

TECHNICAL APPENDIX 9

PROJECT COST ESTIMATES

INTRODUCTION

Project cost estimates are developed by the San Diego Association of Governments (SANDAG) in coordination with the California Department of Transportation (Caltrans), Metropolitan Transit System (MTS), North County Transit District (NCTD), and the Cities and County. Summaries of the cost estimates used in the 2030 San Diego Regional Transportation Plan: Pathways for the Future are presented below.

DISCUSSION

Arterial System Cost Summary

SANDAG has identified two levels of regional arterial networks: 103 miles of arterials in the Congestion Management Program (CMP) network and 935 miles in the Regional Arterial System (RAS). The total estimated arterial cost is \$1,437 million. A combination of local, state, and regional funds would be used to fund this effort.

Highway System Cost Summary

There are approximately 600 miles of state highways in the San Diego region. Approximately 300 miles are freeways and expressways, and the remaining 300 miles are conventional highways. A combination of federal, state, and local funds would be used to complete and expand the existing system of freeways, expressways, and conventional highways.

The cost of completing or expanding the existing highway network is influenced by a number of factors. Right-of-way, terrain, mitigation of environmental impacts, construction complexity, and other factors all have an affect on the average cost per mile of new or expanded facilities. The cost to design, acquire right-of-way, and construct a mile of a single lane (known as a lane-mile) can vary significantly. Table TA 9.1 lists the major capital costs for the Reasonably Expected Highway Network. Average costs per lane-mile range from approximately \$10 million to \$30 million. There are much higher cost estimates for some projects, such as the extension of State Route (SR) 52 in the City of Santee, due to the high cost of right-of-way acquisition. Lower average costs tend to occur typically with widening of highways that can be accommodated within the existing rights-of-ways and with minimal earthwork. In general, the average cost to design, acquire the necessary right-of-way and build a lane-mile of freeway has significantly increased since the last major update of the RTP — in some cases more than doubling in cost. Some of the reasons for these significant cost increases include a rapid rise in real estate values in San Diego County during the first half of the decade, increased demand for raw materials (such as concrete and steel from other nations), a shortage of supply of locally available materials (including aggregates), and a steep increase in the cost of energy. Direct access ramps (DARs) are included in Table TA 9.2. These costs were estimated by Caltrans and SANDAG.

Table TA 9.1—Major Highway Capital Improvements – Reasonably Expected Network

HOV and Managed Lane Facilities								Cost (millions)			
Route	From	To	Existing	Improvement	Length (miles)	Added Lane-Miles	Cost per Lane-Mile	Construction	Right-of-Way	Engineering	Total Cost
I-5	SR 905	SR 54	8F	8F+2HOV	6.3	12.6	\$16	\$126	\$50	\$25	\$202
I-5	SR 54	I-8	8F	8F+2HOV	10.3	20.6	\$45	\$606	\$206	\$122	\$934
I-5	I-8	La Jolla Village Dr	8F/10F	8F/10F+2HOV	8.4	16.7	\$12	\$134	\$33	\$33	\$200
I-5	La Jolla Village Dr	Vandegrift	8F/14F	8F/14F+2HOV/4ML	30.0	119.8	\$24	\$2,180	\$341	\$378	\$2,900
I-15	SR 94	SR 163	6F/8F	8F+2HOV	10.0	20.0	\$13	\$160	\$65	\$40	\$265
I-15	SR 163	SR 56	8F+2Rev	8F+4ML/MB	7.4	29.4	\$14	\$344	\$16	\$54	\$414
I-15	SR 56	Centre City Pkwy	8F	8F+4ML/MB	8.0	31.9	\$13	\$375	\$11	\$40	\$427
I-15	Centre City Pkwy	SR 78	8F	8F+4ML	4.1	16.5	\$13	\$182	\$3	\$25	\$210
SR 52	I-805	SR 125	4F/6F	6F+2HOV/2ML*	10.3	41.2	\$8	\$251	\$12	\$66	\$330
SR 78	I-5	I-15	6F	6F+2HOV	16.5	33.0	\$20	\$267	\$281	\$102	\$650
SR 94	I-5	I-805	8F	8F+2HOV	2.6	5.2	\$38	\$122	\$42	\$36	\$200
SR 94/SR 125	I-805	I-8	8F	8F+2HOV	9.7	24.3	\$34	\$555	\$170	\$109	\$834
I-805	SR 905	I-5	8F	8F+4ML	27.1	108.3	\$31	\$2,359	\$541	\$435	\$3,336

