FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX M: TRAFFIC

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers ®

Port of LONG BEACH
THE PORT OF CHOICE

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FEHR PEERS

Traffic Technical Memorandum

Date: September 25, 2019

To: Chad Beckstrom, ICF

From: Ribeka Toda and Netai Basu, Fehr & Peers

Subject: Traffic Impact Analysis for Deep Draft Navigation Study and Deepening Project

LA19-3125

Fehr & Peers conducted a traffic impact analysis for the proposed Deep Draft Navigation Feasibility Study and Deepening project. The study presents estimates of trip generation over the course of the entire project and available data on existing and future intersection operations along key access routes to the various sites where construction would occur. Based on the analysis, this memo summarizes conclusions regarding the significance of the temporary project-related traffic impacts.

Project Description

The Port of Long Beach (POLB, the applicant) proposes to widen and deepen existing navigation channels to better accommodate container and liquid bulk vessels. The project is comprised of several components that would be conducted over a period of approximately five years from 2024 to 2029.

- Dredging would occur at five locations throughout the harbor as shown in Figure 1, including in the West Basin, the Pier J Turning Basin and approach; a new Standby Area adjacent to the Main Channel; along the Main Channel; and along the Approach Channel through Queen's Gate. Up to approximately 8.3 million cubic yards of material would be dredged and transported by barge to an approved offshore location.
- To power the dredging equipment, the POLB proposes to build an electric substation in the southeast area of Pier J.
- Underwater bulkheads would be constructed, and other structural modifications made to portions of the existing wharves on Pier J and Pier T to improve their strength near areas proposed for dredging.

The following phases or activities are required for the proposed project:

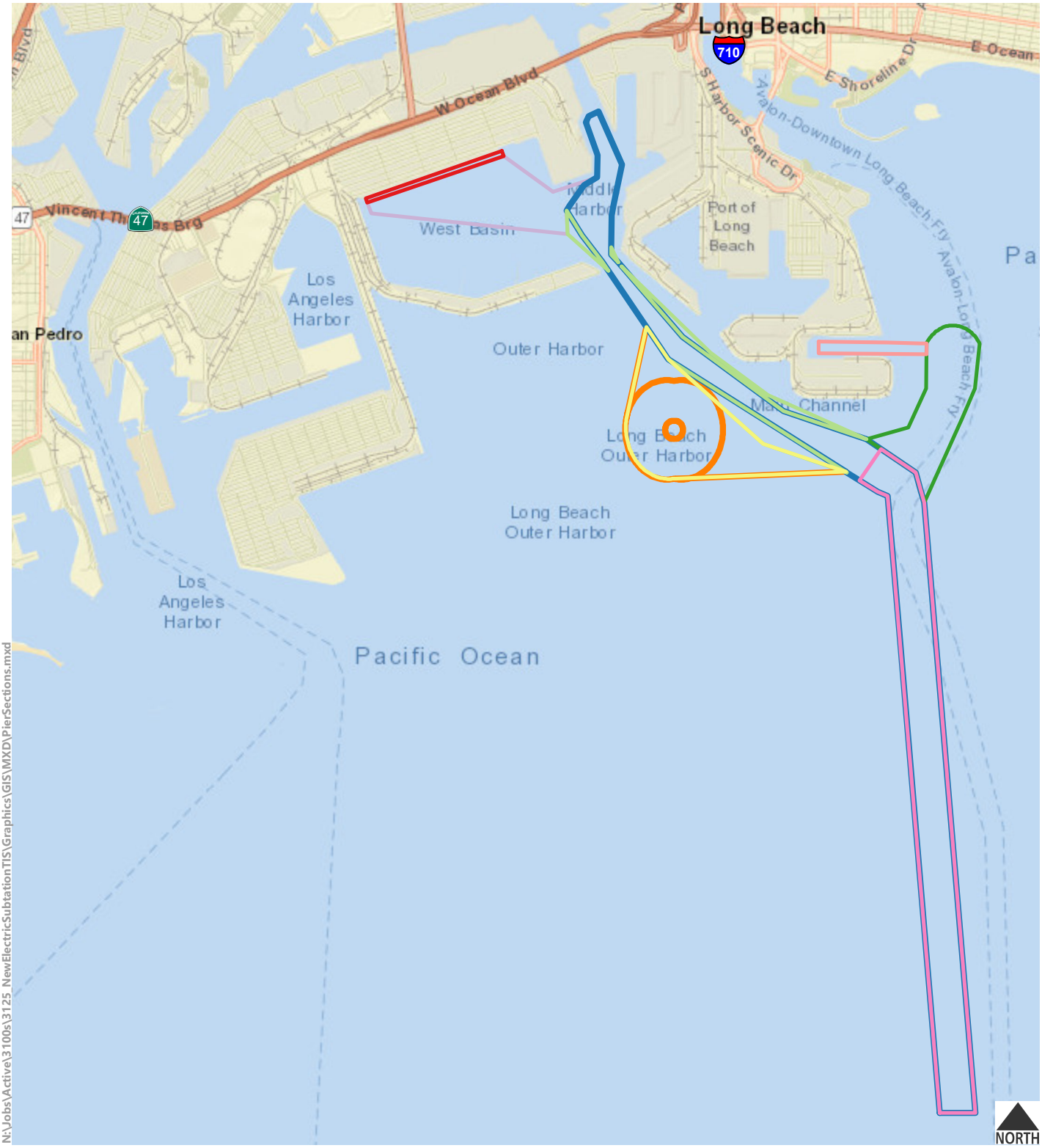
1. Landside Work: Construction of new electric substation (10/1/24 to 12/31/24)
2. Landside Work: Construction of finger dike at Pier J (1/1/24 to 3/2/24)
3. Landside Work: Upgrade of Pier J Wharf (1/1/24 to 6/24/24)
4. Landside Work: Upgrade of Pier T Wharf (1/1/24 to 11/16/24)
5. In-Water Work: Dredging of approach channel (1/1/25 to 2/4/26)
6. In-Water Work: Dredging of main channel for deepening and widening (1/1/26 to 6/28/26)
7. In-Water Work: Dredging of West Basin, part one (6/29/26 to 12/9/26)
8. In-Water Work: Dredging of West Basin, part two (1/1/27 to 3/28/27)
9. In-Water Work: Dredging of Pier T berths (3/29/27 to 4/5/27)
10. In-Water Work: Dredging of Pier J Basin (4/6/27 to 6/13/27)
11. In-Water Work: Dredging of Pier J approach, part one, (6/14/27 to 12/9/27)
12. In-Water Work: Dredging of Pier J approach, part two, (1/1/28 to 12/6/28)
13. In-Water Work: Dredging of Pier J approach, part three (1/1/29 to 2/20/29)

