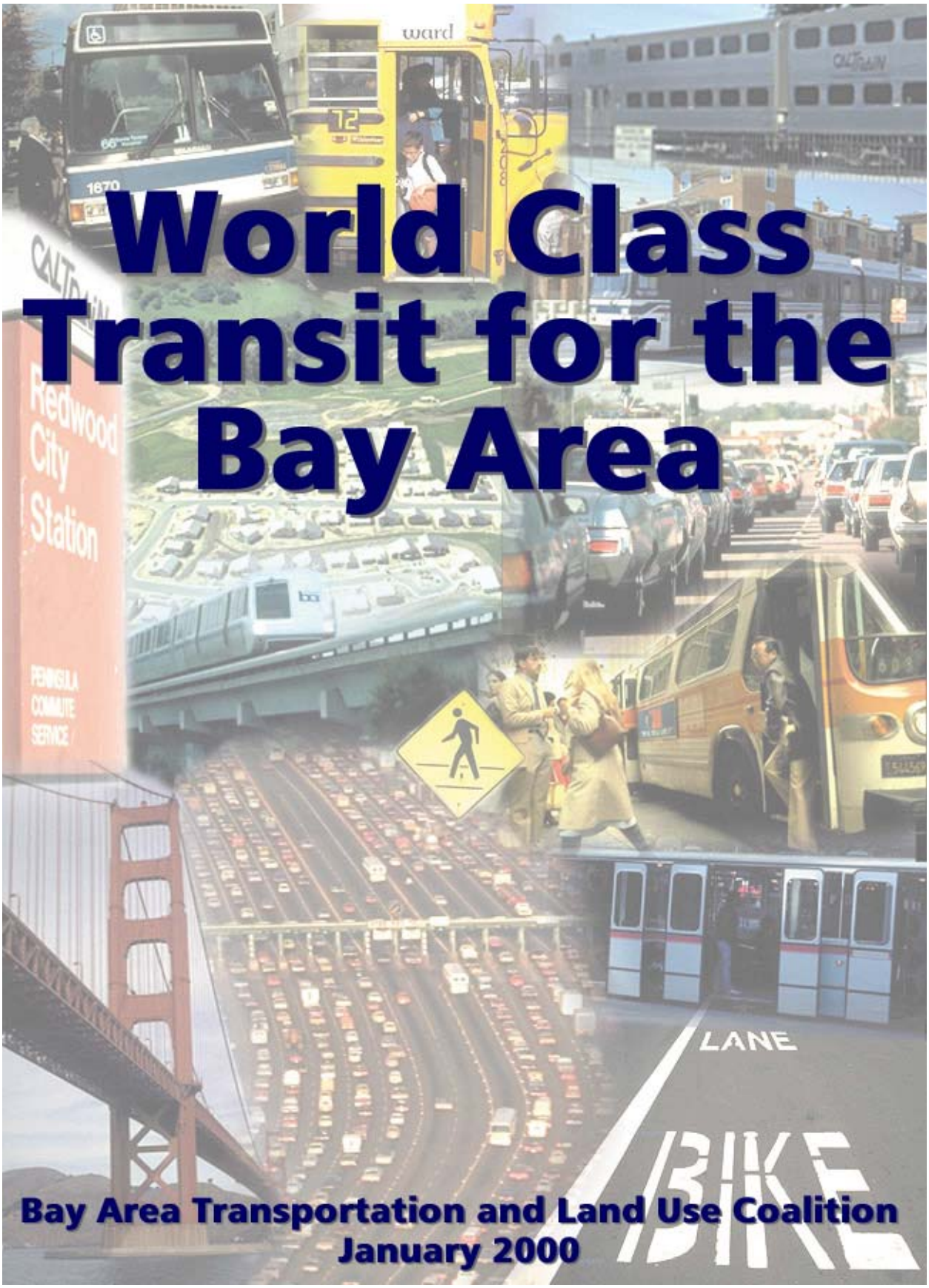

World Class Transit for the Bay Area

Bay Area Transportation and Land Use Coalition
January 2000

bay area transportation and land use

COALITION

The Bay Area Transportation and Land Use Coalition is a groundbreaking partnership of more than 80 groups working to maintain our region's renowned high quality of life, achieve greater social equity, and protect our natural environment. Coalition members believe that current development patterns do not have to be our destiny. Instead, the region can refocus public investment to serve and revitalize existing developed areas; design livable communities where residents of all ages can walk, bike, or take public transit; reform transportation pricing; and redress the burdens and benefits of transportation investments.

The Coalition holds regular regional meetings and also has local chapters in the East Bay, South Bay/Peninsula, and San Francisco. For more information, see the Coalition website or contact the Coalition's main office.

♦ ♦

Additional copies of *World Class Transit for the Bay Area* are available:

- On the Coalition's web-site at www.transcoalition.org
- By sending a $15 check payable to "Transportation & Land Use Coalition/ GA" to the main office address listed below.

♦ ♦

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♦ ♦

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page 96, Matthew Korve

Executive Summary

The Bay Area stands at the threshold of a new era of massive transportation investments. Counties throughout the area are now creating transportation sales tax proposals that could be worth over $10 billion, and billions more dollars may come from state legislation and other sources in the near future. Despite the significant amount of funding these developments represent, the current crisis of traffic congestion, pollution and suburban sprawl will only worsen if the region does not commit to a new vision for transportation investment.

This proposal, entitled *World Class Transit for the Bay Area*, offers such a vision by introducing a bold new approach to fixing our transportation system. Instead of focusing on extraordinarily expensive projects like highway-widenings, BART extensions and large-scale ferry service, this proposal would vastly improve the use of our existing transportation infrastructure, including nearly 18,000 miles of roads and 600 miles of rail tracks. With cost-effective projects, this proposal would provide transit that is fast, convenient, affordable, and could be ready within just a few years. The Coalition's key recommendations for creating a World Class Transit System include:

1. Restore and Expand Central Bay Area Transit. The Coalition advocates investment in frequent, faster transit service that runs 24 hours a day, seven days a week on key routes. This would provide transportation choices for communities which need them most, produce the highest ridership for any given amount of investment, and revitalize urban core areas.
2. Create a Regional Web of Express Buses. A cornerstone proposal would create an "express bus web" to blanket the region with state-of-the-art buses providing direct service for a vast number of suburban commuters. The Coalition proposes the creation of an integrated regional Transitway using the Bay Area's existing 271 miles of carpool lanes as its backbone. On a few key highways that have no carpool lanes, the Coalition recommends optimizing regular mixed-flow lanes by turning them into carpool lanes during peak commute times.
3. Vastly Improve the Efficiency of Existing Rail Lines. The Coalition recommends putting new train service on existing rights-of-way and significantly upgrading existing service. Extensive improvements to Caltrain, including an extension to downtown San Francisco, upgrades to the Altamont Commuter Express, Amtrak Capitol Service and BART, and the initiation of new service in Marin, Sonoma, Alameda and Santa Clara counties are the principal recommendations.
4. Invest in Communities with Transportation Choices. Designing communities the old-fashioned way— with homes, jobs, shops, and parks in close proximity to one another and to transit—is essential to create development that supports a range of transportation choices. In order to promote such design, the Coalition's proposal calls for regional smart growth planning, incentives for cities to plan more transit-supportive land uses, and zoning policies that support compact development.
5. Get the Price Right. Financial signals to consumers discourage transit use and are a major reason our roads are so intensely congested. The proposal calls for increased use of economic incentives that promote alternatives to driving, including parking cashout programs which give employees cash for giving up their "free" parking space at work, and programs such as Eco Pass that provide employees with free transit rides throughout the Bay Area.

This proposal would vastly improve transit use – the report authors estimate it would add at least 110,000,000 transit trips per year. Just as importantly, this plan would support broader regional goals such as preserving open space, promoting compact development, and improving the quality of our air.

Chapter 1
Thirsting for a Vision

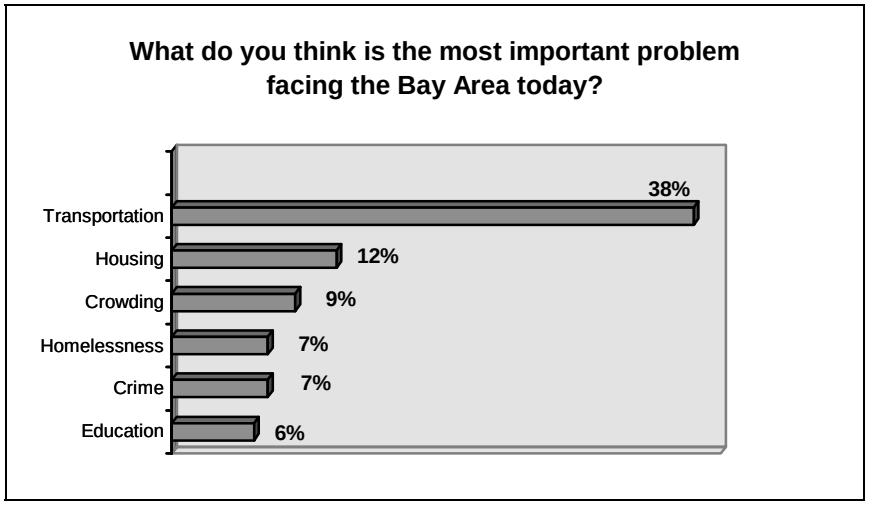
The Bay Area and all of California stands on the threshold of a new era of massive transportation investments. State legislation to increase transportation funding by billions of dollars per year will likely pass in 2000 or soon after. The most dramatic proposal seeks to make it easier to raise money through county transportation sales taxes that require only a majority of votes in each county, instead of a two-thirds supermajority. Such taxes, if approved, would yield more than $3 billion over 20 years for Santa Clara County, and billions for most Bay Area counties.

The Need for a Vision

Despite these state-level efforts, and many others that are being initiated at all levels of government, the Bay Area's growing transportation problems will not be solved if new funding continues down the same investment path that has led to the existing crisis.

Intense traffic congestion, a declining share of trips taken by public transit, suburban sprawl, air quality that does not meet federal standards—these and many other problems result from our current transportation planning and investment framework. They are the result of a system that chooses projects based on political popularity rather than effectiveness, and that subsidizes poorly-planned sprawl development with billions in taxpayer-funded highway infrastructure.

Past highway expansion in the outer sections of the Bay Area has brought hundreds of thousands of vehicles onto already congested urban and suburban roads. And there is no end in sight: current proposals to double the width of key "gateway" roads such as Highway 101 between San Jose and Gilroy and Route 4 East in Contra Costa could translate into further increases in regional congestion.



Each year the Bay Area Council, an association of large businesses, conducts a poll which repeatedly finds transportation to be Bay Area residents' top concern. The 1999 poll shows transportation to be a bigger problem for Bay Area residents than the next four categories combined.[1]

Furthermore, funds spent on public transit are sometimes ill-considered. For example, the proposal to extend BART from Fremont to San Jose would cost at least $4 billion dollars, carrying only about 10,000 new riders per day.[2] In contrast, Caltrain improvements proposed in this report would carry 19,000 new

[1] West County Times, "Patches of fog in area survey" December, 17, 1999.

riders daily at less than half the cost. Express bus proposals described in this report are more than 10 times as cost-effective as implementing wide-scale ferry service.

If It's Broken, Fix It.

The 1999 Bay Area Council Poll again showed transportation to be by far the biggest concern of Bay Area residents. Yet despite growing public concern regarding transportation problems, current regional planning approaches do not adequately address the crisis. Instead, experts expect most transportation problems to worsen dramatically over the next twenty years. For example, the Metropolitan Transportation Commission's 1998 *Regional Transportation Plan* estimates that peak-hour traffic congestion will increase by 249 percent between 1990 and 2020.

In his study of transit success stories around the world, Professor Robert Cervero of U.C. Berkeley argues that "transit metropolises evolve from well-articulated visions of the future."[3] Such a vision must be comprehensive, integrating transportation, land use and economic incentives, and should be oriented toward the creation of a new, transit-oriented urban system. Unfortunately, lack of a vision for the Bay Area and fragmented decision-making have undermined the region's ability to provide effective transit systems to serve economic and population growth.

This proposal for World Class Transit in the Bay Area is the result of more than 13 months of research and analysis by dozens of transportation professionals, local transportation and community advocates, and graduate students at UC Davis' Institute for Transportation Studies. It presents a very specific vision of how transit can be dramatically improved in this region.

The Coalition believes that this proposal can win tremendous support because it provides benefits for *all* Bay Area residents, from parents tired of transporting children to school and activities, to commuters stuck in traffic, to those who depend on transit but find themselves waiting endlessly or stranded on nights and weekends. Many of the Coalition's recommendations can be implemented almost immediately and are extremely cost-effective. Much of this World Class Transit vision relies on improvements to existing infrastructure and can therefore yield tremendous benefits quickly. Implementing the components of this plan would at last begin to provide Bay Area residents with the transportation choices they need and deserve.

So what will a World Class Transit system mean for the Bay Area? Will it bring about the demise of the automobile or a ban on construction of additional single family homes in the suburbs? Will jet-fast high-technology vehicles replace existing buses and trains?

Hardly.

World Class Transit would offer the vast majority of Bay Area residents transit options that are fast, convenient, affordable, pleasant, and safe for a broad range of trips. Such a system would greatly increase the number of trips made on transit. The Coalition estimates there would be over 350,000 transit trips per day, or 110,000,000 per year, generated by the projects and policies. Just as importantly, this plan would support broader regional goals such as preserving open space by promoting compact infill development in urban and suburban centers.

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[2] Preliminary modeling, Metropolitan Transportation Commission, *Draft Transportation Blueprint for the 21st Century*, October 1999.

[3] Robert Cervero, *The Transit Metropolis* (Washington, D.C.: Island Press, 1998): 403.

Key Principles

What are the key planning and investment principles that can lead us on this path to World Class Transit and a more sustainable region? The ones which are most critical to the Bay Area at this time include:[4]

Adaptive Transit

There is no "one-size fits all" solution to public transit. Rather, transit must to a significant extent adapt to meet current needs. For example, BART has done well in bringing commuters to downtown Oakland and San Francisco, but is simply too expensive to keep extending into low-density suburbs. To serve these areas better, flexible transit systems are needed—systems that reduce people's need to transfer between different transit modes or drive to parking lots that are increasingly full at suburban stations. A flexible, adaptable system of rapid express buses and

Increased development density along Oakland's East 14th Street would better support transit. *©UrbanAdvantage*

A few changes to East 14th Street (from the picture above) would make a world of difference. As depicted in this photo illustration, a moderate increase in density, along with bicycle and pedestrian amenities and safety improvements, would bring new life to the neighborhood, support increased transit, and be more conducive to walking and cycling. *©UrbanAdvantage*

[4] These four principles are adapted from Robert Cervero's *The Transit Metropolis*. His list is more extensive.

shuttles could help meet these needs by accessing increasingly dispersed residential, employment, and commercial centers.

Adaptive Cities

Transportation problems cannot be solved separately from land use planning. To create a transit-supportive environment, the built form of the region must adapt over time to make transit work and reduce automobile use (see photo illustration on previous page). To adapt to transit as well as to save open space, public investments should encourage compact growth near urban and suburban centers. While local development issues are always controversial, recent approval of Urban Growth Boundaries by 17 cities throughout the region shows the extent of the public support for reining in sprawl.

A good Bay Area example of transit-oriented development can be found in San Jose, where zoning was changed in the late 1980s and early 1990s to support development along Santa Clara Valley Transit Authority (VTA) light rail lines. A tremendous amount of compact development is now taking place along these lines; 4,500 housing units along the Tasman West line alone during the three years the light rail line was under construction. Unfortunately, such transit-oriented development is still the exception in the Bay Area, and even in Santa Clara County much new office space is built in low-rise office parks with parking lots in front and little transit access.

Efficient Investment

The most important principle at this time can be summed up as "getting the biggest bang for the buck." Transportation investments should result in the greatest increases in transit ridership and the most congestion relief for the least cost. Such efficiency comes about through proactive, coordinated regionwide planning and wise investment choices, in particular those which improve the use of existing infrastructure and serve the greatest concentrations of transit riders. These smart decision-making strategies will require transportation agencies to provide information such as anticipated cost per new transit rider. Doing so for bus, rail or other alternatives will allow Bay Area residents and elected officials to choose the best possible combination of projects.

Economic Incentives

Cities around the world that have made transit work often utilize economic incentives to level the playing field between transit and automobiles. Many built-in economic biases reward driving and discourage use of transit. These counterproductive influences include free parking (which shows up as higher prices for goods and services), cheap gas, and the fact that drivers pay most of their annual costs in lump sums for insurance, registration, and vehicle costs, rather than in fees proportional to the amount they drive. Numerous measures such as discount transit passes or paying employees who are willing to give up their parking spaces can vastly improve our transportation system, and would be broadly accepted by the public if the benefits were clearly seen. These measures, many of which could be adopted by local Bay Area governments and businesses, would make the true price of driving more apparent on a day-to-day basis.

How To Create A World Class Transit System

Based on these principles, the Coalition's key recommendations for creating a World Class Transit System include the following:

1. Restore and Expand Central Bay Area Transit

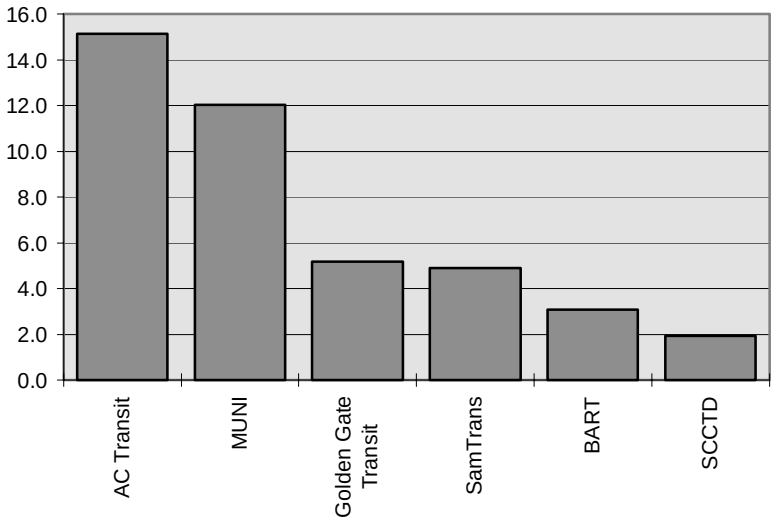
Central Bay Area transit—such as Muni service—needs to be fully restored and expanded.

Years of underfunding have led to cuts in transit service (especially during nights and weekends), declining service quality, and a loss of ridership. As core systems like Muni deteriorate and others like AC Transit and SamTrans cut service, the region loses its most cost-effective forms of transit and those most reliant on public transportation are left stranded. Frequent, fast service that runs 24 hours a day, seven days a week on main lines could revitalize urban core areas, provide better transportation options for communities which need them most, and produce the highest ridership for any given amount of investment.

Focusing on Central Bay Area transit is the most efficient use of our tax dollars. Compared with other regional transit agencies, AC Transit and Muni carry the most passengers for the least cost (see Table 1.1). However, funding shortfalls have put these transit agencies into a destructive spiral of decreased maintenance and reliability, lower ridership and decreasing revenues.

Both capital and operating funds for these systems are essential. Expanded funding would, for example, allow AC Transit to establish a rapid bus system on San Pablo Avenue, East 14th Street and other main corridors. It would allow expansion of Muni rail service, and more frequent and reliable service on many existing lines.

Table 1.1 Rides per $10.00 of Subsidy (1979-1991)



Source: Subsidy data is from *Crash Course in Bay Area Transportation Investment* from Urban Habitat Program, 1999. (Original source: FTA Section 15 reports).

2. Create A Regional Web of Express Buses

The Bay Area has a golden opportunity, and it takes the form of hundreds of miles of bus/carpool lanes on our freeways. The region now has 271 miles of bus/carpool lanes and there are plans to build 148 more miles. The World Class Transit proposal seeks to utilize these lanes as the backbone of an express bus web, making the most efficient use of this existing resource.

Our region is increasingly dispersed or "polycentric." Particularly in suburban areas, transit must adapt to this new urban form. The proposal for a regional express bus web owes its strength to its flexible structure and its ability to pick people up within walking distance of their homes, even in lower-density suburbs. Its use of bus/carpool lanes (also known as "diamond" or "HOV" lanes) allows for fast service and a high volume of passengers. Combined, these factors make it significantly cheaper and more adaptable than building new rail extensions.[5]

The regional express bus web is not a pipe dream. Systems similar to it exist in Pittsburgh, PA; Miami; and Ottawa, Canada. Even in the Bay Area, some transit agencies are already using bus/carpool lanes to speed their buses past highway congestion—AC Transit's Transbay buses, for example, save an average of 15 minutes with a bus/carpool lane that bypasses the congested Bay Bridge toll plaza.

There is a lack of understanding and political will to implement this highly cost-effective form of transit. For example, in a summary of major regional projects that have received the most public support at its *Transportation Blueprint for the 21st Century* workshops, the Metropolitan Transportation Commission lists eleven projects—none of which include express buses.[6]

The Coalition has made the bus web a centerpiece of its World Class Transit proposal in order to provide the information that builds public support, political leadership, and a regional vision in order for this opportunity to be realized.

3. Vastly Improve the Efficiency of Existing Rail Lines

The Bay Area is crisscrossed with more than 600 miles of rail track, 300 miles of which is already in use by commuters. Instead of building new commuter rail lines at $60 million to $200 million per mile, the region could add many more new train passengers by upgrading existing rail service, adding new service to existing rights-of-way, and increasing the frequency of BART trains.

The Coalition proposal prioritizes improvements to Caltrain (between San Francisco and Gilroy) which could attract 19,000 new transit riders or more. Other key upgrades include the Altamont Commuter Express (between Stockton and San Jose), and Amtrak Capitol Service (between San Jose and Sacramento). In addition, the Coalition supports initiating service on publicly-owned tracks in Marin and Sonoma Counties, and on existing tracks between Alameda County and San Jose.

The Coalition also supports maintaining and upgrading the

Altamont Commuter Express (ACE) service from Stockton to San Jose demonstrates the benefits of upgrading existing rail lines. The trains were almost full from the first day of the new service.

[5] Initial modeling of different modes as part of MTC's *Draft Transportation Blueprint for the 21st Century* showed the top performing routes on average would yield a cost per new rider of: $4.50 for express buses, $15 for rail projects, and $60 for ferry service. The express bus web proposal here would be even more efficient because of the HOV conversions and pricing changes. Even if these numbers are off by a significant margin, it is clear that express buses will be by far the least expensive.

[6] MTC, "Bay Area Transportation Blueprint for the 21st Century Update," Memorandum from Lawrence Dahms, January 7, 2000.

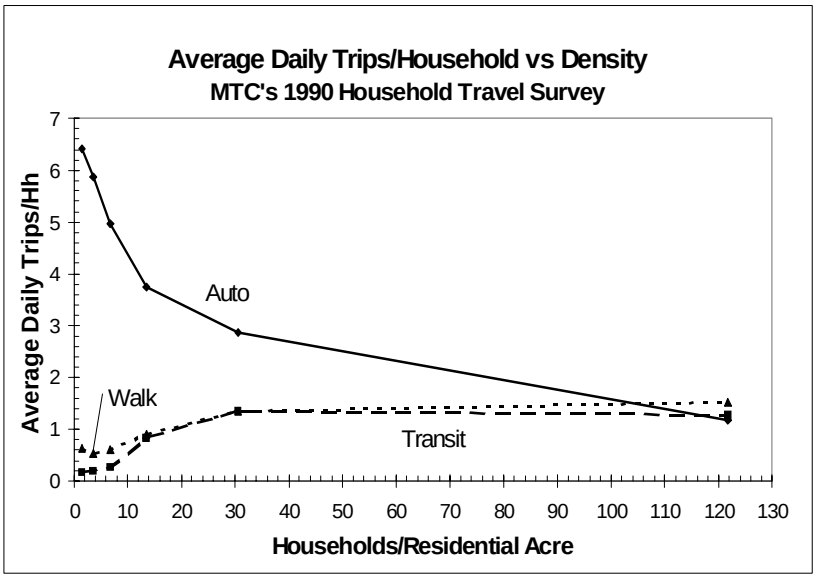
existing BART system. For example, BART's proposed "Advanced Automatic Train Control System" will be able to significantly increase the number and frequency of BART trains, adding crucial capacity through the Transbay tube.

