the terms of this Agreement. Consultant shall be fully liable for the acts and omissions of it their Subconsultants, employees and agents.

B. Nothing contained herein shall be construed as creating an employment, agency or joint venture relationship between City and Consultant. Consultant acknowledge that neither they nor any of their employees or agents shall, for any purpose whatsoever, be deemed to be City employees, and shall not be entitled to receive any benefits conferred on City employees, including without limitation workers' compensation, pension, health, insurance or other benefits.

C. Consultant shall be solely responsible for payment of any required taxes, including California sales and use taxes, city business taxes and United States income tax withholding and social security taxes, levied upon this Agreement, the transaction, or the Services delivered pursuant hereto.

D. Consultant shall make its designated representative available as much as reasonably possible to City staff during the City's normal working hours or as otherwise requested by City. Terms in this Agreement referring to direction from City shall be construed as providing for direction as to policy and the result of Consultant's Services only and not as to the means by which such a result is obtained.

1.11. Insurance

Prior to execution of this Agreement, Consultant shall furnish to City Certificates of Insurance showing satisfactory proof that it maintains the insurance required by this Contract as set forth in the **Insurance Requirements Section,** which are included and made a part of this Agreement. Consultant shall maintain all required insurance throughout the term of this Agreement and as otherwise provided in the Insurance Requirements. In the event Consultant fails to maintain any required insurance, City may (but is not obligated to) purchase such insurance and deduct or retain premium amounts from any sums due Consultant under this Agreement (or Consultant shall promptly reimburse City for such expense).

1.12. Suspension of Services

A. City may, without cause, order Consultant to suspend, delay or interrupt Services pursuant to this Agreement, in whole or in part, for such periods of time as City may determine in its sole discretion. City shall deliver to Consultant written notice of the extent of the suspension at least seven (7) calendar days before the commencement thereof. Suspension shall be treated as an Excusable Delay and Consultant shall be compensated for such delay to the extent provided under this Agreement.

B. Notwithstanding anything to the contrary contained in this Suspension of Services, no compensation shall be made to the extent that performance is, was or would have been so suspended, delayed or interrupted by a cause for which Consultant is responsible.

1.13. Termination of Agreement for Cause

A. If at any time City believes Consultant may not be adequately performing their obligations under this Agreement, that Consultant may fail to complete the Services as required by this Agreement, or that City has provided written notice of observed deficiencies in Consultant's performance, City may request from Consultant prompt written assurances of performance and a written plan, acceptable to City, to correct the observed deficiencies in Consultant's performance ("Cure Plan"). The Cure Plan must include, as applicable, evidence of necessary resources, correction plans, Subconsultant commitments, schedules and recovery schedules, and affirmative commitments to correct the asserted deficiencies, must meet all applicable requirements and show a realistic and achievable plan to cure the breach. Consultant shall provide such written assurances and Cure Plan within ten (10) calendar days of the date of notice of written request. Consultant acknowledges and agrees that any failure to provide written assurances and Cure Plan to correct observed deficiencies, in the required time, is a material breach under this Agreement.

B. Consultant shall be in default of this Agreement and City may, in addition to any other legal or equitable remedies available to City, terminate Consultant's right to proceed under the Agreement, in whole or in part, for cause:

1. Should Consultant make an assignment for the benefit of creditors, admit in writing its inability to pay its debts as they become due, file a voluntary petition in bankruptcy, be adjudged a bankrupt or insolvent, file a petition or answer seeking for itself any reorganization, arrangement, composition, readjustment, liquidation, dissolution, or similar relief under any present or future statute, law, or regulation, file any answer admitting or not contesting the material allegations of a petition filed against Consultant in any such proceeding, or seek, consent to, or acquiesce in, the appointment of any trustee, receiver, custodian or liquidator of Consultant or of all or any substantial part of the properties of Consultant, or if Consultant, its directors or shareholders, take action to dissolve or liquidate Consultant; or

2. Should Consultant commit a material breach of this Agreement and not cure such breach within ten (10) calendar days of the date of notice from City to Consultant demanding such cure; or, if such failure is curable but not curable within such ten (10) day period, within such period of time as is reasonably necessary to accomplish such cure. (In order for Consultant to avail themselves of this time period in excess of ten (10) calendar days, Consultant must provide City within the ten (10) calendar day period a written Cure Plan acceptable to City to cure said breach, and then Consultant must diligently commence and continue such cure according to the written Cure Plan); or

3. Should Consultant violate or allow a violation of any valid law, statute, regulation, rule, ordinance, permit, license or order of any governmental agency in effect at the time of performance of the Services and applicable to the Project or Services and does not cure such violation within ten (10) calendar days of the date of the notice from City to Consultant demanding such cure; or, if such failure is curable but not curable within such ten (10) calendar day period, within such period of time as is reasonably necessary to accomplish such cure. (In order for Consultant to avail themselves of this time period in excess of ten (10) calendar days, Consultant must provide City within the ten (10) calendar day period a written Cure Plan acceptable to City to cure said breach, and then Consultant must diligently commence and continue such cure according to the written Cure Plan.)

C. In the event of termination by City as provided herein for cause:

1. City shall compensate Consultant for the value of the Services delivered to City upon termination as determined in accordance with the Agreement, subject to all rights of offset and back charges, but City shall not compensate Consultant for its costs in terminating the Services or any cancellation charges owed to third parties.

2. Consultant shall deliver to City possession of all tangible aspects of the Services in their then condition including, but not limited to, all copies (electronic, CAD, and PDF format, and hard copy) of designs, engineering, Project records, cost data of all types, drawings and specifications and contracts with vendors and Subconsultants, and all other documentation associated with a Project, and all supplies and aids dedicated solely to performing Services which, in the normal course of the Services, would be consumed or only have salvage value at the end of the Services period.

3. Consultant shall remain fully liable for the failure of any Services completed and drawings and specifications provided through the date of such termination to comply with the provisions of the Agreement. The provisions of this Paragraph shall not be interpreted to diminish any right that City may have to claim and recover damages for any breach of this Agreement, but rather, Consultant shall compensate City for all loss, cost, damage, expense, and/or liability suffered by City as a result of such termination and failure to comply with the Agreement, including without limitation City's costs incurred in connection with finding a replacement.

D. In the event a termination for cause is determined to have been made wrongfully or without cause, then the termination shall be treated as a termination for convenience pursuant to Termination of Agreement of Convenience below, and Consultant shall have no greater rights than they would have had if a termination for convenience had been effected in the first instance. No other loss, cost, damage, expense or liability may be claimed, requested or recovered by Consultant.

1.14. Termination of Agreement for Convenience

A. City may terminate performance of the Services under the Agreement in accordance with this Termination of Agreement for Convenience in whole, or from time to time in part, whenever City shall determine that termination is in the City's best interests. Termination shall be effected by City delivering to Consultant, at least seven (7) calendar days prior to the effective date of the termination, a Notice of Termination ("Notice of Termination") specifying the extent to which performance of the Services under the Agreement is terminated.

B. After receipt of a Notice of Termination, and except as otherwise directed by City, Consultant shall:

1. Stop Services under the Agreement on the date and to the extent specified in the Notice of Termination;

2. Place no further orders or subcontracts (including agreements with Subconsultants) for materials, Services, or facilities except as necessary to complete the portion of the Services under the Agreement which is not terminated;

3. Terminate all orders and subcontracts to the extent that they relate to performance of Services terminated by the Notice of Termination;

4. Assign to City in the manner, at times, and to the extent directed by City, all right, title, and interest of Consultant under orders and subcontracts so terminated. City shall have the right, in its discretion, to settle or pay any or all claims arising out of termination of orders and subcontracts;

5. Settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with approval or ratification of City to the extent City may require. City's approval or ratification shall be final for purposes of this clause;

6. Transfer title and possession of Consultant's and their Subconsultants' work product to City, and execute all required documents and take all required actions to deliver in the manner, at times, and to the extent, if any, directed by City, completed and uncompleted designs and specifications, Services in process, completed Services, supplies, and other material produced or fabricated as part of, or acquired in connection with performance of, Services terminated by the Notice of Termination; City acknowledges that said documents were prepared for the purpose of the Project.

7. Complete performance of any part of the Services that were not terminated by the Notice of Termination; and

8. Take such action as may be necessary, or as City may direct, for the protection and preservation of property related to this Agreement which is in Consultant's possession and in which City has or may acquire an interest.

C. After receiving a Notice of Termination, Consultant shall submit to City a termination claim, in the form and with the certification City prescribes. The claim shall be submitted promptly, but in no event later than three months from the effective date of the termination, unless one or more extensions in writing are granted by City upon Consultant's written request made within such three month period or authorized extension. However, if City determines that facts justify such action, it may receive and act upon any such termination claim at any time after such three-month period or extension. If Consultant fails to submit the termination claim within the time allowed, City may determine, on basis of information available to it, the amount, if any, due to Consultant because of the termination. City shall then pay to Consultant the amount so determined.

D. Subject to provisions of Termination of Agreement for Convenience: Paragraph C above, Consultant and City may agree upon the whole or part of the amount or amounts to be paid to Consultant because of any termination of Services under this Paragraph. The amount or amounts may include a reasonable allowance for profit on Services done. However, such agreed amount or amounts, exclusive of settlement costs, shall not exceed the total Agreement price as reduced by the amount of payments otherwise made and as further reduced by the Agreement

price of Services terminated. The Agreement may be amended accordingly, and Consultant shall be paid the agreed amount.

E. If Consultant and City fail, under Termination of Agreement for Convenience: Paragraph D above, to agree on the whole amount to be paid to Consultant because of termination of Services under this Agreement for Convenience: Paragraph E, then Consultant's entitlement to compensation for Services specified in the Agreement which are performed before the effective date of Notice of Termination, shall be the total (without duplication of any items) of:

1. Reasonable value of Consultant's Services performed prior to Notice of Termination, based on Consultant's entitlement to compensation under Exhibit A, Payments to Consultant. Such amount or amounts shall not exceed the total Agreement price as reduced by the amount of payments otherwise made and as further reduced by the Agreement value of Services terminated. Deductions against such amount or amounts shall be made for deficiently performed Services, rework caused by deficiently performed Services, cost of materials to be retained by Consultant, amounts realized by sale of materials, and for other appropriate credits against cost of Services. Such amount or amounts may include profit, but not in excess of ten (10) percent of Consultant's total costs of performing the Services.

2. When, in opinion of City, the cost of any item of Services is excessively high due to costs incurred to remedy or replace defective or rejected Services (including having to re-perform Services), reasonable value of Consultant's Services will be the estimated reasonable cost of performing Services in compliance with the requirements of the Agreement, and any excessive actual cost shall be disallowed.

3. Reasonable cost to Consultant of handling material returned to vendors, delivered to City or otherwise disposed of as directed by City.

F. Except as provided in this Agreement, in no event shall City be liable for costs incurred by Consultant (or Subconsultants) after receipt of a Notice of Termination. Such non-recoverable costs include, but are not limited to, anticipated profits on the Agreement or subcontracts, post-termination employee salaries, post-termination administrative expenses, post-termination overhead or unabsorbed overhead, costs of preparing and submitting claims or proposals, attorney's fees or other costs relating to prosecution of the claim or a lawsuit, pre-judgment interest, or any other expense that is not reasonable or authorized under Agreement for Convenience: Paragraph E above.

G. This Paragraph shall not prohibit Consultant from recovering costs necessary to discontinue further Services under the Agreement as provided for in Agreement for Convenience: Paragraph B above or costs authorized by City to settle claims from Subconsultants.

H. In arriving at amounts due Consultant under this Agreement for Convenience, there shall be deducted:

1. All unliquidated advance or other payments on account theretofore made to Consultant, applicable to the terminated portion of Agreement,
2. Any substantiated claim that City may have against Consultant in connection with this Agreement, and
3. The agreed price for, or proceeds of sale of, any materials, supplies, or other things kept by Consultant or sold under the provisions of this Agreement for Convenience, and not otherwise recovered by or credited to City.

I. If the termination for convenience hereunder is partial, before settlement of the terminated portion of this Agreement, Consultant may file with City a request in writing for equitable adjustment of price or prices specified in the Agreement relating to the portion of this Agreement that is not terminated. City may, but shall not be required to, agree on any such equitable adjustment. Nothing contained herein shall limit the right of City and Consultant to agree upon amount or amounts to be paid to Consultant for completing the continued portion of the Agreement when the Agreement does not contain an established price for the continued portion. Nothing contained herein shall limit City's rights and remedies pursuant to this Agreement or at law.

1.15. Conflicts of Interest/Other Agreements

A. Consultant represents that it is familiar with Section 1090 and Section 87100, et seq., of the Government Code of the State of California, the Conflict of Interest Code, Resolution 06-23, adopted by the City on October 3, 2006, and that it does not know of any facts that constitute a violation of those sections.

B. Consultant represents that it has completely disclosed to City all facts bearing upon any possible interests, direct or indirect, which Consultant believes any member of City, or other officer, agent or employee of City or any department presently has, or will have, in this Agreement, or in the performance thereof, or in any portion of the profits thereunder. Willful failure to make such disclosure, if any, shall constitute ground for termination of this Agreement by City for cause. Consultant shall comply with the City's conflict of interest codes and their reporting requirements.

C. Consultant covenants that it presently has no interest, and during the term of this Agreement shall not have any interest, direct or indirect, that would conflict in any manner with the performance of Services required under this Agreement. Without limitation, Consultant represents to and agrees with the City that Consultant has no present, and in the future during the term of this Agreement will not have any, conflict of interest between providing the City the Services hereunder and any interest Consultant may presently have, or will have in the future, with respect to any other person or entity (including, but not limited to, any federal or state wildlife, environmental or regulatory agency) that has any interest adverse or potentially adverse to the City, as determined in the reasonable judgment of the City.

1.16. Proprietary or Confidential Information of City; Publicity

A. Consultant acknowledges and agrees that, in the performance of the Services under this Agreement or in the contemplation thereof, Consultant may have access to private or confidential information that may be owned or controlled by City and that such information may contain proprietary or confidential details, the disclosure of which to third parties may be damaging to City. Consultant agree that all private, confidential, or proprietary information disclosed by City to or discovered by Consultant in the performance of the Services shall be held in strict confidence and used only in performance of the Agreement. Consultant shall exercise the same standard of care to protect such information as a reasonably prudent Consultant would use to protect its own proprietary data, and shall not accept employment adverse to the City's interests where such confidential information could be used adversely to the City's interests. Consultant shall notify the City immediately in writing if it is requested to disclose any information made known to or discovered by Consultant during the performance of or in connection with the Services pursuant to this Agreement.

B. Any publicity or press releases with respect to the Project or Services shall be under the City's sole discretion and control. Consultant shall not discuss the Services, the Project, or matters pertaining thereto, with the public press, representatives of the public media, public bodies or representatives of public bodies, without City's prior written consent. Consultant shall have the right, however, without City's further consent, to include representations of Services among Consultant's promotional and professional material, and to communicate with persons or public bodies where necessary to perform under this Agreement.

C. The provisions of this Proprietary of Confidential Information of City; Publicity shall remain fully effective indefinitely after termination of Services to the City hereunder.

1.17. Notices to the Parties

A. All notices (including requests, demands, approvals or other communications other than ordinary course Project communications) under this Agreement shall be in writing and shall include the word "NOTICE" in the subject line.

B. Notice shall be sufficiently given for all purposes as follows:

1. When personally delivered to the recipient, notice is effective on delivery.
2. When mailed by certified mail with return receipt requested, notice is effective on receipt if delivery is confirmed by a return receipt.
3. When delivered by reputable delivery service, with charges prepaid or charged to the sender's account, notice is effective on delivery if delivery is confirmed by the delivery service.
4. Notice by facsimile or electronic mail shall not be allowed or constitute "Notice" under this Notice to the Parties.

C. Any correctly-addressed notice that is refused, unclaimed, or undeliverable because of an act or omission of the party to be notified shall be considered to be effective as of the first date that the notice was refused, unclaimed, or considered undeliverable by the postal authorities, messenger, or overnight delivery service,

D. Addresses for the purpose of giving notice are set forth in Qualified Personnel: Paragraph A above. Either party may, by written notice given at any time or from time to time require subsequent notices to be given to another individual person, whether a party or an officer or a representative, or to a different address or fax number, or both, by giving the other party notice of the change in any manner permitted by this Notice to the Parties.

1.18. Record Keeping and Audit Requirements

A. Consultant shall keep such full and detailed accounting records as are necessary for proper financial management of the Project. Consultant shall maintain a complete and current set of all books and records relating to the construction of the Project. City shall be entitled, upon forty-eight (48) hour written notice, to inspect all books, records, and accounts kept by Consultant relating to the work contemplated by this Contract. Within 90 calendar days after Final Completion, Consultant shall deliver to City those records necessary for City to perform a financial audit of the Project ("Final Audit").

B. Invoice and progress/final reports and all required audit reports shall be submitted to City in a timely manner.

C. Maintain adequate fiscal and Project books, records, documents, and other evidence pertinent to Consultant's work on the Project in accordance with generally accepted accounting principles. Adequate supporting documentation shall be maintained in such detail so as to permit tracing transactions from the invoices, to the financial statement, to the accounting records, and to the supporting documentation. These records shall be maintained for a period of three years after Final Completion of the Project, and shall be subject to examination and/or audit by City or designees, state government auditors or designees.

D. Make such books, records, supporting documentations, and other evidence available to City or designees, their designated representatives, during the course of the Project and for a period of three years after Final Completion of the Project, and provide suitable facilities for access, monitoring, inspection, and copying thereof. Further, Consultant agrees to include a similar right of City to audit records and interview staff in any subcontract related to the performance of this Contract.

1.19. Subcontracting/Assignment/City Employees

A. Consultant and City agree that Consultant's unique talents, knowledge and experience form a basis for this Agreement and that the Services to be performed by Consultant under this Agreement are personal in character. Therefore, Consultant shall not assign any portion of this

Agreement or any duties or obligations hereunder unless approved by City in a written instrument executed and approved by the City in writing. Neither party shall, on the basis of this Agreement, contract on behalf of or in the name of the other party. Any agreement that violates this Subcontracting/Assignment/City Employees: Paragraph A shall confer no rights on any party and shall be null and void.

B. Consultant shall not employ or engage, or attempt to employ or engage, any person who is or was employed by City or any department thereof at any time that this Agreement is in effect, and for a period of two years after the termination of this Agreement or the completion of the Services, without the written consent of City.

1.20. Other Obligations

A. Discrimination, Equal Employment Opportunity and Business Practices. Consultant shall not discriminate against any employee or applicant for employment, nor against any Subconsultant or applicant for a subcontract, because of race, color, religious creed, age, gender, actual or perceived sexual orientation, national origin, disability as defined by the ADA (as defined below) or veteran's status. To the extent applicable, Consultant shall comply with all federal, state and local laws (including, without limitation, City ordinances, rules and regulations) regarding non-discrimination, equal employment opportunity, affirmative action and occupational-safety-health concerns, shall comply with all applicable rules and regulations thereunder, and shall comply with same as each may be amended from time to time.

B. Drug-Free Workplace Policy. Consultant acknowledges that pursuant to the Federal Drug-Free Workplace Act of 1989, the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited on City premises. Consultant agrees that any violation of this prohibition by Consultant, its employees, agents or assigns shall be deemed a material breach of this Agreement.

C. Compliance with Americans with Disabilities Act and Rehabilitation Act. Consultant acknowledges that, pursuant to the Americans with Disabilities Act ("ADA"), programs, services and other activities provided by a public entity to the public, whether directly or through a contractor, must be accessible to the disabled public. Consultant shall provide the Services specified in this Agreement in a manner that complies with the standard of care established under this Agreement regarding the ADA and any and all other applicable federal, state and local disability rights legislation. Consultant agrees not to discriminate against disabled persons in the provision of services, benefits or activities provided under this Agreement and further agrees that any violation of this prohibition on the part of Consultant, its employees, agents or assigns shall constitute a material breach of this Agreement. Consultant shall comply with §504 of the Rehabilitation Act of 1973, which provides that no otherwise qualified handicapped individual shall, solely by reason of a disability, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination in the performance of this Agreement.

D. Violation of Non-Discrimination Provisions. Violation of the non-discrimination provisions of this Agreement shall be considered a breach of this Agreement and subject the Consultant to penalties, including but not limited to: (a) termination of this Agreement; (b) disqualification of the Consultant from bidding on or being awarded a City contract for a period of up to 3 years; (c) liquidated damages of $2,500 per violation; and/or (d) imposition of other appropriate contractual and civil remedies and sanctions. To effectuate the provisions of this section, the City shall have the authority to examine Consultant's employment records with respect to compliance with this paragraph and/or to set off all or any portion of the amount described in this paragraph against amounts due to Consultant under this Agreement or any other agreement between Consultant and City. Consultant shall report to the City the filing by any person in any court of any complaint of discrimination or the filing by any person of any and all charges with the Equal Employment Opportunity Commission, the Fair Employment and Housing Commission or any other entity charged with the investigation of allegations within 30 calendar days of such filing, provided that within such 30 days such entity has not notified Consultant that such charges are dismissed or otherwise unfounded. Such notification shall include the name of the complainant, a copy of such complaint, and a description of the circumstance. Consultant shall provide City with a copy of their response to the complaint when filed.

E. Employee Wages; Records; Apprentices: Consultant shall pay prevailing wages to its employees on any agreement in excess of $1,000.00. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Agreement, as determined by the Director of the State of California Department of Industrial Relations, are on file at the County's Capital Projects Office and may be obtained from the California Department of Industrial Relations website [http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm]. Consultant shall comply with the 8-hours per day/40 hours per week/overtime/working hours restrictions for all employees, pursuant to the California Labor Code. Consultant and all subconsultants shall keep and maintain accurate employee payroll records for Work performed under the Agreement. The payroll records shall be certified and submitted as required by law, including Labor Code Sections 1771.4 (if applicable) and 1776, including to the Labor Commissioner no less frequently than monthly. Consultant shall comply fully with Labor Code Section 1777.5 in the hiring of apprentices for work relating to the Agreement. If the Agreement exceeds $2,000 and is funded with federal funds, then Consultant shall pay federal Davis Bacon wages and comply with applicable federal requirements.

1.21. Disputes

A. Should any question arise as to the meaning and intent of this Agreement, the question shall, prior to any other action or resort to any other legal remedy, be referred to the Project Manager and a principal of the Consultant who shall attempt, in good faith, to resolve the dispute. Such referral shall be initiated by written request from either party, and a meeting between the

Project Manager and principal of the Consultant shall then take place within five (5) calendar days of the date of the request.

B. Provided that City continues to compensate Consultant in accordance with this Agreement, Consultant shall continue its Services throughout the course of any and all disputes. Nothing in this Agreement shall allow Consultant to discontinue Services during the course of any dispute. Consultant's failure to continue Services during any and all disputes shall be considered a material breach of this Agreement Consultant agrees that the existence or continued existence of a dispute does not excuse performance under any provision of this Agreement including, but not limited to, the time to complete the Services. Consultant also agrees that should Consultant discontinue Services due to a dispute or disputes, City may terminate this Agreement for cause as provided herein.

C. In the event of claims exceeding $50,000, as a precondition to commencing litigation, the parties shall first participate in non-binding mediation pursuant to the construction mediation procedures of JAMS (Judicial Arbitration and Mediation Services), in Benicia, California, before a mediator mutually agreeable to the parties, and in the event the parties are unable to agree, selected by a judge of the Solano City Superior Court from an approved list of JAMS qualified construction mediators. The parties may initially agree to engage in discovery prior to mediation. This Agreement is further subject to the provisions Chapter 9 (commencing with section 9204 of the Public Contracts Code and, to the extent there is no conflict, Article 1.5 (commencing at Section 20104) of Division 2, Part 3 of the Public Contract Code regarding the resolution of public works claims of less than $375,000 dispute through mediation. This Agreement hereby incorporates the provisions of section 9204 and of Article 1.5 as though fully set forth herein. Should parties proceed with discovery, they shall follow the procedures prescribed in the California Code of Civil Procedure, Section 201 9, et seq., and discovery so conducted shall apply in any subsequent litigation as if conducted in that litigation.

1.22. Agreement Made in California; Venue

A. This Agreement shall be deemed to have been executed in the City of Benicia, County of Solano. The formation, interpretation and performance of this Agreement shall be governed by the laws of the State of California, excluding its conflict of laws rules. The exclusive venue for all disputes or litigation arising out of this Agreement shall be in the Superior Court of the County of Solano unless the parties agree otherwise in a written amendment to this Agreement.

1.23. Compliance with Laws

A. Consultant shall comply with the Standard of Care in the interpretation and application of all applicable laws in the performance of the Services, regardless of whether such laws are specifically stated in this Agreement and regardless of whether such laws are in effect on the date hereof. Consultant shall comply with all security requirements imposed by authorities with

jurisdiction over any Project, and will provide all information, work histories and/or verifications as requested by such authorities for security clearances or compliance.

B. Consultant represents that all plans, drawings, specifications, designs and any other product of the Services will comply with all applicable laws, codes and regulations and be consistent with the Standard of Care.

1.24. Miscellaneous

A. All section and paragraph captions are for reference only and shall not be considered in construing this Agreement.

B. As between the parties to this Agreement: as to all acts or failures to act by either party to this Agreement, any applicable statute of limitations shall commence to run on the date of issuance by City of the final Certificate for Payment, or termination of this Agreement, whichever is earlier. This Miscellaneous: Paragraph B shall not apply to latent defects as defined by California law or negligence claims, as to which the statute of limitations shall commence to run on discovery of the defect and its cause. However, the applicable statutes of repose, California Code of Civil Procedure, Sections 337.1 and 337.15, shall continue to apply.

C. Any provisions or portion thereof of this Agreement that is prohibited by, unlawful or unenforceable under any applicable law of any jurisdiction, shall as to such jurisdiction be ineffective without affecting other provisions of this Agreement. If the provisions of such applicable law may be waived, they are hereby waived to the end that this Agreement may be deemed to be a valid and binding agreement enforceable in accordance with its terms. If any provisions or portion thereof of this Agreement are prohibited by, unlawful, or unenforceable under any applicable law and are therefore stricken or deemed waived, the remainder of such provisions and this Agreement shall be interpreted to achieve the goals or intent of the stricken or waived provisions or portions thereof to the extent such interpretation is consistent with applicable law. In dispute resolution arising from this Agreement, the fact finder shall receive detailed instructions on the meaning and requirements of this Agreement.

D. Either party's waiver of any breach, or the omission or failure of either party, at any time, to in force in force any right reserved to it, or to require performance of any of the terms, covenants, conditions or other provisions of this Agreement, including the timing of any such performance, shall not be a waiver of any other right to which any party is entitled, and shall not in any way affect, limit, modify or waive that party's right thereafter to in force or compel strict compliance with every term, covenant, condition or other provision hereof, any course of dealing or custom of the trade or oral representations notwithstanding.

E. Except as expressly provided in this Agreement, nothing in this Agreement shall operate to confer rights or benefits on persons or entities not party to this Agreement. Time is of the essence in the performance of this Agreement.

F. Consultant acknowledges that Consultant, and all Subconsultants hired by Consultant to perform services under this Agreement, are aware of and understand the Immigration Reform and Control Act ("IRCA"). Consultant is and shall remain in compliance with the IRCA and shall ensure that any Subconsultants hired by Consultant to perform services under this Agreement are in compliance with the IRCA. In addition, Consultant agrees to indemnify, defend and hold harmless the City, its agents, officers and employees, from any liability, damages or causes of action arising out of or relating to any claims that Consultant's employees, or the employees of any Subconsultant hired by Consultant, are not authorized to work in the United States for Consultant or its Subconsultant and/or any other claims based upon alleged RCA violations committed by Consultant or Consultant's Subconsultant(s).

1.25. Entire Agreement; Modifications

A. The Agreement, and any written modification to the Agreement, shall represent the entire and integrated Agreement between the parties hereto regarding the subject matter of this Agreement and shall constitute the exclusive statement of the terms of the parties' Agreement. The Agreement, and any written modification to the Agreement, shall supersede any and all prior negotiations, representations or agreements, either written or oral, express or implied, that relate in any way to the subject matter of this Agreement or written modification, and the parties represent and agree that they are entering into this Agreement and any subsequent written modification in sole reliance upon the information set forth in the Agreement or written modification and the parties are not and will not rely on any other information. All prior negotiations, representations or agreements, either written or oral, express or implied, that relate in any way to the subject matter of this Agreement, shall not be admissible or referred to hereafter in the interpretation or enforcement of this Agreement.

B. To the extent this Agreement conflicts with the terms of any proposal, invoice, or other document submitted to or by either party, the terms of this Agreement shall control.

C. This Agreement may not be modified, nor may compliance with any of its terms be waived, except by written instrument executed and approved by a fully authorized representative of City, Consultant expressing such an intention in the case of a modification or by the party waiving in the case of a waiver.

D. Consultant, in any price proposals for changes in the Services that increase the Agreement amount, or for any additional Services, shall break out and list its costs and use percentage markups. Consultant shall require their Subconsultants (if any) to do the same, and the Subconsultants' price proposals shall accompany Consultant's price proposals.

E. Consultant and its Subconsultants shall, upon request by City, permit inspection of all original unaltered Agreement bid estimates, subcontract Agreements, purchase orders relating to any change, and documents substantiating all costs associated with all cost proposals.

F. Changes in the Services made pursuant to this Entire Agreement; Modifications and extensions of the Agreement time necessary by reason thereof shall not in any way release Consultant's representations and agreements pursuant to this Agreement.

G. Whenever the words "as directed", "as required", "as permitted", or words of like effect are used, it shall be understood as the direction, requirement, or permission of City. The words "approval", "acceptable", "satisfactory", or words of like import, shall mean approved by, or acceptable to, or satisfactory to City, unless otherwise indicated by the context.

2. Insurance Requirements

2.1. INSURANCE REQUIREMENTS

This is an Appendix to, and made a part of and incorporated by reference to the Agreement dated March 18, 2026, by and between Opterra Energy Services, LLC, hereinafter referred to as "Consultant", and the City of Benicia, hereinafter referred to as "City", providing for professional services.

2.2. 1. Consultant's Duty to Show Proof of Insurance

Consultant, in order to protect City and its City Council members, officials, agents, officers, and employees against all claims and liability for death, injury, loss and damage as a result of Consultant's acts, errors, or omissions in connection with the performance of Consultant's obligations, as required in this Agreement, shall secure and maintain insurance as described below. Consultant shall not perform any work under this Agreement until Consultant has obtained all insurance required under this section and the required certificates of insurance and all required endorsements have been filed with the City's authorized insurance tracking platform. Receipt of evidence of insurance that does not comply with all applicable insurance requirements shall not constitute a waiver of the insurance requirements set forth herein. The required documents must be signed by the authorized representative of the insurance company shown on the certificate. Upon request, Consultant shall supply proof that such person is an authorized representative thereof, and is authorized to bind the named underwriter(s) and their company to the coverage, limits and termination provisions shown thereon, Consultant shall promptly deliver to City a certificate of insurance, and all required endorsements, with respect to each renewal policy, as necessary to demonstrate the maintenance of the required insurance coverage for the term specified herein. Such certificates and endorsements shall be delivered to City prior to the expiration date of any policy and bear a notation evidencing payment of the premium thereof if so requested. Consultant shall immediately pay any deductibles and self-insured retentions under all required insurance policies upon the submission of any claim by Consultant or City as an additional insured.

2.3. Insurance Requirements: Commercial General Liability Insurance

Commercial General Liability Insurance including, but not limited to, Contractual Liability Insurance (specifically concerning the indemnity provisions of this Agreement with the City), Products-Completed Operations Hazard, liability for slander, false arrest and invasion of privacy arising out of professional services rendered hereunder, Personal Injury (including bodily injury and death), and Property Damage for liability arising out of Consultant's performance of services under this Agreement. The Commercial

General Liability insurance shall contain no exclusions or limitation for independent contractors working on the behalf of the named insured. Consultant shall maintain the Products-Completed Operations Hazard coverage for the longest period allowed by law following termination of this Agreement. The amount of said insurance coverage required by this Agreement shall be the policy limits, which shall be at least two million dollars ($2,000,000) each occurrence and four million dollars ($4,000,000) aggregate.

2.4. Business Automobile Liability Insurance

Automobile Liability Insurance against claims of Personal Injury (including bodily injury and death) and Property Damage covering any vehicle and/or all owned, leased, hired and non-owned vehicles used in the performance of Services pursuant to this Agreement with coverage equal to the policy limits, which shall be at least two million dollars ($2,000,000) each occurrence.

2.5. Workers' Compensation Insurance

Consultant shall submit written proof that Consultant is insured against liability for workers' compensation in accordance with the provisions of section 3700 of the California Labor Code. Consultant shall require any Subconsultants to provide workers' compensation for all of the Subconsultants' employees, unless the Subconsultants' employees are covered by the insurance afforded by Consultant. If any class of employees engaged in work or services performed under this Agreement is not covered by California Labor Code section 3700, Consultant shall provide and/or require each Subconsultant to provide adequate insurance for the coverage of employees not otherwise covered. Consultant shall also maintain employer's liability insurance with limits of one million dollars ($1,000,000) for bodily injury or disease.

2.6. Professional Liability Insurance

Professional Liability (Errors and Omissions) Insurance, for liability arising out of, or in connection with, all negligent acts, errors or omissions in connection with services to be provided under this Agreement, with no exclusion for claims of one insured against another insured, with coverage equal to the policy limits, which shall not be less than one million dollars ($1,000,000) per occurrence and two million dollars ($2,000,000) aggregate.

2.7. Self-Insured Retention

Any self-insured retentions in excess of $100,000 must be declared on the Certificate of insurance or other documentation provided to City and must be approved by the City Risk Manager.

2.8. Claims-Made Basis Coverage

If any of the insurance coverages required under this Agreement is written on a claims-made basis, Consultant, at Consultant's option, shall either (i) maintain said coverage for at least five (5) years following the termination of this Agreement with coverage extending back to the effective date of this Agreement; (ii) purchase an extended reporting period of not less than five (5) years following the termination of this Agreement; or (iii) acquire a full prior acts provision on any renewal or replacement policy.

2.9. Insurance terms and conditions:

3.1 Cancellation of Insurance

The above stated insurance coverages required to be maintained by Consultant shall be maintained until the completion of all of Consultant's obligations under this Agreement except as otherwise indicated herein. Each insurance policy supplied by Consultant shall not be suspended, voided, cancelled or reduced in coverage or in limits except after ten (10) days written notice by Consultant in the case of non-payment of premiums, or thirty (30) days written notice in all other cases. This notice requirement does not waive the insurance requirements stated herein. Consultant shall immediately obtain replacement coverage for any insurance policy that is terminated, canceled, non-renewed, or whose policy limits have been exhausted or upon insolvency of the insurer that issued the policy.

3.2 All insurance shall be issued by a company or companies admitted to do business in California and listed in the current "Best's Key Rating Guide" publication with a minimum rating of A-; VII Any exception to these requirements must be approved by the City Risk Manager.

3.3 If Consultant is, or becomes during the term of this Agreement, self-insured or a member of a self-insurance pool, Consultant shall provide coverage equivalent to the insurance coverages and endorsements required above. The City will not accept such coverage unless the City determines, in its sole discretion and by written acceptance, that the coverage proposed to be provided by Consultant is equivalent to the above-required coverages.

3.4 For any claims related to the Agreement, the Consultant’s insurance coverage shall be primary insurance coverage at least as broad as ISO CG 20 01 04 13 as respects the City, its officers, officials, employees, and volunteers. Any insurance or self-insurance maintained by the City, its officers, officials, employees, or volunteers shall be excess of the Consultant’s insurance and shall not contribute with it.

3.5 Insurance coverages in the minimum amounts set forth herein shall not be construed to relieve Consultant for any liability, whether within, outside, or in excess of such coverage, and regardless of solvency or insolvency of the insurer that issues the coverage; nor shall it preclude the City from taking such other actions as are available to it under any other provision of this Agreement or otherwise in law.

3.6 Failure by Consultant to maintain all such insurance in effect at all times required by this Agreement shall be a material breach of this Agreement by Consultant. City, at its sole option, may terminate this Agreement and obtain damages from Consultant resulting from said breach. Alternatively, City may purchase such required insurance coverage, and without further notice to Consultant, City shall deduct from sums due to Consultant any premiums and associated costs advanced or paid by City for such insurance. If the balance of monies obligated to Consultant pursuant to this Agreement are insufficient to reimburse City for the premiums and any associated costs, Consultant agrees to reimburse City for

the premiums and pay for all costs associated with the purchase of said insurance. Any failure by City to take this alternative action shall not relieve Consultant of its obligation to obtain and maintain the insurance coverages required by this Agreement.

3.7 Should any of the required insurance (other than errors and omissions insurance) be provided under a form of coverage that includes a general annual aggregate limit or provides that claims investigation or legal defenses costs be included in such general aggregate limit, such general annual aggregate limit shall be double the occurrence or claims limit specified above.

3.8 City may (but is under no obligation to) secure project-specific insurance, wrap-up insurance, or administer an owner controlled insurance program ("OCIP"), in which case Consultant and its subconsultants shall communicate this fact to their insurance carriers and request that the risk of this project be excluded from their practice policies. Consultant's fees under this Agreement (and the fee of its subconsultants under subconsultant agreements) shall be reduced by the amount of insurance premiums that may be avoided by Consultant and its subconsultants by virtue of the City's obtaining the project-specific insurance, wrap-up insurance or administering an OCIP, and the exclusion of this project from coverage of Consultant's and subconsultants policies. Construction Manager and its subconsultants shall afford City access to their books and records and cooperate with City in verifying the amount of savings realized.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the day first mentioned above.

"Opterra Energy Services, LLC"

By: _____

Its: Vice President

"City"

By: _____

Its: _____

"City Attorney"

By: _____

Its: City Attorney

"Department"

By: _____

Its: Public Works Director

Exhibit A

City of Benicia

Solar PV Operations & Maintenance Services

February 12, 2026

Prepared For:

Jeff Gregory
Deputy Public Works Director-Utilities
City of Benicia
250 East L Street
Benicia, CA 94510

Prepared By:

OPTERRA Energy Services, LLC
500 12th Street, Ste. 300
Oakland, CA 94607

Jake Stewart
Account Manager
716-491-7471
jstewart@opterraenergy.com

This proposal (Proposal), in whole or in part, is to be used only for evaluation purposes. If the Proposal is accepted and a subsequent contract is entered into between the parties, then to the extent federal or state law requires disclosure of information contained in the Proposal, OPTERRA Energy Services, LLC requests advance notice before disclosure of any such information, and that it be given the right to oppose or seek to narrow any such disclosure. The information subject to this restriction is contained in all pages marked, "Use or disclosure of information contained on this page is subject to the restriction on the title page of this Proposal or quotation."

OPTERRA Energy Services, LLC is not a municipal advisor and cannot give advice with respect to municipal securities or municipal financial products. This information provided in this Proposal is to be used for educational purposes about possible financing options and is not the provision of advice, or a recommendation to pursue, any financing option. Consult with your municipal advisor or financial advisor about the financing option appropriate for your situation. OPTERRA Energy Services, LLC can provide information to your municipal advisor or financial advisor about the hypothetical assumptions and educational scenarios used in these materials. To ensure compliance with requirements imposed by the IRS under Circular 230, we inform you that any U.S. federal tax advice contained in this communication (including any attachments), unless otherwise specifically stated, was not intended or written to be used, and cannot be used, for the purpose of (1) avoiding penalties under the Internal Revenue Code or (2) promoting, marketing or recommending to another party any matters addressed herein.

The information contained herein is general in nature and based on authorities that are subject to change. OPTERRA Energy Services, LLC recommends that you consult your tax adviser to understand its applicability to specific situations.

The pricing outlined in this proposal is based on current market conditions and regulatory environments as of the date of submission. Please note that in the event of changes to applicable tariffs, duties, or other trade-related fees imposed by domestic or international regulatory authorities which impacts our pricing, we reserve the right to adjust pricing accordingly.

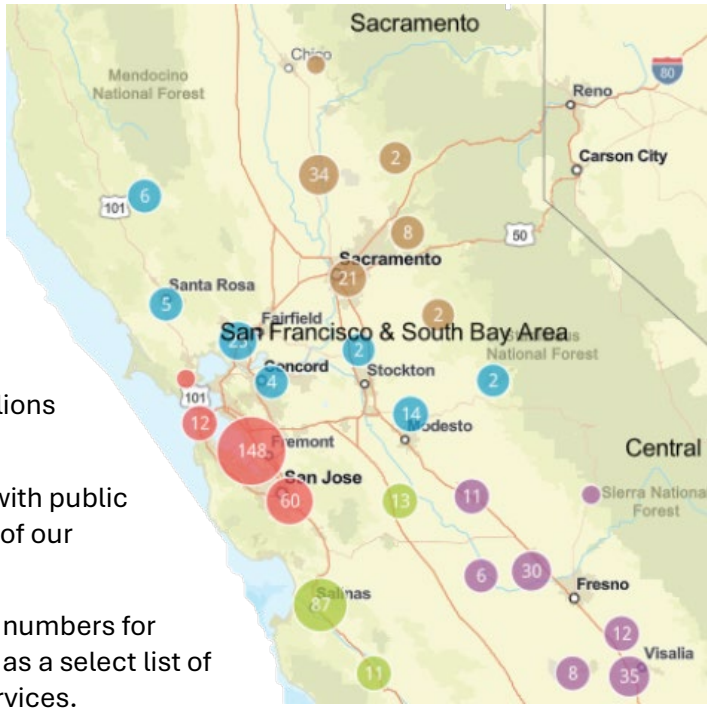
Such adjustments, if necessary, will be communicated in advance and supported by relevant documentation. We are committed to transparency and will make every effort to mitigate the impact of such changes on the final project cost.

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1. Company Information

Experience



While we recently returned to the name, OPTERRA Energy Services, we have more than 50 years of partnering with public sector stakeholders to address the unique energy goals of communities. Focusing on energy and water conservation, system retrofits, as well as developing and maintaining renewable energy projects, we have worked on more than 1,500 projects nationwide and have saved our customers billions of dollars.

We are a well-established municipal partner with public sector customers comprising more than 90% of our portfolio.

The tables below display our current contract numbers for maintenance and monitoring services as well as a select list of municipal projects showing our breadth of services.

OPTERRA's experience in O&M and Monitoring Services

SERVICE	Sites	Size
O& M Services	**1,079**	**322.4 MW**
Monitoring Services	**1,325**	**$67 million in annual guarantees**

Recent OPTERRA municipal projects

Customer	HVAC	Lighting	Solar	BESS	Microgrid	EV Charging	O&M Services
City of Menlo Park			✓	✓	✓	✓	✓
County of Solano	✓	✓	✓	✓	✓		✓
City of Livermore		✓	✓				✓
County of Shasta	✓	✓	✓				✓
City of Dublin	✓	✓	✓				✓

Licenses and Certifications

OPTERRA also boasts the largest engineering team of any Energy Service Company (ESCO) headquartered in California. OPTERRA's active State of California Contractor's licenses are listed in the table below.

Licenses Held	License #	Expiration Date
A – General Engineering Contractor	1142716	8-31-27
B – General Building Contractor	1142716	8-31-27
C10 – Electrical	1142716	8-31-27
C46 - Solar	1142716	8-31-27
Department of Industrial Relations (DIR)	2000014411	6-30-28

References

OPTERRA is proud to present the following references:

County of Shasta	
Mailing address	1855 Placer Street, Redding, CA 96001
Point of Contact	Tom Fuller
Title	Facilities Manager
Phone	530-225-5661
Email address	tfuller@co.shasta.ca.us

City of Dublin	
Mailing address	100 Civic Plaza, Dublin, CA 94568
Point of Contact	Debbie Bell
Title	Public Works Manager
Phone	925-556-4521
Email address	debbie.bell@dublin.ca.gov

2. Service Plan

Maintenance Services Approach

OPTERRA believes that a strong preventive and predictive maintenance program ensures reliability and production standards are met. All maintenance will be performed in accordance with contractual requirements and prudent industry practices.

On the Operations and Maintenance side, our regional service team will schedule all planned activities including panel washing, preventative maintenance and T&M service calls. Our service technicians will promptly report to the site contact and perform the planned work. All Panel Washing and Preventative Maintenance Reports will be generated after the work is performed. Additionally, all reports are housed on a dedicated server for you to retrieve any time. All reports, including previous years, are housed in this location.

Monitoring Options

We acknowledge the City already has a working monitoring system with AlsoEnergy. When using AlsoEnergy, all responsibility to receive alarms and notify OPTERRA when an issue needs investigated are the customer's responsibility.

If in the future there is interest in changing the monitoring platform, OPTERRA has an inhouse service, Utilityvision™, backed by our team of professionals who monitor the performance of each PV system and manage all alarms and tickets that are manually or automatically generated. Our monitoring team will triage the alarm remotely and if further actions are necessary a ticket will be immediately assigned to the regional service team who will respond and take next steps to schedule a service call. All Utilityvision customers have access to our customized online dashboard that provides real-time and historical data along with features to contact customer support. There is no limit to the number of users and free training can be provided at any time upon request.

Inspection Frequency - Calendar of Routine Services

Annual PV Operation & Maintenance Services Plan where applicable

Annual Cleaning



Example of a pre- and post- wash service results

Module Cleaning – Once annually coordinated with customer

Safety First

- Walking on solar panels will not be allowed at any time for any reason. Proper equipment, PPE and planning is required for all work to be performed.
- Polarized safety glasses are always required when working above solar panels.
- Proper lift equipment will be used as needed when reaching above solar modules.
- Parking lot canopies will be required to be roped off/isolated from any vehicles.
- Take before and after photos to document the condition of the modules
- Only deionized water will be used for cleaning.
- Water used for cleaning will be near ambient temperature.
- Clean modules surface & frames, according to solar panel manufacturer's warranty specifications.
- Cleaning shall comply with California Stormwater Quality Association's (CASQA) best management practices (BMP).
- Rooftop Solar array visual inspections during module cleaning

Annual Inspection And Maintenance

Thermal images of all equipment, as well as PV arrays to look for damaged electrical components

- Combiner boxes
- Central and string inverters
- DC & AC disconnects
- AC Combiner Panel
- PV Transformers
- Main service board
- Weather station (if applicable)
- Data Acquisition System (if applicable)
- Remove all plastic screens, etc. (Either cut off all sources of power first or wear flash suit)
- Take photos of each inverter, including wire terminations and electrical components of the frame
- Torque-tighten any loose connections

Inverter Cleaning

- Inverter enclosure, fan, filter, and pad cleaning

PV panel and Installation Inspection

- Check for broken or damaged panels
- Inspect all arrays for broken/damage modules
- Look for missing or damaged clamps, racking components, conduits etc.
- Inspect roofs for damage (before and after cleaning)
- Mounting systems
- Grounding system visual inspection

Inspection of all electrical equipment for water ingress, rust, or structural damage

- Combiner boxes
- Central inverters
- String inverters
- DC & AC disconnects
- AC Combiner Panel
- PV Transformers
- Main service board
- Weather station (if applicable)
- Data Acquisition System (if applicable)

Inspection, Voltage & Current testing

- Voltage test of strings (Can be achieved via monitoring system if available)
- Inverters
- DC current testing
- Open circuit voltage testing
- Visual inspection of mechanical components

Visual inspections of AC & DC electrical components

- Including conductors, conduit, and connectors
- Enclosures
- Disconnects
- Switch gear

Routine monitoring system maintenance and data integrity check, as required

- Routine system maintenance to include correction of loose electrical connections, ground connections
- Inspect combiner boxes
- Tighten connections
- Site drainage inspection
- Ground system testing
- Sensor calibration and potential sensor replacement
- Other minor maintenance

Inspection And Maintenance Report

Inspection and Maintenance Report

- Results from Mechanical Inspection of PV Installation
- Broken/damage modules
- Missing or damaged clamps, racking components, conduits etc.
- Roof damage (before and after cleaning)
- Photos of all damaged or missing components, roof damage, etc.

Results from thermal inspection of inverters, combiner boxes, PV disconnects, and arrays including

- Thermal images of each section of the inverter
- Photos of each inverter, including wire terminations and electrical components of the frame

Results from Electrical Testing, including one or more of the following

- Report from string testing of all solar source circuits utilizing Solmetric PV Analyzer
- Voltage/current measurements taken at string wiring boxes
- Analysis performed from monitoring data of DC current and voltage

Report of all cleaning performed, including

- Cleaning of inverter air filters and fans
- Cleaning of irradiance sensor on weather station
- Photos of array before cleaning
- Photos of arrays after they are clean

3. Fee Structure

Escalation rates are 5% per annum.

O&M annual preventative services fee schedule

Year	Panel Washing	Electrical Preventative Maintenance	Annual Total
1	$ 25,800	$ 41,700	$ 67,500
2	$ 27,100	$ 43,800	$ 70,900
3	$ 28,500	$ 46,000	$ 74,500
4	$ 29,900	$ 48,300	$ 78,200
5	$ 31,400	$ 50,700	$ 82,100

Annual Cost Breakdown By Site (Year 1)

Site	Panel Washing	Electrical Preventative Maintenance
City Hall	$ 2,800	$ 4,900
Community Center	$ 1,900	$ 3,200
Community Park	$ 1,200	$ 1,800
Community Pool	$ 1,200	$ 1,100
Corporation Yard	$ 1,500	$ 2,200
Fire Station #12	$ 1,300	$ 600
P-1 Pump Station	$ 2,100	$ 3,600
P-2 Pump Station	$ 2,900	$ 5,100
P-3 Pump Station	$ 6,400	$ 11,300
Water Treatment Plant	$ 4,500	$ 7,900
Total	**$ 25,800**	**$ 41,700**

Reactive Repair Protocols

OPTERRA's Field Services team is available for phone or email technical support during regular business hours to assist the City with responding to alerts from AlsoEnergy and any other solar needs that may arise. OPTERRA typically remotely reviews the fault codes and any other available information to provide guidance or coordinate a service call to keep the solar PV systems running optimally.

If repair services are necessary, OPTERRA will provide a time and materials quote for the recommended service call. Repairs will only proceed once the City has executed a Work Order for the agreed scope and quoted amount. Standard Business Hours are Monday–Friday, 7:00 a.m.–5:00 p.m. Work performed outside of these hours will be billed at 1.5x rates for evenings and Saturdays, and 2.0x rates for Sundays and Holidays.

T&M Rate Table

Labor Category		Straight Time
Hourly Rate – PV Electrical Journeyman Technician[1]	$/hr.	County Labor Rate
Hourly Rate – PV Electrical Apprentice Technician[1]	$/hr.	County Labor Rate
Hourly Rate – Senior PV Tech/Commissioning[2]	$/hr.	$189
Hourly Rate – Engineering[2]	$/hr.	$ 283
Hourly Rate – Project Management [2]	$/hr.	$283
Hourly Rate – Administrative[2]	$/hr.	$ 108
Mileage	$/Mi	$1.05
Material mark-up %	%	15%
Lift rental fee	$	Current Market Price

[1]*Trade Hourly rate will be adjusted based on the current year of the local prevailing wage determination plus Burden, requirement for either travel or subsistence and lodging, and markup for services being requested.*

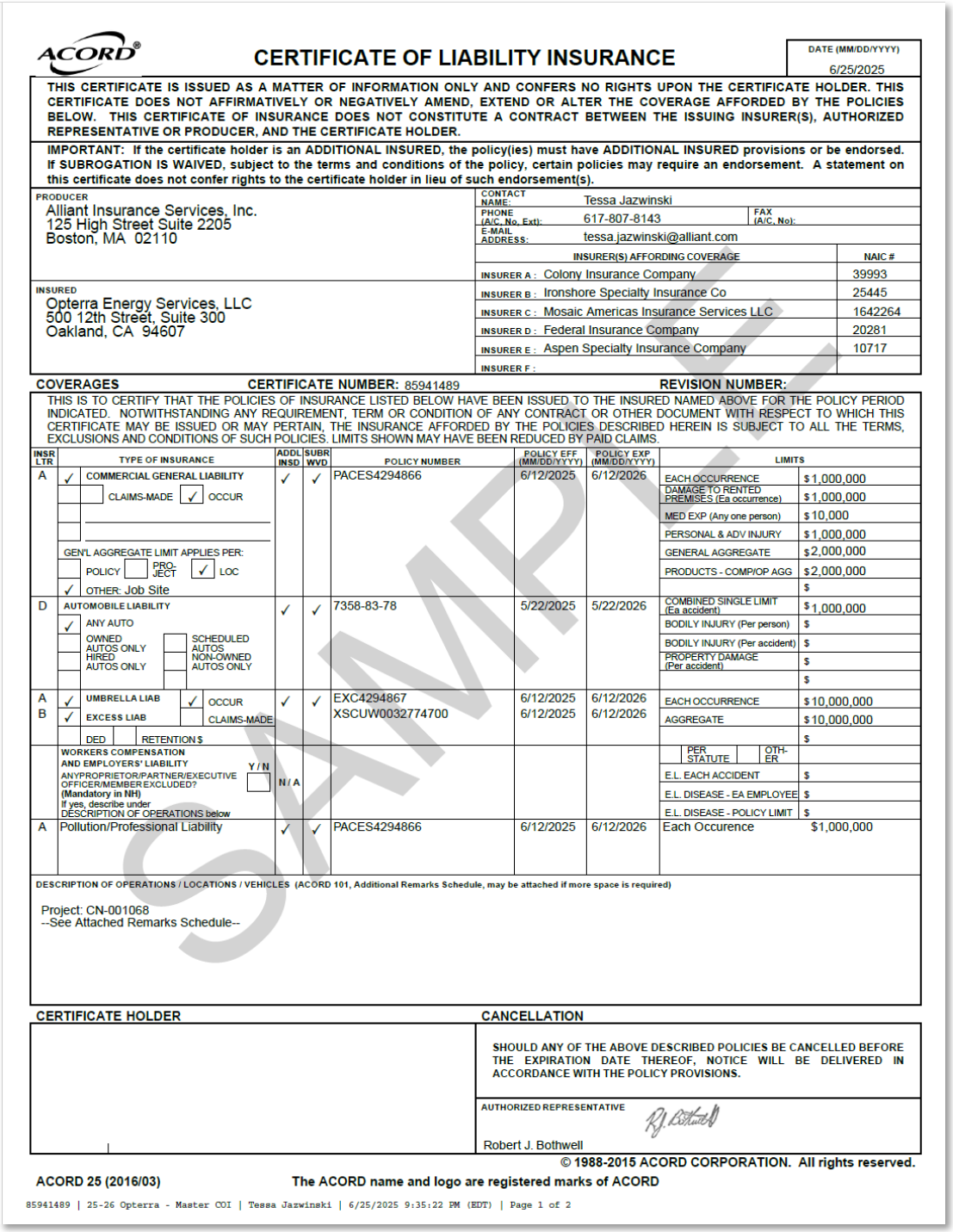
[2]*Escalated according to an inflation rate to the year in which service will occur.*

Current Labor Rates:

Labor	Hourly Rate
Journeyman Electrician Travel & Labor	$ 133
Apprentice Travel & Labor	$ 114
Regional Service Manager	$ 283
Engineering Senior Advisor	$ 283
Project Management Advisor	$ 283
Monitoring Services/Setup	$ 201
Senior PV Field Technician	$ 189
Project Admin Labor & Certified Payroll	$ 108
Roundtrip Mileage	$ 1.05

4. Insurance and Liability

OPTERRA affirms that insurance coverage will be provided at the time of Contract Award. We can confirm our ability to meet expected coverage levels and conditions without exception. Please find below a sample COI.



ACORD

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 6/25/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Alliant Insurance Services, Inc.
125 High Street Suite 2205
Boston, MA 02110

CONTACT NAME: Tessa Jazwinski
PHONE (A/C, No, Ext): 617-807-8143 FAX (A/C, No):
E-MAIL ADDRESS: tessa.jazwinski@alliant.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Colony Insurance Company	39993
INSURER B : Ironshore Specialty Insurance Co	25445
INSURER C : Mosaic Americas Insurance Services LLC	1642264
INSURER D : Federal Insurance Company	20281
INSURER E : Aspen Specialty Insurance Company	10717
INSURER F :	

INSURED
Opterra Energy Services, LLC
500 12th Street, Suite 300
Oakland, CA 94607

COVERAGES CERTIFICATE NUMBER: 85941489 REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	✓ COMMERCIAL GENERAL LIABILITY	✓	✓	PACES4294866	6/12/2025	6/12/2026	EACH OCCURRENCE	$1,000,000
	CLAIMS-MADE ✓ OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$1,000,000
							MED EXP (Any one person)	$10,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						PERSONAL & ADV INJURY	$1,000,000
	POLICY PRO-JECT ✓ LOC						GENERAL AGGREGATE	$2,000,000
	✓ OTHER: Job Site						PRODUCTS - COMP/OP AGG	$2,000,000
								$
D	AUTOMOBILE LIABILITY	✓	✓	7358-83-78	5/22/2025	5/22/2026	COMBINED SINGLE LIMIT (Ea accident)	$1,000,000
	✓ ANY AUTO						BODILY INJURY (Per person)	$
	OWNED AUTOS ONLY / SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	HIRED AUTOS ONLY / NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
A	✓ UMBRELLA LIAB ✓ OCCUR	✓	✓	EXC4294867	6/12/2025	6/12/2026	EACH OCCURRENCE	$10,000,000
B	✓ EXCESS LIAB CLAIMS-MADE			XSCUW0032774700	6/12/2025	6/12/2026	AGGREGATE	$10,000,000
	DED RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						PER STATUTE / OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? N / A (Mandatory in NH)						E.L. EACH ACCIDENT	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$
A	Pollution/Professional Liability	✓	✓	PACES4294866	6/12/2025	6/12/2026	Each Occurence	$1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Project: CN-001068
--See Attached Remarks Schedule--

CERTIFICATE HOLDER

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE
Robert J. Bothwell

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85941489 | 25-26 Opterra - Master COI | Tessa Jazwinski | 6/25/2025 9:35:22 PM (EDT) | Page 1 of 2

SAMPLE

5. Staffing

There are many contractors who can provide construction, repair services, or monitoring, but not all these services under one roof. OPTERRA offers comprehensive services through our **Performance Services Group division.**

OPTERRA specializes in the Public Sector, we hold ourselves to the highest compliance with DIR regulation and ensure we are paying the correct prevailing wage rates, and work is performed by the appropriate certified labor classification. Our electrical workers are not just "PV Technicians," they are registered with the DIR as Journeyman or Apprentices.

Our Project Management Team:



Matt Hobbs
NorCal Regional Service Manager

Role: With nearly three decades in the industry, Matthew leads our service operations in Northern California, making sure every system runs smoothly. He works closely with technicians and clients to keep solar PV systems in top shape, ensuring fast responses and safe, efficient maintenance.

Years of Experience: 27 years

Licenses & Certifications:
OSHA Certified Equipment Trainer
CPR and First Aid
OSHA 30
Certified Pile Driver Operator
NFPA 70B/E

Relevant Experience

- Dublin USD
- Milpitas USD
- Salinas City ESD
- San Mateo Foster City SD
- San Mateo UHSD
- City of Hercules
- Contra Costa County Fire Protection District



Farheed Khan
Sr. PV Field Technician

Role: Farheed is a skilled PV Technician at OPTERRA, specializing in the maintenance, troubleshooting and repair of solar PV systems. He has extensive experience servicing inverters from residential to utility scale, he ensures optimal system performance by conducting site visits, performing firmware upgrades, and analyzing failed components. Farheed prioritizes safety, efficiency, and customer service excellence in all aspects of his work.

Years of Experience: 23 years

Education:
AS, Electronics Engineering Technology, City College of San Francisco

Licenses/Certifications: CA Journeyman Electrician, OSHA30, NFPA 70B/E

Relevant Experience

- City of Milpitas
- Milpitas USD
- Oak Grove USD
- Berryessa USD
- S. San Francisco USD
- City of San Jose
- Jefferson ESD
- City of Dublin



Clifton Clarke
Customer Care Advisor

Role: Clifton has over 21 years of experience in multiple roles. He owned and operated his own maintenance company for over 14 years, providing subcontracted services to OPTERRA before joining the team internally as a Customer Care Advisor.

Years of Experience: 21 years

Education:
BS, Santa Clara University

Licenses & Certifications:

CPR and First Aid certified

NFPA 70B
Certificate of Completion, PV201e: Principles of Solar PV System Design & Installation

Relevant Experience

- Dublin USD
- San Lorenzo USD
- S. San Francisco USD
- Ravenswood CSD
- Milpitas USD
- Jefferson ESD
- San Mateo Foster City SD
- San Mateo UHSD
- Contra Costa County Fire Protection District
- Belmont Redwood Shores SD



Jake Stewart
Account Manager

Role: As the Key Accounts Representative, Jake brings over 16 years of experience driving client satisfaction, fostering team growth, and optimizing processes. Adept at navigating dynamic environments, he excels in identifying opportunities for improvement and implementing strategic Initiatives to drive efficiency and profitability.

Years of Experience: 16 years

Education: BS, Business Administration, Western Governors University, Millcreek, UT

Relevant Experience

- Bellevue USD
- City of Dublin
- City & County of Honolulu
- County of Riverside County of Shasta
- County of Sutter
- City of Livermore
- Los Angeles USD

Subcontractors

Should there be a need for subcontractors, we use reputable local subcontractors selected through a rigorous pre-qualification process that evaluates financial strength, past performance, safety, and quality. Subcontractors are required to provide payment and performance bonds, liability insurance, and certified payroll documents. We manage all subcontractor activity with a focus on quality control, schedule, and safety.

Our subcontractor pre-qualification process ensures operational excellence and quality performance. We have pre-qualified many local subcontractors with outstanding track records and manage a competitive bid process to ensure best value. Non-competitive selection is only considered under specific circumstances and always with customer approval.

6. Warranty

On repair work the parts and installation warranty will be valid through the warranty term of the part manufacturer.

On new inverter installation the installation warranty is 1 year.

7. Time and Material Repair / Upgrade Projects

Our team has dedicated design engineers that will evaluate your current system and provide tailored recommendations for upgrades, replacements, or obsolescence planning to ensure long-term performance and reliability.

The seven proposals for system repairs, system upgrades, and annual repair allocation are included in the following 14 pages as Time and Material estimates. Work will be scheduled in a timely workmanlike manner. The proposals appearing on the following 14 pages are as follows:

James Lemos Swim Center – Solar Repower Project
City of Benicia Pump 2 Inverter 2 – Solar Repower Project
Benicia Pump 3 Inverter Repower
City of Benicia Corp Yard – Replace AC Dist and Aux Power Parts
Install New Bi-Directional Digital Meters at 5 Locations
Support and Update Solar Monitoring Service with Also Energy
City of Benicia – All Sites

Project Reference: James Lemos Swim Center – Solar Repower Project

We have reviewed the existing system and can propose the replacement of the failed inverter located at 181 East J Street, Benicia CA with two new inverters.

Scope of Work

Provide all engineering, labor, materials and equipment needed to replace the failed inverter at the City of Benicia Community Pool with two new smart inverters. Demolished inverter and materials will be removed from site and taken to recycling.

Cost Estimate

Labor	Apprentice Level	Hours/ Mileage	Hourly Rate	Total Price
Electrical Labor, Mileage, Engineering & Proj Management		32	$ 630.00	$ 22,251.11
Labor Subtotal				$ 22,251.11
Subcontracts		**Qty**	**Rate**	**Total Price**
Removal & Recycling of Old Inverter. Underground Rewiring		1	$41,339.12	$ 41,339.12
Subcontracts Subtotal				**$ 41,339.12**
Materials & Equipment Rental		**QTY**	**Unit Cost**	**Total Price**
Inverters & Gateway		2	$ 7,247.29	$ 14,494.57
Misc Electrical Materials (Ties, Straps, Hardware, Connectors, Strut, Conduit)			$ -	$ 1,073.91
Scissor Lift Rental [2 lifts, 1 week]		2	$ 805.43	$ 1,610.87
Material Subtotal				**$ 17,179.35**
Subtotal				**$ 80,769.58**
		Material Sales Tax	9.625%	$ 1,653.51
		Material Markup	15%	$ 2,576.90
Total Material Cost				**$ 21,409.77**
Grand Total				**$ 85,000.00**

Pricing valid through 2/25/26. Payment and performance bond not included.

The labor time is an estimate, hours will be reconciled when the job is completed and billed according to the hours used down to half day(4 hour) minimums.

Project Economics

Simple payback in 3 years.

Pool ETB Utility Analysis $/kWh			$0.41
Pool Repower Cost:			$79,149.96
Year	Annual Production kWh	Production Value $	Simple Payback
1	55,952	$ 22,940.32	$56,209.64
2	55,672	$ 22,825.62	$33,384.02
3	55,394	$ 22,711.49	$10,672.53
4	55,117	$ 22,597.93	($11,925.40)
5	54,841	$ 22,484.94	($34,410.34)
6	54,567	$ 22,372.52	($56,782.86)
7	54,294	$ 22,260.66	($79,043.52)
8	54,023	$ 22,149.35	($101,192.87)
9	53,753	$ 22,038.61	($123,231.48)
10	53,484	$ 21,928.41	($145,159.89)

Project Assumptions

- Permitting fees are not included and to be paid directly by customer if applicable.
- PG&E Interconnection Modification Fees are not included.
  (Fees may not apply for this “like for like” system)
- Underground conduit is assumed to be in good condition.
- There are no changes to the array structure, solar panels, solar panel mountings, array grounding, point of interconnection or AC Disconnect Switch necessary. This equipment is assumed in good condition suitable for reuse.
- No utilty shutdown is required to perform this work
- No ADA compliance required
- This system size is designed to be equivalent to the existing solar and allowed under the existing interconnection agreement and NEM utility rate schedule. Opterra will file the modification request to update the equipment with PG&E.

Project Reference: City of Benicia Pump 2 Inverter 2– Solar Repower Project

This estimate is provided under our time and materials rates to perform a replacement of failed inverter 2 located at 2401 East Second St, Benicia CA and replace it with one new inverter.

Scope of Work

Provide all engineering, labor, materials and equipment needed to replace failed inverter 2 at the City of Benicia Pump Station #2 with one new smart inverter. Demolished inverter and materials will be removed from site and taken to recycling.

Cost Estimate

Labor	Apprentice Level	Hours/ Mileage	Hourly Rate	Total Price
Electrical Labor, Mileage, Engineering & Proj Management		40	$ 543.08	$ 21,723.20
Labor Subtotal				$ 21,723.20
Subcontracts		**Qty**	**Rate**	**Total Price**
Removal & Recycling of Old Inverter. Underground Rewiring		1	-	$ 40,358.35
Subcontracts Subtotal				**$ 40,358.35**
Materials & Equipment Rental		**QTY**	**Unit Cost**	**Total Price**
Inverter & Gateway		1	$ 9,317.42	$ 9,317.42
Misc Electrical Materials (Ties, Straps, Hardware, Connectors, Strut, Conduit)			$ -	$ 1,048.43
Material Subtotal				**$ 10,365.85**
Subtotal				**$ 72,447.41**
		Material Sales Tax	9.625%	$ 997.71
		Material Markup	15%	$ 1,554.88
Total Material Cost				**$ 12,918.44**
Grand Total				**$ 75,000.00**

Pricing valid through 2/25/26. Payment and performance bond not included.

The labor time is an estimate, hours will be reconciled when the job is completed and billed according to the hours used down to half day(4 hour) minimums.

Project Economics

Simple payback less than 2 years. (Analyzed using only production from inverter 2 and not the entire site)

Pump2 ETB Utility Analysis $/kWh:		$0.42	
Pump2 Repower Cost:			$71,535.37
Year	Annual Production kWh	Production Value $	Simple Payback
1	128,900	$ 54,138.00	$ 17,397.37
2	128,256	$ 53,867.31	$ (36,469.94)
3	127,614	$ 53,597.97	$ (90,067.91)
4	126,976	$ 53,329.98	$ (143,397.89)
5	126,341	$ 53,063.33	$ (196,461.23)
6	125,710	$ 52,798.02	$ (249,259.24)
7	125,081	$ 52,534.03	$ (301,793.27)
8	124,456	$ 52,271.36	$ (354,064.63)
9	123,833	$ 52,010.00	$ (406,074.63)
10	123,214	$ 51,749.95	$ (457,824.58)

Project Assumptions

- Permitting fees are not included and to be paid directly by customer if applicable.
- PG&E Interconnection Modification Fees are not included.
  (Fees may not apply for this “like for like” system)
- Underground conduit is assumed to be in good condition.
- There are no changes to the array structure, solar panels, solar panel mountings, array grounding, point of interconnection or AC Disconnect Switch necessary. This equipment is assumed in good condition suitable for reuse.
- No utilty shutdown is required to perform this work
- No ADA compliance required
- This system size is designed to be equivalent to the existing solar and allowed under the existing interconnection agreement and NEM utility rate schedule. Opterra will file the modification request to update the equipment with PG&E.

Project Reference: Benicia Pump 3 Inverter Repower

We have reviewed the existing system layout and worked up three options for replacing inverters at Pump Station 3, located at 2401 East Second St, Benicia CA.

The following page details the three options considered and the estimated price for each. The production value of this site is $263k per year making the payback period less than 1 year for any of the options evaluated.

Option A: Estimate $250k
Each combiner box becomes a separate inverter system, 12 new inverters are installed in replacement of the existing combiner boxes. Underground feeders between combiner boxes and inverter pad replaced with AC feeders. AC switchboard refit with new breakers for each inverter. Both old inverters and accompanying DC switchboards to be recycled. Arrays stay 600V, no restringing. Inverter nameplate value exceeds ICA system size by 34kW but is less than 10% limit.

Option B: Estimate $215k
Each combiner box becomes a separate inverter system, combiner boxes and underground DC feeders remain. Twelve new inverters located at existing inverter pad. Both old inverters and accompanying DC switchboards to be recycled. Arrays stay 600V, no restringing. Each combiner box feed goes to a new de-combiner panel, the output feeds one inverter each. Inverter nameplate value exceeds ICA system size by 34kW but is less than 10% limit.

Option C: Estimate $205k
Replace each combiner box with 1000v rated new combiner box. Underground DC feeders remain. At the inverter pad the number of feeds will be combined and reduced into seven decombiners then wired into 7 larger string inverters. Both old inverters and accompanying DC switchboards to be recycled. Arrays rewired to 1000V, results in 2 unused solar panels. Inverter nameplate is 46kW less than ICA system size.

Considerations:
Option A: Unknown underground wire pull adder. Some new inverters will be underpowered. Easier layout to plan for future panel replacements. Can be upgraded to 1000V when panels replaced and achieve 34kW additional power generation. Array faults not covered by warranty.

Option B: Limited to 600V compatible inverters until arrays are rewired or replaced and combiner boxes replaced. DC feeder ampacity may be limiting to future panel replacement options. Some new inverters will be underpowered. May be able to achieve up to 34kW additional power generation with higher wattage new solar panels in the future. Array faults not covered by warranty.

Option C: Rewiring to 1000V arrays brings the system up to modern solar design standards where both the inverters and solar panels are easier to get replacements for. Less inverters and system is right sized to the existing array output. Array faults would be covered by installation warranty.

Project Economics :
Simple payback less than 1 year.

P3 ETB Utility Analysis $/kWh $0.42
Pump 3 Repower Cost: $ 250,000.00

Year	Annual Production kWh	Production Value $	Simple Payback
1	625,737	$ 262,809.63	$ (12,809.63)
2	622,609	$ 261,495.58	$ (274,305.21)
3	619,495	$ 260,188.10	$ (534,493.32)
4	616,398	$ 258,887.16	$ (793,380.48)
5	613,316	$ 257,592.73	$ (1,050,973.21)
6	610,249	$ 256,304.76	$ (1,307,277.97)
7	607,198	$ 255,023.24	$ (1,562,301.22)
8	604,162	$ 253,748.12	$ (1,816,049.34)
9	601,141	$ 252,479.38	$ (2,068,528.72)
10	598,136	$ 251,216.99	$ (2,319,745.71)

Assumptions:

- Permitting fees are not included and to be paid directly by customer if applicable.
- PG&E Interconnection Modification Fees are not included.
  (Fees may not apply for this “like for like” system)
- Underground conduit is assumed to be in good condition. If wire replacement for option A does not pull through the existing conduits, some trenching or replacement may be necessary at additional cost.
- There are no changes to the array structure, solar panels, solar panel mountings, array grounding, point of interconnection or AC Disconnect Switch necessary in any of the options. This equipment is assumed in good condition suitable for reuse.
- No utilty shutdown is required to perform this work
- No ADA compliance required
- This system size is designed to be equivalent to the existing solar and allowed under the existing interconnection agreement and NEM utility rate schedule. Opterra will file the modification request to update the equipment with PG&E.

Project Reference: City of Benicia Corp Yard – Replace AC Dist and Aux Power Parts

The inverter has faulted and requires new AC Dist and Aux power parts. Once parts are replaced, the inverter will be re-energized.

Scope of Work

Provide materials and labor to install new AC Dist and Aux power parts to repair inverter and restore to operation.

