Bay Area Transportation: State of the System 2002

METROPOLITAN TRANSPORTATION COMMISSION and CALTRANS DISTRICT 4

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State of the System
2002

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The Authoring Agencies

Metropolitan Transportation Commission (MTC)

MTC is the transportation planning, coordinating and financing agency for the nine-county San Francisco Bay Area. The agency also helps to monitor and — in concert with Caltrans and others — to improve the operation of the regional transportation network.

Caltrans District 4

Caltrans District 4 is the operating arm of the California Department of Transportation (Caltrans) for the nine-county San Francisco Bay Area. Caltrans is responsible for the planning, design, construction, maintenance and operation of the state highway system (and the Interstate Highway System in California), and is the state's overall manager of interregional transportation services.

To Users of the Bay Area Transportation System

Transportation is an important aspect of the quality of life in the Bay Area and a matter of keen interest — and concern — to the region's residents. Every year since 1980, respondents to a public opinion poll sponsored by the Bay Area Council have identified transportation as one of the top three problems in the region; in 15 of those years, transportation was identified as the number one problem. From the weekend bicyclist to the long-haul trucker, from the city-dwelling transit rider to the suburban freeway commuter, what's happening on the region's roads, rails and trails is always a top-of-mind issue.

Just how well is our regional transportation system performing and how are travel conditions changing? To answer these critical questions, the Metropolitan Transportation Commission (MTC) and Caltrans District 4 have engaged in a collaborative effort to assemble key facts and performance indicators of interest to Bay Area commuters and other travelers. The publication of this report, *Bay Area Transportation: State of the System 2002*, is a major milestone in this joint effort.

This document, intended as the first in an annual series, assesses how the Bay Area transportation system is holding up. It is a pioneering effort to provide a comprehensive overview of the state of transportation in the Bay Area. The report includes information on freeways, local roadways, transit, bicycle and pedestrian travel, and goods movement — information that, until now, has not been collected in one place. It shows — in a concise and easy-to-understand format — how key factors fared in 2001 (or the most recent time period for which data is available) and discusses trends going back up to five years.

In these pages you will find answers to questions such as the following (organized by topic):

- Mobility — How congested were freeways and local roadways? How often did transit run on time? How much time can you save by carpooling?
- Safety — How many collisions occurred on freeways and local roadways? How many collisions involved bicyclists, pedestrians or transit vehicles?
- State of repair — How well maintained are freeways, local roadways and transit vehicles?
- Airports and seaports — How much cargo passes through Bay Area seaports?

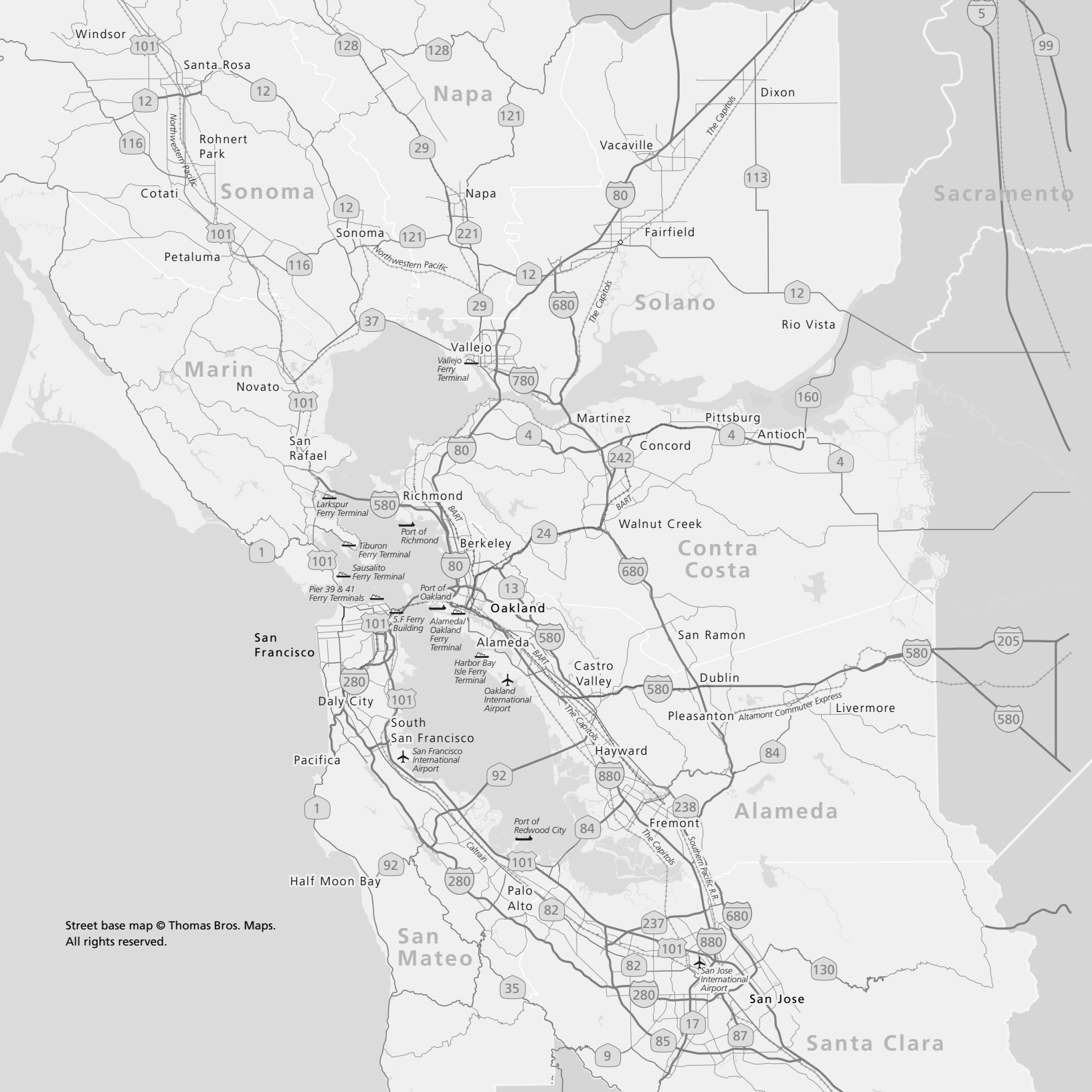
We invite you to page through this inaugural issue of the *State of the System* report. We hope that you will find its contents informative and useful, and we welcome your comments as to both subject matter and presentation.

On behalf of the Metropolitan Transportation Commission and Caltrans District 4, thank you for your interest in Bay Area transportation.

Sincerely,

Steve Heminger
Executive Director
Metropolitan Transportation Commission

Bijan Sartipi
District Director
Caltrans District 4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Vacaville
Fairfield
Rio Vista
Vallejo
Vallejo Ferry Terminal
Martinez
Pittsburg
Antioch
Concord
Walnut Creek
Richmond
Larkspur Ferry Terminal
Port of Richmond
Tiburon Ferry Terminal
Sausalito Ferry Terminal
Pier 39 & 41 Ferry Terminals
Berkeley
Oakland
Port of Oakland
S.F Ferry Building
Alameda/Oakland Ferry Terminal
Harbor Bay Isle Ferry Terminal
Alameda
San Francisco
Oakland International Airport
Daly City
South San Francisco
San Francisco International Airport
Pacifica
Half Moon Bay
Port of Redwood City
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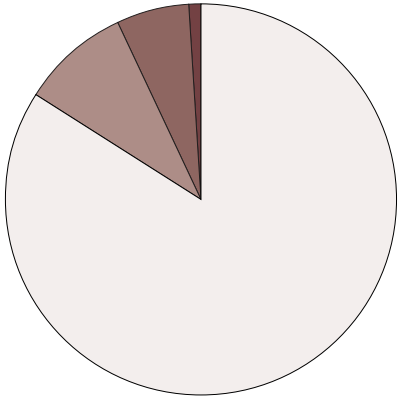
The Transportation System in Brief

Whether by car, bus, ferry or on foot, people in the Bay Area really get around. In 2001, the region's residents made more than 21 million trips on an average weekday, about 17 percent more than in 1990. Most of these trips are made by car (84 percent), with walking being the next most common mode (9 percent), followed by public transit and bicycling (see pie chart at right).

Projections indicate that population will continue to increase in the Bay Area, driven by job growth. More people means more travel and increased pressures on regional and local transportation systems. Maintaining mobility requires wise investment of always-limited resources.

Travel Mode for All Daily Trips



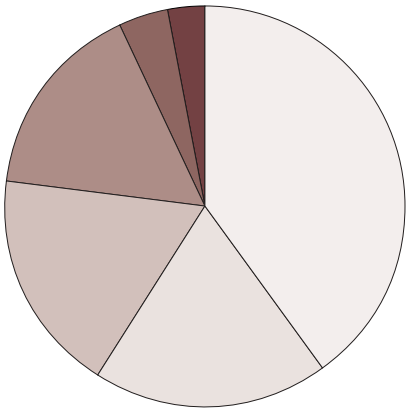
Auto	**84%**
Walk	**9%**
Transit	**6%**
Bicycle	**1%**

Source: Metropolitan Transportation Commission

Percentages are estimates for 2001, based on data developed in 1998.

The latest effort to prioritize transportation funding was completed in late 2001 when MTC adopted the *2001 Regional Transportation Plan*. This 25-year, $87 billion plan devotes about 74 percent of expected revenues to basic maintenance needs and ongoing operations. Recognizing the region's heavy commitment to transit and reflecting the fact that many of the region's highways are already fully developed, the RTP allocates 19 percent of the funds to transit expansion and 4 percent to roadway expansion.

Bay Area Transportation Spending, 2002–2026 (Total: $87.4 billion)



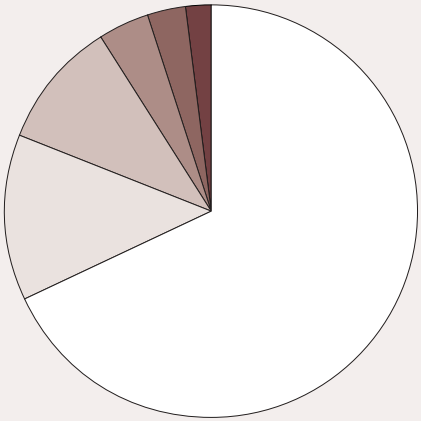
Transit Operations	**40%**
Transit Expansion	**19%**
Transit Rehabilitation	**18%**
Roadway Maintenance and Operations	**16%**
Roadway Expansion	**4%**
Other[1]	**3%**

Source: Metropolitan Transportation Commission

[1]Other includes system management, bike and pedestrian improvements, etc.

Closer Look at Commuting – Commuting to work accounts for roughly a quarter of all Bay Area trips. According to data from the 2000 Census, the average commute in 2000 was 29.4 minutes, an increase of nearly 15 percent from 1990. As with all trips, most commute trips are by private vehicle; 68 percent of work trips are by people driving alone and 13 percent by people in carpools and vanpools. The rate of transit use for commute trips (10 percent) is higher than for all trips (6 percent). One of the main reasons for this is that transit service is at its most frequent during peak periods, when traffic congestion is at its worst. Under these conditions, the attractiveness of transit as a travel option is greatly enhanced.

How Bay Area Workers Commute



Drive Alone	**68%**
Carpool	**13%**
Transit	**10%**
Work at Home	**4%**
Walk	**3%**
Other	**2%**

Source: Census 2000

The Freeway System

The Bay Area's 620-mile freeway system is the workhorse of the transportation network. In 2001, vehicles traveled 28 billion miles on Bay Area freeways — about 60 percent of all miles driven by trucks and passenger vehicles, and an increase of 9 percent since 1997. The roving tow trucks of the Freeway Service Patrol cruise along some 450 miles of the most congested freeways and expressways, helping motorists with car trouble, removing debris or quickly clearing accidents. Approximately 27 percent of freeway ramps are metered to help keep traffic flowing smoothly.

The freeway system includes 275 miles of carpool lanes, or "diamond lanes" that allow people in carpools, vanpools and buses to bypass congestion during peak commute hours. In 2001, carpool lanes carried an average of 16 percent of vehicles and 30 percent of people in the peak commute hour on freeway segments with carpool lanes.

The Local Roadway Network

The Bay Area has 19,000 centerline miles of local roadways, which are owned and maintained by cities and counties. Local roadways carry about 40 percent of all miles driven. They are critical for getting around by bicycle and bus as well as by automobile. About half of the traffic signals on the region's local roadway system are timed to improve travel speeds and reduce delays at major intersections. Some streets feature signals that give preferential treatment to buses that are running late so they can get back on schedule.

The Public Transit System

Public transit is critical to making the region's transportation system work. The region relies on public transit to reduce the number of cars on the road during the commute and to provide mobility to people without access to cars, including school children. Bay Area transit operators are nationally recognized as leaders in making the transit system accessible to persons with disabilities; in fiscal year 2000-01, 91 percent of the region's buses and 72 percent of its rail stations were accessible to people using wheelchairs.

In fiscal year 2000-01, Bay Area residents and workers made roughly 533 million transit trips, and transit operators provided a total of 188 million miles of service. This represents an increase of 13 percent in ridership and 22 percent in miles of service since fiscal year 1996-97. About a quarter of all scheduled transit routes ran at least every 15 minutes during peak commute hours.

More than 60 percent of all transit trips are on buses. The rest are on BART, commuter rail, light rail, ferries, and door-to-door vans and taxis that serve elderly and disabled riders (called paratransit service).

Pedestrian and Bicycle Facilities

The ability to get around safely on foot or by bicycle is increasingly recognized as an essential factor in a neighborhood's quality of life. The network used by bicyclists and pedestrians is ubiquitous. It includes the entire local roadway system, as well as sidewalks and some dedicated pathways. In addition, most buses and trains now accommodate bicycles. Bicycles and pedestrians are excluded from freeways for safety purposes, but access is provided on Bay Area bridges, either through bicycle lanes or some form of transit connection such as the bicycle shuttle across the Bay Bridge. Still, there are numerous locations without sidewalks or bicycle lanes; in such cases, bicyclists and pedestrians must share a lane with traffic.

The *2001 Regional Transportation Plan* proposed a 1,900-mile network of regionally significant bicycle facilities; the plan also identified gaps in city- and county-level bicycle plans and recommended specific improvements to fill these gaps. Approximately 35 percent of the regional network exists today.

Regionwide, bicycling accounts for 1 percent of all trips, and walking accounts for about 9 percent. However, for trips to school, bicycling accounts for about 4 percent of trips and walking for more than 20 percent.

Airports and Seaports

The region's airports and seaports are gateways to the rest of the country and the world for tourism, business travel and trade. The three major international airports (San Francisco, Oakland and San Jose) and five major seaports (Oakland, San Francisco, Richmond, Redwood City and Benicia) generate considerable ground traffic — passengers and cargo arriving and departing by car, truck and rail. In 2001, over 58 million people passed through the region's airports, a drop of 1 percent since 1997. The volume of ocean-going containers and bulk freight passing through Bay Area seaports each rose by 8 percent in the 1997–2001 time period.

Mobility: Getting Around the Bay Area

A principal goal of the *2001 Regional Transportation Plan* is to improve mobility for persons and freight. Mobility can be defined as the ease of getting around. This section includes statistics describing how easy (or difficult) it was to get around the Bay Area on freeways, local roadways and transit, as well as statistics on the number of vehicles and people that used each of these systems in 2001.

Traffic congestion and travel time are used to describe ease of travel on freeways. Statistics on vehicles using freeways include the total number of vehicles and total number of trucks at selected locations. The report presents separate statistics on travel time savings offered by carpool lanes and the number of vehicles using carpool lanes.

Measuring the ease of travel on the local road network is more challenging because the network is so extensive and is managed by more than 100 different cities and nine counties. Most jurisdictions use an indicator of congestion called "level of service," which corresponds roughly with traffic congestion. This report does not include traffic volumes on local roadways because this information is not consistently monitored or reported. We hope to fill this gap in future reports.

Schedule adherence (on-time performance) is used to describe ease of travel on transit. To track transit usage, the report includes annual and daily ridership statistics reported by operators to the Federal Transit Administration.

Time Lost to Freeway Gridlock Declines 12 Percent in 2001

After steadily worsening throughout the economic boom years of the late 1990s, the most closely watched regional mobility index — the number of hours of delay experienced daily by drivers on Bay Area freeways — took a turn for the better in 2001. Regionwide, vehicles spent 155,500 hours in congested conditions (defined as average speeds below 35 miles per hour for 15 minutes or more on a typical weekday) on regional freeways in 2001, down 12 percent from the 177,600 hours of delay experienced in 2000 (see table below).

Average delays decreased the most in San Mateo County (down 40 percent), San Francisco (down 32 percent) and Santa Clara County (down 28 percent). The dramatically improved conditions in these counties are due in part to the coming online of some new projects, though economic factors probably played a much larger role. The economic slowdown resulting from the bursting of the dot.com bubble that began in 2000 has hit the Peninsula subregion harder than other parts of the Bay Area, and the localized reductions in congestion are reflective of this fact. Delay also decreased significantly in Solano and Marin counties in 2001 (25 percent and 20 percent, respectively).

These decreases were partially offset by increases in congestion on East Bay freeways, where delay rose 16 percent in Contra Costa County and 6 percent in Alameda County. These increases can probably be explained by the substantial number of households that have moved to the region's eastern fringes — and beyond — in search of affordable housing in recent years. Even during a slowing economy, large numbers of workers still throng highways in Alameda and Contra Costa counties en route to jobs in San Francisco, the Peninsula and Silicon Valley.

