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## APPENDIX C – PROGRAM COST ESTIMATES

Project cost allowances are broken down by functional area for the recommended development plan. Project cost allowances have been estimated for airside facilities including aprons, taxiways, and remain overnight (RON) aircraft parking positions. In addition, cost allowances have also been estimated for landside facilities including: roadways; rail; Intermodal Transit Center; rental car center; rental car support; public parking; passenger terminals; and airport support facilities.

### C.1 Recommended Development Alternative Description

The following narratives describe the facilities constructed in each planning phase and the estimated total cost:

#### **C.1.1 Opening Day**

Opening Day facilities consist of the intermodal transit center (ITC), rail integration, a passenger walkway, a consolidated rental car and parking facility (CONRAC), and a dedicated on-airport road linking the ITC and the terminals on the south side. The ITC would serve the blue and orange trolley lines, as well as the Coaster/Amtrak, and MTS bus routes. The cost analysis for the rail realignment and station construction was completed by SANDAG. Facilities constructed for the Opening Day phase are estimated to cost approximately \$535 million in escalated dollars.

#### **C.1.2 Planning Activity Level 1**

Planning activity level 1 (PAL1) would involve significant construction and demolition at the Airport. Terminal 1 and the Commuter Terminal would be demolished to provide space for the construction of two linear concourses, the first of which would be completed by the end PAL1 and the second partially built out by the completion of PAL1. To support the concourses on the south, a new north terminal would be constructed. To support aircraft operations, apron would be reconstructed and reconfigured for the new concourses. A non-secure automated people mover (APM) system would be constructed linking the north terminal with the concourses via a tunnel underneath the runway. In addition, significant roadway improvements would be required to serve the north terminal including: parking, passenger processing, and expanded rental car facilities. A new

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central utility plant would also be constructed to service the north terminal. The existing central utility plant would be used to support the passenger concourses. Facilities constructed for PAL1 are estimated to cost approximately \$2.675 billion in escalated dollars.

### **C.1.3 Planning Activity Level 2**

The PAL2 phase would involve the demolition of Terminal 2 West to construct the final phase of the western satellite concourse. Combined, the two satellite concourses would provide approximately 61 aircraft gate positions. Additional apron area construction would be required for the new concourse. Additional parking for the high speed rail line, south remote parking, and rental car storage and ready/return spaces would need to be constructed. The north terminal would be further expanded to support passengers using the expanded western concourse. Facilities constructed for PAL2 are estimated to cost approximately \$3.099 billion in escalated dollars.

## **C.2 Cost Summary**

The tables that follow detail the order of magnitude project cost allowance for the recommended development plan by planning activity level. **Tables C-1, C-2, and C-3** present the capital expenditures for Opening Day, PAL1, and PAL2, respectively. The combined total project cost is estimated at approximately \$6.309 billion.