Cost Estimates

Labor	Apprentice Level	Hours/ Mileage	Hourly Rate	Total Price
Electrical Labor, Mileage & Project Management		10	$ 290.00	$ 2,900.00
Labor Subtotal				$ 2,900.00
Subcontracts		**Qty**	**Rate**	**Total Price**
Bold Renewables Parts & Labor		1	$14,000.00	$ 14,000.00
Subcontracts Subtotal				**$ 14,000.00**
Materials & Equipment Rental		**QTY**	**Unit Cost**	**Total Price**
Misc Electrical Materials		1	$ 100.00	$ 100.00
Material Subtotal				**$ 100.00**
Subtotal				**$ 17,000.00**
		Material Sales Tax	9.63%	$ 9.63
Total Material Cost				**$ 100.00**
Grand Total				**$ 17,000.00**

Pricing valid through 2/25/26. Payment and performance bond not included.

The labor time is an estimate, hours will be reconciled when the job is completed and billed according to the hours used down to half day(4 hour) minimums.

Exclusions & Legal Disclaimer:

Premium Time or Over Time, Work on Nights or Weekends, Cutting, Patching or Painting, Permitting Fees, Plan Revisions, Geotechnical Reports/inspections, PLA/PSA Agreements, Irrigation system inspection/repairs, Landscape repair/tire track removal, Landscape Maintenance, Infestations, Utility Interconnection Agreement Modification Fees.

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Project Reference: Install New Bi-Directional Digital Meters at 5 Locations

The solar net generation output meters (NGOMs) have failed at 2 locations (Pump1 & WTP) and need replaced. In addition, we recommend adding Net Energy Meters (NEMs) to the 5 largest sites to redundantly meter the PG&E service to provide full insight into each facility's energy usage.

The five locations are as follows: City Hall, Pump 1, Pump 2, Pump 3, WTP.

Scope of Work

Provide materials and electrician labor to install 7 new revenue grade digital modbus meters and tie them into the existing monitoring systems. Provide AlsoEnergy required configuration data to setup website monitoring.

Cost Estimates

Replacement Net Generation Output Meters (Solar Meters) at Pump 1 & WTP:

Labor	Apprentice Level	Hours/ Mileage	Hourly Rate	Total Price
Electrical Labor, Mileage & Proj Management		8	$ 414.40	$ 3,628.66
Labor Subtotal				$ 3,628.66
Materials & Equipment Rental		**QTY**	**Unit Cost**	**Total Price**
Accuenergy Acuvim II or Leviton 4100 Meter w/ Rogowski Coil CTs - Replace Existing NGOM		2	$ 1,753.80	$ 3,507.59
Material Subtotal				**$ 3,507.59**
Subtotal				**$ 7,136.25**
		Material Sales Tax	9.625%	$ 337.61
		Material Markup	15%	$ 526.14
Total Material Cost				**$ 4,371.34**
Grand Total				**$ 8,000.00**

New Net Energy Meters (Utility Service Bidirectional Meters) at Locations:

Labor	Apprentice Level	Hours/ Mileage	Hourly Rate	Total Price
Electrical Labor & Proj Management		22	$ 494.49	$ 10,878.72
Labor Subtotal				$ 10,878.72
Materials & Equipment Rental		**QTY**	**Unit Cost**	**Total Price**
Accuenergy Acuvim II or Leviton 4100 NGOM Meter w/ Rogowski Coil CTs		5	$ 1,739.18	$ 8,695.90
Misc Electrical Materials (7 New Meters Conduit, Hardware, Mounting)		5	$ 527.02	$ 2,635.12
Material Subtotal				**$ 11,331.01**
Subtotal				**$ 22,209.74**
		Material Sales Tax	9.625%	$ 1,090.61
		Material Markup	15%	$ 1,699.65
Total Material Cost				**$ 14,121.28**
Grand Total				**$ 25,000.00**

Pricing valid through 2/25/26. Payment and performance bond not included.

The labor time is an estimate, hours will be reconciled when the job is completed and billed according to the hours used down to half day(4 hour) minimums.

Considerations & Additional Costs:

AlsoEnergy monitoring fees are determined by number of devices monitored. The 5 new additional meters will incur additional monitoring fee with AlsoEnergy. The 2 replacement NGOMs are already included in the existing AlsoEnergy monitoring service.

Utility shutdowns are required to perform the installation of the Net Energy Meters. Customer will need to facilitate the utility shutdown and assist with the coordination of the shutdown schedule for each site. Opterra has not included contingency time to wait for PG&E past the 4 hour service window per meter install. If PG&E is delayed in returning to re-energize the site, the customer can have their staff wait onsite for PG&E or approve additional time for Opterra technician to standby until PG&E returns. Labor time will be subject to Overtime (1.5x rates) after 8 hours.

The seven sites proposed for NEM installs were selected because they are the largest sites that would benefit the most from having a complete energy use picture painted by the meter data. This not only helps keep PG&E honest on the exported solar power credits on your true up bills but also allows the facility to better understand when energy is costing the most and make proactive changes to mitigate these costs.

For reference, the table below is organized in order of largest site to smallest PV system kW size, the blue ones are water district sites.

Sites	AsBuilt PV Capacity (kW)
Pump Station #3 E 2ND ST N/O ROSE DR	456.19
Water Treatment Plant LAKE HERMAN RD	318.99
Pump Station #2 .5MI W/E 2ND ST	205.8
City Hall 250 E L ST	195.51
Pump Station #1 2600 E 2ND ST	144

Project Reference: Support and Update Solar Monitoring Service with AlsoEnergy

The AlsoEnergy monitoring interface could be improved to provide a much higher level of diagnostic support, reporting and asset management for your solar projects. The following proposal is to purchase labor from Opterra to update the AE Powertracker web portal on a one-time basis so that it better suits your needs for reporting and provides the diagnostic support needed to expedite solar repairs and remote troubleshooting.

Scope of Work

Provide engineering and technical labor to optimize the features in AlsoEnergy solar monitoring platform. The following features have been requested from AlsoEnergy to add to the current monitoring service agreement:

- Inverter level monitoring
- Inverter level alarming
- Add utility rate to create monetary production reports
- Automated production reports
- Predictive model for actual vs predicted production reporting.

The weather adjusted predictive models are impacted by the weather data collected. The weather stations onsite are likely out of calibration and three are not working at all. It is recommended to install one new weather station and have that linked to all sites for use in the weather adjusted predictive models. There is a one time setup fee that will be charged by AlsoEnergy that is not included. We evaluated using internet satellite weather data as an option but unfortunately it costs $1500/yr/site and is not cost effective.

Cost Estimate

Labor		Hours/ Mileage	Hourly Rate	Total Price
Electrical Labor & Mileage		10	$ 327.94	$ 3,661.58
Project Management Advisor	Website Support		$ 230.00	$ 5,486.82
Engineer Senior	Pvsyst Modeling		$ 185.00	$ 6,444.84
Labor Subtotal				$ 15,593.24
Materials & Equipment Rental		**QTY**	**Unit Cost**	**Total Price**
PVMet Weather Station		1	$ 3,536.02	$ 3,536.02
Material Subtotal				**$ 3,536.02**
Subtotal				**$ 19,129.26**
		Material Sales Tax	9.625%	$ 340.34
		Material Markup	15%	$ 530.40
Total Material Cost				**$ 4,406.76**
Grand Total				**$ 20,000.00**

Pricing valid through 2/25/26. Payment and performance bond not included.

The labor time is an estimate, hours will be reconciled when the job is completed and billed according to the hours used down to half day(4 hour) minimums.

Assumptions

Customer shall grant OPTERRA team access to AlsoEnergy webportal with admin level permissions to enable our team to make the updates on a one-time basis.

Project Reference: City of Benicia – All Sites

Annual Miscellaneous Repairs, Refurbishments, Replacements, and Upgrades.

Scope of Work

Provide engineering and technical labor to optimize the performance of City solar installations and maximize financial performance by way of miscellaneous and minor repairs, refurbishments, equipment replacements, and upgrades.

Annual Cost Estimate:

Labor, Materials, and Equipment: $150,000.

Time & Material Rates:

The labor rates shown are valid from February 1, 2026 to February 1, 2027.

Opterra Labor	Rate
Serion Journeyman Technician (per Hour)	$189.00
Journeyman Electriian Travel & Labor (per Hour)	$133.00
Apprentice Travel & Labor (per Hour)	$114.00
Regional Service Manager/Procurement (per Hour)	$283.00
Design Engineer	$230.00
Project Admin Labor & Certified Payroll (per Hour)	$108.00
Mileage (per Mile)	$1.05

Material Markup is 15%

Pricing valid through 3/19/26. Payment and performance bond not included.

The labor time is an estimate, hours will be reconciled when the job is completed and billed according to the hours used down to half day (4 hour) minimums.

Exclusions & Legal Disclaimer:

Premium Time or Over Time, Work on Nights or Weekends, Cutting, Patching or Painting, Permitting Fees, Plan Revisions, Geotechnical Reports/inspections, PLA/PSA Agreements, Irrigation system inspection/repairs, Landscape repair/tire track removal, Landscape Maintenance, Infestations, Utility Interconnection Agreement Modification Fees.

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EXHIBIT B

WORK ORDER
TO MASTER AGREEMENT

"Contractor": Opterra Energy Services, LLC.

Subcontractor Address:

Subcontractor Phone No.: **Subcontractor Taxpayer Identification No.: On File**

Work Order Contract Amount: **Prevailing Wages Required: Yes**

Master Contract Effective Date: **DIR Project No.:**

This Work Order ("Work Order") dated _____ ("Work Order Effective Date") is issued pursuant to and is subject to the terms and conditions of the Master Agreement ("Agreement") by and between the **City of Benicia** ("CITY") and **OPTERRA Energy Services, LLC** ("OPTERRA") and _____ ("Contractor") dated _____. The terms and conditions of the Agreement are hereby incorporated into and made a part of this Work Order for all purposes.

1. **SCOPE OF WORK/SITE LOCATIONS**. The Scope of Work at each Site Location is set forth at **"Attachment 1 - Scope of Work/Site Locations"**, which is attached hereto, incorporated herein and made a part hereof for all purposes. Unless otherwise described in this Work Order, Contractor shall be responsible for the removal, transport, and proper disposal of Hazardous Substances identified in Attachment 1 and to provide to City certification that such substances were properly transported from the site location(s) and properly disposed of.

2. **PROJECT SCHEDULE.** The Project Schedule for each Site Location where Work will be performed by Contractor pursuant to this Work Order, including Start Date of the Work, Substantial Completion Date, and Final Completion Date, is identified below.

   The Work must achieve Final Completion and be ready for final payment on or before _____, 20__ ("Final Completion Date").

3. **WORK ORDER CONTRACT AMOUNT.** The total Work Order Contract Amount for performance of the Work to be provided under this Work Order is as follows:
   $___,___.00 (insert contract amount spelled out in words_____ dollars). This amount is a lump sum.

   Contractor shall invoice CITY monthly for Work performed during the preceding month or period.

ATTACHMENT 1
SCOPE OF WORK / SITE LOCATIONS

EXHIBIT C

OPTERRA Energy Services
500 12th Street, Suite 300
Oakland CA 94607-4087
USA

Invoice number:

Invoice Date:

Bill To:

Ship To:

For:

Contact:

E-mail to:

Project:

Order Date	Reference	Payment Terms	Due Date
		Net 30 Days	Feb 25, 2026

Item Description	Net Amount

Subtotal	0.00
Taxes	**USD 0.00**
Total Billed Amount	

PAYMENT INSTRUCTIONS:

MAIL CHECKS TO:
OPTERRA Energy Services
PO Box 741212 Los Angeles, CA 90074-1212

OVERNIGHT TO:
OPTERRA Energy Services Lockbox: 741212
2706 Media Center Drive Los Angeles, CA 90065-1733

EMAIL PAYMENT ADVICES TO:
OPTERRA-Remittance_Advices@opterraenergy.com

ACH INSTRUCTIONS:
Bank: BOA Global Finance, Dallas TX
Routing: 111000012 Account: 4451303815

WIRE INSTRUCTIONS:
Bank: BOA New York, NY
Routing: 026009593 Account: 4451303815
SWIFT (USD): BOFAUS3N

AGENDA ITEM
CITY COUNCIL MEETING DATE – APRIL 7, 2026
CONSENT CALENDAR

TO : City Council

FROM : Interim Human Resources Manager

SUBJECT : **APPROVAL OF PUBLICLY AVAILABLE SALARY SCHEDULES AND POSITION ALLOCATION CHANGE FOR THE FINANCE DEPARTMENT**

EXECUTIVE SUMMARY:

California Public Employee's Retirement System (CalPERS) requires the adoption of resolutions duly approving and adopting publicly available pay schedules in accordance with the requirement of the California Code of Regulations (CCR), Title 2, Section 570.5.

RECOMMENDATION:

Adopt a resolution (Attachment 1) approving and adopting publicly available pay schedules (Exhibit A) in accordance with the California Code of Regulations, Title 2, Section 570.5, approving position allocation change, authorizing the Finance Director to make the necessary budget amendments, and authorizing the City Manager to take the necessary administrative steps to implement the actions.

BUDGET INFORMATION:

There is no budget impact for the changes to City Manager salary as the budget for this item was approved at a previous council meeting. The budget impact for the position allocation change is $879.00 for Fiscal Year ending 2026 and $8,286 for Fiscal Year ending 2027.

BACKGROUND:

The City of Benicia contracts with CalPERS to provide retirement benefits for its employees. As a public employer, the City must abide by California law when establishing and reporting compensation for its employees. The CCR Title 2, Section 570.5 provides that each pay schedule meets the following requirements:

1. Has been duly approved and adopted by the employer's governing body in accordance with requirements of applicable public meeting laws; and
2. Identifies the position title for every employee position; and
3. Shows the pay rate and effective date for each position; and
4. Indicates the time base for each pay rate.

CalPERS uses the City's pay schedules to determine final compensation and to calculate retirement benefits for the City's employees. Inaccurate pay schedules could negatively impact an employee's final retirement calculation or delay receipt of the appropriate retirement compensation. The City has been posting salary information on its website for years. To ensure that the City remains compliant with its obligation under Section 570.5, staff will, at a minimum, present pay schedules to the Council to be duly authorized and approved on an annual basis.

The City also continues to make necessary changes to modernize operations within all departments, implement program efficiencies, and identify staffing optimization solutions to secure a strong and sustainable financial future. The efforts to review staffing as part of the City's Resiliency Plan continue and will continue in phases over the next few years.

This report recognizes a position allocation change in the Finance Department as follows:

Finance: Net 0 FTE

- Delete 1 FTE Finance Director
- Add 1 FTE Administrative Services Director

The Administrative Services Director acts as the chief financial officer while also managing information technology, purchasing, and certain functions of risk management. The Finance Director assumed management of the IT division when the Assistant City Manager resigned in 2023. The Finance Director has been receiving acting pay for the assignment, and this allocation change officially organizes both the Finance Department and IT Division under the Administrative Services Director. The acting pay will be eliminated.

Exhibit A reflects 1) the current part-time hourly pay schedule, updated to include the January 2026 minimum wage increase; 2) future salary rates for City Manager, pursuant to the second amendment to the employment contract approved in 2025; and 3) adds the position allocation and salary range for the position of Administrative Services Director.

NEXT STEPS:
Direct staff to take the necessary steps to finalize and post on the City website the salary schedules in accordance with CalPERS requirements.

ALTERNATIVE ACTIONS:
Without Council approval of the position allocation change and budget amendment, no change will be made.

CEQA Analysis	The requested action is exempt from CEQA because it will not result in a direct or indirect physical change in the environment and therefore it is not a project as defined in CEQA Guidelines Section 15378.

ATTACHMENT:

1. Resolution - Salary Schedules
   Exhibit A - Salary Schedules

For more information contact: Kim Imboden, Interim Human Resources Manager
Phone: 707-746-4205
E-mail: kimboden@ci.benicia.ca.us

RESOLUTION NO. 26-

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BENICIA APPROVING POSITION ALLOCATION AND BUDGET AMENDMENT AND PUBLICLY AVAILABLE SALARY SCHEDULE, AND AUTHORIZING THE CITY MANAGER TO TAKE THE NECESSARY ADMINISTRATIVE STEPS TO IMPLEMENT THE ACTIONS

WHEREAS, the City of Benicia contracts with the California Public Employee's Retirement System ("CalPERS") to provide retirement benefits for its employees; and

WHEREAS, pursuant to California Code of Regulations, Title 2, Section 570.5, CalPERS requires governing bodies of local agencies contracting with CalPERS to approve and adopt a publicly available pay schedule in accordance with public meeting laws; and

WHEREAS, the pay schedule must identify the position title for every employee position, the pay rate for each position title, and the applicable time base for the pay rate; and

WHEREAS, the pay schedules reflect the minimum wage increase, effective January 1, 2026, for part-time employees, the future salary changes for City Manager, and adds the classification and salary range for the position of Administrative Services Director; and

WHEREAS, the City Council of the City of Benicia desires to approve and adopt the publicly available pay schedules, as outlined in Exhibit A, showing all established employee positions and pay rates, in accordance with the requirement of California Code of Regulations, Title 2, Section 570.5.

NOW, THEREFORE, BE IT RESOLVED THAT the City Council of the City of Benicia does hereby approve the publicly available salary schedules for the City of Benicia job classifications as outlined in Exhibit A; approves the position allocation change of deleting 1 FTE Finance Director and adding 1 FTE Administrative Services Director, and the budget adjustment for the allocation change, authorizes the Finance Director to make the necessary budget amendments, and authorizes the City Manager to take the necessary administrative steps to implement the actions.

*****

On motion of Council Member , seconded by Council Member , the above Resolution was adopted by the City Council of the City of Benicia at a regular meeting of said Council held on the 7th day of April, 2026 by the following vote:

Ayes:

Noes:

Absent:

Abstain:

_____
Steve Young, Mayor

Attest:

_____
Lisa Wolfe, City Clerk

_____
Date

Exhibit A
Salary Schedules [see next page]

City of Benicia - Full Time Monthly Salary Schedule

For questions, contact Human Resources at (707) 746-4766

Classification Title	Grade	Unit	Effective Date	Step 1	Step 2	Step 3	Step 4	Step 5
ACCOUNT CLERK I	A100	BPSEA	6/21/2025	$4,118.86	$4,324.80	$4,541.06	$4,768.10	$5,006.49
ACCOUNT CLERK II	A101	BPSEA	6/21/2025	$4,530.75	$4,757.28	$4,995.14	$5,244.89	$5,507.14
ACCOUNTANT I	B270	BSPA	6/21/2025	$6,506.82	$6,832.16	$7,173.78	$7,532.48	$7,909.08
ACCOUNTANT II	B271	BSPA	6/21/2025	$7,157.51	$7,515.37	$7,891.14	$8,285.70	$8,700.00
ACCOUNTING MANAGER	C105	MID	6/21/2025	$11,176.01	$11,734.79	$12,321.56	$12,937.62	$13,584.50
ACCOUNTING TECHNICIAN	A120	BPSEA	6/21/2025	$5,730.90	$6,017.43	$6,318.31	$6,634.19	$6,965.92
ADMIN CLERK I	A130	BPSEA	6/21/2025	$3,857.96	$4,050.85	$4,253.41	$4,466.08	$4,689.38
ADMIN CLERK II	A131	BPSEA	6/21/2025	$4,244.32	$4,456.55	$4,679.36	$4,913.33	$5,158.99
ADMIN SECRETARY	B100	BSPA	6/21/2025	$5,340.98	$5,608.01	$5,888.43	$6,182.85	$6,491.99
ADMINISTRATIVE SERVICES DIRECTOR	E165	SENIOR	4/21/2026	$15,905.73	$16,701.01	$17,536.07	$18,412.87	$19,333.51
ASSISTANT ENGINEER	B120	BSPA	6/21/2025	$8,710.75	$9,146.28	$9,603.59	$10,083.78	$10,587.95
ASSISTANT PLANNER	B130	BSPA	6/21/2025	$7,026.43	$7,377.76	$7,746.62	$8,133.97	$8,540.66
ASSOCIATE CIVIL ENGINEER	B140	BSPA	6/21/2025	$9,582.84	$10,061.97	$10,565.07	$11,093.33	$11,648.00
ASSOCIATE PLANNER	B150	BSPA	6/21/2025	$7,729.17	$8,115.62	$8,521.42	$8,947.48	$9,394.84
ASST CITY MGR/COMM DEV DIR	E139	SENIOR	6/21/2025	$16,627.72	$17,459.12	$18,332.08	$19,248.68	$20,211.11
BUDGET MANAGER	C115	MID	6/21/2025	$11,176.01	$11,734.79	$12,321.56	$12,937.62	$13,584.50
BUILDING INSPECTION SUPERVISOR	B155	BSPA	6/21/2025	$9,308.14	$9,773.55	$10,262.22	$10,775.33	$11,314.10
BUILDING INSPECTOR I	A140	BPSEA	6/21/2025	$6,265.98	$6,579.30	$6,908.24	$7,253.67	$7,616.34
BUILDING INSPECTOR II	A141	BPSEA	6/21/2025	$6,892.16	$7,236.77	$7,598.60	$7,978.53	$8,377.46
CITY CLERK	N110	ELECT	7/1/2012	$1,078.67				
CITY ENGINEER	C130	MID	6/21/2025	$13,258.57	$13,921.51	$14,617.59	$15,348.45	$16,115.88
CITY MANAGER	G110	CONTRACT	6/21/2025	$20,211.13				
CITY MANAGER	G110	CONTRACT	6/21/2026	$20,589.31				
CITY MANAGER	G110	CONTRACT	6/21/2027	$22,690.83				
COMMUNITY DEV COORDINATOR	B158	BSPA	6/21/2025	$6,142.13	$6,449.23	$6,771.70	$7,110.28	$7,465.78
COMMUNITY PRESERVATION OFFICER	A145	BPSEA	6/21/2025	$6,708.54	$7,043.97	$7,396.20	$7,765.98	$8,154.29
COMMUNITY SERVICE OFFICER I	I120	BDA	6/21/2025	$5,355.35	$5,623.11	$5,904.27	$6,199.46	$6,509.45
COMMUNITY SERVICE OFFICER II	I121	BDA	6/21/2025	$5,890.53	$6,185.06	$6,494.31	$6,819.04	$7,159.99
COMMUNITY SERVICES DIRECTOR	E145	SENIOR	6/21/2025	$13,594.78	$14,274.52	$14,988.25	$15,737.65	$16,524.54
COUNCIL MEMBER	N120	ELECT	7/1/2012	$393.59				
DEPUTY CDD DIR/BLDG OFFICIAL	C119	MID	6/21/2025	$12,274.43	$12,888.16	$13,532.56	$14,209.19	$14,919.65
DEPUTY CITY CLERK	B170	BSPA	6/21/2025	$7,434.56	$7,806.28	$8,196.60	$8,606.42	$9,036.75
DEPUTY CITY MANAGER	E160	SENIOR	6/21/2025	$13,412.34	$14,082.97	$14,787.10	$15,526.47	$16,302.78
DEPUTY POLICE CHIEF	K125	PDMGT	6/21/2025	$16,476.43	$17,300.26	$18,165.27	$19,073.53	$20,027.21
DEPUTY PW DIR CITY ENG	C255	MID	6/21/2025	$14,065.04	$14,768.30	$15,506.71	$16,282.05	$17,096.15
DEPUTY PW DIR OPERATIONS	C265	MID	6/21/2025	$14,065.04	$14,768.30	$15,506.71	$16,282.05	$17,096.15
DEPUTY PW DIR UTILITIES	C270	MID	6/21/2025	$14,065.04	$14,768.30	$15,506.71	$16,282.05	$17,096.15
DEVELOPMENT SERVICES TECH I	A150	BPSEA	6/21/2025	$4,906.00	$5,151.29	$5,408.86	$5,679.30	$5,963.28
DEVELOPMENT SERVICES TECH II	A151	BPSEA	6/21/2025	$5,396.70	$5,666.55	$5,949.86	$6,247.35	$6,559.72
DIVISION FIRE CHIEF	D120	MID SAFETY	6/21/2025	$12,504.04	$13,129.24	$13,785.70	$14,474.99	$15,198.74
ECONOMIC DEVELOPMENT MGR I	C140	MID	6/21/2025	$10,035.32	$10,537.10	$11,063.95	$11,617.13	$12,198.00
ECONOMIC DEVELOPMENT MGR II	C150	MID	6/21/2025	$12,041.96	$12,644.03	$13,276.24	$13,940.06	$14,637.06
ENGINEERING TECHNICIAN I	A160	BPSEA	6/21/2025	$6,017.14	$6,318.01	$6,633.91	$6,965.60	$7,313.89
ENGINEERING TECHNICIAN II	A161	BPSEA	6/21/2025	$6,618.88	$6,949.81	$7,297.30	$7,662.16	$8,045.28
EXECUTIVE ASST TO CITY MANAGER	B190	BSPA	6/21/2025	$6,142.12	$6,449.22	$6,771.68	$7,110.28	$7,465.77
EXECUTIVE ASST TO POLICE CHIEF	B191	BSPA	6/21/2025	$5,741.55	$6,028.63	$6,330.07	$6,646.56	$6,978.89

City of Benicia - Full Time Monthly Salary Schedule

For questions, contact Human Resources at (707) 746-4766

Classification Title	Grade	Unit	Effective Date	Step 1	Step 2	Step 3	Step 4	Step 5
FIELD UTILITIES STREETS APPR	A170	BPSEA	6/21/2025	$5,700.64	$5,985.67	$6,284.94	$6,599.20	$6,929.15
FIELD UTILITIES STREETS JRNY	A180	BPSEA	6/21/2025	$6,264.43	$6,577.66	$6,906.54	$7,251.86	$7,614.46
FIELD UTILITIES STREETS SUP	B195	BSPA	6/21/2025	$10,107.01	$10,612.37	$11,142.98	$11,700.13	$12,285.14
FINANCE DIRECTOR	E110	SENIOR	6/21/2025	$14,459.74	$15,182.72	$15,941.87	$16,738.97	$17,575.92
FIRE CAPTAIN	L110	BFA	6/21/2025	$10,429.75	$10,951.24	$11,498.80	$12,073.74	$12,677.43
FIRE CHIEF	F110	SEN SAFETY	6/21/2025	$17,435.50	$18,307.28	$19,222.63	$20,183.77	$21,192.97
FIRE ENGINEER	L130	BFA	6/21/2025	$9,460.09	$9,933.09	$10,429.75	$10,951.24	$11,498.80
FIRE LIEUTENANT	L115	BFA	6/21/2025	$9,933.09	$10,429.75	$10,951.24	$11,498.80	$12,073.74
FIRE PREVENTION INSPECTOR	A190	BPSEA	6/21/2025	$6,892.16	$7,236.77	$7,598.60	$7,978.53	$8,377.46
FIRE PREVENTION INSPECTOR II	A191	BPSEA	6/21/2025	$7,581.37	$7,960.45	$8,358.48	$8,776.40	$9,215.22
FIREFIGHTER	L120	BFA	6/21/2025	$8,190.55	$8,600.08	$9,030.09	$9,481.59	$9,955.67
GIS COORDINATOR	B210	BSPA	6/21/2025	$7,787.25	$8,176.62	$8,585.45	$9,014.72	$9,465.45
HUMAN RESOURCES ANALYST I	H129	BSPA UNREP	6/21/2025	$6,734.27	$7,070.99	$7,424.53	$7,795.75	$8,185.55
HUMAN RESOURCES ANALYST II	H130	BSPA UNREP	6/21/2025	$7,407.69	$7,778.08	$8,166.98	$8,575.32	$9,004.10
HUMAN RESOURCES ASSISTANT	A220	BPSEA	6/21/2025	$5,124.83	$5,381.07	$5,650.12	$5,932.63	$6,229.26
HUMAN RESOURCES MANAGER	C151	MID	6/21/2025	$12,328.24	$12,944.64	$13,591.88	$14,271.47	$14,985.05
HUMAN RESOURCES TECHNICIAN	A210	BPSEA	6/21/2025	$5,251.90	$5,514.49	$5,790.23	$6,079.74	$6,383.72
INFORMATION TECHNOLOGY ASST	A240	BPSEA	6/21/2025	$4,659.96	$4,892.95	$5,137.59	$5,394.46	$5,664.19
INFORMATION TECHNOLOGY MANAGER	C160	MID	6/21/2025	$11,797.59	$12,387.47	$13,006.84	$13,657.20	$14,340.06
IRRIGATION SPECIALIST	A230	BPSEA	6/21/2025	$5,724.01	$6,010.21	$6,310.70	$6,626.25	$6,957.57
IT ANALYST I	B215	BSPA	6/21/2025	$6,674.94	$7,008.69	$7,359.11	$7,727.09	$8,113.44
IT ANALYST II	B216	BSPA	6/21/2025	$7,342.99	$7,710.12	$8,095.63	$8,500.42	$8,925.43
LABORATORY ANALYST	A250	BPSEA	6/21/2025	$8,121.83	$8,527.93	$8,954.33	$9,402.05	$9,872.14
LABORATORY TECHNICIAN I	A260	BPSEA	6/21/2025	$6,725.70	$7,061.98	$7,415.09	$7,785.84	$8,175.12
LABORATORY TECHNICIAN II	A261	BPSEA	6/21/2025	$7,390.88	$7,760.42	$8,148.44	$8,555.86	$8,983.65
LIBRARIAN I	C170	MID	6/21/2025	$5,707.15	$5,992.51	$6,292.14	$6,606.75	$6,937.09
LIBRARIAN II	C171	MID	6/21/2025	$6,278.67	$6,592.60	$6,922.24	$7,268.34	$7,631.76
LIBRARY MANAGER	C180	MID	6/21/2025	$8,303.61	$8,718.78	$9,154.71	$9,612.45	$10,093.08
LIBRARY SUPERINTENDENT	E119	SENIOR	6/21/2025	$13,133.47	$13,790.13	$14,479.64	$15,203.62	$15,963.79
LIBRARY TECHNICIAN I	B225	BSPA	6/21/2025	$4,115.41	$4,321.15	$4,537.23	$4,764.09	$5,002.28
LIBRARY TECHNICIAN II	B226	BSPA	6/21/2025	$4,526.50	$4,752.82	$4,990.46	$5,239.99	$5,501.98
LITERACY PROGRAM SUPERVISOR	B235	BSPA	6/21/2025	$5,428.51	$5,699.92	$5,984.93	$6,284.16	$6,598.39
MAINTENANCE CUSTODIAN	A290	BPSEA	6/21/2025	$4,403.44	$4,623.60	$4,854.80	$5,097.53	$5,352.40
MAINTENANCE TECHNOLOGIST I	A270	BPSEA	6/21/2025	$7,559.13	$7,937.09	$8,333.95	$8,750.64	$9,188.18
MAINTENANCE TECHNOLOGIST II	A271	BPSEA	6/21/2025	$8,306.74	$8,722.08	$9,158.18	$9,616.11	$10,096.91
MAINTENANCE WORKER III PCS	A280	BPSEA	6/21/2025	$6,268.92	$6,582.37	$6,911.48	$7,257.07	$7,619.91
MAINTENANCE WORKER III PW	A285	BPSEA	6/21/2025	$7,133.55	$7,490.23	$7,864.74	$8,257.97	$8,670.87
MANAGEMENT ANALYST I	B245	BSPA	6/21/2025	$6,758.46	$7,096.40	$7,451.23	$7,823.78	$8,214.97
MANAGEMENT ANALYST II	B246	BSPA	6/21/2025	$7,434.56	$7,806.28	$8,196.60	$8,606.42	$9,036.75
MAYOR	N130	ELECT	7/1/2012	$525.09				
MECHANIC	A305	BPSEA	6/21/2025	$6,524.51	$6,850.75	$7,193.28	$7,552.95	$7,930.59
PARAMEDIC FIREFIGHTER	L140	BFA	6/21/2025	$9,009.61	$9,460.09	$9,933.09	$10,429.75	$10,951.24
PARAMEDIC FIREFIGHTER TRAINEE	L142	PD/FFTRAIN	6/21/2025	$6,306.73				
PARKS BLDG MAINT SUPERVISOR	B255	BSPA	6/21/2025	$10,107.01	$10,612.37	$11,142.98	$11,700.13	$12,285.14
PARKS COMM SVCS SUPERINTENDENT	C190	MID	6/21/2025	$9,438.62	$9,910.56	$10,406.09	$10,926.38	$11,472.70

City of Benicia - Full Time Monthly Salary Schedule

For questions, contact Human Resources at (707) 746-4766

Classification Title	Grade	Unit	Effective Date	Step 1	Step 2	Step 3	Step 4	Step 5
PAYROLL ANALYST I	B257	BSPA	6/21/2025	$6,758.46	$7,096.40	$7,451.23	$7,823.78	$8,214.97
PAYROLL ANALYST II	B258	BSPA	6/21/2025	$7,434.56	$7,806.28	$8,196.60	$8,606.42	$9,036.75
PERMIT SERVICES SPECIALIST	B575	BSPA	6/21/2025	$8,272.78	$8,690.43	$9,121.72	$9,577.81	$10,056.70
PLANNING MANAGER	C200	MID	6/21/2025	$11,495.17	$12,069.94	$12,673.44	$13,307.10	$13,972.45
PLBM JOURNEYMAN	A330	BPSEA	6/21/2025	$5,451.54	$5,724.12	$6,010.33	$6,310.84	$6,626.38
PLBM WORKER	A340	BPSEA	6/21/2025	$4,955.52	$5,203.29	$5,463.46	$5,736.64	$6,023.46
POLICE CHIEF	F120	SEN SAFETY	6/21/2025	$18,124.07	$19,030.28	$19,981.79	$20,980.89	$22,029.93
POLICE LIEUTENANT	K120	PDMGT	6/21/2025	$14,395.74	$15,115.53	$15,871.31	$16,664.89	$17,498.11
POLICE OFFICER	J110	BPOA	6/21/2025	$9,033.73	$9,485.38	$9,959.68	$10,457.66	$10,980.53
POLICE RECORDS CLERK	I150	BDA	6/21/2025	$5,355.35	$5,623.11	$5,904.27	$6,199.46	$6,509.45
POLICE RECORDS SUPERVISOR	B260	BSPA	6/21/2025	$6,275.52	$6,589.29	$6,918.76	$7,264.72	$7,627.94
POLICE SERGEANT	J120	BPOA	6/21/2025	$10,840.92	$11,382.95	$11,952.12	$12,549.74	$13,177.23
POLICE TRAINEE	I155	PD/FFTRAIN	6/21/2025	$6,323.61	$6,639.77	$6,971.78	$7,320.36	$7,686.37
PRINCIPAL CIVIL ENGINEER	C210	MID	6/21/2025	$12,150.67	$12,758.21	$13,396.11	$14,065.91	$14,769.21
PRINCIPAL PLANNER	C220	MID	6/21/2025	$10,947.80	$11,495.17	$12,069.95	$12,673.45	$13,307.12
PROJECT MANAGER	C230	MID	6/21/2025	$11,101.07	$11,656.13	$12,238.93	$12,850.88	$13,493.42
PUBLIC SAFETY DISPATCH I	I140	BDA	6/21/2025	$6,184.89	$6,494.14	$6,818.84	$7,159.79	$7,517.78
PUBLIC SAFETY DISPATCH II	I141	BDA	6/21/2025	$6,494.14	$6,818.84	$7,159.79	$7,517.78	$7,893.67
PUBLIC SAFETY DISPATCH SUP	I129	BDA	6/21/2025	$7,421.87	$7,792.97	$8,182.63	$8,591.74	$9,021.33
PUBLIC WORKS DIRECTOR	E150	SENIOR	6/21/2025	$16,938.88	$17,785.81	$18,675.11	$19,608.87	$20,589.31
PUBLIC WORKS INSPECTOR	A350	BPSEA	6/21/2025	$7,344.88	$7,712.13	$8,097.75	$8,502.62	$8,927.76
PUBLIC WORKS MAINT SUPT	C240	MID	6/21/2025	$12,150.67	$12,758.21	$13,396.11	$14,065.91	$14,769.21
RECREATION ASSISTANT	A370	BPSEA	6/21/2025	$4,983.72	$5,232.89	$5,494.54	$5,769.26	$6,057.74
RECREATION COORDINATOR	A360	BPSEA	6/21/2025	$6,399.20	$6,719.17	$7,055.13	$7,407.88	$7,778.29
RECREATION MANAGER	C272	MID	6/21/2025	$8,463.13	$8,886.28	$9,330.60	$9,797.12	$10,286.98
RECREATION SUPERVISOR	B265	BSPA	6/21/2025	$7,052.59	$7,405.23	$7,775.50	$8,164.27	$8,572.49
SENIOR ACCOUNT CLERK	A425	BPSEA	6/21/2025	$4,983.72	$5,232.89	$5,494.54	$5,769.26	$6,057.74
SENIOR ACCOUNTANT	B275	BSPA	6/21/2025	$7,873.26	$8,266.92	$8,680.26	$9,114.28	$9,569.98
SENIOR ACCOUNTING TECHNICIAN	A390	BPSEA	6/21/2025	$6,304.86	$6,620.10	$6,951.10	$7,298.65	$7,663.60
SENIOR ADMINISTRATIVE CLERK	A405	BPSEA	6/21/2025	$4,880.47	$5,124.48	$5,380.72	$5,649.73	$5,932.23
SENIOR CIVIL ENGINEER	B285	BSPA	6/21/2025	$11,101.07	$11,656.13	$12,238.93	$12,850.88	$13,493.42
SENIOR FINANCIAL ANALYST	B263	BSPA	6/21/2025	$9,718.26	$10,204.17	$10,714.39	$11,250.11	$11,812.62
SENIOR HUMAN RESOURCE ANALYST	H120	BSPA UNREP	6/21/2025	$8,148.70	$8,556.14	$8,983.95	$9,433.15	$9,904.80
SENIOR HUMAN RESOURCES TECH	A212	BPSEA	6/21/2025	$6,039.69	$6,341.68	$6,658.76	$6,991.70	$7,341.30
SENIOR IT ANALYST	B217	BSPA	6/21/2025	$8,444.42	$8,866.65	$9,309.97	$9,775.48	$10,264.25
SENIOR LIBRARIAN	C280	MID	6/21/2025	$7,220.12	$7,581.14	$7,960.18	$8,358.20	$8,776.12
SENIOR MECHANIC	A415	BPSEA	6/21/2025	$7,378.54	$7,747.46	$8,134.84	$8,541.58	$8,968.66
SENIOR MGMNT ANALYST	B305	BSPA	6/21/2025	$8,178.00	$8,586.90	$9,016.24	$9,467.04	$9,940.42
SENIOR PLANNER	B295	BSPA	6/21/2025	$8,888.80	$9,333.24	$9,799.90	$10,289.89	$10,804.38
TREASURER	N140	ELECT	7/1/2012	$200.00				
WASTEWATER OPERATOR I	A435	BPSEA	6/21/2025	$6,274.89	$6,588.63	$6,918.06	$7,263.96	$7,627.16
WASTEWATER OPERATOR II	A436	BPSEA	6/21/2025	$7,039.36	$7,391.34	$7,760.89	$8,148.94	$8,556.38
WASTEWATER OPERATOR III	A437	BPSEA	6/21/2025	$7,743.29	$8,130.46	$8,536.97	$8,963.83	$9,412.02
WASTEWATER PLANT SUPERVISOR	B335	BSPA	6/21/2025	$10,107.01	$10,612.37	$11,142.98	$11,700.13	$12,285.14
WASTEWATER PLANT SUPT	C290	MID	6/21/2025	$12,150.67	$12,758.21	$13,396.11	$14,065.91	$14,769.21
WATER OPERATOR II	A445	BPSEA	6/21/2025	$6,871.95	$7,215.54	$7,576.31	$7,955.14	$8,352.89

City of Benicia - Full Time Monthly Salary Schedule

For questions, contact Human Resources at (707) 746-4766

Classification Title	Grade	Unit	Effective Date	Step 1	Step 2	Step 3	Step 4	Step 5
WATER OPERATOR III	A446	BPSEA	6/21/2025	$7,559.13	$7,937.09	$8,333.95	$8,750.64	$9,188.18
WATER OPERATOR IV	A447	BPSEA	6/21/2025	$8,306.74	$8,722.08	$9,158.18	$9,616.11	$10,096.91
WATER PLANT SUPERVISOR	B315	BSPA	6/21/2025	$10,107.01	$10,612.37	$11,142.98	$11,700.13	$12,285.14
WATER PLANT SUPT	C310	MID	6/21/2025	$12,150.67	$12,758.21	$13,396.11	$14,065.91	$14,769.21
WATER QUALITY SUPERVISOR	B325	BSPA	6/21/2025	$10,107.01	$10,612.37	$11,142.98	$11,700.13	$12,285.14
WQ TECHNICIAN I	A460	BPSEA	6/21/2025	$6,943.73	$7,290.92	$7,655.46	$8,038.23	$8,440.16
WQ TECHNICIAN II	A461	BPSEA	6/21/2025	$7,638.10	$8,020.01	$8,421.01	$8,842.06	$9,284.16
WTP OPERATOR IN TRAINING	A310	BPSEA	6/21/2025	$6,247.21	$6,559.58	$6,887.56	$7,231.94	$7,593.53
WW QUALITY TECHNICIAN I	A465	BPSEA	6/21/2025	$6,072.94	$6,376.60	$6,695.42	$7,030.20	$7,381.70
WW QUALITY TECHNICIAN II	A466	BPSEA	6/21/2025	$6,679.12	$7,013.06	$7,363.72	$7,731.91	$8,118.50
WWTP OPERATOR IN TRAINING	A320	BPSEA	6/21/2025	$5,564.75	$5,842.98	$6,135.13	$6,441.89	$6,763.98
Classifications for employees who might be Y-Rated. For non Y-Rated employees, please refer to the rates listed abouve and on pages 1-3.								
LIBRARY TECHNICIAN II	Y226	BSPA	6/21/2025	$4,878.75	$5,122.69	$5,378.82	$5,647.76	$5,930.15
SENIOR ADMIN CLERK (Y)	Y405	BPSEA	6/21/2024	$4,999.83	$5,249.82	$5,512.31	$5,787.93	$6,077.33

Approved by Council on _____

Reso# 26-_____

_____

Kim Imboden, Interim Human Resources Manager

City of Benicia - Part Time Hourly Salary Schedule

For questions, contact Human Resources at (707) 746-4766

Classification Title	Grade		Effective Date	Step 1	Step 2	Step 3	Step 4	Step 5
ACCT CLERK I PT	M105	PART TIME	6/21/2025	$23.77	$24.96	$26.20	$27.51	$28.89
ADMIN CLERK I PT	M131	PART TIME	6/21/2025	$22.26	$23.37	$24.54	$25.77	$27.06
BUILDING MAINT WORKER ASST	M102	PART TIME	1/1/2025	$18.97	$19.92	$20.91	$21.96	$23.06
COMMUNITY SVCS OFFICER I - PT	M135	PART TIME	6/21/2025	$30.90	$32.45	$34.07	$35.77	$37.56
COMMUNITY SVCS OFFICER II - PT	M136	PART TIME	6/21/2025	$33.99	$35.69	$37.48	$39.35	$41.32
COMPUTER I.T. INTERN/ASSISTANT	M280	PART TIME	8/21/2018	$18.14	$19.05	$20.00	$21.00	$22.05
CUSTODIAN	M140	PART TIME	10/21/2020	$17.84	$18.73	$19.67	$20.65	$21.68
ENGINEERING INTERN	M165	PART TIME	1/1/2026	$16.90				
EXECUTIVE ASST TO CITY MGR PT	M191	PART TIME	6/21/2025	$35.44	$37.21	$39.07	$41.03	$43.08
FACILITY ATTENDANT	M210	PART TIME	3/21/2023	$17.20	$18.06	$18.96	$19.90	$20.91
FIRE PREVENTION INSP II PT	M245	PART TIME	6/21/2025	$43.75	$45.93	$48.23	$50.64	$53.18
GED INSTRUCTOR	M260	PART TIME	11/21/2018	$32.84	$34.48	$36.21	$38.02	$39.92
HUMAN RESOURCES MGR PT	M951	PART TIME	1/1/2026	$71.14	$74.70	$78.43	$82.35	$86.47
INTERN I	M270	PART TIME	1/1/2026	$16.90				
INTERN II	M271	PART TIME	1/1/2026	$16.90	$17.75	$18.63	$19.56	$20.54
KINDERGYM INSTRUCTOR	M290	PART TIME	10/21/2020	$18.44	$19.36	$20.34	$21.35	$22.42
LIBRARIAN I PT	M320	PART TIME	6/21/2025	$32.93	$34.58	$36.31	$38.12	$40.03
LIBRARIAN II PT	M330	PART TIME	6/21/2025	$36.23	$38.04	$39.94	$41.94	$44.04
LIBRARY AIDE	M335	PART TIME	1/1/2026	$16.90	$17.75	$18.63		
LIBRARY ASSISTANT I	M340	PART TIME	10/21/2020	$18.14	$19.05	$20.01	$21.01	$22.06
LIBRARY ASSISTANT II	M341	PART TIME	10/21/2020	$19.95	$20.96	$22.00	$23.10	$24.26
LIBRARY MONITOR	M510	PART TIME	10/21/2020	$18.09	$19.00	$19.94	$20.95	$21.99
LIBRARY TECHNICIAN II PT	M226	PART TIME	6/21/2025	$26.12	$27.43	$28.80	$30.24	$31.75
LIFEGUARD	M350	PART TIME	1/1/2026	$16.90	$17.75	$18.63	$19.56	$20.54
LIFEGUARD (SENIOR)	M360	PART TIME	1/1/2026	$18.92	$19.87	$20.86	$21.90	$23.00
LITERACY SPECIALIST GRANT FUND	M380	PART TIME	12/21/2022	$22.98	$24.13	$25.34	$25.70	$26.98
MANAGMENT ANALYST II PT	M246	PART TIME	6/21/2025	$42.90	$45.04	$47.30	$49.66	$52.15
OFFICE ASSISTANT I	M390	PART TIME	1/1/2025	$16.50				
OFFICE ASSISTANT II	M391	PART TIME	1/1/2025	$16.50	$17.33	$18.19	$19.10	$20.06

City of Benicia - Part Time Hourly Salary Schedule

For questions, contact Human Resources at (707) 746-4766

OFFICE CLERK	M100	PART TIME	10/21/2020	**$18.98**	**$19.93**	**$20.93**	**$21.97**	**$23.07**
PERMIT SERVICES SPECIALIST PT	M575	PART TIME	6/21/2025	**$46.57**	**$48.89**	**$51.34**	**$53.90**	**$58.03**
POLICE AIDE	M410	PART TIME	10/21/2020	**$22.99**	**$24.14**	**$25.35**	**$26.61**	**$27.95**
POLICE LIEUTENANT - PER DIEM	M420	PART TIME	6/21/2025	**$83.07**	**$87.22**	**$91.58**	**$96.16**	**$100.97**
POLICE OFFICER - RESERVE PT	M435	PART TIME	9/21/2022	**$20.00**				
POLICE OFFICER PT	M430	PART TIME	6/21/2025	**$52.13**	**$54.73**	**$57.47**	**$60.34**	**$63.36**
POLICE SERGEANT PT	M440	PART TIME	6/21/2025	**$62.56**	**$65.68**	**$68.97**	**$72.42**	**$76.04**
POOL COORDINATOR	M460	PART TIME	1/1/2026	**$21.18**	**$22.25**	**$23.35**	**$24.53**	**$25.76**
PROGRAM COORDINATOR	M470	PART TIME	7/1/2006	**$16.50**				
PUBLIC SAFETY DISPATCHER I PT	M170	PART TIME	6/21/2025	**$35.69**	**$37.47**	**$39.35**	**$41.31**	**$43.38**
PUBLIC SAFETY DISPATCHER II PT	M171	PART TIME	6/21/2025	**$37.47**	**$39.35**	**$41.31**	**$43.38**	**$45.55**
RECREATION LEADER	M480	PART TIME	1/1/2026	**$16.90**	**$17.75**	**$18.63**	**$19.56**	**$20.54**
RECREATION SPECIALIST I	M490	PART TIME	1/1/2026	**$19.36**	**$20.34**	**$21.35**	**$22.41**	**$23.54**
RECREATION SPECIALIST II	M491	PART TIME	3/21/2023	**$22.64**	**$23.77**	**$24.96**	**$26.21**	**$27.52**
SEASONAL SENIOR LEAD PARK WORK	M550	PART TIME	1/1/2025	**$18.97**	**$19.92**	**$20.91**	**$21.96**	**$23.06**
SENIOR PLANNER PT	M295	PART TIME	6/21/2025	**$51.29**	**$53.86**	**$56.55**	**$59.38**	**$62.35**
SENIOR RECREATION LEADER	M150	PART TIME	1/1/2025	**$17.63**	**$18.51**	**$19.44**	**$20.41**	**$21.43**
TINY TOT INSTRUCTOR	M560	PART TIME	10/21/2020	**$18.46**	**$19.39**	**$20.36**	**$21.37**	**$22.44**
VOLUNTEER COORDINATOR	M570	PART TIME	10/21/2020	**$37.40**	**$39.27**	**$41.23**	**$43.29**	**$45.46**

AGENDA ITEM
CITY COUNCIL MEETING DATE – APRIL 7, 2026
CONSENT CALENDAR

TO : City Manager

FROM : Police Chief

SUBJECT : **AUTHORIZING THE CITY MANAGER TO ENTER THE CITY INTO A PUBLIC SAFETY COMMUNICATIONS SYSTEM LICENSING AGREEMENT WITH SOLANO COUNTY**

EXECUTIVE SUMMARY:

The City of Benicia Police Department and Fire Department currently participates in a radio network through the East Bay Regional Communications System Authority (EBRCSA) and desire to transition to a digital radio system that is owned and operated by Solano County.

RECOMMENDATION:

Approve a resolution (Attachment 1) that authorizes the City Manager to enter the City into a public safety communications system licensing agreement with Solano County at a fixed annual cost for an initial term of 5 years (Attachment 2).

BUDGET INFORMATION:

The annual service fee to participate in Solano County's radio network is equivalent to the fee currently paid to EBRCSA. For the initial 5-year term of the agreement with Solano County the service fee will be a fixed rate of $110,544 per year. The FY27 budget already includes sufficient budget to cover the annual cost, which is split between the Police Department (0105000-7012) and the Fire Department (0106000-7012) based on the number of radios used in each department. Ongoing costs of the annual service fees through June 30, 2031 will be included as part of budget development for future biennial budgets.

BACKGROUND:

In 2016 the City's radio system was deemed outdated and potentially dangerous for officers' and firefighter's safety. In an effort to provide increased interoperable communications with neighboring public safety agencies, particularly Contra Costa County, the Benicia Police and Fire Departments requested the approval of Council to pursue a new and upgraded radio system through the East Bay Regional Communications System Authority. The request to joins the EBRCSA system was approved in December 2016 by City Council Resolution 16-186.

The participation in EBRCSA's network was not intended to be a permanent solution but was necessary for officer safety. Emergency services in Benicia would benefit from being on the same radio network as other agencies in the County, however, until recently there has not been adequate equipment to provide coverage in the southern part of the County.

In late 2025 construction of a radio tower and transmitter network began at a location in the Southampton district of Benicia and is expected to be completed no later than July 1, 2026. This new communications cell will provide coverage in the southern region of Solano County, including Benicia and Vallejo. Benicia public safety agencies (Police, Fire, and other emergency services) desire to transition from the EBRCSA network to the Solano County P25 radio network and the County is willing to provide the City with licensed access to its system.

The initial term of the agreement is for a 5-year term beginning on July 1, 2026 and ending June 30, 2031. The County will issue an invoice in advance of the initial July 1 start date, and on a similar schedule for subsequent years in the term of the contract, that will be due within 30 days of invoice date. The first annual invoice will be paid in FY27. During this initial term of the agreement the service fee will remain fixed at $110,544 per year, calculated at a steady cost based on radio count. The fee will remain fixed regardless of any possible fluctuations in the number of radios utilized by emergency services in the City, thus allowing Benicia time to become fully integrated into the County's radio system. At the end of the 5-year term, a long-term arrangement or successor agreement will be negotiated. The service fee to participate in the County radio network is equivalent to the cost to participate in EBRCSA, though EBRCSA increases the fees annually. Ultimately a transition to the County network will not only improve communication between City of Benicia emergency services and other Solano County agencies but will potentially result in a cost savings for the next 5 years due to the fixed annual service fee.

NEXT STEPS:
Approve a resolution authorizing the City Manager to enter the City into a public safety communications licensing agreement with Solano County for an initial term of 5 years at a fixed cost per year.

ALTERNATIVE ACTIONS:
If unapproved, the City of Benicia emergency services will continue to participate in the EBRCSA network impacting communications with other Solano County public safety agencies and potentially result in an increase in cost for radio communications.

CEQA Analysis	The requested action is exempt from CEQA because it will not result in a direct or indirect physical change in the environment and therefore is not a project as defined in CEQA Guidelines Section 15378.

ATTACHMENTS:
1. Resolution - Participation Solano County Public Safety Communications Network
2. Solano County Public Safety Communications Licensing Agreement

For more information contact: Mark Menesini, Police Chief
Phone: 707-746-4248
E-mail: mmenesini@ci.benicia.ca.us

RESOLUTION NO. 26-

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BENICIA AUTHORIZING THE CITY MANAGER TO ENTER THE CITY INTO A PUBLIC SAFETY COMMUNICATIONS SYSTEM LICENSING AGREEMENT WITH SOLANO COUNTY AT A FIXED SERVICE FEE FOR AN INITIAL TERM OF 5 YEARS

WHEREAS, the County owns and operates a Motorola P25 digital radio system core and is adding a new South Simulcast Cell under contract with Motorola (collectively, the "System") to provide reliable public safety voice communications within Solano County; and

WHEREAS, Benicia has public safety agencies (police, fire, and other emergency services) that require access to a P25 radio network and has historically participated in the East Bay Regional Communications System Authority (EBRCSA); and

WHEREAS, Benicia desires to transition from the EBRCSA network and access the County's System to improve interoperability and service; and

WHEREAS, the County is willing to provide the City with licensed access to its System; and

WHEREAS, the annual costs to access the County's system are equivalent to those incurred annually with EBRCSA; and

WHEREAS, the service fee will be a fixed rate of $110,544 per year for the 5 year initial term of the agreement, starting on July 1, 2026 through June 30, 2031; and

WHEREAS, there are already monies in both the Police (0105000-7012) and Fire (0106000-7012) budgets to cover the annual costs for FY27; and

WHEREAS, ongoing costs of the annual service fees through June 30, 2031 will be included as part of budget development for future biennial budgets.

NOW, THEREFORE, BE IT RESOLVED THAT the City Council of the City of Benicia does hereby authorize the City Manager to enter the City into a public safety communications system licensing agreement with Solano County for an initial term of 5 years at a fixed cost.

*****

On motion of Council Member , seconded by Council Member , the above Resolution was adopted by the City Council of the City of Benicia at a regular meeting of said Council held on the 7th day of April 2026 by the following vote:

Ayes:

Noes:

Absent:

Abstain:

_____
Steve Young, Mayor

Attest:

_____
Lisa Wolfe, City Clerk

_____
Date

SOLANO COUNTY PUBLIC SAFETY COMMUNICATIONS SYSTEM LICENSING AGREEMENT

This Solano County Public Safety Communications System Licensing Agreement (the "Agreement") is made and entered into as of _____, between the County of Solano (hereinafter "County") and the City of Benicia ("Benicia") referred to as the "City." The County and the City are sometimes individually referred to as a "Party" and collectively as the "Parties."

Recitals

WHEREAS, the County owns and operates a Motorola P25 digital radio system core and is adding a new South Simulcast Cell under contract with Motorola (collectively, the "System") to provide reliable public safety voice communications within Solano County;

WHEREAS, Benicia has public safety agencies (police, fire, and other emergency services) that require access to a P25 radio network and has historically participated in the East Bay Regional Communications System Authority (EBRCSA);

WHEREAS, Benicia desires to transition from the EBRCSA network and access the County's System to improve interoperability and service, under terms that mirror the costs they would have incurred with EBRCSA;

WHEREAS, the County is willing to provide the City with licensed access to its System under a standard agreement that covers the City, with the understanding that this is a transitional arrangement pending full integration of the City into the County's radio system;

WHEREAS, the County and the City agree that neither Party shall charge the other for the use of County- or City-owned land, buildings, or facilities that support the System during the term of this Agreement;

NOW, THEREFORE, in consideration of the mutual covenants and conditions herein, the Parties agree as follows:

1. Definitions

For purposes of this Agreement, the following terms shall have the meanings set forth below:

1.1 System: The County's Motorola P25 radio network core infrastructure and the South Simulcast Cell (radio tower and transmitter network) that will provide coverage in the southern region of Solano County, including Vallejo and Benicia, as described in Exhibit A.

1.2 Subscriber Radio: A mobile or portable two-way radio unit (or other authorized communication device) operated by the City's public safety agencies and programmed to operate on the System.

1.3 Dispatch Center: A City or County emergency communications or dispatch facility where dispatch console equipment is located and connected to the System.

1.4 Demarcation Point: The point of interface between the County's System and a City's own communications equipment. This is typically the network connection point or console gateway at the City's Dispatch Center. The County's maintenance responsibility for the System extends up to this Demarcation Point.

1.5 Service Fee: The yearly fee that a City must pay to the County for access to and use of the System, as detailed in Section 5.

1.6 Optional Services: Additional technical or support services that the County may provide to a City (such as radio programming or console maintenance) under a separate agreement, as described in Section 8.

1.7 Transition Period: The term of this Agreement, during which Benicia uses the System under this transitional arrangement, pending full integration of the City into the County's radio system at a future date.

2. Grant of License and Scope of Use

2.1 License to Use System: The County hereby grants to the City a non-exclusive, revocable license to access and use the System for the purpose of public safety communications. This license permits the City's Subscriber Radios and dispatch consoles to operate on the County's P25 core and South Simulcast Cell.

2.2 Scope: The City's use of the System shall be solely for official governmental and public safety purposes. No commercial use or third-party use of the System by the City is permitted under this Agreement.

2.3 No Transfer: The City shall not sub-license, assign, or transfer its rights to use the System to any other entity without the County's prior written consent.

2.4 Compliance: The City agrees that all use of the System will comply with applicable laws, Federal Communications Commission ("FCC") regulations, and any reasonable operating rules or protocols provided by the County for System users. The County will provide the City with any such operating guidelines at or before the commencement of service and as updated from time to time.

3. Term of Agreement

3.1 Term: The term of this Agreement shall begin on July 1, 2026. The Agreement shall remain in effect through July 1, 2031, unless earlier terminated as provided in this Agreement.

3.2 Transitional Nature: The Parties acknowledge that this Agreement is intended as a transitional solution. By the end of the term of the Agreement, the City may and anticipates becoming fully integrated into the County's radio system under a long-term arrangement or successor agreement (such as joining a radio-as-a-service, joint powers authority or other governance structure by 2031).

3.3 Extension or Renewal: Any extension or renewal of this Agreement beyond July 1, 2031, or any new agreement formalizing the City's full integration into the System, shall be negotiated in good faith and approved by the governing bodies of the Parties prior to the expiration of this Agreement.

3.4 Early Termination: This Agreement may be terminated prior to July 1, 2031 under the following circumstances:

3.4.2 Breach: If either Party fails to perform a material obligation under this Agreement, and fails to remedy the breach after receiving a written notice within ten (10) business days specifying the breach and a reasonable opportunity to cure, the non-breaching Party may terminate this Agreement upon not less than ten (10) business days' written notice to the other Party after the breaching Party was provided sufficient notice and reasonable opportunity to cure.

3.4.3 Legal Requirement: If continued performance of this Agreement becomes unlawful or impossible due to change in law or regulation, then the terminating Party shall provide written notice upon ten (10) business days.

3.5 Effect of Termination: Upon termination or expiration of this Agreement, the County will provide, within thirty (30) calendar days, written notice that the City's access to the System will be disconnected in an orderly manner. The City shall pay any outstanding fees owed. Sections 10.1 and10.2 shall survive termination or expiration of this Agreement.

4. Coordination and Input

4.1 The Parties agree that open communication and coordination are essential to the effective operation of the System for all System users. To that end:

4.1.1 Regular Coordination Meetings: The County will host periodic coordination meetings (for example, quarterly or semi-annually) with representatives from the City. The purpose of these meetings is to discuss System performance, coverage, capacity, upcoming upgrades or maintenance, and to hear any concerns or suggestions from the City.

4.1.2 City Input: The County values the input of the City regarding the System's operation. Although formal joint governance bodies are not established under this Agreement, the County will in good faith consider the City's feedback when making decisions that could significantly affect the City's use of the System.

4.1.3 Notification of Changes: The County will provide reasonable advance written notice to the City of any planned significant changes to the System that may impact the City's communications (e.g. software upgrades, changes in coverage patterns, extended maintenance outages). The County will strive to schedule any routine maintenance in a manner that minimizes disruption to the City.

4.1.4 Emergency Coordination: In the event of major emergencies or System outages affecting the City, the County and City technical staff will promptly communicate and coordinate to restore full functionality. The County will keep the City informed of status and actions during such events.

5. Fees and Payment Terms

5.1 Service Fee: The City shall pay the County a fixed annual service fee, based on the following calculation:

City: 188 radios × $49 × 12 months = $110,544 per year

5.2 These amounts are fixed for the duration of this Agreement (through July 1, 2031), regardless of whether the City's actual radio count increases or decreases.

5.3 Billing and Invoicing: The County will issue invoices in advance to the City on a yearly basis for the Service Fee. Each invoice will show the total amount due. Payment shall be due within thirty (30) days of the invoice date, unless otherwise agreed in writing.

5.4 Payment Method: Payments shall be made by the City to the County by check, electronic transfer, or other agreed method. The County will provide the necessary payment instructions on the invoices.

5.5 Late Payments: If the City fails to pay an invoice by the due date, the County will provide written notice to the City's designated contact. The City shall have a cure period of ten (10) business days after receipt of notice to remit payment. Late payments may be subject to interest or penalties in accordance with County policy or as permitted by state law.

5.6 Fee Adjustments: The fixed fee of $110,544 per year is intended to match what the City would have paid under their previous arrangement with EBRCSA. The Parties agree that this rate shall remain unchanged through the term of this Agreement. Any proposal to change the rate (for example, in an extended term or new agreement after 2031) shall require mutual agreement in writing.

5.7 No Other User Fees: Aside from the Service Fee described above, the County shall not impose additional user fees or subscription charges on the City for routine access to the System under this Agreement. This does not preclude charges for any Optional Services outside the scope of this Agreement, as described in Section 8.

6. Responsibilities of the County

6.1 The County shall perform the following responsibilities under this Agreement:

6.1.1 System Operation and Maintenance: The County will operate, maintain, and manage the P25 radio core infrastructure and South Simulcast Cell to ensure reliable communications for the City. This includes but not limited to hardware, software, and network components of the System, such as radio core controllers, tower sites, antennas, repeaters, microwave/fiber backhaul connecting sites, and associated power systems.

6.1.2 Infrastructure Up to Demarcation: The County's responsibility extends to maintaining all System equipment and network links up to the Demarcation Point at the City's Dispatch Center. The Demarcation Point is the interface where the City's dispatch console or network connects to the County's System. The County will ensure that connectivity to that point is functional and will troubleshoot andrepair any System issues up to that point.

6.1.3 Coverage and Capacity: The County will use reasonable efforts to provide radio coverage and capacity within the City that is consistent with public safety grade communications, but does not guarantee coverage . The new South Simulcast Cell is intended to cover these areas; the County will monitor performance and address coverage deficiencies or capacity issues as feasible, informing the City of any limitations encountered.

6.1.4 Talk-group and ID Management: The County will provide the necessary system access IDs, talk-group assignments, and fleet mapping for the City's' use of the System. Subject to the City's responsibility for actual programming as noted in Section 7, County radio technicians will coordinate with City personnel to program the System parameters (such as talk-group IDs, encryption keys if used, etc.) into the City's Subscriber Radios.

6.1.5 Technical Support: The County will designate a System Manager or technical point of contact that the City can contact for support or to report issues. The County will respond promptly to any reported System malfunctions or outages affecting the City and will work diligently to restore full service.

6.1.6 System Upgrades: The County will be responsible for all necessary upgrades and updates to the System hardware and software during the term of this Agreement. The County will notify the City in advance of any upgrades that may require reprogramming of subscriber units or changes in operation and will coordinate scheduling to minimize disruption.

6.1.7. Licenses and Permits: The County will obtain and maintain any FCC licenses, frequency authorizations, or other regulatory approvals required for operation of the System. The County will ensure that the System remains in compliance with all applicable federal and state laws and regulations.

6.1.8 Insurance: (If applicable) The County will maintain appropriate insurance coverage for its System infrastructure and operations, which may include self-insurance. This Agreement does not in any way obligate the County to maintain insurance coverage for the City's equipment or activities. The County will maintain liability insurance for its own activities as required by law or County policy.

7. Responsibilities of the City

7.1 The City shall have the following responsibilities under this Agreement:

7.1.1 Subscriber Radios and Equipment: The City is responsible for procuring, owning, and maintaining its Subscriber Radios and associated equipment such as chargers, vehicle radio units, antennas, etc. The radios must be compatible with the County's P25 System, and meet the technical specifications provided by the County.

7.1.2 Radio Programming: Initial programming of the City's Subscriber Radios with the County's System information (i.e., talk-groups, frequencies, encryption keys, etc.) is the responsibility of the County under contract with Motorola. The County will provide the necessary System data and coordination, but the City will ensure their radios are made available on a timely basis so they are correctly programmed and updated. Subsequent programming of the City's' Subscriber Radios with the County's System information (i.e., talk-groups, frequencies, encryption keys, etc.) is the responsibility of the City. If the City lack technical capacity, they may request programming assistance from the County as an Optional Service per Section 8.

7.1.3 Dispatch Console Equipment: Initial programming of the City's consoles with the County's System information (i.e., talk-groups, frequencies, encryption keys, etc.) is the responsibility of the County under contract with Motorola. Subsequent to initial programming, the City is responsible for the operation and maintenance of its own dispatch center console equipment and any other communications infrastructure on the City's side of the Demarcation Point. This includes console hardware, dispatcher workstations, logging recorders, and the connection from the console to the Demarcation Point. The City will ensure its console equipment is compatible with the System interface and meets any technical requirements specified by the County. If the City lacks technical capacity, they may request programming assistance from the County as an Optional Service per Section 8.

7.1.4 Adherence to Operating Guidelines: The City shall ensure that its personnel use the System in accordance with any reasonable operating procedures or protocols established by the County (e.g., radio discipline, use of talk-groups, emergency button use, etc.). The City will train its radio users on proper operation within a multi-agency radio system to prevent harmful interference or misuse.

7.1.5 Payment of Fees: The City will timely pay the Service Fees as described in Section 5. The City is only responsible for its own fees.

7.1.6 Incident Reporting: If the City experiences any significant radio communication issue, interference, or suspected malfunction that may be related to the System, it shall promptly notify the County's technical contact so that the issue can be investigated and resolved collaboratively.

7.1.7 No Unauthorized Changes: The City shall not modify or attempt to modify any part of the County's System. The City will not add any infrastructure such as additional sites or channels to the System or connect third-party equipment to the System without the County's prior written approval. Any integration of City-owned infrastructure (e.g., a City-owned radio site) with the System would require a separate agreement or amendment.

7.1.8 Compliance and Cooperation: The City will comply with all applicable laws and regulations in its use of the System. The City will cooperate with the County in any investigations or troubleshooting of System issues and will make knowledgeable staff available for coordination as needed.

8. Optional Services by the County

8.1 This Agreement primarily covers the City's access to and use of the System. The Parties recognize that the City may have needs for additional technical services related to its radio equipment ("Optional Services"). The County may, at the City's request and under separate arrangements, provide such Optional Services. Optional Services include but not limited to the following:

8.1.1 Subscriber Radio Programming and Setup: If the City requests, the County's radio technicians can perform programming of the City's Subscriber Radios or assist with configuring them for the System. Any such work, and any charges for it, would be detailed in a separate memorandum or work order agreed to by the Parties.

8.1.2 Console Configuration and Maintenance: The County may assist with configuring the City's dispatch console to interface with the System (for instance, setting up talk-group selections, templates, or network configurations). Ongoing maintenance or support of console equipment can also be provided if mutually agreed in writing by the Parties. These services would be outside the scope of the core System access license and may involve additional fees or a separate support contract.

8.1.3 Radio Repair Services: If the City does not have its own radio repair capabilities, the City may engage the County's radio shop to repair or service Subscriber Radios or related equipment. Again, the terms for any such repair services would be handled under a separate agreement or on a fee-for-service basis, not covered by the yearly Service Fee.

8.1.4 Training: The County may provide training sessions for City personnel on use of the System or new features. For example, if a System upgrade introduces new user

features. Training arrangements shall be coordinated as needed and are typically provided as a courtesy or at the agreed cost if they require significant resources.

8.2 Any Optional Services requested by the City and provided by the County shall be documented in writing (for example, in a letter agreement, addendum, or services contract) including the scope of services and any costs. The City is under no obligation to procure any Optional Services, and the City's acceptance of Optional Services will not affect the City's right to access the System under the terms of this Agreement. Likewise, the County is not obligated by this Agreement to provide Optional Services unless otherwise required by a separate agreement.

9. Transition to Full Integration

9.1 The Parties acknowledge that this Agreement serves as an interim solution until full integration of the City into a long-term regional radio system framework. Pursuant to that understanding:

9.1.1 Future Planning: The County, in consultation with the City, will continue to plan for the incorporation of the City as a permanent participant in the Solano County radio system (or any regional/joint system that may supersede it). This may involve exploring governance options such as Radio-as-a-Service, joint powers agreements, cost-sharing for future infrastructure, and inclusion of the City in long-term system expansion or upgrades.

9.1.2 Good Faith Negotiation: No later than one (1) year prior to the expiration of this Agreement (by June-2030), the Parties shall initiate good faith discussions on the framework for the post-2031 arrangement. This may result in an extension of this Agreement, a new agreement, or another mechanism to ensure the City's continued radio communications service without interruption. The Parties are not contractually obligated to perform under the terms of a new agreement without prior review and mutual assent to the terms of an extension of this Agreement or a new agreement.

9.1.3 Continued Service Commitment: The Parties intend that the City will not be left without radio service upon the expiration of this Agreement. The Parties commit to work towards a seamless transition. If unforeseen delays occur in finalizing the post-2031 integration, the Parties may mutually agree to an extension of this Agreement as necessary to bridge any gap.

9.2 Technology Updates: By 2031, technology or industry standards may have evolved. The County will keep the City informed about any next-generation radio system developments (e.g., new P25 phases, LTE interoperable systems, etc.) that could influence the integration plan. The City will be given opportunity to participate in any pilot programs or planning meetings about the future system as it relates to their needs.

9.3 Non-Binding Intent: This Section 9 outlines the Parties' intentions and planning efforts. Except for the obligation to negotiate in good faith as noted above, this Section 9 is a

statement of intent and is not intended to create a binding obligation to enter a future agreement. Any actual integration or new partnership will be set forth in a future written agreement approved by both Parties' governing bodies.

10. General Provisions

10.1 Indemnification: Each Party agree to indemnify, defend, and hold harmless the other Party, its officers, employees, and agents from and against any claims, liabilities, damages, or costs (including reasonable attorney's fees) arising out of any services under this Agreement, except to the extent caused by the sole negligence or willful misconduct of the Parties.

10.2 Limitation of Liability: In no event shall either Party be liable to the other for any indirect, special, incidental, or consequential damages (such as lost profits, lost communication time, or loss of data) arising out of or related to this Agreement or the use of the System, even if advised of the possibility of such damages. This Section does not limit either Party's obligation to make payments owed under this Agreement or to indemnify as provided above.

10.3 Insurance Requirements: Each Party shall maintain insurance or self-insurance sufficient to meet its obligations under this Agreement and as required by law. Upon request, a Party will provide proof of insurance or self-insurance to the other.

10.4 Notices: Any notice required or permitted under this Agreement shall be in writing and shall be deemed given when delivered personally, sent by commercial courier, or mailed by certified mail (return receipt requested) to the following representatives for each Party:

For County: Stewart Bruce, Regional IT Infrastructure & Operations Manager (primary)
675 Texas Street, Ste 3700, Fairfield, CA 94533
SBruce@SolanoCounty.gov

Matthew Higdon, PSC Division Manager (secondary)
675 Texas Street, Ste 3700, Fairfield, CA 94533
MHigdon@SolanoCounty.gov

For City of Benicia: Edward Criado, Deputy Chief (primary)
200 East L Street, Benicia, CA 94510
ecriado@ci.benicia.ca.us

Jake Heinemeyer, Lieutenant (secondary)
200 East L Street, Benicia, CA 94510
jheinemeyer@ci.benicia.ca.us

Routine operational communications (e.g., outage notifications, meeting announcements) may be made by email to designated points of contact, but formal notices regarding breach, termination, or legal matters must be delivered as stated above.