4. Invest in Communities with Transportation Choices

Designing communities the old-fashioned way—with sidewalks, narrow tree-lined streets, connecting street networks, and homes, jobs, shops, and parks within close proximity— not only creates very livable, walkable communities, but supports much higher levels of transit. This is critical if the Bay Area is to sustain continued housing and job growth. Compact development not only has strong popular appeal, but could also help save the Bay Area's open space and agricultural land.

The correlation between compact urban form and transit use is clear. Muni, which operates in compactly developed, transit-oriented San Francisco, has 286 annual boardings per capita. AC Transit, operating in medium-density Alameda County, has 58. The Valley Transit Authority and Golden Gate Transit, operating in low-density Santa Clara and Marin Counties, have 32 and 12 annual boardings per capita respectively.

The Coalition supports policies for more transit-oriented communities through a regional smart growth planning effort, local zoning and urban design changes, and regional incentive funding for such reforms. MTC's Transportation for Livable Communities program, for example, provides small amounts of funding for local planning designed to promote more transit-supportive land use. The Coalition also supports a policy for state and regional agencies that conditions certain funds based on adoption of transit-supportive land use plans by local governments in the affected area.



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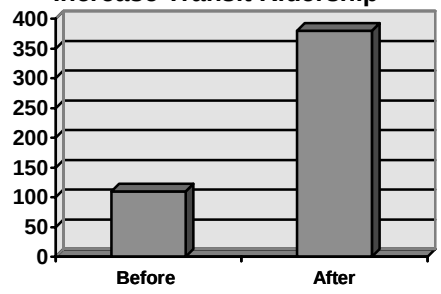
5. Get the Price Right

Financial signals to consumers typically discourage transit use while promoting over-reliance on automobiles. To develop World Class Transit, Bay Area governments need to price transportation in a way that promotes alternatives to driving. Current pricing structures are to blame for congestion, and do not favor transit users, who suffer from less-than-adequate transit systems.

One of the most effective mechanisms is "parking cashout" which gives employees the choice of receiving cash for giving up their "free" parking spot at work (employees can instead walk, bike, carpool, or take public transit to work). These programs are attractive to many employers because they reduce the need for additional parking as the company grows. The "Eco Pass" program that provides free transit rides on all Santa Clara Valley buses and light rail is another great example. Covering over 46,000 employees, some firms offering Eco Pass have seen a rise of over 200% in the number of workers using transit. Local and regional government agencies can promote or subsidize such programs, and can serve as model employers themselves by adopting them.



When Varian, a Palo Alto firm, began providing Eco Pass to their employees, transit ridership shot up by 245%.

MAKING THE VISION A REALITY

As the state of transportation continues to deteriorate in the Bay Area there will be a growing clamor for relief and improved transit options. A vast number of people will only take transit if it is as fast, affordable and comfortable as their cars. This proposal from the Coalition aims to create a system that does just that. Based on existing information it creates a vision firmly planted in the tremendous opportunities that will soon arise. But where will the money come from?

More Money In the New Millennium

The year 2000 may go down in California history as the year of transportation. An awesome amount of funding measures at the local and state level—from sales and property taxes to state infrastructure funding—may be voted upon. The Coalition will work in all nine counties and at the state level to help shape the direction of these expenditure plans. Coalition staff and member organizations will bring this proposal to community groups, transportation agencies, elected officials, and the broader public.

Unfortunately, the biggest obstacle to World Class Transit remains the ongoing preoccupation with projects that are too expensive, ineffective, or that will not show benefits for 10-20 years. Many of the most cost-effective projects, such as upgrading existing rail lines or providing improved bus service, simply do not elicit as much interest or excitement on the part of public officials or the public as new highways or rail extensions.

The Coalition's mission is to make the benefits of the World Class Transit proposal so evident and widely known that the "Express Bus Web" and other projects listed here create a new paradigm for Bay Area transportation investments: one based on moving the most people for the least cost, and providing choices for the 2,000,000 Bay Area residents who cannot or do not want to drive.

Chapter 2
Existing Transit in the Bay Area

TRAVEL PATTERNS

More than 6.8 million people live in the San Francisco Bay Area, making nearly 20 million trips every day, more than 80 percent of them by private automobile.[1] Public transportation also plays a critical role in the region's travel patterns. While only two percent of all trips in the U.S. are taken on transit, in the Bay Area this share exceeds six percent. And for commute to work trips, transit's share is even higher—9.5% in 1990 (see Table 2.1). This differential reflects the importance of transit in high density areas such as San Francisco, where more than 40 percent all work trips are taken on public transit,[2] and in older, less dense areas such as the inner East Bay, which were built as compact, transit-oriented "streetcar suburbs" in the late nineteenth and early twentieth centuries.

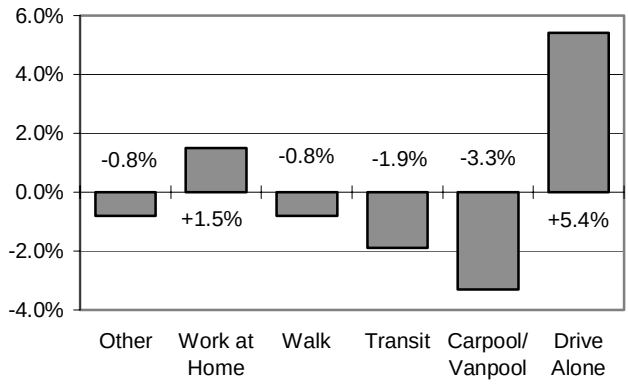
Table 2.1 Share of Trips by Transportation Mode

Share of Trips	1980	1990
Drive Alone	62.8	68.2
Carpool/Vanpool	16.3	13.0
Transit	11.4	9.5
Walk	4.4	3.6
Work at Home	1.9	3.4
Other	3.1	2.3

Source: 1990 Census: Working Paper #9, MTC (September 1994)

Despite the historic importance of trains, streetcars, buses, and ferries in the central Bay Area, in the past 40 years there has been a dramatic decrease in the share of trips taken by transit. In part this is due to the rise in communities specifically designed for the automobile (Fremont has the distinction of being the first city in this country to win a planning award for auto-oriented design[3]). Other factors include a rising number of vehicles per person and per family, and the low costs of driving. Between 1980 and 1990, solo driving was the only transportation mode that increased, while the proportion of work trips continued to decline for transit, carpooling, and other alternative modes (see Table 2.2).

Table 2.2: More people are driving alone in the Bay Area



Change in Travel Share (%), 1980-1990

Source: *1990 Census: Working Paper #9,* MTC (September 1994)

Current projections are for a continued decline in

[1] Metropolitan Transportation Commission (MTC), *Regional Transportation Plan* (Oakland, 1998).

[2] San Francisco Planning Dept., *Citywide Travel Behavior Survey (CTBS)* (San Francisco, 1993).

[3] Personal Communication, Gus Morrison, Mayor of Fremont.

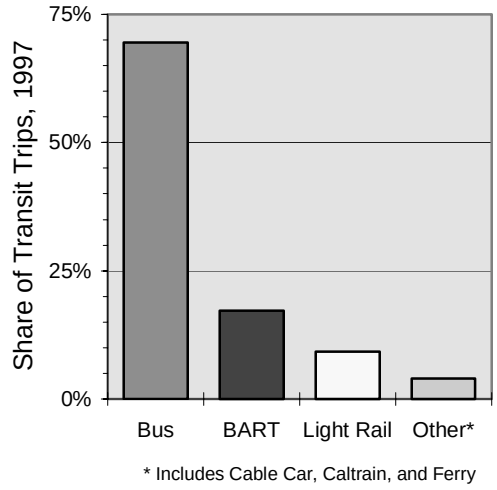
the percentage of trips taken by transit, bicycle, and walking. The challenge for the Bay Area is to reverse these trends; implementing the World Class Transit proposal will be a critical step. Unless we can provide residents with fast and convenient alternatives, the continued deterioration of our transportation system and quality of life will continue.

THE BAY AREA'S EXISTING TRANSIT NETWORK

The Bay Area's transit network already consists of more than 20 bus systems, four rail systems (BART, Caltrain, Amtrak's Capitol Corridor Service, and the new Altamont Commute Express), two light rail systems (San Francisco Muni and Santa Clara VTA), and four ferry services. Other public transportation modes include paratransit,.

The regional transit network currently transports more than one and a half million passengers daily. While rail is often the focus of attention in the transit world and consumes most of the expansion funds, Table 2.3 shows that buses carry the vast majority of passengers in the Bay Area.

Table 2.3 Buses: Workhorses of Bay Area Transit



Source: Statistical Summary of Bay Area Transit Operators, MTC (December 1998)

The Bay Area is unique in that no single transit operator dominates the regional market. However, Muni, BART and AC Transit collectively transport over 75 percent of all regional transit riders (see Table 2.4).[4] Despite this widespread regional coverage, transfers between systems are poorly coordinated and users must buy separate fares to transfer from one system to another.

Many of these regional transit systems provide direct services to and from employment centers in downtown San Francisco and local routes within their jurisdictions. Muni and AC Transit operate the most heavily-used bus services in the region with high passenger volumes on routes such as Muni's Geary lines, which carry nearly 50,000 people per day.[5] Most of the other bus operators serve more suburban environments, where densities are low, transit services are primarily offered on principal arteries or highways, and systems have infrequent or no late night or weekend service.

[4] MTC, Statistical Summary of Bay Area Transit Operators, (Oakland, 1998).

[5] Muni 38, 38L, 38AX and 38BX lines.

Table 2.4 Daily Boardings for the Largest Bay Area Operators: 1998

Transit Operator	Areas Served	Average Daily Boardings	Percentage of Boardings
San Francisco Muni	San Francisco City/County (Co.)	691,100	44.8%
BART	Alameda, Contra Costa, San Francisco, San Mateo Cos.	281,600	18.3%
AC Transit	W. Alameda and Contra Costa Cos.	208,300	13.5%
Santa Clara VTA	Santa Clara Co.	173,200	11.2%
SamTrans	San Mateo Co.	64,100	4.2%
Golden Gate Transit	S.F., Marin, and Sonoma Cos.	38,000	2.5%
Caltrain	E. S.F., San Mateo, Santa Clara Cos.	27,000	1.8%
County Connection	E. Contra Costa Co.	14,400	0.9%
Vallejo Transit	S. Solano, NW Contra Costa Cos.	11,700	0.8%
Santa Rosa City Bus	City of Santa Rosa	6,800	0.4%
Tri-Delta Transit	N. Contra Costa Co.	6,400	0.4%
Wheels	Cities of Livermore, Pleasanton, Dublin	5,100	0.3%
Sonoma County Transit	Sonoma County	4,900	0.3%
Fairfield/Suisun Flyer	Cities of Fairfield and Suisun City	3,000	0.2%
Napa City Vine	City of Napa	2,400	0.2%
Union City Transit	City of Union City	1,900	0.1%
WestCat	W. Contra Costa Co.	1,600	0.1%

Source: Metropolitan Transportation Commission (MTC), Statistical Summary of Bay Area Transit Operators, *Oakland: MTC, 1998.*

In addition to these "fixed route" transit services, paratransit services are run by some of the regional transit operators, who also contract out the routes with private firms. Paratransit consists of flexibly-routed transportation alternatives that provide door-to-door service, using shuttle vans, microbuses, and taxis. Each year, about one million paratransit boardings are made in the Bay Area.

While paratransit services chiefly serve seniors and disabled persons unable to use fixed-route transit services, there are a few programs in low-density areas that provide dial-a-ride services to the general public (e.g., DART in the Tri-Valley and Benicia Yellow Cab in Solano County). In many rural and suburban areas of the country, these services have proven to be more cost-effective than fixed-route transit.

Great Variety In Transit Subsidies and Effectiveness

The region's operators require a large range of subsidies in order to carry a set amount of passengers. Table 2.5 below shows subsidy estimates for the six largest operators in the region. The total subsidy figure per rider is not surprising; the most urban carriers, AC Transit and Muni, are running through areas that were originally designed for transit (see "Recycling the Past" in Chapter 8 for a history of these systems.)

While funds should not be distributed solely to the operators that require the least subsidy, it should be a greater consideration in how the state and region allocate funds. For example, California Transportation Development Act (TDA) funds are allocated using a population-based formula. Using a formula based on ridership would benefit those areas where transit is most used and most effective. Other factors, such as providing funding to those areas in which the transit systems provide a transportation lifeline, or improving air quality, should also be considered.

Table 2.5 Estimates of Subsidy by Transit Operator (1979-1991)

Operator	Capital Cost/ Passenger Trip	Operating Cost/ Passenger Trip	Total Cost	Passenger Fare/Trip	Subsidy /Trip
AC Transit	$0.15	$0.72	$0.87	$0.21	$0.66
Muni	$0.20	$0.93	$1.13	$0.30	$0.83
Golden Gate Transit	$0.44	$2.94	$3.38	$1.45	$1.93
SamTrans	$0.50	$2.08	$2.58	$0.54	$2.04
BART	$1.48	$3.17	$4.64	$1.42	$3.23
SCCTD	$1.86	$3.70	$5.55	$0.36	$5.19

Source: Crash Course in Bay Area Transportation Investment *from Urban Habitat Program, 1999, based on FTA Section 15 reports.*

Some Major Transit Expansions

The Association of Bay Area Governments (ABAG) now predicts that the region's population will reach 8 million by 2020, and that more than one million new jobs will be created during the next twenty years.[6] As Table 2.6 makes clear, there is an even greater anticipated increase in driving. To keep the Bay Area roads from choking on all of this growth, transit and other alternatives must be able to provide a higher proportion of these new trips.

Indeed, a fairly broad range of transit improvements are slated to take place soon, including:

[6] Association of Bay Area Governments, *Trends and Challenges Facing the Future of the San Francisco Bay Area* (1998).

- By 2004, Santa Clara's light rail service will expand east towards Milpitas and then south (the Tasman East and Capitol lines) and southwest from San Jose towards Campbell (the Vasona line).
- Muni is working on a new streetcar line that will go down Third street to Bayview.
- BART is adding eight miles of track to reach San Francisco Airport and Millbrae.
- Transit Operators from Solano to Santa Clara are expanding their bus systems, adding some express buses, and experimenting with ways to speed up buses on city streets.

Table 2.6 Bay Area Jobs and Travel Forecasts, 2000 to 2020

	2000	2020	Change
Population	6,900,000	8,000,000	+16%
Jobs	3,700,000	4,700,000	+27%
Vehicle Miles Traveled per Average Weekday	127,800,000	166,800,000	+31%

Sources: Travel Forecasts for the San Francisco Bay Area: 1990–2020, *MTC, revised February 1999. Jobs and population figures from Association of Bay Area Governments.*

Still: Transit Decreases, Congestion Skyrockets

Despite these planned expansions and enhancements of transit service, MTC forecasts decreases in the percentage of trips taken by public transit over the next 20 years. The only transportation mode gaining ground is the single occupant vehicle. The combination of growing population, a rising number of automobile trips per person, and a decrease in the use of public transit, shared rides, bicycles, and walking results in a predicted increase in congestion of 249 percent between 1990 and 2020.[8]

As the existing conditions and projections have made clear, current planning and investing strategies simply do not work. A shift in public investment from automobile-oriented highways to transit alternatives that actually reduce overall congestion levels is a change that must be made soon.

Congestion expected to rise 249% between 1990-2020

Between 1990 and 2020, the amount of time vehicles are sitting in traffic delays is expected to increase by 249% to 366,000 hours per day![7]

[7] MTC, *Draft 1998 Regional Transportation Plan*, p. 12.

[8] Metropolitan Transportation Commission (MTC), *Regional Transportation Plan for the Bay Area*, (Oakland, 1998)

Fortunately, an opportunity to improve planning methods has arisen as MTC moves forward with a new transportation planning process. With several potential funding opportunities on the horizon, MTC has begun a planning effort known as the *Transportation Blueprint for the 21st Century* that is scheduled to conclude in April 2000. The *Blueprint* seeks to identify funding sources and create a cohesive package of transportation strategies. While it would not provide funding directly, the *Blueprint* package would be used as an advocacy document.

By comparing a host of bus, rail and ferry projects against each other, the *Blueprint* will provide information on which projects will be the most cost effective. This will be the first time such comparisons are available in such a comprehensive manner. Since many projects will require the support of voters, however, a primary criteria for project prioritization will be the perceived level of "public and political support."

The Coalition has urged MTC to release information that is as detailed as possible, so the public can have meaningful input into the process. The authors of this report believe that the Express Bus Web, upgrading of existing rail lines, and other proposals in the World Class Transit proposal will be incredibly popular at the polls and with elected officials if the benefits are made clear.

Chapter 3
Creating A Regional Express Bus Web

Imagine boarding an express bus just a short walk from your home. Your monthly pass eliminates the need to carry exact change. As you settle into your comfortable reclining seat, with a power port to plug in a laptop computer, a reading light, and overhead storage bins, the bus reminds you of an airplane cabin—except it's not cramped like today's aircraft. With traffic lights that stay green for buses and a bus/carpool lane on the highway to cruise past solo drivers, the bus whisks you quickly to your workplace. You arrive on-time and ready to start your day, happy that your days of battling traffic are over.

AN OPPORTUNITY AWAITS

The Coalition has made the regional express bus web a centerpiece of its World Class Transit proposal in order to build public understanding and support for this exceptional opportunity. An express bus web is by far the most cost-effective transit option available for a broad segment of the Bay Area. In addition, although buses are often perceived of as poor substitutes for trains, buses with a slew of amenities are available that would more closely resemble airplane cabins, except they would be more spacious than today's jets.

Particularly in more dispersed suburban areas, express buses would be faster, less expensive, available sooner, and could carry many more people than new rail extensions. Express buses are already in use in some areas and buses from Livermore to Silicon Valley and on AC Transit Transbay routes are so successful they are covering all of their operating costs.

Express buses or vans are only becoming possible now, as they will bypass traffic by using the Bay Area's growing High Occupancy Vehicle (bus/carpool) lane system. Already the region has 271 miles of bus/carpool lanes and is planning to build more, for a total of 419 miles.

However, there are still several key gaps in the bus/carpool lane system that would force buses to inch along with all other traffic. This problem could be overcome by strategically converting existing regular "mixed flow" to HOV lanes (during peak hours) rather than adding expensive new lanes. Conversions should be done on highways that already have at least eight lanes, including parts of I-880, I-580, and Highway 101 in Marin and San Mateo. This would provide the region with an integrated express bus web at extremely low costs.

The Benefits Of A Regional Express Bus Web

Low capital costs save taxpayer dollars. Unlike building new highways or rail lines, which entail huge sums, these buses make use of existing infrastructure.

Use it sooner. Rail extensions and highway projects typically take ten to twenty years to move from concept to final product. The bus web could be operational within six months, as the only required elements are new signs, new buses and the re-striping of existing highway lanes.[1]

Travel faster. By using bus/carpool lanes, buses can move along unimpeded by traffic congestion, while simultaneously reducing highway congestion for drivers in the remaining mixed-flow lanes.

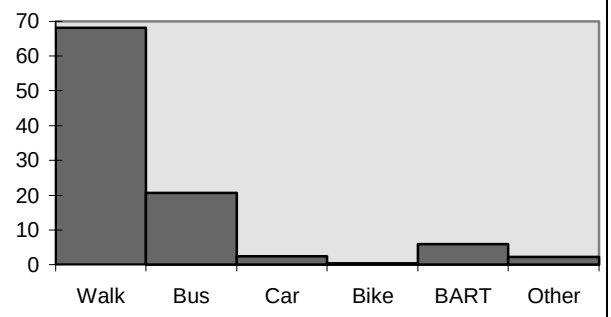
Modular. The bus web can be created in stages and put into place in the most congested areas first to get the maximum payoff.

Adaptable. Routes can be reconfigured as needs change over time. Vehicle size can be adjusted to demand, increasing from vans and mini-buses to full-size or even articulated buses as demand along a route increases. This ability to match demand keeps operating costs low.

More people can walk to the bus. Buses, unlike rail, get close to where people live. For example, within Alameda and Contra Costa counties there are 8,000 AC Transit bus stops, compared to 29 BART stations. An impressive eighty percent of Santa Clara County's 1.6 million residents live within a quarter mile of at least one VTA bus route. This proximity decreases the need for short, "cold-start" car trips, which are the most polluting. And because people can walk to them, buses don't require large parking lots.

At 7:43 a.m. on September 17, 1998, an AC Transit express bus and a reporter posing as a drive-alone commuter departed from the Richmond Parkway Park and Ride lot in a head-to-head race to San Francisco. The bus, using the I-80 bus/carpool lane, had a decisive victory, arriving in 26 minutes. The car, which could only travel in the regular congested lanes, took almost an hour to arrive.

Figure 3.1 How People Get To The Bus



Source: Wilbur Smith Associates. AC Transit bus passengers along San Pablo Avenue were surveyed.

[1] Transit hubs could be constructed later on to increase convenience and allow for easy timed transfers. In the meantime, park-and-ride lots would suffice.

HOW TO CREATE THE SYSTEM

1. Fill In the Bus/Carpool Lane Gaps

The regional express bus web can be implemented now, at a very low cost, on the region's freeways. Even with 271 miles of bus/carpool lanes and plans to build 148 more, key gaps in the system will still remain. However, rather than adding expensive new lanes, strategically converting existing mixed-flow lanes to bus/carpool lanes along 880, 580, and 101, can help create an integrated regional system able to speed express buses, vanpools and carpools along (see the attached HOV map). As congestion increases and more bus/carpool lanes are completed, traveling via the bus web will often be faster than driving.

2. Employ Transit Hubs for Easy Transfers

For those passengers who will need to combine two bus routes, a system of transit hubs will offer comfortable waiting areas and timed transfers on many routes. By creating a few inexpensive transfer hubs, it would be possible for many commuters to go door-to-door with no more than one simple transfer. For example, a commuter from Solano County would be able to travel directly by express bus to San Francisco, Napa, or Oakland, or with one simple connection could reach San Rafael.

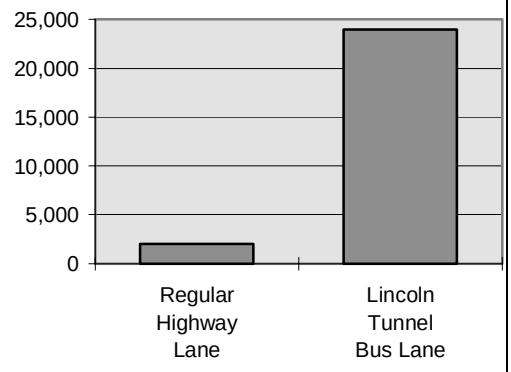
Myth
Buses don't have the "sex appeal" of trains and light rail.

Reality
Most buses on the bus web will provide service that is superior to trains and light rail. Many of these buses will feature reclining, high-back, deep-cushioned seats with armrests and footrests. Tray tables and power ports will accommodate laptop computers, individual reading lamps and adjustable curtains alongside window seats will allow tired travelers to rest in subdued light, and overhead racks will hold briefcases and coats.

3. Use Carpool Minimums and Tolls to Balance Capacity and Demand

Bus/carpool lanes are most useful if they're kept free flowing—operating at or near capacity, but not above it. The right level of traffic can be maintained by setting appropriate occupancy levels (two-, three-, or four-person carpools), and periodically reviewing them to see if adjustments are needed. On the flip side, nearly-empty bus/carpool lanes are a waste of highway space. One way to avoid this is to allow single occupancy vehicles to use the bus/carpool lane for a fee, as has successfully been done in southern California. Tolls would rise as congestion in mixed-flow lanes increased to keep traffic flowing smoothly on the bus/carpool lane. Electronic signs would indicate the current toll,

Figure 3.2 Highway Capacities



A single, bus-only lane that takes Manhattan-bound buses from the New Jersey Turnpike to the Lincoln Tunnel carries 24,000 passengers per hour during peak periods.[2] Regular highway lanes can only carry, on average, 2,000 passengers per hour.

[2] A staggering 52% of all morning commuters travel through the Lincoln Tunnel on this lane. According to a 1998 survey, from 6:00 to 10:00 a.m. 115,200 people traveled through the Lincoln Tunnel, of which 60,200 were carried on the bus-only lane. 1998 peak flow statistics from Jerry Quelch, Senior Transportation Planner, Port Authority of New York and New Jersey (October, 1999).

allowing solo drivers to decide if they wanted to enter the bus/carpool lane. Fares would be collected automatically and electronically so that cars would not have to stop.