Table C-1  
**OPENING DAY COST ESTIMATES**  
San Diego International Airport

Opening Day is 2015. The midpoint of construction is 2013

Action	Project Component	Cost Definitions	Corresponding Factor in Evaluation Matrix	Unit	Volume	Unit Price	Subtotal	Estimate			
								Soft Costs	Contingency	Escalation	
								26%	22%	17%	
							<b>\$ -</b>			<b>\$ -</b>	
<b>AIRSIDE</b>											
1	Construct	Aprons/Taxiways (North)	1, 2	4	Sq. Yards	N/A	\$ -	\$ -	\$ -	\$ -	
2	Construct	Aprons/Taxiways (South)	1, 2	4	Sq. Yards	N/A	\$ -	\$ -	\$ -	\$ -	
3	Construct	Taxiway C Extension	1	4	Sq. Yards	N/A	\$ -	\$ -	\$ -	\$ -	
4	Construct	Apron Areas (RON)	2	4	Sq. Yards	N/A	\$ -	\$ -	\$ -	\$ -	
5	Construct	Apron Areas (Terminal Adjacent)	2	4	Sq. Yards	N/A	\$ -	\$ -	\$ -	\$ -	
<b>LANDSIDE</b>							<b>\$262,000,000</b>			<b>\$434,000,000</b>	
6	Add	Property Acquisition	3	8	Acre	5.00	\$ 1,000,000	\$ 5,000,000	N/A	\$ 6,075,000	\$ 7,107,750
7	Add	Rail Right of Way Acquisition			Acre	2.40	\$ 1,000,000	\$ 2,400,000	\$ 3,028,800	\$ 3,679,992	\$ 4,305,591
8	Construct	Rail Alignment and Platform			Lump Sum	N/A	\$ -	\$ 55,653,744	N/A	N/A	\$ 65,114,880
9	Construct	ITC Tunnel			Sq. Feet	11,100	\$ 500	\$ 5,550,000	\$ 7,004,100	\$ 8,509,982	\$ 9,956,678
10	Construct	Roadways - Flyovers - Freeway Ramps	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
11	Construct	Roadways - At Grade - Freeway Ramps	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
12	Construct	Roadways - Elevated - Freeway Ramps	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
13	Construct	Roadways - Flyovers - Terminal/Rental Car	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
14	Construct	Roadways - At Grade - Terminal/Rental Car	4	7	Lane Feet	22,000	\$ 600	\$ 13,200,000	\$ 16,658,400	\$ 20,239,956	\$ 23,680,749
15	Construct	Roadways - Elevated - Terminal/Rental Car	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
16	Construct	Roadways - Flyovers - ITC	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
17	Construct	Roadways - At Grade - ITC	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
18	Construct	Roadways - Elevated - ITC	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
19	Construct	Roadways - Flyovers - ITC/Airport			Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
20	Construct	Roadways - At Grade - ITC/Airport			Lane Feet	24,200	\$ 600	\$ 14,520,000	\$ 18,324,240	\$ 22,263,952	\$ 26,048,823
21	Construct	Roadways - Elevated - ITC/Airport			Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
22	Demolish	Roads (South Side)	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
23	Demolish	Parking (South Side)	7	6	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
24	Demolish	Off-airport Structures	16	1	Sq. Feet	146,119	\$ 6	\$ 876,714	\$ 1,106,413	\$ 1,344,292	\$ 1,572,821
25	Construct	Rental Car Support	10	5	Sq. Feet	357,192	\$ 60	\$ 21,431,520	\$ 27,046,578	\$ 32,861,593	\$ 38,448,063
26	Construct	Parking - Rental Car Ready Return	10	5	Stall	2,550	\$ 25,000	\$ 63,750,000	\$ 80,452,500	\$ 97,749,788	\$114,367,251
27	Construct	Parking - Rental Car Storage			Stall	1,000	\$ 25,000	\$ 25,000,000	\$ 31,550,000	\$ 38,333,250	\$ 44,849,903
28	Construct	Parking - South Remote (Surface)	10	1	Stall	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
29	Construct	Parking - High Speed Rail	10	5	Stall	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
30	Construct	Parking - Airport Public	7	6	Stall	1,800	\$ 25,000	\$ 45,000,000	\$ 56,790,000	\$ 68,999,850	\$ 80,729,825
31	Construct	Parking - Transit	7	6	Stall	100	\$ 25,000	\$ 2,500,000	\$ 3,155,000	\$ 3,833,325	\$ 4,484,990
32	Construct	Overhead Passenger Gateway	10	5	Sq. Feet	25,024	\$ 300	\$ 7,507,200	\$ 9,474,086	\$ 11,511,015	\$ 13,467,888
33	Construct	Elevated People Mover Alignment	9	2	Linear Ft.	N/A	\$ -	\$ -	\$ -	\$ -	\$ -

**OPENING DAY COST ESTIMATES (Continued)**

Action	Project Component	Cost Definitions	Corresponding Factor in Evaluation Matrix	Unit	Volume	Unit Price	Subtotal	Estimate			
								Soft Costs	Contingency	Escalation	
34	Construct	Cut-and-cover People Mover Alignment	9	2	Linear Ft.	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
35	Construct	Bored People Mover Alignment			Linear Ft.	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
36	Construct	At Grade People Mover Alignment	9	2	Linear Ft.	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TERMINAL</b>							<b>\$ 56,000,000</b>				<b>\$101,000,000</b>
37	Demolish	Demolish Terminals 1, 2, and Commuter	11	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
38	Demolish	Teledyne-Ryan Properties Processor / Rental Car Customer Service	11	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
39	Construct	Building	11	1	Sq. Feet	125,000	\$ 450	\$ 56,250,000	\$ 70,987,500	\$ 86,249,813	\$100,912,281
40	Construct	Concourses (two levels)	11	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
41	Construct	Baggage Conveyance	11	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
<b>AIRPORT SUPPORT</b>							<b>\$ -</b>				<b>\$ -</b>
42	Demolish	Control Tower	16	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
43	Demolish	Fuel Farm	16	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
44	Demolish	ARFF	16	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
45	Demolish	FBO	16	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
46	Demolish	Central Utility Plant	12	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
47	Demolish	NTC Landfill	16	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
48	Demolish	Airport Support Buildings	16	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
49	Construct	Control Tower	16	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
50	Construct	Fuel Farm	16	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
51	Construct	ARFF	16	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
52	Construct	Cargo Aprons	2	1	Sq. Yards	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
53	Construct	FBO	16	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
54	Construct	Central Utility Plant	12	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
<b>GRAND TOTAL</b>							<b>\$318,000,000</b>				<b>\$535,000,000</b>

Source: HNTB, 2008.