Daily Freeway Delay by Bay Area County, 1996–2001

		Daily Vehicle Hours of Delay					Percent Change	
	Freeway Miles (2001)	1996	1998	1999	2000	2001	2000–2001	1996–2001
Alameda	138	35,400	41,800	44,300	61,700	65,600	+6%	+85%
Contra Costa	87	12,500	14,000	14,500	16,200	18,800	+16%	+50%
Marin	28	6,300	7,200	7,700	9,900	7,900	-20%	+25%
Napa	5	0	0	0	0	0	0%	0%
San Francisco	19	6,500	6,900	9,100	12,500	8,500	-32%	+31%
San Mateo	73	7,000	9,800	11,500	18,100	10,900	-40%	+56%
Santa Clara	137	20,500	29,300	36,900	51,700	37,000	-28%	+80%
Solano	79	70	400	700	3,200	2,400	-25%	+3,329%
Sonoma	55	1,800	2,800	3,600	4,300	4,400	+2%	+144%
Bay Area	**621**	**90,070**	**112,200**	**128,300**	**177,600**	**155,500**	**-12%**	**+73%**

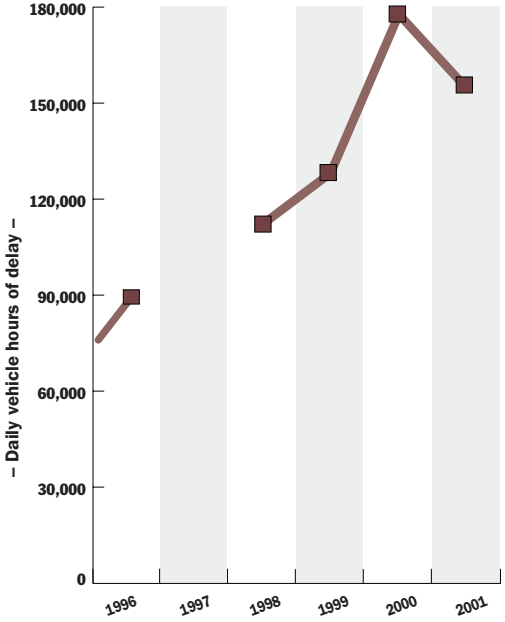
Source: Caltrans District 4

Caltrans did not measure freeway delay in 1997.

Appendix B lists delay on all freeway segments for the morning and evening commute periods in 2001.

Congestion Up Sharply Since Mid-1990s — After holding steady in most Bay Area counties during the early 1990s, congestion increased significantly in the latter half of the decade as the regional economy boomed. By 2000, total regional delay had almost doubled from 1996 levels (see graph below). The lower levels of delay observed in 2001 mark a departure from this trend; however, 2001 congestion levels remain higher than 1999 congestion levels regionally and in all counties except recession-plagued San Francisco, San Mateo and Santa Clara counties.

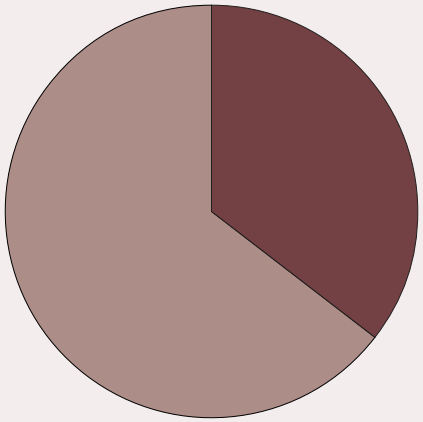
Total Daily Freeway Delay in the Bay Area, 1996–2001



Source: Caltrans District 4

Caltrans did not measure freeway delay in 1997.

Travel Speeds on Bay Area Freeways In Peak Commute Periods
[5 a.m.–9 a.m. and 4 p.m.–8 p.m.]



Over 50 miles per hour	**72%**
0 – 50 miles per hour	**28%**

Source: Metropolitan Transportation Commission
Based on analysis of data for 1999–2001

Commute-hour Congestion Not Systemwide — An interesting footnote to the discussion of travel and delay is the fact that a large portion of the Bay Area freeway system operates at fairly good speeds during the commute period, notwithstanding the considerable congestion at certain key points. Based on data from 1999–2001, MTC estimates that approximately 72 percent of the vehicle miles traveled during peak commute periods were at speeds over 50 miles per hour.

Freeway Congestion (continued)

Gridlock's Top 10 — Each year, Caltrans District 4 identifies the 10 freeway locations with the worst congestion during morning or evening peak commute hours (see table and map). Familiar bottlenecks occupied the top spots in 2001, with some moving up or down a notch. But 2001 also saw three new trouble spots crack the top 10: Interstate 580 in Alameda County near Pleasanton, Interstate 880 in Alameda and Santa Clara counties, and Route 84 in Alameda County approaching the Dumbarton Bridge. These segments replaced U.S. 101 in San Mateo County, Route 237 in Santa Clara County, and Route 92/San Mateo-Hayward Bridge in San Mateo and Alameda counties.

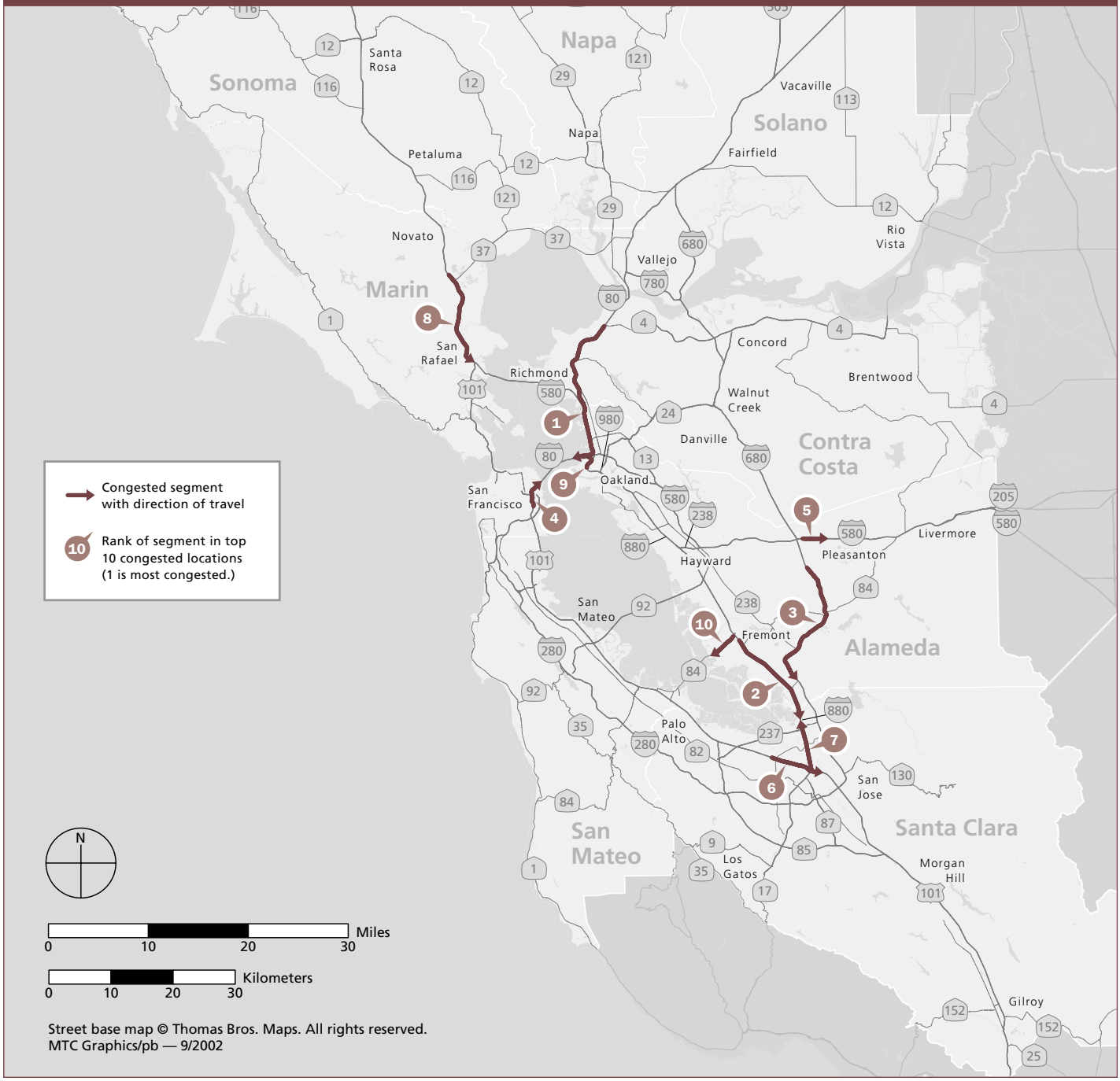
Bay Area Freeway Locations With Most Delay During Commute Hours, 2001

2001 Rank	Location	Delay in Vehicle Hours	2000 Rank
1	**Interstate 80, westbound, a.m. —** Alameda/Contra Costa County *Route 4 to Bay Bridge metering lights*	9,410	1
2	**Interstate 880, southbound, a.m. —** Alameda County *South of Route 84 to north of Dixon Landing Road*	8,880	3
3	**Interstate 680, southbound, a.m.** — Alameda County *Sunol Road to south of Route 262*	8,510	2
4	**Interstate 80, eastbound and U.S. 101, northbound, p.m.** — San Francisco County *Army Street to west end of Bay Bridge*	5,050	5
5	**Interstate 580, eastbound, p.m.** — Alameda County *Hopyard Road to west of El Charro*	5,030	13
6	**U.S. 101, southbound, p.m. —** Santa Clara County *Great America Parkway to 13th Street*	4,100	4
7	**Interstate 880, northbound, p.m. —** Santa Clara/Alameda County *U.S. 101 to Dixon Landing Road*	4,000	12
8	**U.S. 101, southbound, a.m.** — Marin County *Rowland Boulevard to Interstate 580*	3,230	6
9	**Interstate 880, northbound, a.m.** — Alameda County *1 mile north of 7th Street to Bay Bridge*	2,920	10
10	**Route 84, westbound, a.m.** — Alameda County *Newark to Dumbarton Bridge toll plaza*	2,860	11

Source: Caltrans District 4

Rankings are for routes in which continuous stop-and-go conditions occur with few, if any, breaks in the queue. Thus, corridors that have equally severe delays but where congestion is broken into several segments may rank lower in this type of congestion listing.

Gridlock's Top 10, 2001



MTC Graphics/pb — 9/2002

San Francisco, San Jose Morning Commutes Improve, Oakland Commutes Lengthen

Using the freeway congestion data gathered by Caltrans, we can calculate driving times for some popular morning commutes. We report here on drive times into San Francisco, Oakland and San Jose — the region's three largest cities — from various locations around the Bay Area. The selected commutes assume drivers use the main freeway routes between the origin and destination points, and it is further assumed that the drivers travel in regular, mixed-flow freeway lanes (not carpool lanes).

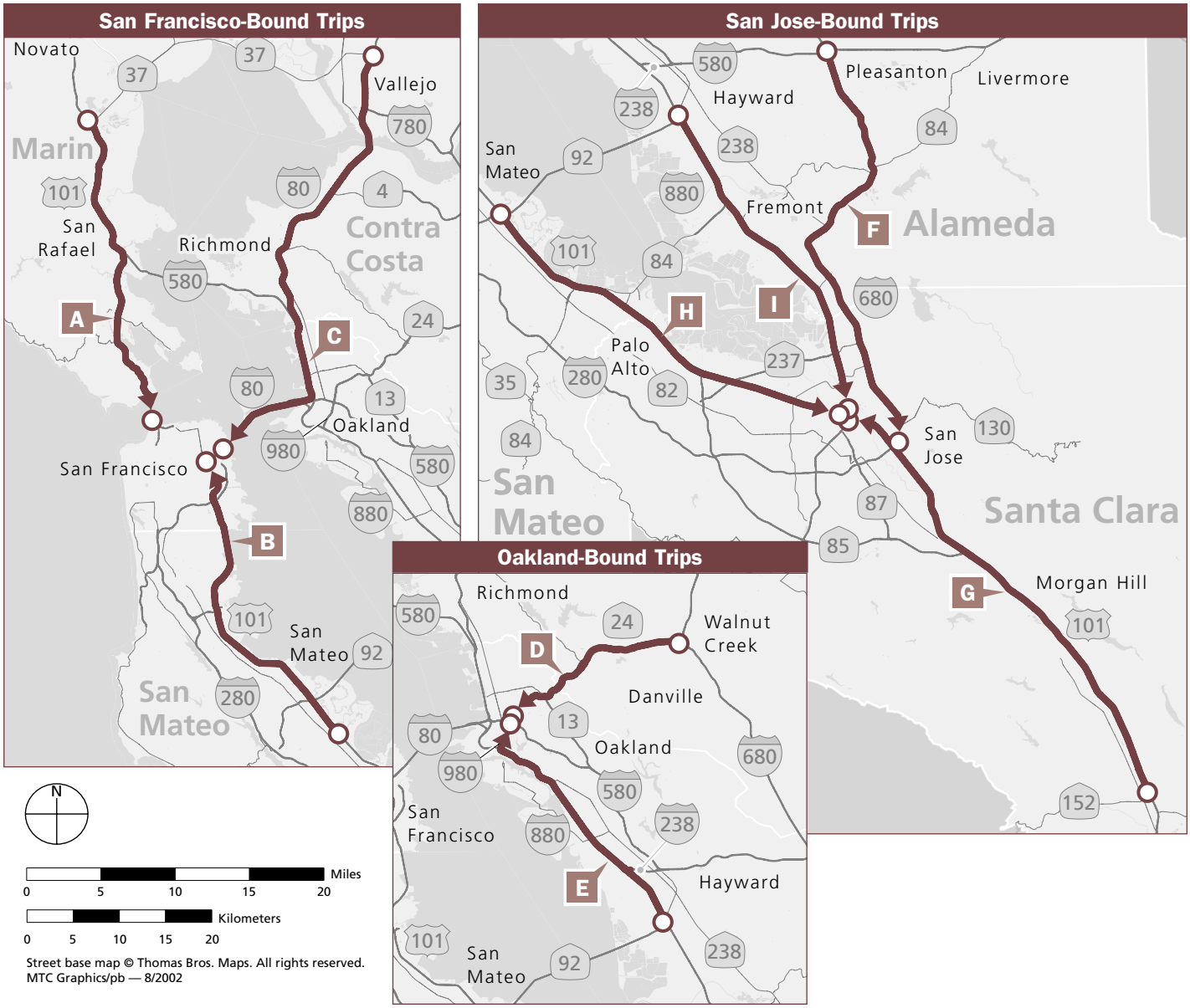
Looking at the table below, we can see that drive times improved for the San Francisco- and San Jose-bound commuters, a finding that is consistent with the reduction last year in freeway congestion in Marin, along the Peninsula and in Santa Clara County (see page 8). Accounting for a

Travel Time for Selected Commutes (Arriving at 8:30 a.m.), 1996, 2000 and 2001

		Travel Time in Minutes			Change in Minutes	
		1996	2000	2001	2000–2001	1996–2001
SAN FRANCISCO-BOUND TRIPS						
A	**U.S. 101, southbound** *Novato to Route 1 junction in San Francisco (27.6 miles)*	59	69	55	-14	-4
B	**U.S. 101, northbound** *Redwood City to Interstate 80 junction (23.8 miles)*	30	32	26	-6	-4
C	**Interstate 80, westbound** *Route 37 in Vallejo to 5th Street (31.5 miles)*	60	87	82	-5	+22
OAKLAND-BOUND TRIPS						
D	**Route 24, westbound** *Interstate 680 junction in Walnut Creek to Interstate 580/980 junction (14.2 miles)*	20	20	26	+6	+6
E	**Interstate 880, northbound and Interstate 980, eastbound** *Route 92 junction in Hayward to Interstate 580 junction (16.9 miles)*	19	19	23	+4	+4
SAN JOSE-BOUND TRIPS						
F	**Interstate 680, southbound** *Interstate 580 junction in Dublin to U.S. 101/ Interstate 280 junction in San Jose (28.7 miles)*	67	69	69	0	+2
G	**U.S. 101, northbound** *Route 152 junction in Gilroy to Interstate 880 junction (32.5 miles)*	38	59	55	-4	+17
H	**U.S. 101, southbound** *Route 92 junction in San Mateo to Interstate 880 junction (26.1 miles)*	46	44	43	-1	-3
I	**Interstate 880, southbound** *Route 92 junction in Hayward to U.S. 101 junction (22.8 miles)*	48	67	61	-6	+13

Source: Caltrans District 4 Data not developed for 1997–1999.

large part of the reduction in travel time from Marin into San Francisco was the introduction (in July 2000) of the FasTrak™ electronic toll collection system on the Golden Gate Bridge. But the stubborn congestion patterns in the East Bay increased drive times for Oakland-bound commuters from areas like Hayward and Walnut Creek. Compared to 1996 levels, travel times increased significantly for most of these big-city commutes, with commutes north and south from San Mateo County being a notable (though not easily explainable) exception.



North Bay and East Bay Gateways See Traffic Surge

How heavily used are Bay Area freeways? To answer this question, Caltrans maintains fixed traffic count stations that continuously record the number of vehicles that pass by (in both directions) throughout the year. These counts are expressed in terms of average daily vehicle volumes. Changes in freeway traffic volumes are often correlated with changes in congestion and travel time.

In 2001, this correlation is evident. As can be seen in the map at right, traffic volumes showed marked increases in North Bay and East Bay "gateway" locations (sites near the Bay Area's borders with neighboring counties). Meanwhile, in Marin, on the Peninsula and in South Bay locations, traffic volumes showed little growth or actually decreased, paralleling similar trends in congestion and travel times, as outlined in the preceding sections of this report. These same patterns are evident in the 2001 traffic volumes on the Bay Area's eight toll bridges (see table below).