10.5 Entire Agreement: This Agreement constitutes the entire agreement between the Parties regarding the subject matter herein and supersedes all prior or contemporaneous understandings, agreements, negotiations, representations, and warranties, whether oral or written, with respect to such subject matter. No attachments or exhibits are incorporated unless expressly listed and attached hereto.

10.6 Amendments: Any amendment or modification to this Agreement must be in writing and signed by authorized representatives of the County and the City. No oral modifications shall be valid.

10.7 Governing Law and Venue: This Agreement shall be governed by and interpreted in accordance with the laws of the State of California. Any legal action or proceeding arising out of or relating to this Agreement shall be brought in a court of competent jurisdiction in Solano County, California, and the Parties hereby consent to the jurisdiction and venue of such courts.

10.8 Severability: If any provision of this Agreement is held to be invalid, illegal, or unenforceable by a court of competent jurisdiction, that provision shall be severed from the Agreement and the remaining provisions shall remain in full force and effect, provided that severing the invalid provision does not materially alter the rights or obligations of the Parties.

10.9 No Third-Party Beneficiaries: This Agreement is for the benefit of the County and the City only and is not intended to confer any rights or benefits on any third parties (including any residents of the City or other agencies). No entity or person that is not a signatory to this Agreement shall have any right to enforce any term of this Agreement.

10.10 Independent Entities: The Parties are independent governmental entities. Nothing in this Agreement shall be interpreted as creating an agency, partnership, or joint venture between the County and the City. Each Party retains full control over its employees and operations.

10.11 Authority to Execute: Each person signing this Agreement represents and warrants that they have the appropriate authority to execute this Agreement on behalf of the Party for whom they sign, and to bind that Party to the terms of this Agreement.

10.12 Counterparts: This Agreement may be executed in multiple counterparts, each of which shall be deemed an original, and all of which together shall constitute one and the same instrument. Electronic or PDF signatures shall be deemed equivalent to original signatures for the purposes of executing this Agreement.

11. Signatures

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed by their duly authorized representatives.

County of Solano
By: _____
Title: _____
Date: _____

City of Benicia
By: _____
Title: City Manager
Date: _____

By: _____
Title: City Attorney
Date: _____

Exhibit A: Project Description

1. The Solano County P25 System Expansion Project is a strategic initiative to enhance interoperable emergency communications within Solano County, beginning with a new simulcast cell serving the City of Benicia. This expansion forms a key phase in the County's long-term plan to develop a comprehensive, countywide digital radio network using Motorola's ASTRO® 25 Phase 2 technology.

This project establishes a 4-site, 6-channel simulcast subsystem, fully integrated into the existing Solano County P25 Core located at the Solano County Data Center. The system operates in the 800 MHz band and provides enhanced coverage, capacity, and security for public safety communications in the southwest region of the county.

2. Project Focus Area: Vallejo and Benicia

The immediate purpose of this expansion is to deliver reliable portable radio coverage throughout the cities of Vallejo and Benicia. These areas are served by a new simulcast cell connected via a digital microwave backhaul loop. Each site supports voice and data operations using both FDMA and TDMA-capable radios.

3. Simulcast Cell Site Overview:

Site Name	Role	RF Channels	FDMA Only Channels	TDMA Equipped Channels	Total Talkpaths
Courthouse	Prime / RF Remote	6	2	4	9
Fairgrounds	Geo-Prime / RF Remote	6	2	4	9
Southampton	RF Remote (New Shelter)	6	2	4	9
Cummings	RF Remote	6	2	4	9
Hiddenbrooke	ASR (Existing)	3	1	2	4

4. Encryption and Security

The system supports AES-256 encryption allowing for secure end-to-end voice communications across all participating agencies. This level of encryption meets or exceeds federal security standards and ensures compliance with CJIS and other public safety requirements.

5. Part of a Larger System Expansion

a. While this project centers on Vallejo and Benicia, it is part of a larger countywide vision for Solano County. The overall conceptual plan includes:

i. The existing Northeast Simulcast subsystem, serving Fairfield, Vacaville, and Suisun City
ii. Several standalone ASR sites (e.g., Hiddenbrooke, Red Top, Rio Vista, Kregor) providing coverage in rural or terrain-limited areas
iii. A countywide MPLS microwave backhaul network, supporting high-throughput, resilient communications
iv. Potential future integration with regional systems such as EBRCSA, Yolo, and Sacramento County for seamless mutual aid

b. This phase lays the foundation for scalable future growth and broader regional interoperability.

6. System Standards and Reliability

All new repeater sites are built to Motorola R56 guidelines, with emergency backup power (e.g., generator, battery, solar, etc.) to ensure continuity during power outages. The system supports Dynamic Dual Mode (DDM), enabling both FDMA and TDMA operation across channels. Equipment installed at each site includes tower-mounted amplifiers, microwave gear, and simulcast synchronization hardware.

7. Conclusion

The Solano County P25 Expansion Project enhances public safety communications by providing secure, reliable, and interoperable radio coverage to Vallejo and Benicia. It represents a critical milestone toward a fully integrated, countywide system — scalable for future needs and responsive to the evolving demands of modern emergency response.

AGENDA ITEM
CITY COUNCIL MEETING DATE – APRIL 7, 2026
CONSENT CALENDAR

TO : City Manager

FROM : Police Chief

SUBJECT : **PUBLIC REVIEW OF ANNUAL REPORT OF MILITARY EQUIPMENT USE BY THE BENICIA POLICE DEPARTMENT**

EXECUTIVE SUMMARY:

In October 2022, City Council adopted an ordinance as required by the California State Legislature Assembly Bill 481 (AB481) titled, "Law enforcement and state agencies: military equipment: funding, acquisition, and use." Section 7072 of AB481 requires the Benicia Police Department to submit an annual military equipment report for as long as the military equipment is available for use. Within 30 days of making the annual report publicly available on the internet website, the Benicia Police Department must be available at a community meeting to allow the general public the opportunity to discuss the annual military report, or use of military equipment. The 2025 AB481 report was posted on the City of Benicia's webpage on March 4, 2026, and will be on the agenda for the April 7, 2026 City Council Meeting.

RECOMMENDATION:

Review AB481 Annual Report - 2025 (Attachment 1) and allow public opportunity to discuss information available in report.

BUDGET INFORMATION:

There are no impacts on the budget.

BACKGROUND:

In 2021, the California State Legislature passed AB481 titled, "Law enforcement and state agencies: military equipment: funding, acquisition, and use" and amended California Government Codes §7070 – 7075, effective January 1, 2022. As amended, California Government Code §7071(b) requires that law enforcement agencies submit a proposed Military Equipment Use Policy to their governing body for approval.

In September of 2021, the California State Legislature passed Assembly Bill 481 titled, "Law enforcement and state agencies: military equipment: funding, acquisition, and use." The Bill was approved by Governor Newsom on September 30, 2021, and amended California Government Codes §7070 – 7075, effective January 1, 2022.

As amended, California Government Code §7071(b) now requires that law enforcement agencies submit a proposed Military Equipment Use Policy to their governing body for approval.

On October 4, 2022, City Council adopted Ordinance 22-8 – Military Equipment Use Policy (Attachment 2) that established a City of Benicia Military Equipment Use policy.

Per AB481, section 7072 a law enforcement agency that receives approval for a military equipment use policy pursuant to Section 7071 shall make each annual military equipment report required by this section publicly available on its internet website for as long as the military equipment is available for use. The annual military equipment report shall, at a minimum, include the following information for the immediately preceding calendar year for each type of military equipment:

(1) A summary of how the military equipment was used and the purpose of its use.
(2) A summary of any complaints or concerns received concerning the military equipment.
(3) The results of any internal audits, any information about violations of the military equipment use policy, and any actions taken in response.
(4) The total annual cost for each type of military equipment, including acquisition, personnel, training, transportation, maintenance, storage, upgrade, and other ongoing costs, and from what source funds will be provided for the military equipment in the calendar year following submission of the annual military equipment report.
(5) The quantity possessed for each type of military equipment.
(6) If the law enforcement agency intends to acquire additional military equipment in the next year, the quantity sought for each type of military equipment.

Additionally, within 30 days of submitting and publicly releasing an annual military equipment report pursuant to this section, the law enforcement agency shall hold at least one well-publicized and conveniently located community engagement meeting, at which the general public may discuss and ask questions regarding the annual military equipment report and the law enforcement agency's funding, acquisition, or use of military equipment.

The AB481 Annual Report - 2025 was made public on the website[1] on March 4, 2026. The City Council meeting on April 7, 2026 will be the opportunity for the community to discuss the report.

NEXT STEPS:
Allow public comment on the AB481 Annual Report - 2025

ALTERNATIVE ACTIONS:
None.

[1] www.ci.benicia.ca.us/police

CEQA Analysis	The Military Use Policy does not constitute a project under California Environmental Quality Act (CEQA) Guidelines Section 15378 (b) (2) therefore is not subject to environmental review under CEQA Guidelines Section 15060 (c) (3).

ATTACHMENT(S):

1. AB481 Annual Report – 2025
2. Ordinance 22-8 – Military Equipment Use Policy

For more information contact: Mark Menesini, Police Chief
Phone: 707-746-4262
E-mail: mmenesini@ci.benicia.ca.us

Benicia Police Department
2025 Annual Military Equipment Report
AB 481 – Government Code § 7070 *et seq.* – BPD Policy 709

In compliance with Assembly Bill 481 (Gov. Code 7070 *et seq*.) and Benicia Police Department Policy 709 (Military Equipment), the Benicia Police Department ("Department") has prepared this 2025 Annual Military Equipment Report ("Report"). This Report has been submitted to the Benicia City Council and made available to the community on the Department website and disseminated through other channels, and a copy of which is available upon request at the Benicia Police Department. This report has been prepared to assist the Council and the community in understanding how Military Equipment possessed by the Department has been utilized during the 2025 calendar year.

This report follows the Benicia Police Department's initial compliance with AB 481 Compliance, which includes the completing the following:

- Approval of the Benicia Police Department Military Equipment Policy ("Policy 709") (Completed October 2022)
- Approval of the Police Acquisition and Use of Military Equipment Ordinance (Completed October 2022, Benicia City Council Ordinance No. 22-08)
- Initial Community Engagement Meeting (October 4th, 2022)
- Current Military Equipment Inventory (Attached)

Annual Report:

As Required by applicable law and Policy, the Department is required to report annually on the inventory, procurement, use of covered military equipment. The annual report is required to include the following:

1. A summary of each type of military equipment possessed by the Department was used and the purpose of its use.
2. A summary of any complaints or concerns received by the Department concerning the military equipment.
3. The results of any internal audits, any information about violations of the military equipment use policy, and any actions taken in response.
4. The total annual cost for each type of military equipment, including acquisition, personnel, training, transportation, maintenance, storage, upgrade, and other ongoing costs, and from what source funds will be provided for the military equipment in the calendar year following submission of the annual military equipment report.
5. The quantity possessed for each type of military equipment.
6. If the law enforcement agency intends to acquire additional military equipment in the next year, the quantity sought for each type of military equipment.

The Department addresses each item below. Please also find a copy of the Military Equipment Inventory List attached for reference, as the questions below describe the utilization of such equipment possessed by the Department.

(1) A summary of how the military equipment was used and the purpose of its use.

The Department did not deploy any military equipment within the City of Benicia during the reporting period. However, as described below, some equipment was used for training purposes.

Military Equipment deployed in other jurisdictions:

No military equipment was deployed in other jurisdictions.

Training involving Military Equipment:

During training exercises, the Department used Military Equipment. Conducting such training ensures that the equipment, if needed, will be deployed in the manner in which it was designed and consistent with Department Policy. The Department used the following Military Equipment during training exercises:

1. Heckler & Koch 5.56mm Semiautomatic Rifles
2. Winchester Ranger .223 Rem 55 Grain Soft Point Rifle Round.
3. 40mm Launchers and Rounds
4. Pepper ball Launcher Tac-SF and Rounds.
5. Less Lethal Shotgun and Rounds

No other military equipment was deployed within the City of Benicia, whether by the Benicia Police Department, or by another agency working in coordination or collaboration with the city.

(2) A summary of any complaints or concerns received concerning the military equipment.

The Department did not receive any complaints or concerns regarding this equipment during the reporting period. The Department does maintain in its policy details on where to send complaints or concerns, as well as on the Department AB 481 website.

(3) The results of any internal audits, any information about violations of the military equipment use policy, and any actions taken in response.

There were no reportable issues identified during any internal audits or any violations of the military equipment policy.

(4) The total annual cost for each type of military equipment, including acquisition, personnel, training, transportation, maintenance, storage, upgrade, and other ongoing costs, and from what source funds will be provided for the military equipment in the calendar year following submission of the annual military equipment report.

Equipment: Heckler & Koch 5.56mm Semiautomatic Rifles and Ammunition.

Fiscal Impact: The initial cost of equipment was approximately $1,476 per rifle. Rifle maintenance is conducted by trained departmental staff at no additional cost. No rifles were purchased in 2025.

Equipment: Winchester Ranger .223 Rem 55 Grain Soft Point Rifle Round.

Fiscal Impact: Cost $767.00 per case of 1000. 5 cases were purchased for a total of $3,835.00. The funds used to make the purchase were obtained from the annual Benicia Police Department budget.

Equipment: .308 Bolt Action Rifle - Barrett MRAD and Ammo

Fiscal Impact: The initial cost of the equipment was approximately $5,970. The ongoing costs for ammunition will vary and maintenance is conducted by departmental staff at no cost. No purchases in 2025.

Equipment: .308 Winchester Supreme 168 grain Ammunition

Fiscal Impact: Cost is $44.89 per box of 20 rounds. No rounds were purchased in 2025.

Equipment: 40mm Launchers and Rounds

Direct Impact 40mm Model 6326 Marking Crushable Foam Round
Cost is $24.46 per round. No purchases in 2025.

Exact Impact 40mm Model 6325 Standard Range Sponge Round.
Cost is $28.95 per round. No purchases in 2025.

Fiscal Impact: The initial cost of this equipment was approximately $1710 for two 40mm Less Lethal Launchers. The ongoing costs for munitions will vary depending on supply. Maintenance is conducted by departmental staff. No additional purchases in 2025.

Equipment: Pepper ball Launcher Tac-SF and Rounds.

Pepper ball Live-X.68 caliber rounds.
Cost is $1,236 per pack of 375 rounds. 4 packs were purchased in 2025 for a cost of $4944.00.

Fiscal Impact: The initial cost of this equipment was approximately $1700. The ongoing costs for munitions will vary depending on market costs. Maintenance and training are conducted by departmental staff.

Equipment: Less Lethal Shotgun and Rounds

Fiscal Impact: The initial cost of this equipment was approximately $4,800 total. The ongoing costs for munitions will vary based on need and market cost.

Maintenance is conducted by departmental staff. The current replacement cost for the Remington 870 shotgun is approximately $675 + tax for a new weapon. The Department purchased two used shotguns at $295 each in 2025 for a total cost of $590.00. The funds used to make the purchase were obtained from the annual Benicia Police Department budget.

Equipment: Combined Tactical System 12 gauge Drag Stabilized Bean Bag Round.
Fiscal Impact: $6.55 per round replacement cost. Approximate expiration date of 5 years. 200 rounds were purchase in 2025 for total cost of $1310.00. The funds used to make the purchase were obtained from the annual Benicia Police Department budget.

(5) The quantity possessed of each type of military equipment.

Equipment Name:
Heckler & Koch 5.56mm Semiautomatic Rifle
Quantity owned: 6
Winchester Ranger .223 Rem 55 Grain Soft Point Rifle Round
Quantity owned: 17,000 rounds

Equipment Name:
.308 Bolt Action Rifle- Barrett MRAD
Quantity owned: 1
.308 Winchester Supreme 168 grain Ammunition
Quantity owned: Approximately 800 rounds

Equipment Name:
40mm Launchers
Quantity owned: 2
Direct Impact 40mm Model 6326 Marking Crushable Foam Round
Quantity owned: 4 rounds
Exact Impact 40mm Model 6325 Standard Range Sponge Round
Quantity owned: 17 rounds

Equipment Name:
Pepper ball Launcher Tac-SF
Quantity owned: 4
Pepper ball Live-X.68 caliber rounds.
Quantity owned: Approx. 2,250 rounds
Pepper ball Live .68 caliber rounds.
Quantity owned: Approx. 375 rounds

Equipment Name:
Less Lethal Shotgun
Quantity owned: 14

Combined Tactical System 12 gauge Drag Stabilized Bean Bag Round
Quantity owned: Approx. 355 rounds

(6) If the law enforcement agency intends to acquire additional military equipment in the next year, the quantity sought for each type of military equipment.

The Benicia Police Department does not intend to acquire additional military equipment in the next year.

Summary

As a result of the 2026 Annual Report, the Department continues to find the following:

- Military equipment in the possession of the Department is necessary because there is no reasonable alternative that can achieve the same objective of officer and civilian safety.
- The military equipment use policy continues to safeguard the public's welfare, safety, civil rights, and civil liberties by providing the Department access to and use – if necessary, of such equipment.
- The Department's use of military equipment has at all times complied with the military equipment use policy and any other applicable policies of the Department.

AGENDA ITEM
CITY COUNCIL MEETING DATE – APRIL 7, 2026
BUSINESS ITEM

TO : City Manager

FROM : Deputy City Manager

SUBJECT : **STATUS UPDATE ON DELIVERABLES 3 (DECARBONIZATION AND RESILIENCY PATHWAYS) AND 4 (CIP AND YARD EXPANSION FEASIBILITY ANALYSIS) FOR THE PORT OF BENICIA FACILITIES AND INFRASTRUCTURE MODERNIZATION PLAN**

EXECUTIVE SUMMARY:

The City of Benicia continues implementation of the Port of Benicia Facilities and Infrastructure Modernization Plan, funded by a $750,000 Priority Production Area (PPA) grant awarded by the Metropolitan Transportation Commission and Association of Bay Area Governments.

This item provides the Council with a status update on Deliverable 3 and Deliverable 4, which focuses on: Decarbonization and Resiliency Pathways (Task 3) and Capital Improvement Planning and Yard Expansion Feasibility (Task 4).

These deliverables begin identifying potential strategies and investments to modernize port infrastructure, support economic activity, and improve environmental performance. Staff has coordinated with the key Port stakeholders including AMPORTS, in developing these deliverables. The work also aligns with the City's ongoing Circulation Element update to ensure consistency with broader transportation and goods movement planning efforts.

Staff and the project consultant, GHD, will provide a presentation summarizing key findings and the next phase of the plan process.

RECOMMENDATION:

Accept the status update on Deliverable 3 (Attachment 1) and Deliverable 4 (Attachment 2) for the Port of Benicia Facilities and Infrastructure Modernization Plan.

BUDGET INFORMATION:

There is no fiscal impact associated with accepting this informational update.

Work associated with the Port Modernization Plan is fully funded through the previously awarded $750,000 Priority Production Area grant. This project is remaining on time and on budget and therefore there are no additional budget requests at this time.

BACKGROUND:
In October 2024, the City Council accepted a $750,000 Priority Production Area (PPA) grant and approved a consultant agreement with GHD, Inc. to prepare the Port of Benicia Facilities and Infrastructure Modernization Plan.

At its December 16, 2025, meeting, the City Council received an informational update on the first two deliverables of the project, including the Infrastructure Assessment and the Port Demand, Capacity, and Circulation/Transportation Analysis. These deliverables established baseline conditions and technical analysis necessary to guide future phases of the modernization effort.

The modernization plan includes the following major tasks:
• Task 1 – Infrastructure Assessment
• Task 2 – Port Demand, Capacity and Circulation / Transportation Analysis
• Task 3 – Decarbonization and Resiliency Pathways
• Task 4 – Capital Improvement Plan and Yard Expansion Feasibility
• Task 5 – Update and Modernize Industrial Design Guidelines
• Task 6 – Environmental Review
• Task 7 – Draft and Final Plan
• Task 8 – Plan Activation and Funding Support
• Task 9 – Ongoing Funding Support (optional)

Deliverable 3 focuses on identifying strategies to reduce greenhouse gas emissions and improve climate resiliency at the Port of Benicia. The analysis evaluates potential opportunities for electrification, shore power infrastructure, and other measures that could support lower-emission port operations.

Deliverable 4 evaluates potential capital improvement projects and operational enhancements that could support modernization of port facilities. This includes evaluating infrastructure upgrades, yard configuration opportunities, and other investments needed to support current and future cargo operations.

Together, these deliverables begin identifying infrastructure improvements and strategic investments that could strengthen the Port’s long-term economic viability while supporting environmental and resiliency goals.

Staff has engaged with major Port stakeholders, including AMPORTS, throughout development of Deliverables 3 and 4 to ensure that operational needs and business considerations are reflected. In addition, this work is being developed in coordination with the City’s ongoing Circulation Element update, particularly as it relates to truck routes, traffic circulation, and infrastructure serving the Port.

Staff and the consultant team will present key findings and recommendations during the City Council meeting.

NEXT STEPS:
Following completion of Deliverables 3 and 4, the consultant team will continue work on the remaining phases of the modernization plan, including updates to industrial design guidelines, environmental review, and preparation of the draft and final Port of Benicia Facilities and Infrastructure Modernization Plan.

Ongoing work will continue to incorporate stakeholder coordination and alignment with related City planning efforts.

Staff will return to the City Council with additional updates as part of the adoption of final modernization plan once completed.

ALTERNATIVE ACTIONS:
None. This item is informational only.

CEQA Analysis	Accepting a status update is not a project under CEQA Guidelines §15378 and does not require environmental review.

ATTACHMENT:
1. Port of Benicia Deliverable 3 – Decarbonization and Resiliency Pathways
2. Port of Benicia Deliverable 4 – CIP and Yard Expansion Feasibility Analysis

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THE CITY OF BENICIA CALIFORNIA

Port of Benicia

Facilities and Infrastructure Modernization

Deliverable 3

Decarbonization and Resiliency Pathways

October 31, 2025



GHD

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Executive Summary

Shore Power

A shore power system provides an electrical connection facility for a vessel at berth to turn its auxiliary engines off and to feed its hoteling load by connecting to shore side electrical power outlets. The electricity to supply the vessel's hoteling load can be provided by utility companies, sometimes augmented by other renewable land side generation sources. Although the design and installation of a shore power system is technically challenging and requires large capital investment, the emission reduction scale resulting from utilization of a shore power system provides a significant incentive for ports and marine terminals to adopt it.

The California Air Resources Board (CARB) requires vessels, including crude oil transport vessels (i.e. tankers), to comply with CARB's at-berth regulation while in port within the State of California. Each vessel visit to a regulated California port or marine terminal must use a CARB Approved Emission Control Strategy (CAECS) to control emissions for the duration of the visit, unless the visit qualifies for an exception or an alternative compliance option is used. Compliance start dates for per-visit emissions control requirements are listed in the table below, by vessel type.

Table ES1: CARB Compliance Start Date for Emission Control Requirements

Date	Vessel Type
January 1, 2023	Container, reefer, cruise vessels (for visits to all regulated terminals)
January 1, 2025	Roll-on-roll-off vessels (for visits to all regulated terminals) Tanker vessels (for visits to regulated terminals at Port of Los Angeles or Port of Long Beach)
January 1, 2027	Tanker vessels (for visits to all regulated terminals)

Source: California Air Resources Board (https://ww2.arb.ca.gov/our-work/programs/ocean-going-vessels-berth-regulation)

The shore power system evaluated for this Modernization plan focuses on accommodating two vessels docked simultaneously at the pier structure serving the AMPORTS facility because that is the current operating model for Port of Benicia. It is assumed that both vessels would be simultaneously connected to an operable shore power system. A three-berth alternative will be costed out as part of Task 4, but is not elaborated here.

CARB's at-berth regulations allow the use of alternative methods to cold ironing to achieve at-berth vessels emission reductions. These alternatives, which generally fall into the category of CARB-Approved Emission Control Strategy (CAECS) provide a vessel exhaust capturing system which moors alongside the vessel and extends capturing bonnets over the vessel's exhaust pipes. The exhaust fumes are captured and processed, and the residual is discarded compliant with State air quality standards and regulations. Such technology is available as a service to vessels at port, not only in Benicia, but as needed across the state.

In addition to the environmental and emission control benefits, based on the analysis presented in this Task 3 deliverable, shore power is the recommended long-term approach to vessel-based emission reductions at the Port of Benicia.

Other Decarbonization Pathways

Microgrid

A grid-connected microgrid that can also function autonomously in "island mode", as needed, is recommended for the Port of Benicia. This dual functionality would improve the Port of Benicia's energy resiliency by providing a backup source of power in the event that PG&Es' interconnected grid is unable to provide power to the port for any reason.

For optimal effectiveness, such a system would need to be combined with a battery energy storage systems (BESS). BESS electricity can be used to meet short-term peak power demand or for ancillary services, such as providing an operating reserve and frequency control to minimize the chance of grid-based power outages. Scope 1 (direct) emissions at the Port of Benicia are the only source of GHG and other emissions relevant to the scope of this Modernization plan. In addition, Scope 1 emissions are the only potential category of emissions that a microgrid-BESS system could realistically reduce at the Port of Benicia. Further exploration of such a system at the Port of Benicia will be presented in the Task 4 deliverable for this plan.

Green Fleet

From a CARB compliance perspective, the Port of Benicia is like any other port in California in that it must comply with state (and federal) regulations across its operating parameters, including emissions. In this sense, Port of Benicia is not exceptional and its decarbonization compliance efforts will necessarily mirror those of other ports in California. Beyond compliance, however, Port of Benicia is exceptional because the nature of its current operations – ro-ro/automobile handling and coke reception and vessel loading – don't require any mobile cargo handling equipment per se, meaning there is effectively no on-port medium-duty or heavy-duty equipment to replace. The extent of any green fleet initiatives at the Port of Benicia based on current operations would therefore include only the following equipment/vehicle types, none of which are owned or operated by either the City or AMPORTS:

- HD (drayage) trucks
- Locomotives
- Harbor craft

Since CARB has already developed and announced rules and schedules for all of these equipment/vehicle types, and since neither the City nor AMPORTS has the ability to mandate standards that go beyond compliance, it is unlikely that Port of Benicia stakeholders that own/operate trucks, locomotives and/or harbor craft within the port will be motivated to accelerate adoption of zero-emission alternatives beyond compliance. In short, green fleet initiatives that go beyond mandatory compliance with state regulations do not appear to make sense for the Port of Benicia at this time.

Climate Change Resiliency

The climate change resiliency section of this Task 3 deliverable is intended to inform port infrastructure improvements and investments through 2080 in support of the Port of Benicia Modernization plan. The methodology used consists of a review of the latest state sea level rise (SLR) guidance from the Ocean Protection Council (OPC, 2024) to develop projected flood mapping under the Intermediate, Intermediate-High, and High SLR scenarios affecting port properties. These scenarios provide reasonable to conservative SLR projections to inform long-term planning of infrastructure investments.

The USGS CoSMoS, BCDC ART, and FEMA flood mapping methods and results were reviewed for this analysis. Due to limitations of the available models, alternative flood mapping was developed for the port using similar methods as those used in BCDC ART. Water levels of interest were projected landward to delineate flood extents based on existing ground elevations, resulting in what is commonly referred to as a "bathtub model." The water levels of interest consisted of SLR projections added on top of 100-year still water levels, obtained from a comprehensive San Francisco Bay Tidal Datums and Extreme Tides Study (AECOM, 2016). Due to this simplified approach, the flood projections do not account for complex hydraulics associated with the quantity of overtopping and overland flow throughout the affected area and are only indicative of an estimated maximum extent of flooding during extreme high tide events. While much of the Port is currently protected by levee structures, many segments exhibit crest elevations below extreme event water level and will become more susceptible to overtopping as SLR progresses.

Additionally, the existing levees are not FEMA-accredited, therefore the ability of these structures to withstand overtopping or persistent high-water levels is not known. By 2080, significant portions of the existing levees are projected to exceed general failure thresholds, especially under extreme events and/or higher SLR scenarios. This would indicate that even if higher sections of the levee are not overtopped, the port's inland areas would still be exposed to flood events due to overtopping and potential failure of lower-elevation areas of the shoreline.

The vulnerability of Port of Benicia assets has been evaluated based on the results of the flood projections completed for this plan. Most of the port's assets along the shoreline will be exposed to flooding by 2080 under the Intermediate SLR scenario of 1.8 ft SLR and the 100-year event. However, all of the assets along the pier structure exhibit high deck elevations above projected water levels and are not considered vulnerable to SLR. While the pier structure's soffit may experience infrequent interactions with the 100-year peak water level associated with the 2080 Intermediate-High SLR scenario of 3.0 ft SLR, this is still not anticipated to result in significant damage over the planning horizon of this plan (2080).

Based on the results of this SLR vulnerability assessment for the port, several mitigation strategies are proposed to reduce the exposure and associated impacts of flooding caused by extreme events and rising sea levels in order to support consistent, long-term operational functionality. Due to the nature of Port of Benicia's operations, which require maintained access throughout the site, strategies primarily focus on protection of the port perimeter to prevent flooding of operational areas up to the 1% annual chance water level in 2080 under the Intermediate-High SLR scenario (3.0 ft SLR).

Due to the varying shoreline conditions along the port, several flood mitigation options were investigated. While most of the recommended strategies are based on perimeter flood protection to maintain continuity of port operations, future capital improvement projects could include asset-specific adaptation strategies, such as flood proofing or elevating individual assets *in-situ*, to provide additional protection as needed. This is expected to reduce the complexity and cost of increasing the port's resiliency while allowing for current planning efforts to continue without major design modifications. Given that the port is bordered by non-industrial land uses and other property owners, the recommended strategies assume that encroachment or disturbance of these areas is not feasible. A summary of each shoreline segment's recommended mitigation strategy(ies) is provided below:

Segment A (YUBA Property to Van Buren Street)

- Augment existing levee with sheet pile wall along southern edge of port
- Raise asset elevation *in-situ*
- Relocate assets

Segment B (Pier Structure)

- Increase frequency of inspections
- Retrofit vulnerable assets (floodproofing utilities/substructure components)
- Schedule maintenance around low tide events

Segment C (Valero Leasehold)

- Elevate ground between Building 169 and railroad
- Elevate Van Buren Street

Segment D (Railroad Prism)

- Fill and elevate engineered shoreline revetment in locations below 14 ft (NAVD88)

Segment E (Benicia-Martinez Bridge to Marsh Channel)

- Elevate existing public trail to create new ecotone slope levee
- Install sheet pile wall around segmentRaise asset elevation *in-situ*
- Relocate assets

Segment F (Marsh Channel to UP Lease North)

- Install sheet pile wall around segment
- Raise asset elevation *in-situ*
- Relocate assets

Shore Power

Overview

Shore power, also known as cold ironing, provides a significant emissions reduction opportunity while a given vessel is at berth. A shore power system provides an electrical connection facility for a vessel at berth to turn its auxiliary engines off and to feed its hoteling load by connecting to shore side electrical power outlets. The electricity to supply the vessel's hoteling load can be provided by utility companies, sometimes augmented by other renewable land side generation sources. Typically, the electricity generated by the utility companies is much cleaner and "greener" than the power generated by a much smaller diesel generator on-board the vessel. An increasing number of container vessels are utilizing shore power connections, especially in California, but increasingly also in other states as well as in Europe and Asia.

Although the design and installation of a shore power system is technically challenging and requires large capital investment, the emission reduction scale resulting from utilization of a shore power system provides a significant incentive for ports and marine terminals to adopt it. Moreover, growing local and national legislative and environmental justice interests have resulted in increasingly stringent state regulations requiring strict zero emission compliance for the port and marine industry in numerous jurisdictions. The penalties ascribed to non-compliance associated with such regulations make a shore power system the most effective method to maximize greenhouse gas and other at-berth emission reductions while avoiding heavy financial penalties.

During the past decade, various shore power systems have been successfully installed and have been continuously operating at major ports throughout California as well as elsewhere in the U.S., and in Europe and Asia. As the utilization of shore power at California ports continues to increase, realizing the scale of its emission reduction benefits, other ports and facilities in different states and countries have now begun to intensify their shore power planning and implementation efforts for their respective ports and marine terminals.

In addition to the electrical power availability at each marine terminal, the viability of electrification is also directly dependent upon the electrical power system transmission, distribution and control infrastructure within a given terminal boundary. The electrification of equipment and facilities requires additional space for the installation of electrical charging facilities as well as supporting electrical power transformation, distribution, conduit and conductor circuit routes, and relative protection and control equipment. This challenge not only concerns the utility companies and electrical generation service providers, but is also a valid challenge for end users, such as marine terminals, where space is considered a precious commodity. Given expansion of cargo throughput strategies and constraints in the fixed space of a cargo terminal, any plans to electrify marine terminal equipment and operations must include space allocation and planning for infrastructure/equipment footprint and general space requirements.

The electrical infrastructure at and within the surrounding areas of a given marine terminal plays a crucial role in the design and development of a shore power system. These factors also have significant impact on project design and construction cost and schedule. In areas where existing electrical infrastructure or the utility distribution system has not been updated for decades, required Infrastructure upgrades typically consist of installing or upgrading utility electrical power service equipment, power transmission and control switchgear, overhead transmission poles and lines or underground conduit and conductor banks, transformers and distribution switchboards equipped with protection circuit breakers and other required electrical power distribution and control systems.

Typically, such projects are delivered utilizing a design-bid-build project delivery method. Alternatively, a design-build project delivery method can also be employed. However, project complexity, distinctive design characteristics and system requirements, high voltage and shore power system design expertise and experience, as well as design and construction process and cost control requirements often make the design-build method less desirable.

International System Standards

The International Electrotechnical Commission (IEC), the International Standards Organization (ISO) and the Institute of Electrical and Electronics Engineers (IEEE) have joined together to comprise a IEC/ISO/IEEE Joint Working Group (JWG) to produce international shore power design and operational guidelines. Currently, the shore power standard is titled as IEC/ISO/IEEE standard No. 80000 series. This series was envisioned to include a variety of shore power systems for a variety of vessels and electrical connectivity modes. The following is a listing of the various sections of this standard:

- *80005-01*
  AC connection of high voltage shore connection for vessels with power demand of equal or larger than 1 MVA. This standard has been published and is currently in effect.
- *80005-02* – Not in use.
- *80000-03*
  AC connection of low voltage shore connection for vessels with power demand of less than 1 MVA. This standard is currently under development, and it is anticipated to be published sometime in late 2025.
- *800005-04*
  Low voltage DC shore power connection systems. This standard is in preliminary stages of development.
- *800005-05*
  Offshore and onshore utility connections. This section is for offshore platforms or near onshore windfarm platforms utility connections. This is a proposed section for future development.

Vessel Types and Operational Voltages

In addition to its general requirements for all shore power installations, the IEC/ISO/IEEE international standard 80005-01 also includes various annexes for a variety of vessel categories. These annexes provide further specific guidelines for each category of vessel type connection details and respective shoreside requirements. The various vessel annexes for this standard are as follow:

- Annex B – Roll-on/roll-off (ro-ro) cargo and passenger vessels
- Annex C – cruise vessels
- Annex D – container vessels
- Annex E – liquified natural gas carriers (LNGC)
- Annex F – tankers
- Annex G – vehicle carriers

Vessels with Electrical Demand Equal to or Greater than 1 MVA

- Container vessels — 6,600 Volts
- Cruise vessels — 11,000 Volts and/or 6,600 Volts
- Ro-ro vessels — 11,000 Volts (6.6 kV may be utilized in regional waterborne transportation services)
- Pure car carriers (PCCs) — 11,000 Volts
- LNG carriers — 6,600 Volts
- Tankers (informative only) — 6,600 Volts

- Dry bulk carriers — The IES/ISO/IEEE HVSC 80005-01 annex for this category of vessels is currently under development. The anticipated publication date of this standard is not yet known.

Vessels with Electrical Demand Less Than 1 MVA

Vessels and shore power facilities under this category which wish to comply with international standards must be designed in accordance with IEC/ISO/IEEE low voltage shore connection (LVSC) Standard 80005-03. This standard is currently under development and is anticipated to be published sometime in late 2025.

Applicability for Port of Benicia

The shore power discussion in this Modernization plan is applicable only to the automobile import and dry bulk operations at the Port of Benicia. The California Air Resources Board (CARB) requires vessels, including crude oil transport vessels (i.e. tankers) to comply with CARB's at-berth regulation while in port within the State of California. Each vessel visit to a regulated California port or marine terminal must use a CARB Approved Emission Control Strategy (CAECS) to control emissions for the duration of the visit, unless the visit qualifies for an exception or an alternative compliance option is used. Compliance start dates for per-visit emissions control requirements are listed in the table below, by vessel type.

Table 1: CARB Compliance Start Date for Emission Control Requirements

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January 1, 2027	Tanker vessels (for visits to all regulated terminals)

Source: California Air Resources Board (https://ww2.arb.ca.gov/our-work/programs/ocean-going-vessels-berth-regulation)

Per CARB's at-berth regulation, operators of terminals receiving 20 or more visits from container, reefer, cruise, ro-ro, and/or tanker vessels in a calendar year must ensure: 1) that each berth has a CAECS available for use for each regulated vessel visit (sections 93130.9(a)-(c)); and 2) that regulated vessels use shore power or another CAECS for the duration of their visit (section 93130.9(d)(4)). Regulated terminal operators must follow the checklist in section 93130.9(d), which includes reporting visit information for each visit/all vessel visits, even those visits without emissions reduction obligations. Lastly, terminal operators were required to provide CARB with terminal plans by December 1, 2021, demonstrating how the terminal intends to comply with the 2020 Regulation. All terminal plans and CARB's responses to each plan are posted to CARB's website for terminal and port plan submissions (https://ww2.arb.ca.gov/terminal-and-port-plan-submissions). All terminal operators are also required to report visit information for each vessel visit, even those terminals receiving less than 20 visits per calendar year.

The shore power system evaluated for this Modernization plan focuses on accommodating two vessels docked simultaneously at the pier structure serving the AMPORTS facility, with both vessels being simultaneously connected to an operable shore power system. As discussed in the Task 2 deliverable for this plan, it is possible that the Port of Benicia could reach a sufficient long-term level of ro-ro activity to justify the addition of a third operating berth. However, it is equally possible that petroleum coke export operations could cease by the time such berth capacity enhancements are necessary, in which case the existing dry bulk berth would most beneficially be repurposed for other productive uses (i.e. ro-ro cargo and/or break-bulk cargo). Given the uncertainty around future coke operations in Benicia, the following sections summarize the requirements of a two-berth scenario. Cost estimates for a three-berth scenario will be included as part of Task 4 for contingency purposes.

It must also be noted that all concepts described in this Task 3 deliverable are planning-level concepts that are illustrative in nature. The concepts described and the associated cost estimates provided are intended exclusively to highlight what the GHD team believes to be the most feasible shore power solution for the Port of Benicia, based on currently available information. Any final shore power solution implemented at the port will be able to elaborate on these concepts, but will necessarily need to be completed as an entirely separate and distinct design project.

Utility Service Entrance and Metering Switchgear

Medium voltage electrical power service entrance from the utility (PG&E) enters the facility and establishes a metered electrical service through the use of a service entrance and metering switchgear. This switchgear will feed the shore power transformer(s), which in turn will feed the shore power switching and control gears feeding the shore power outlets installed on the pier structure. Typically, the utility service entrance voltage for such projects is in the range of 12-66 kV, 3-phase. To route, install and maintain the utility service entrance feeders within the terminal's private property the utility company requires right-of-way authorization from the facility owner. This right-of-way authorization is typically a part of the electrical service request application process.

Shore Power Transformers

There are two dissimilar categories of vessels calling the Port of Benicia: one being a PCC (ro-ro vessel) and the other being a dry bulk vessel. Since there is the possibility of both vessel types needing to connect to shore power simultaneously, the international shore power standard prohibits sharing of one transformer to connect to multiple vessels. It is therefore required to install two separate shore power transformers, one for each of the connections. Both transformers' primary windings would be rated for the utility service entrance voltage level.

The secondary winding of the ro-ro terminal shore power transformer would be rated 11kV. However, the secondary voltage for the dry bulk vessel will depend upon each vessel's power demand level. If the electrical demand for the dry bulk vessel calling the terminal is 1 MVA or larger, then the dry bulk terminal shore power transformer secondary would be rated 6.6kV. Otherwise, if the electrical demand of the dry bulk vessel visiting the terminal is less than 1 MVA, then the dry bulk vessel shore power system is classified as a low voltage shore connection and the relative transformer for the dry bulk berth shore power would be rated in accordance with the IEC/ISO/IEEE LVSC 80005-03 standard.

As mentioned above, this standard is not yet published. However, the LVSC standard has been approved by the international committee and reviewed and approved by IEC headquarters. It is currently in queue for publishing. It is important to note that this standard does not have any bearing on the permitting nor utility company's facilities, permitting, and/or design methodology. Rather, it provides a guideline for the shore power connection system designers to design the shore power distribution system following a uniform and standardized method. At this stage it is extremely unlikely that the standard will change before publishing.

Shore Power Electrical Distribution and Control Switchgear

The shore power electrical distribution and control switchgear would house a main circuit breaker, electrical power control digital relays, earthing switch, and power switch for each of the shore power interface connection points. This switchgear and transformer(s) would be located adjacent to each other and will be installed on a concrete slab. A chain link fence with the appropriate personnel door and equipment slide gate would surround the switchgear/transformer compound. For added security and protection from vehicular movements, bollards would be installed around the switchgear/transformer substation.

Shore Power Electrical Distribution Conduit and Conductor Bank

The shore power electrical distribution system conduit/conductor bank would be an underground conduit which would originate from the shore power substation located at the marine terminal and be extended and routed to reach the shore power connection interface outlets located at the edge of the pier structure. The portion of this conduit bank travelling within the backland area of the port would require trenching and backfilling of the trench, and where the conduits break through the break wall, they would be installed as attached to the bottom of the existing pier deck.

Shore Power Connection Interface Equipment at the Pier Structure

There are two potential methods to provide the required pier-side shore power connection interface system. The first method is to provide a shore power outlet box installed within a concealed concrete vault. Under this scenario, multiple

vaults would be needed. These vaults would be required to be installed along the waterside edge of the pier structure to provide an appropriate shore power connection interface along the full length of the pier. This way, various unique vessels calling the port under different berthing schemes (i.e. with varied mooring positions) would be able to connect to the shore power system. Multiple vaults are necessary to provide maximum flexibility for connection. If the vaults are too few in number, or located too far apart from each other, the cable management system may not reach a given vault under certain berthing scenarios, meaning some vessels would be unable to connect to the shore power system.

The international shore power standards prohibit the use of extension cords. Additionally, the fixed vault method requires each vault to be controlled with its own dedicated power circuit, feeder breaker, relays, earthing switch and power switch. Such a layout exponentially increases the shore power switchgear footprint and requires a large substation area. Since the fixed vault method may be unable to meet 100 percent shoreside connection requirements for all vessels, and its installation would require more equipment with higher construction cost, larger footprint and higher maintenance cost, it is not recommended.

The other method to provide shore power is to install a movable system with an enclosed cable chain track element and a connection interface carriage system moving along the length of the track. The power track can be installed either at the waterside edge of the pier deck, or at the vertical plane of the pier structure hanging over the water and supported by the pier itself. In the event that the pier structure is too old/warped to accommodate such a system, the damaged areas would need to be repaired prior to installation of the track. Given the age and general condition of certain sections of the Port of Benicia pier structure, it is assumed that a number of repairs would be required before such a system could be installed. Such improvements will be further discussed as part of Task 4. The track can be extended along the pier structure for up to 1,000 feet. This system is movable, flexible, and employs only one outlet interface. This method eliminates the need for multiple fixed vaults, multiple switchgear circuit breakers required for each vault, and multiple feeders and conduits. Instead, it requires only one circuit breaker, one power switch and one earthing switch, which translates to a much smaller switchgear footprint and a much more cost-effective system. Moreover, due to its flexibility, this system can provide shore power to all compatible vessels berthing at the terminal, providing a real and cost-effective solution to accomplish 100 percent shore power connectivity and at-berth regulation compliance.

The international HVSC 80005-01 shore power standard for ro-ro vessels and vehicle carriers (Annexes B and G, respectively) requires that the cable management equipment for these vessel types be installed at the shore. This means that a cable management system mounted on a lift truck or similar equipment will be necessary to provide the flexible cable connecting the track mounted outlet to the vessel.

For the dry bulk vessels, although the relative standard annex is not yet published, it is anticipated that the cable management system for such vessels will also be required to be shore-based.

Existing PG&E Electrical Distribution Infrastructure

PG&E overview maps indicate that there is an existing pole-mounted 12 kV overhead electric line located along Bayshore Road. The east end of this overhead electric line begins at Oak Road and extends westerly, terminating near East 5th Street. This information is shown in Appendix A of the Task 1 deliverable for this plan. It is not clear whether PG&E's existing facilities would be able to accommodate the amount of power needed for two shore power systems at the port. In the worst case, PG&E would be required to upgrade their circuits to provide sufficient capacity to deliver the required shore power to the terminal entrance.

Required Shore Power Infrastructure

The existing PG&E 12 kV overhead line includes existing power poles at the south side of Bayshore Road adjacent to Van Buren Street. The south end of this street connects to the pier entrance. The most feasible location for a shore power service entrance switchgear substation based on proximity to both the existing PG&E overhead facility and the pier structure is a parking lot located on Van Buren Street near Bayshore Road, just south of the railroad tracks as shown in Figure 1.

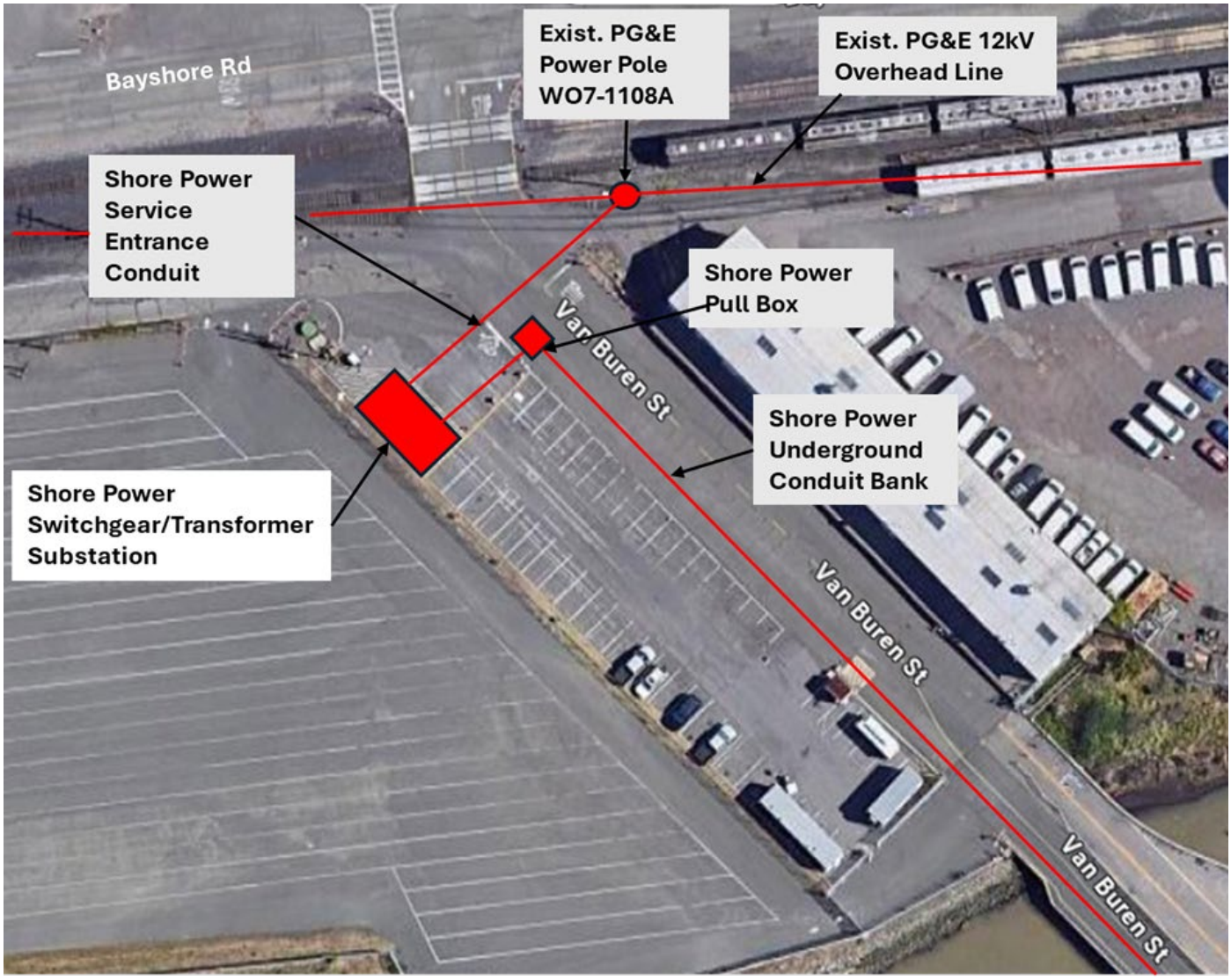


Figure 1: Proposed Shore Power Switchgear/Transformers Substation Location (source: Google Earth/H3)

Dry Bulk System

The easterly portion of the Port of Benicia's pier structure is utilized to load dry bulk vessels carrying petroleum coke. The vessels are loaded through a fixed conveyor loading mechanism located at the west end of the pier. To comply with 100 percent connection regulation and the international shore power standards that prohibit extension cord usage, it is recommended to install a flexible and moveable shore power connection interface system. The shore power feeders traveling south on Van Buren Street (see Figure 1) would turn east to connect to the movable shore power connection interface box. This box would most feasibly be located at the center point of the cable chain track element. The track element will provide the necessary power to a movable shore power connection outlet, traversing along the track element. A movable wheel-based cable management system equipped with a lifting mechanism can provide the flexible cable necessary to connect the movable shore power connection interface to the vessel. Figure 2 below shows the general layout of this concept.

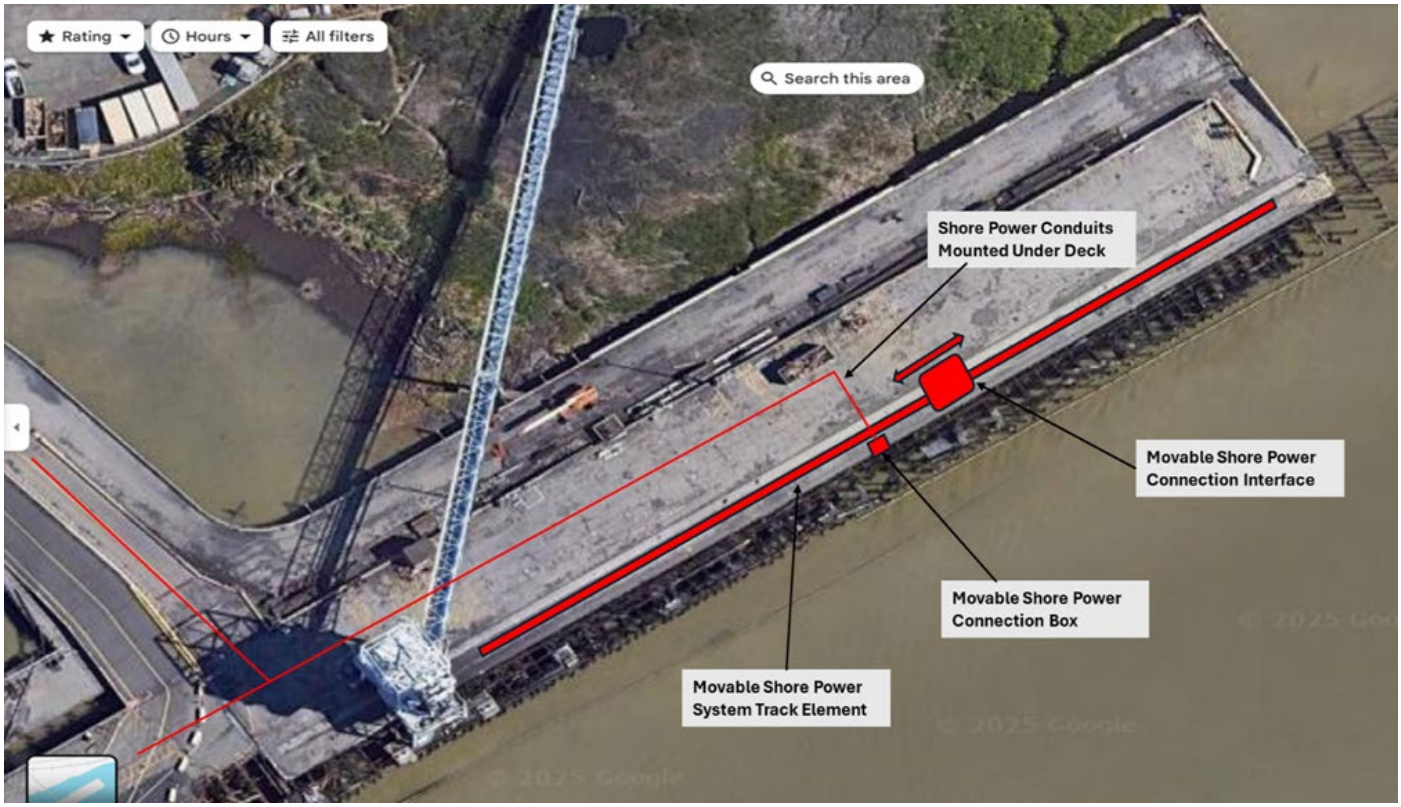


Figure 2: Proposed Movable Shore Power Connection Interface System at Dry Bulk Terminal Wharf (source: Google Earth/H3)

Ro-Ro System

The westerly portion of the Port of Benicia's pier structure is utilized to load/unload ro-ro cargo such as vehicles, farming equipment, and other wheeled and/or self-powered mobile assets. The vehicles and other ro-ro cargo are driven off or onto the vessel utilizing the vessel's ramp. Prior to operations, the vessel lowers its ramp to rest upon the pier deck.

Due to the ramp operation, unlike the dry bulk facility, the movable shore power track element in this scenario would be required to be installed on the vertical face of the pier structure, behind the fender piles. This way the movable shore power system would not interfere with the vessel operations and would also be protected by the fender piles. The connection point of the vessel to the moveable shore power connection interface would ideally be located within 100 meters from the aft of the vessel towards its stern with a maximum five-meter high reach from the keel of the vessel. The shore power feeders extending south on Van Buren Street would turn west to connect to the movable shore power connection interface box.

The optimal location for this box from a flexibility and efficiency of operations perspective would be at the center point of the cable chain track element. The track element would provide the necessary power to a movable shore power connection outlet, traversing along the track element. A movable wheel-based cable management system equipped with a lifting mechanism can provide the flexible cable necessary to connect the movable shore power connection interface to the vessel.

Figure 3 below shows the general layout of this concept. Figure 4 illustrates a typical ro-ro ramp configuration for vehicle offloading operations at the Port of Benicia.

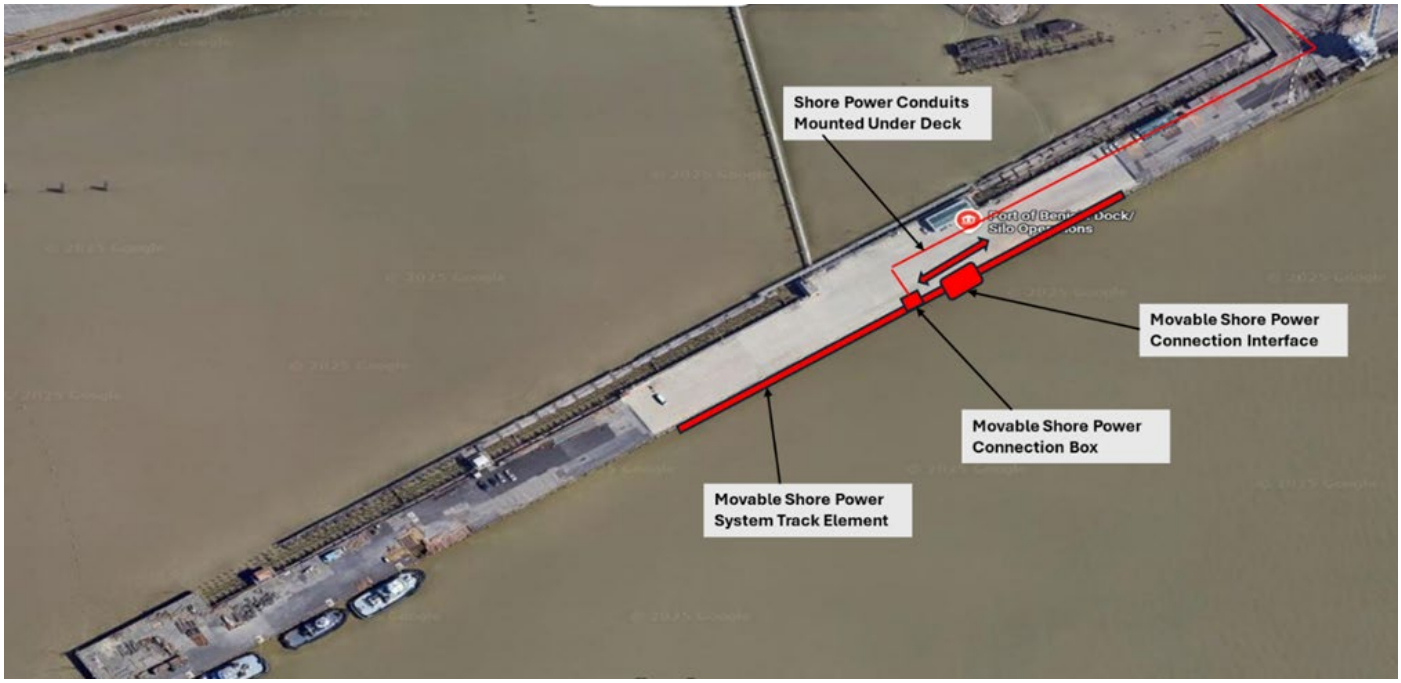


Figure 3: Proposed Movable Shore Power Connection Interface System at RoRo-Vehicle Import/Export Terminal Wharf (source: Google Earth/H3)

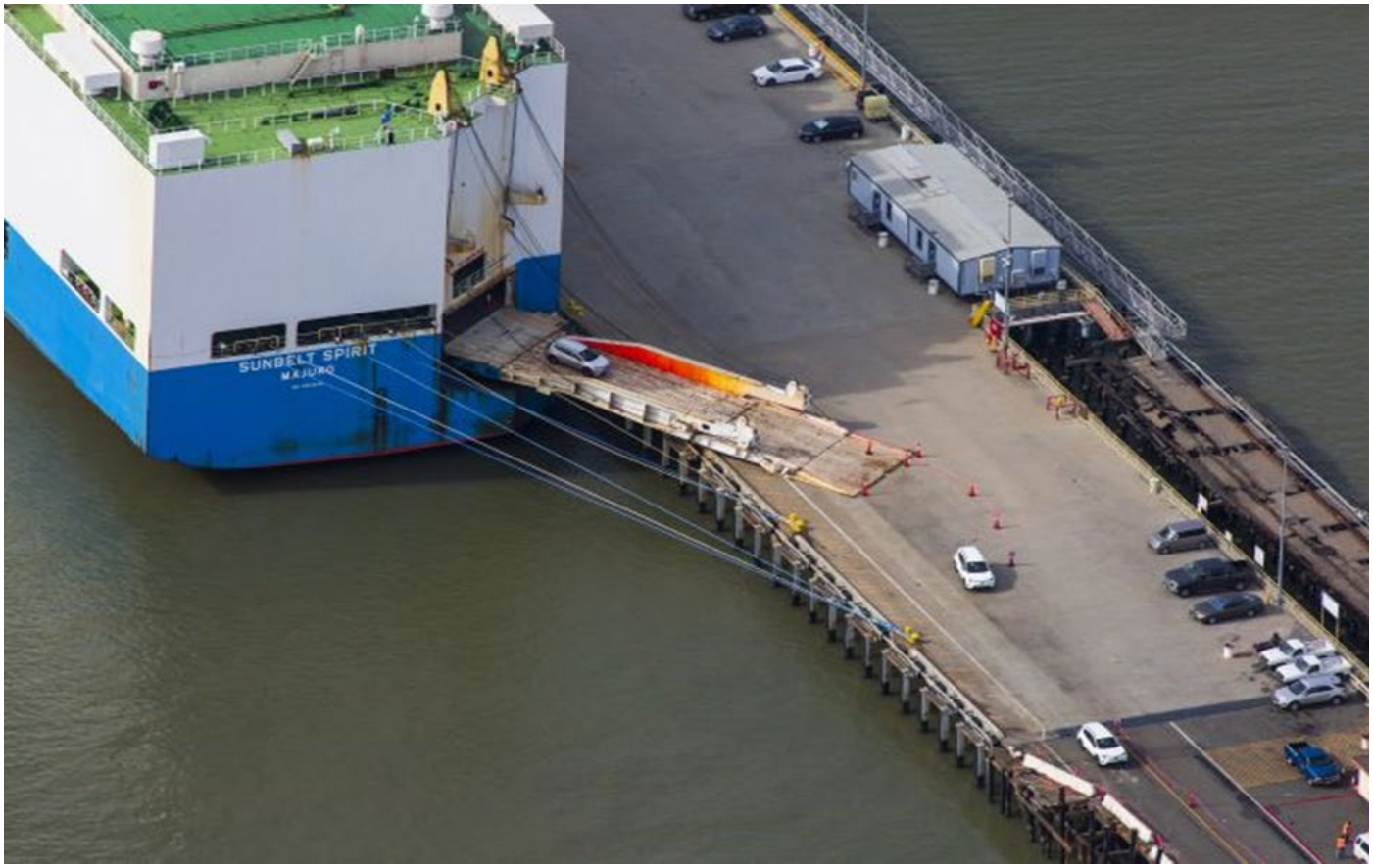


Figure 4: Vessel Operations at Ro-Ro/Vehicle Import/Export Berth (source: AMPORTS)

Tug Boat System

To connect the tug boats that operate and lay up at the Port of Benicia to the proposed shore power system, it is recommended to route a separate 12 kV feeder from the proposed shore power main switchgear located in the proposed shore power substation, as shown above in Figure 1. The tug boat feeder would be sub-metered to capture the tug boat power consumption. It would travel in the same trench as the other shore power feeders and terminate at a local transformer located at the pier to provide the required utilization voltage appropriate for the tug boats. At the pier, adjacent to the transformer, a proposed switchboard would provide the required circuit distribution and power control to multiple tug boat shore power outlets installed at the edge of the wharf. The outlets can be installed in a box flush with the deck of the pier structure or, possibly more cost-effectively, the outlets can be installed on the pier itself. The outlet locations can be equipped with a post-mount cable management system with a cable retractor mounted on the post.

The cost to implement tug boat shore power is dependent upon the number of tug boat shore power outlets and the simultaneous tug boat connections at any given time. As an example, the cost to implement a shore power system to provide sufficient power to connect four (4) tug boats simultaneously would range between $1-$1.5 million. This cost estimate assumes that the two berth terminal shore power system will be installed so that the tug boat shore power feeder could be added to the installed shore power switchgear.

Shore Power System Costs

The cost to design and install shore power at two berths (one ro-ro berth and one dry bulk berth) is estimated to be $25 million. This cost includes all the required electrical equipment, transformers, switchgear, conduit and conductors, power control relays and safety switching equipment, power monitoring and reporting software and hardware, moveable shore power system, track element, shore power connection interface carriage, cable management system, civil and site work, labor to install, test and commission, engineering design, construction support and management, plan check and permit fees. This cost estimate is preliminary and should be considered rough order of magnitude (ROM) in nature as it includes a 20 percent contingency for unknown conditions.

Comparison with CAECS Costs

CARB's at-berth regulations allow the use of alternative methods to cold ironing to achieve at-berth vessels emission reductions. These alternatives, which generally fall into the category of CARB-Approved Emission Control Strategy (CAECS) provide a vessel exhaust capturing system which moors alongside the vessel and extends capturing bonnets over the vessel's exhaust pipes. The exhaust fumes are captured and processed, and the residual is discarded compliant with State air quality standards and regulations. Such technology is available as a service to vessels at port, not only in Benicia, but as needed across the state. To obtain such services, the terminal operator is required to contract with the technology provider and pay for their services. STAX currently provides this service at the Port of Benicia.

The cost for using the existing STAX emission capturing system for a terminal with 3 vessel calls per week with 10 hours of dwell time per vessel is estimated to be $500,000 per month. This translates roughly to $42,000 per vessel call.

Shore Power System Cost Effectiveness and Modeling

To compare the cost effectiveness of the emission reduction alternatives proposed in this plan, the following operational assumptions have been made:

Ro-Ro Berth (x1)

- Average vessel calls per week: 3 (12 calls per month)
- Average vessel dwell time at berth per call: 10 Hrs
- Average electrical power demand: 3,125 kVA (2,500 kW)

Dry Bulk Berth (x1)

- Average vessel calls per week: 3 (12 calls per month)
- Average vessel dwell time at berth per call: 36 Hrs
- Average electrical power demand: 2,500 kVA (2,000 kW)

Electricity Cost

- Average cost: $0.30/KWh
- Shore power system usable life: 30 years

Based on these assumptions, the cost effectiveness of three different scenarios is presented below.

Scenario 1 – Shore Power System

- Design, install and operate shore power system at ro-ro (x1) and dry bulk (x1) berths.
- The total cost of ownership for a two-berth shore power system with a life cycle of 30 years is expected to be:
  - Annual electrical power consumption cost $4,190,400
  - Annual maintenance cost (1% of CAPEX) $ 250,000

  Total cost per year **$4,440,400**
- The lifecycle cost of ownership (x30 years) would be:
  - Shore power CAPEX (installation) $ 25,000,000
  - Annual cost (x30 years) $133,200,000

  Total cost (x30 years) **$158,212,000**

Scenario 2 – CAECS (bonnet barge) System

- Contract for continuous bonnet barge system service
- The total cost of utilization of a mobile third-party emission capture system over 30 years is expected to be:
  - CAECS year 1 service rate ($/hour) $ 2,300
  - Base service cost (1 year) $ 17,683,200
  - Total (base) service cost (x30 years) $530,496,000
  - Escalation costs (2% per year x30 years) $ 32,030,669

  Total cost (x30 years) **$ 562,526,669**

Scenario 3 – Non-Compliance

- Operate without any emission control system and pay State of California penalties for 30 years of operation. The assumption under this scenario is that CARB would allow such operation and that, in the event of such an option being available, the penalty amount will not increase over time. (note: this is highly unlikely given the current and anticipated regulatory environment within California).
- The total cost of non-compliance over 30 years is expected to be:
  - CARB non-compliance penalty ($/hour) $ 1,980

- Annual ro-ro penalty $ 2,851,200
- Annual dry bulk penalty $ 10,264,320

Total cost per year $ 13,115,520

- The cost of this option over 30 years would be, at minimum, assuming no escalation over time and ongoing regulatory permissibility:

Total cost (x30 years) $393,465,600

Shore Power System Implementation

The current Modernization plan is intended to outline a path forward for facility improvements at the Port of Benicia. In addition to the environmental and emission control benefits, based on the analysis above, shore power is also the most cost-effective long-term approach to vessel-based emission reductions at the Port of Benicia. To implement a successful shore power system, the following steps will need to be taken, using the concepts described above as a starting point:

1. Complete a port-wide Initial Study/Mitigated Negative Declaration (IS/MND) document to comply with California Environmental Quality Act (CEQA) requirements (this will be done as part of Task 6 of this Modernization plan).
2. Thoroughly study and understand both existing and likely future marine terminal characteristics and conditions, including along the pier structure as well as within the backland areas supporting the pier structure.
3. Areas of study will need to include operations/functionality, limitations/constraints, vessel berthing patterns and operational preferences, projected future vessel types, anticipated future call frequency, expected future vessel dwell times, future vessel electrical loads and potential alternative future fuels that may allow vessels to comply with California's at-berth emission control standards without needing to plug into the local electrical grid.
4. Coordinate closely with the local utility company (PG&E) to more clearly understand their power delivery capabilities and capacity adjacent to the terminal. This will entail working with the utility company to identify specific future electrical power demand at the port, apply for new electrical service, understand, clarify and negotiate shore power rates, confirm the cost and timeframe for developing any additional facilities upgrades and determine how these costs will be covered, when and by what party. It will also be necessary to coordinate the point of service and location of the utility company's service entrance equipment at the port.
5. Secure rights of way and/or easements, as necessary, from property owners.
6. Develop shore power system construction and equipment procurement plans, civil, structural and electrical drawings, calculations, layouts, technical specifications, and procurement documents.
7. Develop a project delivery schedule.
8. Develop a final project cost estimate.
9. Issue design and construction procurement documents and install shore power system.

Long-Lead Electrical Equipment

Due to the high demand for electrical switch gear and other power distribution and control equipment and components in the U.S., currently, large electrical equipment such as transformers, switchgear, and power system control components require 18-24 months of lead time. This lead time begins when the manufacturers receive the purchase order from contractor or the owner.

Plan-check and Permitting Process

Upon completion of the final design drawings and specifications, plans get submitted to the local authority having jurisdiction (AHJ) over the project for project plan check. Upon obtaining the AHJ's plan check approval, the port or, in the case of Port of Benicia, the marine terminal owner/operator (AMPORTS) will prepare a bid package and will advertise the bid documents for a construction contract.

The construction contract will include the requirements for all electrical materials and equipment procurement, technical information, installation and construction plans, testing and commissioning requirements. The successful bidder will be required to obtain the necessary permits from the AHJ for the construction work. Specific to Port of Benicia, this entails the following:

- The electrical service entrance will need to be reviewed and approved by PG&E.
- If there is a need for underground conduit banks to cross existing railroad tracks, the crossing drawings will need to be approved by UP.
- Design documents for the complete shore power project will need to be reviewed and approved by the City of Benicia Building Safety Division and/or any other City staff with responsibility for performing plan check review and approval, issuing construction permits and conducting inspections after construction is completed.

Project Schedule

Given the complexity of the shore power project design and construction as conceptualized above for the Port of Benicia, and the long lead time requirement for major electrical equipment and components, the design, plan-check, advertising, bidding, construction and testing/commissioning of two berths is expected to require a minimum of 28-32 months, not including environmental review.

Other Decarbonization Pathways

Alternative Power Generation/Storage

Microgrid

One high-potential measure the Port of Benicia can implement in the clean energy space is an on-port microgrid. A microgrid is a local electrical production facility that typically utilizes non-traditional energy sources such as photovoltaic (PV) solar panels, hydrogen fuel cells, or similar technologies to produce and distribute electricity within a tightly defined physical area. Microgrids can operate in grid-connected and off-grid modes and can be scaled, or clustered, depending on factors such as available space, cost, and the amount of power production required/desired[1].

A standalone microgrid has its own sources of electricity, supplemented with a battery energy storage system (BESS), which is a type of energy storage technology that uses a group of batteries to store electrical energy. This type of microgrid is optimal in cases where power transmission and distribution from a central grid is not possible and/or not reliable. Such a system is not applicable to Port of Benicia since PG&E already serves the port.

A grid-connected microgrid is integrated with the local utility's interconnected grid system but is also able to disconnect from that system to function autonomously in "island mode" as needed. This dual functionality would improve the Port of Benicia's energy resiliency by providing a backup source of power in the event that PG&E's interconnected grid is unable to provide power to the port for any reason. For optimal effectiveness, such a system would be combined with a BESS.

Battery Energy Storage System (BESS)

Battery energy storage systems are generally designed to deliver their full rated power for durations ranging from 1-4 hours[2], though emerging technologies are extending this to longer durations. BESS electricity can be used to meet short-term peak power demand or for ancillary services, such as providing an operating reserve and frequency control to minimize the chance of grid-based power outages.

Potential Application

Depending on the size of the microgrid-BESS system, there are multiple options for how the power produced and stored could be applied at the Port of Benicia. According to the United States Environmental Protection Agency (USEPA), and based on the Greenhouse Gas Protocol established jointly by the World Resources Institute and the World Business Council for Sustainable Development (WBCSD), there are three levels of emissions[3] that a microgrid-BESS system might be able to curtail:

- Scope 1

  Scope 1 emissions are direct greenhouse gas (GHG) emissions that occur from sources that are controlled or owned by an organization. In the case of the Port of Benicia, this would include buildings, vehicles and other facilities and equipment that are owned by some combination of AMPORTS, Valero (coke operation, not refinery) and Union Pacific (yard operations, not mainline operations).

- Scope 2

  Scope 2 emissions are indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling by a given organization.

- Scope 3

  Scope 3 emissions are the most complex and extensive emissions, encompassing all other indirect emissions that occur in an organization's value chain. Such emissions include emissions from the extraction and production of purchased materials, transportation of products, waste disposal, and even the use of sold

[1] https://en.wikipedia.org/wiki/Microgrid
[2] https://docs.nrel.gov/docs/fy19osti/74426.pdf
[3] https://www.epa.gov/climateleadership/scope-1-and-scope-2-inventory-guidance

products. An example for the Port of Benicia would be the emissions generated by cargo vessels in transit to/from the port.