Table C-2  
**PAL1 COST ESTIMATES**  
San Diego International Airport

**PAL1 is 2020. The midpoint of construction is 2018**

Action	Project Component	Cost Definitions	Corresponding Factor in Evaluation Matrix	Unit	Volume	Unit Price	Subtotal	Estimate		
								Soft Costs 26%	Contingency 22%	Escalation 42%
							<b>\$ 219,000,000</b>			<b>\$ 477,000,000</b>
<b>AIRSIDE</b>										
1 Construct	Aprons/Taxiways (North)	1, 2	4	Sq. Yards	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
2 Construct	Aprons/Taxiways (South)	1, 2	4	Sq. Yards	408,800	\$ 400	\$ 163,520,000	\$206,362,240	\$ 250,730,122	\$ 356,036,773
3 Construct	Taxiway C Extension	1	4	Sq. Yards	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
4 Construct	Apron Areas (RON)	2	4	Sq. Yards	107,200	\$ 275	\$ 29,480,122	\$ 37,203,914	\$ 45,202,756	\$ 64,187,913
5 Construct	Apron Areas (Terminal Adjacent)	2	4	Sq. Yards	131,000	\$ 200	\$ 26,200,000	\$ 33,064,400	\$ 40,173,246	\$ 57,046,009
							<b>\$ 574,000,000</b>			<b>\$1,240,000,000</b>
<b>LANDSIDE</b>										
6 Add	Property Acquisition	3	8	Acre	5.60	\$ 1,000,000	\$ 5,600,000	N/A	\$ 6,804,000	\$ 9,661,680
7 Add	Rail Right of Way Acquisition			Acre	1.72	\$ 1,000,000	\$ 1,720,000	\$ 2,170,640	\$ 2,637,328	\$ 3,745,005
8 Construct	Rail Alignment and Platform	8	5	Lump Sum	N/A	\$ -	\$ 9,103,050	N/A	N/A	\$ 12,926,331
9 Construct	ITC Tunnel			Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
10 Construct	Roadways - Flyovers - Freeway Ramps	4	7	Lane Feet	2,400	\$ 3,800	\$ 9,120,000	\$ 11,509,440	\$ 13,983,970	\$ 19,857,237
11 Construct	Roadways - At Grade - Freeway Ramps	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
12 Construct	Roadways - Elevated - Freeway Ramps	4	7	Lane Feet	4,300	\$ 2,500	\$ 10,750,000	\$ 13,566,500	\$ 16,483,298	\$ 23,406,282
13 Construct	Roadways - Flyovers - Terminal/Rental Car	4	7	Lane Feet	10,200	\$ 3,800	\$ 38,760,000	\$ 48,915,120	\$ 59,431,871	\$ 84,393,257
14 Construct	Roadways - At Grade - Terminal/Rental Car	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
15 Construct	Roadways - Elevated - Terminal/Rental car	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
16 Construct	Roadways - Flyovers - ITC	4	7	Lane Feet	1,600	\$ 3,800	\$ 6,080,000	\$ 7,672,960	\$ 9,322,646	\$ 13,238,158
17 Construct	Roadways - At Grade - ITC	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
18 Construct	Roadways - Elevated - ITC	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
19 Construct	Roadways - Flyovers - ITC/Airport			Lane Feet	25,800	\$ 3,800	\$ 98,040,000	\$123,726,480	\$ 150,327,673	\$ 213,465,296
20 Construct	Roadways - At Grade - ITC/Airport			Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
21 Construct	Roadways - Elevated - ITC/Airport			Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
22 Demolish	Roads (South Side)	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
23 Demolish	Parking (South Side)	7	6	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
24 Demolish	Off-airport Structures	16	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
25 Construct	Rental Car Support	10	5	Sq. Feet	39,204	\$ 60	\$ 2,352,240	\$ 2,968,527	\$ 3,606,760	\$ 5,121,599
26 Construct	Parking - Rental Car Car Ready Return	10	5	Stall	250	\$ 25,000	\$ 6,250,000	\$ 7,887,500	\$ 9,583,313	\$ 13,608,304

