MOBILITY BENEFITS FROM HIGH-OCCUPANCY VEHICLE LANES

High-occupancy vehicle lanes (also known as diamond lanes, bus and carpool lanes, transitways) provide a high-speed travel option to buses and carpools as an incentive to share a vehicle and reduce the number of vehicle trips. The lanes are most used during the peak travel periods when congestion is worst and the time savings compared to the general travel lanes is most significant. In addition to saving time on an average trip, the HOV lanes also provide more reliable service as they are less affected by collisions or vehicle breakdowns.

The HOV lanes provide service similar to freeway mainlanes in that there are relatively few lanes that have stations on the route. The buses on the lanes can either pickup patrons on regular bus routes before entering the HOV lane, or they can provide service to a park-and-ride lot that allows patrons to drive their private vehicle to a parking lot and use a bus to their destination. The high-speed lanes are also open to use by carpools (although there are some bus-only lanes) which provide additional flexibility for use by travelers.

Another version of high-occupancy vehicle lane involves allowing single-occupant vehicles to use the lane for a fee. These have been labeled high-occupancy/toll lanes (HOT lanes) and, while fewer than ten of these projects exist, many more are being planned and studied. The advantages of high speed and reliable transportation service can be extended to another user group. If a variable tolling system is used to maintain high-speed operations (e.g., by charging a higher toll when the freeway mainlanes are congested) more vehicles can be allowed to use the lane without the possibility of speed decreases or congestion.

Delay Reduction Estimate

HOV lane service is similar to the general freeway operation, and because HOV lane data is not included in the regular freeway data, the operating statistics (e.g., speed, person volume and miles traveled) can be added to the freeway and street data. Exhibit B-39 is a summary of HOV lane operations in several urban corridors from the year 2005. While this is only a partial list of HOV projects, it provides a view of the usefulness of the data, as well as an idea of the mobility contribution provided by the facilities. The exhibit includes information about the typical peak period operating conditions (three hours in the morning and evening) on the HOV lane. The statistics from six peak hours of operation may appear to show relatively low ridership, but in some corridors the significant benefits may only be for one hour in each peak. Some other aspects of the corridor operations such as the variation in travel time and the effects of park-and-ride service or transit operations are also not fully explored in these statistics.

The data for freeway mainlanes and HOV lanes in a city or region can be combined to produce an improved Travel Time Index. This index and other statistics can provide a multimodal mobility estimate.

Exhibit B-39. Mobility Levels in HOV Corridors in 2005

		Peak Period Operations	
	Miles	Person Volume	Average Speed (mph)
Atlanta			
I-75	20.0	6,340	54
I-85	20.0	7,890	52
I-20	8.5	7,240	49
Dallas			
I-30 East	5.5	6,350	60
I-35 North	7.3	4,850	60
I-35 South	9.0	6,000	60
I-635 North	6.7	9,410	62
Denver			
I-25	7.0	9,700	57
Houston			
I-10 West	12.3	23,290	52
I-45 North	19.3	26,660	54
I-45 South	15.0	17,940	56
US 290	13.4	23,050	52
US 59 South	11.5	22,680	59
US 59 North	19.9	12,380	60
Los Angeles			
LA/Ventura Counties			
I-10	20.1	13,740	53
SR-14	35.9	9,880	66
SR-57	4.5	8,700	27
SR-60	7.5	8,770	54
SR-91	14.3	10,390	55
I-105	16.0	11,360	32
I-110	10.7	24,170	58
SR-118	11.4	9,510	69
SR-134	12.8	7,110	67
SR-170	6.1	6,770	42
I-210	27.2	22,930	39
I-405	16.7	20,700	35
I-605	20.7	11,500	59
Orange County♦			
I-5	35.3	N/A♦	53
SR-55	10.3	N/A♦	56
SR-57	12.1	N/A♦	50
SR-91	22.2	N/A♦	53
I-405	23.6	N/A♦	55
Miami			
I-95 North	31.4	4,450	57
I-95 South	22.7	5,600	52
Minneapolis-St. Paul			
I-394	10.4	9,920	65
I-35W	7.5	5,590	58
New York			
Long Island Expressway	40.0	3,150	60

♦Passenger-miles of travel estimated from Caltrans PEMS data.

Exhibit B-39. Mobility Levels in HOV Corridors in 2005, continued

		Peak Period Operations	
	Miles	Person Volume	Average Speed (mph)
Phoenix			
I-10 West	21.0	4,000	60
I-10 East	5.0	4,000	60
SR-202	9.0	3,000	60
I-17	7.0	3,000	60
Portland			
I-5/I-405	6.7	7,700	34
Riverside-San Bernardino♦			
SR-60	13.3	N/A♦	58
SR-91	17.6	N/A♦	52
I-10	8.4	N/A♦	58
I-210	10.4	N/A♦	58
SR-71	7.7	N/A♦	57
Sacramento			
US-50	11.5	1,710	63
I-80	9.6	1,970	63
SR-99	14.3	3,070	47
San Francisco-Oakland			
I-80 (Alameda County)	5.3	16,760	53
I-84 (Alameda County)	2.0	4,900	60
SR-92 (Alameda County)	3.0	5,060	60
I-680 (Alameda County)	14.0	3,840	65
I-880 (Alameda County)	20.5	5,920	65
SR-4 (Contra Costa County)	7.0	4,930	65
I-80 (Contra Costa County)	9.9	10,670	48
I-680 (Contra Costa County)	12.9	6,080	65
US-101 (Marin County)	6.1	4,810	47
SR-85 (Santa Clara County)	23.8	3,750	65
US-101 (Santa Clara County)	34.8	3,790	64
Seattle			
I-5 South	16.5	51,880	55
I-5 North	18.4	77,330	54
I-405 South	12.9	42,260	55
I-405 North	15.9	60,890	57
I-90	7.4	30,010	60
SR-520	7.0	21,550	55
SR-167	9.2	51,960	59
Virginia Beach			
I-64	14.0	1,500	64
I-64 SS	9.0	3,620	64
I-264	9.0	3,070	59
Washington, DC			
I-395	28.4	26,010	63
I-66	27.9	14,010	40
I-270	18.4	5,920	49
VA 267	24.2	6,550	51
US 50	9.1	4,010	64

♦Passenger-miles of travel estimated from Caltrans PEMS data.