Scope 1 emissions at the Port of Benicia as described above are the only source of GHG and other emissions relevant to the scope of this Modernization plan because they are the only source of emissions that the City and AMPORTS have the ability to either control or influence through direct action. The City and AMPORTS can install and require the use of shore power while vessel are at berth, for example. However, neither the City nor AMPORTS has jurisdiction over vessels while not at berth. In addition, Scope 1 emissions are the only potential category of emissions that a microgrid-BESS system could realistically reduce to any significant extent. Further exploration of such a system at the Port of Benicia will be presented in the Task 4 deliverable for this plan.

Green Fleet Initiatives

Many ports across the United States, and especially within California, have developed green fleet initiatives. Most of these in-state initiatives have been established to achieve CARB compliance, but others go beyond compliance, most notably those of the San Pedro Bay ports of Long Beach and Los Angeles. The overall purpose of these initiatives is to accelerate reduction of mobile-source emissions. Such "green" fleet initiatives generally focus on adoption of zero-emission alternatives to gasoline, diesel and other fossil fuel-powered vehicles and equipment across the following categories.

On-port Light Duty (LD), Medium Duty (MD) and Heavy Duty (HD) Equipment

- Cargo handling equipment (CHE)
    - Ship-to-shore (STS) cranes
    - Rubber tired gantry cranes (RTGs)
    - Forklifts
    - Utility tractor rigs (UTRs)
    - Container handlers (i.e. reach stackers, top-loaders)
- Vehicles
    - Vans
    - Trucks
    - Other passenger vehicles
- Locomotives
- Harbor craft

Off-port Light-Duty (LD), Medium Duty (MD) and Heavy Duty (HD) Equipment

- Drayage trucks
- Passenger vehicles

The applicability of green fleet initiatives to the Port of Benicia is complicated for several reasons. From a CARB compliance perspective, the Port of Benicia is like any other port in California in that it must comply with state (and federal) regulations across all of its operating parameters, including emissions. In this sense, Port of Benicia is not exceptional and its decarbonization compliance efforts will necessarily mirror those of other ports in the state.

Beyond compliance, however, Port of Benicia is exceptional because the nature of its current operations – ro-ro/automobile handling and coke reception and vessel loading – don't require any cargo handling equipment per se, meaning there is effectively no on-port MD or HD equipment to replace. The extent of any green fleet initiatives at the

Port of Benicia would therefore include only the following equipment/vehicle types, none of which are owned or operated by either the City or AMPORTS:

- HD (drayage) trucks
- Locomotives
- Harbor craft

Since CARB has already developed and announced rules and schedules for all of these equipment/vehicle types – see table below – and since neither the City nor AMPORTS has the ability to mandate standards that go beyond compliance, it is unlikely that Port of Benicia stakeholders that own/operate trucks, locomotives and/or harbor craft within the port will be motivated to accelerate adoption of zero-emission alternatives beyond compliance. In short, green fleet initiatives that go beyond mandatory compliance with state regulations do not appear to make sense for the Port of Benicia at this time.

Heavy Duty Truck Rules	
Existing (January 1, 2023)	Pre-2010 trucks prohibited on California roads
January 1, 2024	Only zero-emission trucks may register in CARB's online system
January 1, 2036	Non-zero-emission trucks banned from accessing California ports and intermodal yards; 100% of new truck sales must be zero-emission
Locomotive rule	
January 1, 2024	CARB registration and emissions-based fees required; 30-minute idling limit imposed
	Pre-2007 locomotives prohibited within California; locomotives built in 2030 or after required to operate in zero-emission configurations
January 1, 2035	Class I line haul locomotives built in 2035 or after required to operate in zero-emission configurations while in California
Harbor Craft Rule	
Existing (January 1, 2023)	CARB diesel use and CARB reporting required
December 31, 2029	Use of Tier 4 engines with diesel particulate filters (DPF) required
Government Fleet Rules[4]	
January 1, 2024	*50% of new vehicle purchases must be zero-emission*
January 1, 2027	*100% of new vehicle purchases must be zero-emission*

Finally, while AMPORTS and its port operating partners/subtenants, Valero and UP, do operate their own fleets of LD passenger vehicles, the Government Fleet Rule summarized above does not apply to non-governmental passenger vehicles.

Terminal Lighting System

Another means to increase electrical energy utilization efficiency and to enhance the visibility and security of the terminal is to use a high mast LED lighting system. LED high mast lighting systems use up 40-50 percent less energy than the traditional mercury vapor or high-pressure sodium light fixtures, and produce much higher visibility while maintaining a very highly accurate color index. Employment of LED high mast lighting also enhances visibility as well as security on terminal. Based on information provided by AMPORTS, the Port of Benicia already uses high mast LED lighting across its Benicia facilities.

[4] This regulation applies only to public fleets and is not applicable to AMPORTS, Valero, UP or any other non-governmental port users; participation by non-governmental port stakeholders would be strictly voluntary.

Climate Change Resiliency

Introduction

This section of the Port of Benicia Facilities and Infrastructure Modernization Plan encompasses a review of the best available sea level rise (SLR) science, SLR mapping projections, and an inventory of vulnerable port assets. These data sets collectively have informed the development of vulnerability profiles for the port's infrastructure, transportation networks, and critical buildings. The results of this analysis will directly inform the CIP developed during Task 4 of the plan.

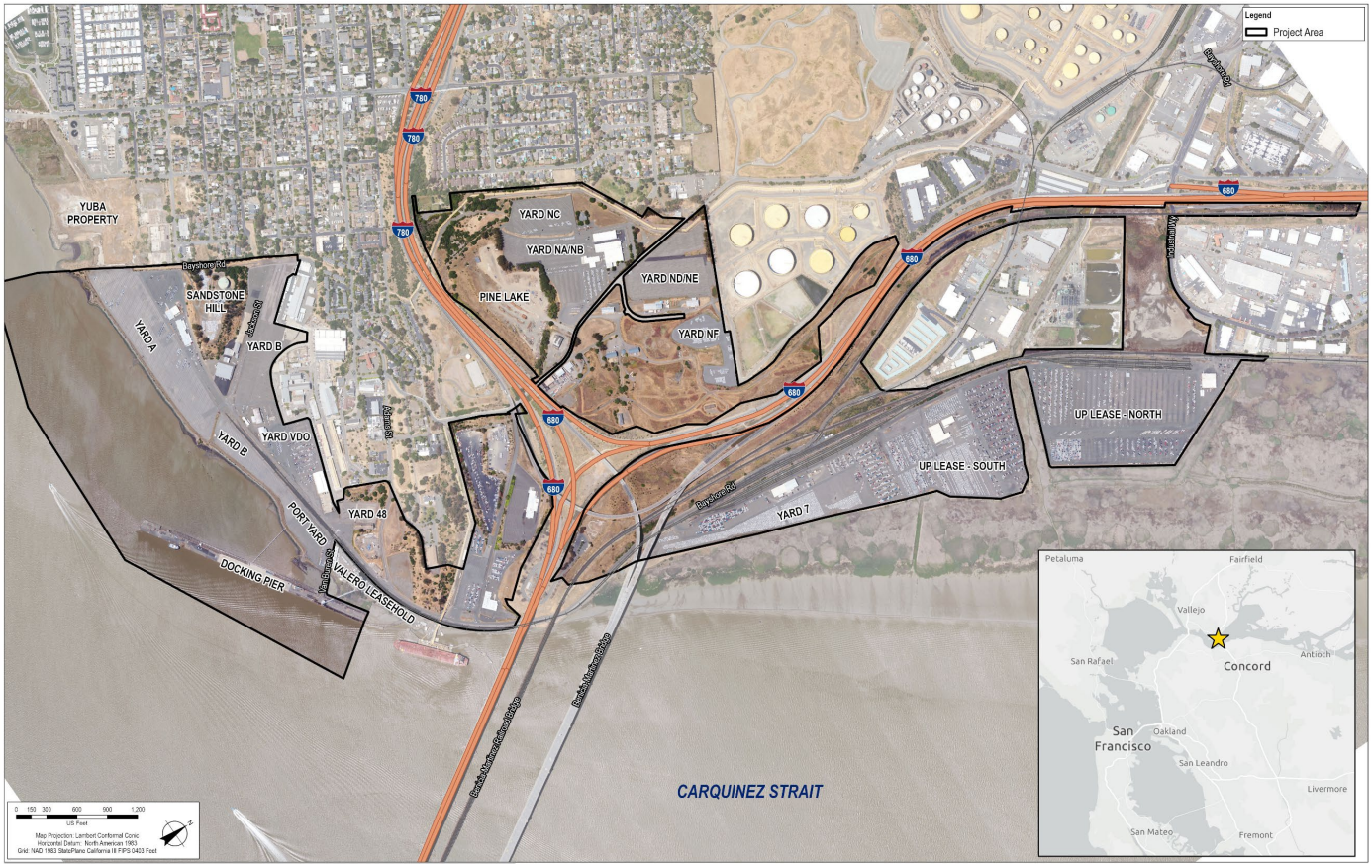


Figure 5: Port of Benicia SLR Study Area (source: GHD)

Approach

This assessment identifies vulnerability of port assets to future water levels due to SLR to inform infrastructure improvements, investments, and modernization to the year 2080 for the City and project team. A review of the most recent state SLR guidance[5] was performed to identify projected estimates of SLR within the port area. Flood pathway and flood extent maps for the port study area were created based on extreme still water level (tide and storm surge) flooding of port property in combination with projected SLR. The asset inventory and flood maps were then used to identify existing and future vulnerable areas of the port. This vulnerability assessment also includes a concise overview of potential flood pathways into the port, along with an estimated timeline for when flooding impacts might be anticipated.

[5] Ocean Protection Council (OPC). 2024. State of California Sea Level Rise Guidance: 2024 Science & Policy Update. https://opc.ca.gov/wp-content/uploads/2024/05/California-Sea-Level-Rise-Guidance-2024-508.pdf

Assumptions and Limitations of Methodology

Flood pathways and extents are based on 100-year still water levels from a comprehensive study of the San Francisco Bay completed by AECOM in 2016.[6] and SLR projections added to this extreme water level. Shoreline and ground elevations were determined using elevation data collected for Solano County in 2023 for the National Oceanic and Atmospheric Administration (NOAA) Office for Coastal Management (OCM).

Flood pathways were identified based on a comparison of shoreline elevations and water levels with SLR. Flood prone, vulnerable areas were delineated based on water levels with SLR and ground elevations. The delineated projected SLR flooding does not account for complex hydraulics of the quantity of overtopping and overland flow throughout the affected area and therefore indicates a maximum extent that can be achieved with significant overtopping, hydrodynamic processes of the nearby channel and other flooding considerations (i.e. soil characteristics/permeability, vegetation, precipitation, fluvial forces, etc.), or intermittent overtopping due to wind waves.

This approach is often considered a “bathtub” model and commonly applied in the absence of a detailed hydrodynamic model. These simplifications do not provide detail regarding flood velocities, depths, and duration, but rather an upper bound of potential flooding extent. While the assumptions made simplify the complex processes associated with SLR flooding, they are considered reasonable and acceptable for the purposes of this Plan. However, this inherently places limitations on the level of detail associated with projected SLR flooding and their usage outside of this plan.

Other available flood models include the United States Geological Survey’s (USGS) Coastal Storm Modeling System (CoSMoS).[7] and the San Francisco Bay Conservation and Development Commission’s (BCDC) Adapting to Rising Tides (ART) program.[8]; these were determined not to be appropriately representative of flood extents for this plan.

A preliminary investigation of the USGS CoSMoS data found that the hydrodynamic model for this area results in the 100-year water level approximately 2 feet below that of the Port Chicago tide station (#9415144).[9] – see Table 2 – and a comprehensive study of the bay by AECOM in 2016 that established site-specific daily and extreme tide datums. This lower water level is likely due to a difference in assumptions and contributing factors to water levels at the site and were not selected for use due to the potential underestimate of water levels due to other, localized factors.

While the BCDC ART program is considered to provide accurate flood projections for the area, the flood scenario water level increments differed from the SLR scenarios assessed in this plan. As a result, a customized flood projection was developed to better match the specific SLR scenarios being investigated and utilized a similar methodology to estimate flood prone area extent.

The base flood elevation used in each flood scenario was the 100-year extreme still water level obtained from the San Francisco Bay Tidal Datums and Extreme Tides Study performed by AECOM in 2016. This study calculated daily and extreme tide datum information for the bay shoreline by leveraging a regional hydrodynamic model of the San Francisco Bay that simulated water surface elevations, providing localized values of extreme water levels.

Validation of these modeled results with the observation-based NOAA tide station datums found them to agree well with each other, indicating they are well calibrated. Therefore, these modeled results were utilized to provide approximate still water levels (SWL) relevant to the Port of Benicia that could be applied uniformly throughout this plan.

[6] AECOM. 2016. San Francisco Bay tidal Datums and Extreme Tides Study. https://www.adaptingtorisingtides.org/wp-content/uploads/2016/05/20160429.SFBay_Tidal-Datums_and_Extreme_Tides_Study.FINAL_.pdf
[7] USGS. 2019. CoSMoS 2.1: San Francisco Bay. https://www.usgs.gov/centers/pcmsc/science/cosmos-21-san-francisco-bay
[8] San Francisco BCDC. 2019. ART Bay Shoreline Flood Explorer. https://explorer.adaptingtorisingtides.org/explorer
[9] NOAA Tides & Currents. 2025. Station 9415144 Port Chicago, CA. Accessed from: https://tidesandcurrents.noaa.gov/stationhome.html?id=9415144

Table 2: Tidal Datums for Port Chicago

Datum	Elevation (ft, NAVD88)
100-year Return Period	9.27
10-year Return Period	8.19
1-year Return Period	7.21
Mean Higher High Water (MHHW)	6.05
Mean High Water (MHW)	5.52
Mean Sea Level (MSL)	3.55
NAVD88	0.00
Mean Low Water (MLW)	1.55
Mean Lower Low Water (MLLW)	0.68

Source: NOAA Station 9415144

SLR Science Review

SLR is an issue of concern when considering how impacts from a changing climate could affect the Port of Benicia. In 2023, the City of Benicia adopted its Community Health and Safety Element update[10] that assessed its vulnerabilities to SLR based on the available state guidance at the time from OPC[11]. In 2021, the Intergovernmental Panel on Climate Change's 6th Assessment Report[12] updated the global probabilistic SLR projections. A multi-agency federal group integrated these findings into the 2022 Federal Sea-Level Rise Technical Report[13] and generated five sea level scenarios spanning the plausible range of SLR from 2020 to 2150 for the U.S. The State of California cabinet level group, the Ocean Protection Council (OPC), has further integrated these scenarios into regionalized projections at 14 different locations along California's coast[14].

These projections were adopted in November 2024 by the California Coastal Commission (CCC), resulting in formal replacement of the 2018 Sea Level Rise Policy Guidance for planning, permitting, and other coastal management decisions. Notable advancements in this updated guidance include greater confidence in near-term projections to mid-century and an increased understanding of how low confidence processes (e.g., ice-shelf disintegration, marine ice-sheet-ice-cliff instability, and faster-than-projected changes in surface-mass balance) are anticipated to affect sea levels near the end of the century. Additionally, SLR projections were developed for two more tide gauges along California, including the Port Chicago tide gauge, located approximately 5.25 miles northeast from the Port of Benicia.

The five updated SLR scenarios (Low, Intermediate-Low, Intermediate, Intermediate-High, and High) are based on the 'plausibility' of occurring. Plausible ranges of SLR means the credible and reasonable range of future SLR supported by published, peer-reviewed publications and the consensus assessment of the IPCC AR6. These scenarios, as described in OPC's 2024 guidance, are as follow:

Low

- The scenario is on the lower bounding edge of plausibility given current warming and sea level trajectories, and current societal and policy momentum.

[10] City of Benicia. 2023. Community Health and Safety Element: Vulnerability Assessment
[11] Ocean Protection Council (OPC). 2018. State of California Sea Level Rise Guidance: 2018 Update. https://opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_ Exhibit-A_OPC_SLR_Guidance-rd3.pdf
[12] Intergovernmental Panel on Climate Change (IPCC). 2021. Climate Change 2021 – The Physical Science Basis: Working Group I Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change
[13] Sweet, W. V., Hamlington, B. D., Kopp, R. E., Weaver, C. P., Barnard, P. L., Bekaert, D., … Zuzark, C. 2022. Global and Regional Sea Level Rise Scenarios for the United States: Updated Mean Projections and Extreme Water Level Probabilities Along the U.S. Coastline. Silver Spring, MD: NOAA. Retrieved from https://earth.gov/sealevel/us/internal_resources/756/noaa-nos-techrpt01-global-regional-SLR-scenarios-US.pdf
[14] OPC. 2024

Intermediate-Low

- A reasonable estimate of the lower bound of most likely SLR in 2100.

Intermediate

- Based on sea level observations and current estimates of future warming, a reasonable estimate of the upper bound of most likely SLR in 2100.

Intermediate-High

- Intermediate-to-high future emissions and high warming; this scenario is heavily reflective of a world where rapid ice sheet loss processes are contributing to SLR.

High

- High future emissions and high warming with large potential contributions from rapid ice-sheet loss processes; given the reliance on sea level contributions for processes in which there is currently low confidence in their understanding, a statement on the likelihood of reaching this scenario is not possible.

Figure 6 shows the SLR scenarios from the 2024 projections for the nearest tide gauge to the Port of Benicia, at Port Chicago, and Table 3 provides these scenarios in a tabular format. As SLR science advances, updates to projections occur. Previous studies, such as the City of Benicia's Community Health and Safety Element Update: Vulnerability Assessment[15] utilized the previous 2018 guidance, which reported higher rates of SLR and fewer tide gauges than the 2024 guidance. While updated guidance has revised SLR projections, previous studies utilizing the 2018 projections consider a higher rate of SLR and are therefore more conservative. While these remain relevant for long-term SLR planning, the guidance expressed in this document is reliant upon the latest 2024 SLR guidance.

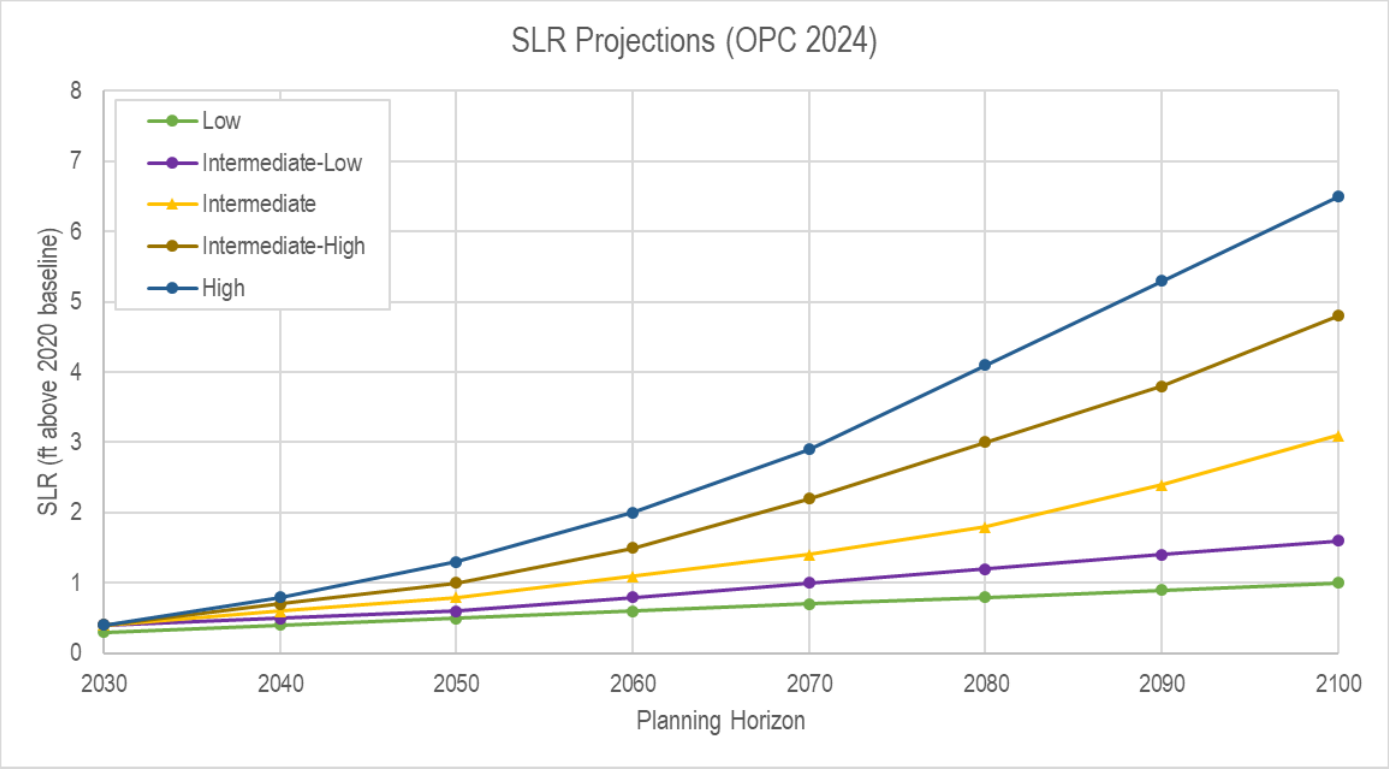


Figure 6: SLR Projections for the Port Chicago Tide Gauge (source: OPC 2024)

[15] City of Benicia. 2023

Table 3: SLR Projections for Port Chicago in ft from 2020 Baseline across Four Time Horizons

Year	Scenario				
	Low (ft)	Int-Low (ft)	Intermediate (ft)	Int-High (ft)	High (ft)
2030	0.3	0.4	0.4	0.4	0.4
2050	0.5	0.6	0.8	1.0	1.3
2080	0.8	1.2	1.8	3.0	4.1
2100	1.0	1.6	3.1	4.8	6.5

Source: OPC 2024

The California SLR projections show increased certainty in projections to 2050 along the entire coast, indicating that seas are most likely to follow the Intermediate scenario and rise 0.8 ft by 2050. The statewide range of mid-term projections (2050-2100) expand due to uncertainties in physical processes, likely rising between 1.6 ft and 3.1 ft by 2100 (Intermediate-Low to Intermediate Scenarios). However, this could reach up to 6.5 ft of SLR under the High Scenario. In order to appropriately consider risk tolerance, risk aversion, and design life that inform SLR planning and project decisions, the OPC (2024) guidance recommends a precautionary approach, when feasible, through an evaluation of the Intermediate, Intermediate-High, and High scenarios.

SLR increases the baseline around which tidal variations, storm surge and waves act. Table 4 shows SLR projections for the year 2080 combined with a range of daily and extreme tides for the specific AECOM-modeled tidal datum[16] relevant to the port. Extreme tides are shown as different return periods, which correspond to the percent annual chance of occurrence. For example, a 100-year return period has a 1 in 100 chance of happening for a given year. The table shows that the daily occurrence of Mean Higher High Water (MHHW), the long-term average of the higher of the two tides each day, may increase by 0.8 – 4.1 ft by 2080 depending on the SLR scenario.

Table 4: Existing and 2080 SLR Projections for Daily and Extreme Tide Levels for Port of Benicia – NAVD88 (ft)

	Tide Level	Existing	Low	Intermediate-Low	Intermediate	Intermediate-High	High
Extreme Tides	100-year	9.27	10.07	10.47	11.07	12.27	13.37
	10-year	8.19	8.99	9.39	9.99	11.19	12.29
	1-year	7.21	8.01	8.41	9.01	10.21	11.31
Daily Tides	MHHW	6.05	6.85	7.25	7.85	9.05	10.15
	MHW	5.52	6.32	6.72	7.32	8.52	9.62
	MSL	3.55	4.35	4.75	5.35	6.55	7.65
	MLW	1.55	2.35	2.75	3.35	4.55	5.65
	MLLW	0.68	1.48	1.88	2.48	3.68	4.78

Source: AECOM 2016

Flood Mapping

Scenario-based coastal flood maps have been developed using the AECOM-modeled tidal datum information to identify areas of greatest vulnerability in the port. The flood exposed areas of the port have been mapped utilizing a range of SLR scenarios in accordance with the California Sea Level Rise Guidance 2024 and the methods described above.

[16] AECOM. 2016

SLR Scenarios

The three SLR scenarios utilized for this plan as defined by OPC SLR 2024 Guidance are the Intermediate, Intermediate-High, and High scenarios. The appropriate application for each of these scenarios is described below.

Intermediate

- Based on sea level observations and current estimates of future warming, a reasonable estimate of the upper bound of most likely SLR through the end of this century. The Intermediate scenario should be included in technical analyses for development with low risk aversion, i.e., development that would have limited consequences or a higher ability to adapt, such as some ancillary development of public access amenities.

Intermediate-High

- Intermediate to high future emissions and high warming; this scenario is heavily reflective of a world where rapid ice sheet loss processes are contributing to SLR. The Intermediate-High scenario should be included in technical analyses for development with medium-high risk aversion, i.e., development that would experience greater consequences and/or have a lower ability to adapt, such as most residential and commercial structures.

High

- High future emissions and high warming with large potential contributions from rapid ice-sheet loss processes; given the reliance on sea level contributions for processes in which there is currently low confidence in their understanding, a statement on the likelihood of reaching this scenario is not possible. The High scenario should be included in technical analyses for development with extreme risk aversion, i.e., development with little to no adaptive capacity that would be irreversibly destroyed or significantly costly to repair, and/or would have considerable public health, public safety, or environmental impacts should that level of SLR occur, such as most critical infrastructure.

The Intermediate and Intermediate-High scenarios provide reasonable to conservative projections of SLR. The “High” scenario is included to align with state guidance, which encourages inclusion of high-end SLR projections to inform long-term planning for important infrastructure investments.

Flood Model

The 100-yr SWL model is based on the 100-year water level of 9.27 ft (NAVD88), obtained by averaging modeled values along the project shoreline from the 2016 San Francisco Bay Tidal Datums and Extreme Tides Study by AECOM[17]. This incorporates factors such as astronomical tide ranges, El Niño Southern Oscillation, and wind set up. This plan highlights the potential flood exposure and vulnerability of Port of Benicia assets to an event with a low recurrence interval, which provides conservative planning horizons for the port.

The existing topography of the port shoreline was utilized to identify flood pathways associated with the 100-yr SWL and SLR scenarios. Much of the port areas are protected by an elevation barrier or levee along the shoreline that generally ranges from 9.1 ft to 13.3 ft (NAVD88) with isolated lower-lying reaches below the elevation of the 100-yr SWL (Figure 7). These lower-lying shoreline reaches are considered subject to overtopping of the 100-yr SWL and result in primary pathways for flooding of the inland port areas, include the Yuba property adjacent to the port, the Valero refinery, and the northern extent of the UP lease north levee. Very short, isolated sections of the Yard A, Port Yard, and Yard 7 levees exhibit elevations below the existing 100-yr SWL. Directly backing these levees, the port lots are relatively low-lying, ranging in elevation from approximately 4.5 ft to 13 ft (NAVD88) before steeply elevating towards the port’s inland border above 15 ft (NAVD88). The only exceptions to this are the elevated sandstone hill behind Yard A and the low-lying segment of Yard B along Jackson Street adjacent to it.

For planning purposes, 2080 represents the desired point in time to evaluate the capital investments that will need to be made, as that is the likely end of the useful life of any capital improvements made as a result of this plan (50-year life assumed). Similar to the BCDC ART program[18], the 100-yr SWLs and SLR scenarios for 2080 have been projected landward to estimate the maximum extent of potential flooding resulting from an extreme event, as shown in Figure 8.

[17] AECOM. 2016
[18] San Francisco BCDC. 2019

Due to the low-lying conditions throughout the port, almost the entire port is projected to be exposed to this flooding under the 2080 Intermediate scenario. Under the Intermediate-High and High scenarios, this maximum potential flood extent incrementally increases in certain locations, but is largely restricted by the steep elevations present along the back boundary of the port. The resulting flood extents are utilized to identify the port's exposed assets and evaluate the expected impacts.

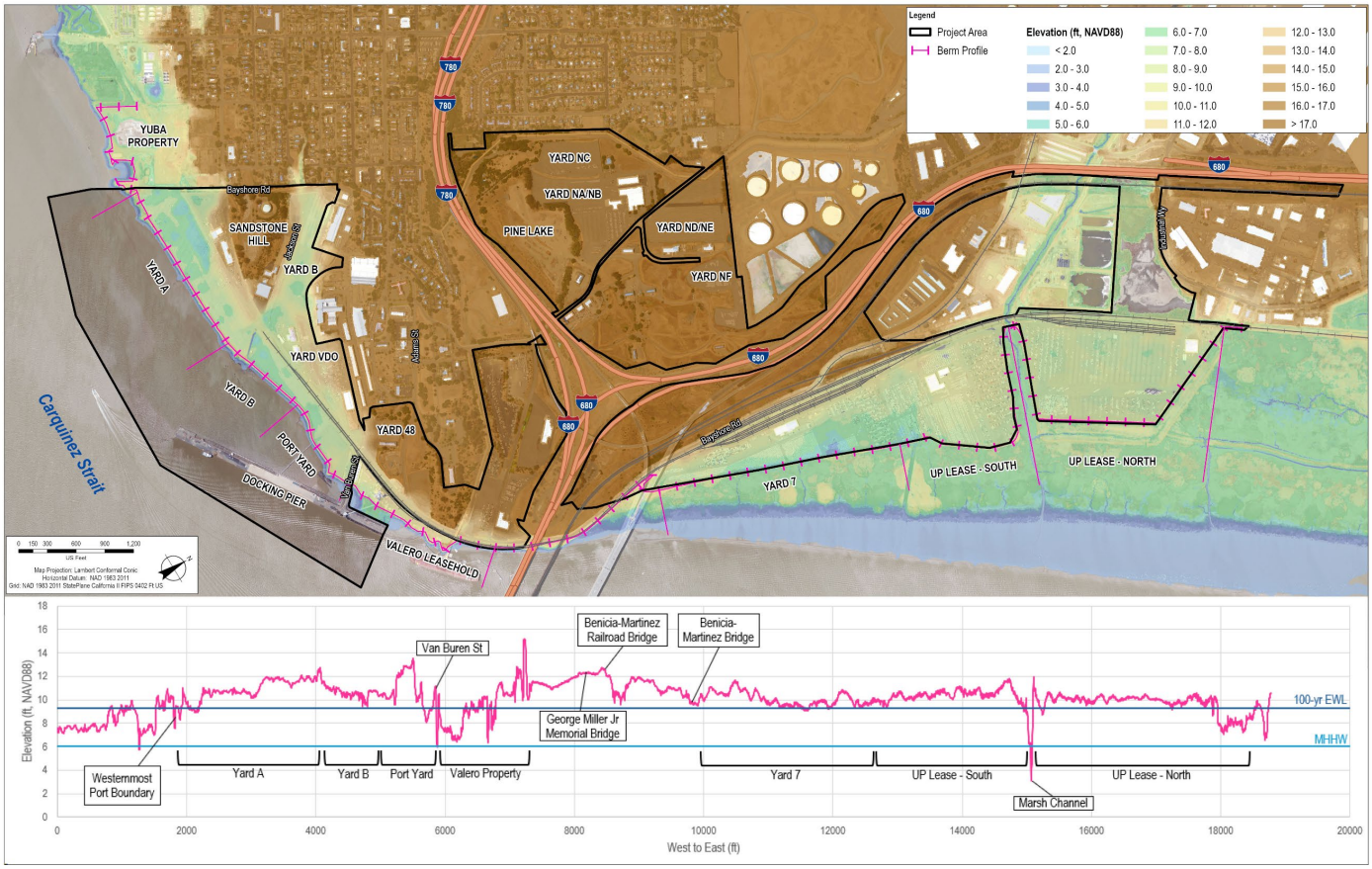


Figure 7. Existing Topography of Port of Benicia Study Area and Levees Crest (source: GHD)

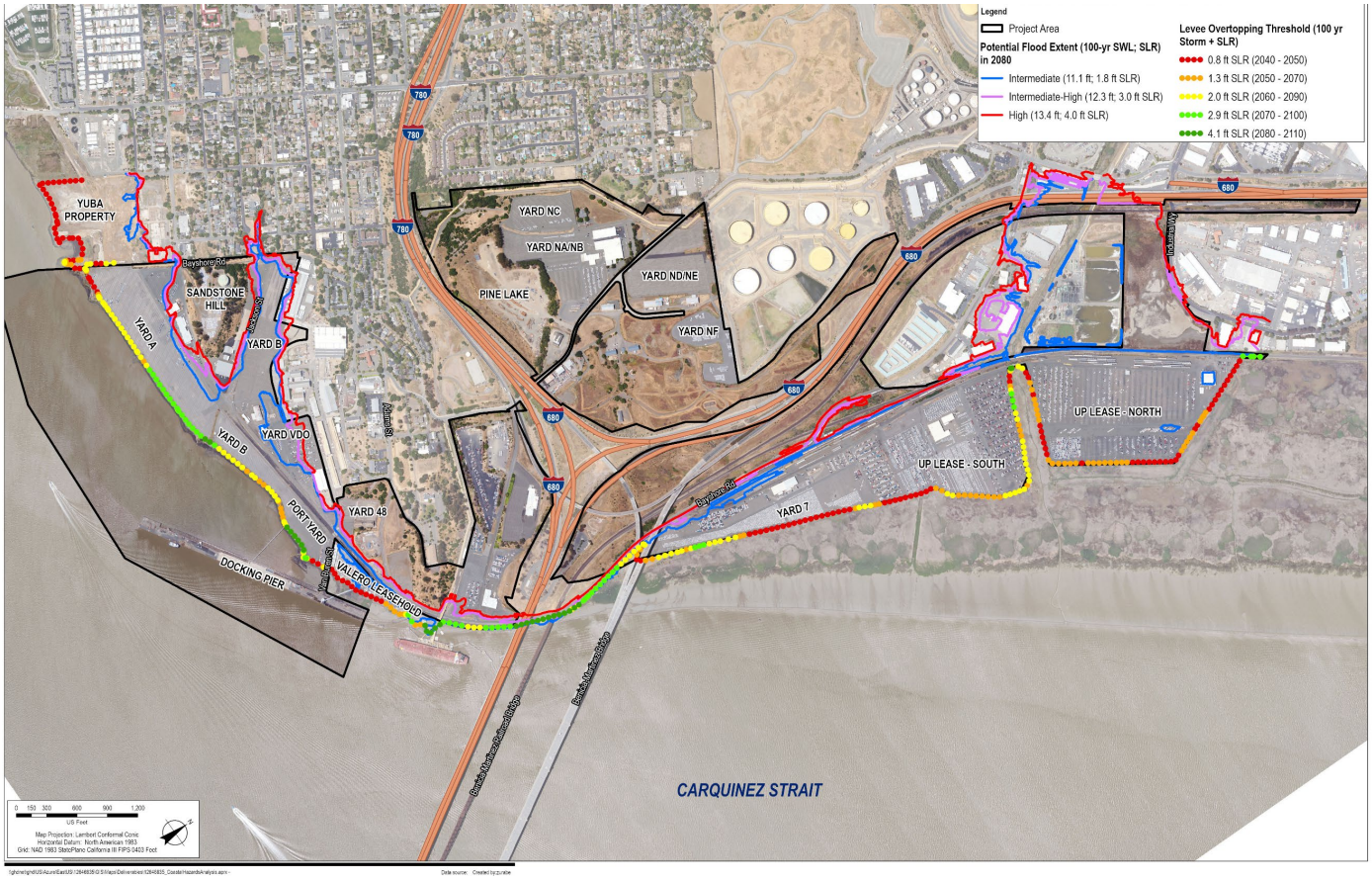


Figure 8: Projected 100-year SWL Flood Extents under the Existing and 2080 Time Horizon for Each SLR Scenario along with Levee Overtopping Thresholds (source: GHD)

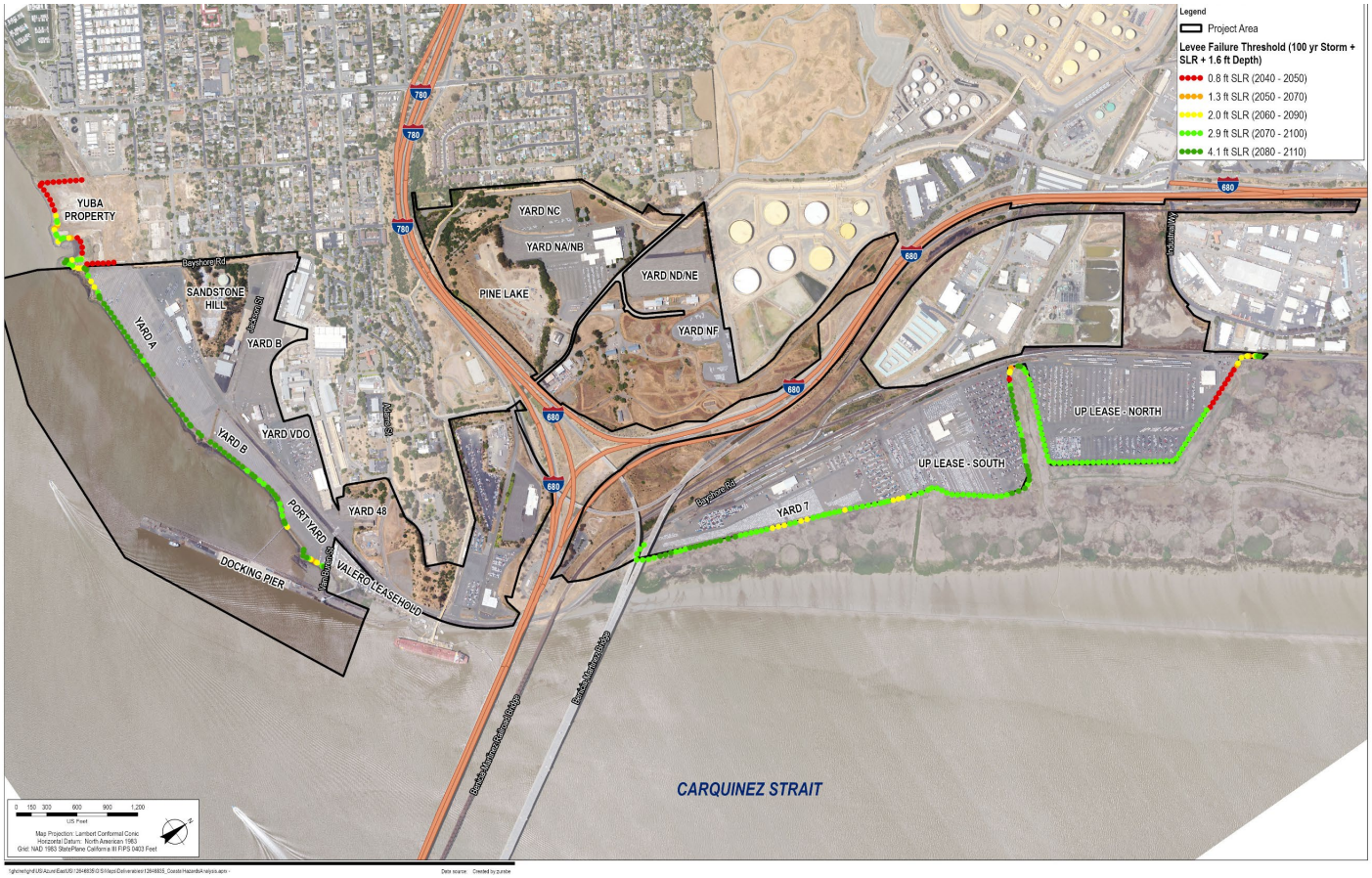


Figure 9: Projected Levee Overtopping Failure Thresholds (source: GHD)

Additionally, five representative water level scenarios were utilized to identify SLR thresholds for tidal overtopping of the existing levee. Each scenario was related to an increment of SLR that could be associated with its projected time horizons. These SLR increments were compounded with the 100-yr SWL and compared to the existing levee's crest elevation to identify at which water level scenario the levee would be overtopped. The results of this analysis indicate the sequence and anticipated time range for which levee sections will no longer provide desired, 100-yr SWL flood protection (Figure 9). The representative SLR scenarios and their associated time horizons based on OPC 2024 guidance are provided in Table 5.

Table 5: OPC (2024) SLR Projections in Relation to Projected Levee Overtopping Threshold Scenarios (0.8 ft SLR in red, 1.3 ft SLR in orange, 2.0 ft SLR in yellow, 2.9 ft SLR in light green, 4.1 ft SLR in dark green)

Year	OPC SLR Scenario (ft SLR)		
	Intermediate	Intermediate-High	High
2040	0.6	0.7	0.8
2050	0.8	1.0	1.3
2060	1.1	1.5	2.0
2070	1.4	2.2	2.9
2080	**1.8**	**3.0**	**4.1**
2090	2.4	3.8	5.3
2100	3.1	4.8	6.5
2110	3.8	5.6	7.8

***BOLD** indicative of flood hazard mapping results shown*

Vulnerability Assessment – Coastal Flooding

The State of California, Office of Planning and Research provides guidance for a phased approach to adaptation planning. Assessing vulnerability is an important step in this process focused on identifying and characterizing climate related hazards and effects. This section evaluates the vulnerability of Port of Benicia assets based on estimated hazards associated with coastal flooding. The asset types evaluated include various facilities and transportation infrastructure. These assets were assessed under the 2080 time horizon and each of the OPC-recommended SLR scenarios. This time horizon represents the desired planning period for the City to evaluate capital investments, as that is the likely end of the useful life of any capital improvements made as a result of this plan.

This vulnerability assessment focuses on identifying existing port assets that may be vulnerable to flooding due to tidal overtopping of the shoreline, within the 2080 planning horizon, and therefore require some form of adaptation to remain serviceable. The vulnerability of an asset is a function of exposure (i.e. asset located within projected coastal flood hazard zone) and sensitivity (i.e. the degree to which exposure of an asset may impair port operations). Port facilities were designated a level of importance to support their evaluation based on consultation with AMPORTS staff (Table 5). Exposure of port assets is shown in Figure 10 and Figure 11. Table 6 summarizes the exposure of each asset to each SLR scenario. Higher SLR scenarios (i.e. Intermediate-High; High) would result in earlier exposure of assets and increased flood depth and additional asset exposure in 2080.

Figure 8, shown in the previous section, illustrates the potential flood extents under 100-year water level conditions with SLR for the 2080 planning horizon alongside the levee overtopping thresholds around the port boundaries. The flood projections shown align with the OPC 2024 SLR projections for this area under the 2080 planning horizon and are intended to provide a conservative estimate for the potential extent of flooding. The levee overtopping thresholds are indicative of when levee crest elevations are expected to experience overtopping of the 100-year SWL. The low probability occurrence of a 100-year water level is a common design parameter for flood protection. The existing levees along the port's shoreline are not FEMA-accredited, therefore the ability of these structures to withstand overtopping or persistent high water levels is not known. Screening-level guidance provided in the U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, Federal Energy Regulatory Commission, Tennessee Valley Authority in their Overtopping Failure: Best Practices in Dam and Levee Safety Risk Analysis Part D – Embankments and Foundations Chapter D-3 presentation[19] suggests that overtopping of greater than 1 foot for more than 2 hours has the potential to result in increased levee erosion risk, extended flooding of inland areas, and/or failure of the structure. Based on typical tidal cycles, this structural integrity threshold roughly equates to the occurrence of an overtopping event exceeding a depth of 1.6 ft.

Limited, shallow overtopping (less than 1 ft) would be limited to a couple hours at the peak of the tidal cycle and typically result in flooding of the inland areas for multiple hours. The assessment of levees and the inlands area vulnerability is described in six distinct areas (Figure 10). These include:

- Segment A – Yuba Property to Van Buren Street
- Segment B – Pier Structure
- Segment C – Valero Leasehold
- Segment D – Railroad Prism
- Segment E – Benicia-Martinez Bridge to Marsh Channel
- Segment F – Marsh Channel to UP Lease North

[19] USACE, USBR, FERC, TVA. 2017. Overtopping Failure: Best Practices in Dam and Levee Safety Risk Analysis Part D – Embankments and Foundations Chapter D-3

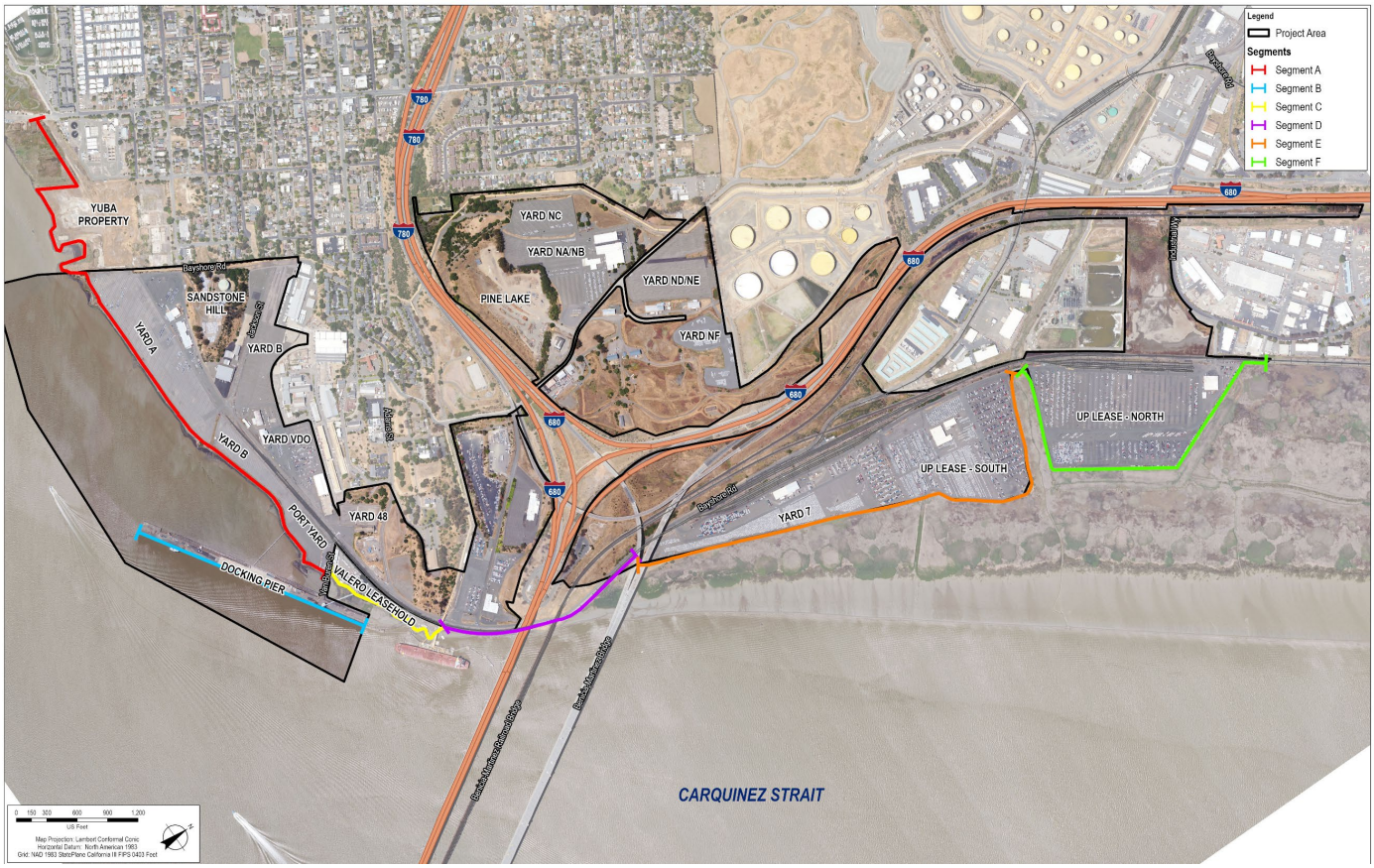


Figure 10: Port of Benicia Study Area Vulnerability Segments (source: GHD)

Table 6: Facilities at Risk Based on Input from AMPORTS

Facility ID	Facility Name	Facility Type / Notes	Importance (High, Medium, Low)
1	2650 Harbor Way	Operations Buildings with Warehouse/office	High
2	3800 Industrial Way	UP Office Building (Not owned by AMPORTS)	High
3	2850 Harbor Way	Processing Facility- UP Owned	High
4	Dock House	Pier dock house, plans to replace	Low
5	Rail line	not building, rail line	N/A
6	Petcoke Silos	Petcoke Silos, important if petcoke continues	Medium
7	Pier Structure	semi-temporary, easily replaced	Low
8	Pumpstation 2	Functional stormwater pumphouse	Medium
9	Car Wash Tunnel	Car Wash Tunnel	Low
10	2850 Harbor Way	Processing Facility- UP Owned	High
11	Pier Structure	semi-temporary, easily replaced	Low
12	Pier Structure	semi-temporary, easily replaced	Low
13	Pier Structure	semi-temporary, easily replaced	Low
14	Building 167	Old Military warehouse buildings, slated for demo	Low
15	Pumpstation 2	Functional stormwater pumphouse	Medium
16	Car Wash Pad	Old Carwash Pad, set for demo	Low
17	2850 Harbor Way	Processing Facility- UP Owned	High

Facility ID	Facility Name	Facility Type / Notes	Importance (High, Medium, Low)
18	2650 Harbor Way	Operations Buildings with Warehouse/office	High
19	Pier Structure	double wide trailer, semi-temporary, easily replaced	Low
20	Valero Asset	Pipeline related structure, liquid bulk	Medium
21	Building 169	Warehouse not currently in use, future demo	Low
22	Valero Asset	Pipeline related structure, liquid bulk	Medium
23	Valero Asset	Pipeline related structure, liquid bulk	Medium
24	Building 168	Old Military warehouse buildings, slated for demo	Low
25	Yuba Property	Building façade, structure already demolished	Low
26	Awning	Awning	Low
27	Guardhouse	Temp Structure, guardhouse	Low
28	Petcoke Conveyor	Bottom of petcoke conveyor	Medium
29	Toyota Processing Building	Large warehouse, car processing	High
30	Maintenance Building	Large warehouse, Masonry with beam ceilings	High
31	Adjacent building to processing facility	small building adjacent to larger processing facility	Low
32	Processing Building	car processing facility	High

Source: AMPORTS; GHD

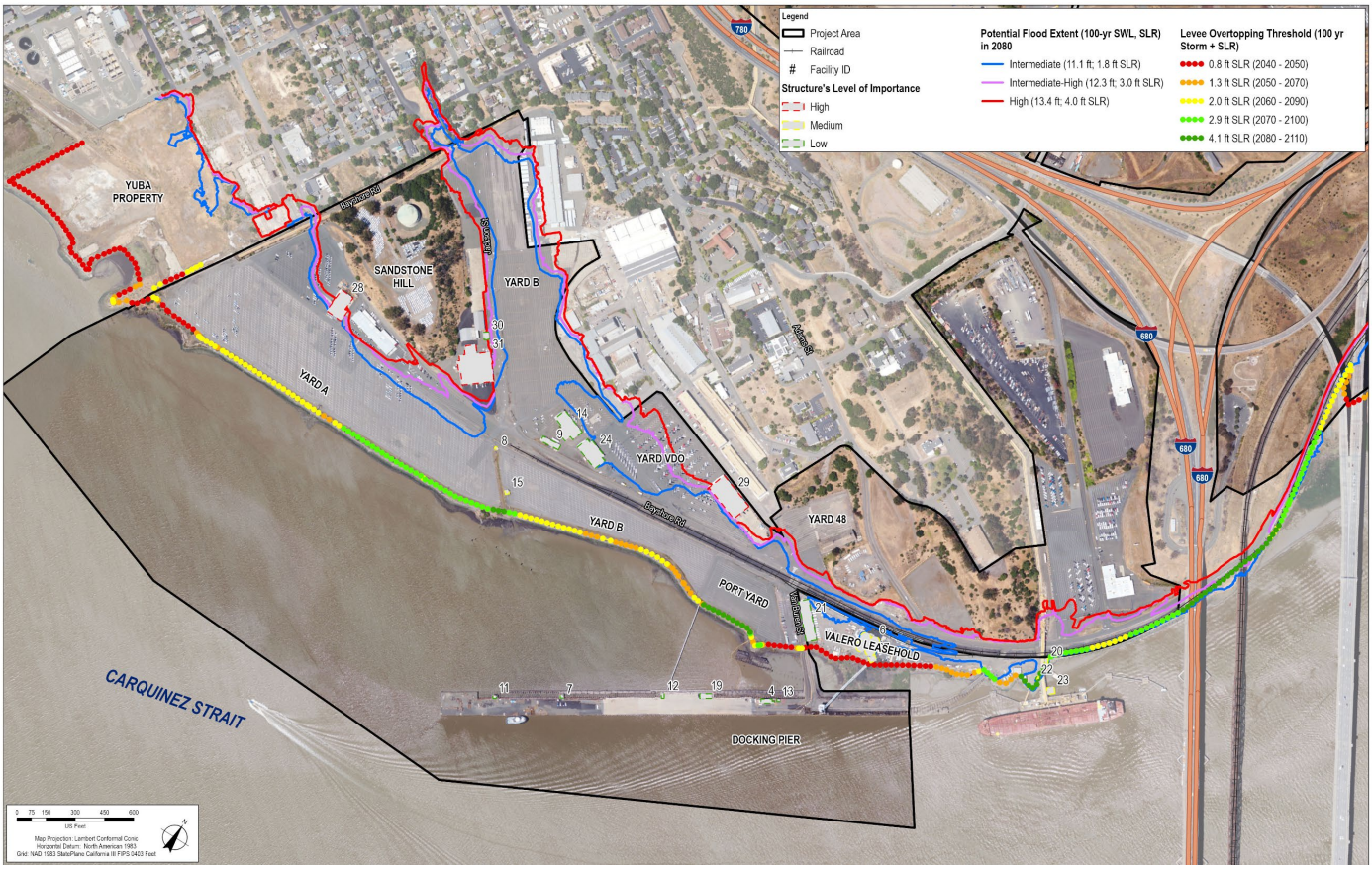


Figure 11: Projected 100-year SWL Flood Extents under the Existing and 2080 Time Horizon for Each SLR Scenario along with Levee Overtopping Thresholds for Segments A, B, C, and D

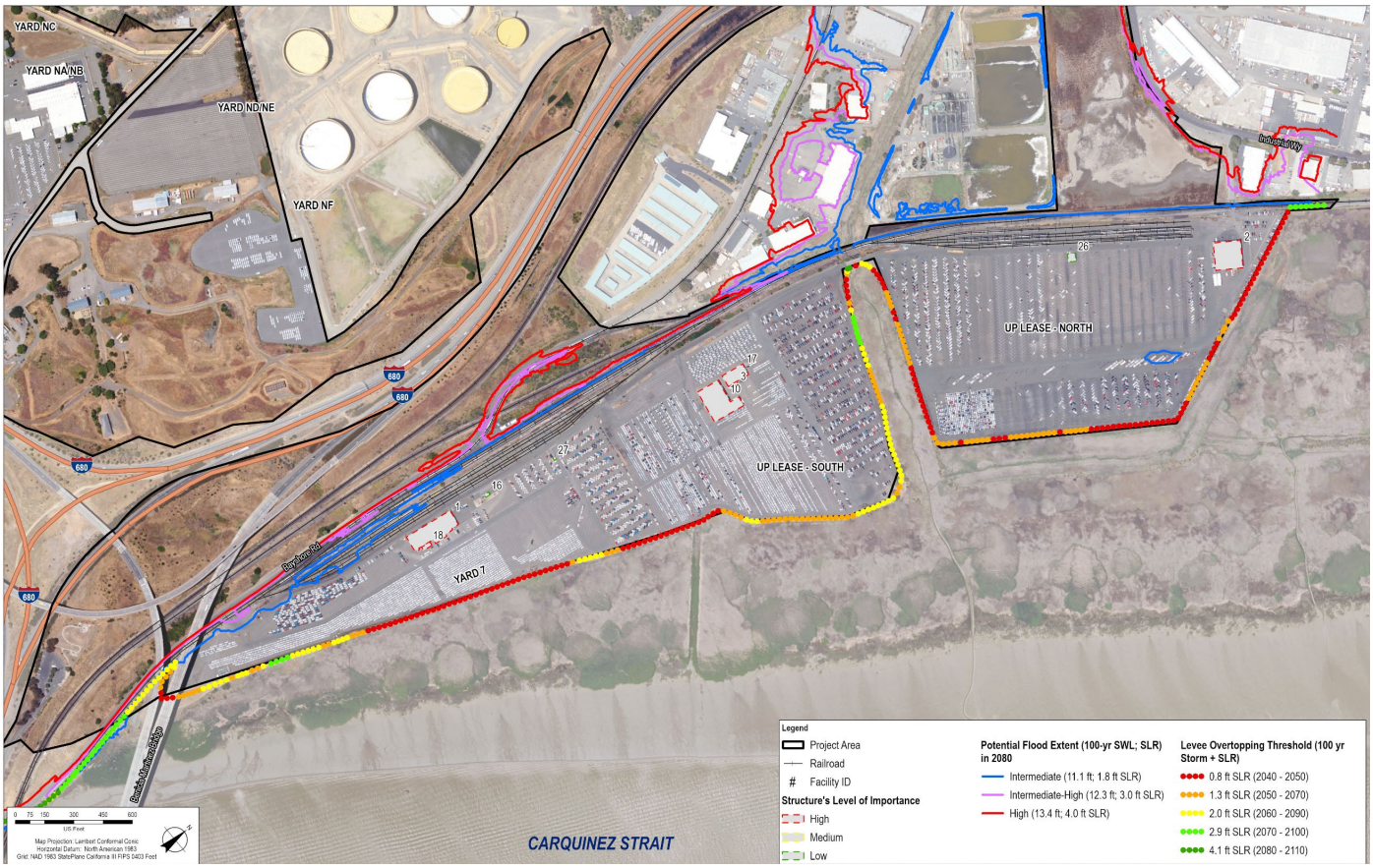


Figure 12. Projected 100-year SWL Flood Extents under the Existing and 2080 Time Horizons for Each SLR Scenario along with Levee Overtopping Thresholds for Segments E and F

Table 7: Asset Exposure under the 2080 SLR Scenarios by Segment

Segment	Intermediate (1.8 ft SLR)	Intermediate-High (3.0 ft SLR)	High (4.1 ft SLR)
Segment A (Yuba Property – Van Buren St)	Yard A Lot Yard B Lot Yard VDO Port Yard Railroad **High Facility Importance** Toyota Processing Building (29) **Medium Facility Importance** Pumpstation 2 (8, 15) **Low Facility Importance** Car Wash Tunnel (9) Building 167 (14) Building 168 (24) Yuba Property (25)	*Intermediate Scenario and the following:* **High Facility Importance** Maintenance Building (30) Processing Building (32)	*Intermediate and Intermediate-High Scenario and the following:* **Low Facility Importance** Adjacent building to processing facility (31)
Segment B (Pier Structure)		Docking Pier soffit	*Same as Intermediate and Intermediate-High Scenario*

Segment	Intermediate (1.8 ft SLR)	Intermediate-High (3.0 ft SLR)	High (4.1 ft SLR)
Segment C (Valero Leasehold)	Valero Leasehold Railroad **Medium Facility Importance** Petcoke Silos (6) Valero Asset (20, 22, 23) Petcoke Conveyor (28) **Low Facility Importance** Building 169 (21)	*Intermediate Scenario and the following:* Yard 48	*Same as Intermediate and Intermediate-High Scenario*
Segment D (Railroad Prism)		Railroad	*Same as Intermediate and Intermediate-High Scenario*
Segment E (Benicia-Martinez Bridge – Marsh Channel)	Yard 7 UP Lease – South Railroad **High Facility Importance** 2650 Harbor Way (1, 18) 2850 Harbor Way (3, 10, 17) **Low Facility Importance** Car Wash Pad (16) Guardhouse (27)	*Intermediate Scenario and the following:* Bayshore Rd	*Same as Intermediate and Intermediate-High Scenario*
Segment F (Marsh Channel – UP Lease North)	UP Lease – North Railroad **High Facility Importance** 3800 Industrial Way (2) **Low Facility Importance** Awning (26)	*Same as Intermediate Scenario*	*Same as Intermediate and Intermediate-High Scenario*

Source: GHD

Segment A (Yuba Property to Van Buren Street)

Segment A consists of the most southerly portion of the port study area from the Yuba property to Van Buren Street. While the existing levee provides protection for most of Segment A, the west end of Yard A and the westerly adjacent Yuba property contain a low-lying undeveloped shoreline that provides a low threshold flood pathway into Yard A. Also, since the parking lot along Van Buren Street lacks any raised shoreline protection (i.e. levee), a low threshold flood pathway is present at the east end of Segment A (see Figure 11).

Based on the 100-yr SWL with 0.8 ft of SLR, both of these low shoreline pathways could result in flooding during a 100-yr SWL event around 2040 to 2050 as about 40% of the existing levee's length is projected to be overtopped (Table 8).

Near 2050 to 2070, the length of overtopping is anticipated to increase to 54% of the levee, most prominently near Yard B (Table 8).

By 2060 to 2090, a significant portion, about 79%, of the levee along all of the yards is projected to experience overtopping, thereby increasing the potential flood extent within the port (Table 8). Additionally, under this time horizon, it is estimated that approximately 2,370 linear feet (LF) of the levee would be in exceedance of the screening-level threshold for failure (i.e. overtopping of greater than 1 foot for more than 2 hours across a levee).

See Table 8.

Table 8: Proportion of Segment A Levee Overtopping under SLR Scenarios

Levee Overtopping Threshold	Linear Feet of Levee Overtopped	% of Levee Overtopped (Total Length = 4,570 LF)	Estimated Linear Feet of Levee Exceeding Screening Criteria for Overtopping Failure (>1 ft for >2 hrs)
0.8 ft SLR (2040 – 2050)	2,453	40%	1,456
1.3 ft SLR (2050 – 2070)	3,313	54%	1,571
2.0 ft SLR (2060 – 2090)	4,854	79%	2,370
2.9 ft SLR (2070 – 2100)	5,779	95%	3,417
4.1 ft SLR (2080 – 2110)	6,115	100%	5,240

Source: GHD

Under the 2080 Intermediate Scenario with 1.8 ft of SLR and a 100-year water level, potential flooding is projected to reach towards the back of Yard A, Yard B, and Port Yard, while beginning to encroach on Yard VDO (see Figure 11). Several facilities exposed to this projected flooding are deemed by AMPORTS to have a low level of importance to operations, including the car wash tunnel, buildings 167 and 168, and the Yuba property. Buildings 167 and 168 are old military warehouse buildings that are slated for demolition and are therefore not considered vulnerable to the projected SLR. The two stormwater pumphouses are located between Yard A and Yard B directly behind the existing levee, and are considered to have a medium level of importance. Due to their proximity to the shoreline, it is likely that these facilities could be exposed to flooding if the levee is overtopped or breached. The only highly important facility projected to be exposed to flooding under the 2080 Intermediate Scenario is the Toyota processing building behind Yard A. However this is largely limited to the south edge of the building and is unlikely to result in significant damage with shallow flooding.

By 2070 to 2100, approximately 95% of the levee is projected to be overtopped under a 100-year SWL and about 3,417 linear feet of the levee would exceed the screening-level threshold for failure (Table 8). This would indicate that while short, isolated segments of the levee near Yard A and Port Yard remain above the overtopping threshold, they are unlikely to provide notable flood protection. Under the 2080 Intermediate-High scenario with 3.0 ft of SLR and a 100-year water level, potential flooding could extend further into the port, reaching into most of Yard VDO (Figure 11). This projected flooding could be expected to reach the edges of other highly important facilities, including the maintenance building adjacent to Yard VDO and the processing building along Yard B. Also, the Toyota processing building behind Yard A would be expected to become vulnerable to damage from water entering along its entrances as the potential flooding extends further into the port.

Under the 2080 High scenario with 4.1 ft of SLR and a 100-yr SWL, it is anticipated that the entire levee could experience overtopping (see Table 7). However, the potential flood extent is limited due to the steeper topographic conditions along the back of the port. Therefore, the only additional facility exposed to flooding under this scenario is the adjacent building to the processing building along Yard B (Figure 11). This facility is considered to have a low level of importance for the port. Additionally, the Toyota processing building and maintenance building adjacent to Yard VDO are projected to be further encompassed by flooding, leaving them more vulnerable to water damage entering their entrances and higher water levels within the facilities. It is also estimated that about 5,240 linear feet of the levee would be in exceedance of the failure threshold, indicating an increased potential for erosion risk.

Segment B (Pier Structure)

Segment B is focused on the existing pier structure connected to the port through Van Buren Street. This pier consists of two main reaches, the west end timber pier and the east end concrete pier. The pier deck elevation ranges from 16.1 ft to 15.1 ft (NAVD88), respectively, between the two sides. Water level calculations (i.e., 100-yr SWL + SLR) were utilized to show how the water level scenarios compare to the existing docking pier's elevations along each reach (Table 8).

Along the west reach timber pier, the pier's deck elevation is about 16.1 ft (NAVD88), and with an approximate 3.67 ft pier deck thickness, the soffit is 12.43 ft (NAVD88). While this pier deck is only expected to begin to experience partial submergence under a 100-yr SWL in combination with a High SLR Scenario of 4.1 ft, there are additional hazards beyond hydrodynamic forces and buoyancy effects considered due to it consisting of a timber substructure (Figure 13).

Rather than being cast in place like a concrete deck, the timber decking is fastened to the timber piles with bolts and screws. These connection points are considered vulnerable to SLR due to the threat of corrosion over time as they become exposed to tidal submergence more frequently. Also, once the elevated water reaches the soffit of the deck, additional stress on these connection points is experienced, potentially resulting in failure or inability to conduct regular maintenance.

The timber pier is unlikely to be significantly affected by the elevated water levels by 2080, as the soffit elevation is 3.16 feet above the existing 100-year water and 6.38 feet above existing MHHW. The event of partial submergence of the deck or its connection points would be limited to low probability occurrences during a few hours at the peak of the tidal cycle. Necessary clearance for inspections (+3 feet below the soffit during low tide) is not affected under any scenarios in 2080, although the duration for which maintenance activities may be completed with sufficient clearance will be reduced. Therefore, the pier and assets on top of it are considered unlikely to be affected under the investigated SLR scenarios.

Along the east reach concrete pier, the deck slightly increases elevation from its edge to the crest from 15.1 ft to 15.4 ft (NAVD88), respectively, while the soffit is at approximately 11.27 ft (NAVD88). Based on the top and soffit of the deck elevations, the concrete pier deck would begin to experience partial submergence under a 100-yr SWL in combination with an Intermediate-High SLR scenario of 3.0 ft (Figure 14). Any hanging utilities underneath the pier deck would also be exposed to these elevated water levels. While this exposure would subject the pier to increased hydrodynamic forces and buoyancy effects, these low probability occurrences would be limited to a few hours at the peak of the tidal cycle. Necessary clearance for inspections (+3 feet below the soffit during low tide) is not affected under any scenarios in 2080, but the duration of acceptable clearance will be reduced. Therefore, the pier structure would have a very low vulnerability to SLR over the planning horizon of this Modernization plan. Additionally, any assets on top of the pier are unlikely to be affected under the investigated SLR scenarios.

Table 9: 100-yr Water Level Scenarios Compared to the Existing Pier Structure

SLR Scenario	SLR Projection (ft)	100-yr Water Level Scenario*	West Reach Timber Pier Freeboard (ft) (Deck Elevation Minus Water Level Scenario)		East Reach Concrete Pier Freeboard (ft) (Deck Elevation Minus Water Level Scenario)	
			Top of Deck (16.1 ft)	Soffit of Deck (12.43 ft)	Top of Deck (15.1 ft)	Soffit of Deck (11.27 ft)
Existing	0	9.27	6.83	3.16	5.83	2.0
Intermediate	1.8	11.07	5.03	1.36	4.03	0.2
Intermediate-High	3.0	12.27	3.83	0.16	2.83	-1.0
High	4.1	13.37	2.73	-0.94	1.73	-2.1

**Elevations provided relative to ft, NAVD88 (source: GHD)*

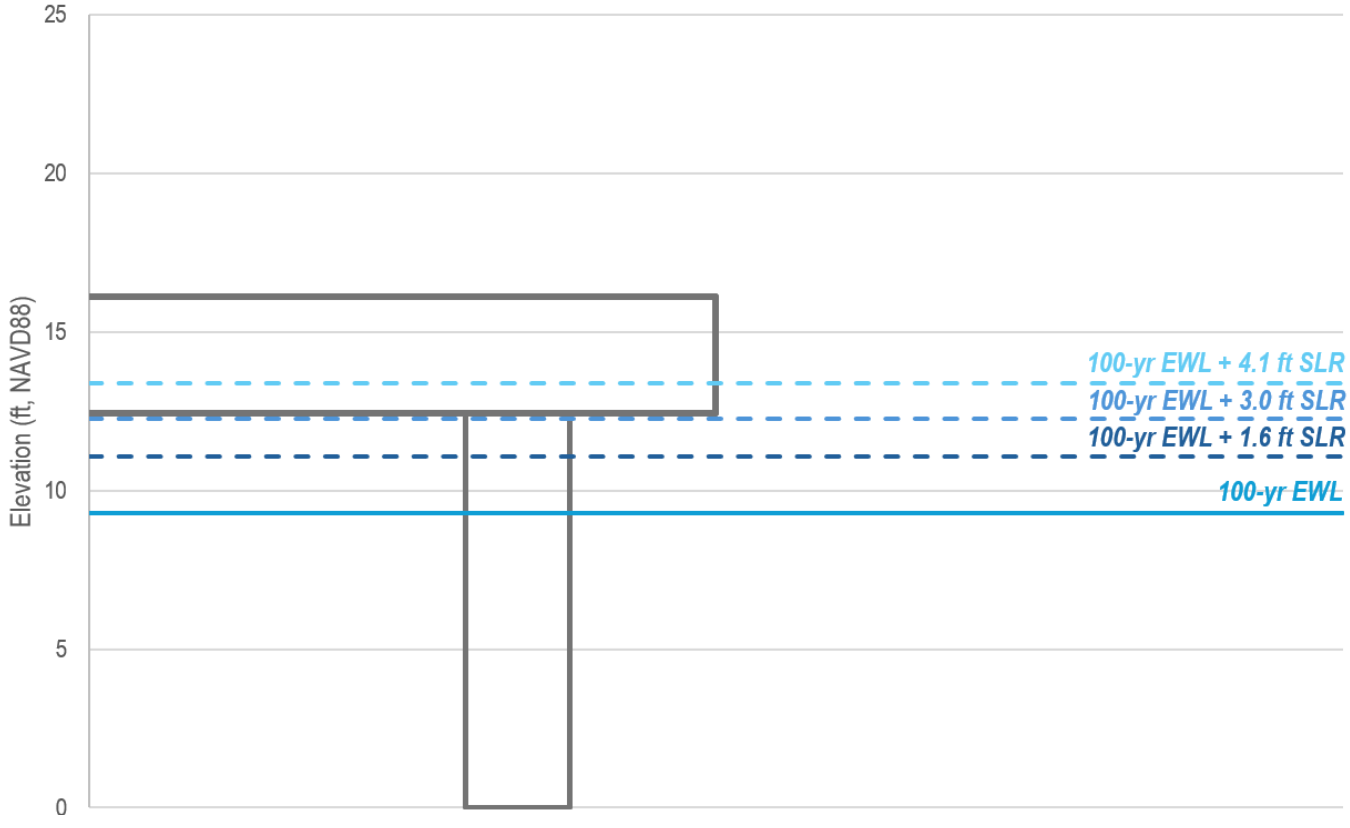


Figure 13: West Reach of Timber Pier Flood Hazards Cross Section for 100-yr Water Level Scenarios (Source: GHD)

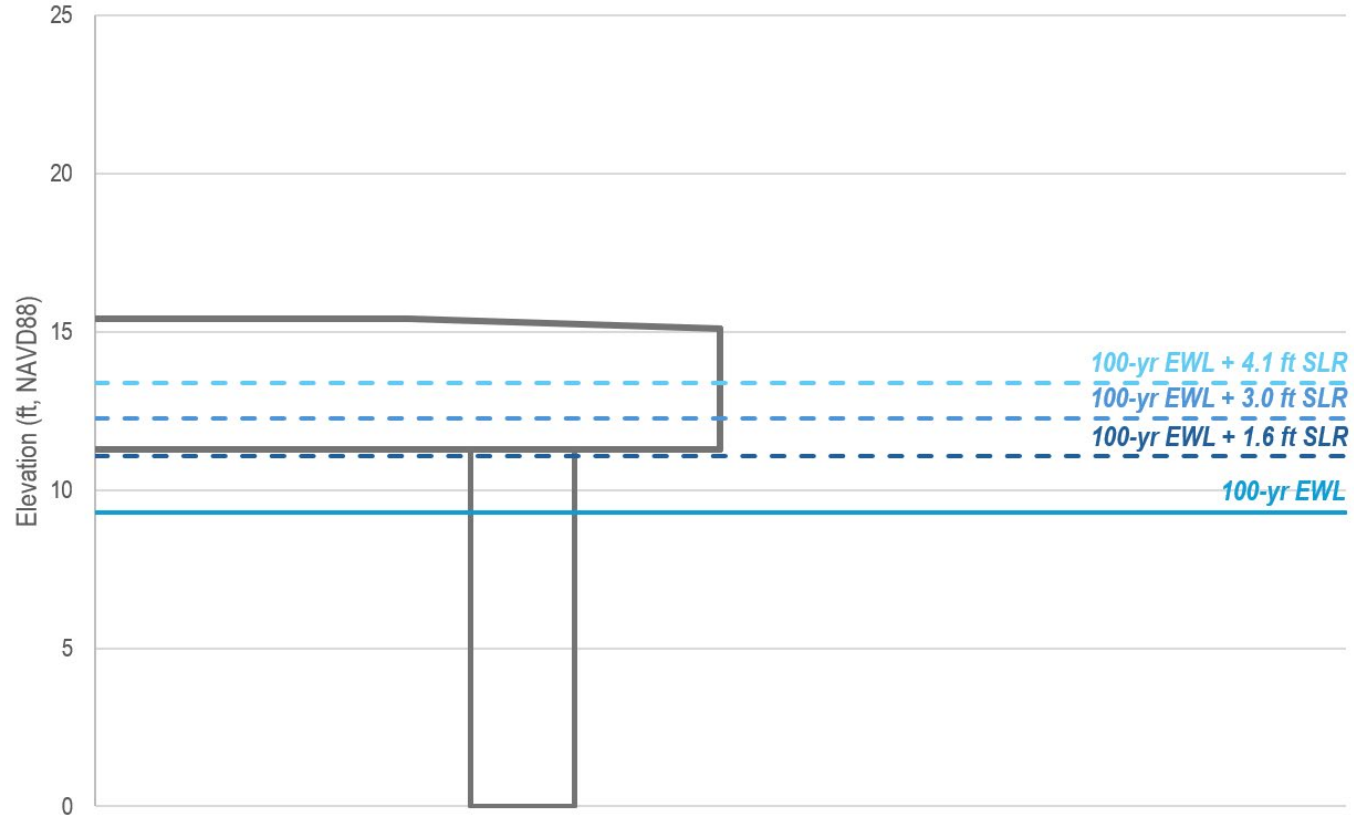


Figure 14: East Reach of Concrete Pier Flood Hazards Cross Section for 100-yr Water Level Scenarios (source: GHD)

Segment C (Valero Leasehold)

Segment C incorporates the coke facility at the east end of the main pier structure of the port and extends all the way to Valero's private deep-water liquid bulk berth/operations. While Valero's liquid bulk operations are outside the scope of analysis for this plan, it is important to evaluate the entire waterfront in this area in order to understand the port's overall resiliency to flooding. Currently, Segment C is fronted by two piers and a road bridge, while its shoreline is composed of low-lying marsh and assorted rip rap. The crest of these features is relatively level with the areas backing them so they are not expected to provide significant flood protection from elevated water levels. Based on the 100-yr SWL with 0.8 ft SLR, approximately half (50%) of Segment C's shoreline is projected to be overtopped by 2040 to 2050, primarily along its west end (Table 9). From 2050 to 2090, a significant proportion, about 74% to 76%, of the levee is expected to experience overtopping (Table 10).