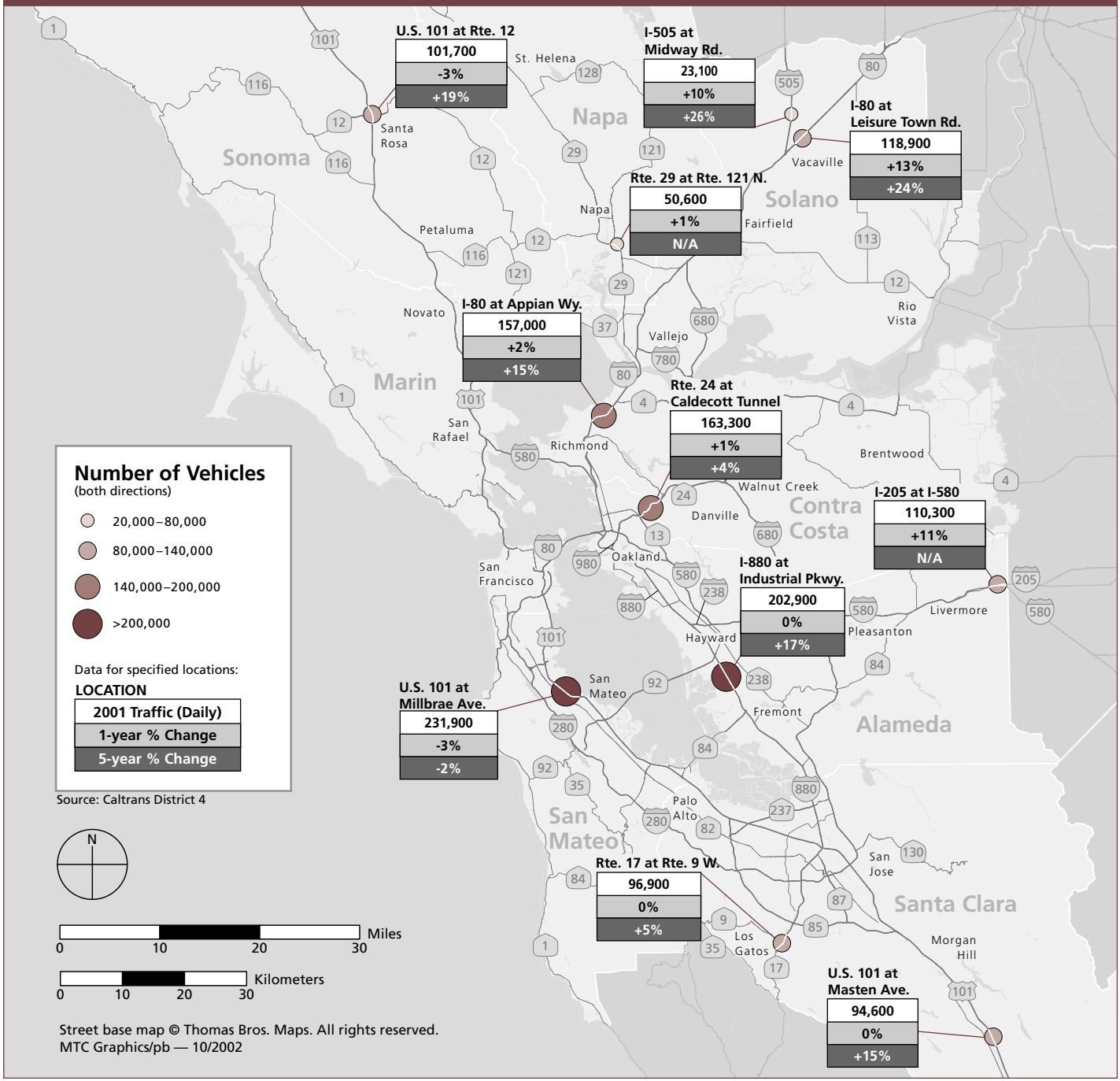
Average Daily Traffic on Bay Area Bridges (Toll Direction Only), 1999–2001

	Number of Vehicles			Percent Change
Bridge	**1999**	**2000**	**2001**	**2000–2001**
San Francisco-Oakland Bay	135,220	138,181	136,636	-1%
Carquinez	58,139	60,402	62,185	+3%
Golden Gate	57,586	58,127	56,511	-3%
Benicia–Martinez	46,892	47,705	49,382	+4%
San Mateo–Hayward	40,932	42,586	41,153	-3%
Richmond–San Rafael	32,759	33,968	35,427	+4%
Dumbarton	31,926	34,226	34,362	0%
Antioch	5,267	5,785	6,487	+12%
Total All Bridges	**408,721**	**420,979**	**422,142**	**+.3%**

Sources: Bay Area Toll Authority; Golden Gate Bridge, Highway and Transportation District

Data for 1997 and 1998 not available.

Average Daily Traffic on Bay Area Highways, 2001 (Selected Locations)



Source: Caltrans District 4

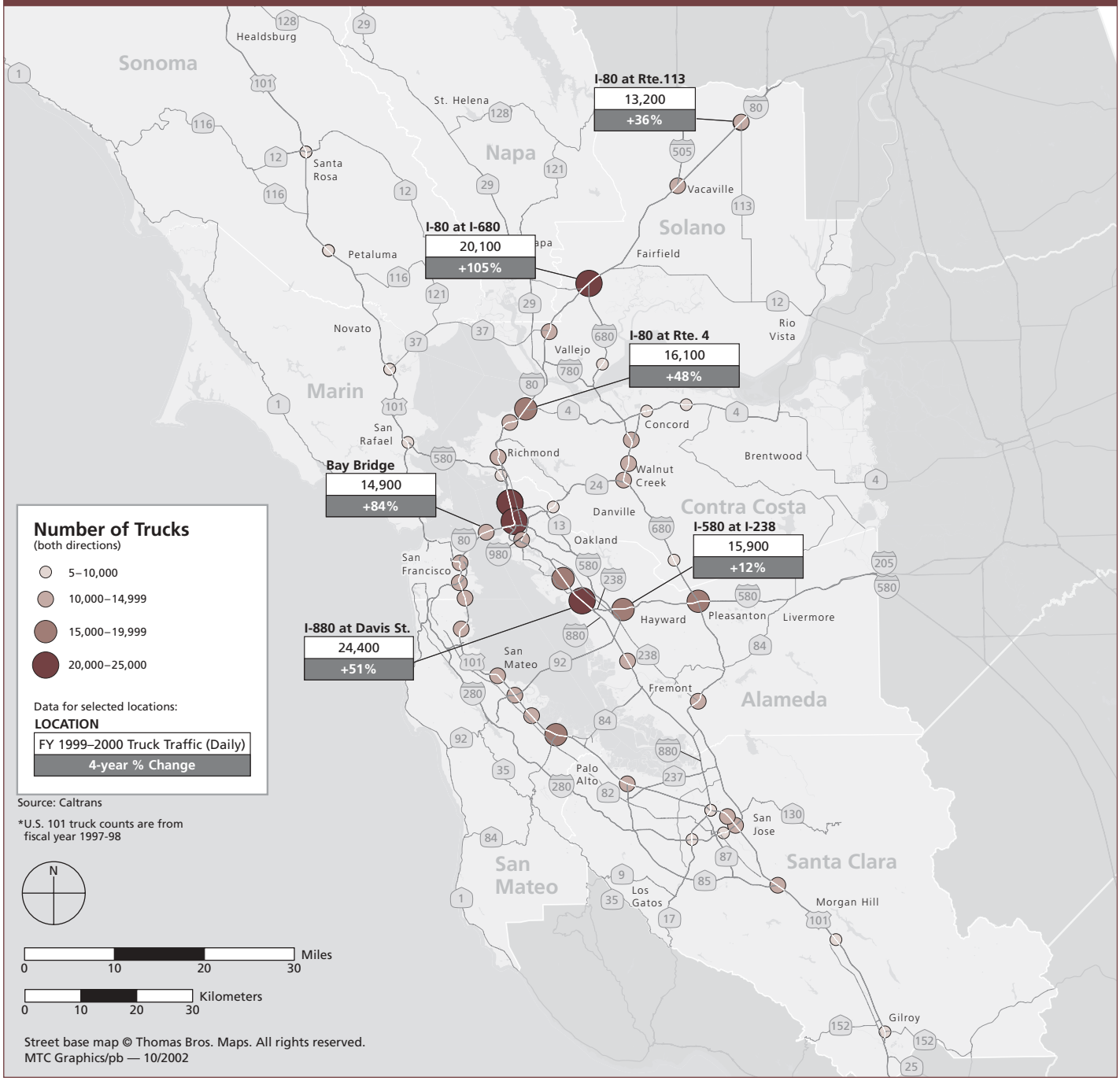
MTC Graphics/pb — 10/2002

Big Jump in Truck Traffic on Interstate 80 During Late '90s

Most of the goods produced, consumed in, or just passing through the Bay Area travel by truck for at least some part of the journey to market. This makes freight activity a key segment of overall freeway usage. The freeways with the largest volumes of truck traffic are Interstate 80, Interstate 880, and Interstate 580 east of Oakland — all key routes for moving goods to and from the Central Valley and the Port of Oakland. Of these, Interstate 80 experienced the greatest growth in truck traffic during the most recent four-year period for which data is available (fiscal year 1996-97 to fiscal year 1999-2000). Truck traffic on Interstate 80 at the Interstate 680 junction in Solano County more than doubled during this period, a time of tremendous growth in the regional economy. (See map for truck traffic levels at selected Caltrans monitoring locations.)

Although complete data is not yet available, observations suggest that truck volumes declined between fiscal year 1999-2000 and fiscal year 2000-01 at some locations, due chiefly to the economic slowdown. These observations are buttressed by the Port of Oakland's reporting of a 7 percent drop in the number of containers handled at the port in 2001 (see page 48). Fewer containers passing through the port means fewer trucks are required for pick up and delivery, as the effects of reduced economic activity are felt along the supply chain.

Average Daily Truck Traffic, Fiscal Year 1999–2000*



Source: Caltrans

*U.S. 101 truck counts are from fiscal year 1997-98

MTC Graphics/pb — 10/2002

Carpool Lanes Take Big Bite Out of Some Bay Area Commutes

Bay Area commuters who double up or triple up can realize significant time savings by taking advantage of the region's 275-mile network of carpool lanes. From Interstate 880 and Route 85 in the South Bay to U.S. 101 in Marin County, the number of minutes saved on some of the region's toughest commutes is well into double digits, and in most cases savings have increased in recent years.

The amount of time that can be saved in any given carpool-lane segment is a function of several things, including the length of the segment, the amount of congestion in the neighboring mixed-flow lanes (the more congestion, the slower the travel speed), and the number of cars in the carpool lane itself (if a carpool lane becomes too "popular," travel speeds decrease and time savings are reduced). In the Bay Area, where most carpool lanes are not operating at capacity, the first two factors — lane length and adjacent congestion — are the primary determinants of time savings. So it is not surprising that as congestion increased dramatically in the late 1990s, so too did the absolute time savings offered by freeway carpool lanes.

Bay Area Carpool Lanes Where Most Time Was Saved, 1997–2001

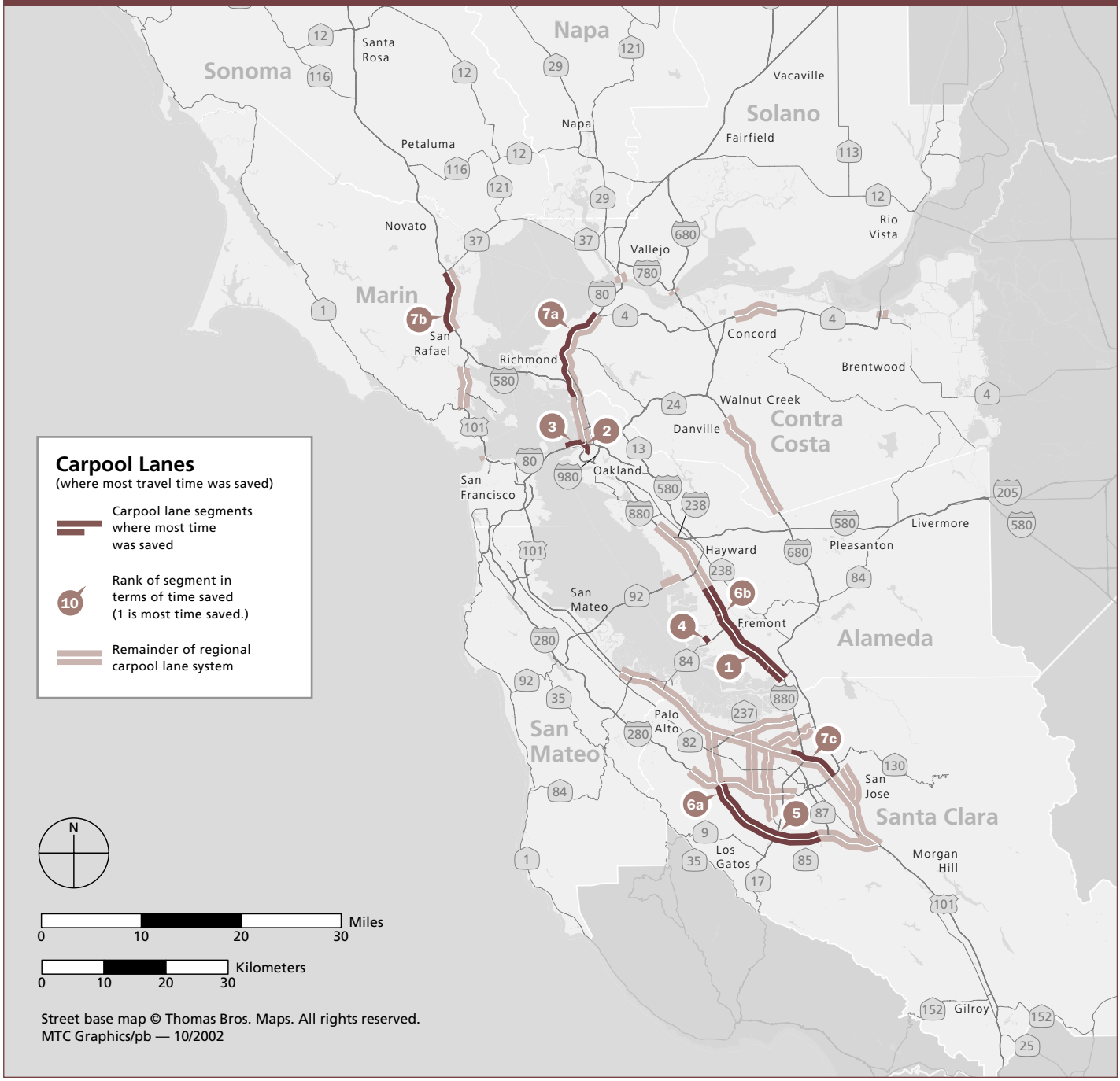
		Minutes Saved per Vehicle in Peak Hour					Change in Minutes Saved	
Rank	Carpool Lane	1997	1998	1999	2000	2001	2000–2001	1997–2001
1	**Interstate 880, southbound, a.m.** — Alameda County *Whipple Road to Mission Boulevard (11.5 miles)*	NA	NA	25	25	40	+15	NA
2	**Interstate 880, northbound, a.m.** — Alameda County *16th Street to Bay Bridge toll plaza (1.2 miles)*	NA	9	18	32	31	-1	NA
3	**Interstate 80, westbound, a.m.**[1] — Alameda County *Bay Bridge toll plaza (4 lanes, 0.4 to 1.0 miles)*	12	15	18	24	24	0	+12
4	**Route 84, westbound, a.m.** — Alameda County *Dumbarton Bridge toll plaza (1.8 miles)*	12	16	16	16	19	+3	+7
5	**Route 85, northbound, a.m.** — Santa Clara County *Almaden Expressway to Interstate 280 (12.5 miles)*	8	0	5	9	16	+7	+8
6a	**Route 85, southbound, p.m.** — Santa Clara County *Interstate 280 to Almaden Expressway (12.5 miles)*	3	11	9	9	15	+6	+12
6b	**Interstate 880, northbound, p.m.** — Alameda County *Mission Boulevard to Whipple Road (11.5 miles)*	NA	NA	9	9	15	+6	NA
7a	**Interstate 80, westbound, a.m.**[1] — Contra Costa County *Route 4 to Alameda County Line (9.7 miles)*	NA	10	11	11	13	+2	NA
7b	**U.S. 101, southbound, a.m.** — Marin County *Route 37 to North San Pedro Road (6.1 miles)*	19	15	6	9	13	+4	-6
7c	**U.S. 101, northbound, a.m.** — Santa Clara County *I-280/I-680 interchange to Guadalupe Parkway (6 miles)*	14	7	11	16	13	-3	-1

Source: Caltrans District 4

[1]Carpool is three or more persons per vehicle. For all other listed locations, carpool is two or more persons.

NA = Not available

Time Savings in Carpool Lanes, 2001



MTC Graphics/pb — 10/2002

Carpool Lanes Grow in Popularity With Bay Area Commuters

As time savings have increased for carpoolers on Bay Area freeways (see preceding topic), carpool lanes have grown in popularity. In the most recent five-year period, from 1997–2001, peak-hour traffic volumes on the region's 10 most heavily used carpool-lane segments have gone up steadily. And the growth has been most dramatic in the highest-volume carpool corridor, the morning approach to the San Francisco-Oakland Bay Bridge on westbound Interstate 80. Faced with the perennial morning backup at this traffic chokepoint, commuters have migrated to the carpool lane in record numbers, resulting in a 77 percent increase in usage over the last five years.

However, in 2001 — as congestion eased around the region due to the economic downturn — carpool lane volumes decreased in a few locations, mostly in the South Bay (see table below).

Tracking the number of vehicles in carpool lanes enables Bay Area travel planners to see how system use changes over time and in response to freeway congestion. Lanes where vehicle volumes are especially low can become candidates for conversion back to regular, mixed-flow lanes. Lanes where vehicle volumes are nearing capacity may indicate that an increase in vehicle occupancy requirements is warranted.