4. Match Express Bus Service With Commuters' Travel Patterns

There are 3.4 million workers that travel to job sites throughout the Bay Area, and yet there is no existing means to effectively match new express service with workers' travel patterns. Transit agencies are forced to predict where commuters need to go, instead of being able to use actual data. Data could be collected, perhaps by MTC or RIDES for Bay Area Commuters, and be made available to transit agencies. Transit agencies in turn could glean valuable insights from a centralized database showing employee origins and destinations. Data collection would not impose an onerous burden on companies, as mid-sized and large corporations would only need to report aggregate zip codes of where their employees live. Companies would stand to benefit as well, as express bus service well-matched to commuters' needs would increase transit ridership and reduce the need to provide parking spaces for employees, which is often a large expense.

EXPRESS BUSES ALREADY EXIST IN THE BAY AREA

While some express bus services already operate in the Bay Area, transit agencies are hampered by a fragmented system that does not work well at a regional scale. The bits and pieces of the bus web that we currently have will continue to grow at a slow pace without the four changes mentioned above. Yet, even without much regional coordination or money, some agencies have surmounted these obstacles.

Existing Service

AC Transit's service between the East Bay and San Francisco's Transbay Terminal includes 36 routes, and in 1998 began taking advantage of new bus/carpool lanes along I-80. Transbay service has increased in popularity, and over the last three years ridership has risen 50% to over 13,500 boardings per day. AC Transit plans to add forty new high-quality, comfortable coaches to four of its longest-distance routes early in 2000.

Golden Gate Transit has sixteen commuter bus routes that utilize bus/carpool lanes along Highway 101 in Marin County. About 7,300 San Francisco-bound passengers take advantage of these express routes daily. The northernmost routes, which can use the full extent of the existing bus/carpool lanes, save an average of fifteen minutes in travel time compared to single-occupant cars traveling in regular lanes of traffic.

LAVTA/Wheels (the Livermore Amadore Valley Transit Authority) operates two subscription express bus routes from Livermore/Pleasanton to Lockheed Martin and Intel in Sunnyvale. Buses along both routes now operate at an impressive 90% of capacity. LAVTA has cut costs by using employer-based drivers, which allows the bus to be parked at the driver's worksite during the workday. This strategy has cut expenses and pollution, and allows the service to operate without any subsidy from LAVTA. Future service is planned from the Tri-Valley area to IBM's facilities in South San Jose, and between Pleasanton and Merced.

Dumbarton Express (DE) operates three routes across the Dumbarton Bridge between the Union City BART station and Menlo Park and Palo Alto destinations. DE buses utilize a two-mile bus/carpool lane to bypass traffic at the Dumbarton toll plaza, saving an average of 16 minutes with each westbound morning trip.

Planned Service

Tri-Delta Transit—which serves the eastern Contra Costa cities of Antioch, Pittsburg, and Brentwood—will begin new subscription express bus service starting in spring 2000. Initially, service will be provided to Lawrence Livermore and Sandia Labs in Alameda County. Future expansions will extend the service westward to the Hacienda Business Park in Pleasanton, and potentially even to Silicon Valley. The cost of operating the express service is expected to be fully paid for by passenger fares.

BUSWAYS ARE ALIVE AND WELL IN NORTH AMERICA

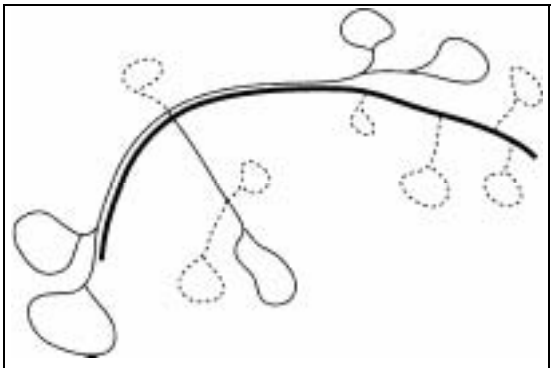
North American cities, including Ottawa, Pittsburgh, and Miami, all operate highly successful busways. In addition, Boston and Cleveland are both working on electric busways which are expected to open in 2002 and 2003, respectively.[3] Busways are simply roads open only to buses. The Coalition's proposal is different because carpools and vanpools would be allowed to share the same lane with buses. While the Coalition's proposal doesn't require the construction of busways, it still achieves the key benefit of busways: removing buses from congestion to speed their travel.

The Best In North America: Ottawa, Canada

The Bay Area can learn a lot from Ottawa's transit system—one that is well adapted to serve low-density suburbs. Ottawa has been so successful that today it is recognized by the American Public Transit Association for moving more passengers per day than any other public transit system in a comparably-sized North American city.

Located 200 miles northeast of Toronto in Ontario province, greater metropolitan Ottawa has about 730,000 inhabitants. About 325,000 Ottawans live in the relatively dense core of Ottawa itself, and the remainder live in suburban-style development throughout the region.

In 1974, the metropolitan Ottawa-Carleton area adopted a regional plan which called for transit as the preferred transportation solution, but didn't specify what type of technology should be used. A subsequent analysis showed that capital and operating costs of a busway would be over 20% lower than for a light rail system.[4]



Ottawa Transitway Schematic Diagram
The heavy line indicates Transitway-only buses that travel back and forth along the busway to each of the stations—as frequently as every three minutes during peak periods. The thin line represents buses that pick up passengers in local neighborhoods and then continue on the Transitway directly to the downtown. Feeder buses, which also pick up passengers in local neighborhoods, connect to the Transitway-only buses at transfer stations, and are shown with a dashed line.

The busway (known to Ottawans as the Transitway) is operated by OC Transpo, the regional transit agency, and was opened in the mid-1970s. Today it is comprised of nineteen miles of bus-only roads with thirty stations along its length. The Transitway

[3] Information on Boston's project is available at: *http://www.mbta.com/info/projects/transitway/body/*
Information on Cleveland's project is available at: *http://little.nhlink.net/~rta/ecip/default.html*
[4] Dr. Helen Gault, P. Eng. "Bus Rapid Transit in Canada: Ottawa-Carleton's Transitway System." Paper for Nottingham Transport Conference (1996).

is one lane in each direction, except in the approaches to bus stations where it widens to four lanes. Stations are heated and have plenty of seating; other amenities include video monitors with real-time bus information, pay phones, timetables, and direct-dial phones to OC Transpo.

Yet, the system's success stems from the innovative role that the Transitway plays, not from the station amenities. Like a rail line, the Transitway allows buses to travel unimpeded by traffic. But, unlike a rail system, buses can go onto local arterials and get people directly to their worksites.

For many of their trips, OC Transpo passengers "benefit from fast, reliable service without the need to make a transfer."[5] Furthermore, nearly all major regional employment centers—whether on or off the Transitway—can be reached by no more than one transfer between express buses.[6]

Ottawa's system is superbly adapted to low-density suburbs—by putting stops within walking distance, more people will utilize the service. It's important to note that a rail system with local feeder bus routes would not provide the same caliber of service, as feeder buses require passengers to transfer from the bus to the train, adding time and hassle to the trip.

The Numbers Speak for Themselves

The statistics below illustrate how successful Ottawa's Transitway has been, and why the system is considered to be among the best in North America.

- OC Transpo carries about 320,000 passengers per day—200,000 of whom travel on the Transitway for at least part of their trip—more riders per capita than any similar-size North American transit system, including those with rail.[7]
- During peak commute hours, the Transitway carries about 10,000 passengers per hour, a volume that would require five lanes of freeway lanes if replaced by automobiles. The Transitway, with one lane heading in each direction, is nowhere near capacity: it's estimated that it could handle 20,000 passengers per hour.[8]
- Almost 75% of peak-hour trips to downtown Ottawa are by transit. Although the percentage of suburban shopping and commuter trips taken by transit is lower, this ratio is still as high as the amount of peak-hour trips to the downtowns of many similarly-sized North American cities.[9]
- Transitway operation costs are about half those of the rest of the system. Because buses operate at higher speeds along the busway and are more full, the average cost per passenger trip is $0.56 (1996 US$), compared to $1.13 (1996 US$) for the system as a whole.[10]
- It was estimated in 1996 that if the Transitway didn't exist, OC Transpo would need an additional 150 buses—a 19% increase—just to serve the same number of passengers. This would require $33 million (1996 US$) to purchase the extra buses and an additional $18 million (1996 US$) each year to operate them.[11]
- Between 1975 and 1986, about one-third of the increase in total trips and virtually all new trips to downtown Ottawa were taken on the transit system. In fact, in 1986, fewer cars departed from

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[5] Ibid.
[6] Robert Cervero, *The Transit Metropolis: A Global Inquiry* (Washington, D.C.: Island Press, 1998).
[7] Ibid.
[8] Gault 1996.
[9] Cervero, 1998.
[10] Gault 1996.
[11] Ibid.

downtown during the evening peak period than in 1975. And in 1984, the number of downtown parking spaces had declined by fifteen percent from 1975 levels, even though the amount of office space had nearly doubled.[12]

Table 3.3 Comparing BART to Ottawa's Transitway[13]

	Daily Ridership	Service Area Population	Percentage of Area Population Using Service
Ottawa Transitway	200,000	500,000	40.0%
BART	261,750	3,629,516	7.2%

Promoting Development: Pittsburgh, Pennsylvania

Pittsburgh's MLK, Jr. East Busway demonstrates not only that bus-only roadways can be financially successful (see Table 3.4), but that they are just as capable of attracting development as trains and light rail are.

Table 3.4 The Costs of Operating Pittsburgh's Transit[14]

Per Passenger Figures	East Busway	Remainder of Bus System	Pittsburgh Light Rail
Operating and Maintenance Cost	$0.95	$2.55	$3.22
Operating Subsidy	$0.32	$1.53	$2.31

The East Busway, which attracts approximately 30,000 riders per day, runs 6.8 miles from the eastern suburbs to downtown Pittsburgh and can be traversed in 15 minutes, compared to 52 minutes for buses on adjacent roadways.[15] Built in 1983 at a cost of $113 million, the busway has six stations along its length, none of which have park-and-ride lots. Eliminating parking lots at the stations cut construction and land acquisition costs, and was made possible because buses pick up passengers in local neighborhoods and then enter the busway, greatly reducing the need for passengers to drive their cars in order to reach transit. (The main part of the Coalition's proposal for the Bay Area requires no new construction, only the conversion of existing traffic lanes to bus/carpool lanes.)

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[12] Cervero, 1998.
[13] From December 1995 FTA Transit Profiles, in Thomas A. Rubin and James E. Moore, II, *Rubber Tire Transit: A Viable Alternative to Rail* (Los Angeles: Reason Foundation, 1997) : 9.
[14] Port Authority of Allegheny County, *Light Rail and Busway Statistical Overview (Based on Fiscal Year 1995 Operations)*, (May 1996).
[15] David E. Wohlwill. *Development Along A Busway: A Case Study of Development Along the Martin Luther King, Jr. East Busway in Pittsburgh, Pennsylvania*, (June 1996)

Since it was opened in 1983 there have been 54 developments along the East Busway with a total value of $302 million. Of these, 42 developments (with 58% of the value, or $176 million) are clustered within a six minute walk (1,500 foot radius) of a busway station. Developments encompass a broad range of uses: apartments, townhouses and single-family homes; restaurants, shopping centers, and a supermarket; and offices, medical buildings, and a theater. This development has occurred in the face of declining populations in ten out of twelve communities along the busway.[16]

©Port Authority of Allegheny County

The six East Busway stations have no parking lots because buses pick up passengers in the neighborhood, or passengers can walk to the stations. This cut construction costs.

Based on the success of the East Busway, Pittsburgh is currently constructing a new West Busway and is extending the East Busway an additional 2.3 miles into more distant communities. A bus/carpool lane is used in the northern parts of greater Pittsburgh to cut travel time for buses. The city also has a 4 mile South Busway built in 1977 which attracted high levels of ridership for many years. Throughout the early 1990s the South Busway suffered declining passenger levels, due largely to the deteriorating condition of a bridge along the route; this forced buses to take detours which added eight to ten minutes to the trip time.[17] This demonstrates the importance of fast and convenient trips in attracting transit riders.

©Port Authority of Allegheny County

Pittsburgh's East Busway cuts travel time and operating costs. Passengers save an average of 35 minutes by using the busway, and bus operations and maintenance are about one third of those on the rest of the bus system.

[16] Information in this paragraph from Wohlwill, 1996. (There has been an average population decline of 7.9% in communities along the busway corridor and a 12.8% population drop in the city of Pittsburgh between 1980 and 1990.)
[17] Van Wilkins. "Pittsburgh Plans Busway Expansion," *Bus World* 15:3 (Spring 1993).

Recovering from the Storm: Miami, Florida

The Miami-Dade Busway is located in the southern part of Miami-Dade County. After Hurricane Andrew—the costliest disaster in U.S. history—devastated this part of southern Florida, recovery efforts included plans to extend the Metrorail line south from the Dadeland South station towards Florida City. However, at an estimated cost of $300 million the project was rejected and a busway was ultimately built instead, at a cost of $59.9 million.[18] The project was completed quickly: planning, design, and construction of the nine-mile busway took a little over four years.[19] Although it is difficult to know exactly how long a comparable rail line would have taken to build, it is hard to imagine a rail extension being completed in anywhere nearly as short a time.

©Miami-Dade Transit Agency

The Miami-Dade Busway was constructed faster and cheaper than a comparable rail line.

18 David R. Fialkoff, P.E. The South Miami-Dade Busway: A Transit and Highway Joint Project, (Miami-Dade Transit Agency: 1998).

[19] David R. Fialkoff, MDTA Chief of Service and Mobility Planning. Email correspondence. 10 December 1999.

Chapter 4
County Proposals

PROJECT DESCRIPTIONS

Over the next twenty years, $90 billion of transportation projects and programs will be funded in the Bay Area. These include: transit and highway expansion projects, a few ferry, bicycle and community-oriented projects, and significant funds for simply maintaining and operating our existing roads and transit system. These $90 billion worth of projects all listed in MTC's 1998 *Regional Transportation Plan* (RTP).

The Coalition's proposal for World Class Transit assumes that projects included in the 1998 RTP will be built.[1] The existing infrastructure and 'funded' projects create a baseline that the Coalition proposal assumes will take place. The projects proposed here are *in addition to* this baseline. With billions of dollars of new funding possibilities, the universe of realistic projects were evaluated based on the principles outlined in Chapter 1. For project selection, the two most critical principles are:

- Efficient Investments—projects that would result in the greatest increases in transit ridership (and often the most congestion relief) for the least cost.
- Adaptive Transit—Acknowledging there is no "one-size fits all" solution, and tailoring transit to meet the specific needs of the communities being served.

The outcome of the project selection. The projects listed here would restore and expand urban transit, create a regional web of express buses, and vastly improve the efficiency of existing rail lines.

The projects in this chapter are listed by county. (See Appendix A for a index of projects.) Projects that cut through many counties, or are more regional in nature, are in Chapter Five. These include, lifeline transit services, bicycle and pedestrian projects, Amtrak Capitol Service, and sections that explain the Coalition recommendations to "Optimize-A-Lane" on a number of highways by converting certain mixed-flow lanes, and to improve BART by focusing on the existing system without building any more extensions at this time.

Counties can be found on the following pages:

[1] This Coalition does not support all of the projects in the RTP, for example the Hayward Bypass and Highway 101 auxiliary lanes should be reconsidered and the Coalition is actively opposing them. Yet as a starting point for creating a vision of World Class Transit, it made sense to assume some baseline of projects will be completed. The list of many projects in the RTP is available at MTC or on their web-site.

ALAMEDA COUNTY

Interstate 80	1990	2020	Change	% Change
Total trips	1,937,846	2,583,390	645,544	+33%
Transit trips	53,395	68,380	14,985	+28%
% Transit Share	2.76%	2.65%		-3.94%
Congestion	12,812	82,697	69,885	+545%

(Note: Data in this table is for the Bay Area I-80 corridor, not specifically in Alameda County.)

These statistics were taken from the draft 1998 Regional Transportation Plan. Note that the 1990 numbers are not the same as in Caltrans' highway congestion reports, but are essentially backwards projections (backcasts). This ensures consistency in the model.

"Total trips" represents the total average daily person trips
"Transit trips" represents average daily person trips by transit
"% Transit Share" represents the percentage of total trips in that corridor that are taken by transit
"Congestion" represents the average daily Vehicle Hours of Delay (VHD).

Northern Alameda County developed around the old Key Route system of streetcars. That network had dozens of rail lines in the East Bay, with a network stretching from Richmond to San Leandro. Where San Francisco is an example of the lasting benefits of transit infrastructure, urban Alameda County is an example of the downward spiral of mobility when a community disinvests in transit. But with recent improvements in service, AC Transit is on the rebound and has the potential to become a truly comprehensive transit service for the urban East Bay.

Alameda County also has twenty BART stations, more than any other county in the system. Seismic retrofitting of BART is essential to maintain the safety of the existing system.

Local Bus and Light Rail in Urban Alameda County

AC Transit hit its lowest point in recent times when federal funding cuts forced it to eliminate all night and most evening and weekend service. While the total social and economic costs of these cuts are incalculable, a conservative estimate placed measurable costs at $47 million in 1997, about four times more than the annual savings from cutting service.[2]

In October and December 1999, AC Transit was able to reverse some of these cuts, reinstating ten overnight bus routes, two evening routes, and thirty-one weekend routes. But none of these routes have funding past 2003, and funding for some will run out within two years. Further, the 1999 service reinstatements are not enough to meet the growing needs. The Coalition proposal calls for significant enhancements to AC Transit's local service and enhanced bus service on key corridors.

24/7 Service For the Urban Core

The 1999 service reinstatements include almost no increase in evening service. Too many buses stop at 7:00 pm, and very few run past 10:00 pm. It is a key priority to restore or add evening service on lines that currently have little or no evening service. These service increases would provide service on 30-minute frequencies (or better) on almost all local lines that serve the urban East Bay.

[2] Crain and Associates, Inc. "Using Public Transportation to Reduce the Economic, Social and Human Costs of Personal Immobility. Technical Memorandum #3: AC Transit Service Case Study," May 1997, p. 2-7.

While 1999 service reinstatements renewed daytime weekend service in some areas, other areas still have no weekend service. It is essential to provide weekend daytime service on 30-minute frequencies (or better) on almost routes, and to provide evening weekend service on most local routes.

The reinstated owl service provides a skeletal network of trunk lines and three local lines in Oakland, and this network must be maintained and expanded. In the northern area of the county, it is essential to secure funding to continue and expand existing fixed-route owl service, and allow route deviations on local lines where appropriate. In the central and southern areas of the county, the existing owl route makes only four stops in an eleven-mile route. This service needs to be expanded, possibly by allowing for route deviations or by instituting demand-responsive owl service. The eastern part of the county, with no owl service, would benefit from a dial-a-ride service to provide local trips and connect to the AC Transit owl network.

CAPITAL COSTS:	TBD
TOTAL ANNUAL OPERATING COSTS:	$4.7 MILLION FOR EVENING SERVICE
TOTAL ANNUAL OPERATING COSTS:	$3.5 MILLION FOR WEEKEND SERVICE
TOTAL ANNUAL OPERATING COSTS:	$1.6 MILLION TO MAINTAIN EXISTING OWL NETWORK, TBD TO EXPAND OWL SERVICE

Enhanced Bus/Trolley/Light Rail on Key AC Transit Corridors

Several key corridors in AC Transit's network need a significant upgrade from current service. Existing East Bay service only has four limited stop routes and three express routes; all others are local buses. Significant improvements are recommended for the following corridors:

- East 14th (International Boulevard) / Mission (routes 82, 82L)
- MacArthur Boulevard (57, 58)
- Foothill/Bancroft (40, 40L, 43)
- San Pablo Avenue (72, 72L, 73)
- Broadway/College/University (51)
- Telegraph Avenue (40)
- Mission-South (21)
- Hesperian Boulevard (97)

These corridors should be considered for immediate high quality bus improvements, with possible long-range implementation of electric trolley bus and/or light rail. Improvements in these corridors will foster new development interest, which can in turn revitalize the area, promote more transit usage and help relieve local traffic congestion. High quality bus enhancements should include:

- high-capacity articulated buses,
- increased frequencies,
- bus-only lanes at congested intersections and downtown areas
- pavement changes to improve bus stops (bulb-outs, etc.)
- low-floor buses
- improvements to stops and shelters
- automated vehicle locating and monitoring systems
- traffic signal improvements (including bus preemption)

One corridor—San Pablo Avenue—is already introducing several of these features based on collaborations among the cities along the corridor. Upgraded bus service in the San Pablo and

Telegraph corridors is seen as a viable alternative to construction of a light rail system, which would be significantly more expensive to construct and operate. AC Transit is in the process of a Major Investment Study for the Telegraph, East 14th, and Foothill/Bancroft corridors.

CAPITAL COSTS:
- $90.9 MILLION ($26.4 MILLION FOR BUSES) INCLUDES FOOTHILL/BANCROFT, BROADWAY/COLLEGE/UNIVERSITY, AND EAST 14TH/MISSION CORRIDORS
- $64.4 - $79.9 MILLION ($12.84 - $17.34 MILLION FOR BUSES) FOR SAN PABLO, MACARTHUR AND TELEGRAPH CORRIDORS

TOTAL ANNUAL OPERATING COSTS:
- TBD FOR FOOTHILL/BANCROFT, BROADWAY/COLLEGE/UNIVERSITY AND EAST 14TH/MISSION CORRIDORS
- $2.12 MILLION FOR MACARTHUR CORRIDOR
- $3.92 MILLION FOR SAN PABLO/TELEGRAPH CORRIDORS

Note: $57.4 million in regional discretionary funding is available in MTC's 1998 Regional Transportation Plan for enhanced AC Transit bus service along San Pablo Avenue and for new transit centers.

Express Buses From Urban Alameda County to San Francisco

Increase Frequencies on Existing Transbay Express Buses

The Transbay corridor is the most heavily traveled corridor in the entire Bay Area. Moving additional people through this corridor is crucial to maintain the vitality of downtown San Francisco. It is essential to expedite the movement of express buses across the Bay Bridge. An additional 80 buses per hour could carry up to 4,000 people – the same as adding two entire lanes of mixed-flow traffic – but without requiring a dime to build any new lanes.

Improving bus flow on the bridge would increase service reliability and transit ridership and reduce transit costs. The most promising options are to create a bus-only lane on the bridge (following models described in Chapter 3) and to improve metering lights.

To meet rising demand and offer more convenient service, AC Transbay bus service frequency should be increased as follows:

Increase Frequency on AC Transbay Routes

AC Transbay Route	Current Headways (minutes)		Proposed Headways (minutes)	
	Peak	Mid-Day	Peak	Mid-Day
F	20-45	30	15-30	15
G	30	--	30	60
H	45	--	30	60
O	10-60	45	10-30	30
S	30-45	--	15	60
W	15-45	--	15-30	60
Y	25	--	15	60

CAPITAL COSTS: $4.18 MILLION
TOTAL ANNUAL OPERATING COSTS: $3.6 MILLION

New Express Buses for I-80 HOV Lane Service

Along I-80, from the Route 4 intersection all the way to the Bay Bridge, AC Transit Transbay buses already utilize the HOV lane to cut their travel time. Express bus service should be upgraded and expanded along the I-80 corridor from communities in Alameda County to San Francisco. Provide 10 minute peak period service between Albany, Berkeley, Emeryville and San Francisco (15 buses).

FOR ESTIMATED COSTS SEE SOLANO COUNTY SECTION

Tri-Valley And I-580 Corridor

Interstate 580	1990	2020	Change	% Change
Total trips	732,524	1,212,839	480,315	+66%
Transit trips	14,107	16,850	2,743	+19%
% Transit Share	2%	1%		-27.86%
Congestion	6,200	37,783	31,583	+509%

The Tri-Valley area (Livermore/Dublin/Pleasanton/San Ramon) has recently received rail relief in the form of BART and the Altamont Commuter Express (ACE) train. Yet ACE service is unlikely to expand beyond 6 trains and BART doesn't reach many of the new sprawling jobs centers. With little space left to expand, it is time to look at using the existing infrastructure much more efficiently.

I-580's carpool lane, which could have offered relief congestion and quicker commutes to those in a carpool, vanpool or bus, were eliminated soon after new lanes were added in the early 1970s. The elimination of the carpool lane may have made sense at the time given that there was little congestion, and therefore little incentive to carpool. Now, however, traffic congestion is severe and growing worse (see table above).

Create a Demand-Responsive Express Bus and Vanpool System

This area is perfectly suited for an express bus network because most of the adjoining highways are also slated for carpool lanes in the near future and many principal destinations (such as those along I-680) are not located near rail lines.