**PAL1 COST ESTIMATES (Continued)**

Action	Project Component	Cost Definitions	Corresponding Factor in Evaluation Matrix	Unit	Volume	Unit Price	Subtotal	Estimate		
								Soft Costs	Contingency	Escalation
27 Construct	Parking - Rental Car Storage	10	1	Stall	100	\$ 25,000	\$ 2,500,000	\$ 3,155,000	\$ 3,833,325	\$ 5,443,322
28 Construct	Parking - South Remote (Surface)	10	5	Stall	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
29 Construct	Parking - High Speed Rail			Stall	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
30 Construct	Parking - Airport Public	7	6	Stall	3,830	\$ 25,000	\$ 95,750,000	\$120,836,500	\$ 146,816,348	\$ 208,479,213
31 Construct	Parking - Transit	7	6	Stall	300	\$ 25,000	\$ 7,500,000	\$ 9,465,000	\$ 11,499,975	\$ 16,329,965
32 Construct	Overhead Passenger Gateway	10	5	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
33 Construct	Elevated People Mover Alignment	9	2	Linear Ft.	921	\$ 20,000	\$ 18,420,000	\$ 23,246,040	\$ 28,243,939	\$ 40,106,393
34 Construct	Cut-and-cover People Mover Alignment	9	2	Linear Ft.	3,459	\$ 35,000	\$ 121,065,000	\$152,784,030	\$ 185,632,596	\$ 263,598,287
35 Construct	Bored People Mover Alignment	9	2	Linear Ft.	2,184	\$ 60,000	\$ 131,040,000	\$165,372,480	\$ 200,927,563	\$ 285,317,140
36 Construct	At Grade People Mover Alignment	9	2	Linear Ft.	1,001	\$ 10,000	\$ 10,010,000	\$ 12,632,620	\$ 15,348,633	\$ 21,795,059
<b>TERMINAL</b>							<b>\$ 414,000,000</b>			<b>\$ 902,000,000</b>
37 Demolish	Demolish Terminal 1 and Commuter	11	1	Sq. Feet	390,500	\$ 9	\$ 3,319,250	\$ 4,188,894	\$ 5,089,506	\$ 7,227,098
38 Demolish	Teledyne-Ryan Properties	11	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
39 Construct	Processor / Rental Car Customer Service Building	11	1	Sq. Feet	250,000	\$ 450	\$ 112,500,000	\$141,975,000	\$ 172,499,625	\$ 244,949,468
40 Construct	Concourses (two levels)	11	1	Sq. Feet	918,866	\$ 325	\$ 298,631,450	\$376,872,890	\$ 457,900,561	\$ 650,218,797
41 Construct	Baggage Conveyance	11	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
<b>AIRPORT SUPPORT</b>							<b>\$ 26,000,000</b>			<b>\$ 56,000,000</b>
42 Demolish	Control Tower	16	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
43 Demolish	Fuel Farm	16	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
44 Demolish	ARFF	16	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
45 Demolish	FBO	16	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
46 Demolish	Central Utility Plant	12	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
47 Demolish	NTC Landfill	16	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
48 Demolish	Airport Support Buildings	16	1	Sq. Feet	114,178	\$ 6	\$ 685,067	\$ 864,555	\$ 1,050,434	\$ 1,491,617
49 Construct	Control Tower	16	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
50 Construct	Fuel Farm	16	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
51 Construct	ARFF	16	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
52 Construct	Cargo Aprons	2	1	Sq. Yards	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
53 Construct	FBO	16	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -
54 Construct	Central Utility Plant	12	1	Lump Sum	1	\$ 25,000,000	\$ 25,000,000	\$ 31,550,000	\$ 38,333,250	\$ 54,433,215
<b>GRAND TOTAL</b>							<b>\$1,233,000,000</b>		<b>\$2,675,000,000</b>	

Note: These costs include additions beyond "Opening Day"

Note: Includes Updated Rental Car Takeoffs 1/23/09

Source: HNTB, 2008.