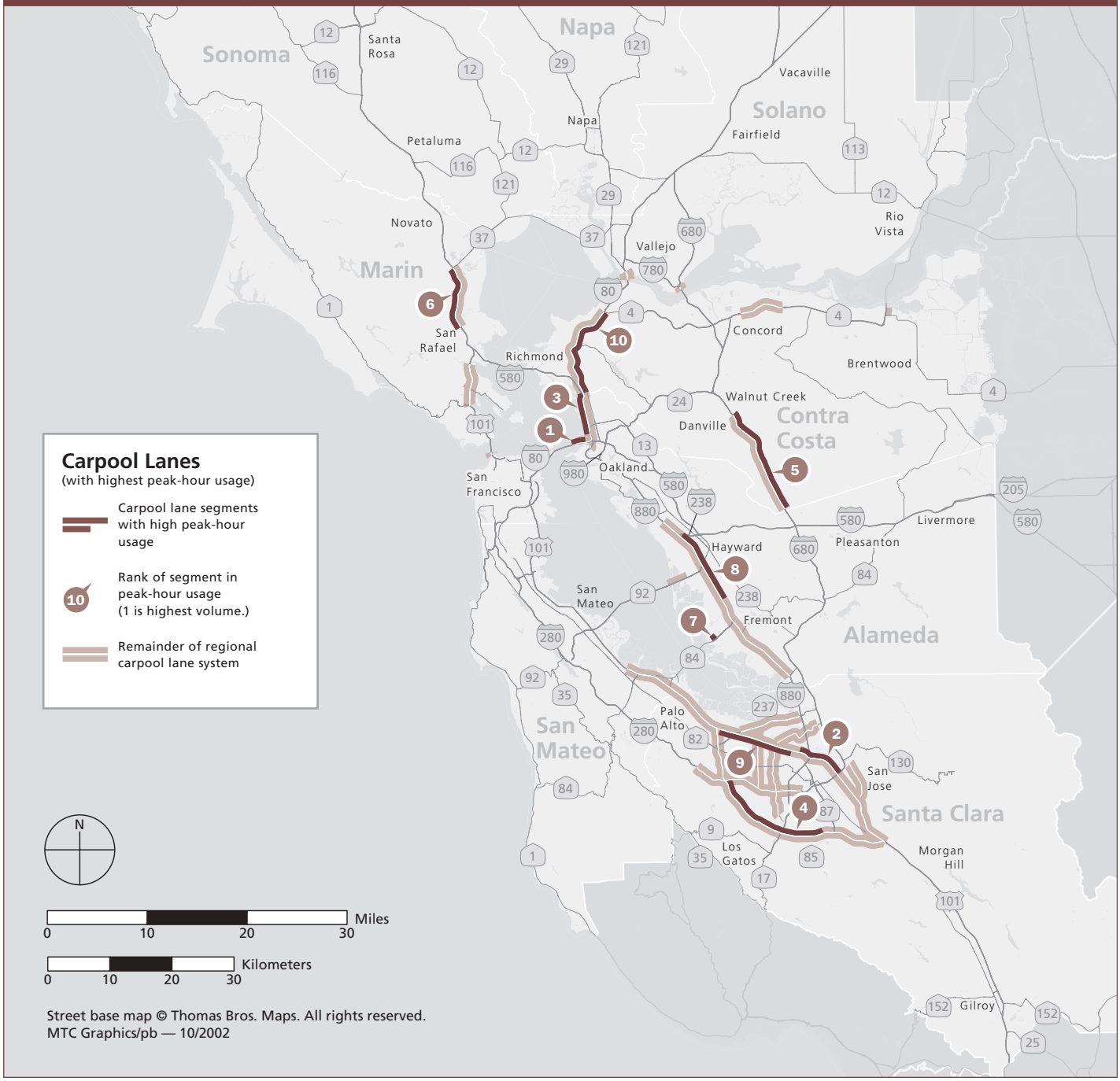
Bay Area Carpool Lanes With Highest Peak-Hour Usage, 1997–2001

		Peak-Hour Carpool Vehicles[1]					Percent Change	
	Carpool Lane	1997	1998	1999	2000	2001	2000–2001	1997–2001
1	**Interstate 80, westbound, a.m.[2]** — Alameda County *Bay Bridge toll plaza*	2,246	3,083	3,492	3,804	3,975	+4%	+77%
2	**U.S. 101, northbound, a.m.** — Santa Clara County *I-280/I-680 interchange to Guadalupe Parkway*	1,548	1,672	1,692	1,585	1,594	+1%	+3%
3	**Interstate 80, westbound, a.m.[2]** — Alameda County *Contra Costa County line to Powell Street*	NA	1,365	1,503	1,113	1,555	+40%	NA
4	**Route 85, northbound, a.m.** — Santa Clara County *Almaden Expressway to Interstate 280*	1,049	1,071	1,188	1,456	1,409	-3%	+34%
5	**Interstate 680, northbound, p.m.** — Contra Costa County *Alcosta Boulevard to Livorna Road*	1,041	1,043	1,119	1,421	1,383	-3%	+33%
6	**U.S. 101, southbound, a.m.** — Marin County *Route 37 to North San Pedro Road*	1,319	1,103	1,217	1,282	1,361	+6%	+3%
7	**Route 84, westbound, a.m.** — Alameda County *Dumbarton Bridge toll plaza*	1,218	1,453	1,626	1,376	1,354	-2%	+11%
8	**Interstate 880, northbound, p.m.** — Alameda County *Whipple Road to south of Interstate 238 interchange*	1,074	788	867	1,364	1,338	-2%	+25%
9	**U.S. 101, southbound, p.m.** — Santa Clara County *Ellis Street to Guadalupe Parkway*	1,161	1,295	1,342	1,333	1,331	0%	+15%
10	**Interstate 80, eastbound, p.m.[2]** — Contra Costa County *Alameda County line to Route 4*	NA	834	794	1,091	1,322	+21%	NA

Source: Caltrans District 4

[1]Includes buses, vanpools and motorcycles. [2]Carpool is three or more persons per vehicle. For all other listed locations, carpool is two or more persons.

Carpool Lane Peak-Hour Usage, 2001



MTC Graphics/pb — 10/2002

Afternoon Congestion on Upward Trend, but Traffic Still Flows Freely on Most Local Roads

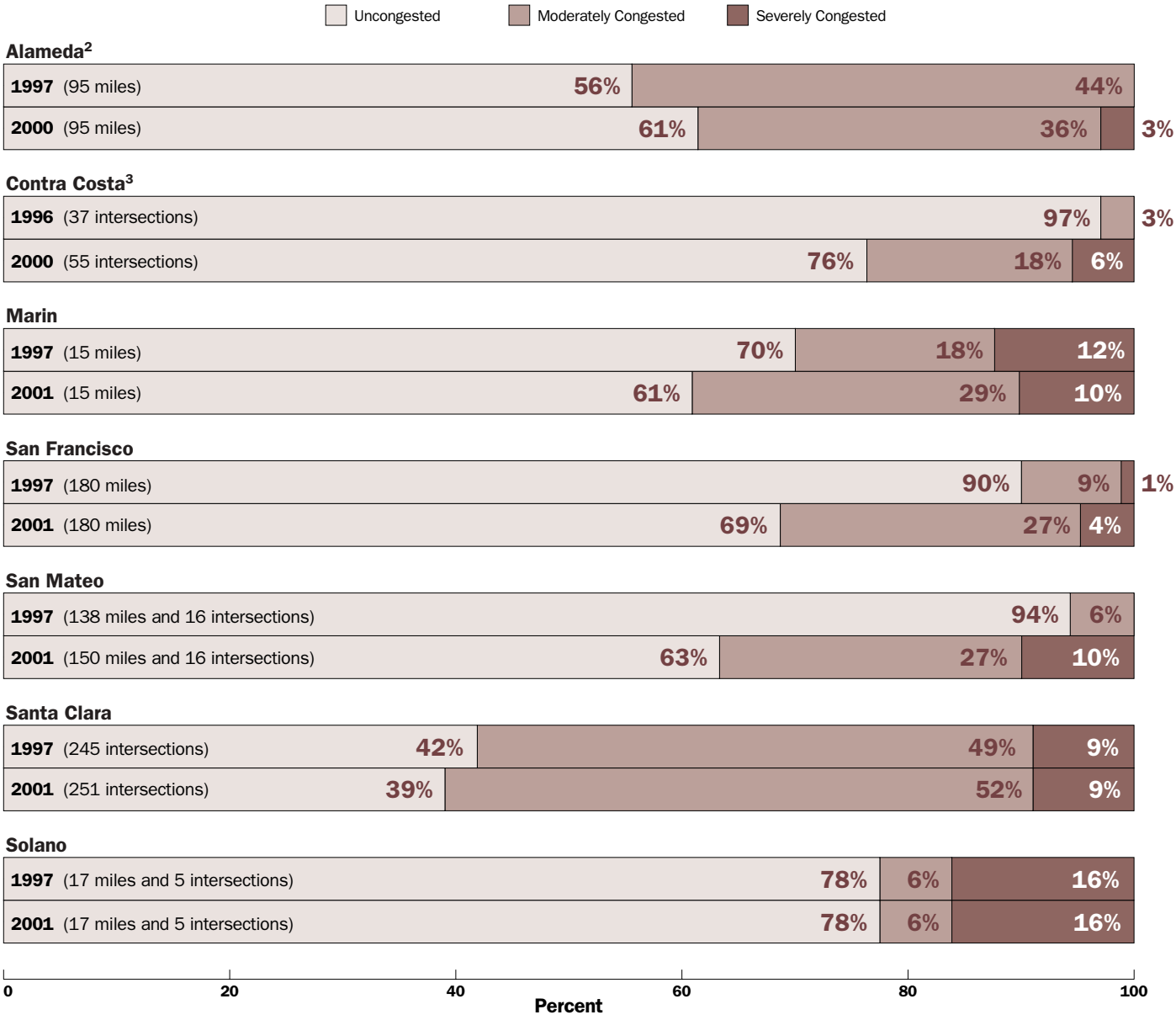
Mirroring the trend on Bay Area freeways, traffic conditions on local roadways deteriorated during the late 1990s and into the new century. In the five-year period from 1997 to 2001, monitoring of congestion levels on "high-priority" local streets and roads showed an increase in the percentage of "moderately congested" segments or intersections in most counties. During the same time, several counties showed increases in the percentage of roadways deemed "severely congested." Even so, only a very small portion (3 percent to 16 percent) of each county's roadway system was found to be severely congested.

However, even with the overall rise in congestion, it should be noted that in most of the monitored segments and intersections in the local roadway system, traffic flowed freely during the evening commute period. Santa Clara County is an exception to this phenomenon. Here, even the slowing economy has not appreciably thinned traffic at the 251 intersections monitored by the county's congestion management agency in 2001, with 52 percent experiencing moderate congestion.

In the Bay Area, congestion management agencies monitor performance of a selected system of "high priority" local roads biennially in every county except Napa and Sonoma. Santa Clara and Contra Costa counties measure congestion based on vehicle counts at major intersections. San Francisco, Alameda and Marin counties measure congestion via specially equipped cars that cruise selected segments of the roadway system to calculate the average travel speed. San Mateo and Solano counties use both techniques.

Because monitoring techniques vary by county, the congestion data presented here is best used to track changes within a given county over time (rather than to compare conditions in different counties). See Appendix A for further discussion of monitoring techniques and definitions of congestion severity.

Local Roadway Congestion by County[1] During the P.M. Peak Commute Period, 1997 and 2001



Source: County congestion monitoring reports

[1] Selected road segments and/or intersections; Napa and Sonoma counties do not monitor local roadway congestion.
[2] 2000 data used in lieu of 2001 data, which is not available.
[3] Contra Costa County measures congestion in even-numbered years; data is for 1996 and 2000, as labeled.

On-Time Records of Bay Area Transit Operators Vary Widely

The challenge of getting the Bay Area's buses and trains to run on time is met with varying degrees of success by the region's seven major transit operators. In fiscal year 2000-01 (the most recent 12-month period for which data is available), both the Valley Transportation Authority and BART continued their records of punctuality, logging on-time performance ratings of 93 percent and 92 percent, respectively.

While San Francisco Muni's fleet of light-rail vehicles turned in the lowest on-time performance record (49 percent), the rating was an almost 100 percent improvement over the performance recorded just three years prior, in 1997-98. Muni's motor buses and trolley buses also showed significant on-time improvements in 2000-01. The gains in Muni's performance reflect recent efforts to improve service in response to 1999's voter-approved

On-Time Performance of Seven Major Bay Area Transit Operators, Fiscal Years 1996-97–2000-01

	Percent of Trips on Time by Fiscal Year					
	1996-97	1997-98	1998-99	1999-2000	2000-01	2000-01 Goal[7]
Buses						
Valley Transportation Authority[1] (VTA)	NA	NA	94%	94%	93%	95%
Golden Gate Transit[1]	92%	91%	88%	87%	85%	95%
SamTrans[2]	89%	88%	85%	85%	85%	85%
AC Transit[3]	68%	70%	73%	73%	69%	90%
Muni[4] (electric trolley bus)	NA	54%	54%	NA	64%	85%
Muni[4] (diesel motor bus)	NA	50%	57%	NA	63%	85%
Rail						
BART[1]	92%	92%	92%	92%	92%	95%
VTA[5]	NA	NA	91%	91%	93%	95%
Caltrain[6]	94%	89%	88%	66%	86%	95%
Muni[4]	NA	26%	43%	NA	49%	85%

Sources: AC Transit, Golden Gate Transit, Muni, SamTrans, VTA, Caltrain, BART

Notes:
[1] No more than 5 minutes late
[2] No more than 5 minutes late or 1 minute early
[3] Never early and no more than 5 minutes late
[4] No more than 4 minutes late or 1 minute early; prior to 1998-99, no more than 3 minutes late or 1 minute early
[5] No more than 3 minutes late
[6] Train arrived at end of the line station within 5 minutes of scheduled time
[7] Goals from operators' triennial audit reports and Caltrain 1997 Strategic Plan

Proposition E. Proposition E also liberalized the definition of "on-time," though Muni's standard is still the most rigorous of the major operators. (See Note 4 to the table on page 24.)

The data show that many of the major operators maintain a relatively consistent on-time record from year to year. One exception is Caltrain, whose on-time performance in fiscal year 1999-2000 was adversely affected by major track rehabilitation work that disrupted service. Golden Gate Transit's buses are perhaps another exception, with the results showing on-time performance gradually declining over the five-year period from 1996-97 to 2000-01. For some operators, deterioration of on-time performance is due to increases in roadway congestion, which can affect the ability of buses to stay on schedule.

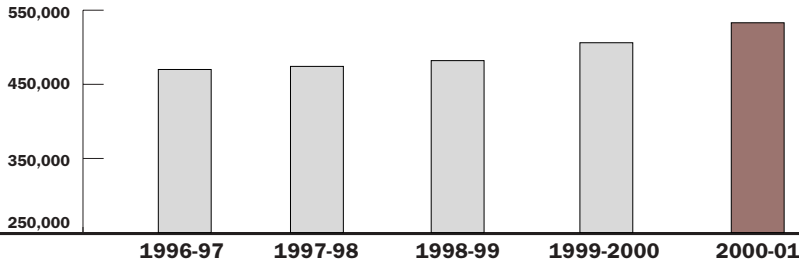
New Rails, Economic Growth Boosted Transit Ridership Through 2000-01; Dropoff Foreseen Due to Slowing Economy

After enduring a prolonged stretch of basically flat ridership during the early 1990s — a period of economic recession — Bay Area transit operators racked up five straight years of steadily increasing ridership in the period ended June 30, 2001. In fiscal year 1999-2000, annual boardings for the region topped the 500 million mark. This figure soared still higher the next year when transit riders boarded trains, buses, streetcars and ferries a record 533 million times in the Bay Area. (A "boarding" refers to each time a passenger gets on a transit vehicle.)

The 13 percent overall increase in ridership since 1996-97 is due in part to a hot regional economy that created many new jobs. But ridership also was boosted by a number of attractive new transit service expansions — especially rail extensions — which came online and succeeded in luring new riders onto transit. Among the rail extensions and new services that contributed to ridership gains are: new Altamont Commuter Express rail service

Ridership on Bay Area Transit Systems by Operator, Fiscal Years 1996-97–2000-01

	Thousands of Annual Boardings					Percent Change	
Operator	**1996-97**	**1997-98**	**1998-99**	**1999-2000**	**2000-01**	**1999-2000–2000-01**	**1996-97–2000-01**
Muni	217,631	219,507	217,050	226,182	236,205	+4%	+9%
BART	83,446	81,422	86,488	97,024	103,919	+7%	+25%
AC Transit	63,303	63,877	66,089	68,088	71,529	+5%	+13%
Valley Transportation Authority	53,062	53,547	54,996	55,701	58,160	+4%	+10%
SamTrans	18,562	18,834	18,350	17,925	18,136	+1%	-2%
Golden Gate Transit	10,962	11,032	11,108	11,465	11,618	+1%	+6%
Caltrain	7,040	8,632	8,622	8,735	9,925	+14%	+41%
Other Operators	16,022	17,349	19,283	20,986	23,546	+12%	+47%
Total – All Operators	**470,028**	**474,200**	**481,986**	**506,106**	**533,038**	**+5%**	**+13%**



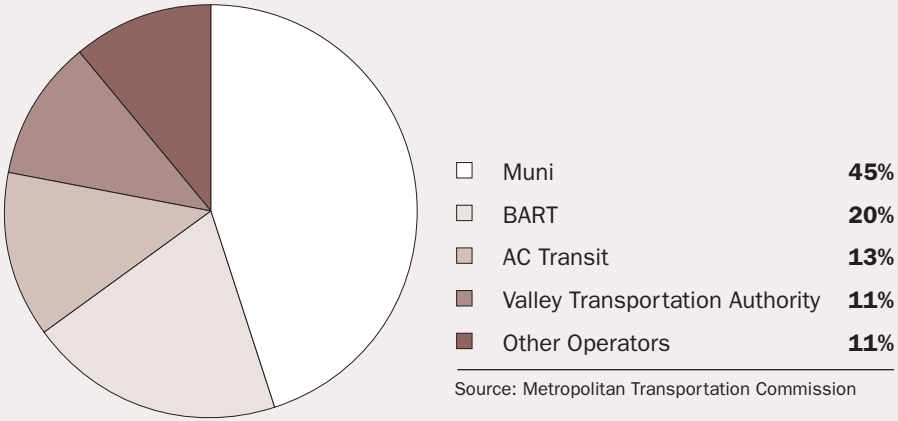
Source: Metropolitan Transportation Commission

from Stockton to the Silicon Valley (1998-99); the Tasman light-rail extension in Santa Clara County (2000-01); the new Muni F-line extension to Fisherman's Wharf and the Muni light-rail extension to the San Francisco Caltrain depot (1998-99).