Table 10: Proportion of Segment C Shoreline Overtopping under SLR Scenarios

Shoreline Overtopping Threshold	Linear Feet of Shoreline Overtopped	% of Shoreline Overtopped (Total Length = 1,470 LF)
0.8 ft SLR (2040 – 2050)	741	50%
1.3 ft SLR (2050 – 2070)	1,091	74%
2.0 ft SLR (2060 – 2090)	1,117	76%
2.9 ft SLR (2070 – 2100)	1,229	84%
4.1 ft SLR (2080 – 2110)	1,470	100%

Source: GHD

Under the 2080 Intermediate scenario with 1.8 ft of SLR and a 100-year water level, this potential flood extent would reach back throughout almost the entire area identified in Figure 11 as Valero Leasehold to the elevated rail spur. This flooding is projected to almost entirely encompass building 169. However, this warehouse is not currently in use by the port operator and is set for demolition in the near future, meaning it is not considered vulnerable to the projected SLR. In addition, all of the coke handling facilities in this area are exposed to this flooding and are considered to have a medium-to-high level of importance due to their current operations. Exposure of these structures to flooding could increase corrosion rates and the potential for damage to supporting equipment.

By 2070 to 2100, approximately 84% of the shoreline is expected to be overtopped under a 100-year water level (Table 10). Due to the topographic conditions of Segment C, it is expected that the remaining segment of shoreline above this threshold will not be capable of providing flood protection. Under the 2080 Intermediate-High scenario with 3.0 ft of SLR and a 100-yr SWL, potential flooding is projected to overtop the elevated railroad and Bayshore Road reaching back towards Yard 48 (Figure 11).

Under the 2080 High scenario with 4.1 ft of SLR and a 100-yr SWL, the entire shoreline is expected to be overtopped. However, due to the topographic conditions along Segment C, this is unlikely to significantly increase the potential flood extent (Table 10; Figure 11). This could support potential flooding in adjacent segments, though, thereby increasing the impact of these flood events.

Segment D (Railroad Prism)

Segment D is focused on the vital railroad prism that connects the southern and northern portions of the Port of Benicia study area. Due to its importance for port operations and overall port resiliency, the crest of this feature is elevated to approximately 11 ft to 13 ft (NAVD88) and the shoreline fronting it consists of assorted rip rap. From 2040 to 2060, Segment D is not anticipated to experience any overtopping of its shoreline. By 2060 to 2090, about 30% of the shoreline is expected to be overtopped, primarily towards the far south and north ends of Segment D (see Table 11). While this overtopping may occur under the 2080 Intermediate scenario with 1.8 ft of SLR and a 100-yr SWL, the potential flood extent is limited to the front of the railroad, resulting in no impacts to this asset (Figure 11). By 2070 to 2100, approximately 73% of the shoreline is projected to be overtopped under a 100-yr SWL along the southern and northern ends of Segment D, while the center of the segment remains resilient to SLR (Table 11).

Table 11: Proportion of Segment D Levee Overtopping under SLR Scenarios

Shoreline Overtopping Threshold	Linear Feet of Shoreline Overtopped	% of Shoreline Overtopped (Total Length = 2,426 LF)
0.8 ft SLR (2040 – 2050)	0	0%
1.3 ft SLR (2050 – 2070)	0	0%
2.0 ft SLR (2060 – 2090)	718	30%
2.9 ft SLR (2070 – 2100)	1,765	73%
4.1 ft SLR (2080 – 2110)	2,426	100%

Source: GHD

Under the 2080 Intermediate-High scenario with 3.0 ft of SLR and a 100-yr SWL, potential flooding would extend past the railroad and Bayshore Road towards the petroleum pipeline connected to the Valero deep-water liquid bulk berth/operations on the southern side of Segment D (Figure 11). However, north of George Miller Jr Memorial Bridge, the potential flood extent is limited to the back of the railroad. Since these areas are expected to be exposed to very infrequent flooding occurrences that would be limited to a few hours at the peak of the tidal cycle, it is unlikely to significantly affect the rail line or Bayshore Road's capacity outside of these tidal conditions.

Under the 2080 High scenario with 4.1 ft of SLR and a 100-yr SWL, the entire railroad prism could experience overtopping, resulting in unimpeded flooding of Segment D (Table 11). This potential flooding is expected to extend along this entire reach of Bayshore Road, but the steep topographic conditions of this area limit significant expansion (see Figure 11). Additionally, the lack of any other port assets along Segment D avoids severe flooding impacts.

Segment E (Benicia-Martinez Bridge to Marsh Channel)

Segment E consists of the port study area from the Benicia-Martinez Bridge to the marsh channel bridge connecting the UP Lease parcels. The existing levee runs along this entire segment and is fronted by low-lying marsh that ranges in width from 300 ft to 830 ft. While this marsh likely mitigates wave-driven erosion of the shoreline under existing conditions, the projected elevated water levels would exceed this low-lying area and directly interact with the levee. It should be noted that this is not considered a FEMA-accredited levee, therefore it is not assumed to reduce risk to the port.

Based on the 100-yr SWL with 0.8 ft SLR, approximately 39% of the existing levee could begin to experience overtopping by 2040 to 2050, primarily in the center of Yard 7, and the southern and northern ends of UP Lease South (Table 12). This would nearly double to 70% by 2050 to 2070 as more sections of the levee are projected to be overtopped in both Yard 7 and UP Lease-South (Table 12). However, only about 228 linear feet of the levee are projected to be in exceedance of the overtopping failure threshold. By 2060 to 2090, almost the entire levee (96%) is expected to be overtopped, resulting in nearly unprotected flooding of Segment E (Table 12).

Table 12: Proportion of Segment E Levee Overtopping under SLR Scenarios

Levee Overtopping Threshold	Linear Feet of Levee Overtopped	% of Levee Overtopped (Total Length = 5,500 LF)	Estimated Linear Feet of Levee Exceeding Screening Criteria for Overtopping Failure (>1 ft for >2 hrs)
0.8 ft SLR (2040 – 2050)	2,140	39%	199
1.3 ft SLR (2050 – 2070)	3,867	70%	228
2.0 ft SLR (2060 – 2090)	5,264	96%	1,120
2.9 ft SLR (2070 – 2100)	5,488	100%	4,289
4.1 ft SLR (2080 – 2110)	5,500	100%	5,455

Source: GHD

Under the 2080 Intermediate scenario with 1.8 ft of SLR and a 100-yr SWL, this potential flooding is projected to encompass both Yard 7 and UP Lease South, as well as extend past the rail yard (Figure 12). Two facilities considered to have a low level of importance are exposed under this projected flooding, including an old car wash pad that is slated for demolition and a temporary guardhouse structure that, if damaged by flooding, is unlikely to have its operations significantly impacted. However, there are two facilities considered to have a high level of importance within the potential flood extent that would be vulnerable to damage from water entering along the entrances of the structures. These consist of an operations building with a warehouse and office at 2650 Harbor Way and a processing facility owned by UP at 2850 Harbor Way.

By 2070 to 2100, the entire levee is projected to be overtopped under a 100-yr SWL with 2.9 ft of SLR and approximately 4,289 linear feet of the levee would exceed the screening-level threshold for failure (Table 12). Under the 2080 Intermediate-High Scenario with 3.0 ft of SLR and a 100-yr SWL, the potential flooding extent expands to include the railroad bridge and a portion of the Bayshore Road (see Figure 12). This potential flood extent would only slightly increase under the 2080 High scenario with 4.1 ft of SLR and a 100-yr SWL due to the site's topographic conditions (Figure 12). Therefore, while no additional assets are identified under either scenario, the exposed facilities are considered more vulnerable to these flooding events, as a result of the almost unimpeded flooding of the site. In addition, the estimated length of the levee in exceedance of the failure threshold would increase to about 5,455 linear feet.

Segment F (Marsh Channel to UP Lease North)

Segment F consists of the most northerly portion of the study area, the UP Lease North parcel. Similarly to Segment E, the existing levee that runs along this entire segment is not FEMA-accredited and is fronted by low-lying marsh that ranges in width from 1,000 ft to 1,100 ft. The projected elevated water levels would still be expected to exceed this low-lying area and directly interact with the levee. Based on the 100-yr SWL with 0.8 ft SLR, approximately 64% of the levee is projected to be overtopped by 2040 to 2050 (Table 13). These low threshold sections are located along the entire levee, therefore there are multiple flood pathways into the UP Lease North. From 2050 to 2090, nearly the entire levee, ranging from 95% to 96%, is anticipated to be overtopped, resulting in unprotected flooding of Segment F (Table 13). Across this time horizon, it is estimated that between 644 linear feet and 928 linear feet of the levee will exceed the screening criteria for overtopping failure (Table 13).

Table 13: Proportion of Segment F Levee Overtopping under SLR Scenarios

Levee Overtopping Threshold	Linear Feet of Levee Overtopped	% of Levee Overtopped (Total Length = 3,678 LF)	Estimated Linear Feet of Levee Exceeding Screening Criteria for Overtopping Failure (>1 ft for >2 hrs)
0.8 ft SLR (2040 – 2050)	2,361	64%	602
1.3 ft SLR (2050 – 2070)	3,484	95%	644
2.0 ft SLR (2060 – 2090)	3,531	96%	928
2.9 ft SLR (2070 – 2100)	3,678	100%	3,642
4.1 ft SLR (2080 – 2110)	3,678	100%	3,678

Source: GHD

Under the 2080 Intermediate scenario with 1.8 ft of SLR and a 100-yr SWL, the extent of this potential flooding is expected to include the entire UP Lease North and extend past the adjacent rail infrastructure (Figure 12). Only two facilities are considered exposed under this potential flood extent. This includes an awning that is considered to be of low importance and is unlikely to be significantly at risk of damage, as well as a UP office building located at 3800 Industrial Way considered to be of high importance. This building would be surrounded under this scenario's projected flooding, likely resulting in damage from water entering along the structure's entrances. By 2070 to 2100, the entire levee is expected to be overtopped under a 100-yr SWL and the majority of it, 3,642 linear feet, is projected to be in exceedance of the overtopping failure threshold (Table 13). Under the 2080 Intermediate-High Scenario with 3.0 ft of SLR and a 100-yr SWL, the potential flooding extent would surpass the UP Lease-North parcel and begin to encroach on Industrial Way and Park Road (Figure 12). This potential flood extent would slightly increase under the 2080 High Scenario with 4.1 ft of SLR and a 100-yr SWL (Figure 12). However, while the exposed facilities could be considered more vulnerable to flooding, there were no additional port assets identified under either scenario.

SLR Mitigation Options

SLR mitigation strategies include engineering, planning, and policy-based approaches designed to reduce the risks and impacts of flooding caused by rising sea levels. Strategies typically fall into three categories:

Protection

- Defending existing assets through barriers, levees, seawalls, and tide gates.

Accommodation

- Modifying infrastructure to function under flood conditions (e.g., elevating buildings, installing pump stations).

Retreat

- Relocating assets away from identified flood-prone areas.

Several mitigation strategies were considered to support long-term operational functionality at the Port of Benicia. Each shoreline segment was evaluated with respect to the topographic and spatial characteristics and desire to maintain the existing footprint of operational areas within the port. Due to the nature of port operations, with large, open storage areas at ground level and a need to maintain access throughout the site, strategies primarily focus on protection of the port perimeter. While these strategies can increase the port's ability to mitigate impacts associated with SLR, there will still be residual risk of flooding from extreme events that exceed the targeted 1% annual chance water level in 2080 under the Intermediate-High SLR scenario. Without the implementation of any mitigation strategies, the existing assets can be expected to experience varying levels of flood impacts by 2080. Mitigation options were evaluated using the projected 100-yr, 1-yr, and mean higher high water (MHHW) tide conditions, based on the AECOM-modeled tidal datum information. This allowed for estimation of the anticipated flood recurrence intervals for each of the exposed assets, based on their elevations.

Future capital improvement projects could include asset-specific adaptation strategies to provide additional flood protection as needed, such as elevating specific components (electrical panels, building flood elevations, etc.) above flood levels. This is expected to reduce the complexity and cost of increasing the port's resiliency while allowing for current planning efforts to continue without major design modifications. Due to the varying shoreline conditions along the port, three perimeter flood mitigation options were investigated. These include the following options with assumed crest elevation of 14 feet and minimum access width along the feature of 10 feet:

Ecotone Slopes

- Assumed footprint based on a 3H:1V backslope, 10 ft wide crest, and 10H:1V maximum front slope resulting in a typical footprint of approximately 100 feet; this feature would be expected to provide flood protection in addition to area for habitat transition with SLR

Earthen Levees

- Assumed 3H:1V maximum backslope and 3H:1V maximum front slope resulting in a typical footprint of approximately 60 feet; it is not expected to provide any habitat benefits due to the steep side slopes

Sheet Pile Walls

- Consist of interlocking metal sheets embedded into the existing ground and no significant modifications to adjacent ground elevations

Available space adjacent to operational areas is limited throughout nearly all of the project area by existing habitat or other property ownership. Due to these space constraints, the implementation of ecotone slopes and earthen levees that achieve a crest elevation of 14 feet are not feasible without coordination with adjacent property owners and regulatory agencies to determine whether or not fill in sensitive habitats would be permissible. Therefore, the following recommendations assume that mitigation measures cannot encroach onto other properties and that disturbance to adjacent habitats must be minimized. While a summary of each shoreline segment's evaluation is provided in Table 14, additional details for the recommended mitigation options are further elaborated below.

Table 14: 2080 SLR Scenario – Intermediate-High (3.0 ft)

Segment	Asset Name	Impact Projections	Consequence (No-Action)	Mitigation Options
Segment A (Yuba Property – Van Buren St)	Yard A Lot	Overtopping under MHHW tide conditions indicates frequent flooding	• Substantial operational disruption (roads, railroads, facilities) • Routine circulation impacts and lack of access to key areas of the Port • Equipment/vehicle damage • Cargo damage (i.e. containers) • Work stoppages due to employee access and safety issues • Other operational impacts • Substantial operational disruption (facilities, pump station) • Recurring/permanent loss of use (buildings and site) • Work stoppages due to employee access and safety issues • Other operational impacts	a) Augment existing levee with sheet pile wall along southern edge of Port; b) Raise asset elevation *in situ*; c) Relocate assets
	Port Yard			
	Yard B Lot	Overtopping under 1-yr tide conditions indicates occasional flooding		
	Railroad			
	Yard VDO	Overtopping under 100-yr tide conditions indicates infrequent flooding		
	Pumpstation 2 (8, 15)	Exposed to frequent flooding under MHHW tide conditions		
	Car Wash Tunnel (9)	Exposed to occasional flooding under 1-yr tide conditions		
	Building 167 (14)			
	Building 168 (24)			
	Toyota Processing Building (28)			
	Maintenance Building (29)	Exposed to infrequent flooding under 100-yr tide conditions		
	Processing Building (31)			
Segment B (Pier Structure)	Docking Pier Soffit	Exposed to infrequent submergence of east reach concrete pier soffit under 100-yr tide conditions	• Additional hydrodynamic forces and buoyancy effects on pier substructure • Exposure of hanging utilities beneath pier deck	a) Increase frequency of inspections b) Retrofit vulnerable assets (floodproofing utilities/ substructure components) c) Schedule maintenance around low tide events
Segment C (Valero Leasehold)	Valero Leasehold	Overtopping under MHHW tide conditions indicates frequent flooding	• Substantial operational disruption (roads, railroads, facilities) • Routine circulation impacts and lack of access to key areas of the Port • Equipment/vehicle damage • Work stoppages due to employee access and safety issues • Other operational impacts	a) Elevate ground between Building 169 and railroad b) Elevate Van Buren Street
	Railroad	Overtopping under 100-yr tide conditions indicates infrequent flooding		
	Yard 48			
	Petcoke Silos (6)	Exposed to frequent flooding under MHHW tide conditions		
	Building 169 (21)	Exposed to occasional flooding under 1-yr tide conditions		
	Petcoke Conveyor (27)			

Segment	Asset Name	Impact Projections	Consequence (No-Action)	Mitigation Options
Segment C (Valero Leasehold) – cont.	Valero Asset (20, 22, 23)	Exposed to infrequent flooding under 100-yr tide conditions	• Substantial operational disruption (facilities, pump station) • Recurring/permanent loss of use (buildings and site) • Work stoppages due to employee access and safety issues Other operational impacts	
Segment D (Railroad Prism)	Railroad	Overtopping under 100-yr tide conditions indicates infrequent flooding	• Substantial operational disruption (railroads) • Routine circulation impacts • Equipment/vehicle damage • Work stoppages	a) Fill and elevate engineered shoreline revetment in locations below elevation 14 ft (NAVD88)
Segment E (Benicia-Martinez Bridge – Marsh Channel)	Yard 7	Overtopping under 1-yr tide conditions indicates occasional flooding	• Substantial operational disruption (roads, railroads, facilities) • Routine circulation impacts and lack of access to key areas of the Port • Equipment/vehicle damage • Work stoppages due to employee access and safety issues • Other operational impacts	a) Elevate existing public trail to create new ecotone slope levee b) Install sheet pile wall around segment
	UP Lease – South			
	Railroad			
	Bayshore Rd	Overtopping under 100-yr tide conditions indicates infrequent flooding		
	2650 Harbor Way (1, 18)	Exposed to frequent flooding under 1-yr tide conditions	• Substantial operational disruption (buildings and equipment) • Recurring/permanent loss of use (buildings and site) • Work stoppages due to employee access and safety issues • Other operational impacts	a) Elevate existing public trail to create new ecotone levee b) Install sheet pile wall around segment c) Raise asset elevation *in situ* d) Relocate assets
	2850 Harbor Way (3, 10, 17)			
	Car Wash Pad (16)			
	Guardhouse (26)			
Segment F (Marsh Channel – UP Lease North)	UP Lease – North	Overtopping under MHHW tide conditions indicates occasional flooding	• Substantial operational disruption (roads, railroads, facilities) • Routine circulation impacts and lack of access to key areas of the Port	Install sheet pile wall around segment

Segment	Asset Name	Impact Projections	Consequence (No-Action)	Mitigation Options
Segment F (Marsh Channel – UP Lease North) – cont.	UP Lease – North	Overtopping under MHHW tide conditions indicates occasional flooding	• Equipment/vehicle damage • Work stoppages due to employee access and safety issues • Other operational impacts	a) Install sheet pile wall around segment
	Railroad			
	3800 Industrial Way (2)	Exposed to frequent flooding under MHHW tide conditions	• Substantial operational disruption (buildings and equipment) • Recurring/permanent loss of use (buildings and site) • Work stoppages due to employee access and safety issues • Other operational impacts	a) Install sheet pile wall around segment b) Raise asset elevation *in situ* c) Relocate assets
	Awning (25)			

Recommended Mitigation Measures

Segment A – Yuba Property to Van Buren Street

Within Segment A, it is recommended that the sheet pile wall with a crest elevation of 14 ft (NAVD88) be established around the border of the port from the Yuba property boundary to Van Buren Street. See Figure 16. This sheet pile wall would be established on the bay side of the parking lot along the back of the existing revetment. An improved access road/trail would then be constructed between the sheet pile wall and the parking lot to provide access for inspections and maintenance of the structure (Figure 15). This is intended to mitigate the flood pathways from both the Yuba property and the east edge of Port Yard. The implementation of this feature would create a continuous level of flood protection for Segment A. This would reduce overtopping of the shoreline and mitigate flooding within the port under extreme events. It recommended that the implementation of any flood protection feature along the western boundary of the port consider the planned usage and shoreline protection for the Yuba property, be coordinated with the property owner(s), and reevaluate this mitigation measure along the property boundary, as needed. For example, if this site is developed, it is likely that it will need to incorporate some form of flood mitigation that may indirectly reduce flood risk and needed crest elevation along the property boundary for the port.

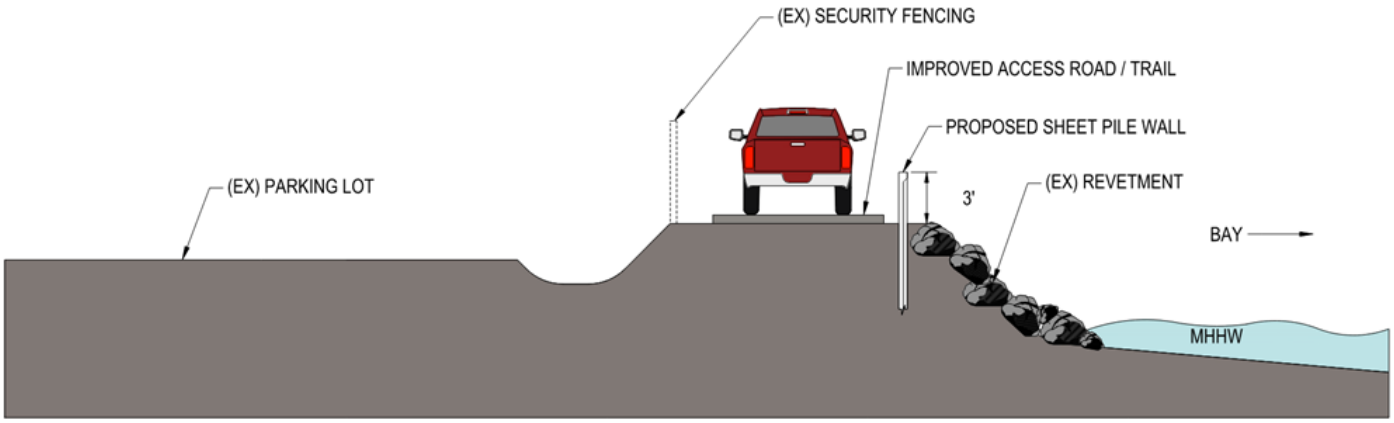


Figure 15: Segment A Typical Cross Section of Sheet Pile Wall Concept (source: GHD)



Figure 16: Segment A Plan View of Proposed Concepts (source: GHD)

Segment B – Pier Structure

It is expected that, since the docking pier in Segment B consists of different substructure materials, its vulnerabilities and mitigation strategies are addressed differently. Under the 2080 Intermediate-High SLR scenario, only the soffit of the east reach concrete pier is anticipated to be exposed to partial submergence during the 1% annual chance still water level. It is recommended that any sensitive hanging utilities be retrofitted with an adaptive design to accommodate this hazard. It is also recommended that any maintenance be scheduled during lower tides that achieve the necessary clearance for inspections. Given the low probability of the pier being subjected to increased hydrodynamic forces and buoyancy effects during a few hours at the peak of an extreme tidal cycle, no significant impacts are anticipated. Therefore, no flood mitigation recommendations are proposed for the pier's substructure at this time. Future inspections may indicate otherwise and regular inspections of the pier are necessary and recommended to maintain its operation.

Segment C – Valero Leasehold

The shoreline along Segment C, where the Valero Leasehold is located, does not contain an existing levee or other elevation barrier for flood protection. Since the area adjacent to the Valero Leasehold (i.e. deep-water liquid bulk berth/operations) is located outside of the port's jurisdictional boundary, the recommended mitigation strategies are limited to available flood connection points to the port and may not provide a uniform level of protection, as flood pathways will still exist. This is primarily along Van Buren Street as the existing railroad grade limits the amount of flooding behind this structure. While elevating Van Buren Street would mitigate flooding of Segment C, this may not be feasible within the port's jurisdiction, due to the area needed to conform to the road connections between the pier structure and railroad grade. Therefore, an approach that focuses on the flood pathways directly north of Building 169 is recommended (Figure 17). This would include the installation of an approximately 95 ft long, 25 ft wide, and 2.5 ft high paved fill connection, with a crest elevation of 11 ft (NAVD88), on the north side of Building 169 that conforms to the railroad grade. See Figure 18.

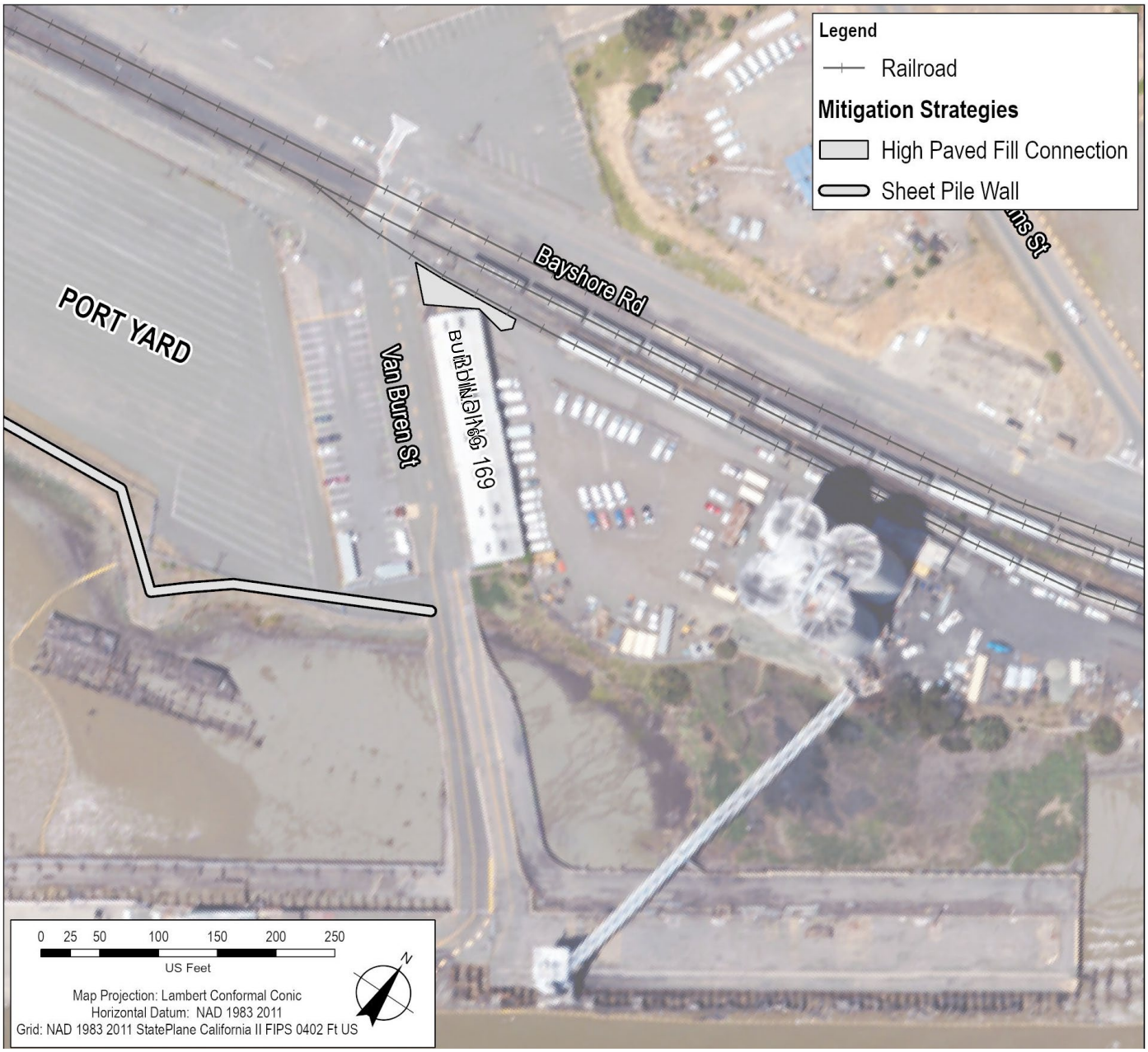


Figure 17: Segment C Plan View of Proposed Concept (source: GHD)

This flood protection concept is considered short-term as it does not achieve the target future flood protection, but would consist of a less intensive effort to limit flooding while leveraging the existing building's elevated concrete foundation that could act as a flood barrier. Alternatively, since Building 169 is set for demolition in the near future, the proposed fill could be extended along the north side of Van Buren Street.

Work performed adjacent to the railroad grade will require coordination with the owner and manager of these rail lines (UP) to maintain acceptable grades, elevations, and clearances. It is expected that the proposed structures provide limited protection to SLR as the features may be flanked by overtopping of adjacent, lower-elevation railroad grades. This flood pathway through the railroad alignment will need to be addressed in coordination with UP. It is recommended that a site-specific plan be prepared that evaluates the long-term strategies for this area in coordination with the adjacent property owners and expected future land uses.

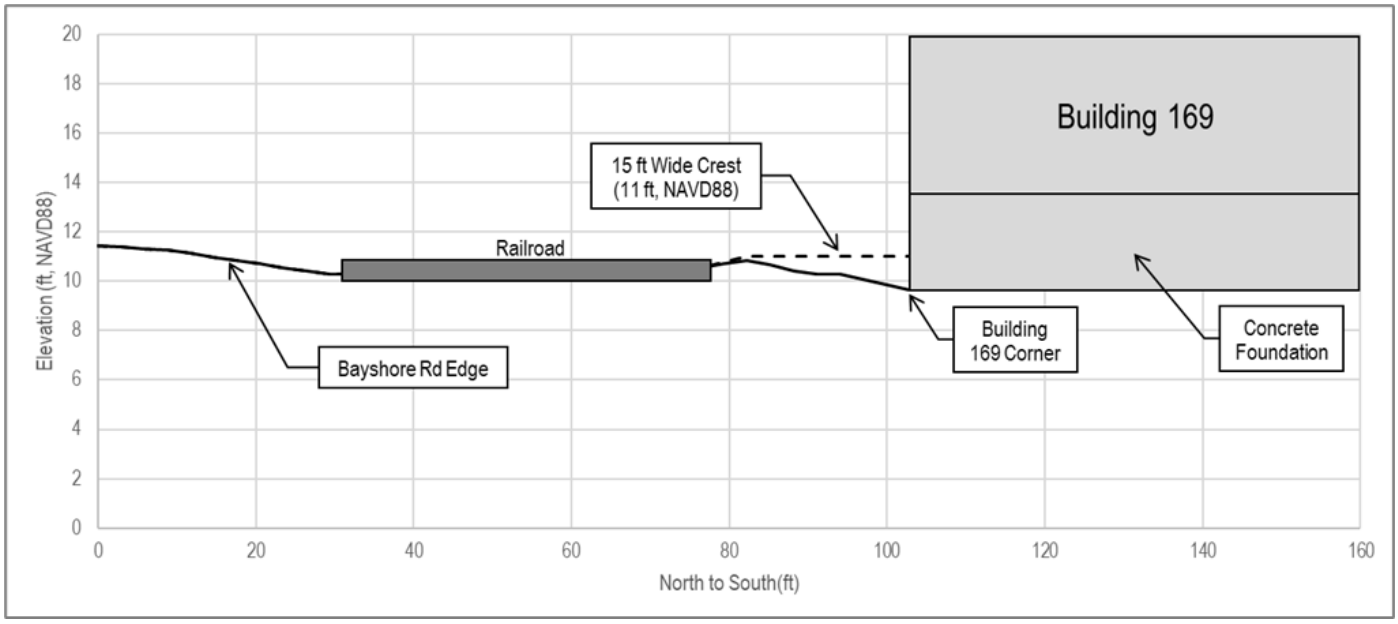


Figure 18. Segment C Cross Section 6 of High Paved Fill Connection Concept (source: GHD)

Segment D – Railroad Prism

In consideration of the limited amount of space available and existing shoreline protection structure in Segment D, increasing the existing engineered revetment elevation that protects the shoreline along the railroad prism in the priority spots identified in the vulnerability assessment is recommended (Figure 20). While the majority of the existing revetment exhibits sufficient elevation to protect from overtopping with up to 2.9 feet of SLR, isolated segments have been identified as requiring increased crest elevation to improve long-term resiliency. These sections of the revetment would need to be raised by approximately 3 ft to reach a crest elevation of 14 ft (NAVD88) (Figure 19). Additionally, fill would be placed to increase the shoreline elevation. Limiting the amount of overtopping in Segment D will mitigate flooding along this reach and prevent flooding of the railroad prism, thereby reducing operational downtime.

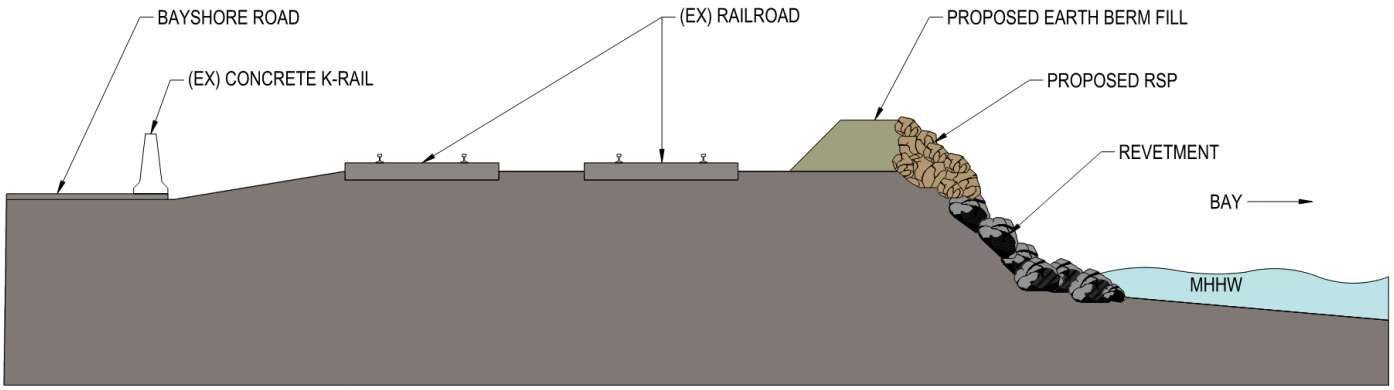


Figure 19: Segment D Typical Cross Section of Raised Revetment Concept (source: GHD)

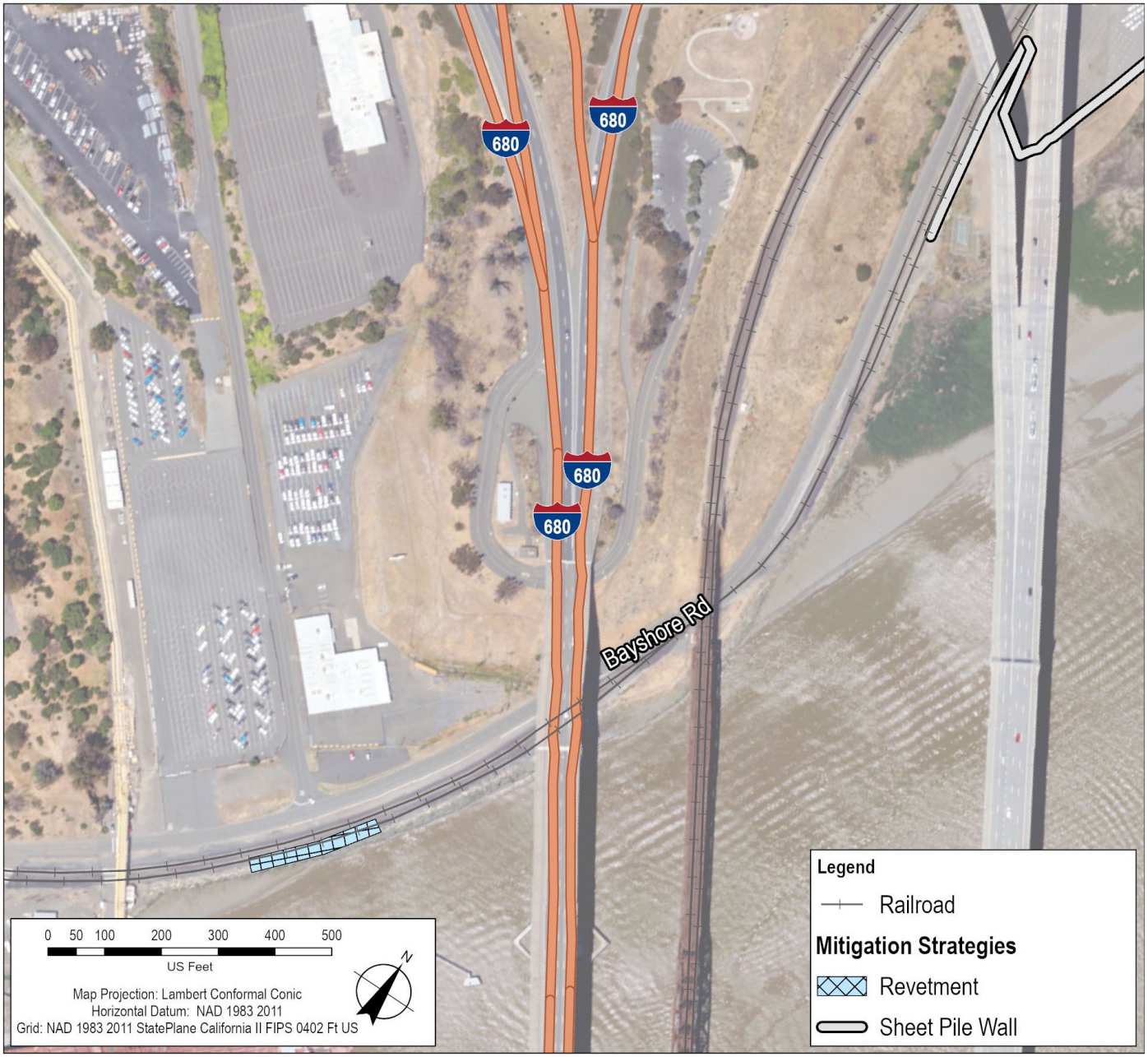


Figure 20. Segment D Plan View of Proposed Concepts (source: GHD)

Segment E – Benicia-Martinez Bridge to Marsh Channel

Segment E currently contains a non-FEMA-accredited levee that extends halfway from Yard 7 north to the marsh channel. Based on the vulnerability assessment, a large segment of this levee may be overtopped by the 1% annual chance stillwater level with 0.8 feet of SLR. Additionally, since this shoreline protection feature does not reach across the entire segment, it does not provide a continuous level of flood protection. The three primary mitigation options described previously were evaluated for this area. Raising the existing public trail and using the available upland space to create an ecotone levee structure with the typical design parameters described earlier and a crest elevation of 14 ft (NAVD88) would maintain public access and have the potential to enhance habitat benefits while providing flood protection to Segment E. However, these would require a wide footprint with fill extending at least 30 ft into the existing marsh habitat. While these state tidelands were granted to the City of Benicia, coordination with relevant resource agencies, such as the Regional Water Quality Control Board, U.S. Army Corps of Engineers, and San Francisco Conservation and Development Commission (BCDC) would be necessary to pursue the implementation of this option.

A sheet pile wall installed with a crest elevation of 14 ft (NAVD88) would maintain a consistent level of flood protection along the port's boundaries. See Figure 21 and Figure 22. An improved trail could be established behind the sheet pile wall to avoid placing fill in the existing marsh habitat while maintaining public access along this recreational trail. As the sheet pile wall option does not have the same spatial requirements as the ecotone levee, this achieves the smallest project footprint and is located entirely within the port's jurisdictional boundary, preventing fill placement in the existing marsh habitat.



Figure 21: Segment E Plan View of Proposed Concept (source: GHD)

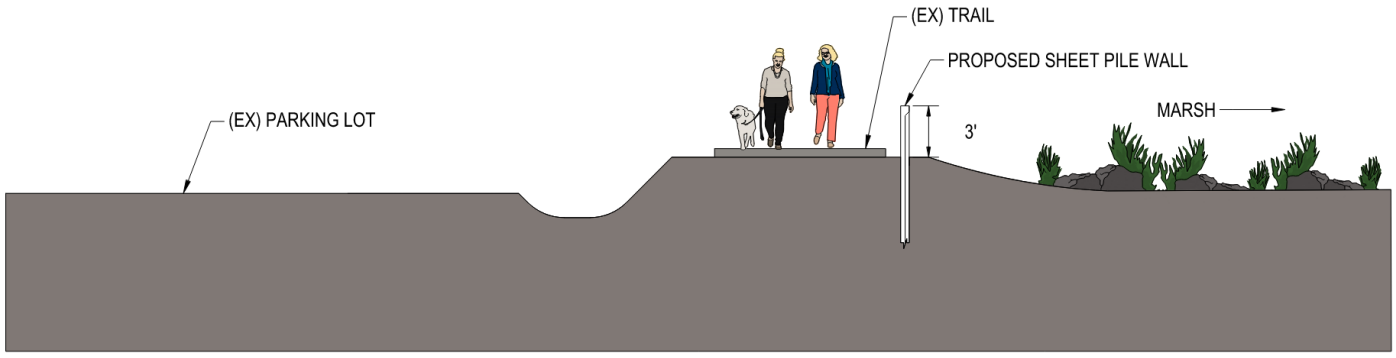


Figure 22: Segment E Typical Cross Section of Sheet Pile Wall Concept (source: GHD)

Segment F – Marsh Channel to UP Lease North

Similar to Segment E, a non-FEMA-accredited levee protects the entirety of Segment F. This segment is adjacent to the Grizzly Island Wildlife Area, marsh land owned by the California Department of Fish and Wildlife (CDFW). An ecotone slope concept along this segment using the typical design parameters would require the structure to extend into this marsh area by approximately 50 ft to reach a crest elevation of 14 ft (NAVD88). Feasibility of implementing this type of structure would need to be coordinated with CDFW. Assuming placement of fill on the CDFW property is not permitted, a sheet pile wall along the perimeter of Segment F is recommended to mitigate flooding of the UP Lease – North (Figure 23). An improved trail could then be established behind the sheet pile wall to support inspections and maintenance of the structure. This wall would be approximately 4 ft high to provide a crest elevation of 14 ft (NAVD88) (Figure 24). It is important to note that a regulatory floodway, the Sulphur Springs Creek Overflow, leads directly into the existing parking lot. Therefore, further evaluation of the recommended structure will be necessary to gain a better understanding of how this floodway functions in the area.

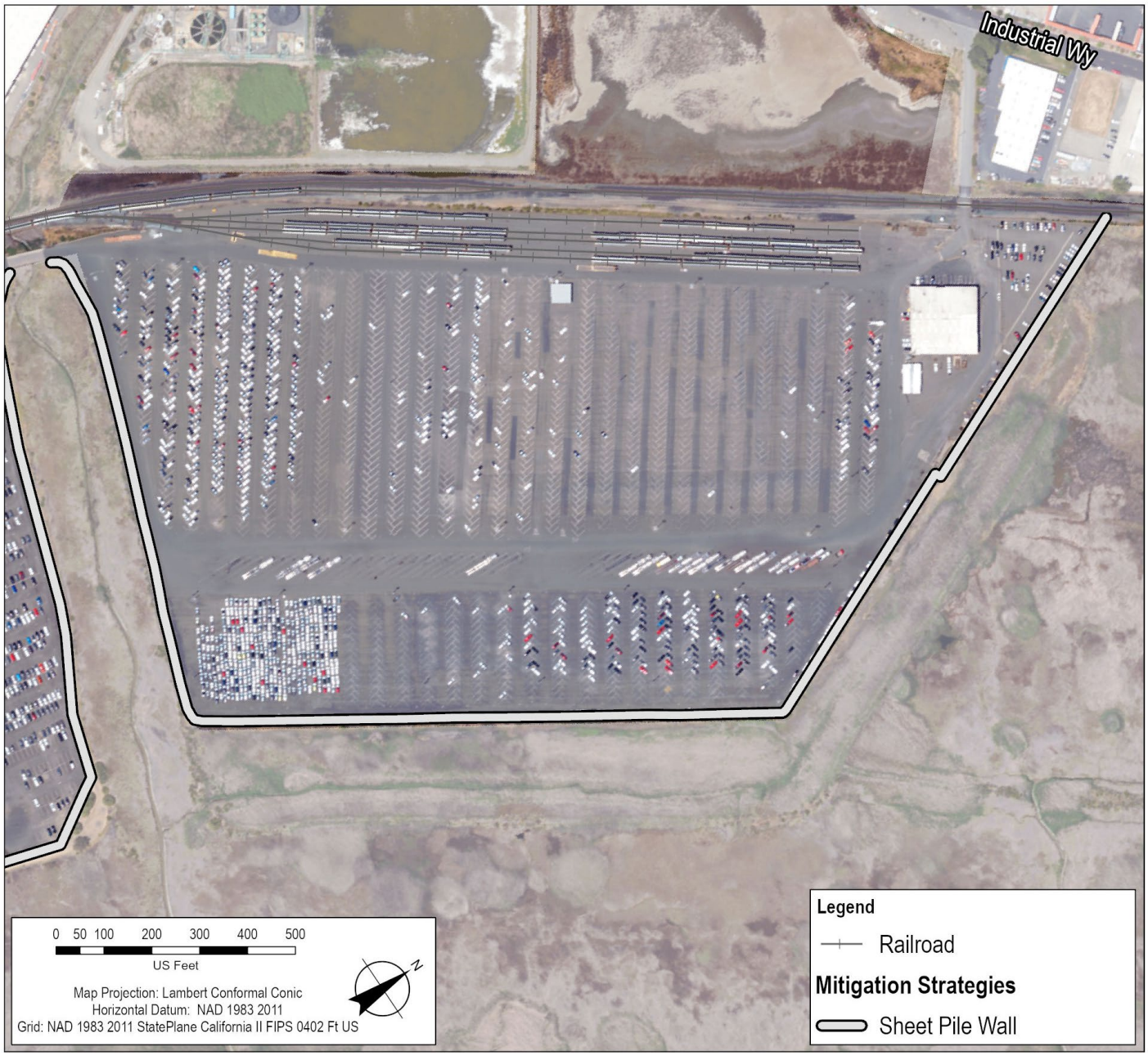


Figure 23: Segment F Plan View of Proposed Concept (source: GHD)

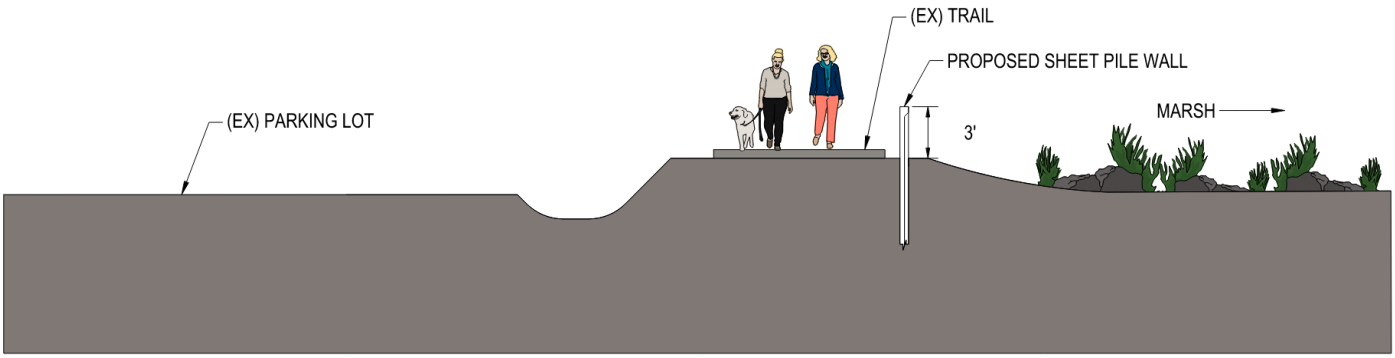


Figure 24: Segment F Typical Cross Section of Sheet Pile Wall Concept (source: GHD)

Other Measures

While the segment-specific mitigation strategies recommended in the preceding pages are expected to improve the port's SLR resiliency, additional asset-type-specific mitigation measures have also been identified and are recommended for consideration, as follows:

- If the proposed shoreline protection features are not implemented in Segments A, E, and F, other mitigation strategies are suggested for building assets such as raising their finished floor elevations and/or relocating them farther inland to a higher elevation .
- If the proposed shoreline protection features are implemented around the port, additional stormwater improvements may also be necessary to redirect impounded stormwater during and after storm events. The two stormwater pumphouses located in Segment A will likely need to be upgraded and/or maintained to accommodate this. Other improvements could include the establishment of high-capacity stormwater vaults or integration of tide gates into the proposed concepts. These vaults could temporarily store stormwater runoff during elevated tide conditions that coincide with precipitation events, thereby reducing the likelihood of inland flooding of the port from backed up storm outlets. Additionally, tide gate structures could control the flow of water by allowing water to flow in one direction while preventing its flow in the opposite direction. Sizing and detailed design of these features would need to occur in a future phase of work. In order to appropriately evaluate the feasibility of any improvements, the existing drainage features should be investigated further as part of this future work.

Appendix A: Shore Power Cost Calculations

Estimated Project Costs

Status quo operations entail a two-berth shore power scenario. Cost assumptions and estimates for this two-berth shore power scenario are presented below.

Ro-Ro/Vehicle Carrier Vessel Shore Power Connection – Assumptions	
Number of Monthly Ro-Ro Vessel Calls – 1 Ro-Ro Berth	12
Average Ro-Ro Vessel Dwell Time per Call (Hrs)	10
Average Ro-Ro Vessel Power Demand per Call (KW)	2500
Average Ro-Ro Vessel Energy Demand per Call (KWh)	25000
Average Shore Power Utility Cost per KWh ($)	0.3
Ro-Ro/Vehicle Carrier Vessel Calculations	
Estimated Average Shore Power Cost For Each Ro-Ro/Vessel Connection ($)	$7,500.00
Estimated Average Monthly Shore Power cost for Ro-Ro Terminal ($)	**$90,000.00**
Emission Capture Cost per Vessel Call – Average Estimated Hourly Rate	$4,000.00
Estimated Monthly Emission Capture Service Cost	**$480,000.00**
Non-compliance Penalty per Hour ($)	$1,980.00
Estimated Monthly Ro-Ro Vessels Non-compliance Penalty ($)	**$237,600.00**
Estimated Annual Ro-Ro Vessels Non-compliance Penalty ($)	**$2,851,200.00**
Dry-Bulk Carrier Vessel Shore Power Connection – Assumptions	
Number of Annual Dry Bulk Vessels Calls	12
Average Dry Bulk Vessel Dwell time per Call (Hrs)	36
Average Dry Bulk Vessel Power Demand (KW)	2000
Average Dry Bulk Vessel Energy Demand per Call (KWh)	72000
Average Shore Power Utility Cost per KWh ($)	0.3
Dry-Bulk Carrier Vessel Calculations	
Estimated Average Shore Power Cost for Each Dry Bulk Vessel Connection	$21,600.00
Estimated Average Monthly Shore Power Cost for Dry Bulk Terminal	**$259,200.00**
Estimate Monthly Emission Capture System Cost for Dry-Bulk Terminal	
Emission Capture Cost per vessel Call – Average Hourly Rate ($/Hr)	$2,300.00
Estimated Monthly Emission Capture Service Cost	$993,600.00
Non-compliance Cost Calculator	
Non-compliance Penalty per Hour ($)	$1,980.00
Estimated Monthly Dry Bulk Non-compliance Penalty ($)	**$855,360.00**
Estimated Annual Dry Bulk Non-compliance Penalty ($)	**$10,264,320.00**

Cost Summary	
Total Average Shore Power Monthly Cost for Both Terminals	**$349,200.00**
Total Average Emissions Capture Service – Monthly Cost for Both Terminals	**$1,473,600.00**
Total Non-compliance Monthly Penalties	**$1,092,960.00**
Total Annual Non-compliance Penalties	$13,115,520.00

Shore Power Cost Summary

Total Annual Electrical Power cost	$4,190,400.00
Total Annual Maintenance Cost (1% of total CAP Ex.)	$250,000.00
Total Operational Cost	$4,440,400.00
Total Capital Expenditure Cost	$25,000,000.00
System Life Span (Yrs)	30
Shore Power System Total Cost of Ownership over 30 Years	**$158,212,000.00**

Emission Capture System Cost Summary

Emission Capture Annual Service Fee	$17,683,200.00
Total Base Service Fee for 30 Years	$530,496,000.00
Total Fee Escalation (2% annual) per Year for 30 Years	$32,030,669.16
Emission Capture Annual Service Fee Total Cost	**$562,526,669.16**

Non-compliance Cost Summary

Total 30 Years Life Cycle Non-compliance Fee	**$393,465,600.00**

(Assuming no increase of penalty amount for 30 years)

Note:

Terminals that received fewer than 20 vessel visits per calendar year in 2021 and 2022 were initially considered “low activity terminals” and qualified for an exception from emissions control requirements per CARB’s At-Berth Regulation Sections 93130.8(e) and 93130.10(a). If a low activity terminal sees an increase in vessel calls and has two consecutive years with 20 or more visits, it will no longer qualify as low activity and must comply with all control and planning requirements.

Appendix B: SLR Flood Mapping Exhibits



Figure 5: Port of Benicia Study Area (source: GHD)

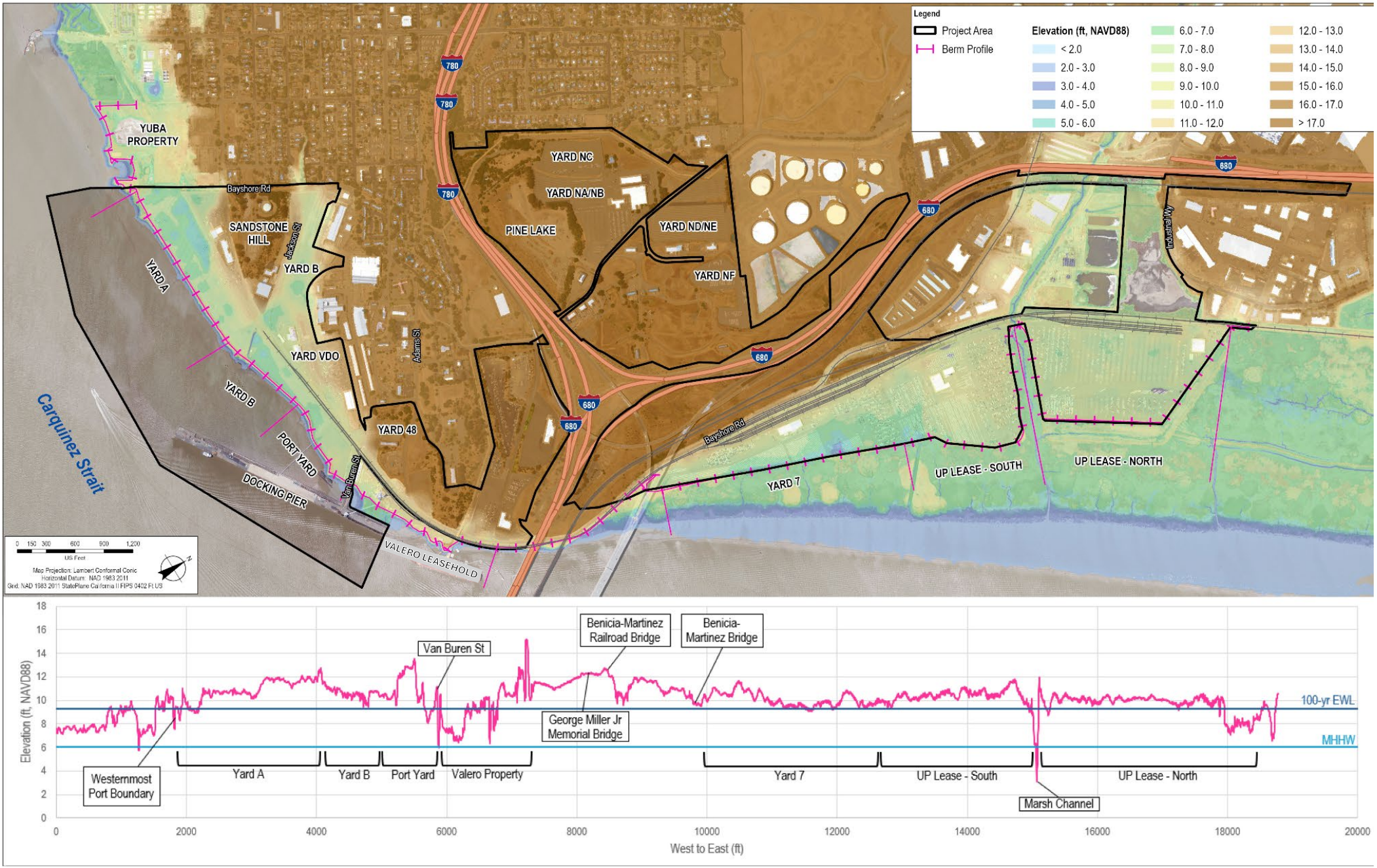


Figure 7. Existing Topography of Port of Benicia Study Area and Levees Crest (source: GHD)

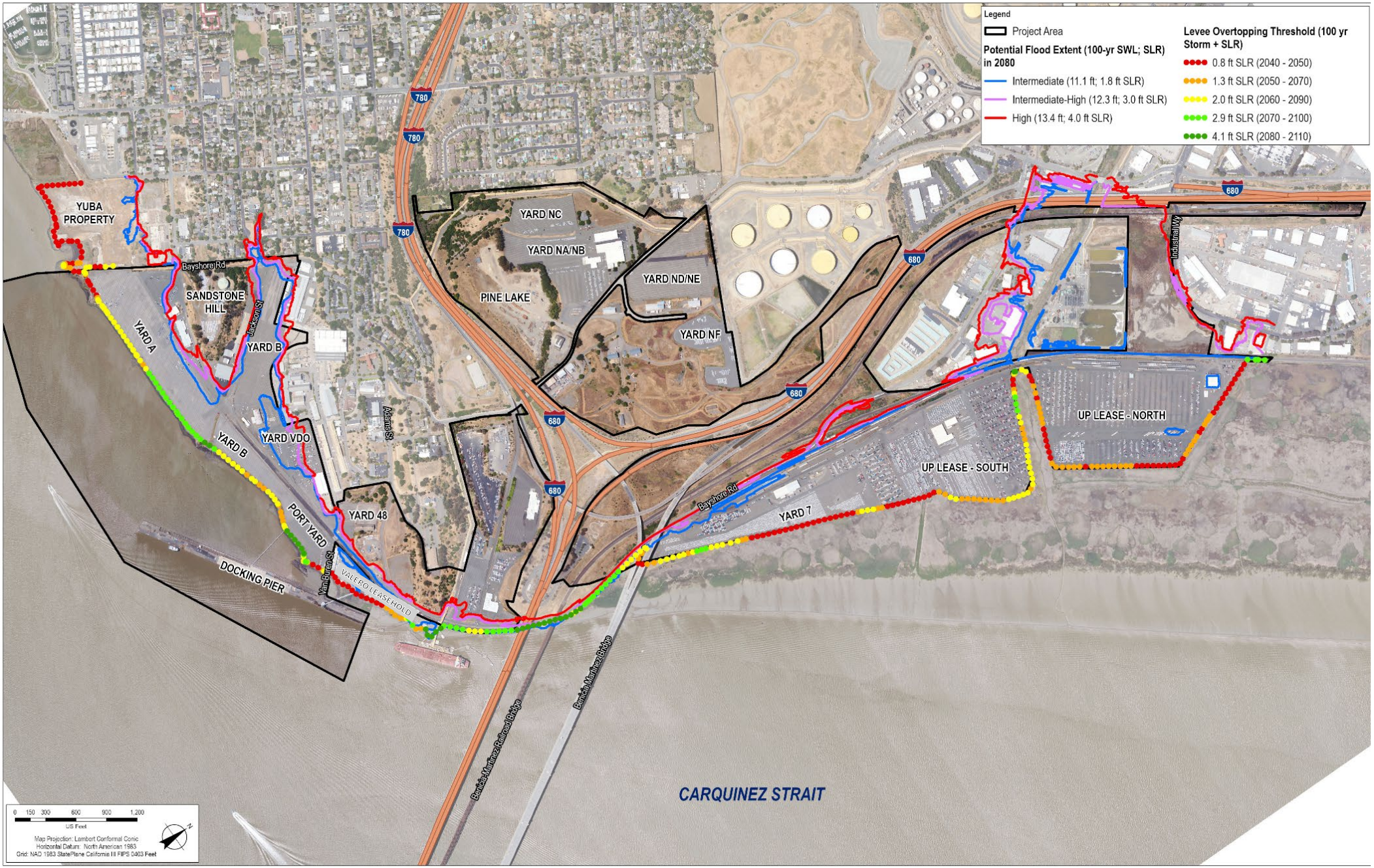


Figure 8: Projected 100-year SWL Flood Extents under the Existing and 2080 Time Horizon for Each SLR Scenario along with Levee Overtopping Thresholds (source: GHD)



Figure 9: Projected Levee Overtopping Failure Thresholds (source: GHD)



Figure 10: Port of Benicia Study Area Vulnerability Segments (source: GHD)

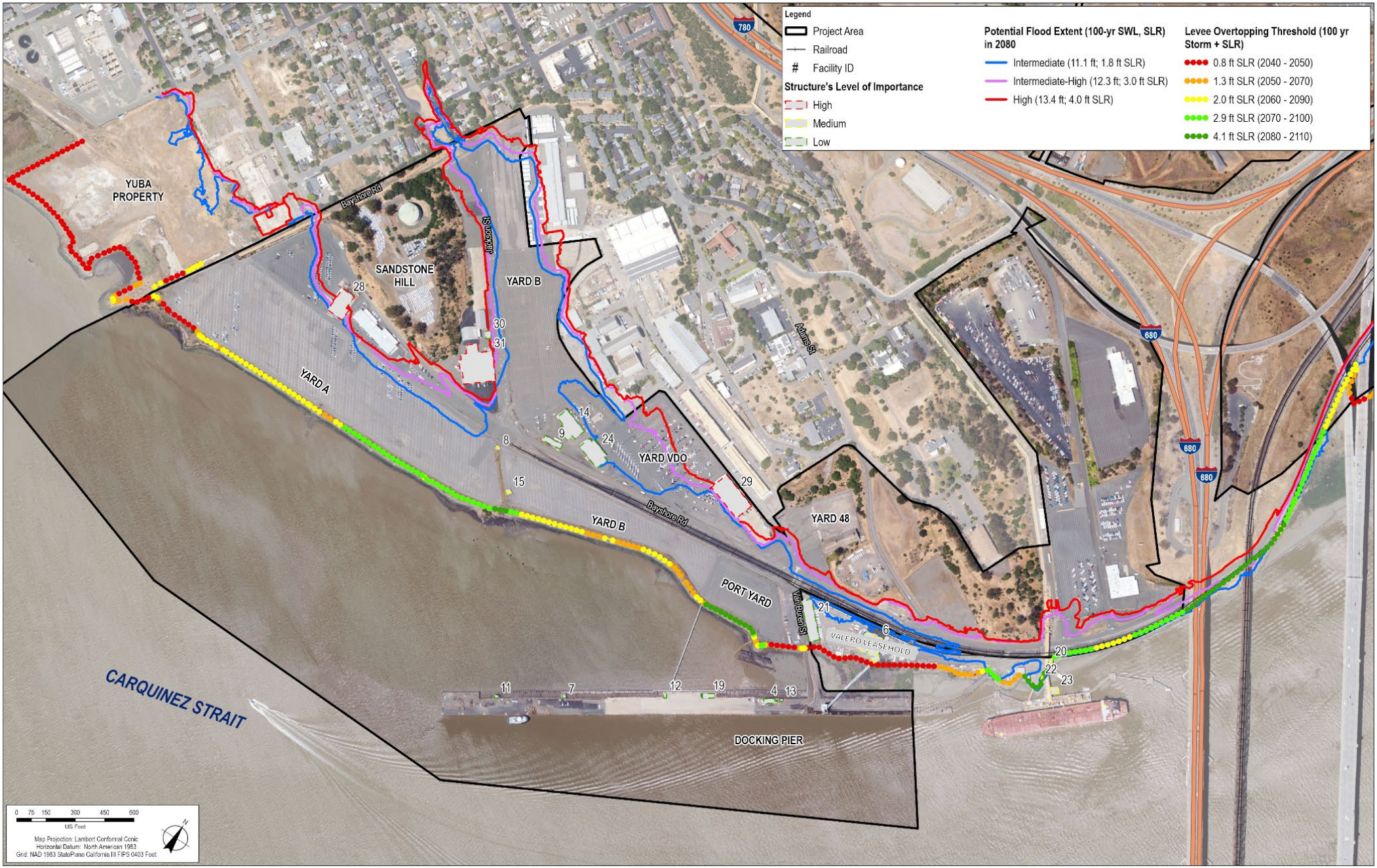


Figure 11: Projected 100-year SWL Flood Extents under the Existing and 2080 Time Horizon for Each SLR Scenario along with Levee Overtopping Thresholds for Segments A, B, C, and D

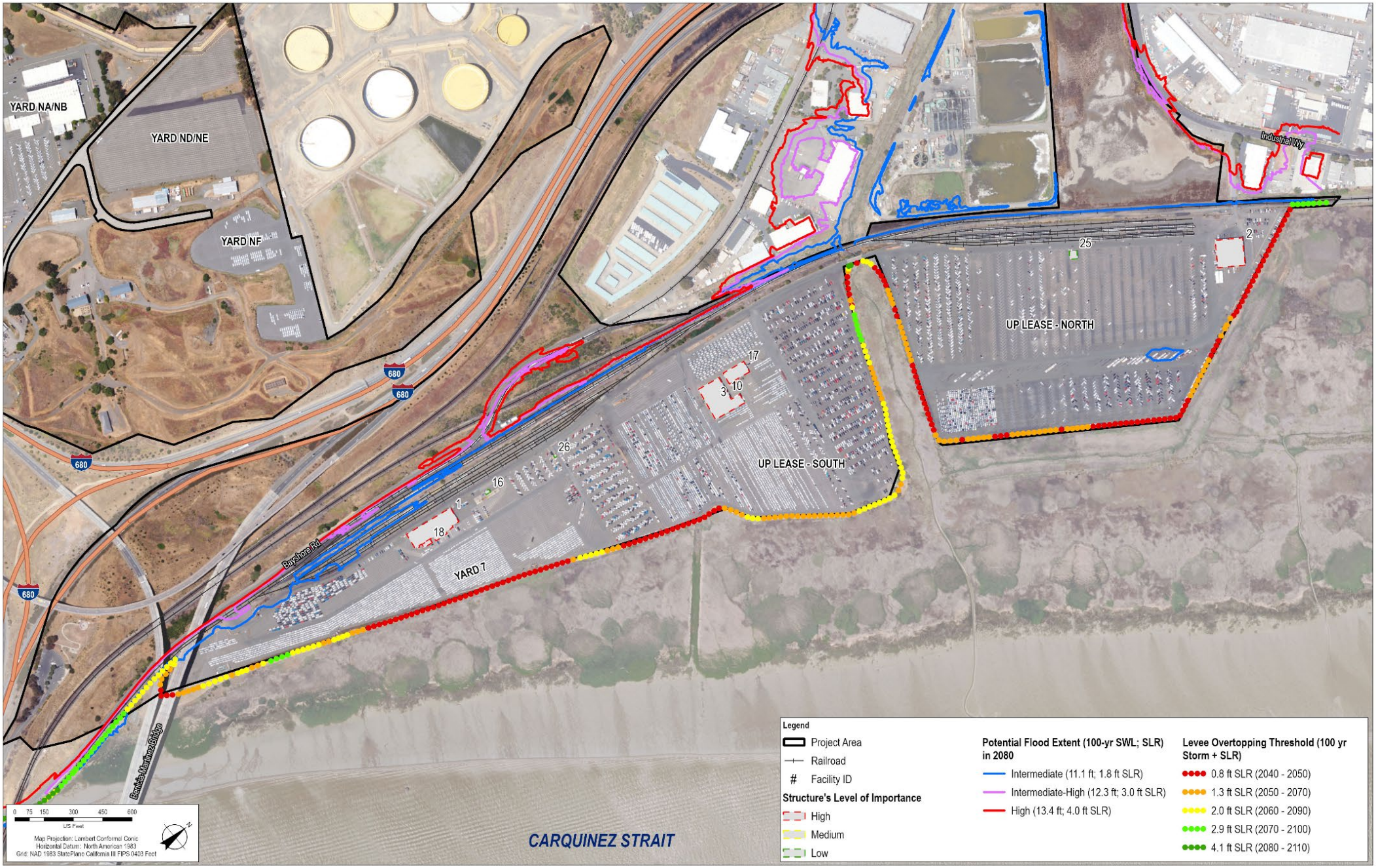


Figure 12. Projected 100-year SWL Flood Extents under the Existing and 2080 Time Horizons for Each SLR Scenario along with Levee Overtopping Thresholds for Segments E and F



THE CITY OF BENICIA CALIFORNIA

Port of Benicia

Facilities and Infrastructure Modernization

Deliverable 4

Yard Expansion Feasibility Analysis and Capital Improvement Plan (CIP)

February 6, 2026



GHD

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Executive Summary

Port Expansion Options

Consistent with findings and analyses from the Infrastructure Assessment (Task 1), Port Demand, Capacity and Circulation/Transportation Analysis (Task 2) and Decarbonization and Resiliency Pathways (Task 3) deliverables already submitted, the GHD team assessed the ability of the Port of Benicia to increase its overall acreage to accommodate two separate growth scenarios:

1. Growth in Volume of Existing Cargo (only)
2. Growth in Volume of Existing Cargo Plus Diversification

Because additional backland area is required to accommodate anticipated future growth in cargo volumes under both of these port modernization scenarios, and since additional berth capacity is required to facilitate long-term diversification of cargo types, which is in the best interest of both the City and the port operator, it is recommended that the City of Benicia and AMPORTS work together to adopt a series of capital improvement projects as part of the current Modernization plan that, consistent with Scenario 2, allow the port to simultaneously grow its legacy operations while accommodating as-yet unspecified alternative future business uses and cargo types.

In addition, given the financial advantages to the port of implementing shore power rather than continuing to manage California Air Resources Board (CARB) compliance via the current vessel exhaust capturing system (see Task 3 deliverable), capital improvements associated with shore power are also recommended as are stormwater infrastructure improvements and long-term sea level rise mitigation measures.

Lastly, it is also recommended that a series of transportation network improvements be further evaluated and/or implemented in order to increase safety, improve physical conditions and provide higher levels of service for major roadways and select intersections surrounding the Port of Benicia.