Table C-3  
**PAL2 COST ESTIMATES**  
 San Diego International Airport

PAL2 is 2030. The midpoint of construction is 2028

											Estimate		
Action	Project Component	Cost Definitions	Corresponding Factor in Evaluation Matrix	Unit	Volume	Unit Price	Subtotal	Soft Costs 26.2%	Contingency 22%	Escalation 110%			
							<b>\$ 165,000,000</b>			<b>\$ 531,000,000</b>			
<b>AIRSIDE</b>													
1	Construct	Aprons/Taxiways (North)	1, 2	4	Sq. Yards	N/A	\$ -	\$ -	\$ -	\$ -			
2	Construct	Aprons/Taxiways (South)	1, 2	4	Sq. Yards	357,097	\$ 400	\$ 142,838,800	\$ 180,262,566	\$ 219,019,017			
3	Construct	Taxiway C Extension	1	4	Sq. Yards	N/A	\$ -	\$ -	\$ -	\$ -			
4	Construct	Apron Areas (RON)	2	4	Sq. Yards	N/A	\$ -	\$ -	\$ -	\$ -			
5	Construct	Apron Areas (Terminal Adjacent)	2	4	Sq. Yards	110,048	\$ 200	\$ 22,009,600	\$ 27,776,115	\$ 33,747,980			
							<b>\$ 439,000,000</b>			<b>\$ 1,405,000,000</b>			
<b>LANDSIDE</b>													
6	Add	Property Acquisition	3	8	Acre	12.90	\$1,000,000	\$ 12,900,000	N/A	\$ 15,673,500			
7	Add	Rail Right of Way Acquisition			Acre	N/A	\$ -	\$ -	\$ -	\$ -			
8	Construct	Rail Alignment and Platform	8	5	Linear Ft.	N/A	\$ -	\$ -	\$ -	\$ -			
9	Construct	ITC Tunnel			Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -			
10	Construct	Roadways - Flyovers - Freeway Ramps	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -			
11	Construct	Roadways - At Grade - Freeway Ramps	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -			
12	Construct	Roadways - Elevated - Freeway Ramps	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -			
13	Construct	Roadways - Flyovers - Terminal/Rental Car	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -			
14	Construct	Roadways - At Grade - Terminal/Rental Car	4	7	Lane Feet	10,200	\$ 600	\$ 6,120,000	\$ 7,723,440	\$ 9,383,980			
15	Construct	Roadways - Elevated - Terminal/Rental car	4	7	Lane Feet	10,200	\$ 3,800	\$ 38,760,000	\$ 48,915,120	\$ 59,431,871			
16	Construct	Roadways - Flyovers - ITC	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -			
17	Construct	Roadways - At Grade - ITC	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -			
18	Construct	Roadways - Elevated - ITC	4	7	Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -			
19	Construct	Roadways - Flyovers - ITC/Airport			Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -			
20	Construct	Roadways - At Grade - ITC/Airport			Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -			
21	Construct	Roadways - Elevated - ITC/Airport			Lane Feet	N/A	\$ -	\$ -	\$ -	\$ -			
22	Demolish	Roads (South Side)	4	7	Lane Feet	38,215	\$ 6	\$ 229,290	\$ 289,364	\$ 351,577			
23	Demolish	Parking (South Side)	7	6	Sq. Feet	2,381,443	\$ 6	\$ 14,288,658	\$ 18,032,286	\$ 21,909,228			
24	Demolish	Off-airport Structures	16	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -			
25	Construct	Rental Car Support	10	5	Sq. Feet	104,544	\$ 60	\$ 6,272,640	\$ 7,916,072	\$ 9,618,027			

**PAL2 COST ESTIMATES (Continued)**

											Estimate		
Action	Project Component	Cost Definitions	Corresponding Factor in Evaluation Matrix	Unit	Volume	Unit Price	Subtotal	Soft Costs	Contingency	Escalation			
26	Construct	Parking - Rental Car Ready Return	10	5	Stall	700	\$ 25,000	\$ 17,500,000	\$ 22,085,000	\$ 26,833,275	\$ 56,349,878		
27	Construct	Parking - Rental Car Storage	10	1	Stall	300	\$ 25,000	\$ 7,500,000	\$ 9,465,000	\$ 11,499,975	\$ 24,149,948		
28	Construct	Parking - South Remote (Surface)	10	5	Stall	3,848	\$ 15,000	\$ 57,720,000	\$ 72,842,640	\$ 88,503,808	\$ 185,857,996		
29	Construct	Parking - High Speed Rail			Stall	6,000	\$ 25,000	\$ 150,000,000	\$189,300,000	\$ 229,999,500	\$ 482,998,950		
30	Construct	Parking - Airport Public	7	6	Stall	4,905	\$ 25,000	\$ 122,625,000	\$154,752,750	\$ 188,024,591	\$ 394,851,642		
31	Construct	Parking - Transit	7	6	Stall	200	\$ 25,000	\$ 5,000,000	\$ 6,310,000	\$ 7,666,650	\$ 16,099,965		
32	Construct	Overhead Passenger Gateway	10	5	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
33	Construct	Elevated People Mover Alignment	9	2	Linear Ft.	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
34	Construct	Cut-and-Cover People Mover Alignment	9	2	Linear Ft.	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
35	Construct	Bored People Mover Alignment	9	2	Linear Ft.	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
36	Construct	At Grade People Mover Alignment	9	2	Linear Ft.	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
<b>TERMINAL</b>							<b>\$ 361,000,000</b>			<b>\$ 1,163,000,000</b>			
37	Demolish	Demolish Terminal 2	11	1	Sq. Feet	551,700	\$ 9	\$ 4,689,450	\$ 5,918,086	\$ 7,190,474	\$ 15,099,996		
38	Demolish	Teledyne-Ryan Properties Processor / Rental Car Customer Service	11	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
39	Construct	Building	11	1	Sq. Feet	450,000	\$ 450	\$ 202,500,000	\$255,555,000	\$ 310,499,325	\$ 652,048,583		
40	Construct	Concourses (two levels)	11	1	Sq. Feet	474,014	\$ 325	\$ 154,054,550	\$194,416,842	\$ 236,216,463	\$ 496,054,573		
41	Construct	Baggage Conveyance	11	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
<b>AIRPORT SUPPORT</b>							<b>\$ -</b>			<b>\$ -</b>			
42	Demolish	Control Tower	16	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
43	Demolish	Fuel Farm	16	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
44	Demolish	ARFF	16	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
45	Demolish	FBO	16	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
46	Demolish	Central Utility Plant	12	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
47	Demolish	NTC Landfill	16	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
48	Demolish	Airport Support Buildings	16	1	Sq. Feet	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
49	Construct	Control Tower	16	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
50	Construct	Fuel Farm	16	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
51	Construct	ARFF	16	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
52	Construct	Cargo Aprons	2	1	Sq. Yards	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
53	Construct	FBO	16	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
54	Construct	Central Utility Plant	12	1	Lump Sum	N/A	\$ -	\$ -	\$ -	\$ -	\$ -		
<b>GRAND TOTAL</b>							<b>\$ 965,000,000</b>			<b>\$ 3,099,000,000</b>			