While LAVTA has pioneered subscription buses in the Bay Area, there would be little point to additional buses without converting lanes on I-580. By creating a time advantage, destinations that are not directly on the BART line—whether Cal State Hayward or the burgeoning corporate parks in Fremont—could quickly be reached. Additional express shuttles between communities in Livermore and the Dublin/Pleasanton BART station could reduce I-580 peak traffic and reduce the need for a Livermore BART extension.

CAPITAL COSTS: $2 - $4 MILLION (BUSES AND SHUTTLES)
TOTAL ANNUAL OPERATING COST: $0.7 - $1.4 MILLION[3]

[3] Not a project in MTC's draft *Blueprint*. Specific mix of buses, vans and routes would be based on employee/destination surveys.

Enhance Rapid Bus Service on Stanley Boulevard in Livermore and Pleasanton.

This improvement would create fast service between the Tri-Valley's two largest cities. In MTC's *Draft Transportation Blueprint for the 21st Century*, the proposed peak headways are 10 minutes on the W10, or 6 buses per hour. This service, more frequent than BART service at Dublin, is what is needed to make the route realistically competitive with the automobile.

CAPITAL COSTS: $2.11 MILLION FOR SIX BUSES
TOTAL ANNUAL OPERATING COSTS: $870,000

West Dublin BART station

The current proposal for an additional BART station at West Dublin is worthy of support as it begins BART's turn towards joint development at their stations. The project proposal includes a convention center, hotel and meeting facilities adjacent to the station. This project could prove that transit-oriented development is not only a smarter way to grow but can relieve taxpayer burdens, since the developer helps to pay for the station.

The station should be designed to handle large volumes of shuttles and buses for riders from the San Ramon Valley and West Dublin. BART should also consider charging market prices for parking in order to help pay for the shuttles. This could mitigate traffic increases on local roads by reducing the number of drivers and ensuring there is not overflow into the surrounding area.

CAPITAL COSTS: $43 MILLION
TOTAL ANNUAL OPERATING COSTS: N/A

No BART Extensions

Except for a few basic rail upgrades, such as additional ACE service, this corridor will not see major rail improvements. The enormously expensive proposal for BART to Livermore, now estimated at $800 million to $1 billion, would not add substantial new ridership to the system. Consideration of creating a "seamless" connection between BART and ACE in East Livermore ignores the fact that ACE only runs two trains a day, increasing to three (and at most six) in the near future. Further, San Joaquin Express Bus service could get people to Dublin/Plesanton BART quickly and easily.

I-880 Corridor

Interstate 880	1990	2020	Change	% Change
Total trips	2,570,704	3,153,956	583,252	+23%
Transit trips	98,924	124,809	25,885	+26%
% Transit Share	3.85%	3.96%		+2.83%
Congestion	10,670	26,764	16,094	+151%

Employer Shuttles to and from BART Stations

Employer-centered shuttle buses from the Hayward, South Hayward, Union City, and Fremont BART stations could provide transit service to the existing low-density business parks in Alameda County, expanding usage of each BART station significantly.

New employer shuttles can follow the successful model VTA has pursued with shuttles from light-rail and ACE stations in Santa Clara County, where 18 shuttles provide 500,000 trips per year at an average cost of $2.50/ride. BART and local bus operators around each station need to work with employers around suburban BART stations to identify and design new routes, typically involving a few employers in a small area up to a few miles from the station.

CAPITAL COSTS: $700,000
TOTAL ANNUAL OPERATING COSTS: $35,000 (20 SHUTTLE ROUTES)[4]

Improved Transit Connection from BART to the Oakland Airport

As Oakland Airport continues to grow in importance and passenger volume, a quicker connection from the Coliseum BART station to the airport is needed. A number of options have been proposed and a study should be conducted to compare transit alternatives on the basis of common criteria.

The primary proposal, in MTC's *Draft Transportation Blueprint for the 21st Century*, is to construct an exclusive transit guideway over the three-mile distance between the station and the airport. With a capital cost of $130 million and unknown operating costs, there may be more cost-effective alternatives that can also provide local transit service with stops along the way.

One cost-effective alternative is a "quality-bus" from BART to the airport, including stops along the way for East Oakland residents and workers. This alternative would have elevated platforms and low-floor buses to allow no-step boarding, use the right turn lane and preempt traffic signals to quickly bypass intersections, and slight modifications to roadway configurations to improve transit flow.[5] Buses would be cheaper and more flexible than rail, and the money saved could be used to strengthen local bus service throughout Oakland, particularly access to job sites in East Oakland. If the Port of Oakland insists on a fixed-rail project that does not have intermediate stops, equity and fairness require that project costs be borne by air travelers.

CAPITAL: $130 MILLION FOR FIXED-GUIDEWAY RAIL SYSTEM,
$30 MILLION (1998$) FOR QUALITY BUS
TOTAL ANNUAL OPERATING COST: TBD

Improved Access to Cal State Hayward (CSUH)

Improved transit access to California State University, Hayward (CSUH) is necessary to meeting the growing demand for attendance. About 5,000 people need to travel to the campus at all different times of the day, providing day-long transit demand. Another 1,000 come from the Tri-Valley area.[6] Current service to the campus by BART, AC Transit, and the Hill Hopper is slow and limited. The Hill Hopper does not run most of the day and the AC Transit 92 bus takes a roundabout, slow route to the campus. Many people are already riding transit to the campus despite the poor service. There is clearly great potential to improve ridership with better service.

Currently, many students and staff lose time looking for parking spaces and walking in from crowded parking lots at the outer edges of the campus. Two alternatives would offer a more convenient alternative: electric trolley buses or quality bus improvements. Access to CSUH requires

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[4] Coalition estimate based on MTC Blueprint costs for exployer shuttles in Contra Costa County.

[5] Sherman Lewis, "Pros and Cons of OAC, the BART Oakland Airport Connector", July 25, 1998.

[6] CSUH, "Access statistics," Haystac, for 1995.

climbing steep hills, so the power of an electric trolley bus, combined with lower operating costs, make it the more attractive long-term option. However, high capital costs may mean that quality bus improvements are more appropriate in the near-term.

Quality bus requires raised sidewalks at stops, low floors, wide doors, lane preference signal preemption, and proximity card (or barrier free) fare collection for faster boarding. It requires more level travel lanes and better paving. A limited-stop route would be timed to meet BART trains at the Hayward station (15-minute frequency on weekdays), thus encouraging BART ridership by students, making more efficient use of the parking structure at the station, and supporting downtown Hayward's transit-oriented development.

CAPITAL COSTS: $2 - 2.5 MILLION (3 BUSES AND LOCAL IMPROVEMENTS)
TOTAL ANNUAL OPERATING COSTS: $400,000 TO $650,000[7]

Union City Intermodal Station

The convergence of BART, Amtrak's Capitol Corridor, and future VTA commuter rail service make the existing BART Union City station a prime location for the development of an intermodal station. The existence of vacant or underdeveloped land adjacent to the station provides an opportunity to plan and implement land uses—such as a transit village—that could generate transit patronage. A project to Improve AC Transit bus access to BART is already partially funded and being implemented.

CAPITAL COSTS: $30 MILLION (1996$)
TOTAN ANNUL OPERATING COSTS: N/A

[7] Capital and annual operating costs are Coalition estimates based on project concept proposed by Sherman Lewis, 1999.

CONTRA COSTA COUNTY

State Route 4	1990	2020	Change	% Change
Total trips	597,154	1,123,367	526,213	+88%
Transit trips	6,405	12,022	5,617	+88%
% Transit Share	1.07%	1.07%		-0.22%
Congestion	4,772	32,356	27,584	+578%

Interstate 680 North	1990	2020	Change	% Change
Total trips	1,400,760	2,101,974	701,214	+50%
Transit trips	15,454	17,807	2,353	+15%
% Transit Share	1.10%	0.85%		-23.21%
Congestion	9,256	52,852	43,596	+471%

Even the significant investment in the construction of a new BART line did not prevent Contra Costa from sprawling into an extremely auto-dependent county. But now, growing opposition to continued development in remaining open space, combined with intense traffic congestion, has led to a call for a building moratorium in East County. This is creating an unprecedented window of opportunity for both more compact transit-oriented development and a similar increase in travel choices via investment in buses and shuttles. An impressive and growing bicycle path network will also tie into many of the bus lines and existing BART stations.

Limiting Traffic Flow Into the County

A key issue for Contra Costa residents is how additional traffic flow into the county will be addressed. Maintenance of the current size of existing "gateways" into the county would slow increases in traffic congestion. For example, building two new lanes in a fourth bore of the Caldecott Tunnel for reverse commuters (as is proposed) would bring up to 4,000 additional vehicles per hour from Alameda County to Contra Costa County roads. The new lanes would not help most county residents, since the tunnel will remain just 4 lanes during the eastbound morning commute and the westbound evening commute.

In order to prevent I-680 and other roads from becoming gigantic parking lots, key gateways such as the Caldecott Tunnel and Route 4 East should not be expanded beyond what is currently called for in the *Regional Transportation Plan*. The large sums that would be spent on such expansions should instead be used to greatly increase incentives and services for out-of county commuters to use transit and other alternatives.

Transit Alternatives to the Caldecott Tunnel Fourth Bore

The Metropolitan Transportation Commission is currently overseeing the "Route 24/Caldecott Tunnel Corridor Study," which may be finished by May 31, 2000. Coalition members have been advocating for transit alternatives to a fourth bore that would help bring in more employees without

further congesting Contra Costa roads and adding to severe summer air pollution. In a recent survey conducted for MTC, the three top reasons reverse commuters did not use transit were:

- long travel time,
- trip destination not accessible by transit, and
- transit was more expensive.[8]

The proposals below would address all three of these issues by increasing point to point service, adding service to activity centers not currently reachable by transit, and making transit inexpensive or free for residents.

Ridership on the Pittsburgh/Bay Point line is about 14,000 passengers in the 3-hour peak direction of travel (i.e. to San Francisco and points west in the morning) and just 3,000 in the reverse commute.[9] Filling the BART trains in the reverse commute direction would move almost as many people as building a new bore. A number of programs could combine to entice commuters onto this route including additional coordinated employer shuttles and free BART and bus passes. More frequent trains, soon to be made possible with the use of advanced train technology, will also facilitate this reverse commute.

Employer Shuttles to and from Contra Costa BART Stations

Employer shuttle buses from the Walnut Creek, Pleasant Hill, and Concord BART stations will serve growing employment centers as well as travel from nearby neighborhoods to employment centers. There is a potential for flexible-route "smart" shuttles which could serve multiple origins and destinations, instead of a fixed-route service. In MTC's *Draft Transportation Blueprint for the 21st Century*, ten employers would be involved starting with shuttles from Walnut Creek—with one shuttle for each employer—and shuttles would be free. The Coalition calls for higher levels of service from all three stations. (Walnut Creek, Pleasant Hill, and Concord.) Service should be analyzed yearly for route changes and additions.

CAPITAL COSTS: $700,000 (20 SHUTTLES)
TOTAL ANNUAL OPERATING COSTS: $35,000[10]

Free Transit Passes for Reverse Commuters

Transit agencies, elected officials and large business in the region should collaborate on a "CoCo" Eco Pass. Emulating the successful program in Santa Clara, employers would pay a minimal yearly fee per employee to have all their workers able to ride transit absolutely free, all of the time. Some companies in Santa Clara County have seen transit ridership double with the introduction of Eco Pass. Combined with increased transit and employee shuttle services, this program would entice a significant number of drivers off the Contra Costa roads and make room in the reverse commute through the Caldecott Tunnel. Any public cost of such a program would be easily offset by the savings from not having to build a fourth bore and from reduced congestion. (See Chapter 7 for other economic incentives to encourage the use of transit.)

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[8] Metropolitan Transportation Commission, *Draft Existing Conditions Report*, a part of the Route 24/Caldecott Tunnel Study (September 22, 1999).

[9] Ibid.

[10] The number of shuttles and costs is double the number proposed in MTC's draft *Blueprint for the 21st Century*.

CAPITAL COSTS: N/A
TOTAL ANNUAL OPERATING COSTS: $0 (DESIGNED TO BE REVENUE NEUTRAL FOR TRANSIT OPERATORS.)

Add Bus/Carpool Lane On Existing Tunnel Approaches

This option is being examined as part of the current Route 24 study. This low-cost improvement is critical for moving more people through the tunnel without increasing congestion on adjacent roads. It adds an important choice to commuters who now have no choice but to sit in congestion, even if they carpool or vanpool. It is also critical for the success of the express buses proposed below.

CAPITAL COSTS: TBD

Express Bus and Vanpools Through Caldecott Tunnel (Reverse Commute)

For Alameda County residents who do not live near a BART station and whose work in Contra Costa is not near a BART station, bus and vanpool service through the tunnel can create direct one-transfer service. This service can also help avoid the need to increase parking at BART stations by bringing transit service within walking distance of people's homes.

CAPITAL COSTS: $3.9 MILLION
TOTAL ANNUAL OPERATING COSTS: $960,000

Express Buses on Contra Costa's HOV Lanes

Express Bus Service on Route 4 HOV Lanes (East County to Pittsburgh/Bay Point BART)

By using HOV lanes on Route 4, express bus service would compete well with the travel time of single-occupant vehicles and eliminate the time spent looking for parking upon arrival at the BART station. Peak period service will operate on 15-minute headways from Brentwood, Oakley and Antioch to the Pittsburgh/Bay Point BART station.

CAPITAL COSTS: $2.8 MILLION FOR BUSES
TOTAL ANNUAL OPERATING COSTS: $650,000

Subscription Bus Service on Vasco Road to I-580 (Brentwood/Antioch to Tri-Valley)

This service would provide four morning and four evening trips (until demand increases) to the Tri-Valley area with stops at Livermore Lab, Sandia Lab, and the Dublin BART station. The service would be subscriber-based with monthly passes; single daily trips would be provided on a space-available basis. The buses would be comfortable with airline-style seats and would use drivers employed at a site in the Tri-Valley, thereby allowing the bus to stay parked in the Tri-Valley until the return trip in the afternoon.

CAPITAL COSTS: $3 MILLION
TOTAL ANNUAL OPERATING COSTS: $192,000

New Express Buses for I-80 HOV Lane Service

Upgrade and expand express bus service using the I-80 HOV lane from communities in Contra Costa County to San Francisco and the El Cerrito del Norte BART station. Express bus service in the I-80 corridor would be increased to 30 minute service between the Crockett/Hercules area and

San Francisco. In addition, 15 minute peak period service between Crockett, Hercules and El Cerrito del Norte BART should be provided.

FOR ESTIMATED COSTS SEE SOLANO I-80 BUS SECTION

Express Bus Service From Solano to Contra Costa County Along I-680

For details see Solano County section.

New and More Frequent Buses and New Lines on Major Arterials

West Contra Costa Intercity Bus Service

West Contra Costa County including the towns of Hercules, El Sobrante, Crockett, Richmond and Martinez have older urbanized areas that could support frequent transit service, and the relatively low car ownership in these areas makes these proposed services important for expanding access to jobs and education for many residents.

- Provide 15 minute service in peak and 30 minutes in midday between Hercules and Del Norte BART (BART Express, Route J)
- Provide 30 minute service in peak and midday between El Sobrante and San Francisco (AC Transit, Route L)
- Provide 30 minute service in peak and midday along WestCat Route 30Z (Richmond/Martinez/SR 4)
- Provide 15 minute service in peak and midday between Crockett/Hercules/Berkeley (AC Transit, new route)
- Provide 15 minute service in peak and off-peak from Crockett to Hercules (WestCat, Route 11)
- Provide 15 minute service in peak and 30 in midday between Hercules and San Francisco (AC Transit, new route)

CAPITAL COST: $5.28 MILLION
TOTAL ANNUAL OPERATING COSTS: $3.72 MILLION

Improved Bus Transit on San Pablo Dam Road (San Pablo to Orinda)

Transit riders in this increasingly busy corridor must transfer to go from Orinda BART to San Pablo. This service would provide key direct service for low income areas of West County and job centers in Central County. Service would be at least every 30 minutes on-peak and every 60 minutes in off-peak hours.

CAPTIAL COSTS: $1.2 MILLION (4 BUSES)
TOTAL ANNUAL OPERATING COSTS: $560,000

MARIN AND SONOMA COUNTIES

Golden Gate Corridor	1990	2020	Change	% Change
Total trips	1,752,448	2,550,529	798,081	+46%
Transit trips	58,652	80,232	21,580	+37%
% Transit Share	3.35%	3.15%		-6.01%
Congestion	9,115	36,710	27,595	+303%

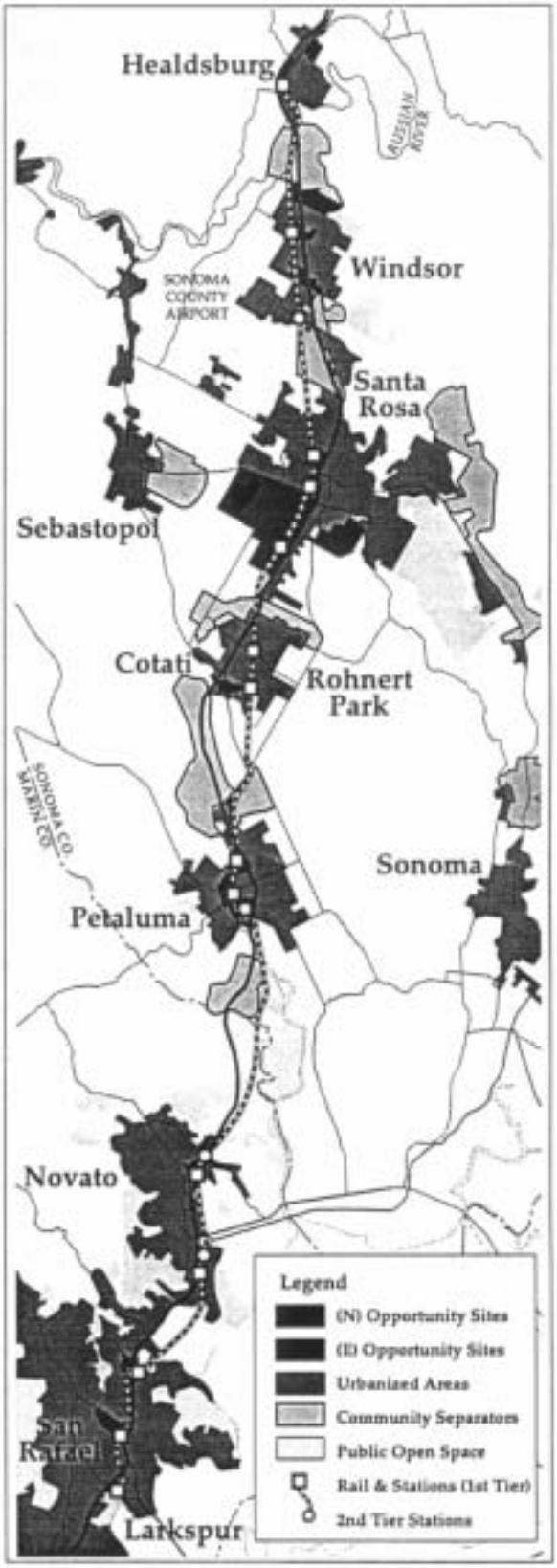
Unlike other Bay Area counties, Marin and Sonoma share one common highway as well as a rail line which has the potential to carry commuter rail passengers. Most of the towns in Marin and Sonoma also share similar patterns of development, having grown up in the early 20th century around the stations of the Northwestern Pacific Railroad. While the advent of the automobile and the freeway led to suburban sprawl development following World War II, these towns have retained their downtowns and their unique characteristics.

Recent planning efforts have focused on infill development in the downtowns of San Rafael, Petaluma, Cotati, Santa Rosa and Healdsburg. Long-standing urban growth boundaries in Marin County, coupled with a recent series of successful Urban Growth Boundary (UGB) initiatives in Sonoma County, have resulted in strong land use protection for agriculture. Unlike anywhere else in the Bay Area, the combination of these two trends and the area's historic rail-based legacy could result in breaking the pattern of sprawl development, if sufficient non-auto-dependent mobility can be achieved. This will take a significant investment in rail, along with feeder bus and bicycle routes, combined with focused redevelopment of the station areas.

Marin and Sonoma are now highly auto-dependent, with widely dispersed land uses and poorly funded local transit systems. The inconvenience of infrequent service means that buses are used principally by passengers without other options. Highway 101 serves as the main street of both Marin and Sonoma counties. It carries local traffic for short trips, as well as through traffic on long distance trips. While HOV lanes have been built from Mill Valley to Novato, with the gap in San Rafael to be closed soon, the highway in Sonoma has the same capacity as it had in the 1950's, despite a massive increase in population.

The 1997 Sonoma/Marin Multi-Modal Transportation and Land Use Study (the Calthorpe Study) proposed that much of the region's planned future growth be accommodated in mixed-use transit villages convenient to rail stations. Walking, bicycle and commuter rail would provide a substantial portion of everyday transportation needs. The armature for this proposed transit-oriented development would be the restoration of rail passenger service on the Northwestern Pacific. The Sonoma Marin Area Rail Transit agency (SMART) is now developing a start-up operational plan. Meanwhile, forces allied with the paving industry have pushed for widening Highway 101 between Novato and Petaluma, a project rejected by the Calthorpe study as too expensive. Costing more than the rehabilitation of the entire Cloverdale-to-San Rafael rail infrastructure (which runs parallel to the highway), the widening of this short bottleneck stretch of highway would be a major obstacle to the needed change in travel habits that new rail systems require to be successful. It would instead encourage a continuation of the status quo, with more long-distance auto commuting, congestion, air pollution and suburban sprawl. The North Bay's future land use pattern will depend, in significant part, on how this important transportation decision is made.

The rail line will only be truly successful if localities commit to increased mixed-use development both at station areas and in the environs. Such development will make the trains more cost-effective by guaranteeing higher patronage. Compact growth will preserve open space and make vibrant communities. For that reason, the Coalition recommends that commitments for supportive land use accompany the rail proposal.



New Commuter Rail Service

- Cloverdale to downtown San Rafael.
- 30 minute peak service at start up, with more frequent service later.
- FRA-compliant diesel multiple unit cars.
- future expansion phase to Larkspur Ferry Terminal or possible new ferry terminal at San Quentin.

- limited station parking lot capacity, to encourage arrival by non-auto modes.
- station area densities are somewhat higher than typical suburban patterns and include residential, commercial and retail uses.

Many major employers are located near the proposed rail stations. Others can be reached via shuttle buses. The start up system would be useful in providing reduced stress commutes, bypassing both the existing congestion in Sonoma and the exacerbation that will be caused by HOV lane construction. Trains would fly by congestion in north San Rafael and Novato. Given the current land use pattern, it is likely that Highway 101 will always be congested. However, a convenient rail/bus/van system will allow residents to opt out of congestion, while reducing congestion on parallel arterials.

This system would be a long-term investment in the future of the region. While useful to current commuters, it will be the fabric of everyday life for residents of future transit villages. The availability of convenient transit, coupled with appropriate land use planning, will shift future development towards sustainability, with less auto use, less energy consumption, less greenhouse gas emissions, and less conversion of open lands to sprawl development.

CAPITAL COSTS: $101 - $131 MILLION (HIGHER FIGURE INCLUDES EXPANSION TO LARKSPUR)
TOTAL ANNUAL OPERATING COSTS: $5.4 - $12.5 MILLION

Note: MTC's 1998 Regional Transportation Plan contains committed funding for acquiring and upgrading rail station sites for future commuter rail service.

Expanded Express And Inter-City Bus Service

Golden Gate Transit already operates express bus service from Marin and Sonoma counties to San Francisco. This project would increase the frequency of Golden Gate Transit's express and inter-city service, as well as Sonoma County Transit's inter-city service. Bus service could be implemented more quickly than rail service, and would serve as a complement to commuter rail when passenger trains begin to roll.

Potential frequency improvements could be implemented as follows:

Service	Peak Frequency	Off-Peak Frequency
GGT Sonoma/Marin to San Francisco		
Routes 71, 78, 90	30	60
Route 80	15	15
GGT Marin to San Francisco/East Bay		
Route 20	15	30
Routes 30, 51	60	
Routes 40, 50	15	15
Route 70	30	30
GGT Marin Inter-City		

Routes 1, 21, 23	15	15
Sonoma County Transit		
Routes 30, 40, 44, 48, 60	30	60

CAPITAL COSTS: $20.8 MILLION
TOTAL ANNUAL OPERATING COSTS: $17.7 MILLION

Enhanced Local Bus Service

Extensive network of fixed route feeder buses and demand-operated community shuttle vans brings passengers to rail stations, employment sites, hospitals, schools and shopping in Marin and Sonoma counties.