The slowing of the regional economy in 2001 and 2002 is almost certain to be reflected in smaller annual boarding figures for the fiscal year ended June 30, 2002, when that data becomes available.

A Closer Look – Although nearly two dozen transit agencies provide service in the Bay Area, four operators — San Francisco Muni, BART, AC Transit and the Valley Transportation Authority — account for the lion's share of annual boardings. Together, these four operators logged 89 percent of all boardings in fiscal year 2000-01.

Ridership by Bay Area Transit Operator, Fiscal Year 2000-01



Source: Metropolitan Transportation Commission

The 10 most heavily used bus routes in 2001 are shown to the right. Eight of the routes are operated by San Francisco Muni.

Top 10 Bay Area Bus Routes, by Boardings

Route	Average Weekday Boardings
1. San Francisco Muni: 38 Geary	52,500
2. San Francisco Muni: 14 Mission	47,600
3. San Francisco Muni: 1 California	32,400
4. San Francisco Muni: 9 San Bruno	30,200
5. San Francisco Muni: 15 Third Street	28,200
6. San Francisco Muni: 30 Stockton	27,300
7. San Francisco Muni: 22 Fillmore	25,500
8. Valley Transportation Authority: 22 Eastridge – Palo Alto/Menlo Park	25,200
9. AC Transit: 82/82L West Oakland – Hayward BART	22,500
10. San Francisco Muni: 49 Van Ness/Mission	21,000

Sources: AC Transit, Muni, VTA

Information for fiscal year 2000-01 except for AC Transit, which reflects 1998.

Safety

One of the goals of the *2001 Regional Transportation Plan* is to improve safety for all users of the transportation system — drivers and passengers, transit users, bicyclists and pedestrians.

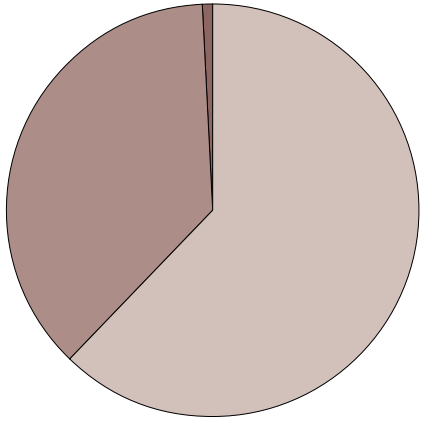
This report uses statistics on injuries and fatalities resulting from collisions to gauge safety. The most widely used safety information on automobile collisions with other cars, bicyclists and pedestrians comes from data assembled by the California Highway Patrol. Transit operators report injuries and fatalities occurring on their systems to the Federal Transit Administration.

Despite Increasing Travel, Collision Numbers Vary Little

When millions of people drive billions of miles each year, accidents will happen. In 2001, over 100,000 accidents were reported on Bay Area roadways. Fortunately, most of these accidents result in property damage only (see pie chart). But some are more serious. In this section we take a look at statistics on the number of injuries and fatalities from motor vehicle collisions reported in the Bay Area. In the following section, we pay special attention to those motor vehicle collisions that involve bicycles and pedestrians.

Several factors influence the number of injury and fatal collisions in the Bay Area: driver education and behavior, vehicle safety features, roadway conditions, and, of course, the number of miles driven (on both freeways and local roadways). With respect to this last point, studies show that although freeway driving accounts for approximately 60 percent of all vehicle miles driven in the Bay Area, only about one-quarter of all collisions occur on freeways.

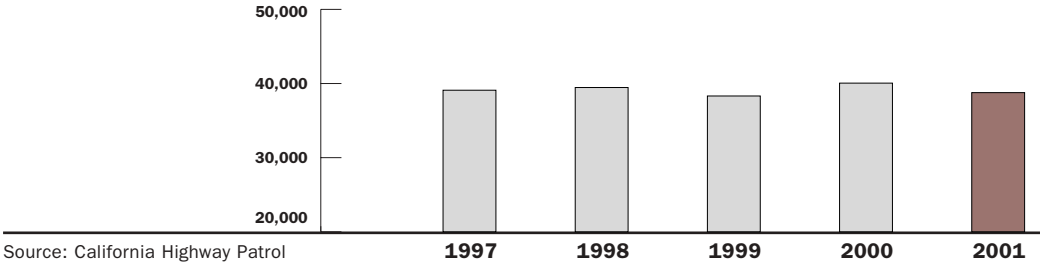
Motor Vehicle Collisions in the Bay Area in 2001: Fatal, Injury, Property Damage



Source: California Highway Patrol
103,990 collisions = 100%

Injury and Fatal Collisions on Bay Area Roadways, 1997–2001

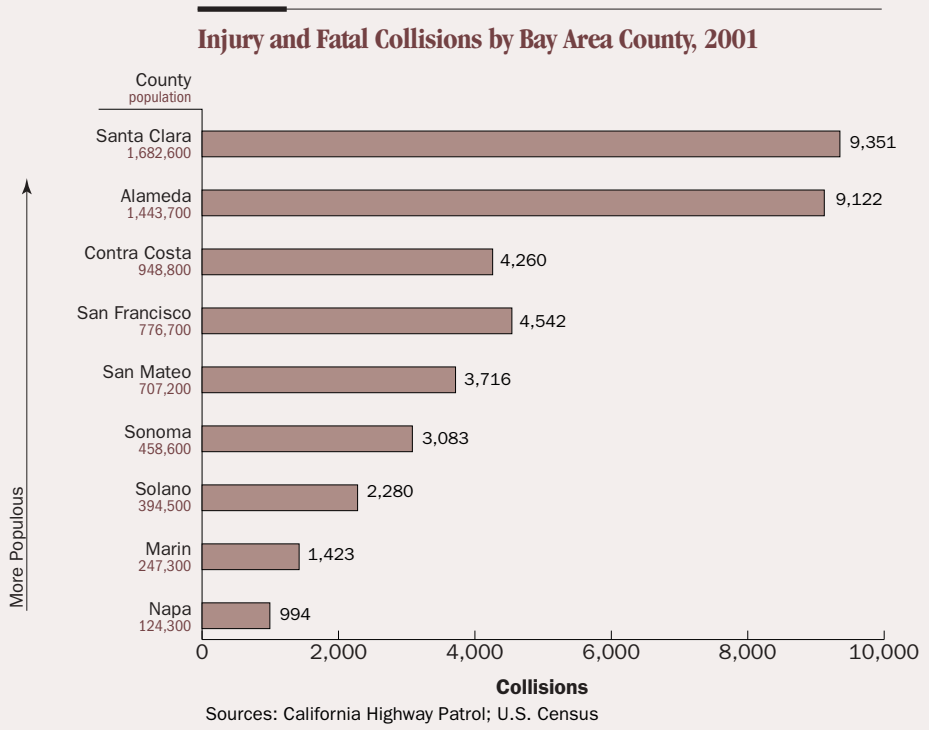
	Collisions					Percent Change	
	1997	1998	1999	2000	2001	2000–2001	1997–2001
Injury Collisions	38,646	39,027	37,913	39,609	38,322	-3%	-1%
Fatal Collisions	450	433	405	444	449	+1%	0%
Total Injury and Fatal	**39,096**	**39,460**	**38,318**	**40,053**	**38,771**	**-3%**	**-1%**



Source: California Highway Patrol

In 2001 there were 38,771 motor vehicle collisions that resulted in injuries or fatalities on Bay Area roads and freeways. (Motor vehicle refers to all motorized conveyances that use the roads — private automobiles, commercial trucks, buses, motorcycles, etc.) As can be seen in the table on page 30, the number of injury and fatal collisions fluctuated very little from year to year during the recent five-year period from 1997 to 2001, despite increased travel on Bay Area roads over this period. The same goes for the individual components of the measure — injury collisions and fatal collisions. These also remained within a relatively narrow range.

A Closer Look – We can get a rough idea of the geographical distribution of the injury and fatal collisions that occurred in 2001 by breaking them out by county of occurrence. Perhaps not surprisingly, a given county's share of collisions correlates closely with its size, as measured by population (see bar graph).



Sources: California Highway Patrol; U.S. Census

Motor Vehicle Collisions Involving Walkers and Cyclists On Downward Trend

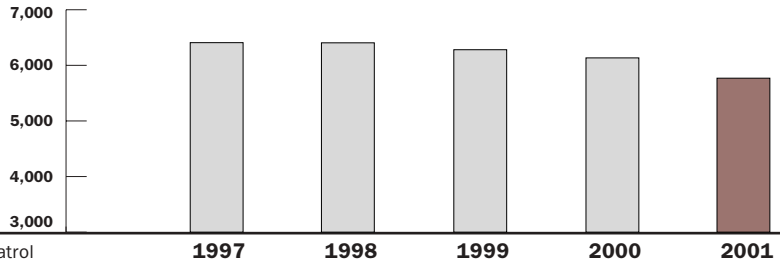
Injuries and fatalities resulting from motor vehicle collisions are not all suffered by motorists. A considerable number of incidents involve bicyclists and pedestrians as well. Indeed, of the 38,771 injury-or-fatality motor vehicle collisions reported in the Bay Area in 2001 (see page 30), 3,183 involved pedestrians and 2,586 involved bicyclists (see table below).

Together, these 5,769 collisions comprise 15 percent of all injury-and-fatality motor vehicle collisions in 2001. If, however, we factor out collisions on freeways (which rarely involve bicyclists or pedestrians), the bicycle/pedestrian share of collisions on the remaining, non-freeway roadways rises to 20 percent — one fifth of all injury-or-fatality incidents that occurred on these roads in 2001 (see pie chart on next page). This figure helps to explain why the safety of bicyclists and pedestrians is an issue of concern in communities around the Bay Area.

The data show evidence of a slight general downward trend — for the one-year and five-year periods shown — in injury collisions involving bicycles or pedestrians.

Injury and Fatality Motor Vehicle Collisions Involving Pedestrians or Bicyclists, 1997–2001

	Collisions					Percent Change	
	1997	1998	1999	2000	2001	2000–2001	1997–2001
Collisions Involving Pedestrians							
Injury Collisions	3,371	3,258	3,099	3,173	3,080	-3%	-9%
Fatal Collisions	133	125	97	134	103	-23%	-23%
Subtotal	3,504	3,383	3,196	3,307	3,183	-4%	-9%
Collisions Involving Bicyclists							
Injury Collisions	2,884	3,004	3,066	2,810	2,566	-9%	-11%
Fatal Collisions	20	18	19	17	20	+18%	0%
Subtotal	2,904	3,022	3,085	2,827	2,586	-9%	-11%
Total Involving Bicyclists Or Pedestrians	**6,408**	**6,405**	**6,281**	**6,134**	**5,769**	**-6%**	**-10%**

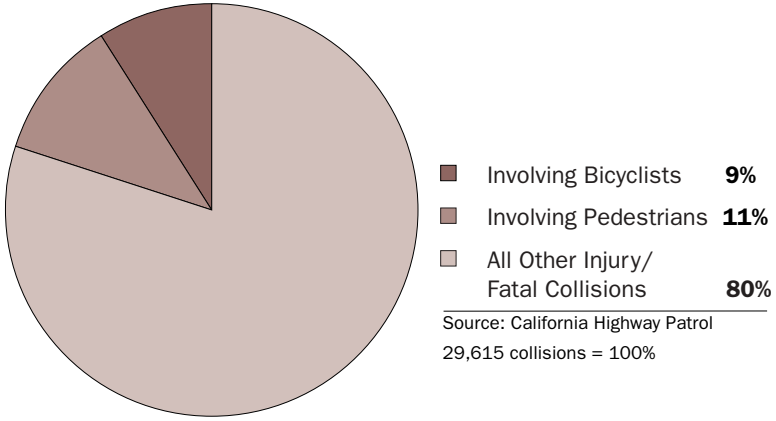


Source: California Highway Patrol

Fatal collisions involving bicyclists are very small in absolute terms, and the figures showing percentage change should also be viewed in this context.

It should be noted that the statistics presented here include only motor vehicle collisions that are reported to law enforcement authorities. Collisions involving pedestrians and bicyclists that are not reported could be significant in number and would make these totals higher.

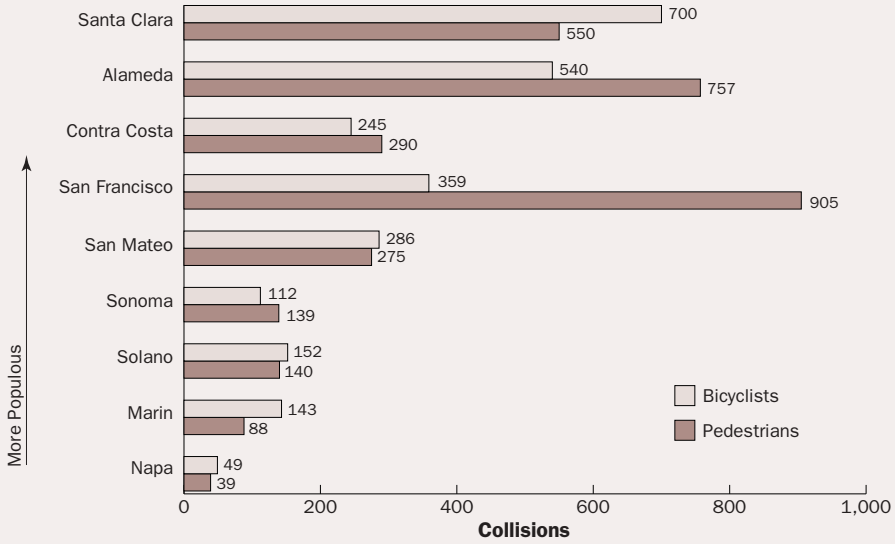
Injury and Fatal Motor Vehicle Collisions Involving Pedestrians And Bicyclists on Non-Freeway Roads in the Bay Area, 2001



Source: California Highway Patrol
29,615 collisions = 100%

A Closer Look – Areas where lots of people walk or bike are likely to have greater numbers of collisions involving pedestrians and bicyclists. In the absence of better data on the amount of bicycling and walking in the Bay Area, we can look for patterns based on population by county. Notable in the bar graphs at right are the high number of pedestrian injuries and fatalities in San Francisco. Here, large numbers of residents and downtown workers walk to their destinations because this is often the quickest and most convenient means of transportation.

Injury and Fatal Motor Vehicle Collisions Involving Pedestrians Or Bicyclists by Bay Area County, 2001



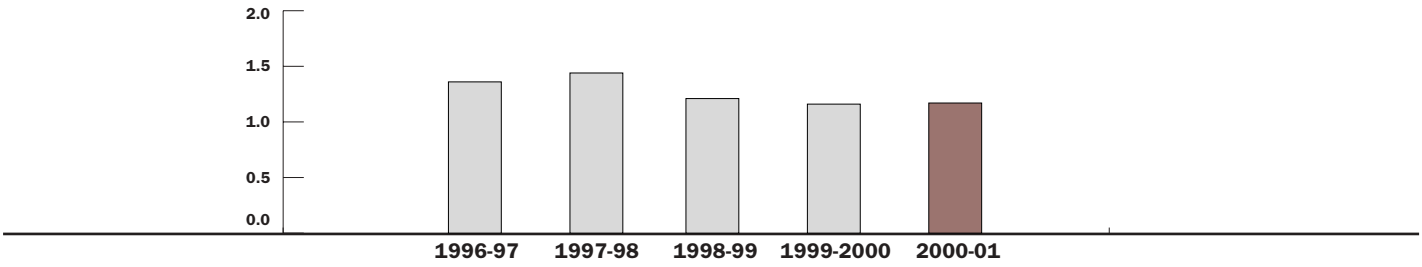
Source: California Highway Patrol
Note: See page 31 for county populations

Key Transit Safety Measure Improves and Holds Steady

The number of injuries or fatalities involving transit vehicles in the Bay Area fluctuated within a narrow range over the most recent five-year period, even as the number of miles traveled on transit rose steadily. The result was a noticeable improvement in the per-mile safety record of Bay Area transit operators in the fiscal year 1996-97 to 2000-01 time frame covered by this report (see table and graph below). This trend has held steady over the last couple of years, despite a slight increase in the total number of injury-or-fatality incidents. In 2000-01, for instance, the number of injuries and fatalities increased by 185, or 6 percent. But because the total number of miles traveled by passengers also increased (by 5 percent) the rate of injuries and fatalities increased only minimally (to 1.17 injuries/fatalities per million passenger miles, up from 1.16 in fiscal year 1999-2000).

Rate of Injuries and Fatalities on Bay Area Transit, Fiscal Years 1996-97–2000-01

						Percent Change	
	1996-97	1997-98	1998-99	1999-2000	2000-01	FY 1999-2000–2000-01	FY 1996-1997–2000-01
Injuries	3,164	3,455	3,014	3,057	3,240	+6%	+2%
Fatalities	15	20	21	31	33	+6%	+120%
Total Injuries and Fatalities	**3,179**	**3,475**	**3,035**	**3,088**	**3,273**	**+6%**	**+3%**
Passenger Miles (Millions)	2,331	2,416	2,509	2,670	2,807	+5%	+20%
Rate of Injuries and Fatalities Per Million Passenger Miles	**1.36**	**1.44**	**1.21**	**1.16**	**1.17**	**+1%**	**-14%**



Source: Federal Transit Administration

However, the increasing number of fatalities involving Bay Area transit vehicles stands out in sharp relief (although the numbers are relatively small considering the size of the regional transit system). Included in this category are deaths on rail tracks judged to be suicides, and there have been a number of these incidents in the Bay Area in recent years.