Source: HNTB, 2008.

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### **C.2.1 Background**

This section provides background information on the project cost allowances of demolishing and constructing facilities in the recommended development plan. Project cost allowances provide the ability to gauge the cost in current dollars of constructing the facilities included in a given alternative. The project cost allowances are derived by determining the cost of constructing a structure based on its size, type and complexity. The estimated size of a structure is determined using gross area measurements. The size and type of the structure determines the approximate quantities of materials required to construct it and its unit cost.

Notably, the unit costs used in these estimates accounted for the difference in complexity associated with constructing a large building versus a smaller one. Specifically, the unit cost per square foot for a larger building may be higher than that of a smaller less complex building.

Construction project cost allowances are based on unit costs, which include:

- The cost of the labor to build a structure of a given size.
- The cost of the material (steel, concrete, etc.), plant equipment, and construction equipment required for construction.
- Contractor's general conditions, profit, and overhead costs.

Different building types vary in terms of unit cost. For example, cargo facilities are less expensive per square foot than terminal facilities due to the cost of finish materials and complexity of the structures:

- 25,000 square foot terminal building – more expensive per square foot
- 25,000 square foot cargo building – less expensive per square foot

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### **C.2.2 Construction Project Cost Allowances**

The construction project cost allowances are categorized and broken down into the following categories and are defined in **Table C-4**.

- Airside – (aprons / taxiways / RON aircraft parking)
- Landside – (roadways / rail / parking / APM)
- Terminal – (processor / concourses)
- Airport Support (ATCT / fuel farm / general aviation / central utility plant)

### **C.2.3 Preliminary Markup Costs**

The project cost allowance estimates also factor in the following markup costs, as defined in **Table C-4**.

- Soft Costs
- Contingency
- Escalation

The total estimated cost of each option is calculated in the following manner:

Labor & Materials Cost  
+ Soft Costs  
+ Contingency  
+ Escalation  
= Grand Total

Labor and material costs are calculated based on their current estimated unit price in the market and multiplied by the quantities estimated from area measurements.

Associated costs (soft costs, contingency, and escalation) are calculated as a percentage of the labor and material costs and added to the labor and material costs to arrive at a subtotal.

- Soft costs range from on average from 24.9 percent to 27.4 percent. Much of the uncertainty arises from the complexity of the phasing of the recommended development plan from a program management perspective. A soft cost percentage of 26.2 percent is applied for this project.

Table C-4

**PROJECT COST ALLOWANCE DEFINITIONS**

San Diego International Airport

<b>Cost Definition</b>	For demolition of existing facilities, repair / maintenance and construction of new facilities
<b>Unit Costs</b>	Construction labor, materials, plant equipment, and construction equipment / contractor's general conditions, profit and home office overhead
<b>Airside</b>	<p><b>Taxiways</b> : Earthwork, pavements section, shoulders, infield area drainage, taxiway lighting, pavement markings, etc.</p> <p><b>Aprons</b> : Earthwork, pavement section, high mast lighting (RON), triturator, wash rack, waste disposal, apron edge lighting, pavement markings, etc.</p>
<b>Landside</b>	<p><b>Property Acquisition:</b> Purchase of land</p> <p><b>Access and Circulation Roads:</b> At -grade, elevated, and flyover roadways off and on airport; earthwork, pavement sections, columns, signage, pavement markings, lighting, etc.</p> <p><b>Intersection Improvements</b> : Reconfiguration of intersections and roadways, widening of pavements, pavement markings, signaling, lighting, landscaping, etc.</p> <p><b>Structured Parking:</b> Structured parking, finishes, building systems, entrance/exit plazas, pavement markings, etc.</p> <p><b>Surface Parking:</b> Parking pavement, curbs, wheel stops, pavement markings, drainage, lighting, etc.</p> <p><b>Rail:</b> Reconfiguration of track, addition of switching stations, safety improvements (Does not account for high-speed rail).</p> <p><b>People Mover Alignment:</b> Configuration of track, addition of switching stations, safety improvements.</p> <p><b>Landside Facilities:</b> CONRAC, ITC</p>
<b>Terminal</b>	<b>Terminal Building / Systems</b> : Building, finishes, building systems, airport systems (FIDS, BIDS,SIDS, security systems), passenger conveyance, baggage handling system, jet bridges, etc.
<b>Airport Support</b>	<p><b>Central Utility Plant</b> : Building, chillers, boilers, switchgear, motor control centers, cooling towers, piping, electrical, buildings systems, etc.</p> <p><b>Utilities:</b> Electrical switchgears, transformers, gas, etc.</p> <p><b>SDCRAA Offices:</b> Existing interiors, flooring, ceilings, interior walls, windows, doors, finishes, lighting, building systems, signage, etc.</p> <p><b>Fueling:</b> Extension of existing fuel line from fuel farm.</p> <p><b>Ancillary Facilities:</b> Remediation, demolition, new construction of cargo buildings, GSE storage buildings, maintenance buildings, foundation demolition, etc.</p>