Feasibility Analysis

A total of 19 potential capital improvement projects were evaluated for inclusion in the Port of Benicia Facilities and Infrastructure Modernization plan. All of these potential projects were evaluated by the project team, consistent with the goals of the plan and the preferred approach elaborated in the previous section. A qualitative evaluation of each project's feasibility was conducted, resulting in a short list of projects recommended for advancement. Table ES1 below summarizes the list.

Table ES1: Projects Recommended for Advancement

#	Project Name	Advance? (Y/N)	Comments
1	Pier Structural Improvements	Y	This project is critical to near-term port operations and is considered a top priority for port modernization.
2	Pier Expansion for Additional Mooring/Tug Berths	Y	This project will greatly enhance the port's long-term capabilities and would ideally be completed simultaneously with Project 1.

3	Port Backlands Improvements	Y	Due to the complex topography and mix of uses within the Benicia PPA, these two sites are the only relatively large parcels of land located immediately adjacent to existing port operations that have near-term potential to be developed for waterfront industrial use. Both sites are considered high priorities for port modernization.
4	Overwater Deck and Wharf Expansion	N	The cost of this project, combined with the potential for regulatory complexity (i.e. overwater development within the tidelands), makes it a less-attractive alternative to activate additional port backlands than Project 3.
5	Shore Power System	Y	This project achieves multiple goals for both the City/County and AMPORTS since it optimizes both at-berth vessel emission reduction and regulatory compliance costs. It is recommended for advancement to the detailed planning and design phase in collaboration with PG&E.
6	Solar Array and Landside BESS	N	This project is not essential to port operations and would take up significant waterfront acreage that is more productively used for port operations.
7	Stormwater Infrastructure Improvements	Y	This project requires additional study but is essential to mitigate the potential impacts of stormwater runoff into the Carquinez Strait. A detailed follow-up study is recommended.
8	SLR Seawall	Y	This project requires additional study and is not needed in the near term. However, it is important to identify condition-based triggers for long-term coastal resiliency projects, including SLR mitigation measures, so this project is recommended to advance to the next phase of planning.
9	Intersection Improvements - Park/Bayshore	Y	As one of the most challenging and poorest performing areas in the City of Benicia's road network, this project is recommended for advancement to the PID + streamlined ISOAP/ICE phase.
10	Intersection Improvements - Bayshore/I-680	Y	As one of the most challenging and poorest performing areas in the City of Benicia's road network, this project is recommended for advancement to the PID + streamlined ISOAP/ICE phase.
11	Intersection Improvements - Industrial/Park	Y	As one of the most challenging and poorest performing areas in the City of Benicia's road network, this project is recommended for advancement to the PID + streamlined ISOAP/ICE phase.
12	Bayshore Road Improvements	Y	This project will improve the safety and overall condition of a primary truck route (Bayshore Road) connecting the Port of Benicia to the Interstate system and is recommended for advancement to the next phase of planning.

13	Park/Adams Truck Restriction/Realignment	Y	This administrative project will improve safety and eliminate wear and tear on sections of roadway that are not appropriate for heavy-duty truck traffic and is recommended for advancement.
14	Industrial Way Improvements	N	Industrial Way is outside the area of the PPA that is impacted by port-related truck traffic, so this project is out of scope for the Modernization plan.
15	Adams Street Improvements	N	While conditions on Adams Street are suboptimal, since Projects 13 and 17 will eliminate truck access to Park Road from Adams Street and restrict truck traffic on Military East between Adams Street and 1st Street, respectively, improvements to Adams Street are not a priority for the port Modernization plan.
16	Park Road Improvements	Y	This project will improve the safety and overall condition of a primary truck (Park Road) route connecting the Port of Benicia to the Interstate system and is recommended for advancement to the next phase of planning.
17	Military East Improvements	Y	This administrative project will improve safety and eliminate wear and tear on sections of roadway that are not appropriate for heavy-duty truck traffic and is recommended for advancement.
18	Intersection Improvements - Oak/Park	Y	This project represents an important connection point between Oak Road and Park Road and will be critical to reducing the number of port origin/destination trucks that use Bayshore Road to access I-680 (and vice-versa) near the intersection of Park Road once Project 19 is implemented. It is strongly recommended for near-term advancement to the PID + streamlined ISOAP/ICE phase.
19	East 2nd Street/Park Road Connector	Y	This project would significantly reduce the number of trucks accessing the Interstate system via Bayshore Road by diverting port origin/destination traffic onto a dedicated truck route that connects to the port via Park Road and Oak Road. It is considered a high priority for port modernization.

Source: GHD

Capital Improvement Plan (CIP)

Based on the qualitative evaluation of feasibility for all 19 potential capital improvement projects presented above, and consultation with key project stakeholders, including AMPORTS, Table ES2 below presents a list of the top 15 candidate projects for advancement to a more detailed planning/evaluation phase and/or design and construction, subject to required environmental and/or other permitting requirements as well as available funding. Table ES2 also presents a summary of capital costs by level of prioritization for the 15 modernization projects selected for advancement. The level of prioritization is based on considerations including, but not necessarily limited to: importance for current/near-term port operations; importance for near-term and long-term port diversification; importance for future air/water quality; and, importance for long-term port operations.

Project costs are based on Class 5[1] concept-level cost estimates completed for each project by the GHD team and have been rounded to the nearest $1,000. These cost estimates use 2029 as a base year. For projects expected to begin prior to 2029, the annualized 2029 cost estimate is still used. For projects expected to begin after 2029, a simple three percent (3%) annual escalation has been applied to the 2029 base amount to account for future labor and materials costs.

Four of the 15 projects (projects 9-11 and 18) require additional study before detailed project descriptions and associated capital cost estimates can be determined, meaning the cost estimates presented in this report specific to these four projects are placeholders for initial studies only. Once the recommended Project Initiation Document (PID) and streamlined Intersection Safety and Operational Assessment Process (ISOAP) and Intersection Control Evaluation (ICE) work has been completed for these four intersection improvement projects, design and construction costs can be estimated and added to the medium-priority projects total.

In addition, while a total project cost estimate of $69,800,000 was prepared for Project 8 (SLR Seawall), only $10,497,000 is included in this CIP. Of this, $100,000 is included as placeholder for a near-term follow-up geotechnical study of the existing port levee. The remaining $10,397,000 represents a 10 percent share of the total $69,800,000 2029-based project estimate, escalated to the year 2042. The reason only 10 percent of this cost has been included, and that it has been pushed out to the year 2042, is:

1. 10 precent is the rough proportion of the total cost of Project 8 assumed to be applicable to Segment D (Railroad Prism) mitigation; and
2. Implementation of the recommended SLR mitigation measure for Segment D (see Task 3 deliverable) is unlikely to be necessary prior to 2040, and would be optimally timed to coincide with the Bayshore Road improvements completed between 2040 and 2041 as part of Project 12.

Consistent with the City of Benicia's fiscal calendar, the following CIP is recommended for the Port of Benicia for the 15-year period beginning July 1, 2028 and ending June 30, 2042. This CIP totals $692,907,000.

There are still too many unknowns associated with the 15 projects selected for advancement to be able to accurately estimate precise implementation timeframes. However, based on the relative level of prioritization, expected capital costs and the respective technical complexity of each project, the timeframes shown in Table ES3-a (0-5 years), Table ES3-b (5-10 years) and Table ES3-c (10-15 years) reflect ranges within which each project might realistically be expected to be implemented. These timeframes will need to be updated dynamically and continuously over time in order to incorporate best available information as it becomes available. The availability of funding to advance each individual project from concept to design to construction will be especially critical to the ultimate CIP implementation schedule.

Table ES2: Prioritized Port of Benicia Capital Investments

Priority	Project # and Name	Subtotal with Annualized Escalation ($)	TOTAL ($)
High			
	1. Pier Structural Improvements	$216,699,000	
	2. Pier Expansion for Additional Mooring/Tug Berths	$68,387,000	
	3. Port Backlands Improvements	$239,344,000	
	5. Shore Power System	$34,108,000	
	7. Stormwater Infrastructure Improvements	$59,036,000	
			$617,574,000
Medium			
	9. Intersection Improvements - Park/Bayshore	$500,000	

[1] Class 5 cost estimates are rough order of magnitude (ROM), or "ballpark" estimates used to assist with preliminary capital planning.

	10. Intersection Improvements - Bayshore/I-680	$500,000	
	11. Intersection Improvements - Industrial/Park	$500,000	
	12. Bayshore Road Improvements	$16,438,000	
	13. Park/Adams Truck Restriction/Realignment	$250,000	
	16. Park Road Improvements	$16,003,000	
	17. Military East Improvements	$250,000	
	18. Intersection Improvements - Oak/Park	$500,000	
	19. East 2nd Street/Park Road Connector	$29,895,000	
			$64,836,000
Low			
	8. SLR Seawall	$10,497,000	
			$10,497,000
TOTAL (all 15 projects)			**$692,907,000**

Source: GHD

Table ES3-a: Recommended 0-5 Year CIP for Port of Benicia Facilities and Infrastructure Modernization Plan

		2028	2029	2030	2031	2032
1	Pier Structural Improvements			$70.11M	$72.21M	$74.38M
2	Pier Expansion for Additional Mooring/Tug Berths	$22.57M	$22.57M	$23.25M		
3	Port Backlands Improvements					
5	Shore Power System	$6.58M	$6.58M	$6.78M	$6.98M	$7.19M
7	Stormwater Infrastructure Improvements		$19.10M	$19.10M	$19.67M	
8	SLR Seawall	$100K				
9	Park/Bayshore Road Intersection Improvements		$500K			
10	Bayshore Road/I-680 Ramps Intersection Improvements		$500K			
11	Industrial Way/Park Road and I-680 Ramps Intersection Improvements		$500K			
12	Bayshore Road Improvements					
13	Park Road and Adams Street Truck Restriction/Realignment	$250K				
16	Park Road Improvements					
17	Military East Roadway Improvements/Truck Restriction	$250K				
18	Oak Road and Park Road Intersection Improvements		$500K			
19	East 2nd Street to Park Road Connector					
		$29.75M	$50.25M	$119.81M	$99.46M	$81.57M
				$380.83M		

Source: GHD

Table ES3-b: Recommended 5-10 Year CIP for Port of Benicia Facilities and Infrastructure Modernization Plan

		2033	2034	2035	2036	2037
1	Pier Structural Improvements					
2	Pier Expansion for Additional Mooring/Tug Berths					
3	Port Backlands Improvements	$77.44M	$79.76M	$82.15M		
5	Shore Power System					
7	Stormwater Infrastructure Improvements					
8	SLR Seawall					
9	Park/Bayshore Road Intersection Improvements				TBD	TBD
10	Bayshore Road/I-680 Ramps Intersection Improvements				TBD	TBD
11	Industrial Way/Park Road and I-680 Ramps Intersection Improvements				TBD	TBD
12	Bayshore Road Improvements					
13	Park Road and Adams Street Truck Restriction/Realignment					
16	Park Road Improvements		$7.88M	$8.12M		
17	Military East Roadway Improvements/Truck Restriction					
18	Oak Road and Park Road Intersection Improvements		TBD	TBD	TBD	TBD
19	East 2nd Street to Park Road Connector			$9.67M	$9.96M	$10.26M
		$77.44M	$87.64M	$99.94M	$9.96M	$10.26M
				$285.24M		

Source: GHD

Table ES3-c: Recommended 10-15 Year CIP for Port of Benicia Facilities and Infrastructure Modernization Plan

		2038	2039	2040	2041	2042
1	Pier Structural Improvements					
2	Pier Expansion for Additional Mooring/Tug Berths					
3	Port Backlands Improvements					
5	Shore Power System					
7	Stormwater Infrastructure Improvements					
8	SLR Seawall					$10.40M
9	Park/Bayshore Road Intersection Improvements	TBD	TBD			
10	Bayshore Road/I-680 Ramps Intersection Improvements	TBD	TBD			
11	Industrial Way/Park Road and I-680 Ramps Intersection Improvements	TBD	TBD			
12	Bayshore Road Improvements			$8.10M	$8.34M	
13	Park Road and Adams Street Truck Restriction/Realignment					
16	Park Road Improvements					
17	Military East Roadway Improvements/Truck Restriction					
18	Oak Road and Park Road Intersection Improvements					
19	East 2nd Street to Park Road Connector					
		$0	$0	$8.10M	$8.34M	$10.40M
				$26.84M		

Source: GHD

Port Expansion Options

Overview

Consistent with findings and analyses from the Infrastructure Assessment (Task 1), Port Demand, Capacity and Circulation/Transportation Analysis (Task 2) and Decarbonization and Resiliency Pathways (Task 3) deliverables already submitted, the GHD team assessed the ability of the Port of Benicia to increase its overall acreage to accommodate two separate growth scenarios:

1. Growth in Volume of Existing Cargo (only)
2. Growth in Volume of Existing Cargo Plus Diversification

The land adjacent to the tidelands area of the port is privately owned and operated as a marine terminal by AMPORTS. As a result, AMPORTS is a key stakeholder in the development of this Modernization plan. Since AMPORTS' legacy operation and primary cargo handling expertise in Benicia does involve, has involved and is expected to continue to involve ro-ro cargo, no scenario was explored that displaces existing ro-ro operations entirely. Similarly, only alternative uses that are able to complement projected future ro-ro operations are considered within this plan. In addition, while this Modernization plan envisions the Port of Benicia handling multiple different cargo types over time, no specific cargo type has been identified for facility and infrastructure modernization purposes. Rather, the intent of this plan is to maximize the capacity and flexibility of marine terminal facilities in Benicia in order to allow the port to adapt nimbly over time to new cargo types and emerging market opportunities, as needed. This cargo- and customer-agnostic approach to expansion of Port of Benicia waterside and landside facilities is reflected in the port expansion scenarios, feasibility analysis and capital improvement plan (CIP) discussed throughout the remainder of this Task 4 deliverable.

Expansion Scenarios

Scenario 1: Growth in Volume of Existing Cargo (only)

- Petroleum Coke (Coke)

  The future of the Valero Benicia refinery remains in question as of the development of this Modernization plan. This uncertainty was addressed to the extent possible within the Task 2 deliverable, and the following situation still holds true: if refining activity in Benicia increases, the volume of coke available to export will also increase; if refining activity in Benicia curtails or ceases altogether, then the volume of coke available to export through the Port of Benicia will also decrease (or disappear) accordingly. Regardless, none of the three coke volume forecasts completed during Task 2 anticipate the Port of Benicia's coke export volumes ever again equaling the historic peak volumes reached between 2015 and 2016 given the general decrease in fossil fuel consumption expected within California going forward. As a result, there is insufficient projected demand to justify any increase in berth or storage capacity at the Port of Benicia specific to petroleum coke operations. Should coke operations continue at the port at Berth East (see Figure 1), then existing infrastructure there that is dedicated to this product will not need to change. It will need to be maintained, repaired and/or replaced over time, consistent with state of good repair and other operating/regulatory requirements and best practices. However, all such maintenance and asset repair/replacement work is entirely the responsibility of the port operator (AMPORTS) and/or its sublessee at that location (Valero) and is therefore not considered a project for port modernization purposes in the context of this plan.

- Ro-Ro

  For ro-ro imports, there is potential for demand to outpace the port's ability to handle the increased volume. Available vessel berth windows (i.e. berth capacity) might be limited by 2040. Available landside space to store offloaded vehicles is already becoming a limiting factor from time to time (under current storage densities), but this constraint will almost certainly intensify by the 2040s, when all three demand forecasts (see Task 2 deliverable) exceed existing capacity even under the densest storage strategy.

To adequately meet demand for ro-ro cargo in the near term, the port needs to expand landside capacity or utilize denser storage strategies (primarily done by handling smaller vehicles or reducing on-terminal dwell times). In the long term, the port will need to implement those strategies along with adding more berthing windows, either by adding a vessel berth or by decreasing the dwell time of vessels at berth. In order to address this gap between future demand and existing capacity, a series of expansion options was evaluated by the GHD team. See Figure 2 for landside sites ultimately deemed to be viable and Figure 3 for recommended waterside improvements. A complete project description for these improvements and all other evaluated options is included in the feasibility section of this Task 4 deliverable.



Figure 1: Approximate Existing Port of Benicia Landside Coke Operation Footprint (source: Google Earth; GHD)



Figure 2: Approximate Footprint of Suitable Port of Benicia Yard Expansion Sites (source: Google Earth; GHD)

Scenario 2: Growth in Volume of Existing Cargo Plus Diversification

- Petroleum Coke (Coke)

  Given the lingering uncertainty around the future of Valero in the City of Benicia, it is premature to plan a specific replacement use for their coke operation at the Port of Benicia. This operation, which is currently managed by Valero under sublease to AMPORTS, currently sits on approximately three and a half (3.5) acres of improved waterfront backland area that connects to Berth East (Figure 1). The entire existing coke operation footprint sits within the Tidelands area of the port and is currently under lease to AMPORTS through 2031. Should coke operations at the port cease prior to that time, then how the Valero sublease gets repurposed will be determined by AMPORTS, in which case it is assumed that all acreage currently being used for coke operations will be cleared of existing vertical assets and improved/repaved to match the adjacent backland area in order to add more acreage for ro-ro cargo handling. Once a clear timeline has been determined for discontinuation of coke operations at the Port of Benicia, a more informed decision can be made as to the optimal alternative uses of the Valero sublease. For purposes of this plan, no modernization project has been scoped for this site since it is expected to be re-absorbed by the operator as a general cargo laydown area if/when coke operations are discontinued (assuming they are discontinued prior to 2031).

- Ro-Ro

  Because ro-ro demand is expected to continue growing, it will be challenging if not impossible to accommodate such growth in addition to new cargo types without beneficial use of additional acreage and berth capacity. From a modernization perspective, expanding the overall footprint of the port and improving the condition of the pier structure to the extent feasible are both critical. Doing both allows the port operator and the City to pursue potential new lines of business without disrupting or curtailing the predominant current business use (i.e. automobile imports) while doing only one (adding acreage) or the other (improving the condition of the pier structure) is insufficient to accommodate new cargo types and/or business uses without displacing ro-ro cargo.

- Other Uses

  A number of alternative potential business uses for the Port of Benicia were explored as part of Task 2 of this plan. The primary alternative uses identified for the Port of Benicia include wind energy support (i.e. manufacturing/fabrication (MF)) for offshore wind (OSW), high and heavy ro-ro cargo (i.e. tractors, heavy-duty trucks, military cargo, etc.), project cargo (i.e. pre-fabricated structures) and potentially other breakbulk cargo (i.e. steel, lumber, etc.). Steel component manufacturing and/or assembly associated with the proposed California Forever development, and/or shipbuilding support more generally were also considered as potential alternative uses. A detailed summary of all such alternative/complementary use cases is presented within the Task 2 deliverable for this plan. Regardless of what alternative uses are introduced to the Port of Benicia to complement legacy ro-ro activity, a larger footprint beyond the repurposing of the 3.5 acres of land currently used to handle coke, and an improved pier structure (see Figure 3) are both required. It must also be acknowledged that, because the port is a Tidelands asset, all port uses must meet Tidelands nexus criteria as determined by the California State Lands Commission (CSLC). In addition, the City, as well as essentially all stakeholders engaged as part of this Modernization plan process, communicated a very clear preference to prioritize waterfront industrial uses at the Port of Benicia over other options (i.e. waterfront commercial uses). Finally, in light of the uncertainty surrounding the future of the Valero Benicia refinery, it is possible, if not inevitable, that business uses for the port beyond those explored within this Modernization plan will emerge within the coming months and years as a result of economic and workforce shifts associated with turnover and/or redevelopment of the Valero Benicia refinery property. It is therefore important to future proof facilities at the Port of Benicia by ensuring that all port assets are planned in such a way that capacity and flexibility are maximized. Like the first scenario, in order to address the gap between future demand and existing capacity under this second scenario, a series of yard expansion options was evaluated by the GHD team. A complete project description for each evaluated option is included in the feasibility analysis section of this Task 4 deliverable.



Figure 3: Approximate Footprint of Minimum Recommended Port of Benicia Pier Improvements (source: Google Earth; GHD)

Generally speaking, since growth of any magnitude under either scenario necessitates backland area (yard) expansion, the fundamental difference between Scenarios 1 and 2 above is the relative extent of improvements to be made to the existing pier structure. Under Scenario 1, the pier structure requires only standard maintenance and asset repair/replacement in order to keep the pier structure in a state of good repair. No expansion of the pier is necessary under this scenario, even if the current coke operation remains (i.e. is not discontinued). Under Scenario 2, however, pier expansion is necessary, for two reasons.

First, the existing pier structure has structural load constraints that limit the ability of the operator to handle certain types of cargo (i.e. high and heavy cargo). This constraint effectively prevents alternative uses that exceed the load limits of the weakest areas of the existing pier structure. To eliminate these constraints, structural improvements to the pier must be made.

Second, an additional berth that can be available specifically for vessels carrying cargo types other than over-the-road vehicles (i.e. automobiles) is required in order to accommodate alternative future cargo types without disrupting future ro-ro operations. Without this pier expansion, the port will continue to be berth constrained long term, which will indefinitely limit the type of cargo that can be handled at Port of Benicia – regardless of how much additional acreage is added to the port's backland areas – and so too the long-term value that the port can provide in terms of economic activity and employment to the City of Benicia and its stakeholders.

Preferred Approach

Because additional backland area is required to accommodate anticipated future growth in cargo volumes under both port modernization scenarios outlined above, and since additional berth capacity is required to facilitate long-term diversification of cargo types, which is in the best interest of both the City and the port operator, it is recommended that the City of Benicia and AMPORTS work together to adopt a series of capital improvement projects as part of the current Modernization plan that, consistent with Scenario 2, allow the port to simultaneously grow its legacy operations while accommodating as-yet unspecified alternative future business uses and cargo types.

In addition, given the financial advantages to the port of implementing shore power rather than continuing to manage California Air Resources Board (CARB) compliance via the current vessel exhaust capturing system (see Task 3 deliverable), capital improvements associated with shore power are also recommended as are stormwater infrastructure improvements and long-term sea level rise mitigation measures.

Lastly, it is recommended that a series of transportation network improvements be further evaluated and/or implemented in order to increase safety, improve physical conditions and provide higher levels of service for major roadways and select intersections surrounding the Port of Benicia.

The feasibility analysis and CIP that follow reflect this preferred approach to both yard and berth expansion, and incorporate ancillary environmental and transportation projects, as appropriate. Both the City of Benicia and AMPORTS have contributed to the ideation and shortlisting of all projects presented below.

Feasibility Analysis

Introduction

This section of the Port of Benicia Facilities and Infrastructure Modernization plan presents a series of 19 potential capital improvement projects. All of these potential projects were evaluated by the Modernization plan project team, consistent with the goals of the plan and the preferred approach elaborated in the previous section.

A qualitative evaluation of each project's feasibility is also presented below, along with a short list of projects recommended for advancement. This qualitative evaluation consists of a matrix assessment of the relative technical, operational, economic and environmental characteristics of each project and a three-tiered determination of feasibility based on "low", "medium" and "high" performance against the following set of criteria:

- Complexity
- Cost
- Positive Benefit
- Negative Impact

In order to perform a quantitative analysis of feasibility for one or more of the recommended projects, a detailed benefit-cost analysis (BCA) for each project is required. Such BCA analyses are not included in the scope of this Modernization plan.

Potential Project Descriptions

Potential Project 1: Pier Structural Improvements



Figure 4: Proposed Structural Improvements to Existing Pier Structure (source: GHD)

Project Purpose

- To enhance the structural integrity and operational longevity of the Port of Benicia pier by replacing aging timber and deteriorating deck sections with modern concrete components. This upgrade would align the pier's structural capacity and approximate service life with previously replaced portions of the pier.

Project Location

- This project is located at the Port of Benicia, along the Carquinez Strait in Solano County, California. Targeted improvement areas include:
    - An approximately 300 foot section of pier near the access trestle
    - An approximately 850 foot section at the end of the pier

Project Description

- This effort proposes the removal of old timber piles and deck portions in two key segments of the existing pier structure. These sections would be replaced in their entirety, as described below, to match the newer portions of the pier.
    - 20-inch diameter precast prestressed concrete piles (spaced approximately 8 ft C.C. longitudinally and 6.5 ft C.C. transversely)
    - Reinforced concrete deck to match other deck sections (approximately 21-23”)
    - Safety features such as perimeter railing for the new segments
    - Fender replacements along new segments
    - New mooring equipment
    - Electrical and mechanical infrastructure to support at-berth operations

Approximate Quantities for Cost Estimating Purposes

- Total new sq ft: (300 ft + 830 ft = 1,130 ft) x 80 ft = 90,400 sq ft
- Estimated new piles:
    - 1,130 ft/8 ft = 141 rows
    - 80 ft/6.5 ft = 12 piles per row
    - 141 rows * 12 piles/row = 1,692 piles
- Concrete: 90,400 sf ft x 23/12 ft = 173,267 cubic ft = 6,417 CY

Cost Estimate

- $216,699,000

Qualitative Evaluation of Project Feasibility

- This project is critical to the future viability of the port since the load-bearing capacity of the timber pile supported sections of the existing pier structure (estimated to be 250 pounds per square foot) is substantially lower than that of the adjacent concrete pile supported sections of the existing pier structure (estimated to be 500 pounds per square foot). As highlighted in the Task 1 deliverable for this plan, because the area immediately adjacent to the trestle connecting the pier to the terra firma backland areas of the port is timber-pile supported, it serves as the controlling load capacity for all operations at the Port of Benicia. This limits the type of cargo that can be handled at the port since “high and heavy” cargo, including tractors, military equipment, and many types of break-bulk and project cargo would exceed the structural capacity of the unimproved sections of the pier. Thus, this differential in load-bearing capacity between original and upgraded sections of the existing pier structure serves as the literal weakest link in the port’s overall chain of assets and governs how heavy cargo coming into and going out of the Port of Benicia can be. Due to the age of the existing timber pile sections of the pier, there are also safety concerns associated with their degree of degradation and structural integrity (unverified).
- From a technical perspective (i.e. design and construction), improving the timber pile sections of the existing pier structure is feasible, with cost estimates being in line with standard costs for similar projects in similar contexts. No additional dredging would be required since the existing berthing envelope would not be expanded.

Operationally, there would be significant near-term impacts to AMPORTS and their customers during construction due to large sections of the pier being taken entirely or partially out of service for months at a time. Long term, however, the recommended structural improvements to the existing pier are critical to the viability of the port. In terms of economics, without improving the timber pile sections of the existing pier structure, no expansion beyond current capacity is possible at the Port of Benicia, meaning all future economic benefits beyond existing conditions depend on this project. Environmentally, improving this existing port asset requires an Initial Study/Mitigated Negative Declaration (IS/MND) document under the California Environmental Quality Act (CEQA), but does not require an Environmental Impact Report (EIR).

Table 1: Qualitative Feasibility of Project 1

Evaluation Criterion	Complexity (high/medium/low)	Cost ($) (high/medium/low)	Positive Benefit (high/medium/low)	Negative Impact (high/medium/low)
Technical	medium	high	n/a	n/a
Operational	medium	medium	high	medium
Economic	n/a	n/a	high	n/a
Environmental	low	n/a	n/a	low

Source: GHD

Potential Project 2: Pier Expansion for Additional Mooring/Tug Berths



Figure 5: Proposed Linear Expansion of Existing Pier Structure (source: GHD)

Project Purpose

- To increase operational capacity and improve safety/efficiency at the Port of Benicia by constructing a 400-foot pier extension that allows up to three (3) vessels to berth simultaneously without displacing tugboats and/or other marine service providers.

Project Location

- This project is located at the Port of Benicia, along the Carquinez Strait in Solano County, California. Improvements would occur adjacent to the existing pier structure via a 400-foot linear extension into the water to the southwest. See Figure 5.

Project Description

- This proposed project would consist of two phases.

  Phase 1: Pier Expansion

  The proposed 400-foot pier expansion will include the following components:

  - An approximately 400 ft x 80 ft deck expansion
  - An approximately 21”-23” concrete deck (to match existing improved pier areas)
  - 20” precast/prestressed concrete piles

  In order to match the existing pier structure, piles will be spaced approximately 8 feet in the longitudinal direction and 6.5 feet in the transverse direction. These piles will have to be driven into the seabed to support a reinforced concrete deck, a fendering system will need to be installed to support the new tugboat berth, and mooring hardware will need to be installed. Electrical and mechanical systems required to support at-berth operations, such as lighting, shore power, marine fueling, ladders, guardrails, etc. will be included.

  Phase 2: Associated Dredging Activity

  To ensure adequate water depth for vessel maneuvering and berthing, dredging to a minimum depth may be required. Quantities associated with this activity cannot be reliably estimated until a bathymetric survey has been completed for the project area.

Approximate Quantities for Cost Estimating Purposes

- Pier deck area: 400 ft x 80 ft = 32,000 sq ft
- Concrete volume: 32,000 sq ft x (23”/12 ft) = 61,333 cubic ft = 2,270 CY
- Pile count: 400 ft/8 ft = 50 rows
- 80 ft/6.5 ft = 12 piles per row
- 12 x 50 = 600 piles (approximately)

Cost Estimate

- $68,387,000

Qualitative Evaluation of Project Feasibility

- This project, while not critical to the future viability of the port, would add significant value to the port by opening up a third berth for cargo vessels. This additional berth would give the port operator much more flexibility to accommodate its customers without displacing tug operators and/or other marine service providers, and without requiring cargo vessels to wait at anchor during peak periods of activity until one of the two existing berths is available.
- From a technical perspective (i.e. design and construction), adding 400 linear feet of in-kind pier structure to the southwest end of the existing pier structure is feasible, with cost estimates being in line with standard costs for similar projects in similar contexts. Some additional dredging would be required since the existing berthing envelope would need to be expanded. The amount of dredging required, and the associated costs, will not be known unless/until a detailed bathymetric survey of that area is completed. Technically, this degree of dredging is feasible, though the lead time for permitting this in-water work remains to be determined. Operationally, there would be some near-term impacts to AMPORTS and their customers during construction.

- Long term, this pier expansion, combined with the structural improvements from Project 1, would enhance operational efficiency at the Port of Benicia by removing a known capacity constraint. In terms of economics, this pier expansion would increase the linear feet available for vessel berthing in Benicia by approximately 17 percent, meaning up to three vessels could berth at the port simultaneously compared to two vessels under existing conditions. Environmentally, adding this 400-foot section of new pier infrastructure at the port and dredging alongside to match the design depth of the rest of the pier (-38 feet mean lower low water (MLLW)) requires an IS/MND document under CEQA, but does not require an EIR.

Table 2: Qualitative Feasibility of Project 2

Evaluation Criterion	Complexity (high/medium/low)	Cost ($) (high/medium/low)	Positive Benefit (high/medium/low)	Negative Impact (high/medium/low)
Technical	medium	medium	n/a	n/a
Operational	medium	low	high	low
Economic	n/a	n/a	medium	n/a
Environmental	medium	n/a	n/a	low

Source: GHD

Potential Project 3: Port Backlands Improvements

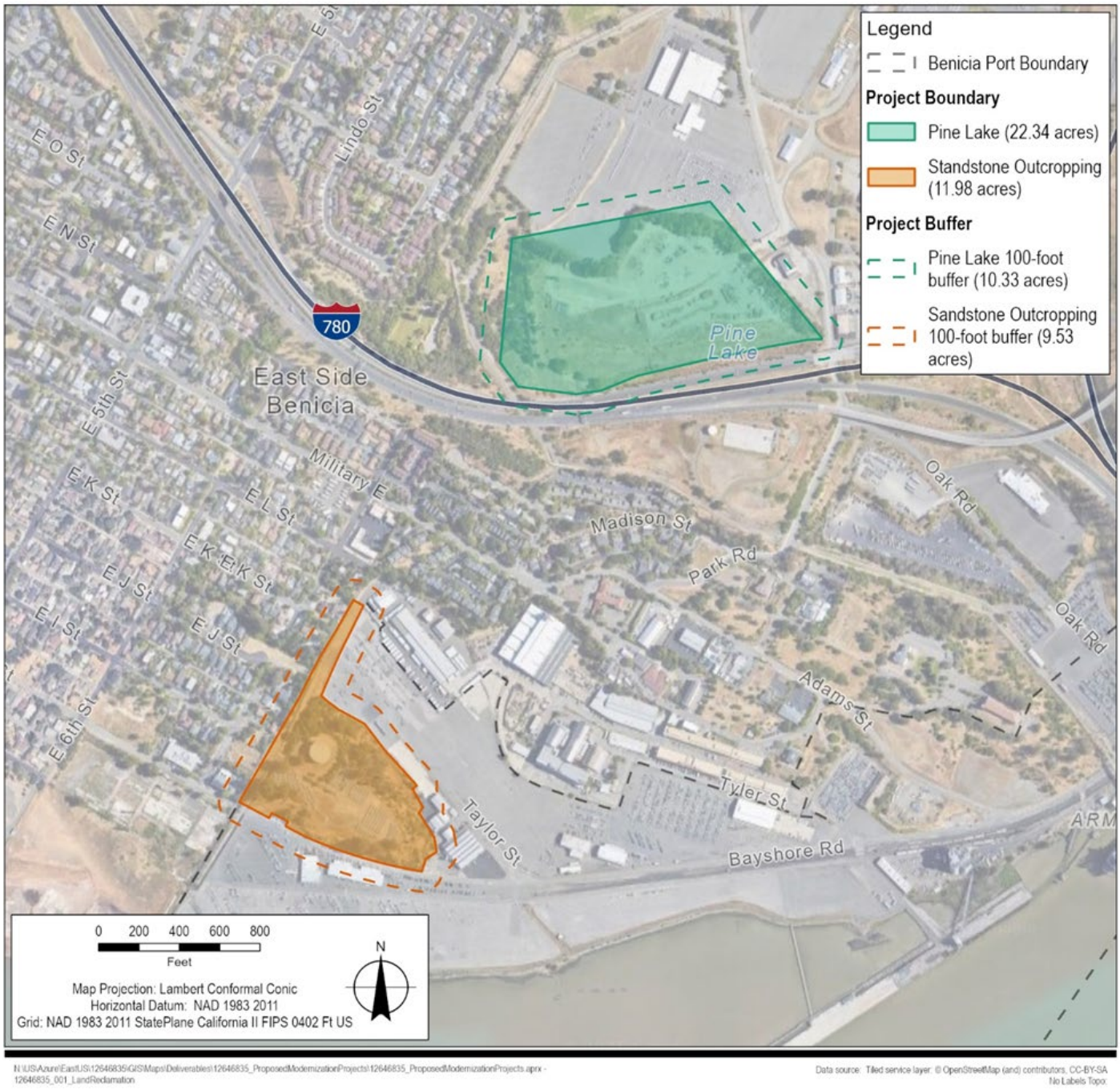


Figure 6: Proposed Port of Benicia Backlands Improvements Project Areas (source: GHD)

Project Purpose

- To repurpose underutilized terrain and expand Port of Benicia backland areas to increase static storage capacity and enhance operational capability/flexibility.

Project Location

- This project is located at the Port of Benicia, along the Carquinez Strait in Solano County, California. The two project sites under consideration are described below.

Site 1: Bottle Hill (aka sandstone outcropping)

Located on-port, consisting of approximately 12 acres of land ranging in elevation from 10-15 feet above sea level at the surrounding "flat" areas to approximately 45 feet above sea level at the highest point of the site. See Figure 6, Site 1.

Site 2: Park Yards (aka Pine Lake)

Located off-port and directly north of the existing pier structure, consisting of an elevated basin that is approximately 23 acres in total area with an elevation ranging from 153 feet above sea level at the lowest-lying area of the site to 166 feet above sea level at the surrounding "rim" areas. See Figure 6, Site 2.

Project Description

- This backlands improvement project involves two coordinated efforts at each of the two project sites.

  Site 1: Bottle Hill (aka sandstone outcropping)

  This 12-acre sandstone formation would be excavated, leveled and improved/paved to match the surrounding site conditions at an elevation of 10-15 feet above sea level. This would require the removal of approximately 630,000 cubic yards of sandstone. See calculation below:

  - Area: 12 acres x 43,560 sq ft/acre = 522,720 sq ft
  - Elevation reduction: 45 ft – 12.5 ft = 32.5 ft
  - Volume: 522,720 sq ft x 32.5 ft = 16,978,400 cubic ft = 630,000 CY (estimate)

  Site 2: Park Yards (aka Pine Lake)

  This 23-acre area, the basin of which is situated at an elevation of 153 feet above sea level, would be filled/raised to approximately 166 feet and improved/paved to match the surrounding site elevation/conditions. This would require approximately 480,000 cubic yards of fill material. See calculation below:

  - Area: 23 acres x 43,560 sq ft/acre = 1,002,880 sq ft
  - Elevation increase: 166 ft – 153 ft = 13 ft
  - Volume: 1,002,880 sq ft x 13 ft = 13,037,440 cubic ft = 480,000 CY (estimate)

  Fill material sourced from the sandstone outcropping (Site 1) excavation could be used to minimize the costs of bringing in additional non-local fill material.

Cost Estimate

- $239,344,000

Qualitative Evaluation of Project Feasibility

- This project is critical to the future viability of the port since there are no other *terra firma* sites with comparable available acreage surrounding the port with potential for near-term acquisition and/or improvement. As discussed in the previous section of this Task 4 deliverable, future diversification of the Port of Benicia depends equally on the ability of the existing pier structure to accommodate a wider range of cargo types (see Project 1 description) and on the availability of suitable backland areas in which to handle, store and manipulate/add value to cargo moving across the pier. Improvement of the two backland sites proposed above would add up to 35 acres of net new land to the port's operating footprint. This represents an increase of nearly 27 percent compared to status quo operations.
- From a technical perspective (i.e. design and construction), excavating, leveling and improving the Bottle Hill site (site 1) and filling, leveling and paving the Park Yards site (site 2) would require substantial site work and new utility infrastructure, but such work is feasible at both locations. From a cost perspective, it would likely be advantageous to complete both projects simultaneously and to schedule work at the two sites such that material removed from site 1 could be used to fill site 2. Operationally, there would be significant near-term impacts to AMPORTS and their customers during construction, especially at site 1, due to the amount of space required

to manage excavation of Bottle Hill and the sensitivity of AMPORTS' ro-ro cargo to dust debris, etc. As with the pier structural improvements recommended above (see Project 1), however, the recommended backland improvements are critical to the long-term viability of the port. In terms of economics, since AMPORTS owns both sites, acquisition costs are not a factor. Long term, without the additional acreage provided as a result of Project 3, it is difficult to imagine how the Port of Benicia would be able to diversify its future business activity without significantly disrupting its existing business activity. From an environmental perspective, improving sites 1 and 2 requires an IS/MND document under CEQA, as well as a biological study of the two currently unimproved sites. No EIR is required, however.

Table 3: Qualitative Feasibility of Project 3

Evaluation Criterion	Complexity (high/medium/low)	Cost ($) (high/medium/low)	Positive Benefit (high/medium/low)	Negative Impact (high/medium/low)
Technical	medium	high	n/a	n/a
Operational	medium	medium	high	medium
Economic	n/a	n/a	high	n/a
Environmental	medium	n/a	n/a	low

Source: GHD

Potential Project 4: Overwater Deck and Wharf Expansion

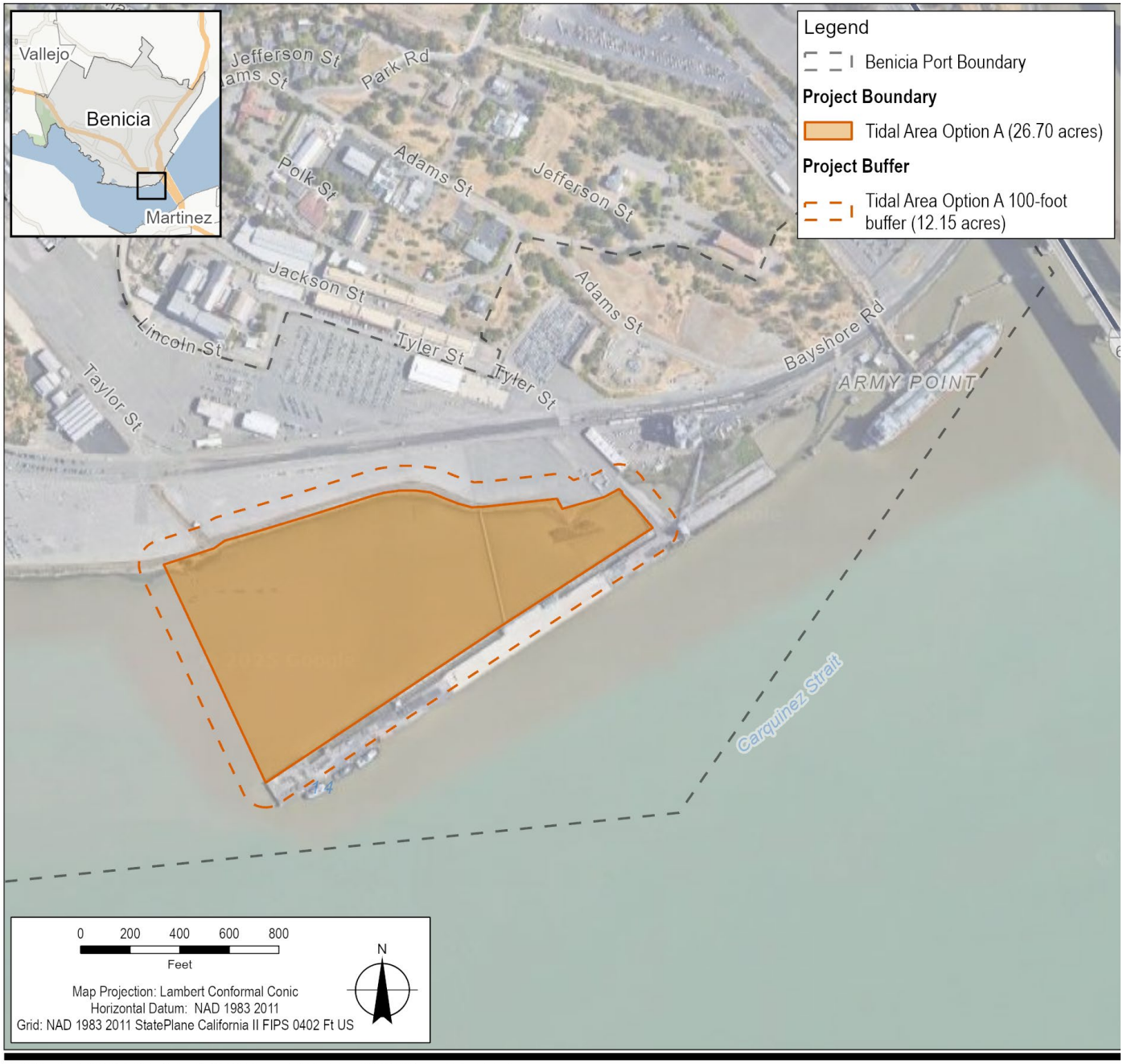


Figure 7: Proposed Port of Benicia Overwater Deck and Wharf Expansion – Option A (source: GHD)

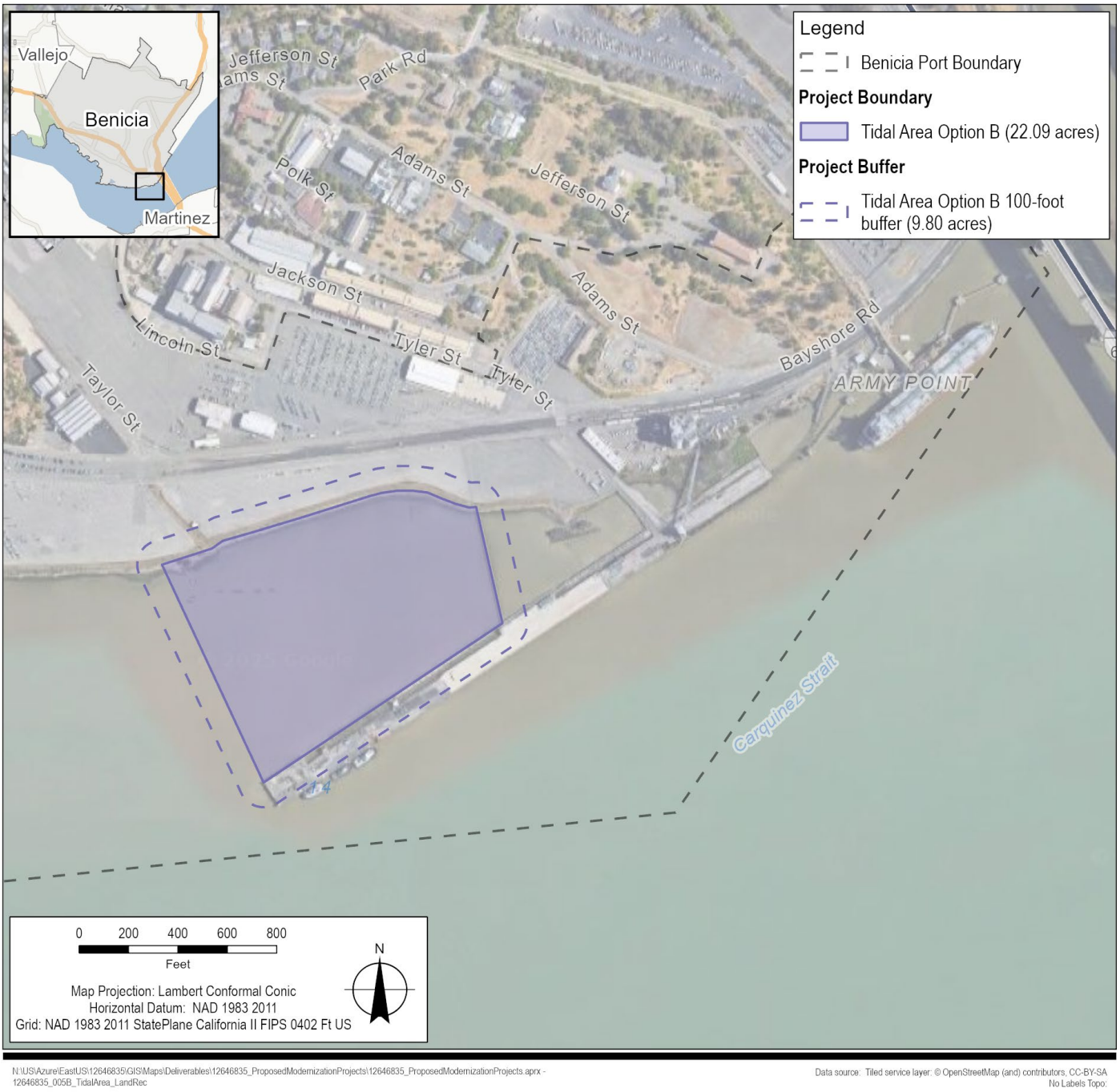


Figure 8: Proposed Port of Benicia Overwater Deck and Wharf Expansion – Option B (source: GHD)

Project Purpose

- To increase the efficiency of port operations and accommodate a greater variety of cargo types and/or future growth in overall cargo volumes by adding additional cargo handling area to the port backlands. This land submerged land reclamation project could take the form of a pile supported deck structure or dewatering with land improvement/fill.

Project Location

- This project is located at the Port of Benicia, along the Carquinez Strait in Solano County, California. The specified submerged land reclamation site is between the existing pier structure and the port backlands, which are currently situated behind a levee for flood protection purposes.

Project Area

- There are two separate expansion options for this project

  Option A: No Solar Array

  If the entire tidal area between the existing pier structure and the landside area of the port were to be reclaimed as deck/wharf space, it would add approximately 26 acres of new cargo handling area to the port. Under this option, there would be no overwater solar array/microgrid. See Figure 7.

  Option B: Solar Array

  If only the submerged area southwest of the catwalk connecting the port backlands to the existing pier structure were to be reclaimed as deck/wharf space, it would add approximately 21 acres of cargo handling area to the port, with the remaining 5 acres overwater potentially being allocated to a solar array/microgrid. See Figure 8 and Potential Project 6 description.

Project Description

- There are two structural options for the proposed new overwater cargo handling area.

  Option A: Pile Supported Structure

  This option would entail constructing a pile-supported deck over the tidal area. Steel pipe or concrete piles would need to be driven into the underlying strata to support a reinforced concrete deck. The deck's elevation would be designed to accommodate tidal fluctuations and sea level rise, and would need to be integrated with existing pier and terminal infrastructure. This new area would require electrical and mechanical utilities to be routed through the deck structure. To match the newer deck sections of the pier, the pile supported structure would have 20" precast/prestressed piles and a reinforced concrete deck of approximately 21"-23" thickness. To match piles spacing to the existing new portions of the pier, the piles would be spaced 8 feet C.C. longitudinally and 6.5 feet C.C. transversely.

  - Size: 21-26 acres of pile supported deck

  Approximate Quantities for Cost Estimating Purposes

  - Number of Piles:
    - Area Supported per pile: 6.5 ft x 8 ft= 52 sq ft/pile
    - 26 Acres = 1,132,560 sq ft/ 52 sq ft/pile = 21,780 piles
    - 21 Acres = 914,760 sq ft/ 52 sq ft/pile = 17,592 piles
  - Volume of Concrete:
    - 26 Acres = (1,132,560 sq ft x 23"/12 ft)/27 = 80,398 CY
    - 21 Acres = (914,760 sq ft x 23"/12 ft)/27 = 64,937 CY

  Considerations

  - There is potential for dredging along the southwest edge of the newly created pile supported structure up to -20 feet MLLW for tugboat berthing and maneuvering. The amount of dredging required, and the associated costs, will not be known unless/until a detailed bathymetric survey of that area is completed.
  - The initial quantities involved for this option put cost estimates over $1 billion, so it is deemed not to be feasible.

Option B: Land Improvement/Fill

This option would entail creating permanent reclaimed submerged land for expanded port operations by placing engineered fill over bay mud, likely using staged loading and soil improvement to accelerate consolidation. A retaining structure would need to be built to contain fill (sheet piles or rock revetments). Final grading and paving would be required for operational use. Utilizing the NOAA Bathymetric Data view, the depth to mudline is approximately 3 feet in this tidal area.

- Size: 21-26 acres

Approximate Quantities for Cost Estimating Purposes

- Amount of fill (approximate for 3 ft water depth):
  - 26 acres = (1,132,560 sq ft x 3 ft)/27 = 139,000 CY
  - 21 acres = (914,760 sq ft x 3 ft)/27 = 102,000 CY

Cost Estimate (fill option only)

- 26 acres: $348,100,000 (2029 dollars)
- 21 acres: $312,600 (2029 dollars)

Qualitative Evaluation of Project Feasibility

- This project is not critical to the future viability of the port. However, it would add highly advantageous operating acreage along the waterfront and immediately adjacent to the pier. This configuration would be optimal for port operations since it would allow various types of cargo that cannot easily be loaded or unloaded onto/off of vessels at the existing pier structure to be handled. As discussed in the previous section of this Task 4 deliverable, future diversification of the Port of Benicia depends equally on the ability of the existing pier structure to accommodate a wider range of cargo types (see Project 1 description) and on the availability of suitable backland areas in which to handle, store and manipulate/add value to cargo moving across the pier. Both options evaluated above would therefore facilitate cargo diversification.
- From a technical perspective (i.e. design and construction), both option A (26 acres) and option B (21 acres) as described above are feasible, either as pile-supported structures or as reclaimed submerged land fill projects. From a cost perspective, both option A and option B are within a reasonable range of long-term feasibility assuming a land improvement/fill construction method (approximately $312-$348 million). A pile-supported structure, on the other hand, would be an order of magnitude costlier and infeasible from a return on investment perspective, even over the complete life of the asset. Operationally, either option A or option B would be optimal in terms of adding acreage to the port's waterfront. Option A (26 acres), in particular, would create a near-ideal operating condition across multiple cargo types. From an economic perspective, the additional acreage added under either option would help the port operator capture additional future value by expanding the footprint of the port between 16 percent (21 acres) and 20 percent (26 acres). Environmentally, both option A and option B would require an EIR under CEQA.

Table 4: Qualitative Feasibility of Project 4

Evaluation Criterion	Complexity (high/medium/low)	Cost ($) (high/medium/low)	Positive Benefit (high/medium/low)	Negative Impact (high/medium/low)
Technical	high	high	n/a	n/a
Operational	medium	medium	high	medium
Economic	n/a	n/a	high	n/a
Environmental	high	n/a	n/a	high

Source: GHD

Potential Project 5: Shore Power System

Project Purpose

- The purpose of this project is to eliminate vessel emissions within the Port of Benicia by allowing vessels at berth to turn off their auxiliary engines and power their hoteling operations using grid-provided electrical power.

Project Location

- This project is located at the Port of Benicia, along the Carquinez Strait in Solano County, California. The specific project sites are illustrated in the exhibits below.

Project Description

- This project would involve multiple development sites and connecting electrical infrastructure as described and illustrated below.

  Site 1: Switchgear/Transformer Substation

  PG&E owns a 12 kV overhead line along Bayshore Road extending from Oak Road at its west end all the way to its crossing with Bayshore Road at 5th Street at its east end. It is not clear whether PG&E's existing facilities would be able to accommodate the amount of power needed for either a two-berth or three-berth shore power system. Under a conservative scenario, which GHD believes to be most likely, PG&E would be required to upgrade their circuits to provide sufficient capacity to deliver the required shore power to the terminal entrance. A shore power service entrance switchgear/transformer substation is proposed to be located at the southwest corner of Van Buren Street and Bayshore Road at the south side of the railroad tracks. Underground shore power conduit would then be run along Van Buren Street to connect this substation via feeders to waterside shore power infrastructure along the existing/improved pier structure. See Figure 9.

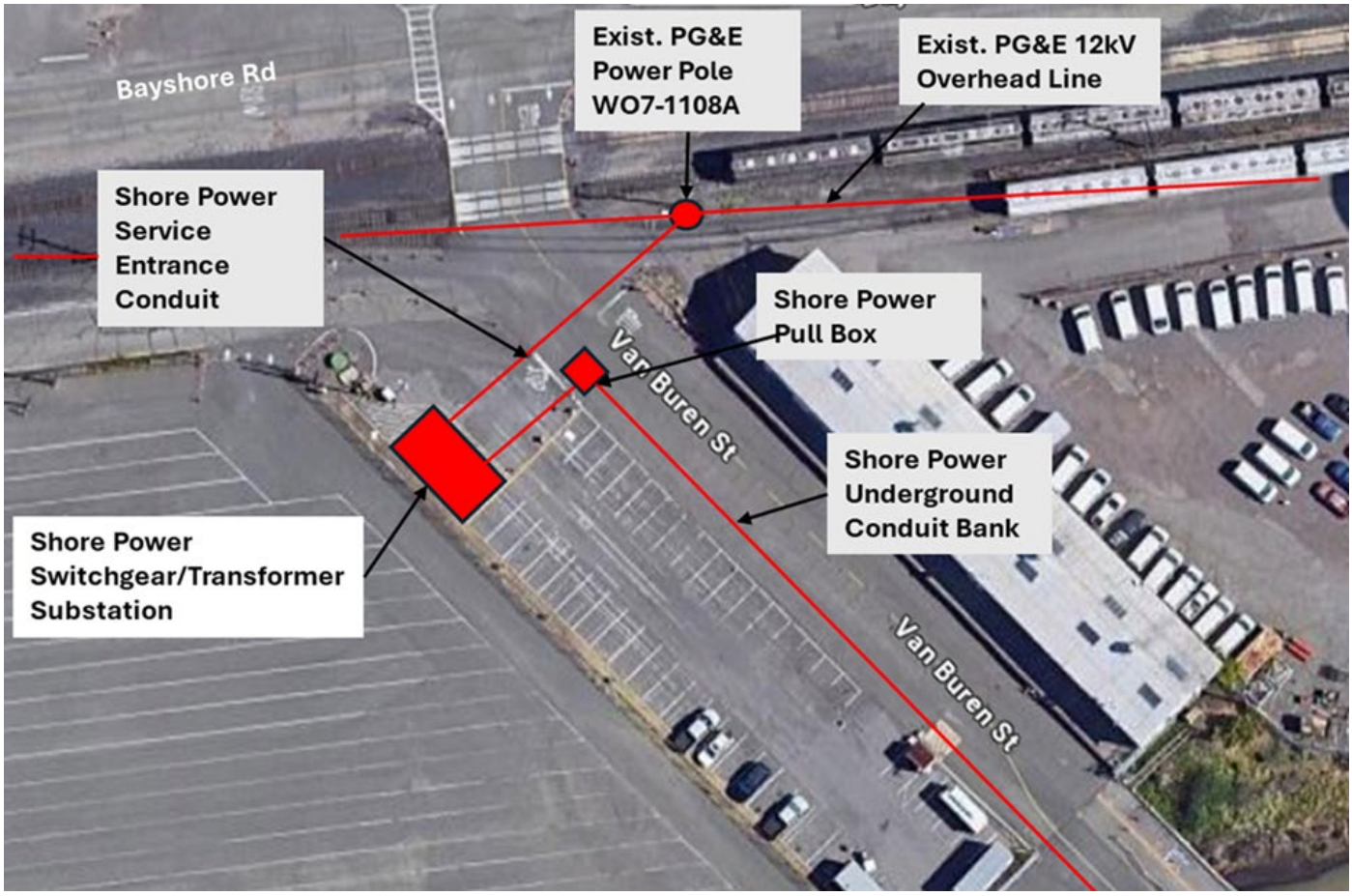


Figure 9: Proposed Port of Benicia Shore Power Infrastructure – Site 1 (source: Google Earth; H3)

Site 2: Berth East (Dry Bulk Terminal)

The eastern portion of the Port of Benicia's pier structure is currently utilized to load dry bulk vessels carrying petroleum coke. The vessels are loaded through a fixed conveyor loading mechanism located at the west end of this section of the pier. The proposed shore power feeders traveling south along Van Buren Street via underground conduit would turn east to connect to a movable shore power connection interface box. This box is proposed to be located at the center point of the cable chain track element. The track element would provide the necessary power to a movable shore power connection outlet, traversing along the track element. A movable wheel-based cable manager system equipped with a lifting mechanism would provide the flexible cable necessary to connect the movable shore power connection interface to multiple bulk vessel types. See Figure 10. It must be noted that it is possible, if not likely, that coke operations will have ceased by the time a shore power system has been designed for the Port of Benicia. However, the core infrastructure proposed here can be designed around the needs of multiple vessel types and power requirements, meaning the concept proposed here remains valid even if the Berth East section of the pier is repurposed to an alternative operation.



Figure 10: Proposed Port of Benicia Shore Power Infrastructure – Site 2 (source: Google Earth; H3)

Site 3: Ro-Ro Terminal(s)

The western portion of the Port of Benicia's existing pier structure is utilized to unload/load roll-on/roll-off (ro-ro) cargo such as automobiles, farming equipment and other wheeled cargo. This ro-ro cargo is driven or towed off or onto the vessel utilizing the vessel's ramp (See Task 1 deliverable). Prior to operations, the vessel lowers its ramp to rest upon the wharf. Due to the ramp operation, unlike the dry bulk facility, the movable shore power track element on this section of the pier must be installed on the vertical face of the wharf edge, behind the fender piles in order not to interfere with vessel operations.

The proposed connection point of the vessel to the moveable shore power connection interface in this area of the pier would be located within 100 yards of the aft of the vessel towards its stern with a maximum 30-foot vertical reach from the finished surface of the pier. The proposed shore power feeders traveling south on Van Buren Street would turn west to connect to the proposed movable shore power connection interface box. This box is proposed to be located at the center point of the cable chain track element. The track element would provide the necessary power to a movable shore power connection outlet, traversing along the track element. A movable wheel-based cable manager system equipped with a lifting mechanism would provide the flexible cable necessary to connect the movable shore power connection interface to multiple ro-ro vessel types. See Figure 11.

It should be noted that there are two options for connection of this system, depending on whether or not the existing timber pile sections of the pier structure are improved to activate a third usable berth (see Project 1). The description above assumes no improvement to the existing pier structure, i.e. status quo operations. Should the proposed pier improvements move forward as a separate project, then a second shore power connection interface that is substantially similar to that described above would be required at the new berth at the far southeastern end of the pier. Cost estimates for both a two-berth and a three-berth scenario are provided below.

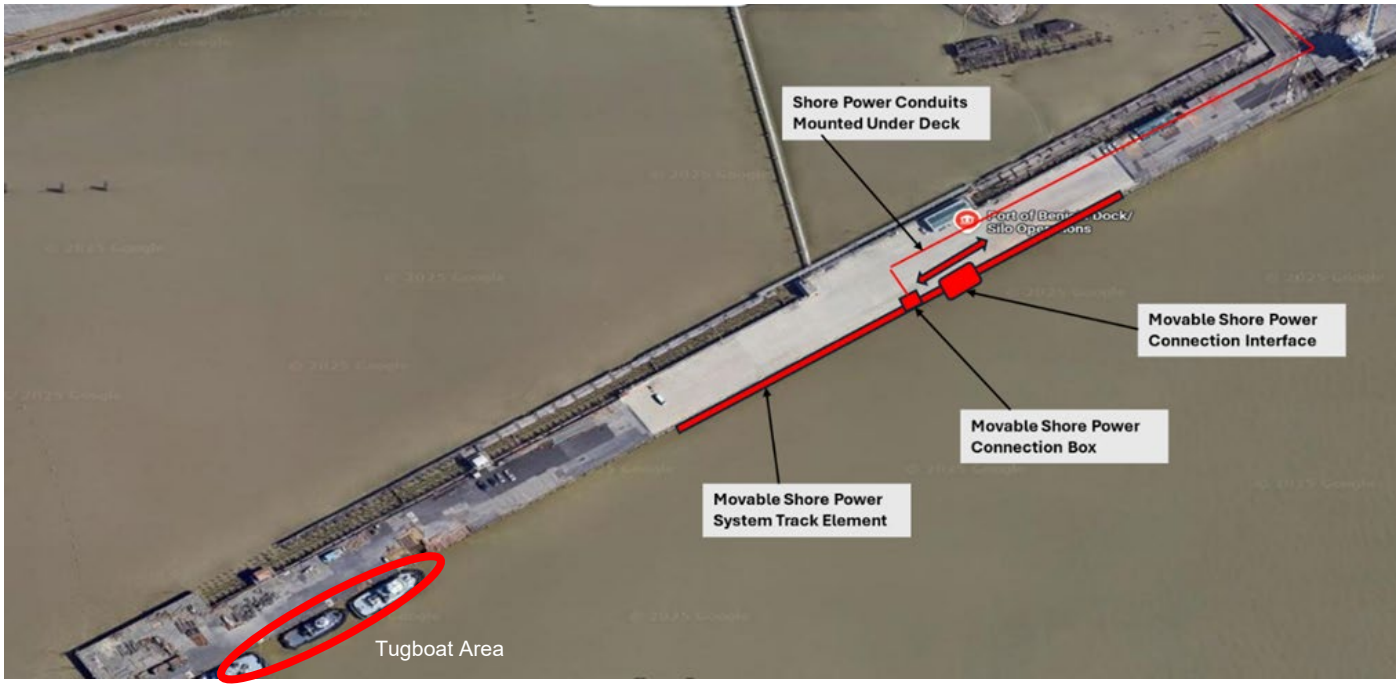


Figure 11: Proposed Port of Benicia Shore Power Infrastructure – Sites 3 and 4 (source: Google Earth; H3)

Site 4: Tugboat Area

Regardless of whether or not the proposed pier improvements move forward as a separate project (Project 1), tugboats serving the Port of Benicia require a separate area to tie up and plug in to shore power. To connect tugboats to the proposed shore power system, it is recommended to route a separate 12 kV feeder from the proposed shore power switchgear/transformer substation (site 1) to the designated tugboat area. This separate tugboat feeder would be sub-metered to capture tugboat power consumption independently of cargo vessel operations. It would travel in the same trench as the other shore power feeders and terminate in a local transformer located at the pier, as appropriate, to provide tug-specific voltage. On the pier, adjacent to this transformer, a proposed switchboard would provide the required circuit distribution and power control to multiple tugboat shore power outlets installed at the edge of the wharf. These outlets could be installed in a box flush with the wharf surface or, for greater cost effectiveness, on top of the wharf. The outlet locations would be equipped with a post-mount cable manager system with a cable retractor mounted on the post. See Figure 11.

Cost Estimate

- $34,108,000 (three berths)

Qualitative Evaluation of Project Feasibility

- This project, while not critical to the future viability of the port, is strongly recommended. The port's STAX unit, which is used to capture and sequester vessel emissions at berth using a California Air Resources Board (CARB) approved bonnet system, is a costlier alternative to shore power (see the Task 3 deliverable for this Modernization plan for a detailed comparison of costs). Because of this, AMPORTS, the port operator, has expressed clear support for implementing a shore power system as their preferred long-term at-berth emission reduction mechanism. Shore power is also the industry standard for curtailing vessel emissions at berth.

- Given the complexity of the shore power system described above, the multiple stakeholders involved, the uncertainty surrounding the future of the coke operation in Benicia, and the likely long lead times for major electrical equipment and components, it is expected that the design, plan-check, advertising, bidding, construction and testing/commissioning schedule for the two-berth scenario will exceed 30 months. The three-berth scenario, which is recommended by the GHD team, is expected to exceed 36 months. Should the proposed pier improvements move forward as a separate project (Project 1), then this shore power schedule could be coordinated and integrated with that project schedule to maximize efficiency and minimize the period of operational disruption.
- From a technical perspective (i.e. design and construction), both a two-berth and three-berth scenario are feasible, and the costs proposed are in line with similar projects at other ports. Any shore power system in Benicia would require close coordination with both PG&E and AMPORTS. Operationally, as discussed above, some disruption to activity at the pier is inevitable during construction, but timing shore power system construction to coincide with Project 1 and Project 2 implementation would minimize such disruption by concentrating all proposed work at the pier within a single construction window. Economically, shore power adds some economic value to the City of Benicia by creating an opportunity for additionl utility surcharge revenue. It would also reduce long-term operating costs, which creates value for AMPORTS and its customers. Environmentally, shore power requires an IS/MND document under CEQA, meaning no EIR is required.

Table 5: Qualitative Feasibility of Project 5

Evaluation Criterion	Complexity (high/medium/low)	Cost ($) (high/medium/low)	Positive Benefit (high/medium/low)	Negative Impact (high/medium/low)
Technical	medium	medium	n/a	n/a
Operational	medium	medium	high	medium
Economic	n/a	n/a	medium	n/a
Environmental	low	n/a	high	low

Source: GHD

Potential Project 6: Overwater Solar Array and Landside BESS

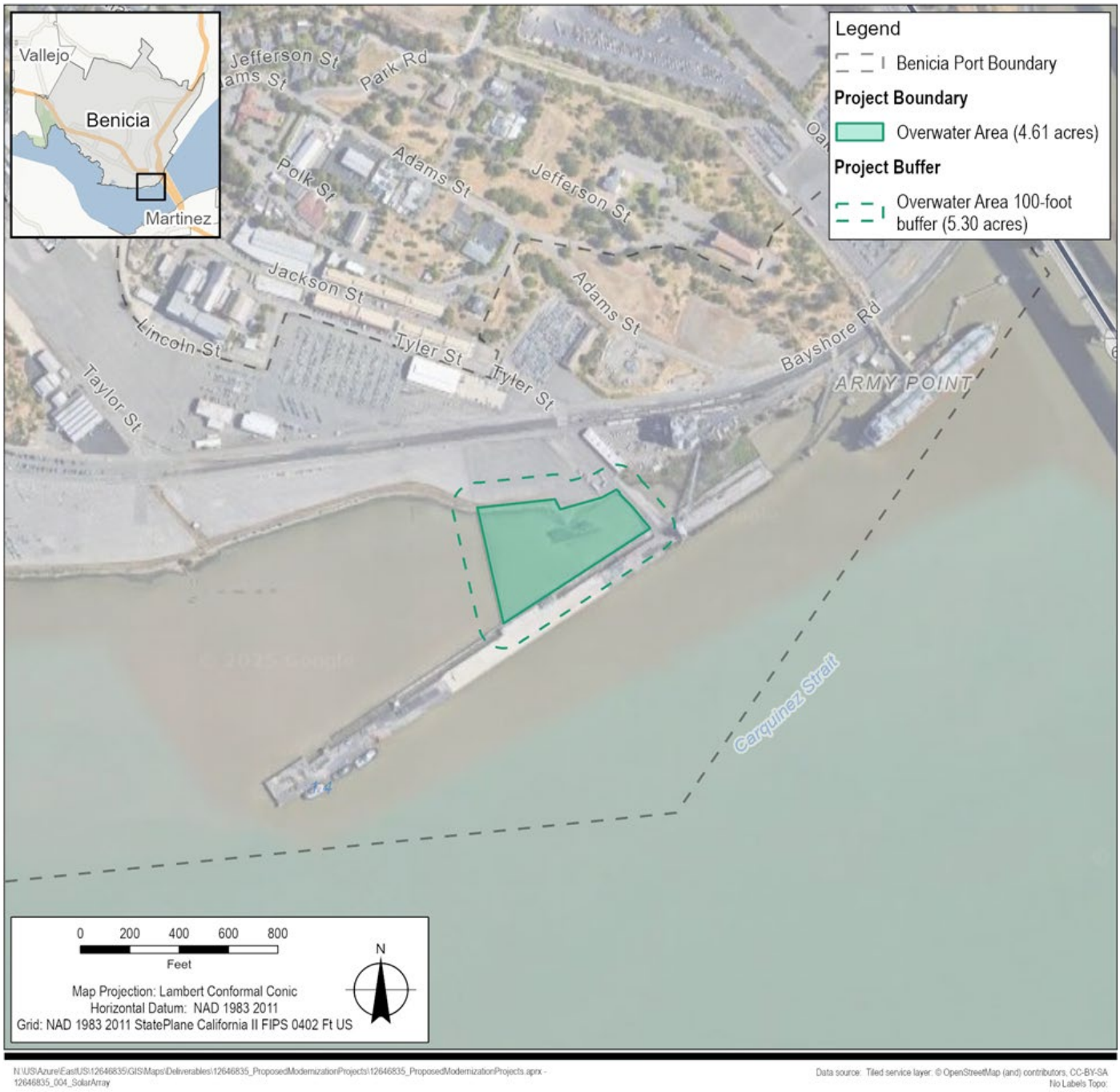


Figure 12: Proposed Port of Benicia Solar Array/BESS System Project Area (source: GHD)

Project Purpose

- To create a renewable energy system (i.e. microgrid) that will enhance the port's operational efficiency and resiliency and support California's clean energy goals.

Project Location

- This project is located at the Port of Benicia, along the Carquinez Strait in Solano County, California. The two project sites under consideration are described below.

Site 1: Overwater Area

Consists of approximately 5 acres of tidal water located between the existing pier structure and the port backlands, which are currently situated behind a levee for flood protection purposes. The specified portion of tidal water area is between the access trestle and the center berth. See Figure 12.

Site 2: Landside Area

Adjacent to the overwater area there would be a zone that has a battery energy storage system (BESS), electrical interconnection equipment, and monitoring systems. See Figure 12. This could be accessible via Bayshore Road as it is already served by PG&E's 12kV overhead line infrastructure. Additional electrical needs are described below.

Project Description

- This project involves two coordinated efforts.

  Site 1: Overwater Area

  Development at this site would entail constructing/installing a solar photovoltaic (PV) array over the tidal water area between the existing Port of Benicia pier structure and the *terra firm*a port backlands, with two design options: a floating solar array system, and a structural truss-mounted solar array system.

  Site 2: Landside Area

  Development at this site would entail BESS construction/installation.

Project Options

- There are two different overwater design options for this project as described below. Both of these options would require existing pile removal/remediation consisting of the following activities:
  - Pile removal
  - Sediment management and environmental studies
  - Preparation for anchoring or piled supports for solar array
- Both options below would also require the following landside electrical improvements:
  - New switchgear, transformer pads, and medium voltage cabling to the BESS area
  - Fire protection and clearances per NFPA 855

  Option A: Floating Solar Array System

  Installation of a floating solar PV array over the approximately 5-acre tidal water area. The system would consist of buoyant platforms supporting solar modules, anchored securely to withstand tidal and wind forces. Electrical cables would be routed underwater to the backland area of the port immediately adjacent to the overwater area, where a BESS would be constructed/installed.

  - Area: 4.65 acres (1.88 hectares)
  - Estimated power production capability: 2.5 MW (based on 1.33 MW/hectare)
  - Battery storage capacity: 2.5 MWh (assumes 1.0 MWh of storage per 1 MW of PV capacity)
  - Battery storage area: 1.25 acres (0.5 acres per MWh, typical of lithium ion system)

  Option B: Structural Truss-Mounted Solar Array System

  Construction of an elevated truss-mounted solar PV array over the approximately 5-acre tidal water area. Steel trusses would be anchored on each end to the existing pier structure and the *terra firma* backland area of the port, with intermediate support structures, i.e. piles, installed in the water. The trusses would be elevated above the water to allow tidal flows and elevation variation. Solar modules would be mounted at optimized tilt angles and electrical cabling would be routed through conduit trays to the landside BESS.