The statistics reported in this section reflect injuries and fatalities resulting from a wide range of safety incidents – from people who slip and fall while boarding a bus to those injured or killed in collisions with transit vehicles. Included in the statistics are incidents involving transit passengers, employees and others.

State of Repair

The state of repair of freeways, local roadways and transit affects travelers in two respects. The more obvious impact is on the quality of travel. The second impact relates to cost: Letting roadways and transit vehicles fall into disrepair often ends up costing more than it would have cost to perform routine maintenance, just as deferring maintenance on a house often results in a more expensive repair.

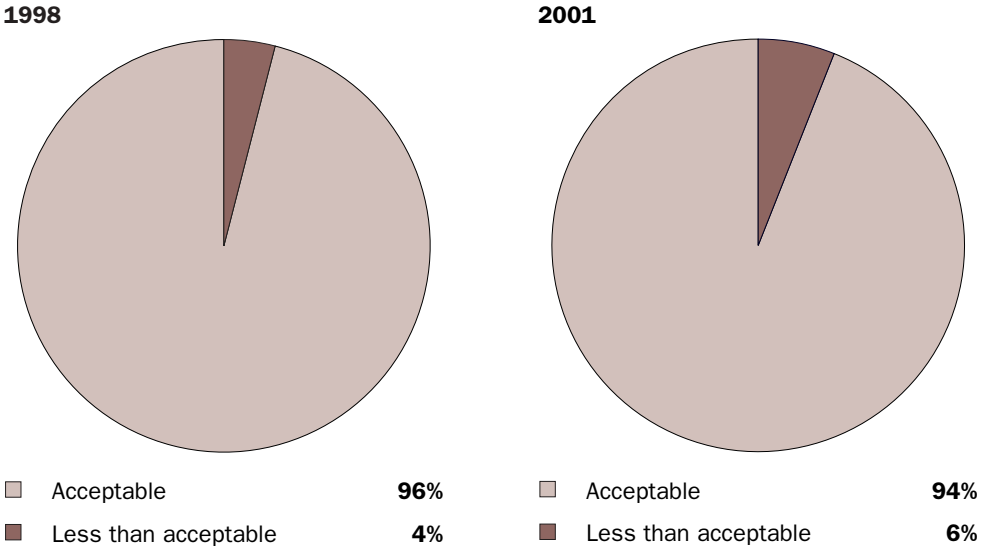
For freeways and local roadways, pavement condition is used as an indication of the state of repair. The condition of the transit system is measured by the number of times service is interrupted for repairs to vehicles or other systems such as tracks or power supply; these unscheduled repairs are known as service calls.

Measure of Freeway Smoothness Slips Slightly From 1998 to 2001

Heavy use of Bay Area freeways has a clear and immediate consequence in the form of increased congestion. One less obvious, somewhat longer-term consequence of heavy freeway use is increased wear and tear on the pavement surfaces themselves. As the agency responsible for maintaining freeways and state highways in the region, Caltrans keeps close watch on what drivers experience when the rubber literally hits the road on Bay Area freeways.

In its most recent measurement, taken at the beginning of 2001, Caltrans found pavement conditions to be acceptable (or better) on the vast majority (94 percent) of Bay

Pavement Condition of Bay Area Freeways, 1998 and 2001



Source: Caltrans District 4

Assessment based on the International Roughness Index

100% = 607 miles

Area freeway miles. This represents a slight decline in conditions since 1998, when 96 percent of freeway pavement merited an acceptable rating.

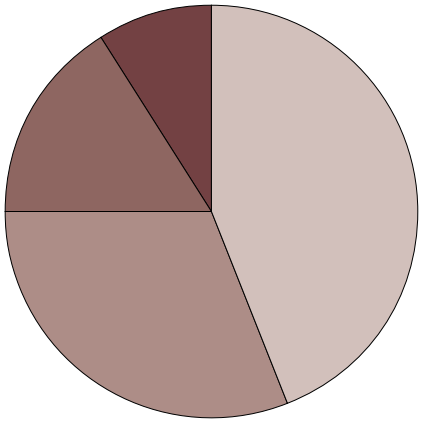
To assess freeway pavement condition, Caltrans deploys roving vehicles equipped with special devices that measure vibrations caused by the road surface. The difference between the vibrations measured on a given stretch of road and the level of vibration that would be experienced on an "ideal" or smooth road is expressed numerically using the International Roughness Index. (See note on page 55 for further discussion of International Roughness Index.)

Region's Roads Rated "Good" Overall, but Conditions Vary by Jurisdiction

While it's the rib-rattling, pothole-laden roads that seem to garner the most attention around the region, the reality is that, on average, the Bay Area's 19,000 miles of local roadways are in fairly good condition. Measured against a "pavement condition index" (PCI) used by MTC's Pavement Management System, the Bay Area's local roadways scored 66 out of a possible 100 in a 2001 survey — the most extensive assessment of pavement conditions ever undertaken in the region. Under the PCI rating system, a score of 66 indicates "good" pavement conditions (see rating scale and pie chart below).

Of course, as an average, the region's score masks a considerable amount of variation in pavement conditions on individual roads. Of all local roads, 44 percent were found to be in very good or excellent condition with only minor or no distresses (see pie chart). Such roads

Pavement Condition of Local Bay Area Roadways, 2001



Excellent (PCI = 90–100) or Very Good (PCI = 75–89) Pavements that have no distress and require mostly preventive maintenance.	**44%**
Good (PCI = 60–74) or Fair (PCI = 45–59) Pavements in this middle range offer acceptable ride quality, though road surfaces are becoming worn to the point where rehabilitation is needed to prevent rapid deterioration.	**31%**
Poor (PCI = 25–44) or Very Poor (PCI = 0–24) Pavements that have extensive amounts of distress and require major rehabilitation or reconstruction.	**16%**
No Data	**9%**

Source: Metropolitan Transportation Commission

92 cities and nine counties reporting

PCI = pavement condition index, a measure of pavement distress

require preventive maintenance only. Pavements in good or fair condition — 31 percent of local road mileage — require some rehabilitation but are still drivable. The 16 percent of local roadways found to be in poor or very poor condition are in need of extensive rehabilitation or reconstruction. Pavements in this category may be difficult to drive on.

Shown below is a list of the Bay Area jurisdictions with the best and worst pavement conditions, based on the most recent survey data. A complete listing of all 101 jurisdictions (out of 109 in the region) surveyed may be found in Appendix C. Where applicable, individual scores from a pavement-condition survey conducted for MTC in 1997 are also displayed. Only 39 jurisdictions participated in this earlier survey.

In contrast to the direct measure of ride quality used by Caltrans to assess freeway pavement condition (see page 39), the MTC Pavement Management System used by most Bay Area jurisdictions measures visible pavement distresses, such as cracking or patching. Pavement condition scores are assigned to roadway segments and cost-effective repair schedules are generated.

A Closer Look – The Bay Area jurisdictions with the best and worst average pavement conditions are shown to the right. Often a jurisdiction's low average pavement condition rating is the result of a roadway maintenance budget that is insufficient to cover a backlog of needs.

Bay Area Jurisdictions With Best and Worst Pavement Condition, 2001

Best	Pavement Condition Index (out of 100)
1. Belvedere	86
Los Altos	86
3. Brentwood	85
4. Oakley	84
5. Windsor	81
6. Contra Costa County (unincorporated)	80
Santa Clara (city)	80
8. Alameda County (unincorporated)	79
American Canyon	79
Cupertino	79
Danville	79
Pleasant Hill	79

Worst	Pavement Condition Index (out of 100)
92. Calistoga	54
El Cerrito	54
Richmond	54
95. Larkspur	53
Napa	53
San Mateo County (unincorporated)	53
98. Petaluma	51
99. Sonoma County (unincorporated)	46
100. Fairfax	45
101. Half Moon Bay	43

Source: Metropolitan Transportation Commission

101 (of 109) jurisdictions reporting

Pavement Condition Index of 100 = Excellent

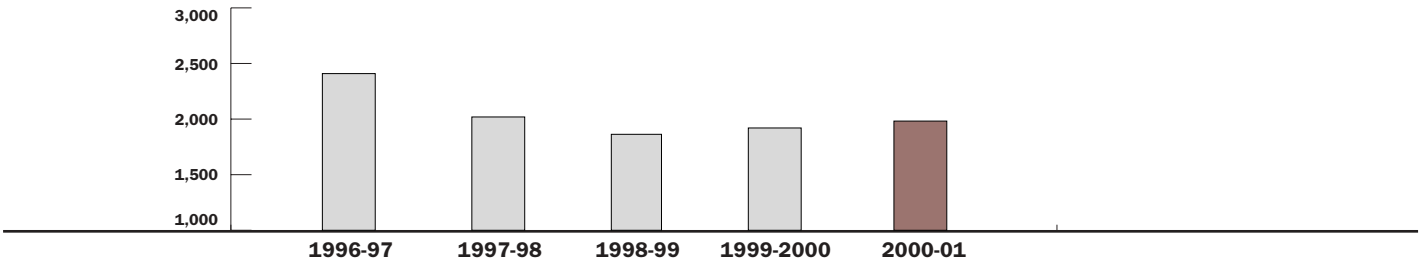
Emergency Repair Rate for Transit Vehicles Up Slightly in 2000-01; Four-year Figures Still Show Improvement

The mobile mechanics who ride to the rescue of stranded Bay Area buses and trains were a little busier in fiscal year 2000-01 than they had been in the 12 months preceding, according to statistics from the Federal Transit Administration. In fiscal year 2000-01, the Bay Area's seven largest bus and rail operators responded to calls for service 1,982 times for every million miles of service provided, an increase of 3 percent over year-earlier levels. Despite the recent uptick, however, the rate of service calls logged by the region's major transit operators has declined by 18 percent in the four years since fiscal year 1996-97.

The improvement is due in part to regional-level funding decisions on the part of MTC that give a high priority to the replacement and rehabilitation of worn-out rail vehicles and buses. (The service-call rate tends to be correlated with both the maintenance practices of individual transit

Service Calls — Major Bay Area Transit Operators, Fiscal Years 1996-97–2000-01

	Service Calls per Million Miles of Transit Service					Percent Change	
	1996-97	1997-98	1998-99	1999-2000	2000-01	FY 1999-2000 – 2000-01	FY 1996-97– 2000-01
Bus[1]	1,505	1,303	1,302	1,347	1,330	-1%	-12%
Rail[2]	904	716	562	573	652	+14%	-28%
Total	**2,409**	**2,019**	**1,864**	**1,920**	**1,982**	**+3%**	**-18%**



Source: Federal Transit Administration

[1]Includes AC Transit, SamTrans, Muni, Valley Transportation Authority (VTA), Golden Gate Transit

[2]Includes Caltrain, BART, Muni light rail, VTA light rail; data not available for Caltrain in fiscal year 1996-97

operators and the age of the equipment in their fleets.) During the period presented here, Muni replaced most of its old light-rail vehicles (which had been experiencing reliability problems) with new ones, and Golden Gate Transit and AC Transit replaced a substantial number of buses.

The number of service calls per million miles of service provided is a good general indicator of the condition of the transit system. A service call is defined as any time service is interrupted in order to repair a vehicle or other key facet of the transit delivery system, such as a switching device or power supply for a rail line. Like private automobiles, transit vehicles and systems tend to need more frequent repairs as they age.

Airports and Seaports

The Bay Area has three major airports (San Francisco International Airport, Oakland International Airport and San Jose International Airport) and five major seaports (San Francisco, Oakland, Redwood City, Benicia and Richmond). Airports and seaports are included in this report because they serve as regional gateways and generate considerable ground traffic by cars, trucks and rail. Statistics on air passengers and air and marine cargo are presented to track changes in traffic generated by airports and seaports.

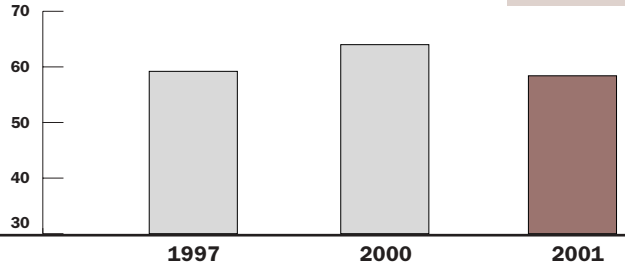
Losing Altitude: Air Travel and Cargo Drop Below 1997 Levels

The combined impact of a slowing economy and the September 11, 2001 terrorist attacks reversed a steady growth trend in the numbers of passengers and tons of cargo handled by Bay Area airports. This heavy one-two punch not only knocked 2001 passenger and air cargo totals off their 2000 highs, it caused volumes to drop below 1997 levels. And whether measured in numbers of airline travelers or tons of airborne goods, San Francisco International Airport bore the brunt of the falloff in air traffic.

In 2001, 58.5 million passengers passed through the region's three international airports, 5.5 million fewer than in 2000 and 700,000 fewer than in 1997 (see table and graph below). These figures represent declines of 9 percent and 1 percent, respectively. A closer look at the data reveals that declining volumes at the region's busiest airport, San Francisco International, account for the entire falloff in passenger traffic. By contrast, traffic into and out of Oakland and San Jose increased by healthy margins

Air Passengers at Bay Area Airports, 1997, 2000 and 2001

	Millions of Passengers[1]			Percent Change	
Airport	**1997**	**2000**	**2001**	**2000–2001**	**1997–2001**
San Jose	10.2	13.1	13.1	0%	+28%
Oakland	9.1	10.6	11.4	+8%	+25%
San Francisco	39.9	40.3	33.9	-16%	-15%
Total	**59.2**	**64.0**	**58.4**	**-9%**	**-1%**



Sources: Port of Oakland, San Jose International Airport, San Francisco International Airport

[1]Measured by enplanements and deplanements.

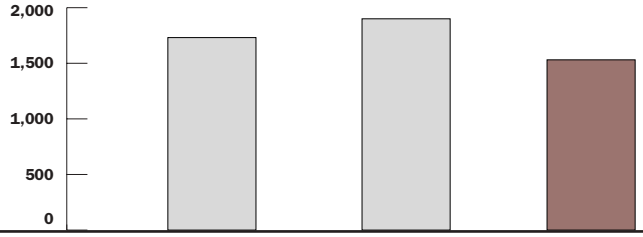
Data for 1998 and 1999 not available.

during the 1997–2001 period. And though 2001 was a flat year for San Jose, passenger traffic at Oakland International continued to rise despite the stalled economy and the trauma of September 11. One possible reason that Oakland was not as greatly affected as the other two airports is the strong presence there of Southwest Airlines, which (unlike most other airlines) did not cut back on flights after the terrorist incidents.

In percentage terms, the falloff in air cargo tonnage was even more dramatic than the decrease in passenger traffic, both for the one-year and four-year periods. The roughly 1.5 million tons of cargo that arrived in or departed the region by air in 2001 represented a 19 percent drop from the prior year, and a 12 percent decline since 1997 (see table and graph below). Again, San Francisco International witnessed the greatest reductions in traffic, but Oakland suffered significant declines as well. San Jose International experienced a modest dropoff in tonnage in 2001, but growth from 1997 to 2000 had been so robust that this smallest of the Bay Area's air cargo centers still posted a 29 percent increase in tonnage for the 1997–2001 period.

Air Cargo at Bay Area Airports, 1997, 2000 and 2001

	Thousands of Tons of Cargo[1]			Percent Change	
Airport	**1997**	**2000**	**2001**	**2000–2001**	**1997–2001**
San Jose	123	163	159	-2%	+29%
Oakland	748	775	671	-13%	-10%
San Francisco	860	962	701	-27%	-18%
Total	**1,731**	**1,900**	**1,531**	**-19%**	**-12%**



Sources: Port of Oakland, San Jose International Airport, San Francisco International Airport

[1]One ton = 2,000 pounds

Data for 1998 and 1999 not available.

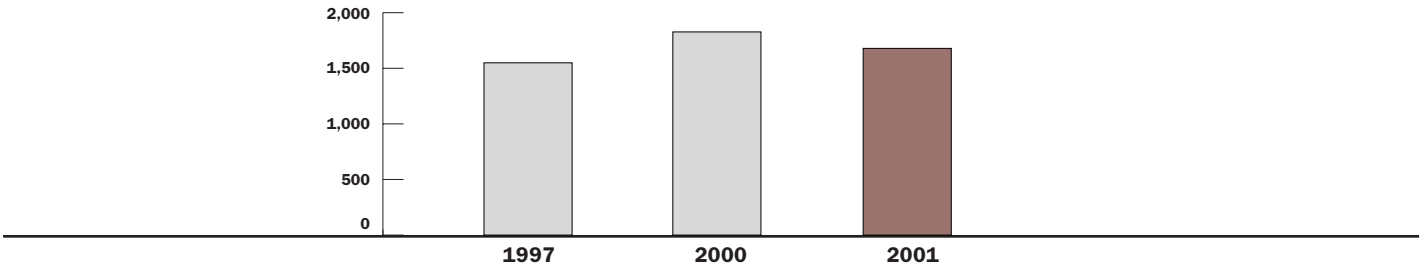
Container Cargo Activity Slows With Economy; Bulk Freight Bucks Trend

The Bay Area's ocean-going trade with the rest of the world suffered a setback in 2001, as the slowing economy took its toll on the number of containers moving through the ports of Oakland and San Francisco. As measured by the industry-standard "twenty-foot equivalent units" (TEUs), the volume of container cargo decreased 8 percent from 2000 levels (see table and graph below). But strong growth during the economic boom years of the late '90s resulted in an overall 8 percent increase in container shipments in the 1997–2001 time frame. Freight shipped in containers tends to be high-value manufactured products (such as computers, electronics and auto parts). Container cargo operations are concentrated almost exclusively at the Port of Oakland – by far the largest Bay Area port – though the Port of San Francisco also has container facilities.