Trip Generation Estimates

Information on the project schedule, number of workers, equipment, and number of truck trips required for different activities during construction of the project was obtained from ICF and Port staff. Maximum daily project trips were estimated for each activity or phase and then put into a table to identify the changes in daily trip-making over the course of the project. The following assumptions were considered in the estimation of total daily and peak hour project trips:

- Number of daily workers during different phases of the project were estimated by the applicant. To be conservative, the peak number of daily workers within each month is assumed for every day of that month.

- Work on the landside construction at Pier T and Pier J will be done in one 8-hour to 10-hour shift, which may include Saturdays. Access routes were identified for each location.



Approach Channel
Main Channel
Main Channel Widening
Pier J Approach Channel
Pier J Basin
Pier T Berths
Standby Area
Turning Basin
West Basin

Figure 1

Areas within the Port Under Study

- There are three potential launch sites for the workers on barges for the dredging activity: Pier S, Pier T, and a site near Pier D Street & Pico Avenue. Dredging activity will be a 24-hour operation, including weekends, with three 8-hour to 10-hour shifts. Access routes were identified for each option.

- Vehicular trip generation closely relates to the number of employee trips to and from the project site. Because the project site is not served by public transit, all employees were assumed to travel by private automobile. Consistent with Port practices and to provide a conservative analysis, it was assumed that no carpooling would occur. All workers were assumed to arrive at the project site during weekday morning peak hour and depart the project site during the afternoon peak hour. Trips by dredging workers at the beginning and end of their shifts were assumed to potentially occur during any of the three analyzed peak hours.

- One quarter of the workers on the land-side elements of the project were assumed to travel off-site during a lunch break.

- Trucks delivering material for the construction of the electric substation were assumed to make up to 4 round trips a day, with one trip occurring in the morning peak hour, one occurring in the midday peak hour, one trip occurring in the afternoon peak hour, and one trip during an off-peak period.

- A passenger car equivalent (PCE) factor of 2.0 is assumed for heavy duty trucks.

- Estimated daily trips are rounded to nearest even number.

Table 1 shows the estimated number of workers needed each month by activity/phase and the periods when simultaneous construction activities would occur. Truck trips are also included in the resulting total daily trips by activity/phase. The month representing peak traffic activity associated with the construction and demolition phase was selected for detailed traffic impact analysis. As shown in Table 1, the total daily trips range from a low of 54 to a high of 240. The highest number of daily trips is expected to occur in February 2024 (162 daily trips) and the first two months of year 2026 (240 daily trips).

The morning, midday, and afternoon peak hours, for traffic impact analysis purposes, are defined as occurring between 7:00 and 8:00 AM, 2:00 PM and 3:00 PM, and 4:00 and 5:00 PM, respectively. As shown in Table 1, the project would generate a maximum of approximately 240 daily trips during the first and second month of 2026, during which there is planned dredging over three shifts at the approach channel with the hopper dredger and the main channel widening with the clam shell dredge. Because it is not known when shift changes would occur, these estimates

assume that they could coincide with the peak hours of traffic within the Port. Of the 240 daily trips, 80 trips would occur in the AM peak hour, 80 trips would occur in the midday peak hour, and 80 trips would occur in the PM peak hour. The 80 trips during each peak hour includes 40 inbound trips and 40 outbound trips. The peak hour trips are estimated based on assumptions set forth above.

Project Site Access

The substation construction and wharf improvements will be located on Pier J and Pier T. For dredging activity, workers will travel by water taxi from one of three potential launch sites: Pier T, and Pier S or a location near Pier D Street & Pico Avenue. Primary access routes connecting the regional freeway system with each landside work site and each launch site under consideration were identified and are shown in Figures 2A through 2E. The main access routes are via Ocean Boulevard, the Long Beach Freeway (I-710), the Harbor Freeway (I-110), and the Terminal Island Freeway (SR-47/SR-103). These access routes would be for both truck access and for workers commuting to the project site.

Table 1: Schedule of Daily Workers and Trips

Activity	Location	2024												2025												2026											
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1. Electrical Substation Construction at Pier J	Pier J										15	15	15																								
2. Finger Dike Construction	Pier J	25	25	7																																	
3. Pier J Wharf Upgrade	Pier J	15	25	25	25	25	25																														
4. Pier T Wharf Upgrade	Pier T	15	15	25	25	25	25	25	25	25	25	25																									
5. Approach Channel (hopper dredge 5,447,000 CY)	In water													66	66	66	66	66	66	66	66	66	66	66	66	66	66										
6. Main Channel Widening (clam shell dredge 1,065,000 CY)	In water																									54	54	54	54	54	54						
7. West Basin (clam shell dredge 975,000 CY)	In water																															54	54	54	54	54	54
Total Workers		**55**	**65**	**57**	**50**	**50**	**50**	**25**	**25**	**25**	**40**	**40**	**15**	**66**	**66**	**66**	**66**	**66**	**66**	**66**	**66**	**66**	**66**	**66**	**66**	**120**	**120**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**
Total Trips		**138**	**162**	**142**	**126**	**126**	**126**	**62**	**62**	**62**	**116**	**116**	**54**	**132**	**132**	**132**	**132**	**132**	**132**	**132**	**132**	**132**	**132**	**132**	**132**	**240***	**240***	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**

Activity	Location	2027												2028												2029	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2
8. West Basin (Clam shell dredge 513,000 CY)	In water	54	54	54																							
9. Pier T Berths (clam shell dredge Berths T132 to T140, 44,000 CY)	In water				54																						
10. Pier J Basin (clam shell dredge 408,000 CY)	In water					54	54																				
11. Pier J Approach (clam shell dredge 1,066,00 CY)	In water							54	54	54	54	54	54														
12. Pier J Approach (clam shell dredge 2,040,000 CY)	In water													54	54	54	54	54	54	54	54	54	54	54	54		
13. Pier J Approach (clam shell dredge 297,000 CY)	In water																									54	54
Total Workers		**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**
Total Trips		**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**