Feeder bus and community shuttle vans will make non-auto travel convenient for current residents, who otherwise would have to drive to reach their destinations. It will improve mobility for the large number of people too young, poor or frail to drive, while reducing the congestion caused by the family chauffeur (and their time spent transporting family members).

CAPITAL COSTS: $11.62 MILLION
TOTAL ANNUAL OPERATING COSTS: $3.7 MILLION

No New Highway Widening

- Restricted to HOV lanes only.
- No new mixed flow lanes.
- No new auxiliary lanes.
- Retain the current highway capacity between Marin and Sonoma, while making safety improvements.

Future transportation funds should support rail and bus service, rather than adding highway capacity. It is essential to avoid widening of Highway 101 between Novato and Petaluma, in order to limit long distance auto travel at peak hours and encourage use of alternative modes.

NAPA COUNTY

Napa Valley	1990	2020	Change	% Change
Total trips	314,876	496,800	181,924	+58%
Transit trips	2,906	5,739	2,833	+97%
% Transit Share	0.92%	1.16%		+25.17%
Congestion	152	4,844	4,692	+3807%

Increase Express Bus Service to BART Link/Vallejo Ferry

This project provides improved connections to regional transit. Express bus service will connect to BART Link and Ferry Terminal in Vallejo via Route 29. Service will increase from eight to fifteen round trips per day, helping Napa Valley Transit increase its 30% farebox recovery ratio—which is already an excellent figure for rural/suburban transit.

CAPITAL COSTS: $450,000 (1 BUS)
TOTAL ANNUAL OPERATING COSTS: $150,000

Express Bus Service to San Rafael and San Francisco

Express bus service should be started to the San Rafael Transit Center and San Francisco Transbay Terminal via the Golden Gate Bridge. This could provide zero or one-transfer transit for Napa residents to most activity centers in the Bay Area. Reverse service could be marketed to tourists interested in attending wineries in Napa.

CAPITAL COSTS: $1.25 MILLION (4 BUSES)[11]
TOTAL ANNUAL OPERATING COSTS: $375,000

New Express Bus Service Between Fairfield and Napa via Route 12

There are no transit alternatives in this corridor to serve growing commute and recreational travel. New express bus service is intended to primarily serve commuters between Napa and Solano Counties, and would operate between Fairfield and Napa on 60 minute headways.

CAPITAL COSTS: $1.05 MILLION
TOTAL ANNUAL OPERATING COSTS: $278,000

Note: MTC's 1998 Regional Transportation Plan contains committed funding for the Trancas intermodal facility and a new transit service center, both in the city of Napa.

[11] This project is not listed in MTC's draft *Blueprint for the 21st Century*.

SAN FRANCISCO

San Francisco	1990	2020	Change	% Change
Total trips	3,019,697	3,692,549	672,852	+22%
Transit trips	586,163	669,917	83,754	+14%
% Transit Share	19.41%	18.14%		-6.54%
Congestion	10,739	24,856	14,117	+131%

San Francisco has the most convenient and walkable neighborhoods and the most comprehensive transit system in the Bay Area. These compact, mixed use communities don't just promote transportation options, they are proof that transit-oriented designs can make great communities and are a large part of what makes San Francisco a world class city.

Even so, the San Francisco Municipal Railway (Muni) is struggling to stay ahead of increasing congestion on city streets. Because the majority of Muni vehicles operate on the streets and share space with automobile traffic, increased automobile congestion reduces Muni's speed and effectiveness; And, as riders increasingly switch to car travel to make up for lost time, the problem is compounded by even worse congestion.

By all estimates, congestion will continue to increase in San Francisco. Significant capital investment in dedicated right-of-way projects is essential to the maintenance of Muni's service and trip share, and ultimately to keeping San Francisco a truly world class city that offers fast transit between its four corners.

The Coalition supports a wide range of proposals, some simple but requiring political will and others that require tremendous new infusions of funds, that combined can bring back a great transit system, and improve quality of life in the city by reducing auto traffic and congestion.

Expand Muni Bus Services

Expanded Muni Rapid Bus Corridors

Muni has recently implemented a partial bus-priority lane on Third Street. They have measured time savings of 10%- 45%. This was done as a demonstration project, and simply required repainting the existing lane.

Expanding the bus corridors would provide enhanced services between outer quadrants of the City and downtown. It is a cost effective way to improve transit capacity and it improves citywide service. It would also improve citywide service coverage and transit connections. This project is meant to reduce headways and add new express service on select Muni Routes. Key Muni routes improved include: 9, 14, 7, 16, 28, 38, 42, 45, 47, and 49.

Most Bus improvements involve reducing peak and mid-day headways on existing Muni routes by 2 to 5 minutes. Some new service is added.

CAPITAL COSTS: $31.6 MILLION (84 BUSES)
TOTAL ANNUAL OPERATING COSTS $22.3 MILLION

Conversion To and Extension Of Electric Trolley-Bus routes

The electrification of diesel bus lines reduces noise, improves air quality, and reduces operational costs. The extension of service into the Presidio will support an increase in demand associated with the National Park conversion.

This project would electrify Muni bus service on three main routes:

- 71-Haight/Noriega
- Extension of 41 Union and 45 Union/Stockton into the Presidio
- Extend 33 Stanyan over Potrero along 48 Quintara

CAPITAL COSTS: $16 MILLION (MUNI 1997 SRTP)
TOTAL ANNUAL OPERATING COSTS: $10.90 MILLION

Note: $56.1 million in regional discretionary funding is available in MTC's 1998 Regional Transportation Plan for Muni replacement and rehabilitation projects, including line 41 and 45 extensions to the Presidio.

Build New Muni Light Rail

An expansion of the Muni Metro along the Bayshore, Geary, North Beach, and Van Ness corridors will significantly widen the scope of the light-rail system, improving north/south cross-town connectivity and providing more efficient service along these heavily traveled routes. These improvements (known as the "Four Corridor Plan") will provide dedicated right of way along these routes to increase the reliability and speed of service and increase transit ridership. These improvements will be integrated with community revitalization projects.

CAPITAL COSTS:
GEARY CORRIDOR – $600 MILLION*
NORTH BEACH CORRIDOR – $900 MILLION*
VAN NESS CORRIDOR – $675 MILLION*
*THESE FIGURES FROM MTC'S *DRAFT TRANSPORTATION BLUEPRINT FOR THE 21ST CENTURY* MIGHT BE CONSERVATIVE.

Note: Bayshore (Third Street) has committed funding in MTC's 1998 Regional Transportation Plan.

Caltrain Downtown Extension

The most important rail upgrade for the entire Bay Area is to drastically increase service on Caltrain. A crucial link is to complete the rail line, which now stops at 4th and King Streets, by bringing it to downtown. In November, 1999, San Francisco voters supported this project by a 69% to 31% margin. The Coalition supports a host of other Caltrain improvements that could make frequencies as little as every 5 minutes in peak times. For detailed descriptions and costs, see the San Mateo County/Peninsula Corridor section below.

Transbay Terminal Improvements

Built in the 1930s as the East Bay rail terminus, the Transbay Terminal today serves as a major center for Muni, AC Transit, Golden Gate Transit, SamTrans and Greyhound. The terminal is located only a few blocks from a large concentration of regional employment, and is close to shopping and eating establishments. However the terminal is also old, dirty, and confusing with

poor signage and dark areas that are a security problem at night. Added confusion for passengers has been the recent relocation of Golden Gate Transit and SamTrans buses from inside the terminal to poorly marked areas outside.

A number of major improvements have been recommended for the terminal. The Coalition supports improvements to the terminal if the following conditions are met:

- AC Transit operations should not be adversely affected as AC Transit riders constitute the greatest customers of the terminal today and in the foreseeable future.
- Improvements should accommodate extensions of Caltrain, and other rail service. Access should be assured from the Peninsula and from any position on the Bay Bridge.
- The surrounding property should be developed in a way that financially supports the reconstruction of the terminal. Estimates for the value of the property surrounding the terminal is in the neighborhood of $400 million.

  CAPITAL COSTS: $130 MILLION
  IMPROVEMENTS TO THE TERMINAL COULD BE FUNDED THROUGH PROCEEDS FROM THE $1 BAY BRIDGE TOLL SURCHARGE. THIS IS ALREADY PERMITTED UNDER STATE LEGISLATION.

Transit-Oriented Urban Communities Plan

The Planning Department has recently launched a planning effort focused on coordinating land use planning along key transit corridors and nodes. The department's first three plans will be for the Central Waterfront, Upper Market/Hayes Valley and Balboa Park BART/Muni Station. The Planning Department intends to have a community planning process for development around these corridors with the purpose of creating Specific Plans. The department hopes that the Specific Plans will improve the development process and encourage developers to build at these nodes or corridors. The Coalition will actively support this program.

Non-vehicle Improvements for Muni Buses

Transit-Preferential Streets

San Francisco has a program called transit-preferential streets (TPS) which makes improvements to high-frequency bus and rail corridors. The project does not have a lot of attention or funding, but should receive more. One example project is on the N-Judah line which carries roughly 35,000 passengers per day. Muni should conduct a corridor analysis and develop a capital program to improve the line. This should include signal preemption for light rail vehicles (LRVs), installing LRV turn signals and pedestrian signals at key intersections, and replacing stop signs with LRV signals at selected intersections. These capital improvements could also be used on other key corridors.

CAPITAL COSTS: COSTS WILL VARY DEPENDING ON THE NUMBER OF STREETS, AND WILL BE LOWER IF RESTRIPING IS DONE IN CONJUCTION WITH REPAVING.

NextBus Implementation

NextBus GPS (Global Positioning Satellite) technology, providing service updates and arrival predictions at transit stops as well as real-time oversight for Muni, will simultaneously improve rider satisfaction and help Muni to reduce service delays.

CAPITAL COSTS: $6.5 MILLION

SAN MATEO COUNTY (PENINSULA CORRIDOR)

Peninsula	1990	2020	Change	% Change
Total trips	3,258,617	4,225,344	966,727	+30%
Transit trips	104,188	154,068	49,880	+48%
% Transit Share	3.20%	3.65%		+14.04%
Congestion	14,624	35,729	21,105	+144%

The majority of San Mateo County residents commute south to Santa Clara County or north to San Francisco. Caltrain serves as a vital transit backbone for this north-south movement on the Peninsula. In the next 10 years, the number of Silicon Valley jobs is projected to grow by 200,000. The ability of Caltrain to serve as a fast, pleasant, and convenient commute option to attract more riders will be increasingly important. Some trains are standing-room only along portions of Caltrain's route during the commute hours, and cyclists are regularly denied boarding with their bikes due to full capacity. Additionally, Caltrain has a constituency reaching beyond commuters, with a large increase in off-peak ridership in recent years to destinations such as the San Jose Arena. The new Giants' baseball stadium and other developments in southeastern San Francisco area promise to attract many more new off-peak and occasional riders. Both frequency and capacity of the Caltrain must be increased throughout the day and on weekends to meet the demand.

Another major issue is accessibility for non-driving residents. SamTrans recently made bus service cuts that elicited strong protests from seniors and parents of schoolchildren. It is critical that service be reinstated to serve these and other transit users who depend on this service.

Caltrain Improvements

With the opening of BART to Millbrae and San Francisco Airport some decision-makers are questioning whether Caltrain should just whither away to make room for BART down the Peninsula. The push for BART can be so strong that without any data showing strong ridership, two San Mateo County leaders tried to get an initiative passed that would raise the sales tax to further extend BART.

The Rapid Rail Study recently completed by Caltrain points out the benefit of improving Caltrain instead. These include:

- Cost. Improving Caltrain is less expensive in terms of capital and operating costs than constructing a new light or heavy rail system within the same corridor.
- Flexibility. The enhancement program will enable Caltrain to operate additional express trains, an ability BART and light rail systems lack.
- Capacity. The enhancement program will enable Caltrain to provide capacity similar to rapid rail systems by increasing frequency.
- Inter-operability. Caltrain is compatible with other standard gauge railroads. Improving Caltrain and retaining standard gauge tracks provides the flexibility to easily expand service to new areas such as the Dumbarton Corridor, through Altamont Pass, and onto Monterey. It also enables other operators—such as Amtrak, Altamont Commuter Express (ACE), Capitol Corridor trains—to share Caltrain tracks for through service.

- Maintenance of Service. Replacing Caltrain with another completely new rail system might require curtailing service on Caltrain while the new system is constructed. In contrast, Caltrain can implement its improvement program without shutting down service.

The Coalition strongly supports upgrading Caltrain as a top priority for the Peninsula Corridor. The majority of the proposals listed below can be completed within a five-year time-frame, with further upgrades and improvements planned after five years to match changes in usage patterns.

Note: An estimated $222.9 million in funding is available in MTC's 1998 Regional Transportation Plan for Caltrain system upgrades and service improvements, 57% of which is committed funding, and 43% is regional discretionary funding.

Electrify Caltrain

Electrify the Caltrain line from Gilroy to San Francisco with overhead lines (catenary) to increase speed, frequency and appeal of train service within the next 2-4 years. This would allow the train to run at 96 trips/week at 5-7 minute intervals in an expanded peak period, and initially at half-hour intervals in the off-peak periods, at faster speeds, reduced operating costs and greater community friendliness than with the current diesels. (Capital cost includes the purchase of 23 electric locomotives.)

CAPITAL COSTS: $375 MILLION (1997$)
TOTAL ANNUAL OPERATING COSTS: WITH THE CURRENT 86 TRAINS/DAY SCHEDULE, THE ADDITIONAL NET ANNUAL OPERATING COST WOULD BE $7.4 MILLION MORE THAN THE DIESEL TRAINS. BUT ELECTRIFICATION'S OPERATING COSTS BREAK-EVEN WITH DIESEL SERVICE OPERATING COSTS AT A 114 WEEKDAY TRAIN SCHEDULE ACCORDING TO THE RAPID RAIL STUDY.

Caltrain Downtown SF Extension

San Francisco now views the Caltrain extension/Transbay Terminal site as key to linking important rail (Caltrain, intercity, HSR) and bus services. The downtown extension better serves a growing reverse commute from S.F. to San Mateo/Santa Clara Counties and continual job growth in downtown San Francisco. Electrification would be needed for at least the underground subway portion in San Francisco. In November, 1999, San Francisco voters supported this project by a 69% to 31% margin.

CAPITAL COSTS: $700 MILLION (1996$)
TOTAL ANNUAL OPERATING COSTS: $7.9 MILLION (S.F. OPERATING INCREMENT FOR 86 WEEKDAY TRAIN SCHEDULE IN 1996$)
(FROM 1997 DOWNTOWN EXTENSION DEIS/DEIR)

Caltrain Mass Transit Service

Caltrain service would be expanded in conjunction with the downtown extension to the Transbay Terminal and an electrified line between Gilroy and downtown San Francisco. Weekday train service would be expanded to about 158 trains per day.

Peak period trains would operate as two lines that alternately stop at every second station (sometimes called skip-stop service), offering peak-hour frequencies to downtown San Francisco of approximately 5 to 7 minutes. Key stations, including San Jose, Lawrence, Mountain View, Palo Alto, Hillsdale, Millbrae, 4th/Townsend, Transbay Terminal, would be served by both lines.

CAPITAL COSTS: $36 MILLION (1992$) FOR 8 ADDITIONAL ELECTRIC LOCOMOTIVES.
TOTAL ANNUAL OPERATING COSTS: $47 MILLION (1992$) ADDITIONAL COMPARED TO 66 TRAIN DIESEL SERVICE.
(FROM 1992 ELECTRIFICATION STUDY)

(NOTE: THESE CAPITAL COSTS ARE HIGHER THAN JUST THE COST OF THE EXTENSION, AS THEY ALSO INCLUDE $128 MILLION FOR NEW ROLLING STOCK, $10 MILLION FOR A NEW YARD, AND $35 MILLION FOR PENINSULA PARKING LOTS.)

Caltrain Rapid Rail Improvements

To allow all of the above projects to move forward, and support more frequent, faster and flexible service a host of improvements need to be made to Caltrain's tracks and signals. These include:

- Cab Signaling and Automatic Train Control
- Super-elevate tracks for 90 mph speeds
- Additional pocket tracks for the mid-line turnbacks
- Third track sections to allow train overtakes

CAPITAL COSTS: $82.7 MILLION

Expand Caltrain Service to Gilroy

This project is a critical alternative to doubling the size of 101 between San Jose and Gilroy. Expanding Caltrain from 4 to 12 round trips per day would provide an alternative way to move South County commuters north, without adding thousands more cars per hour to Santa Clara County's already congested roads. In the long term, there should be double tracking to Gilroy to permit higher frequencies and service could also be extended further south to San Benito County and Monterey County along existing tracks.

CAPITAL COSTS: $51.5 MILLION
TOTAL ANNUAL OPERATING COSTS: $9-$14 MILLION FOR INCREASED SERVICE

Station Reconfigurations

Perform station reconfigurations, such as pedestrian grade-separated crossings (tunnels preferable when possible) outside boarding platforms, and safety devices at grade-level crossings, support future increases of operating frequency to 120 trips/week or more. These will significantly lessen traffic conflicts but has a very high cost, often over $20 million per separation.

The Caltrain Rapid Rail Study recommends construction of 14 grade separation projects, which include 21 separate grade crossings. Six projects are in Santa Clara County, with the remaining 8 projects in San Mateo County

CAPITAL COSTS: $590 MILLION (1998$)
TOTAL ANNUAL OPER ATING COSTS: N/A
(FROM 1998 CALTRAIN RAPID RAIL PROGRAM)

Increase Express Buses on Dumbarton & San Mateo Bridges

Express bus service would be provided at 15-30 minute headways during peak hours and 30 minute headways during the midday hours on the Dumbarton Bridge. San Mateo Bridge service would be offered at 15 minute headways during peak hours and 1 hour headways during the midday. Such service would double the frequency of current Dumbarton bus service and restore recently cut SamTrans service over the San Mateo Bridge.

CAPITAL COSTS: $12.7 MILLION
TOTAL ANNUAL OPERATING COSTS: $4.5 MILLION

Dumbarton Rail Service

This project would connect Union City and Newark to Menlo Park and Redwood City via the Dumbarton rail bridge, running 12-28 trains/day (as demand warrants). Cost estimates below include performing necessary repairs to the track and bridge to allow commencement of service. The Dumbarton Corridor Task Force found that Dumbarton rail service was expected to attract up to 8,000 daily riders. The Coalition support for this project is contingent upon findings, such as these, that ridership will be sufficient to match the capability of express buses in the corridor.

If this project were to be built, it would become possible to run service in a bi-directional loop along the Dumbarton line, the Caltrain line between Redwood City and San Jose, and the UP-Alviso line, establishing efficiency and convenience for commuters traveling from the East Bay to the heart of the Silicon Valley. Additional service on the Alviso line is estimated to attract an additional daily riders.

CAPITAL COSTS: $120 MILLION REQUIRED FOR ALL NECESSARY TRACK REHABILITATION AND BRIDGE REPAIR TO COMMENCE SERVICE OF 12-28 TRAINS/DAY. AS ADDITIONAL FUNDING BECOMES AVAILABLE, ELECTRIFY AND INCREASE THE FREQUENCY OF TRAINS AT A COST OF $0.6 MILLION/MILE (1999 DOLLARS) AND $6 MILLION PER TRAIN.
TOTAL ANNUAL OPERATING COSTS: TBD

Enhanced Express Bus Service

Bus improvements are intended to better serve growing Silicon Valley employment markets and existing San Francisco employment markets. Bus service provides more flexibility in serving growing employment centers east of US 101. The express bus system is compatible with existing or planned rail improvements, as it attracts new riders that otherwise would have too many transfers.

The definition of this project is to expand express bus service throughout the Peninsula to improve the following service areas:

- South San Mateo/northern Santa Clara County to Millbrae BART
- Redwood City to Palo Alto/Sunnyvale
- Central San Mateo County to Millbrae BART
- “Rapid Bus” improvements along El Camino

Routes/Stops*	Peak Headway	Off-Peak Headway
SamTrans 1F, 7F, 16F, and 17F	15 min.	15-60 min.
New Service Redwood City/Lockheed and Palo Alto	15 min	60 min
SamTrans 41F, 47F, 48F, and 49F	15 min.	60 min.
New Service San Mateo/Colma and Palo Alto	15 min.	60 min.
SamTrans 5M, 5L, and 7B	15 min.	15 min.
SamTrans 90H	30 min.	30 min.

**Old Route Number Designations*

CAPITAL COSTS: $31.3 MILLION
TOTAL ANNUAL OPERATING COSTS: $18.0 MILLION

Local Bus Service Reinstatements

In 1999, SamTrans undertook a reorganization of its bus routes which eliminated service entirely in many areas of the county while increasing frequency in areas with higher transit usage. These changes, while adding important service in many areas and increasing connections with BART and Caltrain, leave considerable populations without any alternative to driving. Public transit is essential to those residents of San Mateo County who cannot drive and a reinstatement of service in eliminated areas is essential to their livelihood.

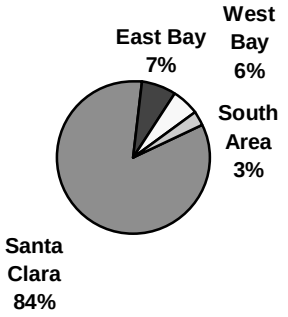
CAPITAL COSTS: $6 MILLION FOR 20 BUSES (COALITION ESTIMATE)
TOTAL ANNUAL OPERATING COSTS: $4 MILLION

SANTA CLARA COUNTY

Santa Clara Valley	1990	2020	Change	% Change
Total trips	5,352,851	7,422,680	2,069,829	+39%
Transit trips	125,381	201,795	76,414	+61%
% Transit Share	2.34%	2.72%		+16.07%
Congestion	39,495	74,700	35,205	+89%

Santa Clara County stands at a crossroads in terms of transportation and land use development. San Jose, Mountain View and other cities are leading the Bay Area in turning away from sprawling residential growth and towards building compact, transit-oriented development along new light rail lines. On the other hand, all of the cities in the county continue to allow sprawling commercial and office development that does not promote the use of transit by workers. Corporate parks surrounded by parking lots and without a broad range of services leave transit riders stranded during the workday.

Figure 4.1 Origins of Commuters to Santa Clara County



Most Santa Clara County workers live in Santa Clara County.[12]

Although long distance commuters from San Joaquin are stealing the headlines, about *84% of Santa Clara workers lived in Santa Clara County* in 1990 (see Figure 4.1). Even with greater in-commuting, that number is still expected to stay above 80% for the foreseeable future. Increased transit must retain a focus on local service and the county must step up efforts to produce more affordable housing in compact, transit-oriented developments.

Even with aggressive efforts to increase housing within the county, it will be important to consider how to accommodate the growing number of commuters coming into the county. The county's own roads could not handle the increased traffic that would result from expanding the existing "gateways", such as 101-South and the Sunol Grade. Santa Clara County must stop expanding these gateways and focus instead on transit improvements: Caltrain, ACE, express buses, and a high-quality commuter rail from Alameda County.

BART To San Jose?

With its rapid rise to the dubious distinction of being the most congested corridor in the Bay Area, the I-680 South corridor is sure to stir huge controversy over the tremendous number of options for moving workers to Silicon Valley. San Jose Mayor Ron Gonzalez has given a tremendous push for BART to San Jose. Yet the relatively low ridership predictions combined with the absolutely enormous cost of ***$4 billion***, could make BART to San Jose a major Bay Area transportation boondoggle if built. Since this extension would be so cost-ineffective, it is very unlikely to get federal

[12] From Metropolitan Transportation Commission, *1990 Census - Working Paper #2*

funding. If the extension is wholly dependent on local funding it would consume 20 years of a continued sales tax, funds which could otherwise provide literally *hundreds* of projects moving *tens of thousands* more people than BART to San Jose. And BART's recent experience with the SFO extension causes significant concern about whether a San Jose extension could be built without huge cost overruns. Finally, even a fully-funded BART extension could not be built for many years.

Instead, the Coalition's proposal looks towards solutions that can start moving people within six months (a typical time for bus ordering and delivery). With the planned implementation of HOV lanes on I-680, express buses will soon have significant travel time advantages over the Sunol Grade. Express bus service will provide a high degree of flexibility in serving employment destinations in northern Santa Clara County. The planning of express bus, subscription bus and rail services would need to be coordinated to ensure complementary operations.

A combination of commuter rail from Union City to San Jose and express buses, (that will be even faster when I-880 HOV lanes to San Jose are complete) will provide the most cost-effective solutions for this intensely congested corridor.