The situation in the bulk freight cargo sector (mainly

Container Marine Cargo at Bay Area Seaports 1997, 2000 and 2001

	Thousands of TEU[1] Containers			Percent Change	
Port	**1997**	**2000**	**2001**	**2000–2001**	**1997–2001**
Oakland	1,531	1,777	1,644	-7%	+7%
San Francisco	18	50	35	-30%	+94%
Total	**1,549**	**1,827**	**1,679**	**-8%**	**+8%**



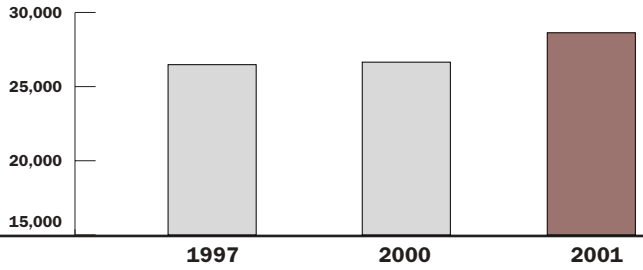
Sources: Ports of Benicia, Oakland, Redwood City, Richmond, San Francisco

[1]TEU = Twenty-foot equivalent containers

petroleum products, sand, cement and wood products) did not so closely track general economic conditions. While bulk freight shipments also grew by 8 percent over the four-year time period, most of this growth was recorded in 2001, when container volumes were shrinking. In that economically difficult year, bulk cargo tonnage actually grew by 7 percent. By contrast, bulk volumes were flat in the 1997–2000 period. The table below shows growth at the Port of Redwood City, where new cement-processing facilities were brought online, and at the Port of San Francisco, where domestic sand activity was reflected in annual tonnage figures for the first time. The Bay Area's largest bulk freight port, Richmond, is the gateway for most of the region's imported oil and gasoline. It, too, saw volume increase in 2001.

Bulk Marine Cargo at Bay Area Seaports 1997, 2000 and 2001

	Thousands of Tons of Bulk Cargo			Percent Change	
Port	**1997**	**2000**	**2001**	**2000–2001**	**1997–2001**
Benicia[1]	410	405	497	+23%	+21%
Oakland	2,318	1,861	1,901	+2%	-18%
Redwood City[2]	632	900	1,124	+25%	+78%
Richmond	23,012	22,541	24,185	+7%	+5%
San Francisco	107	942	925	-2%	+764%
Total	**26,479**	**26,649**	**28,632**	**+7%**	**+8%**



Sources: Ports of Benicia, Oakland, Redwood City, Richmond, San Francisco

[1]Benicia 1997 data does not include fuel/oil

[2]Redwood City 1997 data is for fiscal year 1996-97

Appendix A:
Notes on Data Collection

NOTES ON DATA COLLECTION

This first compendium of key data on the state of the Bay Area transportation system is intended to provide the best snapshot possible, given existing information collected by Bay Area transportation agencies. Because the data have been gathered by multiple sources, responding to varying requirements, differences exist with respect to methodology, frequency, time period covered, level of detail and other variables. Following are some general comments, plus specific discussions of data by category.

Time Period Covered

Most data is collected and reported by *calendar year* (January 1 to December 31). Transit data is collected and reported by *state fiscal year* (July 1 to June 30), as is the custom for accounting purposes. Truck counts on freeways and state highways are collected by *federal fiscal year* (October 1 to September 30) because federal roadway funding is based, in part, on traffic counts.

Every effort was made to assemble consistent data for 1997 through 2001 (or, for data collected by fiscal year, 1996-97 through 2000-01). In some cases, this simply was not possible because data was not collected or analyzed for some years. For example, local roadway pavement conditions were available for 1998 and 2001 only; the latest truck counts available at the time of publication were for 2000.

Future Data Collection

In the future, the authors expect to collect supplemental data to fill gaps in the existing data. For example, traffic volumes on local roadways are not included in this report. While individual cities and counties collect traffic counts for various purposes, there is little consistency among jurisdictions in the timing or location of data collection. As a result, it is extremely difficult to aggregate the data and summarize it at the regional level. MTC intends to collect traffic volumes on a selected set of local roadways for inclusion in future reports.

Additionally, emerging technologies promise to make more complete data available in the future. Some of the techniques used to gather data for this report are extremely labor-intensive, and therefore costly. For example, Caltrans employees drive specially equipped vehicles to collect data on freeway congestion, and transit operators hire people to wait at bus terminals to record on-time performance. Often, agencies can afford to collect data just a few, "typical" days a year due to the high costs of these manual data collection methods.

Examples of emerging data collection technologies that are expected to improve data in future reports include the following.

- Sensors in the freeway pavement and on the roadside will continuously count vehicles and monitor travel speeds on freeways. Whereas traffic counts now are taken just a few days a year, this automated data would be available for a given location 24 hours a day, 365 days a year, giving us a much more accurate understanding of roadway conditions. This information will be sent to Caltrans' Traffic Management Center, in Oakland, where it will be used to manage freeway traffic flow, provided to travelers seeking information on the system, and archived for use in reports such as this one.

- Additional sensors will use FasTrak™ electronic toll tags installed in autos and trucks to monitor the time it takes vehicles to travel between fixed points on the freeway, 24 hours a day, 365 days a year.

- "Smart" traffic signal systems will continuously count vehicles on local roadways. These systems will be deployed on only a small subset of streets in the near future, however, so most traffic counts on local roadways will continue to be done by traditional methods.

- Transit fleet management systems will track the times that buses and trains arrive and depart transit stops. By comparing these times to transit schedules, the systems will generate more complete on-time performance statistics.

Data Collection Techniques Used for This Report

Mobility: Getting Around the Bay Area

Freeway Congestion (pages 8-11)

The measure used to indicate congestion is daily vehicle hours of delay. Delay occurs when the average speed falls below 35 miles per hour for 15 minutes or more. Caltrans District 4 has collected this data every year since 1981 (except for 1985 and 1997, when budget limitations forced the district to forgo the program). Caltrans employees drive specially equipped vehicles on the freeway system during morning and evening commute hours to collect information on average travel speeds and travel times, which is then used to calculate daily delay. Data is collected on Tuesdays, Wednesdays and Thursdays during the spring and fall of each year. Complete freeway congestion data for the Bay Area is published by Caltrans in the report series *Bay Area Freeway Congestion Data*.

Selected Freeway Commute Times (pages 12-13)

It is possible to calculate the driving time between two locations from the data Caltrans District 4 collects to monitor freeway congestion (see above). Because data is available for freeway travel only, the reported commute times do not account for the time it takes to drive from one's home to the freeway or from the freeway to one's workplace. The driving times included in this report were calculated based on an 8:30 a.m. arrival at the destination city.

Freeway Traffic Volumes (pages 14-15)

The annual average daily traffic volume is the number of vehicles that pass by a given freeway location during the course of a year, divided by 365. The traffic volumes included in this report are for locations with permanent count stations. Only a small number of locations have permanent counters that provide data on a continuous basis from year to year. Caltrans collects traffic counts at other freeway and state highway locations with electronic instruments that are moved from location to location throughout the state on a seven-year cycle. Locations with these cyclic traffic counts were omitted from this report because the data does not show year-to-year trends. The complete database of traffic volumes throughout the state is available on the Caltrans Web site at www.dot.ca.gov/hq/traffops/saferesr/trafdata/.

Bridge Traffic Volumes (page 14)

The Bay Area Toll Authority, which has administered the first dollar of the $2 toll on state-owned bridges since 1998, tracks the number of vehicles crossing each of the seven state-owned bridges. Traffic counts reflect vehicle crossings in the tolled direction for accounting purposes. The Golden Gate Bridge, Highway and Transportation District tracks this number for the Golden Gate Bridge. The average daily traffic for each bridge is the total annual traffic divided by 365 days. Due to time limitations, this data was assembled for 1999 through 2001 only. Data on traffic and revenue for the seven state-owned bridges is available on the Bay Area Toll Authority Web site at www.mtc.ca.gov/bata/tolls.htm. Data on traffic and revenue for the Golden Gate Bridge is available on the Web at www.goldengatebridge.org/research/GGBTraffToll.html.

Truck Traffic (pages 16-17)

Annual average daily truck traffic is the total number of trucks that pass by a given location in a year, divided by 365 days. Annual average truck volumes are calculated for the federal fiscal year, which runs from October 1 to September 30. Caltrans conducts truck counting throughout the state in a program of continuous sampling on a six-year cycle. Certain locations with truck weigh stations, including one Bay Area location, are monitored continuously. At the time of this report, data for fiscal year 1999-2000 was the most current data available. The most current data on truck volumes throughout the state is available on the Caltrans Web site at www.dot.ca.gov/hq/traffops/saferesr/trafdata/. This information also is published annually by Caltrans in the report series *Annual Average Daily Truck Traffic on the California State Highway System*.

Carpool Lanes — Time Savings and Usage (pages 18-21)

Caltrans District 4 collects data on carpool lane usage and travel-time savings annually. Data on lane usage is compiled from direct observations by people situated on the side of the freeway adjacent to the carpool lanes. Travel-time savings are computed by comparing travel time in the carpool lane with that in the adjacent mixed-flow lanes during the peak morning and evening commute hours. For carpool lanes that are not congested, travel time is based on the speed limit on the freeway. For carpool lanes that are congested, Caltrans drives specially equipped "floating cars" to record travel time and speed. The same "floating car" technique is used to measure the travel time in adjacent mixed-flow lanes. Caltrans District 4 publishes a report annually with complete data

on carpool lane usage and travel-time savings. The report also includes detailed information on the hours of operation, number of people using the carpool lane compared to adjacent general purpose lanes, and violation rates.

Local Traffic (pages 22-23)

Under state law, county congestion management agencies are charged with monitoring congestion on local roadways. Two Bay Area counties, Sonoma County and Napa County, have exercised an option in the law to opt out of this requirement. The remaining seven counties monitor congestion on local roadways and publish the results at least every two years in a county congestion monitoring report. Most counties report in odd years; however, Alameda and Contra Costa county report in even years. Thus, the most recent data available for those counties was for 2000 rather than 2001.

The congestion management agencies measure local roadway congestion by calculating the "level of service" on a selected set of high priority roads during peak commute periods. Level of service describes traffic conditions based on speed and travel time, volume and capacity, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. Level of service is expressed in grades from A through F, with level of service A representing the best operating conditions and level of service F the worst. At level of service A, B and C, traffic flow is stable and delay is minimal. This report characterizes these conditions as "uncongested." At level of service D and E, traffic flow becomes unstable, conditions characterized in this report as "moderately congested." At level of service F, traffic is stop and go, characterized in this report as "severely congested."

The level of service grade is assigned based on the delay experienced by vehicles traveling through major intersections or on average travel speeds over selected segments of local roadways. It is noteworthy that the procedures for monitoring local roadway level of service are established on a county-by-county basis. As a result, it is more appropriate to compare the results for each county from year to year than it is to compare results across different counties. Links to congestion management agencies for counties in the Bay Area may be found on the MTC Web site at www.mtc.ca.gov/links/lkindex.htm.

Transit On-Time Performance (pages 24-25)

Transit operators monitor on-time performance as a measure of the quality of the service they provide. Like most data on transit operations, on-time performance is reported by fiscal year. Data is usually collected by persons who record the arrival time of individual transit vehicles at key stops. (BART's central computer system automates collection of on-time performance data.) On-time performance data is used by operators primarily as an internal management tool. When deteriorating on-time performance can be traced back to increasing roadway congestion, the data may be used to develop more realistic, revised schedules. San Francisco Muni publishes on-time performance data in its quarterly performance reports as required under Proposition E, passed by San Francisco voters in 1999.

Transit Ridership (pages 26-27)

This report uses transit boardings as a measure of ridership. A boarding refers to each time a passenger enters a transit vehicle or train station. One person may board multiple vehicles to complete a trip. Methods used to collect this ridership data include tracking transit fare receipts and hiring people to count passenger boardings. Transit operators report ridership for each fiscal year to the Federal Transit Administration for inclusion in the National Transit Database. MTC summarizes transit ridership and other operating statistics for Bay Area operators in its annual report, *Statistical Summary of Bay Area Transit Operators*, which covers a rolling five-year period.

Safety

Motor Vehicle Collisions and Motor Vehicle Collisions Involving Pedestrians or Cyclists (pages 30-33)

The California Highway Patrol maintains the most complete data on motor vehicle collisions, including those that involve pedestrians or cyclists. The database, called Statewide Integrated Traffic Records System, includes all collisions reported to local law enforcement as well as the Highway Patrol. The Highway Patrol publishes the series *Annual Report of Fatal and Injury Motor Vehicle Traffic Collisions*, which includes summary statistics by county and for the entire state. Data at a less aggregated level can be requested from the California Highway Patrol.

Transit Safety Statistics (pages 34-35)

This report uses the number of injuries and fatalities involving transit as a measure of transit safety. The statistics represent a wide range of incidents ranging from people who slip and fall while boarding a bus to those injured or killed in collisions with transit vehicles. The statistics include patrons, employees and other

individuals if they are injured or killed on transit property or by transit vehicles. Transit operators report injuries and fatalities to the Federal Transit Administration as part of the National Transit Database project. The National Transit Database also includes statistics on system security (robberies or vehicle thefts, for example). Security statistics for Bay Area transit operators may be included in future reports. Data on individual Bay Area transit operators and national statistics are available on the Web at www.ntdprogram.com/.

State of Repair

Freeway Pavement Conditions (pages 38-39)

The condition of freeway pavement is measured in terms of the International Roughness Index (IRI), an indicator of ride comfort. Caltrans surveys pavement condition using roving vehicles that measure the deviation from a smooth surface in inches per mile. A lower IRI indicates less deviation from a smooth surface, or better ride quality.

For the most rigid pavement surfaces — slabs of pavement connected by joints — IRI ratings of 212 or less are considered acceptable by Caltrans. For seamless-style pavement surfaces, IRI ratings of 224 or less fall within the acceptable range.

Local Roadway Pavement Conditions (pages 40-41)

Most Bay Area jurisdictions use MTC's Pavement Management System, or an equivalent system, to track conditions of streets and roads and develop cost-effective repair schedules. MTC's Pavement Management System measures pavement conditions according to a pavement condition index (PCI) that ranges from 0 to 100, where 100 is the best possible score. Surveyors record the type and severity of pavement distresses such as cracking, weathering and patching through physical inspections. This information is then entered into the Pavement Management System to calculate the PCI.

MTC staff periodically summarizes information on pavement conditions provided by local jurisdictions. MTC hopes to be able to update the pavement condition summary every two years. The characterization of pavement conditions in 2001 is based on the most recent data submitted to MTC by local jurisdictions. For those jurisdictions that had their last inspections done in 2001, the PCI scores were considered current. For those jurisdictions that had inspections done in previous years, MTC staff used Pavement Management System software to project PCI scores forward to 2001.

Transit Service Calls (pages 42-43)

A service call occurs any time transit service is disrupted due to the need to repair a vehicle or other system component, such as a switching line or power supply. Transit operators report total service calls to the Federal Transit Administration as part of the National Transit Database. Operators also report the miles of service provided annually (annual revenue service miles) as part of the National Transit Database. MTC used these data to calculate the total number of service calls per million miles of service provided by the seven largest bus and rail operators.

Airports and Seaports

Airports - Passenger and Cargo Volumes (pages 46-47)

Statistics on airport passengers are based on information supplied to the airports from the airline carriers' computer reservation systems. These numbers are in turn used to collect landing fees from the carriers and for planning efforts at the airports. Statistics on air cargo are reported by private carriers to the airports. Private carriers (e.g., Federal Express, UPS) submit tonnage reports to the airports for planning and billing purposes. Due to limited time, these data were assembled for 1997, 2000 and 2001 only. In the future, data will be assembled and analyzed for all years covered in the report.

Seaports - Marine Cargo Volumes (pages 48-49)

Private operators at the ports collect data on marine cargo. For bulk goods, tonnage is tracked and used by the ports to collect fees. For containers, fees are paid to the port based on the contents of the containers and the number of total containers is tracked for planning purposes. Due to limited time, these data were assembled for 1997, 2000 and 2001 only. In the future, data will be assembled and analyzed for all years covered in the report.