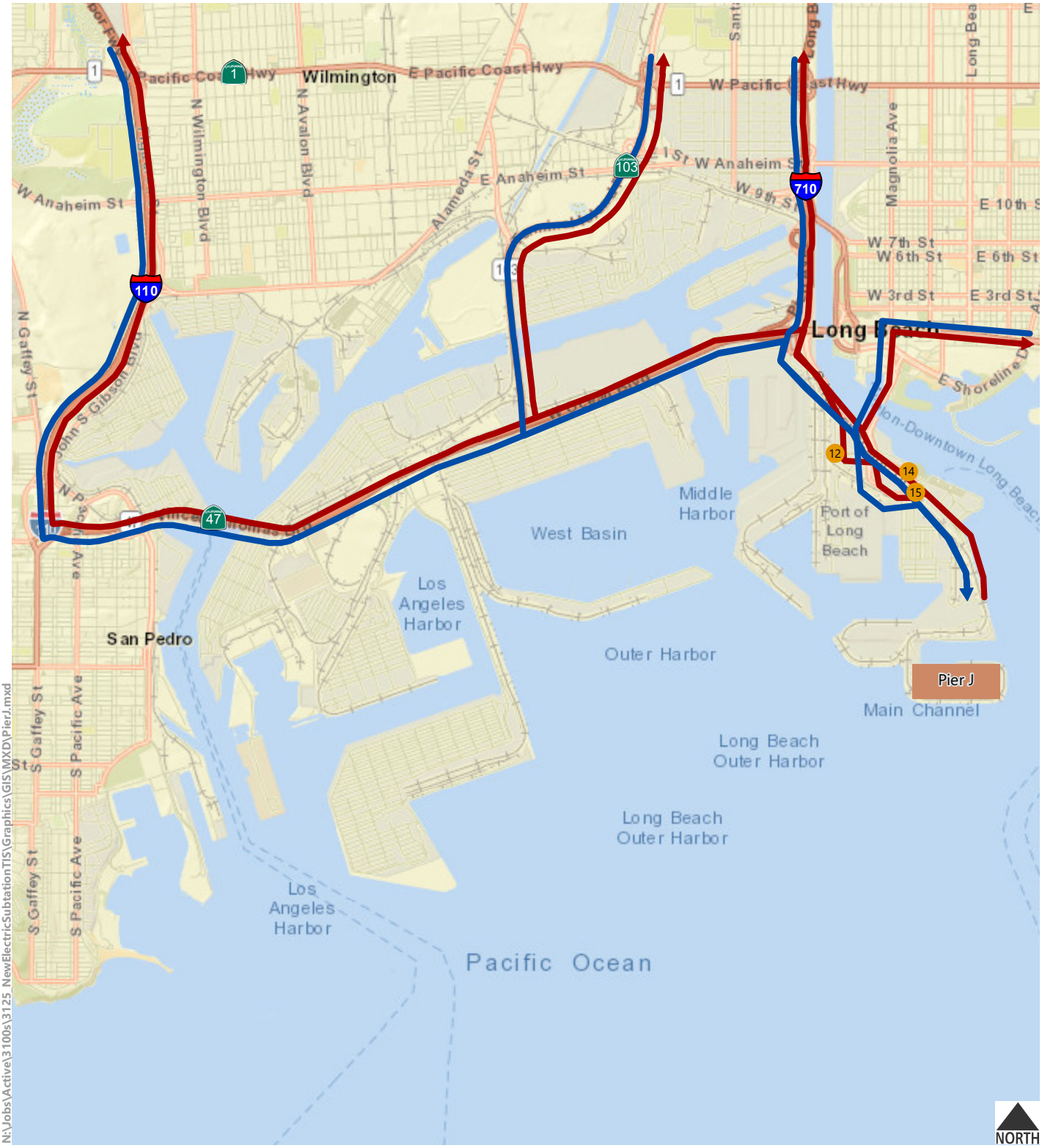
Notes:

The total trips for the electrical substation construction phase includes the trips associated with one truck making 4 round trips a day, with a passenger car equivalent (PCE) of 2.

The dredging work is consecutive and the activities do not overlap, other than in early 2026. The schedule calendar has been simplified to show this.

For example, the dredging of the Pier T Berths is projected to end on April 5th and is projected to to start at the Pier J Basin on April 6th. The calendar has been simplified to show that only one activity - Pier T Berths - occurs in April 2027, to avoid double-counting activities that are consecutive, and not overlapping.

*The maximum number of daily trips, 240, was used for the analysis.