*Reversible

\$10,902

HOV-to-HOV Connections						Cost (millions)			
	Freeway	Intersecting Freeway	Existing	Improvement		Construction	Right-of-Way	Engineering	Total Cost*
	I-5	I-805	--	N to N, S to S		\$0	\$0	\$0	\$170
	I-15	SR 78	--	E to S, N to W		\$0	\$0	\$0	\$213
	I-15	SR 94	--	S to W, E to N		\$0	\$0	\$0	\$140
	I-15	I-805	--	N to N, S to S		\$0	\$0	\$0	\$66
	I-805	SR 52		W to N, S to E		\$0	\$0	\$0	\$190
	I-805	SR 94		N to W, E to S		\$0	\$0	\$0	\$95

*Overall cost provided for HOV to HOV connections

\$874

Table TA 9.1—Major Highway Capital Improvements – Reasonably Expected Network (cont'd)

Highway System Completion								Cost (millions)			
Route	From	To	Existing	Improvement	Length (miles)	Added Lane-Miles	Cost per Lane-Mile	Construction	Right-of-Way	Engineering	Total Cost
I-5	805 Realignment				0	1.0	\$30	\$20	\$6	\$4	\$30
SR 11	SR 905	Mexico	--	4F	4	16.0	\$19	\$160	\$104	\$40	\$300
SR 52	SR 125	SR 67	--	4F	3.1	12.4	\$43	\$263	\$185	\$90	\$538
SR 125	SR 905	San Miguel Road	--	4T	9.5	38.0	\$17	\$388	\$169	\$84	\$640
SR 125	San Miguel Rd	SR 54	--	4F	1.6	6.4	\$25	\$102	\$36	\$21	\$160
SR 905	I-805	Mexico	--	6F	6.3	37.8	\$16	\$305	\$227	\$64	\$595

\$2,263

Highway and Arterial Widening								Cost (millions)			
Route	From	To	Existing	Improvement	Length (miles)	Added Lane-Miles	Cost per Lane-Mile	Construction	Right-of-Way	Engineering	Total Cost
I-5	J Street	Sea World Drive	8F	Access Improvements	13.5	27.0	\$8	\$165	\$30	\$29	\$225
I-5	805 Merge		10F	16F	10.3	41.2	\$5	\$141	\$16	\$29	\$186
I-5	Vandegrift	Orange Co.	8F	8F+4TL	18	36.0	\$22	\$765	\$41	\$121	\$810
I-8	2nd Street	Los Coches	4F	6F	3.3	6.6	\$8	\$251	\$41	\$44	\$54
I-15	SR 78	Riverside Co.	8F	8F+4TL	22.7	45.4	\$45	\$1,543	\$82	\$244	\$2,060
SR 52	I-5	I-805	4F	6F	2.85	5.7	\$21	\$737	\$12	\$112	\$119
SR 56	I-5	I-15	4F	6F	9.2	18.4	\$3	\$38	\$3	\$12	\$53
SR 67	Mapleview Street	Dye Road	2C/4C	4C	15.9	31.8	\$13	\$401	\$49	\$68	\$400
SR 76	Melrose Dr	I-15	2C	4C	8.8	17.6	\$19	\$235	\$55	\$44	\$334
SR 75/SR 282	Glorietta Blvd.	Alameda Blvd.	6C	6C+2TU (PE only)				\$0	\$0	\$20	\$20
SR 125	San Miguel Rd	SR 54	4F	8F	1.6	6.4	\$6	\$33	\$3	\$5	\$40
SR 125	Telegraph Cnyn	San Miguel Road	4T	8T	3	6.0	\$22	\$108	\$5	\$17	\$130
SR 241	Orange Co	I-5	--	4T/6T	6.6	39.6	\$14	\$372	\$109	\$70	\$552
Regionally Significant Arterials			Various		0	0.0	\$1,437	\$255	\$641	\$542	\$1,437