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## PROJECT COST ALLOWANCE DEFINITIONS *(continued)*

### Soft Costs

**Planning Cost:** Cost associated with concept planning and preliminary layout, environmental analysis, and scheduling.

**Program Management Costs:** Costs associated with management and execution of the contract by the Authority, consultant team, and the program manager, legal, testing and inspection, and other costs.

**Design and Engineering Costs:** Costs associated with the design and engineer fees to get the project documents from concept to bid and award.

**Construction Management Costs:** Costs associated with the management of the general contractors.

**Other Costs:** Costs of permits, OCIP, and artwork.

### Contingency

Design contingency allows for preliminary drawings/documentation during the design phase. Construction contingency allows for design changes during construction phase.

### Escalation

Allowance for increase in labor and material cost, typically calculated from the date of estimate to the midpoint of construction. Escalation rates have been revised per Jacobs Consultancy on 1-14-09.

Source: HNTB, 2008.

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- Contingency costs range on average from 18 percent to 25 percent. Anticipated design complexity can be attributed as the chief component of uncertainty for the contingency cost. A contingency cost percentage of 21.5 percent is applied for this project.
- Escalation costs vary by planning activity level. In the Opening Day phase, the escalation is 17 percent. For PAL1, the escalation is 42 percent. For PAL2, the escalation is 110 percent. Costs are escalated to the midpoint of construction for a given phase. Escalation percentages are based on the Congressional Budget Office Inflation Forecasts. **Table C-5** presents the methodology for escalation percentages. Escalation is the most uncertain of any of the project components as it is very difficult to predict the fluctuating costs of materials and labor.

Table C-5  
**ESCALATION METHODOLOGY**  
 San Diego International Airport

	Annual		
	2009	2010	2011 and thereafter
Operating Cost Inflation (a)	0.50%	2.00%	2.50%
Capital Cost Inflation			
"Low Case" (b)	0.75%	3.00%	4.00%
"High Case"	1.75%	4.00%	5.00%

(a) Based on Congressional Budget Office inflation forecasts, increased slightly to be more conservative.

(b) Historically (1998 to 2008 average), construction cost inflation is approximately 1.5 times the operating cost inflation.

Source: HNTB, 2008.

The current project cost allowances represent planning and analysis to date and account for changes expected to occur during the program definition phase through inclusion of contingency.

The project cost allowances are partially based on recent project costs at other airports in the region including: Ontario International Airport, John Wayne Airport, Los Angeles International Airport, San Jose International Airport as well as national cost trends associated with airport improvements. **Table C-6** provides comparisons of terminal project costs at various airports.

Table C-6  
**COMPARATIVE AIRPORT TERMINAL PROJECT ALLOWANCE COSTS**  
 San Diego International Airport

Airport	Project	Completion Year	Square Footage	Jet Gates	Preliminary Cost (Millions)		Cost Per Square Foot Building		Total Cost Building (in 2006)	Total Cost Building (in 2009)
					Building (Actual)	Project (Actual)	(Actual Date)	(in 2006)		
Chicago O'Hare Orange County, CA	New Terminal (a)	1987	1,300,000	55	294	537	226	836	1.8 B	3.0 B
San Jose, CA	New Terminal (b)	1988	335,000	14	70		209	773	259 M	430 M
Chicago O'Hare	New Terminal (c)	1990	244,000	16	36	80	147	400	133 M	220 M
Denver, CO	New Terminal (d)	1994	1,300,000	21	419	618	322	838	833 M	1.4 B
Vancouver, BC	New Terminal (e)	1994	5,922,000	100	843	1,900	142	284	1.6 B	2.7 B
Wash. National	New Terminal (f)	1996	1,100,000	15	230	350	209	418	774M	1.3 B
Boston Logan	New Terminal (g)	1997	1,000,000	34	240	400	240	353	444M	740 M
Chicago Midway	Terminal Expansion (h)	1998	245,000	16	34	--	139	175	63 M	105 M
Tampa, FL	New Terminal (i)	2002	951,000	31	230	519	223	281	290 M	480 M
JFK	New Concourse	2005	315,000	16	64	70	203	--	--	--
	New Terminal (j)	2009	1,500,000	34	1300	1400	866	--	--	1.4 B