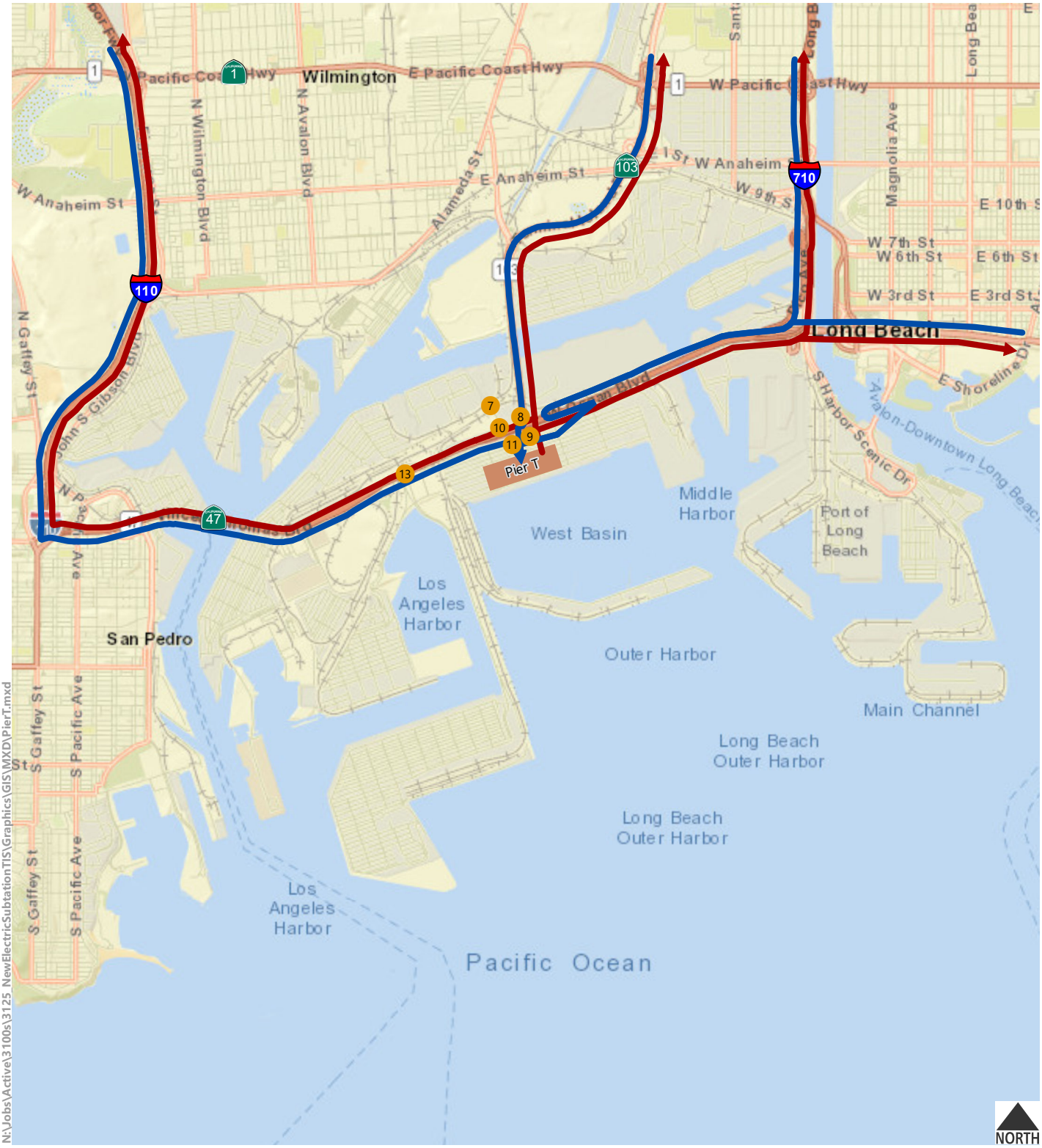


Access Routes
- Inbound
- Outbound
- Study Intersections

Peak Hour Trips	AM	MD	PM	Total
Inbound	50	13	0	63
Outbound	0	13	50	63

Figure 2A

Access Routes to Pier J Landside Work Site

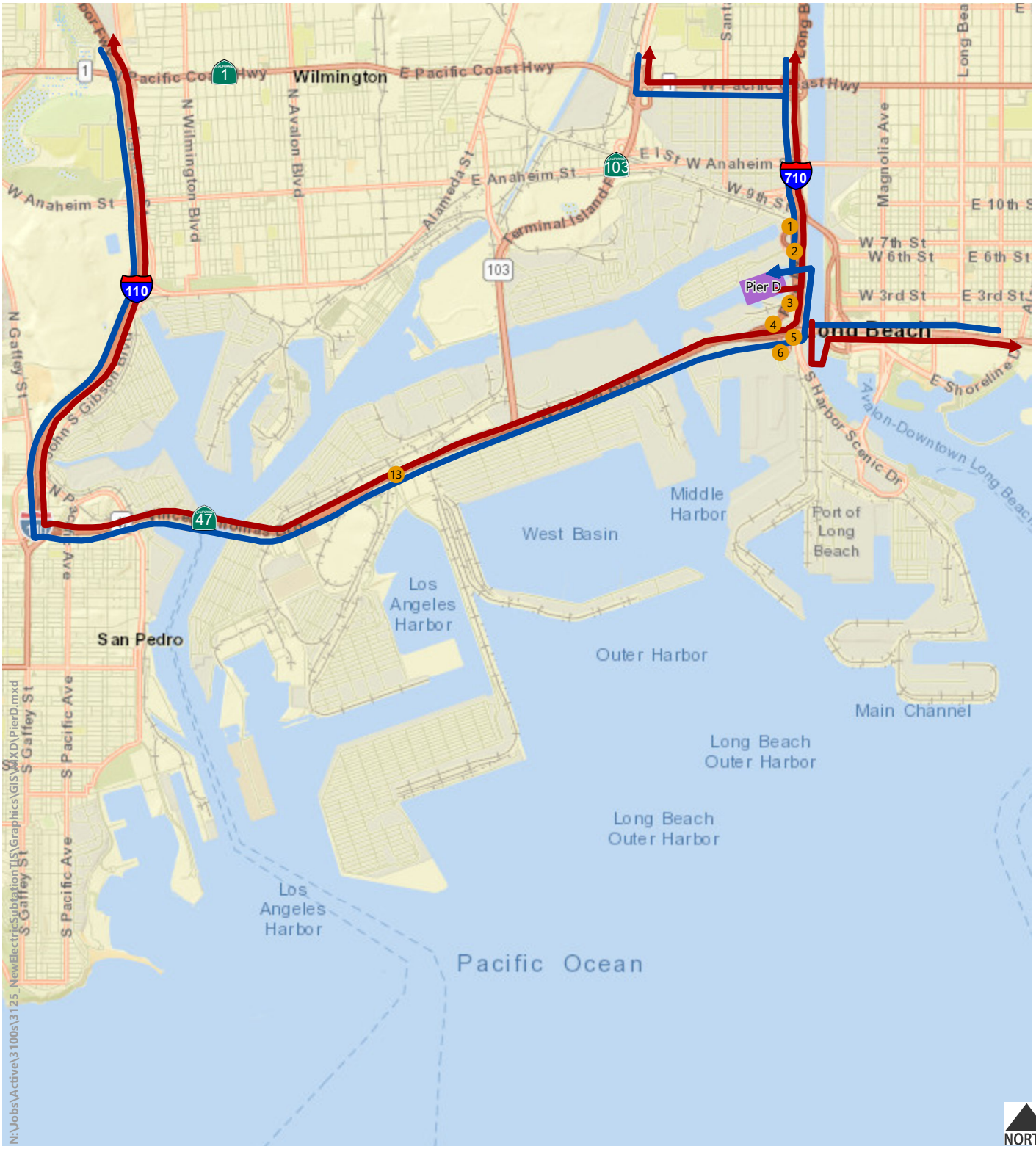


Access Routes
- Inbound
- Outbound
- Study Intersections

Peak Hour Trips	AM	MD	PM	Total
Inbound	25	6	0	31
Outbound	0	6	25	31

Figure 2B

Access Routes to Pier T Landside Work Site



Access Routes

Inbound

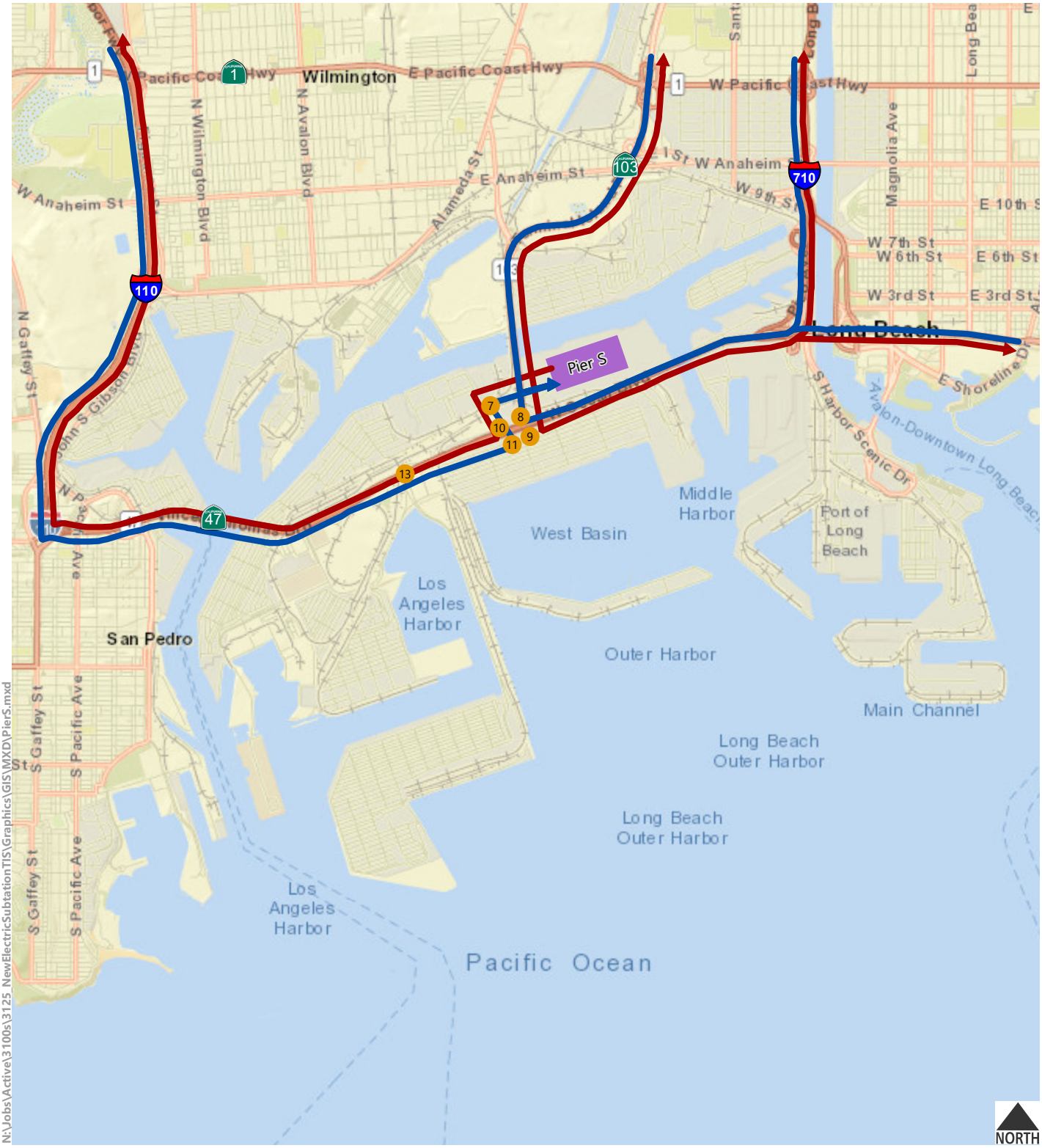
Outbound

Study Intersections

Peak Hour Trips	AM	MD	PM	Total
Inbound	40	40	40	120
Outbound	40	40	40	120

Figure 2C

Access Routes to Potential Launch Site for In-Water Work on Pier D



Access Routes

Inbound

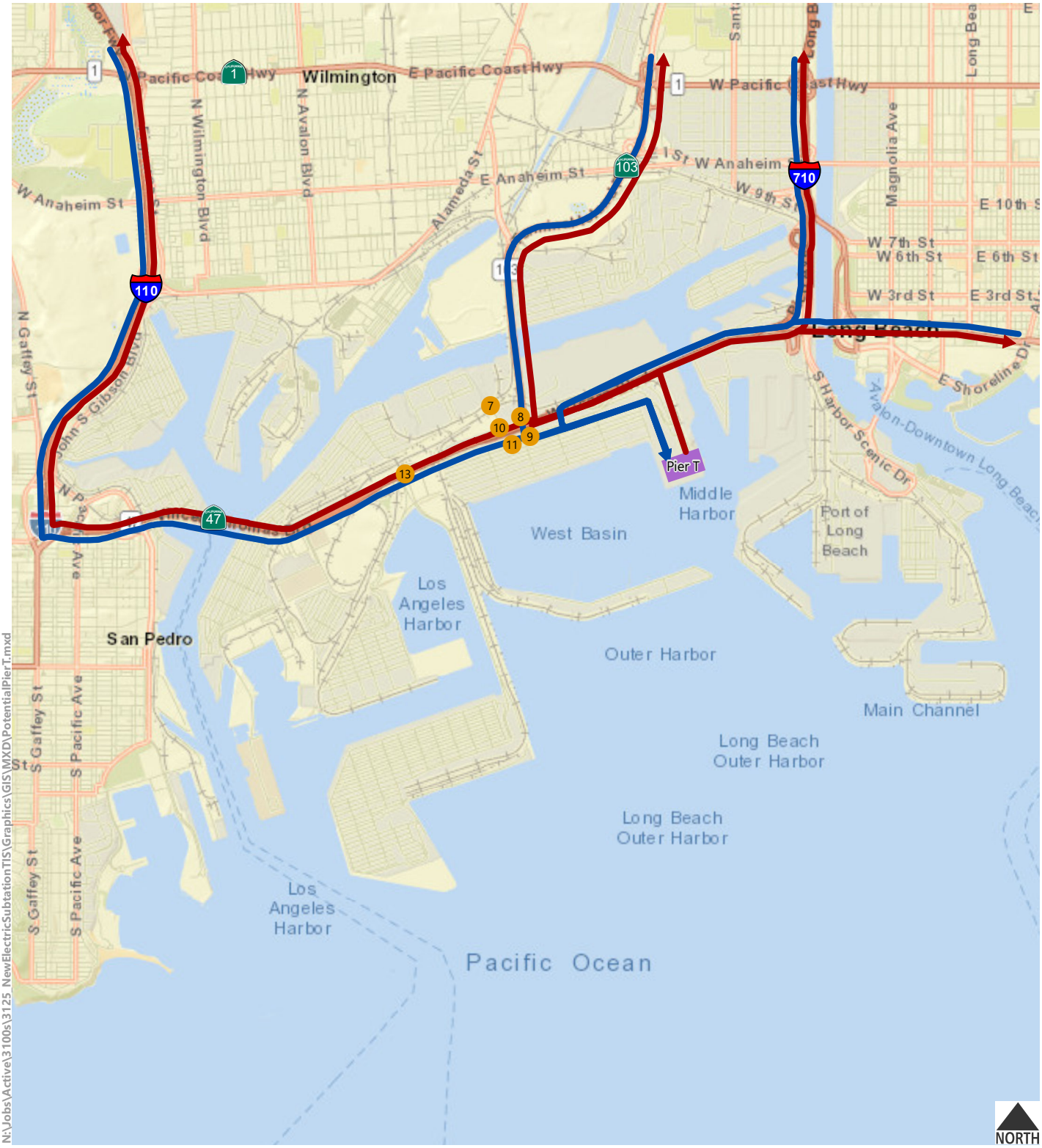
Outbound

Study Intersections

Peak Hour Trips	AM	MD	PM	Total
Inbound	40	40	40	120
Outbound	40	40	40	120

Figure 2D