Of the new projects that will be built with the recently court-approved Sales Tax measure, Table 4.2 lists most important ones. This list provides a baseline, on top of which projects in the Coalition proposal would be added.

Table 4.2 Major Projects Included in Measure A/B Sales Tax Measure[13]

Vasona Light Rail	Downtown San Jose to Downtown Campbell (4.8 miles)
Tasman East Light Rail	Complete Tasman Project: Along Tasman Drive from North First Street to Hostetter Road in Northeast San Jose (4.8 miles)
Capitol Light Rail Project	Along Capitol Avenue from Hostetter Station to the Capitol Avenue/Capitol Expressway intersection (3.3 miles)
Interim Commuter Rail Service in Fremont/South Bay Corridor	From BART in Alameda County (probably Union City) to downtown San Jose using existing tracks (21.8 to 26.1 miles, depending on tracks used)
Caltrain Service Improvements	$80 million was dedicated to improving Caltrain service by adding trains and improving facilities, although the particular upgrades were not specified. The Board of Supervisor and VTA must prioritize new trains over new parking and station upgrades because additional train service and frequency will attract more new riders.

All projects, except the Caltrain improvements, are currently expected to be completed by 2004.

Bus and Light Rail Recommendations Within Santa Clara County

Greatly Expand VTA Bus Service

VTA identified needed bus improvements as part of their 1996-2006 strategic plan, and are continuing that process as part of the Valley Transportation Plan 2020. The focus will be enhancing service to major transit hubs and activity centers. The Coalition strongly supports this process and believes a flexible bus system is a necessary accompaniment to the light rail expansions. Priority

[13] Santa Clara VTA, *Measure A/B Data Fact Sheet* (1996)

should be given to filling needs for low-income workers as noted in the Santa Clara County's Welfare-to-Work Transportation Plan. VTA has not developed a specific operating scenario yet for this service.

CAPITAL COSTS: $77.25 MILLION FOR VEHICLES
ANNUAL OPERATING COSTS: $72.10 MILLION

Rapid Bus on VTA Line 22

This project would initiate a Bus Rapid Transit (BRT) program on VTA Line 22, which connects the Menlo Park Caltrain Station to the transit center at Eastridge Mall. This BRT program will provide significant improvements such as;

- Significantly faster operating speeds by installing "queue jump lanes" at appropriate congested locations and having signal priority for buses to prevent extensive delays at red lights.
- Greater service reliability with Intelligent Transportation System technologies and automated vehicle location.
- Greater passenger convenience with real-time bus arrival information at key stops and transit centers, vending machines to allow fare pre-payment at high volume stops, better shelters and information, and lighting improvements.

Although this program may receive regional discretionary funds, including it as part of new funding program would accelerate this project. The Coalition believes that BRT will be the next great expansion in Santa Clara County as the light rail projects are completed. This project could provide an important case study.

CAPITAL COSTS: $20 MILLION (INCLUDES 40 ARTICULATED BUSES)
ANNUAL OPERATING COSTS: TBD

East Valley Rapid Transit or LRT: East San Jose/Evergreen Area to San Jose

A major investment study is currently underway to determine the most appropriate mix of rail and/or bus services in the corridor. This is critical service for connecting East San Jose residential areas with key employment centers in Downtown San Jose.

Light rail will probably only pay off if there is a significant program to bring economic vitality through intensive development around the line. If land use changes are not integrated into the plan for this corridor, then Bus Rapid Transit will be the most cost-effective option. A significant benefit of the bus option is that transfers can be reduced for those not going to downtown jobs, and the buses can also be routed over more arterials and within walking distance of many more homes than LRT, again reducing the need for transfers or for parking lots at transit stops.

CAPITAL COSTS:
  LIGHT RAIL: $309-412 MILLION
  RAPID BUS: $30-65 MILLION, DEPENDING ON LEVEL OF SERVICE
TOTAL ANNUAL OPERATING COSTS: TBD

Vasona LRT: Campbell to Winchester Station

Extend the Vasona LRT line south from downtown Campbell to the Winchester station in Campbell (about 0.5 miles). This project will more directly serve the needs of residents of Campbell, Los Gatos

and Southwestern San Jose. This project is an extension of the under-construction Vasona LRT line, expected to be completed in 2004.

CAPITAL COSTS: $20.6 MILLION
TOTAL ANNUAL OPERATING COSTS: $845,000

Express Buses to Silicon Valley

Express Bus Service from the Tri-Valley

Currently the only bus services provided in the corridor are by LAVTA from Livermore to Lockheed Martin and Intel in Sunnyvale and by SMART from San Joaquin County to Tri-Valley and Silicon Valley destinations. New express bus service should be introduced from the Tri-Valley to northern Santa Clara County, San Jose, and other parts of Silicon Valley. Existing bus services to and from BART stations should also be enhanced. Stops would be strategically located to provide connections to park-and-ride lots, the BART station and with key employment centers in Fremont, Milpitas, San Jose and Silicon Valley. LAVTA could operate service every 30 minutes during peak periods and every 60 minutes off-peaks (more frequent service would be provided to BART).

CAPITAL COSTS: $7.37 MILLION (21 BUSES)
TOTAL ANNUAL OPERATING COSTS: $6.2 MILLION

Note: $5.0 million in regional discretionary funding is available in MTC's 1998 Regional Transportation Plan to purchase buses for I-680 express bus service between the Tri-Valley and Silicon Valley.

Expand LAVTA Subscription Service from the Tri-Valley

Subscription buses have the advantage of providing the most direct type of transit service to the destination end of a commute trip. LAVTA currently operates two subscription buses from the Tri-Valley to Lockheed Martin, one to Intel, and two from the Pleasanton BART Station to Walnut Creek. The service (called "Primetime") utilizes refurbished Golden Gate Transit buses and trains and pays employees from Lockheed and Intel to drive the buses. Riders travel in comfort on buses with reclining high-back seats, reading lights, and overhead storage bins.

The next increment of service involves refurbishing 12 additional buses ($5,000 each to purchase and $40,000 each to refurbish) to operate to destinations in Santa Clara County (IBM, Stanford, etc.). Additional new buses to further expand service will cost approximately $260,000 each.

CAPITAL COSTS: $540,000
TOTAL ANNUAL OPERATING COSTS: NONE: MAY COVER ALL COSTS IF SUCCESSFUL

Expand Express Bus Service from Fremont BART to Santa Clara County

While commuter rail or light rail services are anticipated, in the long term, from southern Alameda County into Santa Clara County, bus service can provide a high degree of flexibility to serve job centers in northern Santa Clara County. Increasing levels of commuter traffic and congestion on I-880, I-680 and SR 237, combined with existing and planned HOV lanes on I-880 and I-680 would provide travel time advantages for express buses. Expand VTA express bus service from Fremont BART station to Milpitas (LRT connection), San Jose, Sunnyvale and Lockheed Martin. VTA could operate express buses every 15 minutes during peak periods and every 30 to 60 minutes in off-peak periods.

CAPITAL COSTS: $1.75 MILLION FOR FIVE BUSES
TOTAL ANNUAL OPERATING COSTS: $1.20 MILLION

Commuter Rail Improvements to Silicon Valley

Caltrain Improvements

The most important rail upgrade for the entire Bay Area is to drastically increase service on Caltrain. Recent estimates in MTC's *Draft Transportation Blueprint for the 21st Century* predict that the upgrades supported by the Coalition would attract about 19,000 new transit riders per day. The Coalition supports projects that include Caltrain electrification, extension to downtown San Francisco, and frequencies of as little as every 5 minutes in peak times. For detailed descriptions and costs, see the San Mateo County/Peninsula Corridor section above.

Upgrade ACE service

Funding needs to be provided in order to increase service to six round trips in the peak period/peak direction. Speed increases will require substantial upgrade of tracks and signals. Near-term upgrades will include the addition of a third round trip (between Livermore and San Jose). ACE stations present an opportunity for transit-oriented development in eastern Alameda County. For this reason, parking expansion should be limited near the ACE stations.

CAPITAL COSTS: $30 TO $40 MILLION (INCLUDING TRACK AND SIGNAL UPGRADES, STATION IMPROVEMENTS AND EQUIPMENT)
TOTAL ANNUAL OPERATING COSTS: $6-8 MILLION PER YEAR

Note: $2.1 million in regional discretionary funding is available in MTC's 1998 Regional Transportation Plan for ACE rail stations and track upgrades. An additional $34.0 million in regional discretionary funding is available to be divided between ACE and Amtrak/Capitol Corridor rail service for station, track, and signal improvements.

Expanded VTA Commuter Rail Service

This project would significantly enhance the proposed VTA commuter rail service between the Union City BART station and downtown San Jose, providing more frequent trains, more station stops, and, in the long range, service south to Gilroy. Trains would operate on the Union Pacific line from the Union City BART station to downtown San Jose and on to Gilroy. Trains would run every fifteen minutes during peak periods and once an hour off-peak. There would be approximately eight intermediate stops, including transfer stations with the Capitol/Tasman LRT and a connecting station with Altamont Commuter Express rail service at Niles Canyon in Fremont.

Cost estimates include cost of acquiring Union Pacific right-of-way, access and grade separations, stations, tracks, signals and equipment, but do not include costs for extending service south to Gilroy or possible reconfiguration of tracks at major rail junctions (e.g. Niles Canyon "Y")

CAPITAL COSTS: $536 MILLION (1994$) BASED ON FREMONT-SOUTH BAY CORRIDOR STUDY.[14]
MEASURES A/B PROVIDE $89 MILLION FOR THIS PROJECT.
TOTAL ANNUAL OPERATING COSTS: TBD

[14] DKS Associates, "Fremont-South Bay Corridor Final Report" (Oakland, 1994).

South Bay Rail Loop

With the completion of several commuter rail projects in the South Bay, it will become possible to run trains in a loop encircling through the heart of Silicon Valley: along the Caltrain line from Redwood City to downtown San Jose, along the UP-Alviso line to Newark/Union City, and then across the Dumbarton line back to Redwood City.

This South Bay loop would provide convenient connections to major employment centers, corridors and destinations in San Mateo, Santa Clara, and Alameda Counties. Easy access would be provided to a major Menlo Park business park, a large number of major Silicon Valley companies located along the Tasman light rail line, and the growing number of high-tech companies locating in Fremont and Newark. With the help of increased bus and shuttle services, commuters would have a fast, pleasant, appealing and convenient alternative to driving solo to work.

CAPITAL COSTS: TBD—THIS PROJECT IS STILL AT THE CONCEPTUAL LEVEL AND SPECIFIC COSTS ARE NOT AVAILABLE

SOLANO COUNTY

Interstate 80	1990	2020	Change	% Change
Total trips	1,937,846	2,583,390	645,544	+33%
Transit trips	53,395	68,380	14,985	+28%
% Transit Share	2.76%	2.65%		-3.94%
Congestion	12,812	82,697	69,885	+545%

Note: Data in this table is for I-80 throughout the Bay Area, not specifically in Solano County.

Although extremely spread out, and increasingly reliant on the single occupant automobile for local trips, Solano residents may soon have significantly expanded travel options, both locally and for travel throughout the Bay Area. The Solano Transportation Authority has prepared a fairly balanced proposal for area upgrades that includes extensive bicycle routes, pedestrian safety project and carpooling matching services. Already a number of buses are planned, and with additional funding there could be enough to create a truly effective commuter system. Suisun City is providing a strong example of downtown revitalization and the creation of more walkable, livable communities.

New Express Buses for I-80 HOV Lane Service

Upgrade and expand express bus service along the I-80 corridor from communities in Solano County to San Francisco and the El Cerrito del Norte BART station. Express bus service directly serving San Francisco from Solano County would be added using the HOV lane between Route 4 and the Bay Bridge. Express bus service in the corridor would result in:

- 30 minute peak service from Fairfield/Vacaville to El Cerrito del Norte BART
- 10 minute peak period service between Fairfield and Vallejo and San Francisco (18 buses)

CAPITAL COSTS: $78.19 MILLION (INCLUDES I-80 EXPRESS BUSES MENTIONED IN THE ALAMEDA AND CONTRA COSTA SECTIONS)
TOTAL ANNUAL OPERATING COSTS: $88.43 MILLION

Note: $25.0 million in regional discretionary funding is available in MTC's 1998 Regional Transportation Plan for the purchase of express buses to run on I-80 carpool lanes.

Express Bus Service from Solano County to Contra Costa County via I-680

Increase existing service between the Fairfield/Vacaville area along I-680 into Contra Costa County and service between Vallejo, Benicia and Pleasant Hill. Currently, limited service is provided by Solano BART Express Route 40 and Benicia Transit. The Solano Intercity Transit Concept Plan proposes 20 minute peak period frequency for the peak period Vacaville-Fairfield-Contra Costa County service.

CAPITAL COSTS: $4.92 MILLION (14 BUSES)
TOTAL ANNUAL OPERATING COSTS: $1.57 MILLION (1995$)

Note: $4.4 million in regional discretionary funding is available in MTC's 1998 Regional Transportation Plan for express bus service along I-680 North.

Service within Solano and to Sacramento

STA has proposed an ambitious program of intercity buses that, will build ridership over time, particularly as HOV lanes in the area are completed. This service to Sacramento will serve the commute the State's booming capitol city.

Vacaville/Fairfield Service:

30 minute service by 2005

CAPITAL COSTS: $11.5 MILLION
NET ANNUAL OPERATING COST: $3.73 MILLION (ASSUMES 85% FAREBOX RECOVERY)

Sacramento to Vallejo Service:

9 minute in Peak, 60 minute service at midday

CAPITAL COSTS: $6.7 MILLION FOR 19 BUSES (COALITION ESTIMATE)
NET ANNUAL OPERATING COST: $1.84 MILLION

Solano Intercity Service:

CAPITAL COSTS: $7 MILLION FOR 20 BUSES (COALITION ESTIMATE)
NET ANNUAL OPERATING COST: $2.08 MILLION

Note: $12.9 million in regional discretionary funding is available in MTC's 1998 Regional Transportation Plan to purchase buses for Solano County intercity bus service.

Chapter 5
Regional Projects

WELFARE TO WORK/LIFELINE TRANSIT

The clock is ticking for welfare recipients. Federal and state welfare reform imposes strict new time limits for benefits. Tens of thousands of former welfare recipients will try to enter the labor market over the next several years, the vast majority of them dependent on public transit. With the average price of owning and operating a car over $6,500 per year, vehicle ownership is extremely expensive even for those with full time positions that are low wage.

Public transit has been cut in the urban and suburban core in recent years. Exacerbating these transportation difficulties, over 90% of the new jobs created during the 1980s in the Bay Area were outside the urban core and difficult to access by transit.[1]

In addition to getting to work transporting, children to school and child care and completing other daily needs, all on inadequate transit, creates a major barrier to self-sufficiency. Without significant new investment in programs that address these needs, thousands of former recipients will be left without jobs or welfare benefits. Those lucky enough to get local jobs will still remain shut out of the larger regional job market.

The Coalition is working in Alameda and now Santa Clara to advocate for implementation of county welfare-to-work transportation plans. The five recommendations here are for regional programs that could give the Bay Area a leading role on these issues. World Class Transit must include programs focused not just on rush hour commuters, but also on making transit affordable, fast and efficient for those who depend on it as a transportation lifeline 24 hours per day, 7 days a week.

Transit Discounts for Low-Income Residents

Transit costs are a major barrier for welfare recipients and low-income families. While most transit agencies offer discounts (up to 75%) for the disabled, senior citizens, and children, there are no standard discounts for low-income residents who depend on public transit (see Table 5.1). County Social Services Agencies do provide some subsidies to welfare recipients, but these subsidies typically only cover the least expensive form of transit and are only available to clients of the welfare system.[2] The working poor, people who are struggling on the edge of self-sufficiency, get no transit discounts or subsidies at all.

[1] MTC, *Bay Area Travel and Mobility Characteristics, 1990 Census: Working Paper #2*, August, 1992, p. 18.

[2] San Francisco is the major exception, offering Muni Fast Passes to welfare recipients.

Table 5.1 Existing Fare Discounts for Transit-Dependent Populations

	Seniors/Disabled	Children	Low-Income
BART	75%	75%*	no discount
SF Muni	65%	65%**	no discount
VTA	68%	44%**	no discount
AC Transit	52%	52%*	no discount
Caltrain	50%≈	50%≈*	no discount
SamTrans	55%	32%**	no discount
Golden Gate	50%	25%**	no discount

Discounts are calculated based on single-ride cash fares.
Source: Fare information from individual operators.

**Age 12 and under (11 for Caltrain) **17 and under (18 for Golden Gate)*
≈*Approximate, depending on base fare.*

One solution could involve the soon-to-be initiated TransLink universal fare card, which would provide the Bay Area with the technological capacity to provide a single transit card with free or reduced fares on major transit systems. Welfare recipients and other low-income individuals could receive discounted or "lifeline" TransLink cards. It is critical that the lifeline pass is not just offered to welfare recipients, but is also available to all low-income workers. The pass should provide at least basic service on all regional transit operators and offer discounts. Some regional funding will be required to ensure that the program is revenue-neutral for transit operators. But since many or most of the trips added will fill unused off-peak capacity, the lifeline pass would result in very small increases in marginal operating costs for transit operators.

This pass could be structured and administered similar to the lifeline services offered to phone and utility customers. For example, lifeline universal phone service offers a 50% discount to households with incomes below 150% of the poverty line.

The cost of this program will depend largely on the details of its implementation and effects on ridership. Rough estimates of the potential costs suggest a range of $7-35 million per year, assuming 70,000-205,000 eligible residents purchase passes with a 50-75% discount.[3] MTC should work with partners in the regional welfare-to-work transportation planning process to develop a detailed program design and potential funding mechanisms.

CAPITAL COSTS: N/A
TOTAL ANNUAL OPERATING COSTS: $7 - 35 MILLION

24/7 Lifeline Transit Services

Many job opportunities, including the best-paying entry-level jobs, require swing, night, and weekend shifts. Overnight service is only available in San Francisco, a few corridors in the urban East Bay, and two VTA lines (route #22 and light-rail). Weekend service is also in many places.

[3] Cost estimates based on: 50%-75% discount, transit pass face value of $60, eligibility set at 100-150% of poverty line. Number of eligible riders based on 1990 census data, fare-based ridership elasticity of -0.35, and an assumption that 25-50% of eligible riders will purchase the discount pass instead of paying full cash fares.

Transit operators must provide 24-hour service on key corridors in urban and transit-dependent areas and enhance weekend service throughout the region. The list of these corridors needs to be coordinated by the Metropolitan Transportation Commission during the upcoming welfare-to-work planning process.

CAPITAL COSTS: N/A
TOTAL ANNUAL OPERATING COSTS: TBD

Reverse Commute Services

While most low-income residents live in the urban core, most job growth is in the suburbs. Transit agencies and employers must cooperate to create hundreds of new reverse commute services to directly connect low-income neighborhoods with key work destinations.

Functional reverse commute service is not a one-size fits all solution, but will require dozens of separate programs. During peak hours, some new fixed route bus routes may be justifiable, but in many cases a range of shuttles, taxi subsidies, and connections to rail and main bus lines will also be necessary. Key reverse commute needs that are not adequately addressed by existing service include:

- From Bayview and other low-income San Francisco neighborhoods to South San Francisco, SFO, and warehouse/distribution facilities in northern San Mateo County.
- From Oakland and northern Alameda County to warehouse/distribution and industrial areas along I-880 corridor in Hayward, Fremont, and southern Alameda County and to service industry office space in the Tri-Valley.
- From East San Jose to Sunnyvale, Mountain View, and other job centers in northern Santa Clara County.
- From Richmond to suburban office parks in central Contra Costa County job centers and to retail and office development in Marin County.

Success in North Richmond

On November 24, 1997, dozens of North Richmond residents, with their friends and supporters, gathered to celebrate the launching of AC Transit route #376.

In the summer of 1997, North Richmond representatives had asked AC Transit for help, pointing out that the nearest bus route, at the edge of the community, operated infrequently and only until 7 p.m. Given their severely limited access to jobs and services, welfare reform loomed as an impending disaster for many residents of North Richmond.

AC Transit representatives, North Richmond community members, and their supporters met repeatedly in mid-1997 to design transportation services for welfare-to-work needs. The result is AC Transit route #376, the new route that operates from 8 p.m. to 1:30 a.m., seven days a week, connecting North Richmond and the nearby community of Parchester Village to employment sites, a community college, a medical clinic, and shopping centers, as well as regional bus routes and BART trains.

The bus schedule is coordinated with shift changes at major employment sites. The collaborative effort in North Richmond led to an innovative plan for route deviation: that is, bus riders can ask the driver to go off the fixed route a block or two to take them closer to their homes at night.

CAPITAL COSTS: TBD
TOTAL ANNUAL OPERATING COSTS: TBD

Child Care Transportation Project

Transporting children to and from child care forces many transit-dependent parents to make expensive and time-consuming multi-leg trips. Strategies to address this problem include providing more child care at transit centers, initiating child care-specific transportation services, and providing incentives to child care providers to provide their own transportation.

In Santa Clara County, the Valley Transportation Authority (VTA) has successfully established a child care center at a major transportation hub. The Tamien Child Care Center is located adjacent to a light rail station, a Caltrain commuter rail station, and numerous bus routes serving those stations. The center provides high quality child care while providing extensive incentives for parents to make use of public transportation. The cost of setting up the Tamien Child Care Center was about $2.35 million, covered by regional discretionary funds; the center covers its operating costs.

The Social Services Agency in Contra Costa County has initiated a project to employ former welfare recipients as drivers to shuttle children to and from child-care providers. This program is expected to both reduce the complexity of trips for low-income working parents as well as to provide work to the drivers. Contra Costa County expects to have established this service under an independent operator within 2 years. The project will employ eight drivers and provide transportation for 85 children and is being initiated with $352,000 from a two-year federal grant.

CAPITAL COSTS: $20 - 30 MILLION FOR 12 CHILD CARE CENTERS REGIONWIDE. $0.45 - 0.75 MILLION FOR VANS FOR 8 ADDITIONAL CHILD CARE SHUTTLE PROGRAMS[4]

TOTAL ANNUAL OPERATING COSTS: $0.5 - 1.6 MILLION FOR CHILD CARE SHUTTLE PROGRAMS

School Bus Service Program

With the implementation of Proposition 13, many school districts scaled back school bus service. As a result, only 11% of the Bay Area's one million schoolchildren (K-12) use school buses.[5] Even in school districts that have maintained some bus service, buses transport only 6% to 21% of their total student population.[6] Getting children to school on time is a significant burden for transit-dependent parents. Some children chronically miss school due to transportation difficulties. In addition, parents transporting children to and from school contribute to peak period congestion on local roads. Some public transit systems do not have the resources to provide adequate service to schools in their area.

As appropriate to each area, MTC should work with individual municipalities and school districts to identify funding for school bus service and/or supplement local public transit where needed. This may take the form of matching funds to school districts for capital and operating costs, or fare discounts for students riding public transit to school.

CAPITAL COSTS: TBD (DEPENDING IF SCHOOL BUSES ARE NEEDED)
TOTAL ANNUAL OPERATING COSTS: $24 MILLION (INCLUDES LEASES/OPERATING COSTS)[7]

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[4] Costs are estimates by Transportation Choices Forum.

[5] Of the 955,843 children enrolled in grades K-12 in the Bay Area, only 105,664 use school buses to get to school. California Department of Education, 1997.

[6] Metropolitan Transportation Commission, *Draft Transportation Blueprint for the 21st Century*, (Oakland: 1999) : pg. A-20.

[7] Ibid.

BICYCLE AND PEDESTRIAN IMPROVEMENTS

Thousands of new residents are attracted to the Bay Area every year, primarily due to quality of life considerations. Yet new developments continue to be approved with little or no consideration for bicycle or pedestrian accommodations, and increasing traffic makes neighborhood streets in existing urban areas unsafe for bicyclists and pedestrians. Indeed, concerns about unsafe streets and traffic have forced an increasing number of parents to drive their children to school every day. A recent study found that being hit by a car while walking is the second leading cause of death for California children aged 5-12.

A comprehensive approach to improving conditions and facilities for bicyclists and pedestrians could go a long way towards improving the quality of life and safety for urban and suburban dwellers alike, and could dramatically reduce the number of short vehicle trips that clog up the region's roadways (nearly half of all non-work trips are three miles or less). Pedestrian and bicycle access to transit facilities is also a critical component of making public transit work better and more effectively. Pedestrian-oriented developments and bicycle parking and access to transit stops and stations has proven to dramatically increase ridership.