\$6,420

Table TA 9.1—Major Highway Capital Improvements – Reasonably Expected Network (cont'd)

Freeway to Freeway Connections					Cost (millions)				
	Freeway	Intersecting Freeway	Existing	Improvement		Construction	Right-of-Way	Engineering	Total Cost
	I-5	SR 56	--	W to N, S to E		\$120	\$41	\$24	\$185
	I-5	SR 78	--	W to S, S to E		\$130	\$44	\$26	\$200
	SR 94	SR 125	--	W to N, S to E		\$90	\$40	\$20	\$150

\$535

Table TA 9.2—Direct Access Ramps

Project	Environmental	Right-of-Way	Construction	Contingency/ Other	Total Cost (\$ millions)
I-5/Manchester Avenue	2,000,000	1,900,000	11,415,000	1,500,000	16,815,000
I-5/Voight Drive	2,000,000	2,900,000	17,436,000	2,000,000	24,336,000
I-5/Cannon Road	2,000,000	2,900,000	17,289,000	2,000,000	24,189,000
I-5/Oceanside Boulevard	2,200,000	4,000,000	24,471,000	2,500,000	33,171,000
I-15/Hale Street	0	0	4,500,000	500,000	5,000,000
I-15/Del Lago	1,800,000	3,800,000	22,175,000	2,000,000	29,775,000
I-15/Rancho Bernardo	1,600,000	2,800,000	16,875,000	2,000,000	23,275,000
I-15/Ted Williams Parkway	2,700,000	6,500,000	25,713,000	3,800,000	38,713,000
I-15/Mira Mesa (Hillery) DAR	2,700,000	6,500,000	25,565,000	3,800,000	38,565,000
I-805/Carroll Canyon	900,000	0	12,216,000	1,000,000	14,150,000
I-805/Nobel Drive	1,500,000	2,500,000	14,500,000	1,500,000	20,000,000
I-805/Palomar Drive	3,400,000	2,000,000	40,250,000	4,500,000	50,150,000
					\$318,139,000

Transit System Cost Summary

Implementation of the transit services included in Reasonably Expected Revenue scenario depends on a combination of roadway and transit capital improvements (see Table TA 9.3). For transit services operating on freeways, managed/high occupancy vehicle (HOV) lanes are required in order for transit to operate in uncongested conditions. DARs and in-line stations also are included that will enable transit vehicles to exit and enter these Managed/HOV facilities directly from the transit stations without having to merge through general purpose lanes.

For transit services operating on arterials, there are a number of improvements, such as signal priority treatments and queue jumper lanes. The Reasonably Expected plan assumes that all arterial rapid corridors have signals that have the ability to give transit vehicles priority at intersections. The most congested intersections also are assumed to include special queue jumper lanes that allow the transit vehicle to move out ahead of the traffic queue. Transit priority improvements on arterial streets will cost \$395 million for 18 new bus rapid transit (BRT) and rapid bus routes. An additional \$250 million is allocated for other transit priority measures that will be available for the local bus services

Two new light rail extensions are planned in the Reasonably Expected plan. Construction is underway on the SPRINTER light rail segment by NCTD. Funds are available to double track and grade separate key intersections. These costs were developed in conjunction with NCTD staff. The proposed SPRINTER rail extension to Westfield Shoppingtown North County is based on costs originally developed for the 2020 RTP. The Mid-Coast light rail segment is currently under study by SANDAG.