Access Routes to Potential Launch Site for In-Water Work on Pier S



Access Routes

Inbound

Outbound

Study Intersections

Peak Hour Trips	AM	MD	PM	Total
Inbound	40	40	40	120
Outbound	40	40	40	120

Figure 2E

Access Routes to Potential Launch Site for In-Water Work on Pier T

Existing Traffic Conditions

Available information on current and future (2040) traffic operations at 15 intersections in the vicinity of the proposed land-side work sites and potential launch sites was taken from a recent study published by the Port (Port Master Plan Update Draft Program Environmental Impact Report [PMP EIR], August 2019). The intersections are shown on Figure 3. The analysis presents information on Existing Baseline conditions rather than simply Existing (2018) conditions, to account for the completion of the Gerald Desmond Bridge Replacement and Middle Harbor Terminal Redevelopment projects. The traffic counts were collected in 2018 when there were detour routes in place for the construction of these two major projects. The Existing Baseline conditions reflect the post-construction conditions in which the vehicles that were using the detour routes during construction would use the new Gerald Desmond Bridge. The PMP EIR projected 105,110 daily trips under the proposed master plan, of which 62,305 were trucks and 42,805 were autos associated with the Port of Long Beach. These locations are shown in Figures 2A through 2E and listed Table 2. As shown, good levels of service (LOS D or better) are shown under existing baseline and future conditions for the three analyzed weekday peak hours. Construction of the proposed project would occur between 2024 and 2029, ending approximately midway between the two horizon years for which LOS data is available.