Unfortunately, regional and county transportation agencies pay little attention to the needs of pedestrians and bicyclists. All too often, these needs are seen as the sole responsibility of local governments that can barely afford to keep streets free from potholes. The Metropolitan Transportation Commission and the nine county Congestion Management Agencies need to take a far more proactive role in assessing the project needs for bicyclists and pedestrians and funding projects from the billions in transportation dollars under their jurisdiction. All levels of government in the Bay Area should hire bicycle and pedestrian coordinators to ensure that all funded projects include bicycle and pedestrian accommodations, including adequate accommodations for the disabled.

While no accurate estimates exist due to the large gaps in information collection, a very rough but conservative twenty-year cost estimate to begin making the Bay Area a truly bicycle and pedestrian-friendly region could be broken down as follows:

REGIONAL BICYCLE NETWORK: $750 MILLION
PEDESTRIAN SAFETY/ADA IMPROVEMENTS: $250 MILLION
LIVABLE COMMUNITY IMPROVEMENTS: $1.0 BILLION
NEIGHBORHOOD TRAFFIC CALMING IMPROVEMENTS: $500 MILLION
BAY TRAIL COMPLETION: $450 MILLION
OTHER REGIONAL TRAILS: $350 MILLION
SAFE ROUTES TO SCHOOLS: $200 MILLION

TOTAL: $175 MILLION PER YEAR ($3.5 BILLION OVER 20 YEARS)

MORE FERRIES ON THE BAY?

Ferries have a long history on the San Francisco Bay. They were the first transit system in the Bay Area, and despite a brief hiatus in the '50s and '60s, they continue to serve commuters and other travelers throughout the region.

In the past year, business groups and elected officials came together to form the Bay Area Water Transit Initiative. The result of their work was a "Vision and Conceptual Design" for a new Bay-

wide ferry system, including a line out on the Pacific Ocean to Half Moon Bay. While it offered a grand vision, many felt the Water Transit Initiative's report failed to adequately address issues such as cost-effectiveness and environmental impacts.

Ferries have several advantages over other forms of transit. They can span far distances without the significant investment in rights-of-way and tracks that rail requires. Ferry riders can avoid most traffic and enjoy stunning views of the Bay Area's scenery, as well as amenities such as food and beverage service. Ferries also provide opportunities for socializing that are different from other forms of mass transit.

But ferries' disadvantages are also significant. Ferries are expensive. The Water Transit Initiative report estimates that a ferry costs $10 million and that a ferry terminal costs $15 million. If these estimates are accurate, other types of transit such as conventional rail and express buses may be much more affordable and cost-effective.

Ferries Are Slow

Because ferries must push through the water instead of rolling along the tracks or the pavement, ferries are slower than trains or buses in bus lanes. For example, the Richmond-San Francisco travel time via ferry is scheduled to take eleven minutes longer than the travel time via BART—even though the ferry travels directly over open water, and BART trains go a much longer distance and make several stops in El Cerrito, Berkeley, and Oakland. New ferries are of different construction and are faster than the older equipment used on the Richmond run, but still are not as fast as trains or buses for trips where the ferry is not much more direct.

Ferries Have Significant Environmental Impacts

Waves from the ferries' wakes can erode marshlands and negatively affect other shore environments. The dredging necessary to provide deep channels at ferry terminals can disturb the bay-floor habitat and re-suspend toxic contaminants in the water column that were historically deposited there. The significant power necessary to push a boat through the water requires fuel that releases pollutants and, unless fossil fuels are not used, produces greenhouse gas emissions.

Ferries Provide Convenient Access Only to Bayside Points

Most communities along the San Francisco Bay do not have major residential or employment sites near the Bay shore. Access to the ferries must therefore be provided by feeder shuttles. The required transfer—often on both ends of the trip—discourages use of ferries. Transit-oriented development can happen at ferry terminals but environmentally sensitive tidelands often preclude further development in these areas.

Setting Criteria for Additional Ferry Service

Additions to the Bay Area's ferry system are appropriate when they:

- have direct runs across areas of open water,
- do not parallel nearby land corridors that have existing transit which is faster and more frequent and that meets current and projected demand,
- provide convenient access to areas with a concentration of origins and destinations, or where future transit-oriented development is likely,
- will not require significant dredging, and

- will have sufficient ridership to make them cost-effective.

Connecting buses that enable ferry passengers to access land destinations should be an integral part of all new ferry service. This will allow an alternative to massive parking lots at the terminals and allow areas currently used for parking lots to be used for transit-oriented development instead.

Terminals should be added where appropriate. It seems likely that, of the many potential terminals listed in the Water Transit Initiative report, only a few would actually meet the above criteria such as Berkeley/Albany, Point Alameda,[8] and the San Francisco and Oakland airports. Treasure Island and Mare Island may also be appropriate ferry terminals if development is designed to meet the ferries.

Routes could be instituted to take advantage of these new terminals, and to connect older terminals that today have no direct service. Again, these services should be studied to see whether ridership would be sufficient to justify them.

Future routes that may meet the conditions above include:

- San Francisco-Berkeley/Albany
- San Francisco-Oakland Airport
- San Francisco Airport-Oakland Airport
- San Francisco Airport-Oakland-Alameda
- San Francisco Airport-Larkspur-Sausalito-Tiburon

Ferry Projects

There are other potential ferry lines and further study of the ferries will clarify which have the most potential. Until then, the coalition supports full funding for the following program for additional ferry services and facilities as proposed by MTC for 1998-2004:

- **Alameda/Oakland Ferry**: two high-speed, 400 passenger ferries, and construction of a maintenance and fueling facility and upgrade to the Alameda ferry terminal;
- **Golden Gate Ferry**: two high-speed, 400 passenger ferries, and upgraded and additional docks and terminal facilities at Larkspur and San Francisco;
- **Sausalito Ferry Terminal**: a passenger shelter and improved access;
- **Vallejo Baylink Ferry**: a high-speed, 400 passenger ferry, upgrade of existing ferry equipment, construction of a multi-modal terminal, parking and bus facilities, and an upgrade maintenance facility;
- **Port of San Francisco**: new ferry berths and terminal at Pac Bell Park;
- **Treasure Island**: improvement of existing docks.

  CAPITAL COSTS: $85.5 MILLION

Ferries can and should be part of the modal mix of a World Class Transit system for the Bay Area. Routes which provide convenient, fast, cost-effective, environmentally sound service should be investigated and pursued.

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[8] (Point Alameda is on the western, San Francisco, side of the island; the existing Alameda terminal is on the eastern side.)

BART—FOCUSING ON UPGRADES

No BART Extensions At This Time

BART is undoubtedly one of the best run and most important transit systems in the Bay Area. The 1990s were a time of significant expansions for the BART system. But now is the time for BART to focus on better serving its existing customer base and upgrading and maintaining its system. This proposal supports upgrading the system with new technology that will allow an increase in train capacity of up to 50%, safeguarding passenger safety with seismic retrofits and setting aside funds for the $1,000,000,000+ expense on the horizon for car rehabilitation and replacements.

Additional extensions are still being proposed from each end of the line, with Fremont to San Jose getting the biggest push recently. None of the extension are supported in this proposal for several reasons:

- **Astronomically high costs.** The capital costs for new projects are staggeringly high. For example, BART to San Jose is estimated to cost $4 billion, many times more than the express bus proposal for the entire nine county Bay Area. For less than the price of just one mile of track between Fremont and San Jose, commuter rail service could be reinstated in Marin and Sonoma.
- **Relatively low ridership.** For their prices, these extensions would attract relatively few new riders.
- **Other Pressing Needs.** Already BART is an aging system with tremendous maintenance needs. The recommendations below for seismic upgrades and car replacements together add up to over $2 billion. BART passengers deserve a renewed focus on the existing system.
- **Large parking lots.** Suburban BART stations are built for the automobile. With 43,000+ parking spaces, BART has more parking than any transit operator in the entire country! These lots limit development (and therefore new ridership) potential.
- **Limited air quality benefits.** Many suburban commuters drive to BART, and the first few miles of a car trip are by far the most polluting.

BART, if it wants broad-based support for new extensions, must work immediately with affected cities to greatly improve their land use patterns. Only with transit-supportive development *throughout the entire extension area* will any new BART extensions possibly pencil out.

The BART board of Directors recently announced an initiative to promote development around the BART stations. The Coalition strongly endorses this initiative. Yet, Smart Growth needs to happen at a city and county level, not just in the 1/8 of a mile surrounding transit stops. For example, much of the new commercial and office development in cities such as Fremont and San Jose takes the form of low-rise buildings surrounded by massive parking lots, in areas with no sidewalks and no services such as restaurants, dry-cleaners, banks or gyms within walking distance. Potential transit users thus feel stuck during the day, and this is a primary reason that few people use transit when accessing these sites, even with congestion skyrocketing.

The Coalition does support the recommendations listed below:

Seismic Retrofit

Although the BART system was designed above seismic standards of the time, existing structures need to be retrofitted. Since the construction of the original system, new techniques have been devised for retrofitting existing stations and tracks to enable them to better withstand a major

earthquake. The BART Board of Directors recently announced they may put a property tax proposal to fund this seismic work before voters in Alameda, Contra Costa, and San Francisco Counties. Some transit advocates feel this funding should come from parking charges at BART stations, which will have the additional benefit of reducing the need for expensive new parking structures. Either way this is an important project given the high likelihood of a major earthquake along the Hayward Fault or other major fault lines.

CAPITAL COSTS: $800 MILLION

Car Replacement

There are 419 BART cars which are projected to require rebuilding or replacement around the year 2020. BART must start planning for this project now, given the incredible costs.

CAPITAL COSTS: $1,237 MILLION

Advanced Automatic Train Control System

Advanced Automatic Train Control (AATC) is based on a spread spectrum radio control system which will pinpoint trains to within thirty feet of their actual location. AATC will allow BART trains to operate as frequently as every two minutes, or up to 30 trains per hour. AATC will permit reduced travel times and will allow BART to accommodate more frequent service in the future.

CAPITAL COSTS: $271 MILLION (1998$)

"OPTIMIZE-A-LANE": CONVERTING MIXED-FLOW TO BUS/CARPOOL LANES

Although the Bay Area will soon have over 400 miles of bus/carpool lanes, portions of highway 101, I-880 and all of I-580, some of the busiest highways in the Bay Area, will not have them.

The right question to ask is how to best increase capacity on these roads. The usual answer is to spend millions of dollars to construct new bus/carpool lanes along sections of roads that are already eight lanes wide. This is not only enormously expensive, but is a temporary solution that only attracts more drivers as space is freed up in the mixed-flow lanes; bottlenecks at some intersections and connecting highways may become even worse.

Instead, the Coalition is calling for a comprehensive study to "Optimize-A-Lane" on these highways by converting an existing mixed-flow lane in each direction to a bus/carpool lane (during peak commute time). Such conversions have been done around the country and can be particularly successful if combined with new express buses, shuttle and vanpool services.[9] Best of all it can move many more people during rush hour *without the tremendous taxpayer-backed cost of building new lanes.*

Caltrans currently has a policy of never "taking-a-lane." But with the growing transportation crisis, nothing that increases mobility for such a low cost should be prohibited. With enough political support this policy could be reversed.

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[9] For a summary of these see *Rethinking HOV: High Occupancy Vehicle Lanes and the Public Interest* (May, 1993: Chesapeake Bay Foundation, MD). Some examples include a portion o I-93 near Boston, and a slew of mixed flow to bus only lanes in Denver, Portland, Minneapolis and other cities.

In fact, MTC recently included the conversion of lanes as a potential alternative during their study for improving highway 101 from the Santa Clara County limits to the San Francisco Airport. Although this alternative was not selected it was an important step in validating conversions as an option for reducing congestion.

The following specific highway segments have been chosen because they meet the following criteria:

- at least eight lanes, none of them carpool lanes.
- have extremely significant congestion, which guarantees high transit/carpool usage because of the potential time savings
- would be extremely expensive, or physically impossible to expand with new lanes.

I-580 Optimization: a.k.a. Bring Back the Carpool Lanes

The bus/carpool lanes were taken off of I-580 soon after their construction in the early 1970's. At that time, without significant traffic congestion, there was not a strong incentive to carpool or to use alternatives. Almost thirty years later the road is a traffic nightmare and replacing the bus/carpool lanes is likely the most cost-effective way to increase capacity in the corridor.

This conversion would not only help long distance commuters but would allow express buses, shuttles and vanpools operate Even if the proposal for construction of new carpool lanes (not conversions) for the 8-mile stretch between Tassajara Road and Vasco Road is funded, the bottleneck West of Tassajara will remain.

Golden Gate (101) Optimization

Golden Gate Transit and countless carpoolers are hampered by gaps in the bus/carpool lanes, particularly those on the five mile stretch prior to the Golden Gate Bridge, The Coalition recommends analyzing the benefits of converting one lanes of regular traffic to a bus/carpool lane on the five miles leading up to the Golden Gate Bridge. On the bridge the reversible lane should be studied for conversion.

Optimizing 101 to San Francisco

Another of the busiest highways in the Bay Area, there are currently no plans for bus/carpool lanes between the Santa Clara County border and San Francisco. This highway connects the two cities, San Jose and San Francisco, that have the highest job growth expected by 2020 and thus needs greater capacity.

Highway 101 will also be swamped by growing traffic to the San Francisco International Airport. Buses, shuttles and carpoolers to the airport and commuters to the job centers would all benefit greatly by optimizing a lane on this stretch.

I-880 Optimization

Possibly the most effective of all Bay Area lane optimizations is in Oakland on I-880. Carpool lanes recently opened in the Central portion of I-880 between San Leandro and the Santa Clara County border in Fremont and it will not be long until they stretch all the way to San Jose. The northernmost portion of I-880, almost all the way up to the Bay Bridge has only eight mixed-flow lanes.

This northern portion would be incredibly expensive to expand and unfortunately a lane optimization was not seriously considered in the recent I-880 study. The study should add this concept as an adjunct, compare it to the existing project list, and adopt the optimization if it beats the other options on objective criteria. It is important to do this before congestion gets even worse on this section, which decreases the political will to "take away lanes" from solo drivers.

AMTRAK/CAPITOL CORRIDOR SERVICE

Recently, a sixth train was added to the existing service on AMTRAK that runs between Sacramento and Oakland, and a seventh daily round trip is scheduled to begin in 2000. Four of the trains will be round trips to San Jose. AMTRAK service is the most luxurious form of transit in the Bay Area at this time. Its primary problem has been the limited number of trains, and trains not geared towards the commute traveler. This has resulted in low ridership. The service is reliant on an infusion of state funds.

The recent I-80 Corridor Study showed that with some additional service, geared towards commuters, the Capitol routes could attract 3,000 to 4,000 new daily riders. This is more than some of the BART extension proposals, and would carry people longer distances, for a relatively low cost.

CAPITAL COSTS: $25 MILLION FOR ROLLING STOCK (TRAINS AND LOCOMOTIVES)
TOTAL ANNUAL OPERATING COSTS: $10 MILLION (3 ROUND TRIPS)

Note: $34 million in regional discretionary funding is available in MTC's 1998 Regional Transportation Plan to be divided between Amtrak/Capitol Corridor and ACE rail service for station, track, and signal improvements. An additional $20.7 million in regional discretionary funding is available for the construction of rail stations, to potentially be located in Fairfield/Vacaville and Dixon.

Chapter 6
Creating Communities That Promote Transportation Choices

The beautiful San Francisco Bay Area was once filled with walkable communities that could be reached by transit or automobile. Since World War II the region has grown to be dominated by typically auto-oriented development. This has resulted in an environment that does not provide efficient transit use and is inaccessible and even hostile to pedestrians and cyclists. Many communities are automobile dependent and are often choked in congestion. People must use their cars as developments separate people's homes from the places they need to go, instead of bringing them together as in traditional neighborhoods.

There are numerous alternatives that focus on communities built for people instead of automobiles. Communities where walking and bicycling are possible, safe and even enjoyable. Where people have real choices when it comes to how they want to get around. These communities could feature new development patterns; with sidewalks, bike lanes and crosswalks, community open-spaces and safe, convenient access to transit, and with restaurants, shops and cafes within walking distance of homes

Why is it important to consider the connection between the way communities are built and the way the transportation system works? To put it very simply, the Bay Area will never have a World Class Transit system without communities to support it. But a World Class Transit system is not just for transit riders, it would reduce congestion, give drivers an alternative and revitalize communities that could attract new development and benefit the region as a whole.

Table 6.1

Daily Trips by Density, from MTC's 1990 Household Travel Survey						
	Households/Residential Acre					
	<2	2 - 2	5 - 10	10 - 20	20 - 50	>50
Mean Households/Residential Acre	1.4	3.6	6.7	13.5	30.6	121.9
Daily Vehicle Trips/Household	6.4	5.9	5.0	3.8	2.9	1.2
Daily Transit Trips/Household	0.2	0.2	0.3	0.8	1.3	1.3
Daily Walking Trips/Household	0.6	0.5	0.6	0.9	1.4	1.5

Integrating transportation choices into the urban fabric must take place at two levels: in the areas around transit centers and in the community as a whole.

Transit Oriented Development (TOD) focuses on providing housing, work, and retail locations within 1/4 mile of the transit center. Specific TOD guidelines have been established[1] that encourage development near the transit center and create transportation choices for the community as a whole. Community guidelines are similar to the TOD guidelines but are designed to make the entire community a transit-, pedestrian- and cyclist-friendly environment and linking outlying communities to denser transit center areas.

Six key components—common essential guidelines for Transit Oriented Development[2]

- Compact development
- Integration of a variety of land uses
- Access to transit
- Bicycle and pedestrian-friendly environments
- Use of traffic calming features
- Site design of the Transit Oriented Development

[1] TOD guidelines have been established by agencies such as San Diego Metropolitan Ttransit Development Board, Santa Clara County Transportation Authority, Portland's Tri-County Metropolitan Transportation District, New Jersey Transit and Association of Bay Area Governments. While each area is unique with different geographic, demographic, political and cultural characteristics, these guidelines serve to provide a foundation for local design. Local jurisdictions must examine all the factors that are unique to the area and try to incorporate these guidelines into an integrated system that seeks to address local problems. These guidelines and themes provide a start to changing the dominant urban form that has contributed to many of our transportation problems.

[2] These are TOD guidelines that the agencies listed in the previous footnote have in common.

COMPACT DEVELOPMENT

Lafayette's low density development encourages driving. *©UrbanAdvantage*

Increased density through compact development, as depicted in this photo illustration, would enliven the area, make it more walkable, and increase transportation choices. *© UrbanAdvantage*

Compact development brings goods, services, and activities closer together, which creates shorter trip distances and makes pedestrian and bicycle modes viable alternatives to the automobile. This increases access to transit while also improving the effectiveness of its operation. John Holtzclaw's studies of Bay Area communities demonstrate that as density increases walking, cycling, and transit use increase and auto use decreases. Compact development is critical to creating a community that is less reliant on the automobile.

Robert Cervero has compared the communities of Rockridge, with a housing density of 2,194 units per square mile, and Lafayette, with a housing density of 655 units per square mile. Residents of Rockridge were found to walk and bike 5 times more and use transit over twice (for non-work trips) as much as residents of Lafayette.[3] The Rockridge-Lafayette example is carried through the rest of this chapter to illustrate the key components of transit oriented development.

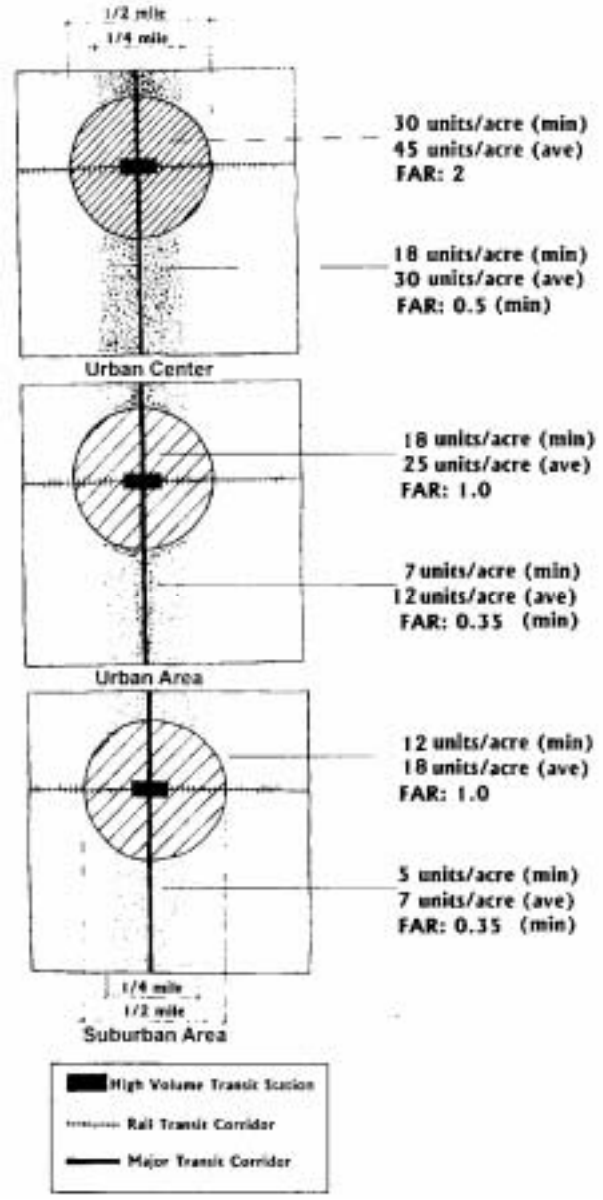
[3] Cervero, Robert and Radisch, Carolyn, *Transportation Choices in Pedestrian Versus Automobile Oriented Neighborhoods*, (Berkeley, CA, University of California Transportation Center, University of California, Berkeley, 1995)

New residential development within the Bay Area—averaging five dwelling units/acre—is below the density needed to support cost-effective transit.[4] To support bus service, a minimum of seven dwelling units/acre is generally required, and light rail requires at least nine.[5] Even higher densities are recommended for rapid transit, such as BART. Studies indicate that going from a low density of 3-5 dwelling units/acre to a moderate density of 7-9, will result in the largest percentage increase of transit use.[6]

Compact Development Strategies

- Establish minimum density requirements for residential and commercial areas.
- Promote infill and intensification within existing developed areas.
- Encourage redevelopment of vacant or underutilized lands
- Provide incentives for developers to build affordable housing, especially along transit corridors and near transit stations.
- Reduce parking space requirements, discourage abundant free parking in transit, activity or employment centers, and encourage the use of shared parking.
- Identify functional open space areas that may serve as urban growth boundaries.
- Urban growth boundaries, Greenbelts and other forms of open space help prevent sprawl-oriented low density development by encouraging more efficient land use and limiting the amount of land that can be urbanized. The land used to create the boundary should be in the form of functional open space, such as parks and natural areas for public use or areas that provide ecological services, such as an estuary.

Figure 6.2 Recommended Development Density



Source: Association of Bay Area Governments, *Making Better Communities By Linking Land Use And Transportation, 1997.*

[4] According to Urban Ecology, new Bay Area residential development, including infill and re-development projects, averages approximately 5 dwelling units/acre.

[5] A minimum of 7 dwelling units/acre is needed to support bus service every 30 minutes and a minimum of 9 dwelling units/acre is needed to support light rail service with feeder (Institute of Transportation Engineers, 1989).

[6] The layout and design of cities and towns is still highly important to the effectiveness and full utilization of transit. The higher transit ridership levels that are correlated with higher development densities are also, in part, a function of such factors as a grid street pattern and the presence of sidewalks.

INTEGRATION OF A VARIETY OF LAND USES

Mixed land use integrates residential, commercial, and public uses into one development. This provides housing, shopping, employment, and open public space that is accessible by walking, biking, and transit. Because mixed-use developments bring where people live closer to where they want go, people are less likely to drive and more likely to walk to their destinations. In addition, mixed land use promotes resource efficiency by enabling daytime uses, such as office space, to share parking with nighttime uses, such as theaters. Overall, mixed land-use reduces the amount of road capacity and parking needed to serve the community, increases the efficiency of transit, and can create a safer, more livable environment.

Strategies to Achieve Mixed Land Use

- Allow a broader range of uses within zoning district—promote heterogeneous zoning.
- Encourage more on-site services, such as day care and cafes, especially within employment centers and office parks.
- Incorporate a variety of uses in infill, intensification and redevelopment projects.
- Provide incentives for developers to build affordable housing within transit, employment and activity centers.
- Incorporate civic uses and create public spaces within transit, employment and activity centers.