Two grade-separated, dedicated transit guideways have been included in Reasonably Expected plan and are used by several BRT, arterial rapid, and local bus routes. The Sorrento Mesa Guideway is an eight-mile guideway connecting Sorrento Mesa with University Town Center and UCSD. The Downtown-Kearny Mesa guideway is a ten-mile guideway roughly paralleling SR 163 between Centre City and Kearny Mesa. Costs for these projects are estimated and will be refined with subsequent project analysis by SANDAG.

A total of \$1.350 billion in improvements are planned for the coastal rail corridor. These include a number of grade separations, double tracking, bridge replacements, and other improvements along the coastal rail line between Orange County and downtown San Diego. These costs were developed by Caltrans for the (Los Angeles to San Diego (LOSSAN) draft program environmental impact report/environmental impact statement (EIR/EIS), which was released in July 2004. Two tunnels are included for the coastal rail corridor in the Del Mar and University City areas in order to remove the tracks from sensitive coastal bluff areas and improve the capacity and reliability of the rail line. These costs also were developed as part of the Caltrans program document and are estimated at \$1.004 billion for both tunnels. Historically, 75 percent of coastal rail improvements have been funded by the State of California and Amtrak.

Table TA 9.3—Transit Capital Costs

1. Light Rail Transit				
	At Opening	Additional Segments	Double-tracking w/Top Four Grade Separations	Total Cost (millions)
Mid-Coast Light Rail Transit Line	\$1,008			\$1,008
SPRINTER Rail	\$484	\$280	\$389	\$1,153
				\$2,161

2. Grade-Separated Transit Guideways	
	Total Cost (millions)
Sorrento Mesa Guideway	\$450
Downtown to Kearny Mesa Guideway	\$660
	\$1,110

3. Coastal Rail Double-tracking and other Improvements	
Includes double tracking, curve straightening, bridge replacements, and other improvements along existing alignment. Costs include construction, right-of-way, environmental mitigation, design, and management.	
	Total Cost (millions)
San Diego segment	\$400
Miramar Hill segment	\$100
Encinitas segment	\$200
Carlsbad to Oceanside segment	\$350
Camp Pendleton segment	\$50
Additional Improvements	\$250
	\$1,350

4. Coastal Rail Tunnels	
Costs include construction, environmental mitigation, design, and management.	
	Total Cost (millions)
Del Mar Tunnel	\$472
University City Tunnel	\$532
	\$1,004

5. Stations			
	Cost Per Station	Number Of Stations	Total Cost (millions)
New major regional BRT station	\$11	23	\$253
New arterial BRT corridor station	\$1	73	\$73
New arterial station	\$0.1	105	\$11
Improved existing regional station	\$3	89	\$267
			\$604

Table TA 9.3—Transit Capital Costs (cont'd)

6. Vehicles			
	Cost Per Vehicle	Number Of Vehicles	Total Cost (millions)
Standard bus	\$500,000	104	\$52
Arterial corridor BRT vehicle	\$800,000	37	\$30
Regional BRT vehicle	\$1,100,000	214	\$235
Rail vehicle	\$4,000,000	43	\$172
			\$489

7. Arterial Improvements			Total Cost (millions)
Arterial rapid corridor improvements for new services	Signal priority, queue jumpers, transit-only lanes, and other arterial improvements for new arterial BRT routes – \$700,000 per mile		\$395
Transit priority measures/enhancements	Signal priority, queue jumpers, transit-only lanes, and other arterial improvements for existing service (to be determined)		\$250
			\$645

8. Other			Total Cost (millions)
	Cost		
Transit parking structures	\$21,000,000 x 35 each		\$735
Regional rail grade separations			\$670
Local share for I-15 high-speed rail			\$100
			\$1,505

Total Transit Capital Cost (millions): \$8,868