Impact Analysis

Significant Impact Thresholds

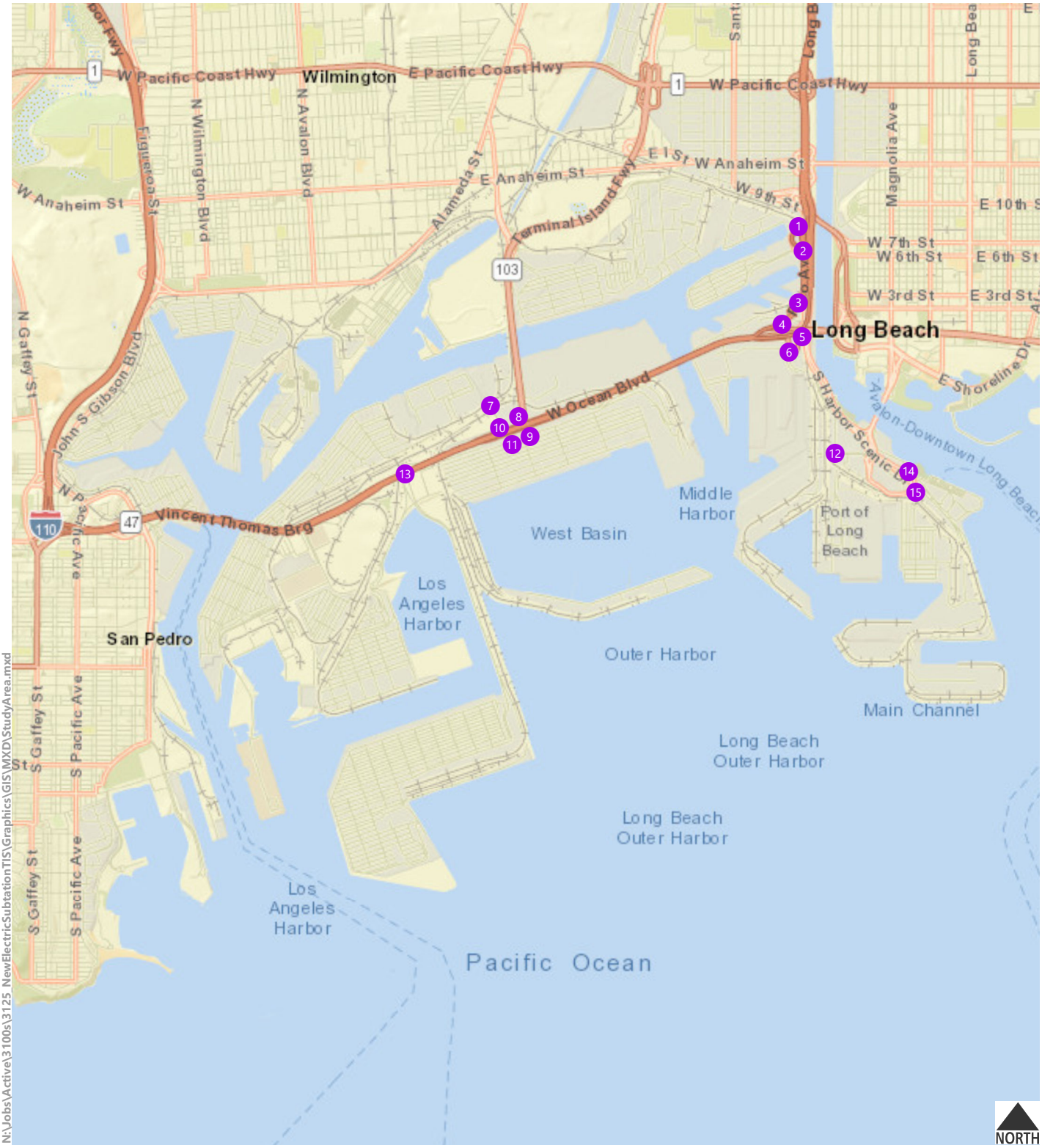
The City of Long Beach considers LOS D as the upper limit of satisfactory operations for intersections. A significant impact is identified where project traffic causes the intersection to deteriorate from LOS D to LOS E or F and increases the V/C ratio by 0.02 or more, or if the project traffic causes an increase in V/C ratio of 0.02 or greater when the intersection is operating at LOS E or F in the baseline condition.

As shown in Table 2, acceptable levels of service (LOS D or better) are shown under existing baseline and future conditions for the three analyzed weekday peak hours. Construction of the proposed project would occur between 2024 and 2029, ending approximately midway between the two horizon years for which LOS data is available. Because workers would travel between their homes and the different project work sites over various access routes, the project trips would be broadly distributed. During the peak of construction activity, estimated to occur over a period of two months, up to 80 trips would occur in any one-hour period (40 inbound and 40 outbound). Given the moderate peak hour trip generation, the various access sites, and the different sites that the workers would be travelling to and from, the trips would be distributed

broadly across the study area, it can be concluded that the additional project traffic would result in less than significant impacts according to the City's criteria.

While other project alternatives are studied under NEPA, the construction impact analysis for each alternative was not analyzed because this analysis is conducted for the peak day and the peak day is the same for all alternatives.

Upon completion of construction, there would be no traffic-related operational impacts as a result of this project. The purpose of this project is to increase safety and efficiency for in-water facilities and would not increase throughput capacity of the terminals. There would a nominal increase in vehicle trips per year for routine maintenance of the electrical substation, which would not be anticipated to impact traffic conditions.



● **Study Intersections**

Figure 3

Study Intersections

Table 2: Intersection Level of Service Summary

	Intersection	Peak Hour	Existing Baseline V/C	Existing Baseline LOS	Future (2040) V/C	Future (2040) LOS
1	PICO AVE &	AM	0.327	A	0.479	A
	PIER B ST	MID	0.390	A	0.546	A
		PM	0.417	A	0.493	A
2	PICO AVE &	AM	0.178	A	0.544	A
	PIER C ST	MID	0.295	A	0.576	A
		PM	0.287	A	0.6	A
3	PICO AVE &	AM	0.235	A	0.443	A
	PIER D ST	MID	0.363	A	0.519	A
		PM	0.241	A	0.486	A
4	PICO AVE &	AM	0.272	A	0.44	A
	WESTBOUND OCEAN BLVD ON-RAMP	MID	0.492	A	0.697	B
		PM	0.308	A	0.443	A
5	PICO AVE &	AM	0.172	A	0.525	A
	WESTBOUND OCEAN BLVD OFF-RAMP	MID	0.206	A	0.594	A
		PM	0.207	A	0.494	A
6	PICO AVE &	AM	0.378	A	0.616	B
	PIER E ST/EASTBOUND OCEAN BLVD RAMP	MID	0.340	A	0.672	B
		PM	0.314	A	0.55	A
7	PIER S AVE &	AM	0.339	A	0.622	B
	NEW DOCK ST	MID	0.328	A	0.664	B
		PM	0.328	A	0.569	A
8	TERMINAL ISLAND FWY &	AM	0.420	A	0.709	C
	SR-47 WESTBOUND	MID	0.469	A	0.757	C
		PM	0.469	A	0.703	C
9	TERMINAL ISLAND FWY &	AM	0.362	A	0.714	C
	SR-47 EASTBOUND	MID	0.387	A	0.805	D
		PM	0.434	A	0.757	C
10	PIER S AVE &	AM	0.346	A	0.819	D
	SR-47 WESTBOUND	MID	0.336	A	0.691	B
		PM	0.361	A	0.578	A
11	PIER S AVE &	AM	0.340	A	0.505	A
	SR-47 EASTBOUND	MID	0.369	A	0.622	B
		PM	0.300	A	0.484	A
12	PICO AVE/PIER G AVE &	AM	0.519	A	0.881	D
	HARBOR PLAZA	MID	0.592	A	0.819	D
		PM	0.592	A	0.812	D
13	NAVY WAY &	AM	0.436	A		
	SEASIDE AVE	MID	0.340	A	Not an intersection in the future*	
		PM	0.554	A		
14	HARBOR PLAZA &	AM	0.275	A	0.609	B
	QUEENSWAY DR	MID	0.387	A	0.863	D
		PM	0.390	A	0.701	C
15	HARBOR PLAZA &	AM	0.449	A	0.723	C
	HARBOR SCENIC DR	MID	0.442	A	0.897	D
		PM	0.434	A	0.585	A

* The intersection of Navy Way & Seaside Avenue, in Los Angeles, is planned for full grade separation in the future.