Notes:

- (a) Includes under apron moving walks, bag room, project extremely expensive at time due to high level of detailing.
- (b) Includes concourses and terminal only; high cost of construction due to details and materials.
- (c) Includes concourses and terminals only; economical design.
- (d) Includes concourses and terminals only; high cost due to underground FIS, significant change orders.

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**COMPARATIVE AIRPORT TERMINAL PROJECT ALLOWANCE COSTS** *(Continued)*

- (e)* Includes head house terminal, concourses only; repetitive modular design adds to economy of scale.
- (f)* Includes new international terminal only; successful project due to moderate cost and high design.
- (g)* Includes new terminal and concourses only; successful project due to moderate cost and high design.
- (h)* Only expansion/renovation.
- (i)* Includes terminal and concourses only; extremely economical cost per gate due to pier design.
- (j)* 2009 Cost includes 66% escalation.
- (k)* 35% Soft costs included and complex design and phasing.

Source: HNTB, 2008.

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### **C.2.4 Cost Estimate Assumptions**

The following is a list of the cost estimate assumptions for the recommended development plan. The item number refers to the line item number found in the cost estimate spreadsheet.

#### **General**

- Facilities are entirely conceptual at this stage of the study. Many of the facilities would not be constructed for at least 10-15 years.
- The mid-point of construction for “Opening Day” is 2013, with an opening of 2015.
- The mid-point of construction for PAL1 is 2018, with an opening of 2020.
- The mid-point of construction for PAL2 is 2028, with an opening of 2030.
- All costs are capital costs. Therefore, they do not include operating, maintenance, replacement, or life cycle costs for facilities.
- The costs for the south parking structure and completion of Terminal 2 West are not included.

**Airside** – Items 1-5 are based on typical flexible pavement cross-sections for aprons, taxiways, and RON areas from similar projects.

#### **Landside**

- Item 6, Property Acquisition assumes that the Airport would need to acquire the footprint of the ultimate north build-out. It is assumed property is acquired as needed by PAL. Soft costs have not been applied to property acquisition.
- Item 8, Rail Alignment and Platform – Opening Day accounts for the realignment of four rail tracks (two railroad and two light rail tracks) with the construction of an additional light rail track. This cost includes the rail platform, four elevators, and stairs. The base lump sum cost accounts for soft costs and contingency. The estimate assumes five tracks with approximately 190-foot wide envelope for tracks and platforms. It assumes railroad

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and light rail tracks can be constructed in between the Washington Street and Sassafras Street grade crossings, but does not account for any grade separation at Washington Street and Sassafras Street. The cost does not account for right-of-way land acquisition.

- In PAL1, the cost accounts for an additional railroad track and associated improvements. The estimate assumes six tracks with approximately 210-foot envelope for tracks and platforms. It assumes railroad tracks cannot be constructed in between the Washington and Sassafras grade crossings. The cost does not account for right-of-way land acquisition or grade separation at Sassafras and Washington.
- Items 10 through 21, the breakout of all roads, are approximated as roads are purely conceptual at this level of planning.
- Item 20, the north-south rubber tire road, does not include the costs for acquiring a fleet of shuttle busses or the costs associated with running the route.
- Item 27, Rental Car Storage, is assumed to be structured parking in all planning phases.
- Items 33-36, the APM system, in PAL1 and PAL2, assume the capital cost of construction and the installation of hardware associated with the APM system, but does not include the costs of acquiring APM trains or the costs associated with running the route. Costs associated with APM construction assume twin 18-foot diameter tunnels consistent with similar transit projects. Relative order-of-magnitude tunnel construction costs are provided by the consultant's tunnel design engineers. The APM alignment would also be used by the baggage conveyance system.

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## **Terminal**

- Item 39, the new north processor, would have a complex construction sequence.
- Item 40, new concourse construction assumes standard unit cost for a combination of single and double-loaded concourse based on comparative projects.
- Item 41, baggage conveyance system, is assumed to use the same tunnels provided for APM in the “bored tunnel” scenario.

## **Airport Support**

- Item 48, the demolition of airport support buildings is necessary to support airport development in PAL1.
- Item 54 assumes the existing central utility plant will be capable of supporting the concourse development in the south. A new central utility plant would be required to support the north development.