Appendix B:
Congested Freeway Locations – Morning and Evening Commutes, 2001

Morning Peak-Period Congested Locations, 2001 (Ordered by County and Route)

COUNTY	ROUTE	DIR.	DELAY (vehicle hours)	DURATION (AM)	LOCATION
ALA	24	E	1,270	6:30-9:45	Route 13 to Caldecott Tunnel
ALA	24	W	400	7:05-9:20	At Telegraph Avenue
ALA/CC	80	W	9,410	5:45-9:30	Route 4 to Bay Bridge metering lights
ALA	84	S	2,860	5:30-9:50	Newark to Dumbarton Bridge toll plaza
ALA	92	W	1,910	6:00-10:00	Clawiter to San Mateo-Hawyard Bridge toll plaza
ALA	238	N	290	5:45-9:05	I-580 to East 14th Street
ALA/CC	580	E	50	7:55-9:10	Central Avenue to I-80
ALA	580	W	540	6:00-7:45	At North Flynn
ALA	580	W	2,745	6:15-9:30	Vasco Road to Airway
ALA	580	W	175	6:45-9:15	At El Charro
ALA	580	W	250	7:10-9:30	Redwood Road to Route 238
ALA	580	W	150	7:35-8:55	Coolidge to Fruitvale and at Park Boulevard
ALA	580	W	800	6:00-9:10	Route 24 to I-80
ALA	680	N	130	7:50-9:00	At I-580 and at Alcosta Boulevard
ALA	680	S	8,510	5:55-10:45	At Bernal and Sunol Road to Route 262
ALA	880	N	2,920	5:45-9:35	1 mile north of 7th Street to Bay Bridge
ALA	880	N	690	7:25-9:15	At Fremont and north of Whipple to Route 92
ALA	880	N	160	7:35-8:30	At Route 238
ALA	880	N	200	7:50-9:05	Route 238 to Marina Boulevard
ALA	880	N	280	7:50-9:00	Hegenberger to High Street
ALA	880	S	1,220	6:25-9:00	Hesperian Boulevard to Route 92
ALA	880	S	1,090	6:20-8:55	North of Industrial and Whipple to Decoto Road
ALA	880	S	8,880	6:00-10:45	Thornton to Mowry and Stevenson to north of Dixon Landing
CC	4	W	2,400	5:30-9:00	Hillcrest Avenue to Railroad Avenue
CC	24	W	900	7:20-9:15	St. Stephens to Caldecott Tunnel
CC	24	W	220	7:35-9:05	I-680 to east of Pleasant Hill Road
CC	242	S	400	6:45-8:30	Concord Avenue to I-680
CC	580	W	490	6:25-8:55	Garrard Boulevard to Richmond-San Rafael Bridge toll plaza
CC	680	N	210	7:35-9:10	Sycamore to El Pintado
CC	680	S	2,010	6:55-9:35	Route 24 to Diablo Road
CC	680	S	900	6:35-8:40	Route 242 to Geary Road and at North Main

County abbreviations: ALA=Alameda; CC=Contra Costa; MRN=Marin; SCL=Santa Clara; SF=San Francisco, SM=San Mateo; SOL=Solano; SON=Sonoma

Morning Peak Period Congested Locations, 2001 (continued)

COUNTY	ROUTE	DIR.	DELAY (vehicle hours)	DURATION (AM)	LOCATION
CC	680	S	310	6:35-8:35	At Concord/Contra Costa Boulevard
CC	680	S	840	6:35-8:50	At Benicia-Martinez Bridge toll plaza and north of Arthur Road to Route 4
MRN/SF	101	S	470	6:15-9:30	Sausalito Lateral to County Line
MRN	101	S	100	7:35-9:10	South of I-580 and Lucky Drive
MRN	101	S	3,230	6:30-9:30	Rowland Boulevard to I-580
SCL	17	N	560	7:00-9:15	Hamilton Avenue to Camden Avenue and at I-280
SCL	85	N	290	6:15-9:00	At Bernal Road on-ramp
SCL	85	N	1,040	6:30-9:00	Almaden Expressway to Saratoga Avenue
SCL	85	N	180	7:45-9:00	North of Saratoga Avenue to De Anza Boulevard
SCL	85	N	1,120	6:45-9:45	I-280 to Fremont Avenue and at U.S. 101
SCL	87	N	100	8:45-10:00	Capitol Expressway to Almaden Expressway
SCL	101	N	1,700	5:30-9:30	East Dunne Avenue to Burnett Avenue overcrossing
SCL	101	N	140	7:30-8:45	At Tully Road
SCL	101	N	2,480	7:00-10:00	I-280 to Guadalupe Parkway
SCL	101	N	360	7:45-9:15	Route 237 to Route 85
SCL	101	S	120	8:00-9:00	Route 237 to Lawrence Expressway
SCL	101	S	30	8:15-9:15	At Ellis Street
SCL	237	E	610	7:30-9:30	Route 85 to Mathilda Avenue and at Lawrence Expressway
SCL	237	W	400	6:45-9:15	I-880 to Zanker Road
SCL	280	N	300	7:15-8:45	10th Street to Route 87
SCL	280	N	2,010	6:45-9:15	Southwest Expressway to I-880
SCL	280	N	90	7:30-8:45	Route 85 to 1 mile north of Foothill Expressway
SCL	680	N	490	7:30-9:00	Capitol Expressway to Mckee Road
SCL	680	S	90	7:30-8:00	At U.S. 101
SCL	880	N	770	7:00-10:00	Bascom Avenue to Brokaw Road
SF/ALA	80	W	440	7:40-9:25	At county line and Treasure Island to Fremont Street
SF	80	E	210	7:55-9:10	U.S. 101 to Sterling Street
SF/SM	101	S	300	7:40-9:15	Cesar Chavez to Harney Way
SF	101	N	250	7:15-9:00	Alemany Avenue to Cesar Chavez
SF	101	N	40	7:05-9:25	At I-80
SF/SM	280	N	440	7:10-8:40	Route 1 to San Jose Avenue
SF	280	N	260	7:10-9:35	At U.S. 101 and 6th Street to King Street

Morning Peak Period Congested Locations, 2001 (continued)

COUNTY	ROUTE	DIR.	DELAY (vehicle hours)	DURATION (AM)	LOCATION
SM	92	W	50	8:00-8:45	U.S. 101 to Alameda De Las Pulgas
SM	92	E	100	7:45-8:45	West Hillsdale Boulevard to Route 82
SM/SCL	101	S	1,430	6:45-9:30	Whipple Avenue to Route 85
SM	101	N	150	7:45-9:15	At Marsh Road
SM	101	S	1,550	7:00-10:00	Third Street to East Hillsdale Boulevard
SM	101	S	100	7:30-8:30	San Bruno Avenue to Millbrae Avenue
SM	101	S	190	7:30-9:00	Marina Boulevard to Grand Avenue
SM	101	N	40	8:00-8:30	De Anza to Broadway
SM	280	S	90	7:30-9:05	At Route 1
SM	280	S	420	7:15-9:00	Route 1 to Westborough Avenue
SM	280	S	60	7:30-8:15	At Cañada Road
SOL	37	W	70	7:15-9:00	At Skaggs Island
SOL	37	W	150	6:10-8:55	East of Skaggs Island and west of Mare Island interchange
SOL	80	W	360	6:15-7:45	Solano Avenue to Carquinez Bridge toll plaza
SOL	80	W	340	6:00-7:35	At West Texas Street and Route 12 to Suisun Valley Road
SOL	680	S	50	6:25-7:30	Industrial Way to Benicia-Martinez Bridge toll plaza
SOL	780	E	160	6:10-7:50	East Second Street to Benicia-Martinez Bridge toll plaza
SON	101	S	670	5:30-8:05	North of East Washington Street to north of Kastania Road
SON	101	S	70	7:25-9:05	South of West Serra Avenue to Truck Stop
SON	101	S	570	6:40-10:15	Hopper Avenue to Route 12 and at Hearn Avenue
SON	101	S	180	7:10-8:30	At Shiloh Road and Airport Boulevard to River Road
SON	101	N	440	7:00-9:00	Santa Rosa Avenue to north of College Avenue

Evening Peak-Period Congested Locations, 2001 (Ordered by County and Route)

COUNTY	ROUTE	DIR.	DELAY (vehicle hours)	DURATION (PM)	LOCATION
ALA	24	E	1,780	3:30-6:45	Claremont to Caldecott Tunnel
ALA/SF	80	E	1,410	2:55-6:30	At Sterling Street and at I-580
ALA	80	E	2,500	3:10-6:55	I-580 to Gilman Street
ALA/SF	80	W	1,250	4:55-6:55	Bay Bridge toll plaza to Fifth Street
ALA	84	N	160	3:25-6:15	Newark Boulevard to I-880
ALA	238	N	340	3:00-6:45	I-580 to East 14th Street
ALA	238	S	320	3:45-6:35	I-880 to Route 185
ALA	580	E	1,360	3:35-7:05	Airway Boulevard and Livermore Avenue to west of Route 84
ALA	580	E	5,030	2:55-6:40	Hopyard Road to west of El Charro Road
ALA	580	E	450	4:35-6:45	Route 24 to Coolidge Avenue
ALA	580	W	220	4:00-7:00	Strobridge to Route 238
ALA	680	N	1,370	3:15-6:15	At Scott Creek and at Route 262 to Washington
ALA	880	N	1,350	2:50-8:10	South of Fremont to Auto Mall Parkway
ALA	880	N	390	3:40-6:20	Stevenson and north of Route 84 to Decoto Road
ALA	880	N	2,120	3:00-6:50	Fremont to Tennyson Road
ALA	880	N	410	4:10-7:05	Route 92 to south of Hesperian Boulevard
ALA	880	N	230	3:20-4:55	South of High Street
ALA	880	S	370	3:30-6:05	Tennyson Road
ALA	880	S	120	4:45-6:15	At Hegenberger and at Marina Boulevard
CC	4	E	1,170	3:45-7:00	Route 242 to Port Chicago
CC	4	E	2,000	3:35-7:00	Bay Point to Loveridge Road
CC	4	E	430	3:25-7:20	East of Loveridge Road to “L” Street
CC	24	E	190	3:50-6:00	At Acalanes Road and at I-680
CC	24	W	1,340	3:15-7:30	West of Camino Pablo to Caldecott Tunnel
CC	80	E	580	3:50-6:15	Central Avenue to San Pablo Avenue
CC	80	E	280	4:05-6:10	El Portal Road to Route 4
CC	80	E	350	4:20-6:40	Route 4 to Cummings Skyway
CC	680	N	660	3:45-6:35	North of Bollinger Canyon Road to Sycamore Valley Road and El Cerro Boulevard to El Pintado Road
CC	680	N	500	3:55-6:00	Stone Valley Road to Treat Boulevard
CC	680	N	80	5:05-6:15	Burnett Avenue to Route 4
CC	680	N	1,580	3:20-6:50	Route 4 and Arthur to Benicia-Martinez Bridge toll plaza

County abbreviations: ALA=Alameda; CC=Contra Costa; MRN=Marin; SCL=Santa Clara; SF=San Francisco, SM=San Mateo; SOL=Solano; SON=Sonoma

Evening Peak Period Congested Locations, 2001 (continued)

COUNTY	ROUTE	DIR.	DELAY (vehicle hours)	DURATION (PM)	LOCATION
MRN/SF	101	S	450	3:50-7:00	South of Waldo Tunnel to south of county line
MRN	101	N	1,820	2:50-6:25	Seminary Drive to Mission Avenue
MRN	101	N	940	3:20-6:35	De Long Avenue to north of San Marin Drive
MRN	101	N	260	3:05-6:40	At Sanitary Road
MRN	580	W	660	2:25-6:55	At U.S. 101
SCL	17	S	40	4:45-6:30	North of Lark Avenue
SCL	85	S	100	5:00-6:15	At Route 87
SCL	85	S	630	4:00-7:00	Winchester Boulevard to Camden Avenue
SCL	85	S	470	4:30-7:45	I-280 to Saratoga Avenue
SCL	85	S	830	4:30-7:00	Evelyn Avenue to Fremont Avenue
SCL	87	S	1,820	3:45-7:30	I-280 to Curtner Avenue
SCL	101	S	1,730	3:40-7:45	Bernal Avenue to 1 mile north of Scheller Avenue
SCL	101	S	1,210	4:00-7:15	I-280/680 Interchange to Tully Road
SCL	101	S	4,100	3:00-7:00	Great America Parkway to 13th Street
SCL	101	N	110	5:30-7:00	At Great America Parkway
SCL/SM	101	N	1,550	3:45-7:15	Route 237 to Embarcadero Road
SCL	101	S	1,200	3:45-7:00	Embarcadero Road to Route 85
SCL	237	E	1,600	4:00-7:15	Zanker Road to I-880
SCL	237	W	50	5:15-6:15	Middlefield Road to Route 85
SCL	237	W	200	5:15-6:45	I-880 to Zanker Road
SCL	280	N	90	5:30-6:45	11th Street to Route 87
SCL	280	N	160	5:15-6:15	At I-880
SCL	280	S	900	4:15-6:30	Bascom Road to 11th Street
SCL	280	S	410	4:45-6:30	Lawrence Expressway to Winchester Boulevard
SCL	280	S	30	5:15-6:00	Magdalena Avenue to north of Foothill Expressway
SCL	680	S	200	4:45-6:00	Capitol Avenue to Berryessa Road
SCL	680	N	470	4:00-7:15	Calaveras Road to Scott Creek Road
SCL	880	S	470	5:00-7:00	U.S. 101 to I-280
SCL	880	S	1,610	3:30-7:30	Great Mall Parkway to Brokaw Road
SCL/ALA	880	N	4,000	3:20-7:00	U.S. 101 to Dixon Landing Road
SF	80	E	3,170	3:15-7:00	U.S. 101 to Sterling Street
SF	80	W	30	4:55-6:25	From 5th Street to U.S. 101

Evening Peak Period Congested Locations, 2001 (continued)

COUNTY	ROUTE	DIR.	DELAY (vehicle hours)	DURATION (PM)	LOCATION
SF	101	N	1,880	3:00-5:55	I-280 to I-80
SF	101	N	170	3:55-6:25	I-80 to Fell Street
SF	101	S	140	3:50-6:20	South Van Ness Avenue to I-80
SF	101	S	80	5:20-6:35	I-80 to I-280
SF	280	S	90	5:15-6:15	U.S. 101 to San Jose Avenue
SF	280	S	70	4:35-6:25	At Pennsylvania Avenue
SM	92	W	30	5:30-6:45	U.S. 101 to Alameda De Las Pulgas
SM/ALA	92	E	2,760	2:30-7:00	1.5 miles east of San Mateo-Hayward Bridge to I-880
SM	101	N	650	5:00-7:15	Marsh Road to Woodside Road
SM	101	N	1,740	4:00-7:45	Whipple Avenue to Ralston Avenue
SM	101	N	1,070	4:30-7:15	Route 92 to Third Avenue
SM	101	N	50	5:30-6:30	At Broadway
SM	101	S	460	5:00-6:45	Woodside Avenue to Willow Road
SM	101	S	30	4:00-4:30	North of Broadway
SM	101	N	250	5:15-7:00	E. Grand Avenue to Marina Boulevard
SM	280	N	450	5:30-6:45	Alpine Road to Woodside Road
SM	280	N	220	5:30-7:00	Route 92 to Bunker Hill Drive
SM	280	N	480	5:00-7:00	Crystal Springs Avenue to Westborough Boulevard
SM	380	W	40	5:00-6:00	Route 82 to I-280
SOL	37	E	50	4:35-6:15	At Route 121
SOL	80	E	610	3:15-6:20	Jameson Road (Route 12) to Suisun Valley Road
SOL	80	E	80	5:00-6:05	East of Magellan Road to Travis Boulevard
SOL	680	N	570	3:25-6:35	At I-80
SON	101	N	190	4:05-6:00	At Old Redwood Highway (Penngrove)
SON	101	N	770	2:40-6:30	Santa Rosa Avenue to Baker Avenue
SON	101	N	330	3:55-6:25	Route 12 to Steele Lane
SON	101	S	1,210	2:40-6:35	Hopper Avenue to Route 12

Appendix C:
Pavement Condition of Bay Area Jurisdictions, 2001

Pavement Condition Index (PCI) for Bay Area Jurisdictions

2001 Average PCI	Jurisdiction	1997 PCI
Very Good		
86	Belvedere	NA
86	Los Altos	NA
85	Brentwood	NA
84	Oakley	NA
81	Windsor	NA
80	Contra Costa County (unincorporated)	64
80	City of Santa Clara	79
79	Alameda County (unincorporated)	73
79	American Canyon	NA
79	Cupertino	NA
79	Danville	72
79	Pleasant Hill	NA
78	Concord	NA
78	Pinole	NA
78	Sunnyvale	75
77	Burlingame	NA
77	Mountain View	78
76	City of Alameda	NA
76	Atherton	NA
76	Campbell	60
76	Gilroy	NA
76	Morgan Hill	NA
75	Dixon	66
75	San Ramon	78
Good		
74	Livermore	75
74	Newark	75
74	South San Francisco	NA
74	Vacaville	NA
73	Benicia	71
73	Brisbane	NA
73	Daly City	NA
73	Foster City	77
73	Los Altos Hills	58
73	Piedmont	NA
73	Portola Valley	NA
72	Corte Madera	NA
72	Fairfield	69
72	Fremont	74
72	Hercules	NA
72	Orinda	55
72	Rohnert Park	NA
71[1]	San Rafael	NA
71	Antioch	NA
71	Clayton	NA
71	Milpitas	NA
71	Novato	NA
70	Dublin	NA
70	Emeryville	NA
70	Martinez	NA
70	Santa Rosa	64
70	City of Sonoma	NA
70	Yountville	NA
69	Cotati	NA
69	Pacifica	NA
69	Pittsburg	NA
69	Redwood City	61
69	Suisun City	NA
69	Tiburon	NA
69	Cloverdale	55
68	Hayward	68
68	Pleasanton	70
68	San Carlos	NA
68[2]	City and County of San Francisco	NA
68	Saratoga	NA
67	Colma	NA
67	Hillsborough	NA
67	Menlo Park	53
66	Belmont	NA
66	Berkeley	61
66	Mill Valley	65

Pavement Condition Index (PCI) for Bay Area Jurisdictions (continued)

2001 Average PCI	Jurisdiction	1997 PCI
Good		
65	Healdsburg	NA
65	Los Gatos	NA
65	Ross	NA
65	San Anselmo	NA
64	Albany	NA
64	San Mateo	59
64	Santa Clara County (unincorporated)	65
64	Sebastopol	NA
63	San Leandro	60
61	San Bruno	50
61	St. Helena	NA
61	Woodside	NA
60	Lafayette	NA
60	San Pablo	31
Fair		
59	East Palo Alto	NA
59	San Jose	NA
59	Vallejo	59
57	Marin County (unincorporated)	45
57	Solano County (unincorporated)	NA
56	Sausalito	62
55	Napa County (unincorporated)	NA
54	Calistoga	44
54	El Cerrito	55
54	Richmond	67
53[1]	Larkspur	NA
53	City of Napa	66
53	San Mateo County (unincorporated)	NA
51	Petaluma	40
46	Sonoma County (unincorporated)	46
45	Fairfax	NA
Poor		
43	Half Moon Bay	NA
No Data		
NA	Millbrae	NA
NA	Monte Sereno	NA
NA	Moraga	NA
NA	Oakland	NA
NA	Palo Alto	NA
NA	Rio Vista	NA
NA	Union City	NA
NA	Walnut Creek	NA

Source: Metropolitan Transportation Commission

[1] Jurisdiction uses an alternate pavement management system in which scoring scale is comparable with PCI.
[2] Score has been correlated to the PCI scale from an alternate pavement management system.

2001 PCI scores based on inspections between 1998 and 2001 (see note on page 55).

NA = Not available

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