VMT Analysis

The following discussion is only relevant to CEQA. Since this is also a NEPA document the VMT discussion has no bearing on NEPA.

On September 27,2013, Governor Brown signed SB 743, which mandated a change in the way that transportation impacts of projects are evaluated under CEQA. The legislation requires the OPR to amend the CEQA guidelines to use VMT as a criterion for determining significant transportation impacts rather than LOS. Instead of promoting mitigation that involves increasing capacity (i.e., the width of a roadway or size of an intersection), which may increase auto use and emissions, and discourage alternative forms of transportation, the new VMT criterion would support reduction of GHG emissions, creation of multimodal networks, and promotion of a mix of land uses. Section 15064.3 in the current (2018) CEQA Guidelines states: "For the purposes of this section, 'vehicle miles traveled' refers to the amount and distance of automobile travel attributable to the project."

OPR published a preliminary evaluation of possible metrics to replace LOS in transportation analyses in December 2013 and, following substantial public input, released the final guidelines in December 2018. While the new analysis rules are now in effect, local agencies have until July 1, 2020, to develop and adopt new analytical procedures and threshold criteria.

The estimation of project-related daily vehicles miles of travel (VMT) is based on the trip generation estimates presented earlier over the course of the project. Average VMT per day and average VMT per year for automobile commute trips, excluding truck trips, were estimated based on information from POLB.

POLB estimates that the commute trip lengths to the construction site could be up to 50 miles. This analysis assumes that one-way commute trips to and from the construction site would average 25 miles.

Based on the estimate 240 daily one-way trips, the highest project-related daily VMT is estimated to be approximately 6,000 miles. The 240 daily one-way trips estimated for the first two months of 2026 do not include truck trips nor midday lunch trips since the activities are in-water dredging work that do not involve trucks and workers are on the barge for the whole shift.

To estimate the VMT per year, the total number of round trips per year was multiplied by the assumed average round-trip length of 50 miles. Table 3 shows the VMT estimates for each year of construction. Of the five full years of construction, Year 2 (2025) has the highest annual average

VMT with an estimated 1,204,500 miles. During this year, there is planned dredging every day for the approach channel.

The City of Long Beach has not yet adopted thresholds for VMT impacts. As such, this VMT analysis is for informational purposes only and no conclusions regarding project-generated VMT impact can be made at this point.

Conclusions

Based on the quantitative and qualitative analysis presented in this memorandum, it is concluded that the temporary traffic impacts related to the construction of the proposed Deep Draft Navigation project would result in less than significant traffic impacts on the surrounding street network.

Table 3: VMT Analysis

Year 1 (2024)				Year 2 (2025)			Year 3 (2026)			Year 4 (2027)			Year 5 (2028)			Year 6 (2029)		
Activity	Days	Daily Round Trips	VMT	Days	Daily Round Trips	VMT	Days	Daily Round Trips	VMT	Days	Daily Round Trips	VMT	Days	Daily Round Trips	VMT	Days	Daily Round Trips	VMT
1. Electric Substation				***5. Approach Channel***			***5. Approach Channel***			***8. West Basin, Part 2***			***12. Pier J Approach, Part 2***			***13. Pier J Approach, Part 3***		
Subtask 1	5	4	1,000	365	66	1,204,500	34	66	112,200	86	54	232,200	340	54	918,000	50	54	135,000
Subtask 2	15	4	3,000															
Subtask 3	5	2	500															
Subtask 4	20	15	15,000															
Subtask 5	26	8	10,400															
Subtask 6	2	8	800															
Subtotal			30,700															
2. Pier J Finger Dike							***6. Main Channel***			***9. Pier T Berths***								
Subtask 1	3	8	1,200				178	54	480,600	7	54	18,900						
Subtask 2	2	11	1,100															
Subtask 3	45	21	47,250															
Subtask 4	40	4	8,000															
Subtask 5	2	7	700															
Subtotal			58,250															
3. Pier J Wharf Improvements							***7. West Basin, Part 1***			***10. Pier J Basin***								
Subtask 1	5	8	2,000				163	54	440,100	68	54	183,600						
Subtask 2	10	8	4,000															
Subtask 3	20	15	15,000															
Subtask 4	135	21	141,750															
Subtask 5	130	4	26,000															
Subtask 6	5	3	750															
Subtotal			189,500															
4. Pier T Wharf Improvements										***11. Pier J Approach, Part 1***								
Subtask 1	5	8	2,000							178	54	480,600						
Subtask 2	20	8	8,000															
Subtask 3	35	15	26,250															
Subtask 4	250	21	262,500															
Subtask 5	245	4	49,000															
Subtask 6	10	3	1,500															
Subtotal			349,250															
Total Annual VMT			**627,700**			**1,204,500**			**1,032,900**			**434,700**			**918,000**			**135,000**

Year 1 Activities and Subtasks:

1. Electric substation activities: 1) Demolish asphalt, 2) Cut trench for ducts and foundation for substation, 3) Removal of demlished material to disposal site, 4) Construct manholes, ducts, foundations, 5) New asphalt and paving, 6) Install transformer and heavy electrical equipment
2. Pier J Finger Pier Activities: 1) Mobilize/demobilize, 2) Clearing of seabed of any obstruction prior to pile driving, 3) Driving of bulkhead wall, 4) Installation of anti-scour rock in front of new bulkhead wall, 5) Survey of installed bulkhead wall
3. Pier J Wharf Improvements Activities: 1) Mobilize/demobilize, 2) Sheet pile delivery, 3) Clearing of seabed of any obstruction prior to pile driving, 4) Driving of bulkhead wall, 5) Installation of anti-scour rock in front of new bulkhead wall, 6) Survey of installed bulkhead wall
4. Pier T Wharf Improvements Activities: 1) Mobilize/demobilize, 2) Sheet pile delivery, 3) Clearing of seabed of any obstruction prior to pile driving, 4) Driving of bulkhead wall, 5) Installation of anti-scour rock in front of new bulkhead wall, 6) Survey of installed bulkhead wall