- Area: 4.65 acres (1.88 hectares)
- Estimated power production capability: 2.5 MW (based on 1.33 MW/hectare)
- Battery storage capacity: 2.5 MWh (assumes 1.0 MWh of storage per 1 MW of PV capacity)
- Battery storage area: 1.25 acres (0.5 acres per MWh, typical of lithium ion system)

Alternative Landside Installation

- In the event that neither of the two overwater options described above is selected for implementation, an elevated truss-mounted solar PV array could be constructed within an area of the existing port backlands. Under this alternative landside installation, steel trusses would be anchored to the ground via foundations or piles, with intermediate supports installed also using foundations/piles. Solar modules would be mounted at optimized tilt angles and electrical cabling would be routed through conduit trays to an adjacent BESS. For cost comparison purposes, this alternative landside installation would be equal in size to the overwater system proposed under Option B.
  - Area: 4.65 acres (1.88 hectares)
  - Estimated power production capability: 2.5 MW (based on 1.33 MW/hectare)
  - Battery storage capacity: 2.5 MWh (assumed 1.0 MWh of storage per 1 MW of PV capacity)
  - Battery storage Area: 1.25 acre (0.5 acres per MWh, typical of lithium ion system)

Cost Estimate

- Option A: $5,760,000 (2029 dollars)
- Option B: $8,960,000 (2029 dollars)
- Landside alternative = not considered.

Qualitative Evaluation of Project Feasibility

- This project is not critical to the future viability of the port, nor is it operationally necessary. In addition, the amount of energy provided by the proposed system, while not insignificant, would be insufficient to power systems at the port beyond existing scope 1 (see Task 3 deliverable). As a standalone project, this microgrid would enhance the energy resiliency of the Port of Benicia by introducing a redundant system that can operate independently of the PG&E grid, as needed. The value of that redundancy, however, must be weighed against the costs and operational impacts of the project.
- From a technical perspective (i.e. design and construction), both overwater solar array and landside BESS options proposed above are feasible, with the cost differential clearly favoring option A. Operationally, the impacts during construction of the overwater options would be minimal. However, it is also the case that the cost of the system compared to the amount of power produced makes the feasibility of both overwater options highly questionable. This is especially true since, should shore power be implemented, a new switchgear/transformer substation is still expected to be required, meaning the proposed microgrid would introduce a capital expense that would not solve any known problem, and would function primarily as a resiliency measure, providing power to some (though, crucially, not all) port systems in cases of grid disruption. The alternative landside installation discussed above would cost about the same as the floating overwater system (option A), but would occupy at least 4.65 acres of high-value waterfront land from the port. Considering the existing land constraints at the Port of Benicia, a landside microgrid is not feasible or recommended. In terms of economics, the upfront capital cost and ongoing maintenance requirements associated with a solar array/BESS facility are not obviously supported since the power provided by such a system would largely be redundant. Environmentally, constructing a microgrid at the Port of Benicia would require an IS/MND document under CEQA rather than an EIR, and would reflect broader sustainability goals.

Table 6: Qualitative Feasibility of Project 6

Evaluation Criterion	Complexity (high/medium/low)	Cost ($) (high/medium/low)	Positive Benefit (high/medium/low)	Negative Impact (high/medium/low)
Technical	medium	low	n/a	n/a
Operational	medium	medium	low	medium
Economic	n/a	n/a	low	n/a
Environmental	medium	n/a	medium	medium

Source: GHD

Potential Project 7: Stormwater Infrastructure Improvements

Project Purpose

- To improve the quality of stormwater runoff from the Port of Benicia into the Carquinez Strait.

Project Location

- This project is located at the Port of Benicia, along the Carquinez Strait in Solano County, California. There are four specific project sites, each corresponding to the location of an existing pump station.

Project Description

- This project entails two separate stormwater treatment measures.

  System 1: Trash Capture

  For trash capture, trash racks would be installed at the intake of the existing pump stations. This would reduce trash that would otherwise be pumped into the adjacent Carquinez Strait and also reduce the potential for clogging and damage to the pump stations. The drainage facilities upstream of the pump stations are not known. The cost estimate developed for this alternative assumes that four trash racks would be installed. Depending on the configuration of upstream drainage facilities, additional trash racks may be recommended at upstream inlets.

  System 2: Stormwater Treatment

  This project would include stormwater treatment facilities, such as bioretention facilities. Infiltration may not be feasible due to the low-lying elevations across the port and likely high groundwater conditions, so bioretention facilities are likely to be more suitable than infiltration basins or trenches. More detailed analysis is required to assess the operational impacts associated with bioretention facilities, including available area for these facilities, elevation (they would likely require ±3 feet of elevation to function). Additional information as to the location and condition of any upstream/downstream drainage facilities is also required. Finally, high groundwater may pose a constructability challenge. For cost estimating purposes, the sizes of the bioretention facilities are assumed to be 4 percent of the tributary impervious area. A typical cross-section of a bioretention facility is shown in Figure 13 below, for example purposes only.

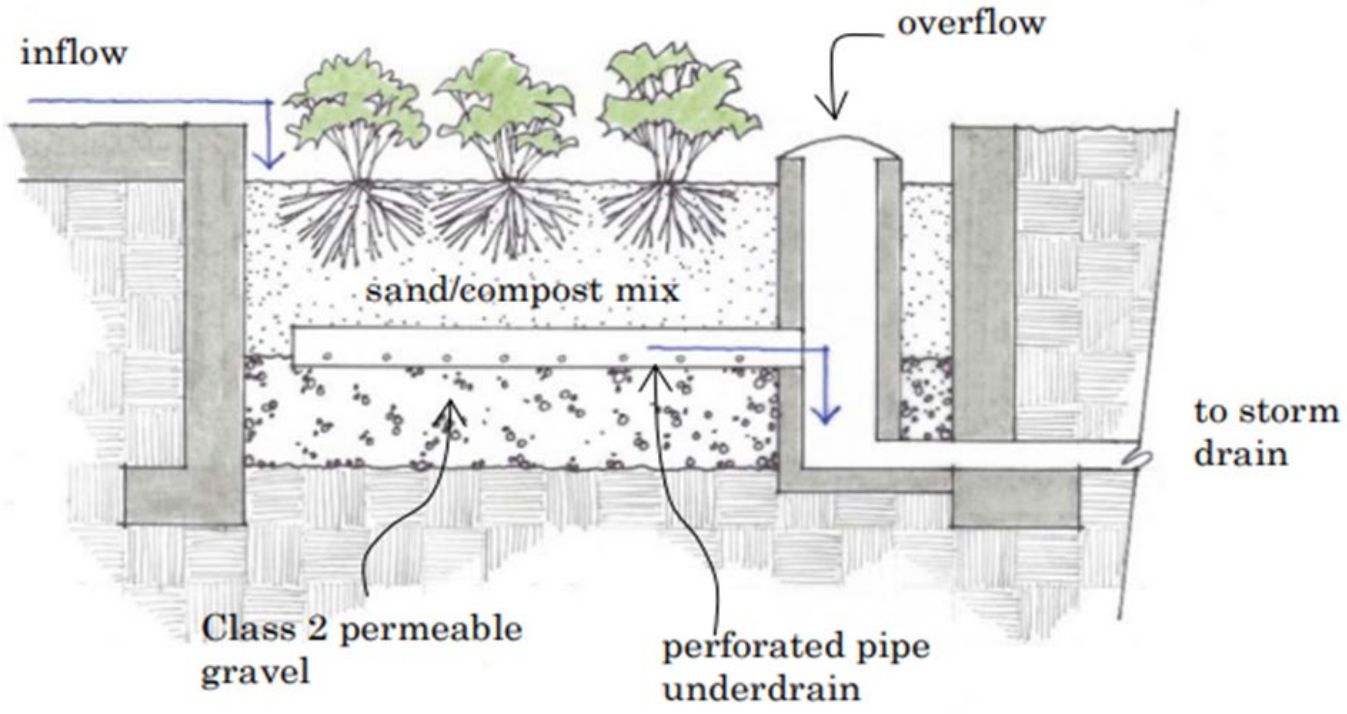


Figure 13: Typical cross-section of a bioretention facility from the Solano Stormwater Alliance Stormwater C.3 Guidebook

Sizing

- Table 7 below indicates the recommended sizing of each bioretention facility. This sizing, which has been estimated exclusively for preliminary ROM cost estimating purposes, is based on minimum Integrated Management Practice (IMP) area, provided as a ratio of impervious tributary area per Table 3-5 of Stormwater C.3 Guidebook for Solano Stormwater Alliance. If/when this project advances to the detailed planning and design phase, additional resources and guidelines will need to be consulted, including the 2019 Bay Area Stormwater Management Agencies Association (BASMAA) Post—construction Manual, available online at: https://www.ci.benicia.ca.us/vertical/sites/%7BF991A639-AAED-4E1A-9735-86EA195E2C8D%7D/uploads/BASMAA_Post_Construction_Manual_2019.pdf).

Table 7: Preliminary Bioretention Facility Areas

Pump Station (PS)	Drainage Area (acres)	Impervious Area (acres)	Bioretention Area (acres)
PS1	11.0	11.0	0.4
PS2 (upper)	41.3	18.6	0.7
PS2 (lower)	59.6	19.1	0.8
PS3	24.1	24.1	1.0
PS4	11.4	11.4	0.5

Source: https://solanostormwater.org/wp-content/uploads/2024/11/SSA_StormwaterC3Guidebook_2024_Ed._2024-11-01.pdf

Notes:

- *PS1 – Several inlets exist within this drainage area, and it is unknown where flow from these inlets is directed. Watershed was assumed.*
- *PS2 (upper) – The pump station appears to be adjacent to a channel that has a large drainage area. It is assumed that this bioretention facility is sized to collect flow from the upper AMPORT parcels area that are tributary to this channel. Impervious area was calculated based on NOAA's 2021 C-CAP data.*
- *PS2 (lower) – The pump station appears to be adjacent to a channel that has a large drainage area. It is assumed that this bioretention facility is sized to collect flow from the lower AMPORT parcels that are tributary to this channel. Impervious area was calculated based on NOAA's 2021 C-CAP data.*
- *PS3 – It is assumed that the 20.6-acre and 10.5-acre parcels leased to UP have a separate outlet (contours show that they drain away from the assumed PS location).*
- *PS4 – Several inlets exist within the 29.3- and 11.4-acre parcels leased to UP. It is unknown where flow from these inlets is directed. Biofiltration facilities are sized assuming they would capture runoff from the 11.4 acre parcel only.*

- Figures 14-17 below show the assumed tributary areas for each of the four pump stations. Locations of existing drainage infrastructure upstream of the pump stations are not precisely known, so drainage areas have been estimated based on LiDAR topography. Further analysis is recommended to refine the tributary areas of the existing pump stations and recommended bioretention areas, which would require more information on the existing drainage facilities in the area. Pump station 2 appears to be adjacent to a channel with a large drainage area. It is assumed that the pump station intake is off of this channel; however, more information would be required to verify the pump station configuration and intake location. The tributary area for Pump station 2 was assumed to be equal to the tributary area of the channel. Providing bioretention facilities for the entire tributary area is unlikely to be feasible, so the sizing below assumes that there would be two bioretention facilities within the drainage area for pump station 2: one that is sized to treat flow from the upper AMPORTS parcels; and another to treat stormwater from the lower AMPORTS parcels.

Cost Estimate

- $59,036,000

Qualitative Evaluation of Project Feasibility

- This project is important to the future viability of the port from both a regulatory and best practices perspective, if not from an operations perspective. Technically (i.e. from a design and construction perspective), the trash capture element of the project is straightforward and the costs in Benicia are in line with other, similar projects

elsewhere. The stormwater treatment element of the project is more complicated given the complexity of the various watersheds feeding into the port, expected groundwater conditions due to low site elevations and the limited acreage already available at the waterfront to handle cargo, which makes biofiltration system siting and sizing equally complicated. Operationally, the impacts during construction are likely to be relatively minor and generally manageable. Specific to biofiltration alternatives, the long-term impact of these improvements on operations requires further study. In terms of economics, this project does not add value to the port per se. However, from a regulatory perspective and from a broader water quality perspective, this project is important as it would not only help to mitigate future costs associated with potentially contaminated stormwater-related remediation efforts, but is also required in order to secure a Phase II permit from the City of Benicia, which mandates the installation of bioretention or an equivalent alternative for projects that create or replace 5,000 square feet or more of impervious surface. Environmentally, this project would bring the Port of Benicia in line with best practices related to stormwater management and require an IS/MND document under CEQA rather than an EIR.

Table 8: Qualitative Feasibility of Project 7

Evaluation Criterion	Complexity (high/medium/low)	Cost ($) (high/medium/low)	Positive Benefit (high/medium/low)	Negative Impact (high/medium/low)
Technical	high	medium	n/a	n/a
Operational	high	medium	high	medium
Economic	n/a	n/a	medium	n/a
Environmental	medium	n/a	high	n/a

Source: GHD



Figure 14: Assumed Drainage Area for PS1 (source: GHD)

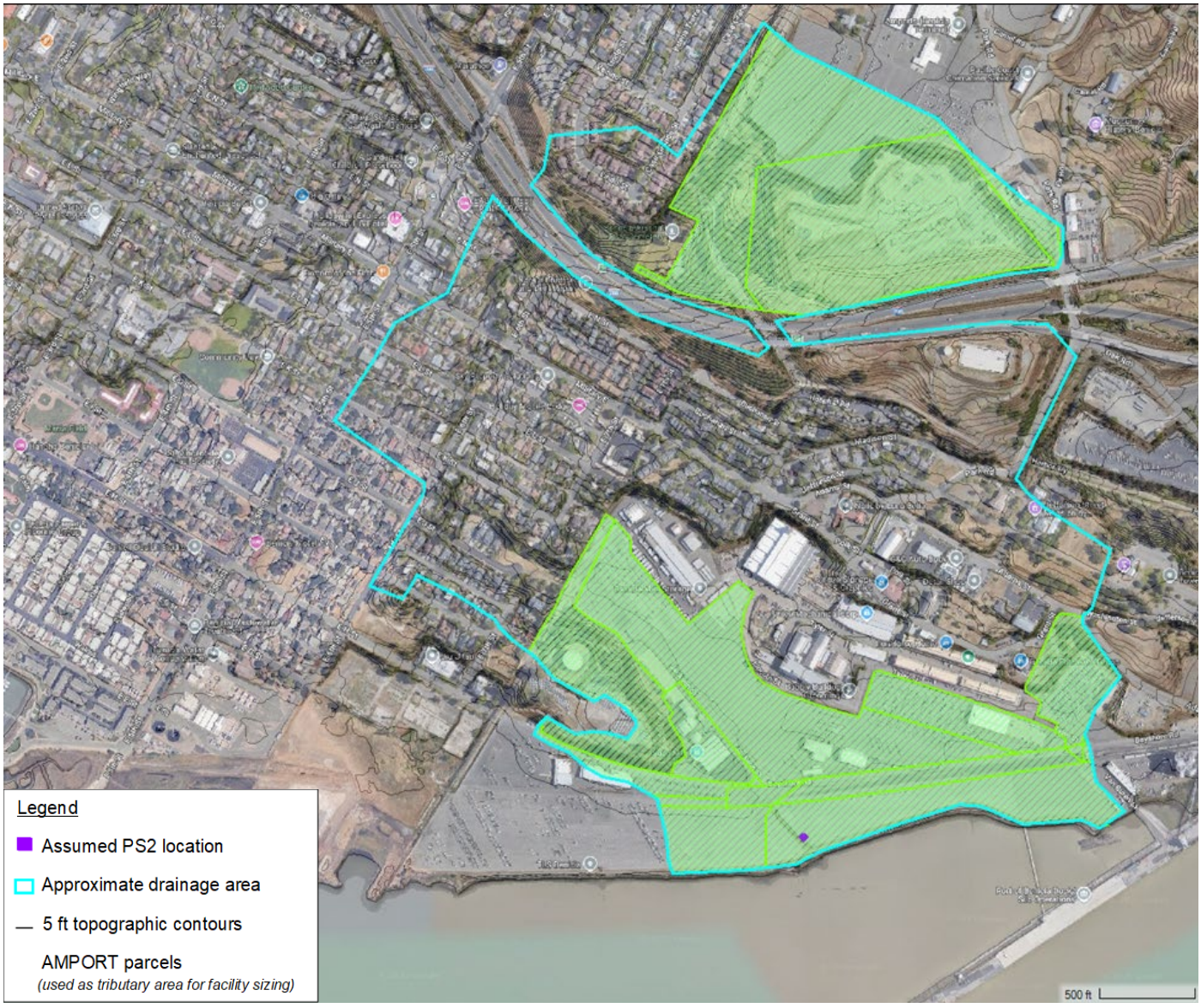


Figure 15: Assumed Tributary Areas for Bioretention Facilities within PS2's Watershed (source: GHD)


Legend
Assumed PS3 location
Approximate tributary area
1 ft topographic contours
Carquinez Strait
Bayshore Rd
Carquinez Strait
Carquinez Strait
Carquinez Strait

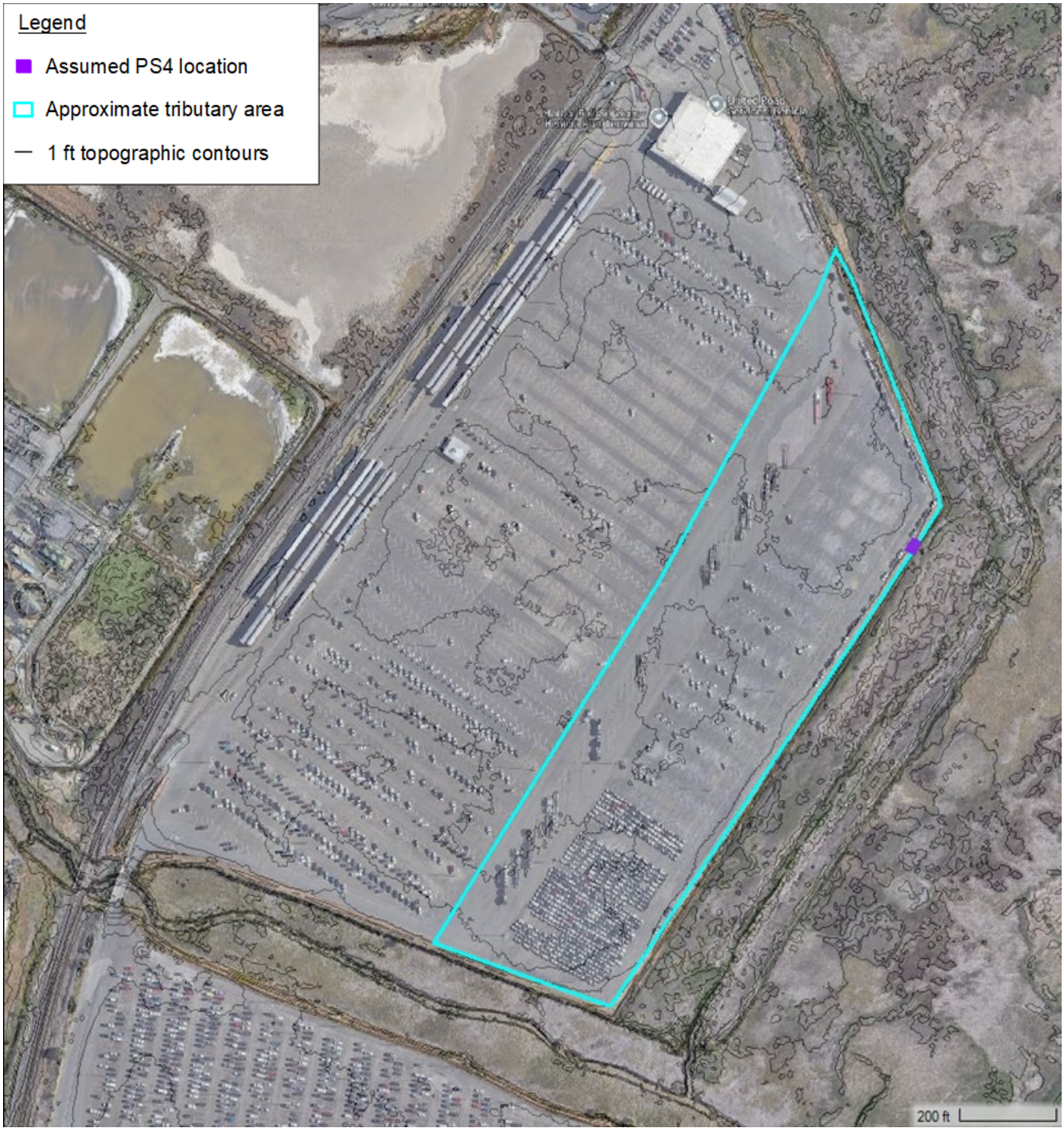


Figure 17: Assumed Drainage Area for PS4 (source: GHD)

Potential Project 8: Sea Level Rise (SLR) Seawall

Project Purpose, Description and Location – Overall

- The purpose of this project is to mitigate impacts associated with future sea level rise (SLR). This project is located at the Port of Benicia, along the Carquinez Strait in Solano County, California. The project entails constructing a multi-segment seawall along water-facing edges of the existing port, as well as land-facing edges that present flood risks. A more detailed description of each segment of this single, integrated project is included below.

Segment A

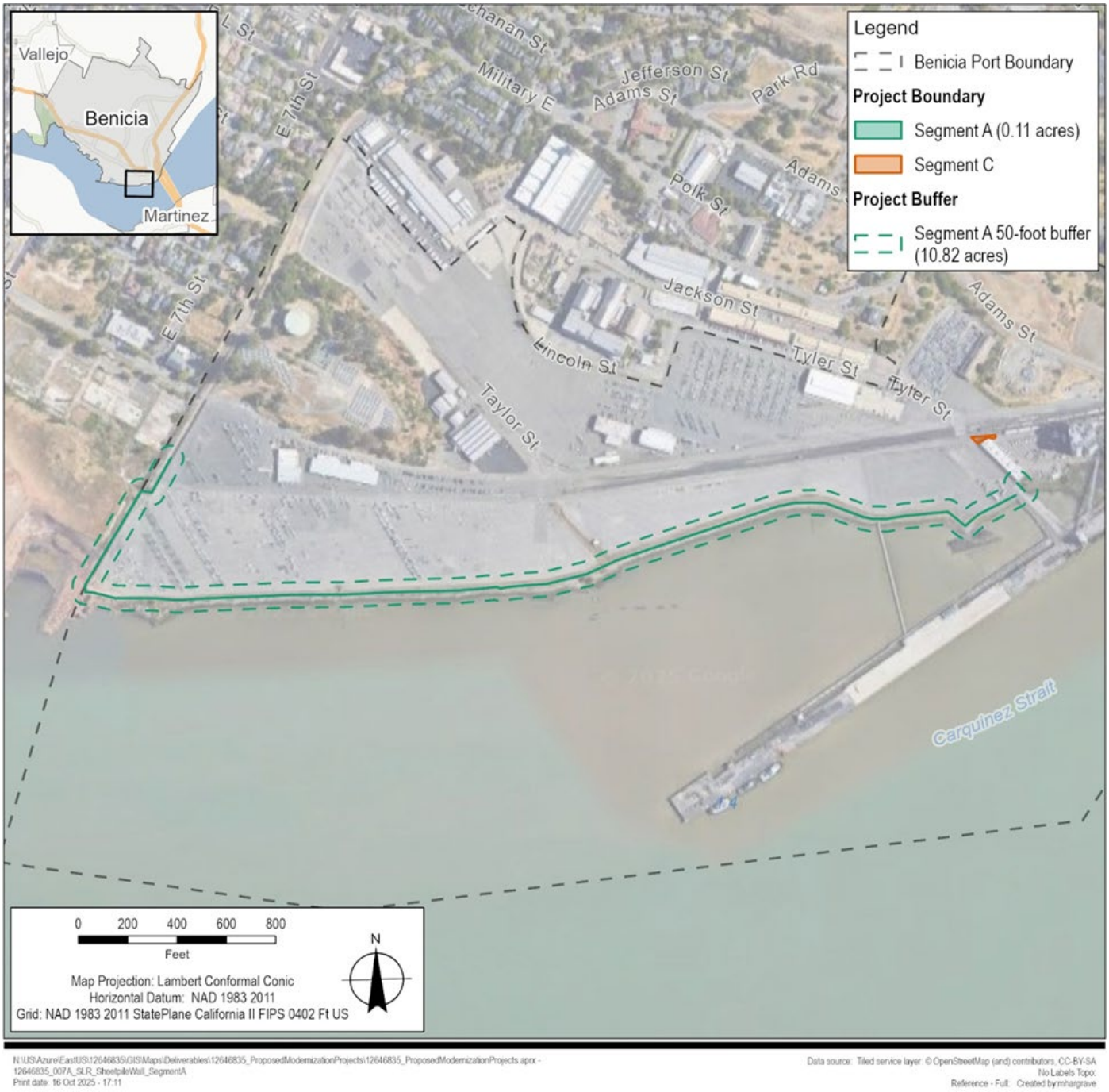


Figure 18: SLR Mitigation Segment A (source: GHD)

Project Purpose

- To protect this area of the port from flood events, which is important to reduce operational impacts and mitigate damage to both infrastructure and cargo.

Project Location

- Segment A encompasses four port yards, all of which are used for temporary storage and processing of automobiles and other ro-ro cargo that is offloaded from vessels berthed at the pier structure. This segment of seawall would extend from the edge of the Yuba property to Van Buren Street. The proposed project would be limited to the edge of the port between the existing backlands and the revetment along the Carquinez Strait.

Project Description

- This project segment proposes the installation of a 4,570 linear-foot sheet pile wall with a crest elevation of 14 feet (NAVD88). This segment of seawall is anticipated to reach a maximum depth of about 24 feet and would create a continuous flood protection feature for all port backlands in this area by reducing overtopping of the shoreline and mitigating flooding within the port under extreme events, through the year 2080. This sheet pile wall would be installed along the water-facing edge of the paved area of the port, along the back of the existing revetment. An improved access road/trail would then be constructed between the sheet pile wall and the port backlands in order to support inspections of the structure. See Figures 18 and 19.

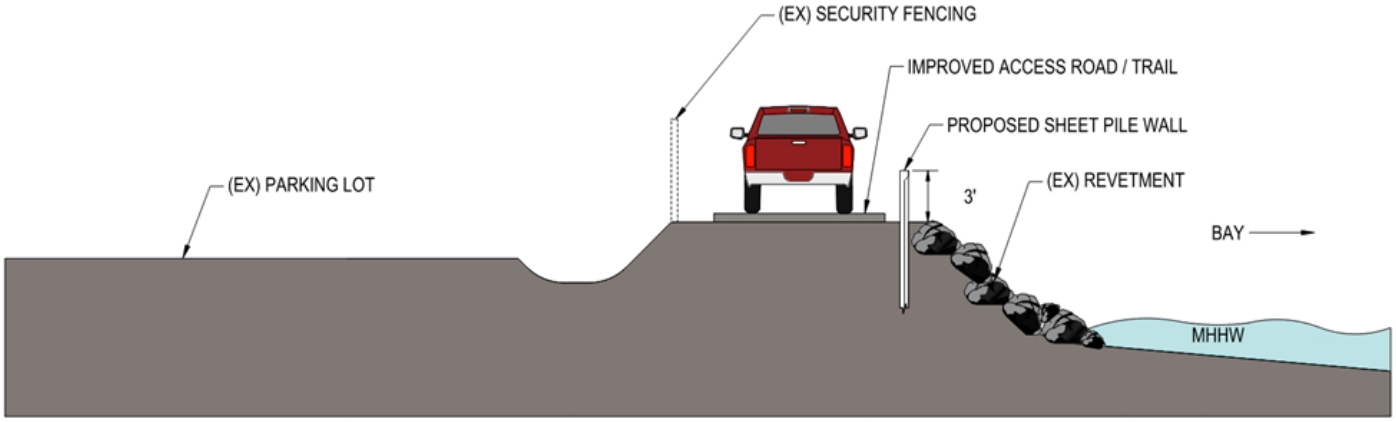


Figure 19: Illustration of Proposed Segment A Seawall (source GHD)

Segment B

This segment encompasses the Port of Benicia pier structure itself, which does not require SLR mitigation within the 2080 planning horizon (see Task 3 deliverable).

Segment C

Project Purpose

- To focus on the low-lying flood connections that could allow flanking of the port behind its established flood protection features. This is intended to consist of a less intensive effort that provides near-term flood protection to address SLR.

Project Location

- Segment C primarily consists of the Valero petroleum coke operation that provides flood pathway connections directly into the port and the existing railroad prism. This flood connection point is located between Van Buren Street and the Valero Property, directly north of Building 169 and south of the existing rail line.

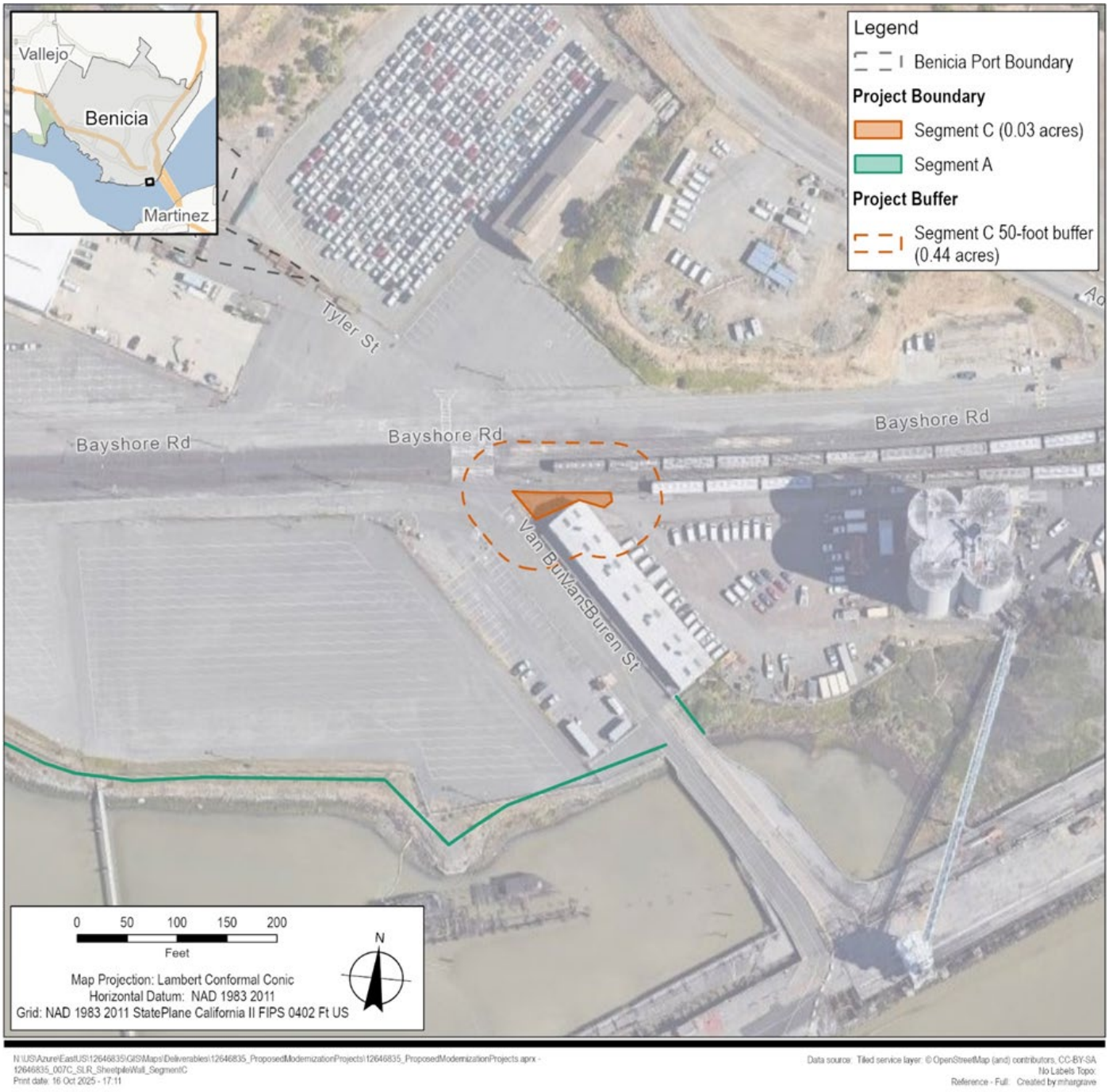


Figure 20: SLR Mitigation Segment C (source: GHD)

Project Description

This project proposes the installation of an approximately 95-feet long by 25-feet wide by 2.5-feet high paved fill connection, with a crest elevation of 2.5 feet (NAVD88) on the north side of Building 169 that connects with the railroad prism. This is expected to consist of approximately 7 cubic yards of fill material. This concept leverages the existing building's elevated concrete base foundation that is expected to act as a flood barrier. Alternatively, in consideration of Building 169's planned demolition in the near future (see Task 3 deliverable), the proposed fill could be extended along the north side of Van Buren Street to enhance flood protection along this area while maintaining access from the port into the Valero leasehold. See Figure 20 below.

Segment D

Project Purpose

- To raise the crest of the existing shoreline protection infrastructure in order to establish a uniform and consistent crest height that mitigates flooding of the railroad prism. See Figure 21.



Figure 21: SLR Mitigation Segment D (source: GHD)

Project Location

- Segment D encompasses the vital railroad prism that connects the southern and northern portions of the Port of Benicia. The included area lies at the end of Oak Road and extends approximately 240 linear feet along the edge of the railroad prism, which is situated between Harbor Way and the George Miller Jr Memorial Bridge.

Project Description

This project proposes increasing the existing engineered revetment elevation fronting the railroad prism in segments that were identified to be lower lying. This 240 linear foot reach of the revetment would need to be raised by approximately 3 feet to reach a crest elevation of 14 feet (NAVD88). This is expected to consist of approximately 2,053 cubic yards of large rock material. Additionally, fill would be placed within the revetment voids to prevent flood water infiltration. This is intended to mitigate flooding along this reach and prevent damage to the railroad prism, thereby reducing operational downtime. See Figure 22.

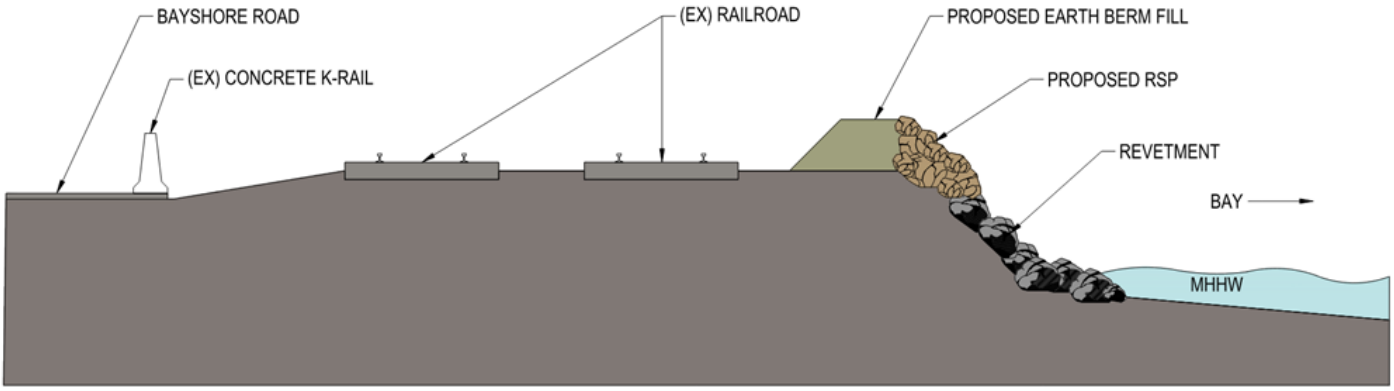


Figure 22: Illustration of Proposed Segment D Revetment (source GHD)

Segment E

Project Purpose

- Segment E contains two yards intended to store cargo products received at the Port of Benicia. Protecting this area from flood events is important to reduce operational impacts and mitigate any damages to the infrastructure and/or cargo that is temporarily stored there. The purpose of this segment's concept is to mitigate flooding of the port from projected flood pathways without reducing the existing yard's footprint.

Project Location

- This segment's concept extends from the Benicia-Martinez Bridge to the marsh channel bridge and is located along the edge of the existing port backlands in that area.

Project Description

- This project proposes the installation of a 5,770 linear-foot sheet pile wall with a crest elevation of 14 feet (NAVD88) around the border of the port from the Benicia-Martinez Bridge to the marsh channel bridge. This wall is anticipated to reach a maximum depth of about 21 feet. This would create a continuous flood protection feature for Segment E, thereby reducing overtopping of the shoreline and mitigating flooding within the port under extreme events. This sheet pile wall would be established in front of the paved backland area adjacent to the existing levee. See Figures 23 and 24. An improved Marsh Observation Area Trail section would then be established behind the sheet pile wall and the existing marsh habitat to maintain public access along this trail.

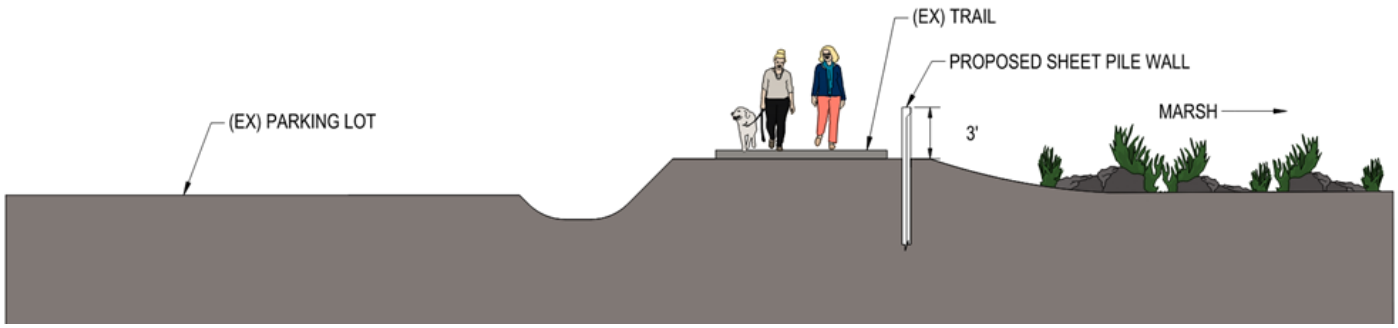


Figure 23: Illustration of Proposed Segment E Seawall (source GHD)



Figure 24: SLR Mitigation Segment E (source: GHD)

Segment F

Project Purpose

- To mitigate flooding of the port from projected flood pathways without reducing the existing yard's footprint.

Project Location

- Segment F contains the UP Lease – North, a lot intended to store cargo received at the Port of Benicia. This segment's concept extends from the marsh channel bridge to the north end of the UP Lease – North and is located along the edge of the existing port backlands.



Figure 25: SLR Mitigation Segment F (source: GHD)

Project Description

- This project proposes the installation of a 3,502 linear-foot sheet pile wall with a crest elevation of 14 feet (NAVD88) around the border of the port from the marsh channel bridge to the north end of the UP Lease – North. This wall is anticipated to reach a maximum depth of about 15 feet. This would create a continuous flood protection feature for Segment F, thereby reducing overtopping of the shoreline and mitigating flooding within this area of the port under extreme events. This sheet pile wall would be established in front of the port backlands along the back of the existing levee. An improved access road/trail would then be constructed between the sheet pile wall and the existing revetment in order to support inspections of the structure. See Figure 25 and Figure 26 below.

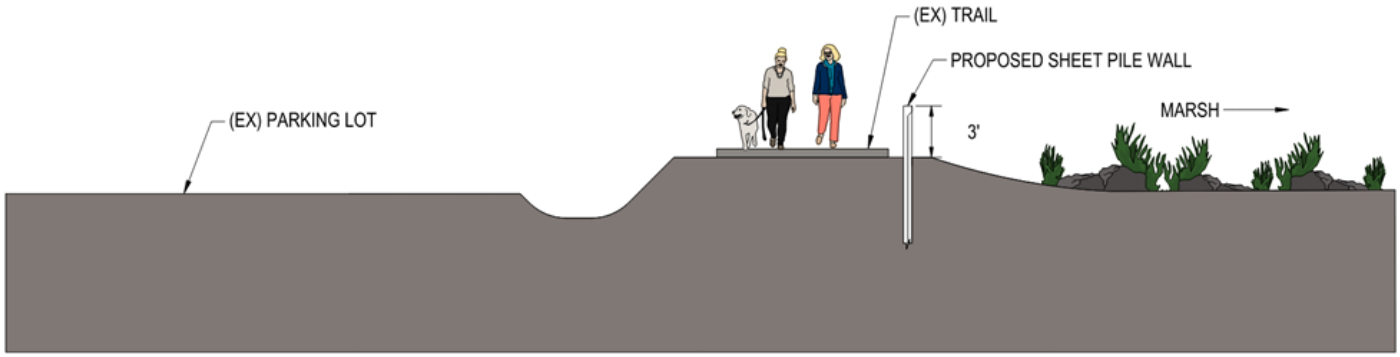


Figure 26: Illustration of Proposed Segment F Seawall (source GHD)

Cost Estimate

- All segments (2029 dollars): $69,800,000

Qualitative Evaluation of Project Feasibility

- As discussed at length in the Task 3 deliverable for this Modernization plan, this project is critical to the long-term future viability of the port, but it is not needed in the near term. The SLR planning year for this project is 2080, more than 50 years in the future. Between now and then, both actual sea level conditions and models used to anticipate potential future ranges for SLR will change multiple times. In order to optimize the timing for implementation of this project, it is recommended that the City and the port operator conduct joint periodic reviews of best available climate science and anticipated future SLR conditions as a means to monitor existing and expected conditions for "triggers" that indicate the project remains necessary and appropriately scaled, with potential to be immediately effective in mitigating SLR risks once constructed. In the near term, it is recommended that a geotechnical assessment of the existing port levee be completed to identify potential issues with its structural integrity and/or general adequacy as a flood protection asset so that any risks detected can be immediately remedied.
- From a technical perspective (i.e. design and construction), the proposed SLR seawall as described above, is feasible, with costs being in line with those of similar projects completed within relatively similar contexts. Operationally, the impacts during construction of all segments of this project are expected to be relatively minor since the work will occur at the boundary edges of the port in most cases. From an economic perspective, this project is vital in the long term, unless current models of future SLR turn out to be wildly inaccurate. This is true because significant seawater inundation of the port would be catastrophic, not only for on-port infrastructure, but also in the sense that it could potentially disrupt port operations to the extent that existing customers re-route their cargo to other ports and never return. Environmentally, the proposed SLR mitigation measures across Segments A-F would require an IS/MND document under CEQA, but not a full EIR.

Table 9: Qualitative Feasibility of Project 8

Evaluation Criterion	Complexity (high/medium/low)	Cost ($) (high/medium/low)	Positive Benefit (high/medium/low)	Negative Impact (high/medium/low)
Technical	medium	medium	n/a	n/a
Operational	low	low	high	low
Economic	n/a	n/a	high	n/a
Environmental	low	n/a	medium	low

Source: GHD

Potential Project 9: Park/Bayshore Road Intersection Improvements



Figure 27: Park/Bayshore Road Intersection Improvements Study Area (source GHD)

Project Purpose

- To enhance traffic operations, accommodate Surface Transportation Assistance Act (STAA) truck movements, and improve multimodal safety by implementing geometric and signalization improvements. The project aims to address existing congestion, turning conflicts, and rail-crossing interactions to support long-term goods movement and community liveability.

Project Location

- This intersection is located in the City of Benicia at the convergence of Park Road and Bayshore Road, west of the I-680 interchange ramps. This corridor connects to the Port of Benicia via Adams Street and Oak Road.

Project Description

- The Park Road and Bayshore Road intersection serves as a critical connection between the Port of Benicia and the regional freeway network via I-680. The existing geometry and control at this intersection is currently not adequate to support efficient or safe operations. This project proposes a follow-up stage of planning that entails a Project Initiation Document (PID) and a streamlined Intersection Safety and Operational Assessment Process (ISOAP) and Intersection Control Evaluation (ICE). This PID and streamlined ISOAP/ICE are necessary to make detailed recommendations for physical improvements to the Park Road and Bayshore Road intersection that will allow it to most effectively accommodate current and future activity while enhancing multimodal safety.

Project Options

- This project anticipates two improvement options.

  Option A: Signalization

  This involves signalization of the intersection, including adjustments to turning radii and lane configuration to support full STAA truck movements.

  Option B: Modern Roundabout

  A modern roundabout is recommended in the City's Traffic Impact Fee (TIF) study, with approach control for the adjacent railroad crossing.

- Both options would include striping upgrades, signage, potential right-of-way acquisition and safety treatments for pedestrians and cyclists. The railroad crossing will need further assessment to reduce vehicle-rail conflict and comply with approach visibility standards. Design would ensure compatibility with Caltrans Design Information Bulletin 78-04 for STAA truck routing, and geometric improvements would be made to reduce vehicle encroachment into opposing lanes.

Cost Estimate

- $500,000 (PID and ISOAP/ICE only)

Qualitative Evaluation of Project Feasibility

- It is not possible to evaluate the feasibility of improvements at this intersection unless or until the PID and streamlined ISOAP/ICE phase is completed.

Potential Project 10: Bayshore Road/I-680 Ramps Intersection Improvements

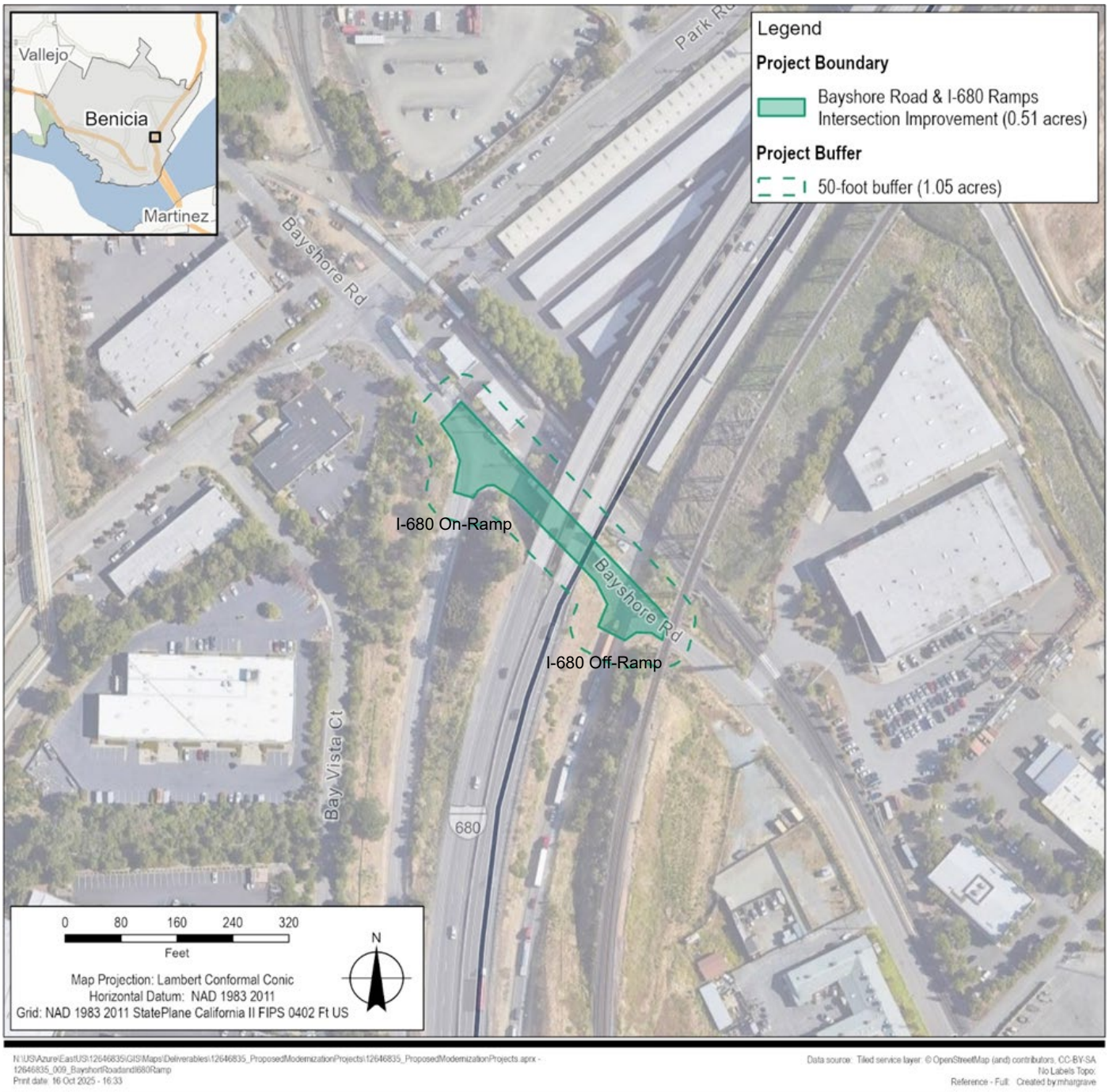


Figure 28: Bayshore Road/I-680 Ramps Intersection Improvements Study Area (source GHD)

Project Purpose

- To address operational deficiencies, improve freight mobility and enhance safety for all users through strategic intersection reconfiguration and geometric improvements.

Project Location

- This project is located at the interchange of Bayshore Road and I-680 in the City of Benicia, California. The surrounding land uses include industrial facilities, the Port of Benicia, and rail lines. The project lies just east of the Park Road and Bayshore intersection, which is also proposed for improvement.

Project Description

- The Bayshore Road and I-680 ramps intersection is a critical node for both port-related truck movements and regional vehicle traffic. However, the current configuration suffers from inadequate turning radii for STAA trucks, limited stopping sight distance, and confusing or circuitous routing for certain on- and off-ramp movements. This project proposes a follow-up stage of planning that entails a PID and a streamlined ISOAP/ICE. This PID and streamlined ISOAP/ICE are necessary to make detailed recommendations for physical improvements to the intersections of Bayshore Road and the I-680 ramp terminals, focusing on improving truck operations and traffic safety.
- Based on the City's Traffic Impact Fee (TIF) study recommendations, the proposed improvements are expected to include:

  Eastbound Right-Turn Pocket

  - Construct a dedicated right-turn lane for eastbound traffic to enter the southbound I-680 on-ramp. This will reduce delay and queueing in the through lanes and provide a safer turning path for STAA vehicles.

  Westbound Left-Turn Rerouting

  - Redirect westbound left-turning traffic to instead proceed to the proposed Park Road roundabout and make a U-turn, thereby reducing conflicting movements at the freeway ramp terminal.

  Geometric Improvements

  - STAA geometric improvements will also be needed by modifying the turning radii and lane alignments at the I-680 ramp intersections to support STAA truck movements per Caltrans DIB 78-04, minimizing encroachment and improving operational safety.

  Together, these improvements will reduce crash potential, streamline truck access to and from the freeway, and provide consistency with broader freight movement goals.

Cost Estimate

- $500,000 (PID and ISOAP/ICE only)

Qualitative Evaluation of Project Feasibility

- It is not possible to evaluate the feasibility of improvements at this intersection unless or until the PID and streamlined ISOAP/ICE phase is completed.

Potential Project 11: Industrial Way/Park Road and I-680 Ramps Intersection Improvements

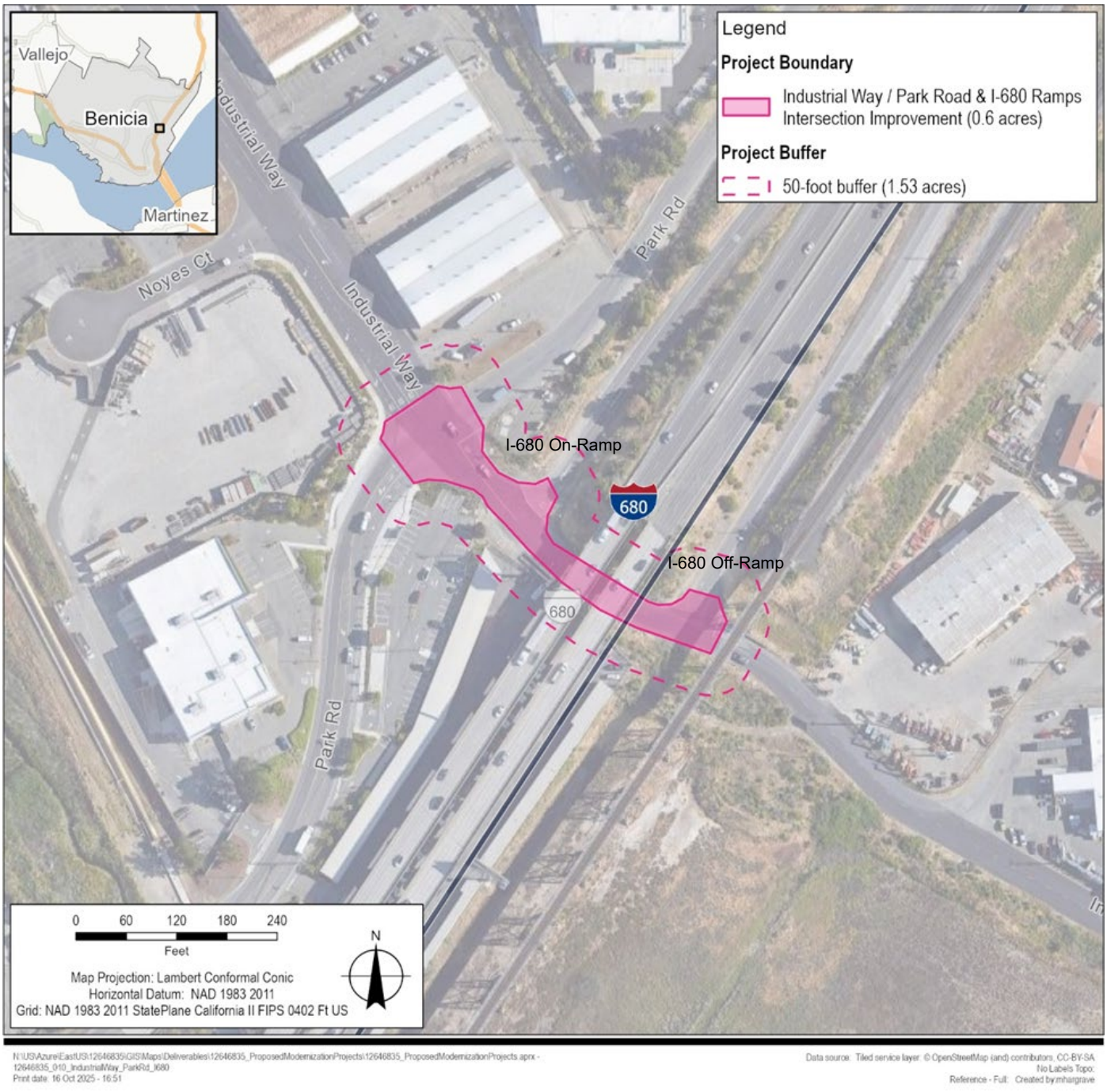


Figure 29: Industrial Way/Park Road and I-680 Ramps Intersection Improvements Study Area (source GHD)

Project Purpose

- To enhance safety and operational efficiency at this location by reducing conflicts, improving truck maneuverability and managing vehicle queues through geometric upgrades and traffic control measures.

Project Location

- This project is located at the northern part of Park Road where it meets Industrial Way and the on/off-ramps for Interstate 680 in the City of Benicia, CA. This junction is heavily used by port traffic, particularly for southbound and westbound truck movements, and it lies in close proximity to the Port of Benicia, regional rail lines and major industrial employers.

Project Description

- The intersection of Industrial Way, Park Road, and the I-680 ramps forms a key access point for port-bound trucks and local industrial traffic in Benicia. However, the current layout suffers from geometric constraints, queueing issues, and inadequate accommodation of large trucks (STAA vehicles). This project proposes a follow-up stage of planning that entails a PID and a streamlined ISOAP/ICE. This PID and streamlined ISOAP/ICE are necessary to make detailed recommendations for physical improvements to the interchange of Industrial Way, Park Road, and the I-680 northbound and southbound ramps, based on recommendations from the City's Traffic Impact Fee (TIF) study. The primary elements of the project include:

  Intersection Control

  - There are two options for intersection control:

    Option A: Modern Roundabout

    A roundabout is proposed at the intersection of Industrial Way and Park Road to facilitate continuous, managed flow of vehicles. The roundabout would require partial reconfiguration of the existing interchange to integrate with the adjacent I-680 ramp terminals. The design would include appropriate deflection, splitter islands, and geometric parameters to accommodate STAA design vehicles.

    Option B: Signalization

    If a roundabout is not feasible due to constraints such as grade or right-of-way, signalized intersection control would be implemented. This includes new signal infrastructure, mast arms, signal timing optimized for truck queues, and pre-emption for freight movements.

  STAA Truck Accommodation

  - Regardless of the control method, the intersections will be geometrically reconfigured to ensure full maneuverability for STAA-designated trucks. This includes wider turning radii and better alignment between ramps and roads.

  Sight Distance and Queuing Improvements

  - The overpass structure currently limits sight distance for westbound vehicles, and the short spacing between Industrial Way and the ramp terminals creates operational inefficiencies. The proposed project would address these deficiencies through lane realignment, signal coordination (if selected), and possibly minor ramp modifications.

Cost Estimate

- $500,000 (PID and ISOAP/ICE only)

Qualitative Evaluation of Project Feasibility

- It is not possible to evaluate the feasibility of improvements at this intersection unless or until the PID and streamlined ISOAP/ICE phase is completed.

Potential Project 12: Bayshore Road Improvements



Figure 30: Bayshore Road Project Area (source GHD)

Project Purpose

- This project seeks to improve structural integrity, reduce modal conflicts, and support long-term freight and industrial traffic through comprehensive upgrades to both the public and privately-owned sections of this primary port traffic corridor.

Project Location

- Bayshore Road runs north-south from the I-680 interchange to the Port of Benicia terminal entrance.

Project Description

- Bayshore Road serves as a primary corridor between the Port of Benicia and regional freeway access points, including I-680. It experiences heavy truck traffic and is directly adjacent to an active rail line. However, the roadway's current condition, including deteriorated pavement, outdated design standards, and proximity to the rail corridor, presents safety, maintenance and operational challenges. Proposed improvements include:

  Widening and Pavement Reconstruction

  - The corridor would be widened, where possible, to meet industrial freight needs and rebuilt to accommodate heavy vehicle traffic. A TI-based pavement design approach would be applied to ensure structural adequacy for long-term truck use.

  Asphalt vs. Concrete Evaluation

  - The project would include a cost-benefit and durability comparison of asphalt and concrete pavement to determine the most suitable material for expected loading conditions.

  Rail Conflict Mitigation

  - Physical separation between the roadway and the adjacent rail corridor would be enhanced. This may include barriers, fencing, or landscape buffers to reduce safety hazards and discourage unauthorized rail crossings.

  Drainage and Utility Improvements

  - The widening effort would incorporate upgrades to stormwater systems, utility corridors, and roadside drainage to support resilience and prevent flooding or infrastructure damage.

Cost Estimate

- $16,438,000

Qualitative Evaluation of Project Feasibility

- As the primary truck corridor currently serving the Port of Benicia, this project is critical to both the near-term and long-term viability of the port. Bayshore road consists of both public and privately-owned sections and improvements are recommended to both.
- From a technical perspective (i.e. design and construction), the proposed improvements to Bayshore Road are feasible. Detailed design solutions have yet to be worked out, but none of the improvements are expected to be substantially more complicated than other, similar roadway improvement projects in Benicia or elsewhere. Cost estimates also reflect those of other, similar projects. Operationally, the impacts during construction on Bayshore Road do have potential to cause significant disruption since Bayshore Road is currently the primary corridor serving port origin/destination truck traffic. Economically, this project is important in the sense that it facilitates ongoing access to the Port of Benicia via Bayshore Road. Environmentally, this project can be completed based on an IS/MND document under CEQA, meaning no EIR is required.

Table 10: Qualitative Feasibility of Project 12

Evaluation Criterion	Complexity (high/medium/low)	Cost ($) (high/medium/low)	Positive Benefit (high/medium/low)	Negative Impact (high/medium/low)
Technical	medium	medium	n/a	n/a
Operational	medium	medium	medium	medium
Economic	n/a	n/a	medium	n/a
Environmental	low	n/a	n/a	low

Source: GHD

Potential Project 13: Park Road and Adams Street Truck Restriction/Realignment

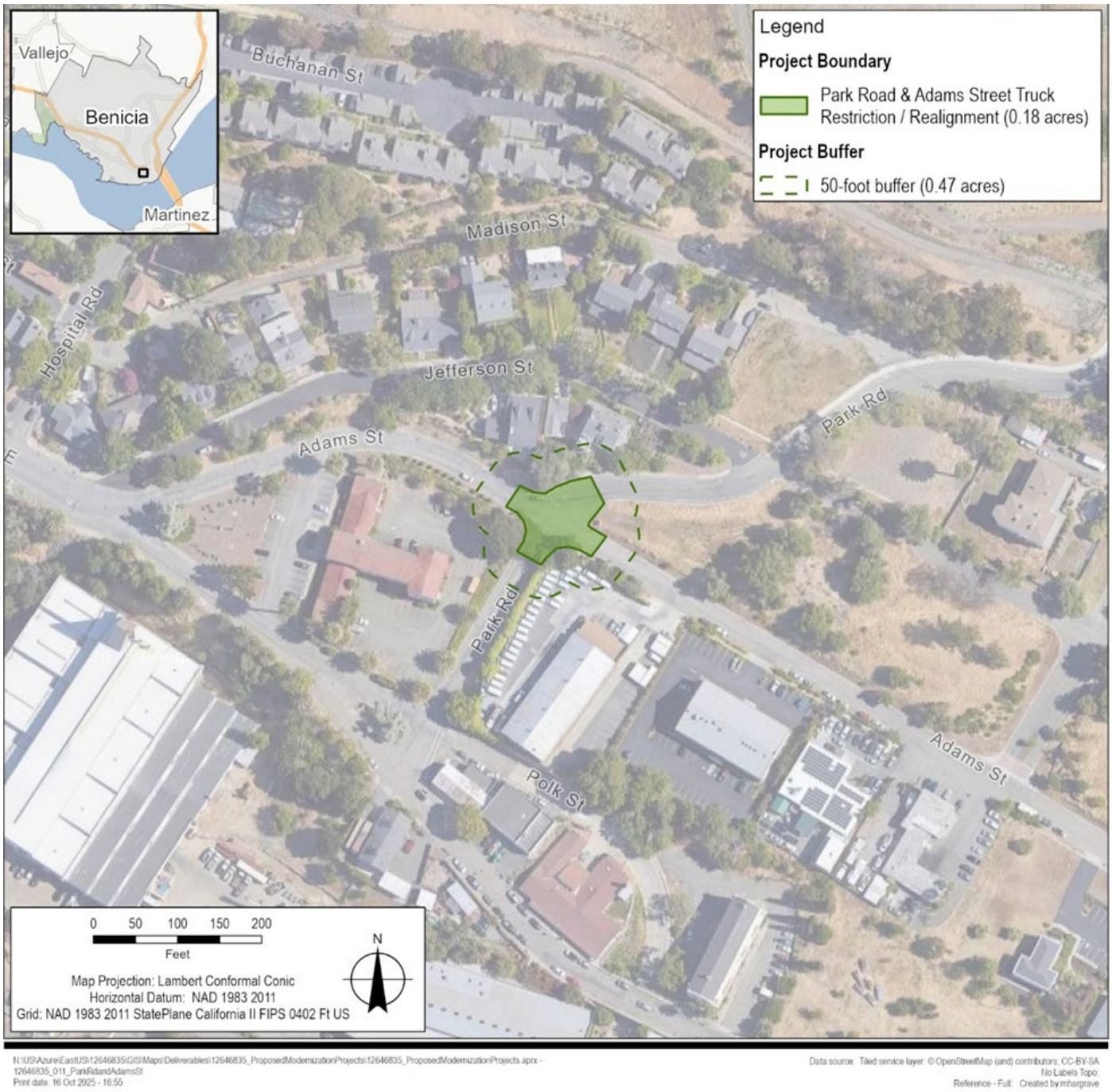


Figure 31: Park Road and Adams Street Truck Restriction/Realignment Project Area (source GHD)

Project Purpose

- To improve safety for all users by discouraging truck usage along this corridor and redirecting heavy vehicle traffic to more suitable alternate routes. This would support the City's freight access goals while enhancing safety for pedestrians, bicyclists and local traffic.

Project Location

- The project is located at the intersection of Park Road and Adams Street, southeast of Benicia's industrial core.

Project Description

- Park Road and Adams Street serve as a local connector in the industrial area of Benicia; however, this intersection presents significant challenges for heavy vehicle operations due to steep grades, limited sight distance and urban-scale design elements that are incompatible with freight movements. Rather than physical intersection modifications, this project proposes truck restrictions and circulation realignment to reduce freight traffic impacts at the Park Road and Adams Street intersection. Key elements of the project include:

  Truck Restrictions

  - Restrict truck access at the intersection through signage, limited design treatments, and possible enforcement mechanisms.

  Circulation Realignment

  - Encourage use of alternate access routes such as the future East 2nd Street to Park Road Connector (Project 19) envisioned in the City's General Plan Circulation Element, thereby removing unnecessary freight conflicts from this residential-industrial interface.

Cost Estimate

- $250,000

Qualitative Evaluation of Project Feasibility

- Given the limited scope of this project, its feasibility is not in question. This is simply a policy decision for the City.

Potential Project 14: Roadway Improvements – Industrial Way

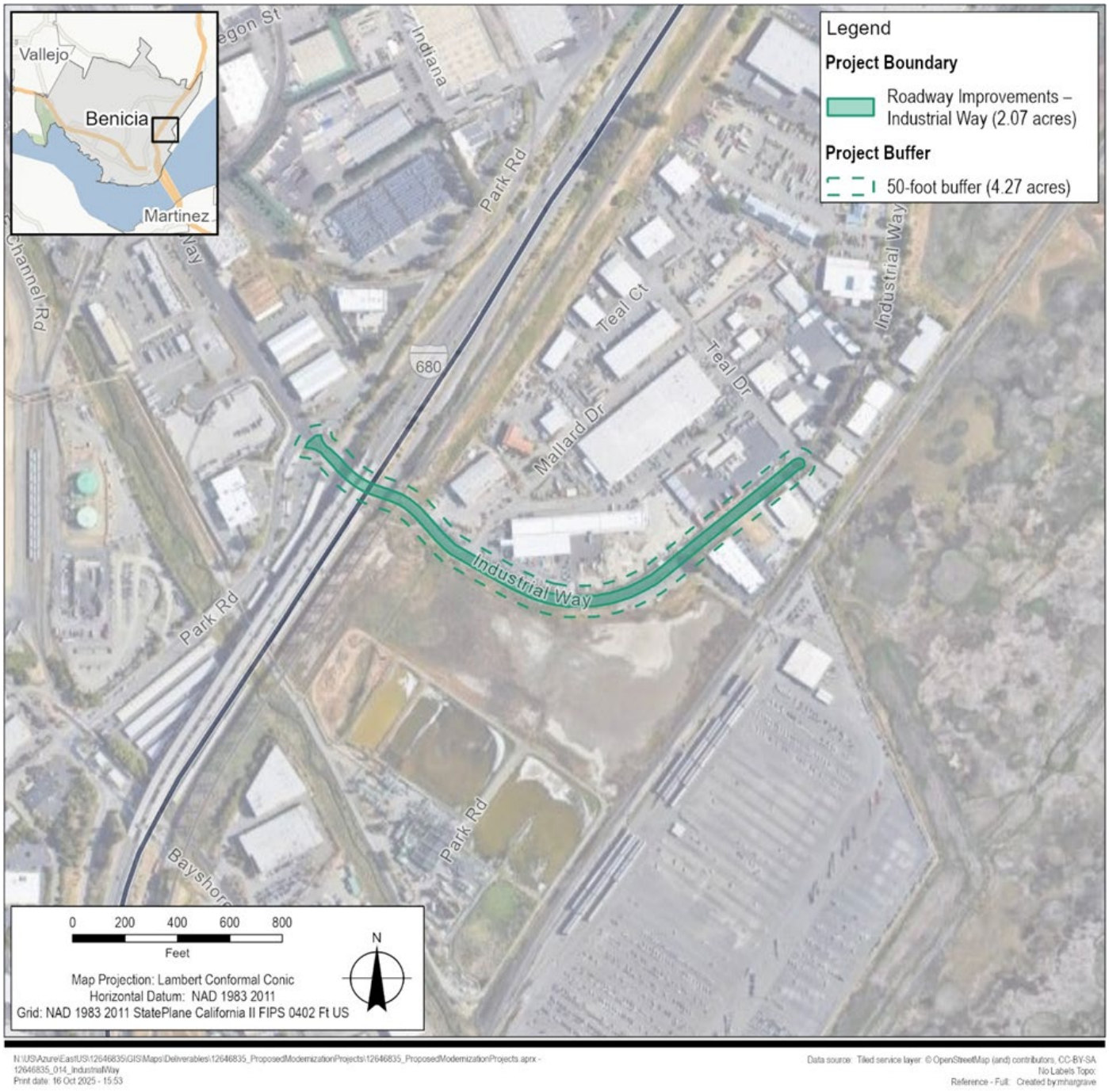


Figure 32: Industrial Way Improvements Project Area (source GHD)

Project Purpose

- The purpose of this project is to rehabilitate the existing pavement along Industrial Way to support current and future truck traffic. The roadway's current pavement conditions are insufficient for the projected traffic index (TI), especially under frequent heavy vehicle loading, and require structural upgrades to maintain safety and durability.

Project Location

- Industrial Way between Park Road and Teal Drive in the City of Benicia.

Project Description

- This project would involve full-depth rehabilitation of Industrial Way, guided by updated pavement design standards and TI-based calculations. The improvements would ensure the roadway can support high truck volumes, reduce ongoing maintenance costs and improve ride quality. The rehabilitation may include reconstruction of the base and subbase layers, application of new asphalt or concrete surfacing, and consideration of enhanced drainage and signage.

Cost Estimate

- N/A (not estimated)

Qualitative Evaluation of Project Feasibility

- Neither cost estimates nor feasibility have been assessed for this potential project because it has been deemed to be outside the geographic area relevant to the Port of Benicia Facilities and Infrastructure Modernization plan. As shown in Figure 32, while Industrial Way does serve industrial areas that are near to the northern edge of the PPA, it does not directly serve any port properties or facilities and is therefore ancillary to the Modernization plan and to associated capital investments.

Potential Project 15: Adams Street Improvements

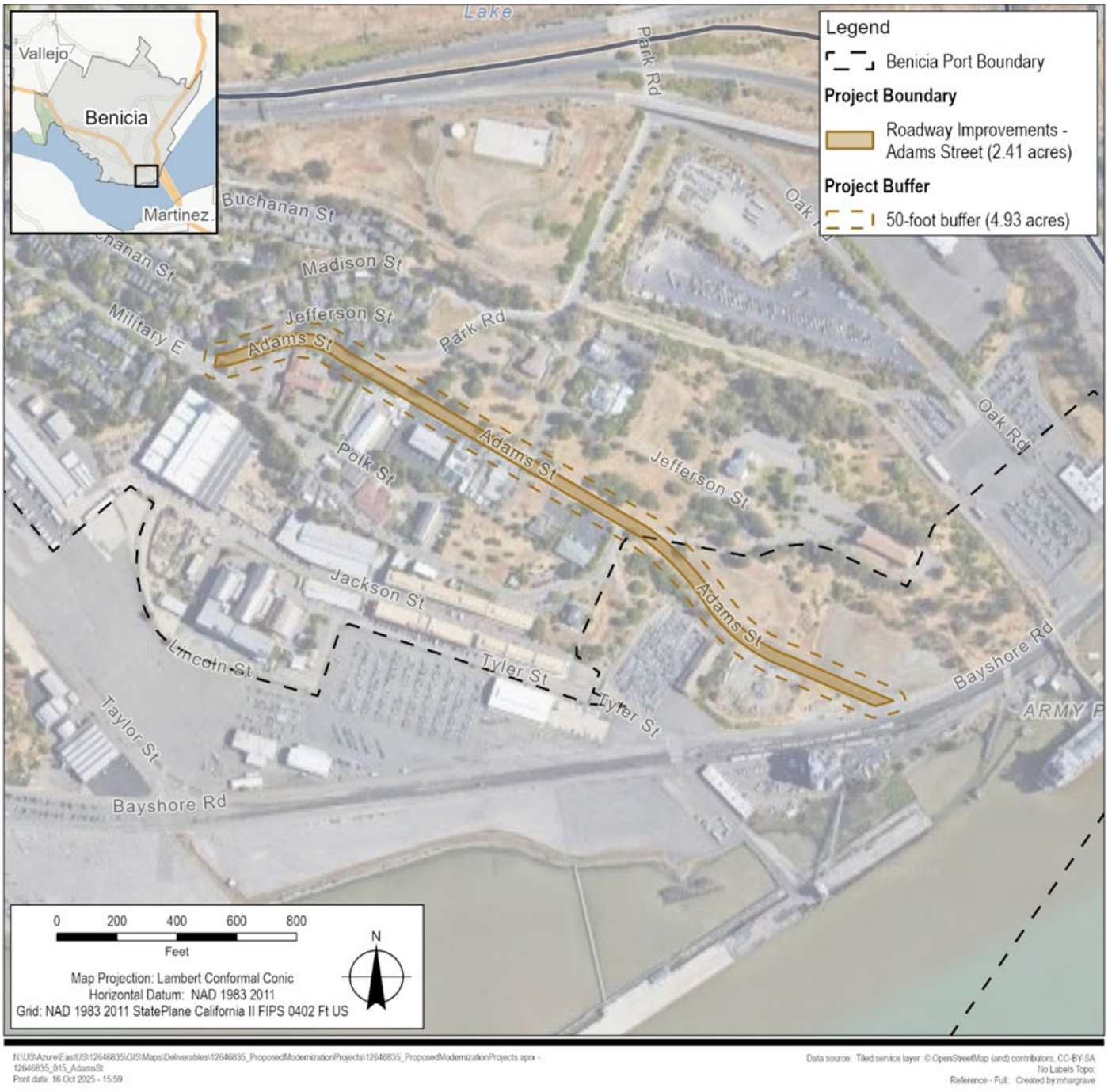


Figure 33: Adams Street Improvements Project Area (source GHD)

Project Purpose

- To upgrade the street to meet modern structural standards based on truck-induced ESALs (Equivalent Single Axle Loads) and TI requirements.

Project Location

- Adams Street, specifically the segment between Military East and Bayshore Road.

Project Description

- Adams Street has been identified as needing pavement rehabilitation due to aging infrastructure and insufficient capacity to handle truck activity. This project includes full-depth roadway rehabilitation to enhance pavement performance, improve safety, and ensure compatibility with the Port's operational needs. Pavement reconstruction would be based on updated TI calculations. Both asphalt and concrete paving options would be evaluated for long-term sustainability.

Cost Estimate

- $3,700,000 (2029)

Qualitative Evaluation of Project Feasibility

- This project is not critical to either the near-term or long-term viability of the port in light of the parallel intent to restrict truck traffic on Adams Street (Project 13).
- From a technical perspective (i.e. design and construction), the proposed improvements to Adams Street are feasible. Operationally, the impacts to the port during construction of the proposed project would be minimal. In terms of port-related economic, this project is insignificant. Environmentally, this project can be completed based on an IS/MND document under CEQA, meaning no EIR is required.

Table 11: Qualitative Feasibility of Project 15

Evaluation Criterion	Complexity (high/medium/low)	Cost ($) (high/medium/low)	Positive Benefit (high/medium/low)	Negative Impact (high/medium/low)
Technical	low	low	n/a	n/a
Operational	low	low	n/a	n/a
Economic	n/a	n/a	low	n/a
Environmental	low	n/a	n/a	low

Source: GHD

Potential Project 16: Park Road Improvements



Figure 34: Park Road Improvements Project Area (source GHD)

Project Purpose

- To upgrade the structural and operational capacity of Park Road to handle truck traffic.

Project Location

- Park Road begins at East 2nd Street and continues south to Adams Street, providing access to the Port of Benicia.

Project Description

- Park Road serves as a critical connector between the Port of Benicia and the regional highway network, accommodating a mix of passenger and heavy-duty truck traffic, as well as bicycles. Current conditions along Park Road exhibit poor pavement quality, limited width and geometric deficiencies that pose safety concerns for all users, especially in areas where grades and sight distance are constrained. By improving Park Road to align with appropriate TI-based design standards, the City of Benicia can enhance safety, prolong roadway life, and support long-term economic vitality. This project includes full-depth roadway rehabilitation along Park Road between Industrial Way to the north and Harbor Way to the south, including the improvements highlighted below. Design criteria will be informed by updated traffic forecasts, including STAA truck percentages, and aligned with Caltrans and City of Benicia standards. Key project elements include:

  Pavement Replacement

  - Evaluate and implement pavement reconstruction based on updated TI values, including consideration of both asphalt and concrete options to improve durability and reduce maintenance.[2]

  Widening

  - Expand narrow sections of the corridor to accommodate the safe passage of both trucks and non-motorized users.

  Geometric Design Updates

  - Realign curves and upgrade substandard vertical profiles where necessary to improve sight distances and truck maneuverability.

  Drainage and Utility Coordination

  - Ensure updated roadway design incorporates modern drainage systems and coordinates with existing utility infrastructure.

Cost Estimate

- $16,003,000

Qualitative Evaluation of Project Feasibility

- Given the importance of Park Road as a connector between the port and the regional highway network, this project is critical to the near-term and long-term viability of the port. In the near term, the recommended improvements will increase safety and functionality along an existing truck route. In the long term, when combined with improvements at the intersection of Park Road and Oak Road (Project 18) and the proposed East 2nd Street to Park Road Connector (Project 19), these improvements to Park Road will create a safer and more efficient route for trucks serving the Port of Benicia to access the Interstate system by removing many of them from Bayshore Road and the general circulation challenges that the intersection of Bayshore Road and Park Road, along with the I-680 ramps, currently present (see Projects 9-12).
- From a technical perspective (i.e. design and construction), the proposed improvements to Park Road are feasible and similar in nature to the work proposed for Bayshore Road (Project 12). Operationally, there would be construction-related impacts to port users, particularly trucks seeking to access the Interstate system. From an economic perspective, once complete, the improvements would reduce the amount of time it takes a given truck to access the local highway network, which is generally beneficial. Environmentally, this project can be completed based on an IS/MND document under CEQA, meaning no EIR is required.

[2] Park Road from Elm Street to Bayshore Road received a 2-inch asphalt overlay in October, 2025.

Table 12: Qualitative Feasibility of Project 16

Evaluation Criterion	Complexity (high/medium/low)	Cost ($) (high/medium/low)	Positive Benefit (high/medium/low)	Negative Impact (high/medium/low)
Technical	medium	medium	n/a	n/a
Operational	medium	medium	medium	medium
Economic	n/a	n/a	medium	n/a
Environmental	low	n/a	n/a	low

Source: GHD

Potential Project 17: Military East Roadway Improvements/Truck Restriction

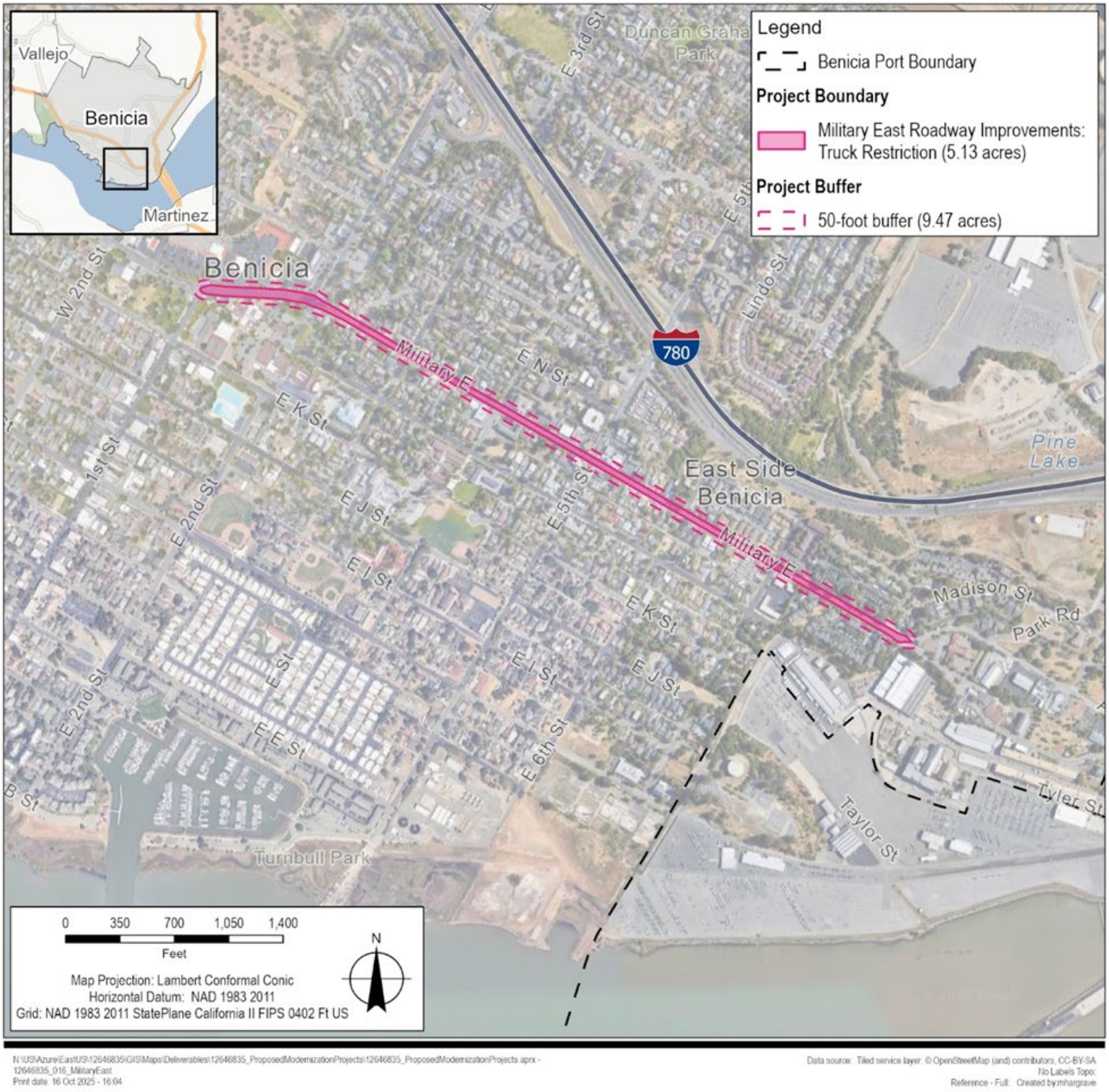


Figure 35: Military East Truck Restriction/Realignment Project Area (source GHD)

Project Purpose

- To enhance safety and maintain the residential character of Military East by implementing truck restrictions along the corridor.

Project Location

- Military East from 1st Street to Adams Street in City of Benicia.

Project Description

- Military East serves a variety of land uses, including schools, residences, parks and community destinations. The increasing use of this route by heavy trucks presents safety concerns for pedestrians, cyclists, and residents, and contributes to pavement deterioration not suited for the roadway's original design intent. By discouraging or restricting truck traffic along Military East, this project aims to reduce conflicts between large vehicles and other road users, extend pavement life, and reinforce the corridor's function as a community-serving street rather than a freight corridor. Specifically, this project proposes implementing truck restrictions on Military East from East 2nd Street to Adams Street. This may include signage, policy updates and physical or geometric changes (such as curb extensions or truck turn limitations) to deter heavy vehicle access. Coordination with law enforcement, city planning, and regional transportation agencies will be required to ensure restrictions are enforceable and align with designated truck routes. Truck activity related to the Port of Benicia and surrounding industrial areas would be redirected to more appropriate roadways, such as Bayshore Road, Park Road, and Industrial Way, corridors evaluated and/or improved to accommodate STAA trucks and heavy freight traffic. Ongoing monitoring will be needed to evaluate compliance and effectiveness. This project complements other truck accommodation efforts on industrial-designated roads and reinforces the City's long-term multimodal and land use goals.

Cost Estimate

- $250,000

Qualitative Evaluation of Project Feasibility

- Given the limited scope of this project, its feasibility is not in question. This is simply a policy decision for the City.

Potential Project 18: Oak Road and Park Road Intersection Improvements



Figure 36: Oak/Park Road Intersection Improvements Project Area (source GHD)

Project Purpose

- To facilitate the safe and efficient movement of goods between the Port of Benicia and Park Road by way of Oak Road, which in turn connects the Port of Benicia to the regional transportation network and other local industrial uses, including the Benicia Industrial Park. The project aims to address turning movement conflicts and support long-term goods movement while addressing community livability and increasing safety for bicyclists.

Project Location

At the intersection of Oak Road and Park Road, including the adjacent intersections of Park Road and Vista Point Road and the Class I trail connection across the Benicia-Martinez Bridge. This intersection is one of two truck freight connections between the Port of Benicia and the regional transportation network via the I-680 ramps at Industrial Way and Bayshore Road, and in the future, via the planned connector road (potential project 19) between Park Road and East 2nd Street to the I-780 ramps.

Project Description

- Oak Road serves as an important connector in the transportation network around the Port of Benicia, but access between Oak Road and Park Road is challenging for motorists, especially larger trucks. Specifically, intersection reconfiguration is required to facilitate the movement of STAA trucks when performing the southbound left turn movement from Park Road onto Oak Road, and when performing the westbound right turn movement from Oak Road onto Park Road, without encroaching into oncoming traffic lanes due to the constrained present geometry. Additionally, the sight distance is obstructed for westbound vehicles exiting Oak Road towards Park Road by a pier structure of the eastbound I-780 to eastbound I-680 elevated connector ramp. As one of only two principal truck access routes between the Port of Benicia and the regional surface transportation network, it is critical that ingress and egress of STAA trucks is facilitated, particularly if Port of Benicia activity is to increase.

  The complexity of any proposed improvements to this intersection is increased by varying and competing approach grades of Vista Point Drive, Park Road, and Oak Road, in addition to the presence of the overhead freeway pier structure. In order to provide adequate sight distance and facilitate unobstructed STAA truck movement between Oak Road and Park Road, it is anticipated that significant intersection realignment and changes to intersection control will be required. Right-of-way in this area is anticipated to include at minimum City of Benicia, private property (Oak Road) and Caltrans (Vista Point Drive, Class I trail, and pier structure), further increasing improvement complexity and the need for stakeholder coordination.

  Besides goods movement, Park Road, south of Oak Road, connects active transportation users, particularly cyclists, via Class II bike lanes to the Class I trail across the Benicia-Martinez Bridge in the vicinity of this intersection. Additionally, passenger vehicle access to the Benicia Bridge Vista Point is provided the Vista Point Drive intersection north of Oak Road. Both of these intersections are in the immediate vicinity of the Oak Road intersection, introducing additional geometric complexity and potential user conflict.

  Key improvements are expected to include:

  - Realignment of intersection(s) to improve spacing between Oak Road, Vista Point Road, and Class I trail access to clarify driver expectations of conflicting turning movements, including trail users.
  - Geometric modification to facilitate safe and efficient STAA truck movement between Oak Road and Park Road, including improved turning radii and stopping sight distance.

Cost Estimate

- $500,000 (PID and ISOAP/ICE only)

Qualitative Evaluation of Project Feasibility

- It is not possible to evaluate the feasibility of improvements at this intersection unless or until the PID and streamlined ISOAP/ICE phase is completed.

Potential Project 19: New Roadway Connector from East 2nd Street to Park Road

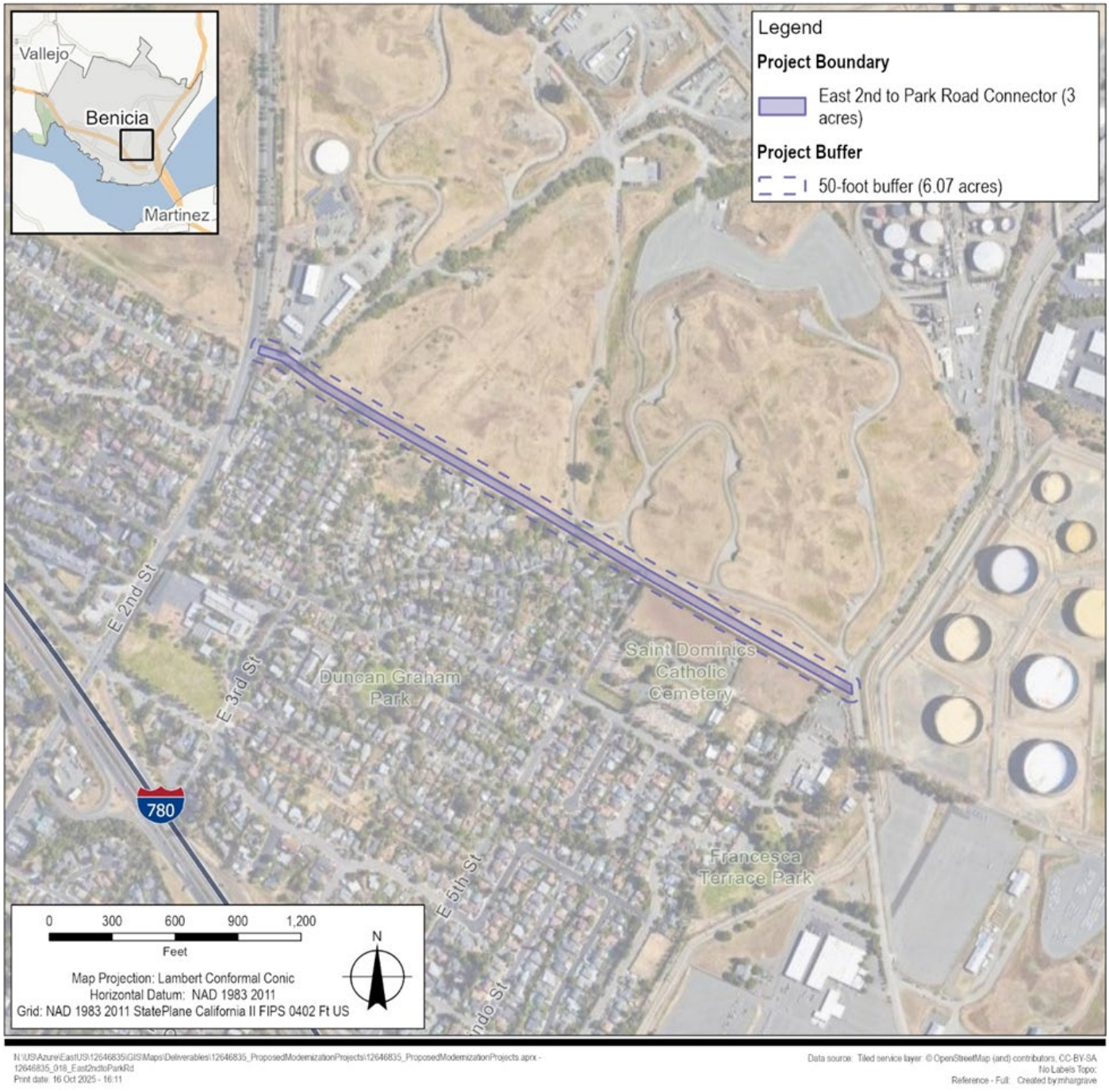


Figure 37: East 2nd Street to Park Road Connector Project Area (source GHD)

Project Purpose

- The purpose of this project is to establish a direct, efficient connection between East 2nd Street and Park Road. This new link aims to improve traffic circulation, reduce congestion at key intersections, and provide an alternative path for goods movement vehicles – particularly those accessing the Port of Benicia – while minimizing conflicts with sensitive areas such as residential zones or roads not suited for high truck volumes.

Project Location

- The project is located within the southern industrial area of the City of Benicia, bridging East 2nd Street (near existing light industrial and storage uses) to Park Road. The precise alignment would be determined based on topographic constraints, right-of-way availability, and safety considerations.

Project Description

- This project proposes the construction of a new roadway segment connecting East 2nd Street to Park Road. Design considerations include:
    - Two-lane urban collector or industrial connector standards, including provisions for bicycles
    - Appropriate turning radii and structural pavement design based on expected truck volumes and ESALs
    - Signal or stop control integration at tie-in points with East 2nd Street and Park Road
    - Stormwater management and utility coordination
    - Landscaping and fencing to buffer adjacent uses, if applicable

This connector is also consistent with policies in the City's General Plan Circulation Element and would play a role in implementing a more complete and coherent goods movement network.

Qualitative Evaluation of Project Feasibility

- This project is important for the near-term and long-term viability of the port and will increase safety and functionality by creating an entirely new truck route within the City of Benicia. In the long term, when combined with improvements to Park Road (Project 16) and the intersection of Park Road and Oak Road (Project 18) this new connector will create a safer and more efficient route for trucks serving the Port of Benicia to access the Interstate system by removing many of them from Bayshore Road and the general circulation challenges that the intersection of Bayshore Road and Park Road, along with the I-680 ramps, currently present (see Projects 9-12).
- From a technical perspective (i.e. design and construction), the proposed construction of a new connector between East 2nd Street and Park Road is feasible, with costs being unexceptional. Operationally, there would be no construction-related impacts to port users since this new route would not disrupt existing traffic patterns. Economically, once complete, the new connector would reduce the amount of time it takes a given truck to access the local highway network, which is generally beneficial. Environmentally, this project can be completed based on an IS/MN) document under CEQA, meaning no EIR is required.

Table 13: Qualitative Feasibility of Project 19

Evaluation Criterion	Complexity (high/medium/low)	Cost ($) (high/medium/low)	Positive Benefit (high/medium/low)	Negative Impact (high/medium/low)
Technical	medium	medium	n/a	n/a
Operational	low	low	high	n/a
Economic	n/a	n/a	medium	n/a
Environmental	medium	n/a	n/a	low

Source: GHD

Projects Recommended for Advancement

Based on the qualitative evaluation of feasibility for all 19 potential capital improvement projects presented above, and consultation with key project stakeholders, including AMPORTS, Table 14 below presents a list of top candidate projects for advancement to a more detailed planning/evaluation phase and/or design and construction, subject to required environmental and/or other permitting requirements as well as available funding.

Table 14: Projects Recommended for Advancement

#	Project Name	Advance? (Y/N)	Comments
1	Pier Structural Improvements	Y	This project is critical to near-term port operations and is considered a top priority for port modernization.
2	Pier Expansion for Additional Mooring/Tug Berths	Y	This project will greatly enhance the port's long-term capabilities and would ideally be completed simultaneously with Project 1.
3	Port Backlands Improvements	Y	Due to the complex topography and mix of uses within the Benicia PPA, these two sites are the only relatively large parcels of land located immediately adjacent to existing port operations that have near-term potential to be developed for waterfront industrial use. Both sites are considered high priorities for port modernization.
4	Overwater Deck and Wharf Expansion	N	The cost of this project, combined with the potential for regulatory complexity (i.e. overwater development within the tidelands), makes it a less-attractive alternative to activate additional port backlands than Project 3.
5	Shore Power System	Y	This project achieves multiple goals for both the City/County and AMPORTS since it optimizes both at-berth vessel emission reduction and regulatory compliance costs. It is recommended for advancement to the detailed planning and design phase in collaboration with PG&E.
6	Solar Array and Landside BESS	N	This project is not essential to port operations and would take up significant waterfront acreage that is more productively used for port operations.
7	Stormwater Infrastructure Improvements	Y	This project requires additional study but is essential to mitigate the potential impacts of stormwater runoff into the Carquinez Strait. A detailed follow-up study is recommended.
8	SLR Seawall	Y	This project requires additional study and is not needed in the near term. However, it is important to identify condition-based triggers for long-term coastal resiliency projects, including SLR mitigation measures, so this project is recommended to advance to the next phase of planning.

9	Intersection Improvements - Park/Bayshore	Y	As one of the most challenging and poorest performing areas in the City of Benicia's road network, this project is recommended for advancement to the PID + streamlined ISOAP/ICE phase.
10	Intersection Improvements - Bayshore/I-680	Y	As one of the most challenging and poorest performing areas in the City of Benicia's road network, this project is recommended for advancement to the PID + streamlined ISOAP/ICE phase.
11	Intersection Improvements - Industrial/Park	Y	As one of the most challenging and poorest performing areas in the City of Benicia's road network, this project is recommended for advancement to the PID + streamlined ISOAP/ICE phase.
12	Bayshore Road Improvements	Y	This project will improve the safety and overall condition of a primary truck route (Bayshore Road) connecting the Port of Benicia to the Interstate system and is recommended for advancement to the next phase of planning.
13	Park/Adams Truck Restriction/Realignment	Y	This administrative project will improve safety and eliminate wear and tear on sections of roadway that are not appropriate for heavy-duty truck traffic and is recommended for advancement.
14	Industrial Way Improvements	N	Industrial Way is outside the area of the PPA that is impacted by port-related truck traffic, so this project is out of scope for the Modernization plan.
15	Adams Street Improvements	N	While conditions on Adams Street are suboptimal, since Projects 13 and 17 will eliminate truck access to Park Road from Adams Street and restrict truck traffic on Military East between Adams Street and 1st Street, respectively, improvements to Adams Street are not a priority for the port Modernization plan.
16	Park Road Improvements	Y	This project will improve the safety and overall condition of a primary truck (Park Road) route connecting the Port of Benicia to the Interstate system and is recommended for advancement to the next phase of planning.
17	Military East Improvements	Y	This administrative project will improve safety and eliminate wear and tear on sections of roadway that are not appropriate for heavy-duty truck traffic and is recommended for advancement.
18	Oak Road and Park Road Intersection Improvements	Y	This project represents an important connection point between Oak Road and Park Road and will be critical to reducing the number of port origin/destination trucks that use Bayshore Road to access I-680 (and vice-versa) near the intersection of Park Road once Project 19 is implemented. It is strongly recommended for near-term advancement to the PID + streamlined ISOAP/ICE phase.

19	East 2nd Street/Park Road Connector	**Y**	This project would significantly reduce the number of trucks accessing the Interstate system via Bayshore Road by diverting port origin/destination traffic onto a dedicated truck route that connects to the port via Park Road and Oak Road. It is considered a high priority for port modernization.

Source: GHD

Capital Improvement Plan (CIP)

The CIP presented in this section represents a comprehensive 15-year investment vision for the Port of Benicia based on the analyses conducted during Tasks 1-4 of this Modernization plan. All recommended investments presented below are based on rough order of magnitude (ROM) cost estimates as completed by the GHD team and a phasing strategy that seeks to prioritize key projects while spreading capital costs over time to the maximum extent possible in order to minimize the single-year capital burden in any given year on both the City and the port operator. It is important to note that a number of separate and/or ongoing investments (i.e. operating and maintenance (O&M) costs) that are required to keep the existing port in a state of good repair will continue to be required over time on a periodic basis. These O&M projects and associated costs are not included in this CIP since they are not considered modernization projects and are the sole responsibility of the port operator (AMPORTS). Task 8 of this Modernization plan will explore funding strategies associated with the CIP presented below as a separate exercise.

Project Prioritization

The following list presents a general order of prioritization for all projects recommended for advancement in this plan based on considerations including, but not necessarily limited to: importance for current/near-term port operations; importance for near-term and long-term port diversification; importance for future air/water quality; and, importance for long-term port operations.

Port of Benicia projects identified as high priority projects below were generally found to score medium or high in Positive Benefit across technical, operational, economic and/or environmental criteria while scoring medium or low across these same criteria in Negative Impact. More importantly, the projects identified as high priority for this Modernization plan reflect priorities as expressed by the port operator, AMPORTS, in terms of those projects that will contribute most directly to the Port of Benicia's value proposition and ability to continue to grow and/or diversify its operations in the future.

The only low priority project identified below is Project 8: SLR Seawall. While this project is compelling as a long-term mitigation measure that will eventually be necessary to protect the port from future SLR-related overtopping, the 2080 timeframe means that any detailed design or construction should be delayed until after 2040.

All other projects selected for advancement in this Task 4 deliverable fit into the medium priority category by virtue of not meeting the high priority threshold, but still being valid and necessary port-adjacent improvements.

High Priority Projects

- Project 1: Pier Structural Improvements
- Project 2: Pier Expansion for Additional Mooring/Tug Berths
- Project 3: Port Backlands Improvements
- Project 5: Shore Power System
- Project 7: Stormwater Infrastructure Improvements

Medium Priority Projects

- Project 9: Park/Bayshore Road Intersection Improvements
- Project 10: Bayshore Road/I-680 Ramps Intersection Improvements
- Project 11: Industrial Way/Park Road and I-680 Ramps Intersection Improvements
- Project 12: Bayshore Road Improvements
- Project 13: Park Road and Adams Street Truck Restriction/Realignment
- Project 16: Park Road Improvements

- Project 17: Military East Roadway Improvements/Truck Restriction
- Project 18: Oak Road and Park Road Intersection Improvements
- Project 19: East 2nd Street to Park Road Connector

Low Priority Projects

- Project 8: SLR Seawall

Project Coordination

From a critical path perspective, no Port of Benicia modernization project recommended for advancement in this Task 4 deliverable is technically dependent on another project. However, six projects are directly linked such that sequential (or simultaneous) implementation is strongly recommended as a means to minimize operational and other impacts during construction. These projects are grouped for potential phasing purposes as follow:

Linked Waterside Improvements

- Project 1: Pier Structural Improvements
- Project 2: Pier Expansion for Additional Mooring/Tug Berths
- Project 5: Shore Power System

While these three projects do not have to be coordinated per se, and could be implemented independently at different points in time if necessary, there is a strong case to implement them simultaneously or otherwise phase them in a way that minimizes design and construction costs as well as operational disruption. Detailed project planning is not possible at this time since no level of design has yet been completed for any of these projects. However, as the City and AMPORTS work toward implementation of this CIP, it is recommended that planning, design, permitting and funding efforts for all three of these projects be closely coordinated.

Linked Landside Improvements

- Project 16: Park Road Improvements
- Project 18: Oak Road and Park Road Intersection Improvements
- Project 19: East 2nd Street to Park Road Connector

As with the three grouped waterside projects, these three landside projects can be implemented entirely independently of each other if necessary. However, sequencing them such that impacts to traffic on surrounding roadways is minimized would be optimal. Additionally, from a construction phasing perspective, it may make sense to implement projects 18 and 19 prior to making the recommended improvements to Bayshore Road (Project 12) in order to activate alternative truck routes before making major improvements to the primary existing truck route. Since no detailed design has yet been completed for any of the projects recommended in this Task 4 deliverable, optimal construction phasing also still needs to be evaluated.

Implementation Timeframes

There are still too many unknowns associated with the 15 projects selected for advancement as part of the Port of Benicia Facilities and Infrastructure Modernization plan to be able to accurately estimate precise implementation timeframes. However, based on the relative level of prioritization, expected capital costs and the respective technical complexity of each project, the timeframes shown in Table 15 reflect ranges within which each project might realistically be expected to be implemented. These timeframes will need to be updated dynamically and continuously over time in order to incorporate best available information as it becomes available. The availability of funding to advance each project from concept to execution will be especially critical to the ultimate CIP implementation schedule.

Table 15: Port of Benicia Modernization Plan – Implementation Timeframes by Project

Project #	Project Name	0-5 Years	5-10 Years	10-15 Years
1	Pier Structural Improvements	x		
2	Pier Expansion for Additional Mooring/Tug Berths	x		
3	Port Backlands Improvements		x	
5	Shore Power System	x		
7	Stormwater Infrastructure Improvements	x		
8	SLR Seawall			x
9	Park/Bayshore Road Intersection Improvements		x	
10	Bayshore Road/I-680 Ramps Intersection Improvements		x	
11	Industrial Way/Park Road and I-680 Ramps Intersection Improvements		x	
12	Bayshore Road Improvements			x
13	Park Road and Adams Street Truck Restriction/Realignment	x		
16	Park Road Improvements		x	
17	Military East Roadway Improvements/Truck Restriction	x		
18	Oak Road and Park Road Intersection Improvements		x	
19	East 2nd Street to Park Road Connector		x	

Source: GHD

Summary of Capital Investments

Table 16 presents a summary of capital costs by level of prioritization for the 15 modernization projects selected for advancement. These costs are based on Class 5[3] concept-level cost estimates completed for each project by the GHD team and have been rounded to the nearest $1,000. These cost estimates use 2029 as a base year. For projects expected to begin prior to 2029, the annualized 2029 cost estimate is still used. For projects expected to begin after 2029, a simple three percent (3%) annual escalation has been applied to the 2029 base amount to account for future labor and materials costs.

Four of the 15 projects (projects 9-11 and 18) require additional study before detailed project descriptions and associated capital cost estimates can be determined, meaning the cost estimates presented in this report specific to these four projects are placeholders for initial studies only. Once the recommended PID and ISOAP/ICE work has been completed for these four intersection improvement projects, design and construction costs can be estimated and added to the medium-priority projects total.

In addition, while a total project cost estimate of $69,800,000 was prepared for Project 8 (SLR Seawall), only $10,497,000 is included in this CIP. Of this, $100,000 of this is included as placeholder for a near-term follow-up geotechnical study of the existing port levee. The remaining $10,397,000 represents a 10 percent share of the total $69,800,000 2029-based project estimate, escalated to the year 2042. The reason the complete 2029-based capital cost of this multi-segment waterfront resiliency project has not been included for capital planning purposes is that, consistent with the feasibility analysis presented above, this project is not expected to be needed within the 15-year capital planning horizon (i.e. 2028-2042) of this plan. The reason only 10 percent of this cost has been included, and that it has been pushed out to the year 2042, is:

[3] Class 5 cost estimates are rough order of magnitude (ROM), or “ballpark” estimates used to assist with preliminary capital planning.

1. 10 precent is the rough proportion of the total cost of Project 8 assumed to be applicable to Segment D (Railroad Prism) mitigation; and
2. Implementation of the recommended SLR mitigation measure for Segment D (see Task 3 deliverable) is unlikely to be necessary prior to 2040, and would be optimally timed to coincide with the Bayshore Road improvements completed between 2040 and 2041 as part of Project 12.

Consistent with the City of Benicia's fiscal calendar, the following CIP is recommended for the Port of Benicia for the 15-year period beginning July 1, 2028 and ending June 30, 2042. This CIP totals $692,907,000.

Recommended CIP

Based on all of the information presented in this Task 4 deliverable, which is in turn based on the findings and analyses completed as part of Tasks 1-3; and, consistent with the City of Benicia's fiscal calendar, the following CIP is recommended for the Port of Benicia for the 15-year period beginning July 1, 2028 and ending June 30, 2042. Table 16 presents total capital costs by project by level of priority. Figure 38 indicates the general location of all 15 CIP projects. Table 17 presents capital costs for each project by year of expected expenditure.

Table 16: Prioritized Port of Benicia Capital Investments

Priority	Project # and Name	Subtotal with Annualized Escalation ($)	TOTAL ($)
High			
	1. Pier Structural Improvements	$216,699,000	
	2. Pier Expansion for Additional Mooring/Tug Berths	$68,387,000	
	3. Port Backlands Improvements	$239,344,000	
	5. Shore Power System	$34,108,000	
	7. Stormwater Infrastructure Improvements	$59,036,000	
			$617,574,000
Medium			
	9. Intersection Improvements - Park/Bayshore	$500,000	
	10. Intersection Improvements - Bayshore/I-680	$500,000	
	11. Intersection Improvements - Industrial/Park	$500,000	
	12. Bayshore Road Improvements	$16,438,000	
	13. Park/Adams Truck Restriction/Realignment	$250,000	
	16. Park Road Improvements	$16,003,000	
	17. Military East Improvements	$250,000	
	18. Intersection Improvements - Oak/Park	$500,000	
	19. East 2nd Street/Park Road Connector	$29,895,000	
			$64,836,000
Low			
	8. SLR Seawall	$10,497,000	
			$10,497,000
TOTAL (all 15 projects)			**$692,907,000**

Source: GHD



Figure 38: General Location of Port of Benicia 15-Year CIP Projects

Table 17: Recommended 15-Year CIP for Port of Benicia Facilities and Infrastructure Modernization Plan

		2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	
1	Pier Structural Improvements			$70.11M	$72.21M	$74.38M											$216.70M
2	Pier Expansion for Additional Mooring/Tug Berths	$22.57M	$22.57M	$23.25M													$68.39M
3	Port Backlands Improvements						$77.44M	$79.76M	$82.15M								$239.34M
5	Shore Power System	$6.58M	$6.58M	$6.78M	$6.98M	$7.19M											$34.11M
7	Stormwater Infrastructure Improvements		$19.10M	$19.10M	$19.67M												$59.04M
8	SLR Seawall	$100K														$10.40M	$10.50M
9	Park/Bayshore Road Intersection Improvements		$500K							TBD	TBD	TBD	TBD				$500K
10	Bayshore Road/I-680 Ramps Intersection Improvements		$500K							TBD	TBD	TBD	TBD				$500K
11	Industrial Way/Park Road and I-680 Ramps Intersection Improvements		$500K							TBD	TBD	TBD	TBD				$500K
12	Bayshore Road Improvements													$8.10M	$8.34M		$16.44M
13	Park Road and Adams Street Truck Restriction/Realignment	$250K															$250K
16	Park Road Improvements							$7.88M	$8.12M								$16.00M
17	Military East Roadway Improvements/Truck Restriction	$250K															$250K
18	Oak Road and Park Road Intersection Improvements		$500K					TBD	TBD	TBD	TBD						$500K
19	East 2nd Street to Park Road Connector								$9.67M	$9.96M	$10.26M						$29.89M
		$29.75M	$50.25M	$119.81M	$99.46M	$81.57M	$77.44M	$87.64M	$99.94M	$9.96M	$10.26M	$0	$0	$8.10M	$8.34M	$10.40M	**$692.91M**
		$380.83M					**$285.24M**					**$26.84M**					

Source: GHD

Appendix A: Project Cost Estimates (2029)

Potential Project 1

Port of Benicia Modernization Study
Capital Improvement Project Cost Estimates
Project 01 Pier Structural Improvements

Pier Replacement 90,400 SF

GHD Project No. 12646835

Draft 03 Nov, 2025

Construction Cost Estimate, Concept-Level Design	QTY	UM	Full Unit Cost	Total
General Requirements				
Temp Fencing, Construction Safety, Security	1	LS	$250,000	**$250,000**
Provide Access and Utilities to Work Sites	1	LS	$30,000	**$30,000**
Land Surveying, per crew day	6	Days	$10,000	**$60,000**
SWPPP Development and Compliance	1	LS	$400,000	**$400,000**
Water Safety	1	LS	$100,000	**$100,000**
Environmental Monitoring	1	LS	$100,000	**$100,000**
Pier Demolition	90,400	SF-Key Quantity		
Demolition Mobilization	1	LS	$400,000	**$400,000**
Remove lights, utilities, and misc.	90,400	SF	$7.00	**$632,800**
Demolish Fenders and struct steel	1,130	LF	$240.00	**$271,200**
Concrete cutting	1	LS	$600,000	**$600,000**
Remove conc curbs / rails / bollards	2,260	LF	$25.00	**$56,500**
Demolish 20" conc deck, convey to shore	6,027	CY	$370.00	**$2,229,867**
Concrete disposal - crush for road base and stockpile	6,027	CY	$35.00	**$210,933**
Pull wood piles	1,600	EA	$225.00	**$360,000**
Wood pile disposal	1,600	LS	$120.00	**$192,000**
Pier Construction	90,400	SF-Key Quantity		
Pier Construction Mobilization	1	LS	$1,500,000	**$1,500,000**
Buy Conc and stockpile piles 20-inch diameter precast-prestressed, use 110 LF Each	186,120	VLF	$200.00	**$37,224,000**
Set Piles	1,692	EA	$9,000.00	**$15,228,000**
Concrete 23" Pier Deck: Combination of Precast and PIP	6,417	CY	$2,800.00	**$17,968,395**
Reinf steel, new pier deck	1,283,457	LBS	$3.20	**$4,107,062**
New conc curbs / bull rail	2,260	LF	$225.00	**$508,500**
New fenders, one side	1,130	LF	$2,000.00	**$2,260,000**
Bollards+Pedestals	20	EA	$10,000.00	**$200,000**
Stormwater Systems	90,400	GSF	$17.00	**$1,536,800**
Pier Utilities	90,400	GSF	$20.00	**$1,808,000**
Pier markings and signs	1	LS	$50,000.00	**$50,000**
Allowances				
Conform / connect at shoreline/upland	1	LS	$1,000,000	**$1,000,000**
Maintenance Dredging, Sea Floor Cleanup	1,000	CY	$200.00	**$200,000**
Hazardous Materials	1	LS	$1,000,000	**$1,000,000**
Shoreside Improvements, utility connections	1	LS	$500,000	**$500,000**
Shoreside stormwater separation / filter systems	1	LS	$200,000	**$200,000**
Security Systems	1	LS	$300,000	**$300,000**
Permanent Fences and gates	1	LS	$200,000	**$200,000**
Railings	1,000	LF	$325.00	**$325,000**

Allowances				
Conform / connect at shoreline/upland	1	LS	$1,000,000	**$1,000,000**
Maintenance Dredging, Sea Floor Cleanup	1,000	CY	$200.00	**$200,000**
Hazardous Materials	1	LS	$1,000,000	**$1,000,000**
Shoreside Improvements, utility connections	1	LS	$500,000	**$500,000**
Shoreside stormwater separation / filter systems	1	LS	$200,000	**$200,000**
Security Systems	1	LS	$300,000	**$300,000**
Permanent Fences and gates	1	LS	$200,000	**$200,000**
Railings	1,000	LF	$325.00	**$325,000**
Subtotal, Direct Construction Costs (2025)				**$92,009,000**
GC's Gen Conditions, Gen Requirements	10.0%			$9,200,900
Gen Contractor's Fee	7.0%			$6,440,630
Bonds	2.5%			$2,691,263
Design Contingency	40%			$44,136,717
Estimated Total Construction Cost, 2025				**$154,479,000**
Cost Escalation, 4 years from August, 2025	17.0%			$26,239,580
Design Costs	7.0%			$12,650,301
Construction Management	6.0%			$10,843,115
Estimated Project Cost, 2029				**$204,211,996**
Estimated Project Cost, Rounded				**$204,200,000**

Source: GHD

Potential Project 2

Port of Benicia Modernization Study

Capital Improvement Project Cost Estimates

Project 02 Pier Expansion for Additional Mooring Tug Berths

GHD Project No. 12646835

Draft 03 Nov, 2025

Construction Cost Estimate, Concept-Level Design	QTY	UM	Full Unit Cost	Total
General Requirements				
Temp Fencing, Construction Safety, Security	1	LS	$100,000	**$100,000**
Provide Access and Utilities to Work Sites	1	LS	$30,000	**$30,000**
Land Surveying, per crew day	6	Days	$10,000	**$60,000**
Erosion Control / Pollution Control	1	LS	$200,000	**$200,000**
Water Safety	1	LS	$100,000	**$100,000**
Environmental Monitoring	1	LS	$100,000	**$100,000**
Pier Demolition				
Demolition Mobilization	1	LS	$40,000	**$40,000**
Remove lights, utilities, and misc.	1,000	SF	$7.00	**$7,000**
Cut end of pier, remove railings, prep for expansion	1	LS	$250,000	**$250,000**
Pier Construction	32,000	SF-Key Quantity		
Pier Construction Mobilization	1	LS	$100,000	**$100,000**
Buy Conc and stockpile piles 20-inch diameter precast-prestressed, use 110 LF Each	66,000	VLF	$200.00	**$13,200,000**
Set Piles	600	EA	$9,000.00	**$5,400,000**
Concrete 23" Pier Deck: Combination of Precast and PIP	2,270	CY	$2,800.00	**$6,356,000**
Reinf steel, new pier deck	454,000	LBS	$3.20	**$1,452,800**
New conc curbs / bull rail	900	LF	$225.00	**$202,500**
New fenders, one side	800	LF	$2,000.00	**$1,600,000**
Bollards+Pedestals	20	EA	$10,000.00	**$200,000**
Stormwater Systems	32,000	GSF	$17.00	**$544,000**
Pier Utilities	32,000	GSF	$20.00	**$640,000**
Pier markings and signs	1	LS	$20,000.00	**$20,000**
Allowances				
Maintenance Dredging, Sea Floor Cleanup	500	CY	$200.00	**$100,000**
Hazardous Materials	1	LS	$400,000	**$400,000**
Security Systems	1	LS	$300,000	**$300,000**
Railings	500	LF	$325.00	**$162,500**

Subtotal, Direct Construction Costs (2025)				**$31,565,000**
GC's Gen Conditions, Gen Requirements	6.0%			$1,893,900
Gen Contractor's Fee	7.0%			$2,209,550
Bonds	2.5%			$891,711
Design Contingency	40.0%			$14,624,065
Estimated Total Construction Cost, 2025				**$51,184,000**
Cost Escalation, 4 years from August, 2025	17%			$8,694,041
Design Costs	7%			$4,191,463
Construction Management	6%			$3,592,682
Estimated Project Cost, 2029				**$67,662,186**
Estimated Project Cost, Rounded				**$67,700,000**

Source: GHD

Potential Project 3

Port of Benicia Modernization Study

Capital Improvement Project Cost Estimates

Project 03 Port Backlands Improvements

GHD Project No. 12646835

Draft 03 Nov, 2025

Construction Cost Estimate, Concept-Level Design	QTY	UM	Full Unit Cost	Total
General Requirements				
Mobilization / Demobilization	2	LOC	$1,000,000.00	**$2,000,000**
Construction Safety, Security	2	LOC	$200,000.00	**$400,000**
Provide Facilities Access and Utilities to Work Sites	2	LOC	$300,000.00	**$600,000**
Additional Erosion / Dust / Pollution Control	2	LOC	$400,000.00	**$800,000**
Road Repairs from heavy trucks	1	LS	$1,000,000.00	**$1,000,000**
Environmental Monitoring	30	Days	$700.00	**$21,000**
Water Safety	N/A			**$0**
Manage and Monitor Contaminated soils: Extent TBD	1	LS	$2,000,000.00	**$2,000,000**
Sandstone Outcropping Excavation	12	Acres	Key-Quantity	
Total Excavation	630,000	CY	Key-Quantity	
Land Surveying, per crew day	10	Days	$4,200.00	**$42,000**
Construction Fencing	3,000	LF	$31.00	**$93,000**
Erosion Control - Perimeter Silt Fence, Haybales/ Rolls	3,000	LF	$20.00	**$60,000**
Demolition	1	LS	$800,000.00	**$800,000**
Clear & Grub	12	Acres	$12,000.00	**$144,000**
Excavate Overburden (20%)	126,000	CY	$40.00	**$5,040,000**
Excavate Moderately weathered Sandstone (40%) Rip-rock	252,000	CY	$65.00	**$16,380,000**
Excavate Unweathered sandstone, Pre-split and/or blast (40%)	252,000	CY	$110.00	**$27,720,000**
Transport Excavated Material to Pine Lake Stockpile, 2-mile distance	630,000	CY	$25.00	**$15,750,000**
Stormwater management during construction	522,720	GSF	$1.50	**$784,080**
Permanent stormwater improvements	522,720	GSF	$3.00	**$1,568,160**
Hydroseeding at completion	522,720	GSF	$0.50	**$261,360**
Pine Lake Embankment Site	23	Acres	Key-Quantity	
Total Embankment	480,000	CY	Key-Quantity	
Land Surveying, per crew day	10	Days	$4,200.00	**$42,000**
Construction Fencing	4,000	LF	$31.00	**$124,000**
Erosion Control - Perimeter Silt Fence, Haybales/ Rolls	4,000	LF	$20.00	**$80,000**
Demolition	1	LS	$400,000.00	**$400,000**
Clear & Grub	23	Acres	$12,000.00	**$276,000**
Stockpile-sort-process excavated sandstone from outcropping	630,000	CY	$20.00	**$12,600,000**
Place and Compact mass embankment	480,000	CY	$34.00	**$16,320,000**
Stormwater management during construction	1,001,880	GSF	$1.50	**$1,502,820**
Permanent stormwater improvements	1,001,880	GSF	$3.00	**$3,005,640**
Hydroseeding at completion	1,001,880	GSF	$0.50	**$500,940**
Landscaping: Minimum landscaping for long term management and aesthetics	1,001,880	GSF	$2.00	**$2,003,760**

Asset-Surplus Excavation, sorted and Stockpiled: Can be utilized or sold	150,000	CY	-$30.00	**-$4,500,000**
Subtotal, Direct Construction Costs (2025)				**$107,819,000**
GC's Gen Conditions, Gen Requirements	6.0%			$6,469,140
Gen Contractor's Fee	7.0%			$7,547,330
Bonds	2.5%			$3,045,887
Design Contingency	25.0%			$31,220,339
Estimated Total Construction Cost, 2025				**$156,102,000**
Cost Escalation, 4 years from August, 2025	17.0%			$26,515,261
Design Costs	7.0%			$12,783,208
Construction Management	6.0%			$10,957,036
Estimated Project Cost, 2029				**$206,357,505**
Estimated Project Cost, Rounded				**$206,400,000**

Source: GHD

Potential Project 4a (26 acres)

Port of Benicia Modernization Study

Capital Improvement Project Cost Estimates

Project 04b2 Overwater Deck and Wharf Expansion (26 Acres)

GHD Project No. 12646835

Draft 03 Nov, 2025

Construction Cost Estimate, Concept-Level Design	QTY	UM	Full Unit Cost	Total
General Requirements				
Temp Fencing, Construction Safety, Security	1	LS	$300,000	**$300,000**
Provide Access and Utilities to Work Sites	1	LS	$500,000	**$500,000**
Land Surveying, per crew day	10	Days	$10,000	**$100,000**
Erosion Control / Pollution Control	1	LS	$1,000,000	**$1,000,000**
Water Safety	1	LS	$200,000	**$200,000**
Environmental Monitoring	1	LS	$200,000	**$200,000**
Stockpile and work areas	1	LS	$500,000	**$500,000**
Option B Construct New, Bulkhead deck	26	Acres	Key-Quantity	
Pier Construction Mobilization	1	LS	$1,500,000	**$1,500,000**
Ground improvements - e.g. stone columns, DSM or similar	26	Acres	$400,000	**$10,400,000**
Construct Sheetpile perimeter seawall	3,000	LF	$8,000.00	**$24,000,000**
Dewatering	1	LS	$3,000,000.00	**$3,000,000**
Clear Sea Floor	1,132,560	SF	$10.00	**$11,325,600**
Dredge & Dispose 2' tidal zone overburden in deck area	83,893	CY	$60.00	**$5,033,600**
Imported Fill, Place and Compact, 8' above excavated seafloor	335,573	CY	$80.00	**$26,845,867**
New Deck Area Site Improvements	26	Acres	Key-Quantity	
Paving - 12" Conc Deck (40%)	453,024	SF	$27.00	**$12,231,648**
Paving - 6" AC Paving (60%)	679,536	SF	$6.50	**$4,416,984**
Signs, Pavement Marking	1,132,560	SF	$0.40	**$453,024**
Storm Drainage	1,132,560	SF	$4.00	**$4,530,240**
Lighting	1,132,560	SF	$5.00	**$5,662,800**
Utilities & Utility Connections	1,132,560	SF	$2.00	**$2,265,120**
Fencing / Railings / Gates	1,500	LF	$260.00	**$390,000**
Additional Allowances	26	Acres	Key-Quantity	
Shoreline / upland improvements	1	LS	$40,000,000	**$40,000,000**
Hazardous Materials Mgmt.	1	LS	$2,000,000	**$2,000,000**
Additional Dredging for shipping - Deferred	None			**$0**
Fenders and Docking - Deferred	None			**$0**

Subtotal, Direct Construction Costs (2025)				**$156,855,000**
GC's Gen Conditions, Gen Requirements	10.0%			$15,685,500
Gen Contractor's Fee	7.0%			$10,979,850
Bonds	2.5%			$4,588,009
Design Contingency	40.0%			$75,243,344
Estimated Total Construction Cost, 2025				**$263,352,000**
Cost Escalation, 4 years from August, 2025	17.0%			$44,732,591
Design Costs	7.0%			$21,565,921
Construction Management	6.0%			$18,485,075
Estimated Project Cost, 2029				**$348,135,588**
Estimated Project Cost, Rounded				**$348,100,000**

Source: GHD

Potential Project 4b (21 acres)

Port of Benicia Modernization Study

Capital Improvement Project Cost Estimates

Project 04b1 Overwater Deck and Wharf Expansion (21 Acres)

GHD Project No. 12646835

Draft 03 Nov, 2025

Construction Cost Estimate, Concept-Level Design	QTY	UM	Full Unit Cost	Total
General Requirements				
Temp Fencing, Construction Safety, Security	1	LS	$300,000	**$300,000**
Provide Access and Utilities to Work Sites	1	LS	$500,000	**$500,000**
Land Surveying, per crew day	10	Days	$10,000	**$100,000**
Erosion Control / Pollution Control	1	LS	$1,000,000	**$1,000,000**
Water Safety	1	LS	$200,000	**$200,000**
Environmental Monitoring	1	LS	$200,000	**$200,000**
Stockpile and work areas	1	LS	$500,000	**$500,000**
Option B Construct New, Bulkhead deck	21	Acres	Key-Quantity	
Pier Construction Mobilization	1	LS	$1,500,000	**$1,500,000**
Ground improvements - e.g. stone columns, DSM or similar	21	Acres	$400,000	**$8,400,000**
Construct Sheetpile perimeter seawall	3,000	LF	$8,000.00	**$24,000,000**
Dewatering	1	LS	$3,000,000.00	**$3,000,000**
Clear Sea Floor	914,760	SF	$10.00	**$9,147,600**
Dredge & Dispose 2' tidal zone overburden in deck area	67,760	CY	$60.00	**$4,065,600**
Imported Fill, Place and Compact, 8' above excavated seafloor	271,040	CY	$80.00	**$21,683,200**

New Deck Area Site Improvements	21	Acres	Key-Quantity	
Paving - 12" Conc Deck (40%)	365,904	SF	$27.00	**$9,879,408**
Paving - 6" AC Paving (60%)	548,856	SF	$6.50	**$3,567,564**
Signs, Pavement Marking	914,760	SF	$0.40	**$365,904**
Storm Drainage	914,760	SF	$4.00	**$3,659,040**
Lighting	914,760	SF	$5.00	**$4,573,800**
Utilities & Utility Connections	914,760	SF	$2.00	**$1,829,520**
Fencing / Railings / Gates	1,500	LF	$260.00	**$390,000**
Additional Allowances	21	Acres	Key-Quantity	
Shoreline / upland improvements	1	LS	$40,000,000	**$40,000,000**
Hazardous Materials Mgmt.	1	LS	$2,000,000	**$2,000,000**
Additional Dredging for shipping - Deferred	None			**$0**
Fenders and Docking - Deferred	None			**$0**
Subtotal, Direct Construction Costs (2025)				**$140,862,000**
GC's Gen Conditions, Gen Requirements	10.0%			$14,086,200
Gen Contractor's Fee	7.0%			$9,860,340
Bonds	2.5%			$4,120,214
Design Contingency	40.0%			$67,571,501
Estimated Total Construction Cost, 2025				**$236,500,000**
Cost Escalation, 4 years from August, 2025	17.0%			$40,171,549
Design Costs	7.0%			$19,367,008
Construction Management	6.0%			$16,600,293
Estimated Project Cost, 2029				**$312,638,851**
Estimated Project Cost, Rounded				**$312,600,000**

Source: GHD

Potential Project 5 (Shore Power)

Item Description	Subtotal Cost Installed ($)
15 kV switchgear with utility metering, main c.b.s, three feeder breakers, one spare breaker, including power logic, distr., sales tax	**$1,680,000.00**
7.5 MVA 3-phase 12KV-11/6.6 KV Dual Secondary, liquid filled transformer with ALTC, temp monitor and oil tank, containment barrier, including power logic, distr., contractor , sales tax	**$7,680,000.00**
11 kV Metal Clad switchgear with main c.b. including power logic, distr., sales tax (For 2 Ro-Ro Berths)	**$1,880,000.00**
6.6 kV Metal Clad switchgear with main c.b. including power logic, distr., sales tax (For one Bulk	**$1,030,000.00**
11 kV Metal Enclosed Earth/Power switchgear power load break & one earthing switch , including power logic, distr., sales tax (For two Ro-Ro Berths)	**$1,580,000.00**
6.6 kV Metal Enclosed Earth/Power switchgear for one power load break & one earthing switch, including power logic, distr., sales tax (For one Bulk Berth)	**$1,580,000.00**
Field Services	**$450,000.00**
Digital Services ,	**$650,000.00**
480 V switchboard with main circuit breaker and branch feeder breakers,	**$85,000.00**
300 kVA transformer, 16.5 kV Pri-480V secondary, 75 kVA transformer 480 Pri-120/208 sec, panel board with main and branch feeder breakers as shown and/or specified in plans and sepecifications.	**$150,000.00**
Neutral Grounding Resistor	**$125,000.00**
IGUS IMSPO Eqpt, cable mgr (For two Ro-Ro Berths)	$5,375,000.00
Trenching and backfill (1000 ft Utility service entrnace + 1000 ft from swgr to wharf)	$920,000.00
5" Fiber Glass conduit (in linear ft length)Utility Co	$50,000.00
4" Fiber Glass conduit (in linear ft length) 11 KV	$64,000.00
2" Fiber Glass conduit (in linear ft length)	$56,000.00
1" Fiber Glass conduit (in linear ft length)	$42,000.00
3/4" Fiber Glass conduit (in linear ft length)	$37,500.00
25 kV cable	$90,000.00
15 kV cable (ft)	$1,410,000.00
1000V Cable Rated as "1000V or Less) (ft)	$170,000.00
12 strand single mode Fiber optic cable, term. Kits	$56,000.00
Mobilization	$150,000.00
Wharf rubber fenders relocation and walkway modifi	$500,000.00
Underwharf conduit brackets	$365,000.00
Protection bollards with foundation	$305,000.00
concrete pull box	$310,000.00
Site work	$1,000,000.00
Utility Company service entrance charges	$150,000.00
Subtotal	$27,940,500.00
Unforseen conditions (10%)	$2,794,050.00
Subtotal	**$30,734,550.00**
Engineering Design & Construction Support	$2,151,418.50
Grand Total	**$32,885,968.50**

Source: H3

Potential Project 6a

OPTION A	Size Watts	Size kWh	Unit Cost $/Watt	Unit Cost $/kWh	Cost ($)
Floating Solar Array	2,500,000		1.5		$3,750,000
Battery Energy Storage System (BESS)		2,500		300	$750,000
Subtotal					$4,500,000
Engineering Design & Construction Support					$360,000
Miscellaneous Cost (10%)					$450,000
Unforeseen conditions (10%)					$450,000
Grand Total					$5,760,000

Source: H3

Potential Project 6b

OPTION B	Size Watts	Size kWh	Unit Cost $/Watt	Unit Cost $/kWh	Cost ($)
Structural Pile and Truss Mounted Overwater Solar Array	2,500,000		2.5		$6,250,000
Battery Energy Storage System (BESS)		2,500		300	$750,000
Subtotal					$7,000,000
Engineering Design and Construction Support					$560,000
Miscellaneous Cost (10%)					$700,000
Unforeseen conditions (10%)					$700,000
Grand Total					$8,960,000

Source: H3

Potential Project 7

Port of Benicia Modernization Study

Capital Improvement Project Cost Estimates

Project 07 Stormwater Infrastructure Improvements

GHD Project No. 12646835

Draft 03 Nov, 2025

Construction Cost Estimate, Concept-Level Design	QTY	UM	Full Unit Cost	Total
General Requirements				
Temp Fencing, Construction Safety, Security	4	LOC	$40,000.00	**$160,000**
Provide Access and Utilities to Work Sites	4	LOC	$50,000.00	**$200,000**
Land Surveying, per crew day	4	Days	$5,000.00	**$20,000**
Erosion Control / Pollution Control	4	LOC	$35,000.00	**$140,000**
Water Safety	4	EA	$10,000.00	**$40,000**
Environmental Monitoring	4	LS	$10,000.00	**$40,000**
Stormwater Bioretention Facilities				
PS1				
Main Area Construction: Area Of Infiltration Basin	17,424	SF	$160.00	**$2,787,840**
Inlets / Outlets / trashracks	1	LS	$200,000	**$200,000**
Utility crossings/relocations	1	LS	$100,000	**$100,000**
PS2-Upper				
Main Area Construction: Area Of Infiltration Basin	30,492	SF	$160.00	**$4,878,720**
Inlets / Outlets / trashracks	1	LS	$200,000	**$200,000**
Utility crossings/relocations	1	LS	$100,000	**$100,000**
PS2-Lower				
Main Area Construction: Area Of Infiltration Basin	34,848	SF	$160.00	**$5,575,680**
Inlets / Outlets / trashracks	1	LS	$200,000	**$200,000**
Utility crossings/relocations	1	LS	$100,000	**$100,000**
PS3				
Main Area Construction: Area Of Infiltration Basin	43,560	SF	$160.00	**$6,969,600**
Inlets / Outlets / trashracks	1	LS	$200,000	**$200,000**
Utility crossings/relocations	1	LS	$100,000	**$100,000**
PS4				
Main Area Construction: Area Of Infiltration Basin	21,780	SF	$160.00	**$3,484,800**
Inlets / Outlets / trashracks	1	LS	$200,000	**$200,000**
Utility crossings/relocations	1	LS	$100,000	**$100,000**

Subtotal, Direct Construction Costs (2025)				**$25,796,640**
GC's Gen Conditions, Gen Requirements	10.0%			$2,579,664
Gen Contractor's Fee	7.0%			$1,805,765
Bonds	2.5%			$754,552
Design Contingency	40%			$12,374,648
Estimated Total Construction Cost, 2025				**$43,311,000**
Cost Escalation, 4 years from August, 2025	17.0%			$7,356,744
Design Costs	7.0%			$3,546,742
Construction Management	6.0%			$3,040,065
Estimated Project Cost, 2029				**$57,254,551**
Estimated Project Cost, Rounded				**$57,300,000**

Source: GHD

Potential Project 8

Port of Benicia Modernization Study
Capital Improvement Project Cost Estimates
Project 08 SLR Seawall

GHD Project No. 12646835
Draft 03 Nov, 2025

Construction Cost Estimate, Concept-Level Design	QTY	UM	Full Unit Cost	Total
General Requirements				
Temp Fencing, Construction Safety, Security	1	LS	$50,000.00	**$50,000**
Provide Access and Utilities to Work Sites	1	LS	$100,000.00	**$100,000**
Land Surveying, per crew day	5	Days	$4,000.00	**$20,000**
Erosion Control / Pollution Control	1	LS	$100,000.00	**$100,000**
Water Safety	1	LS	$25,000.00	**$25,000**
Environmental Monitoring	1	LS	$10,000.00	**$10,000**
Traffic Control	1	LS	$100,000.00	**$100,000**
Sheet Pile Wall: extending the length of the Port.				
Segment A max depth of wall: 24 ft	4,573	LF	$2,465	**$11,272,445**
Segment E max depth of wall 21 ft	5,770	LF	$2,210	**$12,751,700**
Segment F max depth of wall 15 ft	3,502	LF	$1,700	**$5,953,400**
Road Behind Wall: 24' Width, Rough grade + 8" compacted base rock	4,573	LF	Key Quantity	
Segment A Rough Grading	109,752	SF	$1.20	**$131,702**
Segment A 8" Compacted Basecourse	2,710	CY	$100.00	**$270,993**
Segment C: added Fill and paving (minor)	1	LS	$5,000.00	**$5,000**
Raise Revetment				
Large Stone Revetment, Segment D, 240 LF	2,053	CY	$325.00	**$667,225**
Subtotal, Direct Construction Costs (2025)				**$31,457,000**
GC's Gen Conditions, Gen Requirements	10.0%			$3,145,700
Gen Contractor's Fee	7.0%			$2,201,990
Bonds	2.5%			$920,117
Design Contingency	40.0%			$15,089,923
Estimated Total Construction Cost 2025				**$52,815,000**
Cost Escalation, 4 years from August, 2025	17.0%			$8,971,080
Design Costs	7.0%			$4,325,026
Construction Management	6.0%			$3,707,165
Estimated Project Cost, 2029				**$69,818,270**
Estimated Project Cost, Rounded				**$69,800,000**

Source: GHD

Potential Projects 9-11

$500,000 per project is estimated for the PID + streamlined ISOAP/ICE phase. Capital costs for each project are “to-be-determined” pending further project definition.

Potential Project 12

Port of Benicia Modernization Study
Capital Improvement Project Cost Estimates
Project 12 Roadway Improvements - Bayshore Road

GHD Project No. 12646835
Draft 03 Nov, 2025

Construction Cost Estimate, Concept-Level Design	QTY	UM	Full Unit Cost	Total
General Requirements				
Temp Fencing, Construction Safety, Security	1	LS	$25,000.00	**$25,000**
Provide Access and Utilities to Work Sites	1	LS	$25,000.00	**$25,000**
Land Surveying, per crew day	3	Days	$4,000.00	**$12,000**
Erosion Control / Pollution Control	1	LS	$100,000.00	**$100,000**
Water Safety-None	-	LS	$0.00	**$0**
Environmental Monitoring	1	LS	$10,000.00	**$10,000**
Bayshore from Park Road to Adams				
Clear, Grub, Rough Grade	None	SF	$1.50	**$0**
Over excavation	9,451	CY	$75.00	**$708,825**
Pavement Demolition	255,180	SF	$1.80	**$459,324**
Class II AB	10,396	CY	$152.00	**$1,580,226**
AC (Option 1)	9,596	TONS	$165.00	**$1,583,340**
Thermoplastic Striping	34,024	LF	$2.00	**$68,048**
Drainage Improvements	255,180	SF	$3.00	**$765,540**
Street lighting	None	SF	$12.00	**$0**
Curb-and-gutter	None	LF	$70.00	**$0**
PCC 4,726 CY (Option 2) - Deferred	None	CY	Not Used	**$0**
Intersections - Conform	2	LOC	$50,000.00	**$100,000**
Subtotal, Direct Construction Costs (2025)				**$5,437,000**
GC's Gen Conditions, Gen Requirements	6.0%			$326,220
Gen Contractor's Fee	7.0%			$380,590
Bonds	2.5%			$153,595
Design Contingency	40.0%			$2,518,962
Estimated Total Construction Cost, 2025				**$8,816,000**
Cost Escalation, 4 years from August, 2025	17%			$1,497,473
Design Costs	7%			$721,943
Construction Management	6%			$618,808
Estimated Project Cost, 2029				**$11,654,225**
Estimated Project Cost, Rounded				**$11,700,000**

Source: GHD

Potential Project 13

$250,000.

Potential Project 14

N/A (not estimated).

Potential Project 15

Port of Benicia Modernization Study

Capital Improvement Project Cost Estimates

Project 15 Roadway Improvements - Adams Street

GHD Project No. 12646835

Draft 03 Nov, 2025

Construction Cost Estimate, Concept-Level Design	QTY	UM	Full Unit Cost	Total
General Requirements				
Temp Fencing, Construction Safety, Security	1	LS	$25,000.00	**$25,000**
Provide Access and Utilities to Work Sites	1	LS	$25,000.00	**$25,000**
Land Surveying, per crew day	3	Days	$4,000.00	**$12,000**
Erosion Control / Pollution Control	1	LS	$100,000.00	**$100,000**
Water Safety-None	-	LS	$0.00	**$0**
Environmental Monitoring	1	LS	$10,000.00	**$10,000**
Adams				
Clear, Grub, Rough Grade	None	SF	$1.50	**$0**
Over excavation	2,686	CY	$75.00	**$201,450**
Pavement Demolition	72,520	SF	$1.80	**$130,536**
Class II AB	2,953	CY	$152.00	**$448,805**
AC (Option 1)	2,719	TONS	$165.00	**$448,635**
Thermoplastic Striping	10,360	LF	$2.00	**$20,720**
Drainage improvements	72,520	SF	$3.00	**$217,560**
Street lighting	None	SF	$12.00	**$0**
Curb-and-gutter	None	LF	$70.00	**$0**
PCC 1,343 CY (Option 2) - Deferred	None	CY	Not Used	**$0**
Intersections - Conform	2	LOC	$50,000.00	**$100,000**
Subtotal, Direct Construction Costs (2025)				**$1,740,000**
GC's Gen Conditions, Gen Requirements	6.0%			$104,400
Gen Contractor's Fee	7.0%			$121,800
Bonds	2.5%			$49,155
Design Contingency	40.0%			$806,142
Estimated Total Construction Cost, 2025				**$2,821,000**
Cost Escalation, 4 years from August, 2025	17%			$479,171
Design Costs	7%			$231,012
Construction Management	6%			$198,010
Estimated Project Cost, 2029				**$3,729,193**
Estimated Project Cost, Rounded				**$3,700,000**

Source: GHD

Potential Project 16

Port of Benicia Modernization Study

Capital Improvement Project Cost Estimates

Project 16 Roadway Improvements - Park Road

GHD Project No. 12646835

Draft 03 Nov, 2025

Construction Cost Estimate, Concept-Level Design	QTY	UM	Full Unit Cost	Total	Notes
General Requirements					
Temp Fencing, Construction Safety, Security	1	LS	$100,000.00	**$100,000**	
Provide Access and Utilities to Work Sites	1	LS	$60,000.00	**$60,000**	
Land Surveying, per crew day	15	Days	$4,000.00	**$60,000**	
Erosion Control / Pollution Control	1	LS	$250,000.00	**$250,000**	
Water Safety-None	-	LS	$0.00	**$0**	
Environmental Monitoring	1	LS	$25,000.00	**$25,000**	
Park (Harbor Way to Industrial Way)	8,500	LF-Key Quantity			
Clear, Grub, Rough Grade	None	SF	$1.50	**$0**	
Over excavation	10,076	CY	$75.00	**$755,703**	
Pavement Demolition	272,000	SF	$1.80	**$489,600**	
Class II AB	11,081	CY	$152.00	**$1,684,385**	
AC (Option 1)	10,200	TONS	$165.00	**$1,683,000**	
Thermoplastic Striping	34,000	LF	$2.00	**$68,000**	
Drainage improvements	272,000	SF	$3.00	**$816,000**	
Street lighting	None	SF	$12.00	**$0**	
Curb-and-gutter	None	LF	$70.00	**$0**	
PCC 853 CY (Option 2) - Deferred	None	CY	Not Used	**$0**	
Intersections - Conform	7	LOC	$50,000.00	**$350,000**	
Subtotal, Direct Construction Costs (2025)				**$6,342,000**	
GC's Gen Conditions, Gen Requirements	6.0%			$380,520	
Gen Contractor's Fee	7.0%			$443,940	
Bonds	2.5%			$179,162	
Design Contingency	40.0%			$2,938,249	
Estimated Total Construction Cost, 2025				**$10,284,000**	
Cost Escalation, 4 years from August, 2025	17%			$1,746,825	
Design Costs	7%			$842,158	
Construction Management	6%			$721,850	
Estimated Project Cost, 2029				**$13,594,833**	
Estimated Project Cost, Rounded				**$13,600,000**	

Source: GHD

Potential Project 17

$250,000.

Potential Project 18

$500,000 is estimated for the PID + streamlined ISOAP/ICE phase. Capital costs for this project are “to-be-determined” pending further project definition.

Potential Project 19

Port of Benicia Modernization Study

Capital Improvement Project Cost Estimates

Project 19 East 2nd Street to Park Road Connector

GHD Project No. 12646835

Draft 03 Nov, 2025

Construction Cost Estimate, Concept-Level Design	QTY	UM	Full Unit Cost	Total
General Requirements				
Temp Fencing, Construction Safety, Security	1	LS	$25,000.00	**$25,000**
Provide Access and Utilities to Work Sites	1	LS	$25,000.00	**$25,000**
Land Surveying, per crew day	3	Days	$4,000.00	**$12,000**
Erosion Control / Pollution Control	1	LS	$100,000.00	**$100,000**
Water Safety-None	-	LS	$0.00	**$0**
Environmental Monitoring	1	LS	$10,000.00	**$10,000**
E 2nd to Park - New Connection (new road)				
Clear, Grub, Rough Grade	246,636	SF	$1.50	**$369,954**
Over excavation	18,269	CY	$75.00	**$1,370,175**
Pavement Demolition	None	SF	$1.80	**$0**
Class II AB	14,520	CY	$152.00	**$2,207,029**
AC (Option 1)	9,188	TONS	$165.00	**$1,516,020**
Thermoplastic Striping	12,896	LF	$2.00	**$25,792**
Drainage facilities (New)	246,636	SF	$8.00	**$1,973,088**
Street lighting	246,636	SF	$12.00	**$2,959,632**
Curb-and-gutter	6,448	LF	$70.00	**$451,360**
PCC 4,537 CY (Option 2) - Deferred	None	CY	Not Used	**$0**
Signs	1	LS	$4,000.00	**$4,000**
Intersections - Conform	2	LOC	$150,000.00	**$300,000**
Subtotal, Direct Construction Costs (2025)				**$11,349,000**
GC's Gen Conditions, Gen Requirements	6.0%			$680,940
Gen Contractor's Fee	7.0%			$794,430
Bonds	2.5%			$320,609
Design Contingency	40.0%			$5,257,992
Estimated Total Construction Cost, 2025				**$18,403,000**
Cost Escalation, 4 years from August, 2025	17%			$3,125,907
Design Costs	7%			$1,507,023
Construction Management	6%			$1,291,734
Estimated Project Cost, 2029				**$24,327,665**
Estimated Project Cost, Rounded				**$24,300,000**

Source: GHD

Appendix A

TBD