Shopping and housing is tightly integrated in this typical block in the Rockridge neighborhood. By bridging the distance between people and their destinations, mixed use development reduces the amount of road capacity and parking needed to serve a community, increases the efficiency of transit, encourages walking and biking, and can create a safer, more livable environment.

Types of Mixed-Use Developments

- Vertical mixed-use: Incorporates two or more uses within a multi-story building, such as housing above a public library. This is preferred to horizontal mixed-use.
- Horizontal mixed-use: Comprises different uses adjacent to one another, such as housing adjacent to a coffee shop which is adjacent to a business.

ACCESS TO TRANSIT

Transit is accessible when the transit centers themselves are safe and comfortable, transit is reliable enough to count on for regular trips, and walking and biking are viable and efficient means of getting to transit stops and centers. The community around the transit center plays a key role in making transit accessible. Street design is important. Use of short, regularly shaped blocks, frequent intersections, and limited use of cul-de-sacs and curvilinear streets increases the use of transit and encourages non-motorized mode use to and from transit.

Rockridge's street network consists of shorter, more regularly shaped blocks than Lafayette. The Rockridge neighborhood also incorporates mid-block connections, which makes transit conveniently accessible by walking or biking. In contrast, Lafayette's street network consists of several cul-de-sacs and curvilinear streets making it inefficient to travel through. This difference in street design and layout contributes to the higher transit use by Rockridge residents.

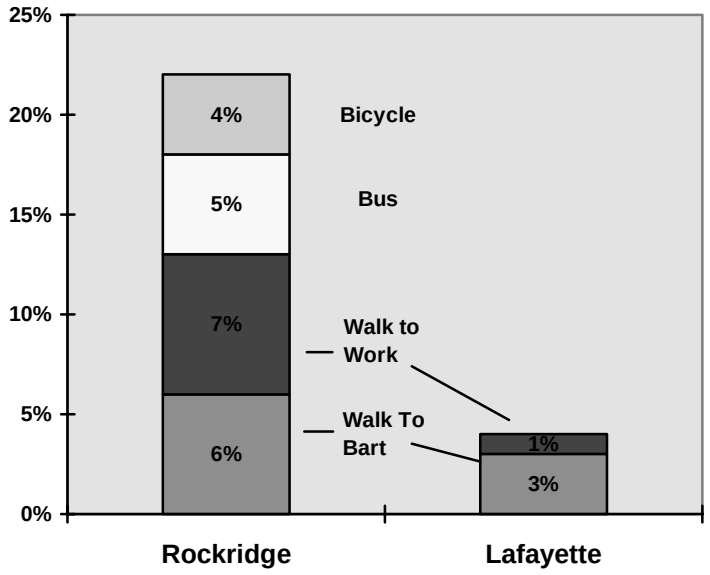
Key Elements of a Transit-Accessible Community

- Mixed land-uses clustered around transit centers.
- Street design/layout consists of short, regularly shaped blocks with frequent intersections.
- Limited or no use of cul-de-sacs and curvilinear streets.
- Through block connections provided, especially in neighborhoods with long blocks.
- Established arterials that connect key sites, such as transit, activity and employment centers.

Strategies to Achieve a Transit Accessible Community

- Promote compact, mixed-use development.
- Understand the land-use-transit connection and develop the community with a transit vision—making sure that transit, walking and biking are given priority over autos.

Figure 6.3 Rockridge Residents Five Times More Likely To Commute Without a Vehicle Than Lafayette Residents



Note that for both neighborhoods, 94 percent of walk trips to BART stations were under one mile in length. According to this study, Rockridge's higher incidence of walking access trips clearly corresponds to its more pedestrian-oriented development pattern. The ease of shopping on the way to or from BART was an important factor for many who walked to Rockridge BART. From Travel Choices In Pedestrian Versus Automobile Oriented Neighborhoods, *Cervero, 1995.*

Improving access to transit does more increase transit ridership. It also goes hand in hand with development that is focused on comfort and safety for all community members.

BICYCLE AND PEDESTRIAN-FRIENDLY ENVIRONMENTS

Bicycle and pedestrian-friendly communities are essential to promoting the use of transit, as most transit users are pedestrians or cyclists on at least one end of their trip.

Pedestrian-friendly features in downtown San Jose—such as pedestrian-oriented building entrances, benches, ample sidewalks, public telephones, and street lamps—encourage walking and transit ridership.

Rockridge is considered to be a pedestrian-friendly environment. The entire neighborhood is linked by an integrated network of sidewalks and pedestrian paths that are, for the most part, lined with shade trees and connect residents to key sites, such as the transit line and shopping. Mixing of land uses is frequent, storefronts are scaled to the pedestrian, building entries open directly onto the sidewalk, and the variety of shops make for a continuous sequence of showcase windows that are viewable from the sidewalk. In addition, almost all parking is accommodated on the street or behind the buildings.

In contrast, Lafayette's network of sidewalks and pathways are not as well integrated and efficient at connecting residents to key sites. There is little mixing of land uses to provide an interesting pedestrian environment and overall, Lafayette's built environment accommodates the auto better than walk and bike modes. These contrasting built environments influence the use of walk and bike modes in their respective communities. Residents of Rockridge were found to use walk and bike modes 5 times as much as residents of Lafayette for non-work trips and 11 times as much for commute trips.[7]

Characteristics of a Bicycle and Pedestrian-Friendly Environment

- Generally, new development should be designed to give pedestrians and cyclists priority over automobiles.
- A comprehensive network of sidewalks and bike lanes through the community.
    - bicycle parking
    - weather protection and benches at transit stops and along paths
- Safety:
    - well lit; emergency call boxes, and security patrol
    - pedestrian and bicycle traffic is coordinated with auto traffic, auto crossings of bike paths and sidewalks is limited
- Buildings and entrances oriented to sidewalks and scaled to pedestrians.
    - Auto parking in the rear of buildings or in such a way as to give priority to pedestrians and bicyclists

[7] Cervero, Robert and Radisch, Carolyn, *Transportation Choices in Pedestrian Versus Automobile Oriented Neighborhoods*, (Berkeley, CA, University of California Transportation Center, University of California, Berkeley, 1995)

USE OF TRAFFIC CALMING FEATURES

Many local streets throughout the Bay Area are dominated by automobiles and unsafe for pedestrians and cyclists. The primary purpose of traffic calming is to give local streets back to the residents by creating a safe environment where residents can walk, chat, and play. Livable streets can knit a community together and enhance its character and identity. The key to creating such an environment is to reduce the speed of auto traffic and the amount of through auto travel.

Milvia Street in Berkeley is one successful example of traffic calming. This street was redesigned to reduce and divert motor traffic, enhance the bicycle and pedestrian environment, and slow motorists. Speed bumps, alternating on-street parking, reduction of parking spaces, and landscaped islands in the street were added to slow traffic. Surveys conducted after the implementation of the traffic calming measures found that the amount of vehicles on the street during peak hour was reduced, bicycle and pedestrian use had greatly increased and residents were generally pleased.[8]

Traffic calming encompasses a range of measures to slow traffic and make walking and bicycling safer and more enjoyable. There are many benefits associated with traffic calming, but such benefits should be considered when distributed over the entire network. Calming traffic on one street may cause an increase of traffic on other residential streets. While this does not necessarily mean that traffic calming has a negative overall effect on the system, the overall effect should be considered when traffic calming is being evaluated.

Traffic Calming Techniques

- Narrow vehicle ways, such as necking down intersections
- Widen sidewalks and provide bicycle lanes
- Well-marked mid-block crossings
- Elimination of "free right turn" lanes, in which drivers do not have to stop to make a turn
- Provide signs to warn drivers that they are entering a designated traffic calmed area

[8] Association of Bay Area Governments (ABAG), "Making Better Communities by Linking Land Use and Transportation." (Oakland: ABAG, April 1997.)

SITE DESIGN FOR TRANSIT ORIENTED DEVELOPMENT

Provide Parks and Plazas

An often-cited reason for dislike of dense urban spaces is the feeling of crowding and closeness. Public space, such as parks and plazas, provide a break in the urban fabric. Grass and trees provide an ecological aesthetic that helps to increase use in a public area. It also serves as a gathering point where people can rest and relax.

Transit Facilities to Meet Everyone's Needs

Transit center facilities should accommodate pedestrians, those arriving by bicycle, and people with special needs. Access to the transit centers should be safe and comfortable for everyone, with pedestrian and bicycle routes leading to the center. Equitable access should be ensured by the use of ramps, and audible transit announcements and signals for vision-impaired individuals. Trains and buses should be equipped with wheelchair lifts or ramps that are easy to operate.

Transit User Safety

Safety within the transit center is vitally important. The transit user should perceive a secure, controlled environment at all times of day.

Site Design of the Transit Oriented Development

- Rather than design infrastructure around the automobile, environments should provide an accessible walking atmosphere to reach transit and retail destinations.
- Discourage large, free parking areas. If a person can park free, then the probability of rail commuting drops by 25 percent. Furthermore, these parking areas waste valuable land that could be turned into mixed-use development, and encourage people to live far away from their jobs and drive to work.

Strategies for Site Design

- Revision in zoning codes and standards for parking requirements.
- Unbundle parking costs, developers and businesses pay for parking as a requirement of development.
- Reduce the parking requirements for new development within a quarter mile of the transit center.
- Provide grade separated bike paths linking the transit corridor with residential areas.
- Require employment and activity centers to have showers for cyclists.
- All new development in the TOD must have safe areas to lock bicycles.
- Provide weather protection at transit stops and key sites.
- Provide outdoor tables and seating, rest areas, water fountains, and public restrooms.
- Provide functional public space.

CREATING A COMMON VISION

Each of the six components (compact development, integration of a variety of land uses, access to transit, bicycle and pedestrian-friendly environments, use of traffic calming features, and site design of the TOD) are individually beneficial when incorporated into a community. However, the integration and coordination of all six components creates a synergy, which increases the magnitude of the individual benefits and ultimately creates a community that promotes transportation choices.

In order to create this synergy it is vital that community members, local government, and institutional structures work together towards a common vision. This vision should help focus development efforts in order to create a compact urban form that makes walking, bicycling, and public transportation viable and effective transportation choices while meeting the needs of the community.

Chapter 7
Innovative Pricing Strategies to Support Transit

In order to develop a world-class transit system, a clear vision of land use, planning, and transit system design is essential. However, even with a transit system that is convenient, comfortable, and prompt, the price must be right to attract potential new riders. "When people decide whether to drive or take a bus, they compare costs mainly in terms of conspicuous, out of pocket payments, such as bus fares, parking, and bridge tolls…Many Americans accept the $20,000 to $40,000 they pay for owning a car as a 'subscription fee,' a payment necessary to have full access to societal offerings."[1]

Although driving is incredibly more expensive, both in terms of total costs to individuals and certainly in terms of larger costs to society such as pollution and congestion, our pricing structure does not give people accurate price signals. Inaccurate pricing negatively impacts both auto users fighting traffic congestion and transit users. Incorrect price signals reduce ridership, triggering service cuts that drive away additional potential passengers, decreasing revenue and creating a cycle which has undermined transit throughout the country.

Revealing the true costs of transportation to consumers through more accurate price-setting has great promise for reducing pollution and congestion, while increasing use of alternative modes of transportation. Benefits from pricing reforms could be almost immediate. Lack of public support is the primary obstacle to these changes, but as highways become more congested, the political impetus to enact price reforms will likely grow. Additionally, price reforms could be made "revenue neutral" so the average consumer pays no more than previously.

There are three primary reasons that driving often seems cheaper than taking transit:

1. Costs to motorists are mostly periodic lump sum payments. For example, insurance and lease or loan payments are often required monthly, and vehicle registration is an annual occurrence. Once a car is purchased, registered and insured, the rational response is to drive as much as possible. Large "fixed" payments make driving appear cheaper than it really is because there is not a frequent reminder of the actual costs.
2. Public transit riders usually must pay directly each time they board a vehicle. These frequent out-of-pocket payments are a constant reminder of the costs associated with transit.
3. Direct costs paid by motorists are quite small compared to the full cost borne by society for providing and maintaining adequate services for motorists. The full costs also cover police, fire, and ambulance service; wasted time caused by traffic congestion; additional road construction and maintenance; air pollution, water pollution, global warming, and ecosystems hurt by road building; noise and vibration damage; land and maintenance of free parking; and uninsured accidents.[2] Many of these external costs are covered through revenue generated from non transportation-related sources, such as sales taxes. In fact, it has been estimated that the full

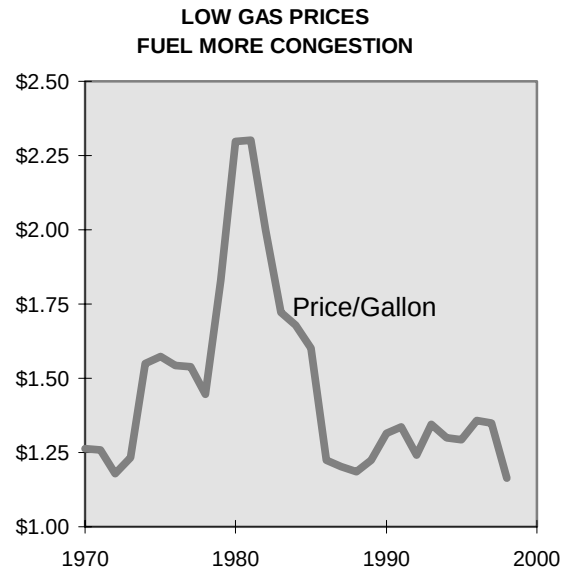
[1] Cervero, Robert, *The Transit Metropolis: A Global Inquiry* (Washington, D.C.: Island Press, 1998): 35.

[2] Holtzclaw, John "Forging Transportation Control Measures to Reduce Driving and Clear the Air" (The Transportation and Air Quality Conformity Conference, 27-28, Feb 1995).

costs related to automobile travel require a $3 to $7 subsidy per gallon of gasoline pumped.[3] 106 billion gallons of gasoline are pumped each year for autos and light trucks, so the total subsidy may be approximately $530 billion.

Unfortunately, current pricing trends may magnify the problem. For example, the price of gasoline is still at historically low levels, even with recent price spikes. Figure 7.1 shows the trend of U.S. gasoline prices from 1970 to 1998. Accounting for inflation, the cost of gasoline has decreased significantly over the past thirty years. A higher price for gasoline (that can be offset by reducing vehicle registration fees, sales taxes etc.) is just one of the pricing reforms needed to support World Class Transit in the Bay Area.

Figure 7.1 Historical Yearly California Gasoline Prices, Adjusted for Inflation (1998 = 100)



Source: California Energy Commission[4]

Depending on the particular goals that are desired – whether it is greatly reducing congestion, cleaning the air, providing more choices to those without cars, or others – there are other pricing reforms that can create immediate and lasting benefits. This chapter discusses price reforms in three categories:

- Revealing the full cost of driving through price reform
- Charging motorists closer to the full cost their travel imposes on society
- Reducing daily out-of-pocket transit fares by offering discounts and/or periodic payments.

REVEALING THE FULL COST OF DRIVING THROUGH PRICE REFORM

Motorists are not frequently reminded of the full price of driving because many payments are made only periodically. Periodic payments can be transformed into more frequent payments in such a way that, on average, motorists are not actually paying any more than before. This type of pricing mechanism is known as a "revenue-neutral" mechanism (no additional revenue is generated) and can be more politically feasible than charging new fees.[5] Two examples follow:

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[3] Holtzclaw, John "Forging Transportation Control Measures to Reduce Driving and Clear the Air" (The Transportation and Air Quality Conformity Conference, 27-28, Feb 1995).

[4] Data from Commission's website: www.energy.ca.gov/fuels/gasoline/gasoline_cpi_adjusted.html

[5] Litman, Todd, Komanoff, Charles, and Howell, Douglas, *Road Relief: Tax and Pricing Shifts for a Fairer, Cleaner, and Less Congested Transportation System in Washington State* (Energy Outreach Center, 1998) or Metropolitan Transportation Commission, *Paying for What You Get & Getting What You Pay For.* (Oakland: MTC, 1995)

Pay-At-The-Pump Insurance

Insurance premiums are currently paid in a lump sum to an agent for vehicle liability coverage. Once this money is sunk into an insurance policy, drivers have an incentive to "get their money's worth" by using their car frequently. Each time the car is used, the per mile rate for the insurance essentially decreases. Pay-at-the-pump insurance would be paid by a per gallon surcharge on gasoline that would be collected each time a motorist pumps gas. Motorists could choose to drive less or purchase more fuel-efficient cars to save money. Not only is this system fair for those who drive less, but it could also fully resolve the problem of uninsured drivers, reduce congestion, and reduce impacts on the environment by reducing vehicle travel and emissions.[6]

Pay-at-the-pump insurance promises Californians tremendous benefits and overall financial savings by reducing insurance company costs such as advertising. However, legislation to initiate such an insurance system was successfully opposed by vested interests in the early 1990s.

Mileage-Based Insurance Or Registration Fees

A system of mileage-based insurance or registration fees would be similar to pay-at-the pump insurance, but the motorist would be charged for each mile traveled instead of each gallon of gasoline consumed. The implication is that motorists who drive more pay more, as they a higher risk factor. Similarly, yearly registration fees could be eliminated and the total registration fee based on overall miles traveled. These mechanisms may not only reduce vehicle travel, but are also likely to help shift people towards more fuel-efficient vehicles. They can help increase transit ridership and decrease congestion to some extent, but their greatest benefit would be reduced air emissions and improved public health.[7]

CHARGING MOTORISTS CLOSER TO THE FULL COST THEIR TRAVEL IMPOSES ON SOCIETY

Various pricing mechanisms are already being successfully implemented in many areas of the world including France, Norway, and locally in Southern California. These places share with the Bay Area the problems of severe congestion, limited available space and money for new highway capacity, and citizens and governments open to new solutions.

In order to alleviate the need for use of taxpayer funds to cover the full actual costs associated with automobile travel, automobile costs could become more internalized through charging motorists the true price for their travel. Like the other suggestions in this chapter, these can have astounding benefits for both drivers and transit users.

Variable Rush Hour Tolls

Variable rush hour tolls could be implemented on any existing toll facilities. For example, variable bridge tolls, like long-distance telephone rates and many transit fares, charge more for using the bridge during peak periods and less during the off-peak. Compared to a flat toll, variable tolls

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[6] Litman, Todd, Komanoff, Charles, and Howell, Douglas, *Road Relief: Tax and Pricing Shifts for a Fairer, Cleaner, and Less Congested Transportation System in Washington State* (Energy Outreach Center, 1998)

[7] Litman, Todd, Komanoff, Charles, and Howell, Douglas, *Road Relief: Tax and Pricing Shifts for a Fairer, Cleaner, and Less Congested Transportation System in Washington State* (Energy Outreach Center, 1998)

promise to save travelers time and to improve air quality. Variable tolls would encourage peak-hour bridge users to shift to higher occupancy modes and reschedule some trips to less congested hours. Toll revenue can be invested into transit alternatives in the corridor.

Express Carpool Lanes

Express Lanes are carpool lanes that solo drivers can access for a fee. Revenues would support transit service in the same corridors where it is raised. The Bay Area has numerous carpool lanes that are not being used at full capacity. Express Lanes allow motorists to use that extra space, reduce congestion in adjacent lanes, and generate revenue for transit alternatives. By getting more use out of the lanes we have, there may be less need and less demand for expensive new lanes. Express Lane projects in Southern California have been overwhelmingly successful.[8]

Why express lanes?

- Increased people-moving capacity *without* adding new lanes
- Faster travel times for all
- Revenue source for buses and rail
- Beneficial to couriers, shippers and other such businesses

Gasoline Tax

Direct transportation user-fees—such as the gas tax—make the connection between those who are using the Bay Area's roads and the operation, maintenance, and improvement of the region's transportation system. Such fees may soon become a reality given that MTC was recently granted the authority to place a regional gas tax of up to ten cents per gallon on a future ballot.

VMT Fee

A vehicle-miles-traveled (VMT) fee would be collected for the total number of miles a vehicle travels. As opposed to the gasoline tax, the VMT fee would not take into account the fuel efficiency of the vehicle because it only considers total mileage. A VMT fee could either replace a registration fee, smog check fees, or be used to reduce sales taxes that are now dedicated to transportation.[9]

Employee Parking Charges

Currently many employers offer free parking to their employees. In fact, approximately 95% of automobile commuters nationwide park for free at work.[10] This encourages people to drive rather than take an alternate form of transportation. A parking fee would be either a set amount or variable amount accounting for peak times charged to motorists who use the parking facility. Employees may take an alternate form of transportation to avoid the parking cost, carpool or vanpool to share the cost, or pay the full parking cost (see Figure 7.2).[11] Over time, we may even see shifts in where employers choose to locate, as employees would be more concerned about the availability of transportation alternatives.

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[8] Kirshner, Daniel, *Escape From Gridlock: Implementing Express Lanes on I-80 and Beyond* (Environmental Defense Fund: 1998) (See EDF's web page at: www.edf.org/pubs/Reports/#Transportation).

[9] Metropolitan Transportation Commission, *Paying for What You Get & Getting What You Pay For.* (Oakland: MTC, 1995)

[10] Shoup, Donald C. *Cashing Out Employer-Paid Parking: An Opportunity to Reduce Minimum Parking Requirements* (Working Paper UCTC: 1995 no. 204)

[11] Metropolitan Transportation Commission, *Paying for What You Get & Getting What You Pay For.* (Oakland: MTC, 1995)

Employee Parking Cashout

This mechanism rewards the non-motorist by providing them a refund for the "free" or subsidized parking space that they are not utilizing. While this mechanism does not directly charge the motorist more, the motorist does pay more in the form of an opportunity cost. That is, the motorist is foregoing the opportunity to be paid the parking cashout. Cashout can have a tremendous impact on transit ridership.

Recent changes have made parking cashout much more attractive

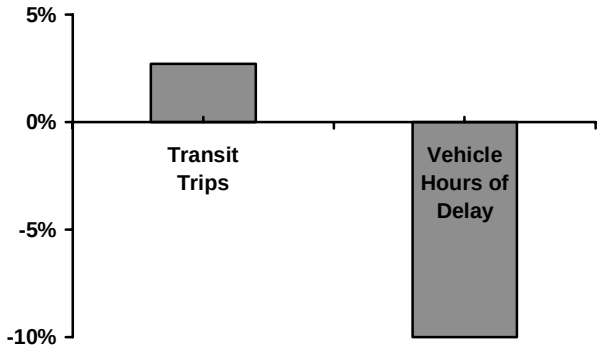
1. The tax code has been revised to encourage employers to offer a cashout benefit. If cashout is given in the form of commuter checks, most or all of it comes as a tax-free benefit to both the employer and employee.
2. Many work sites are running out of parking as employers fit more people into existing office buildings. Parking cashouts decrease the need for parking, thus eliminating the need for employers to lease or build additional parking space.
3. With strong cashout provisions and locating near transit, employers that are constructing new facilities can save tremendous amount of money in land and paving costs by not providing a spot for every employee.

REDUCING DAILY OUT-OF-POCKET TRANSIT FARES

Another method for changing the perception that driving an automobile is relatively cheaper than taking transit is to transform transit fares into periodic payments. This would make transit riding much simpler, as well as provide less frequent reminders of how much the cost of transit fares.

The Metropolitan Transportation Commission is now developing a transit debit card, TransLink, that will work on most major transit operators. These cards will simplify payments as transit users will simply wave cards in front of the electronic reader and the appropriate amount will be deducted from an electronic account. If successful, transit debit cards will simplify discount transit programs and may help entice some new riders. Free or discounted transit is a critical step towards increasing ridership. Specific mechanisms include:

Figure 7.2 Employee Parking Charges Increase Transit Ridership and Decrease Congestion



This recent projection is for the effect of a $2.60 parking charge at worksites in the Bay Area. The reduction in congestion, or vehicle hours of delay, shows how effective pricing reforms can be. If coupled with greatly improved transit, this increases even more.

Discount Transit Programs

Various transit programs can be used to offer free and discounted transit fares. Discount fares would be effective not only because riders would ultimately pay less but also because the payments would be made less frequently. For example, monthly or bulk passes would be offered at a discount rate and would only be purchased periodically. Additional discounted passes might include those for seniors, students, and lower income groups.

Commuter Checks

This mechanism is an employer-based discount distributed to employees who elect to take transit. Generally, it is a set amount each month given to the employee as a tax-free benefit.[12] The organization Rides for Bay Area Commuters has been tremendously successful at getting Bay Area businesses to offer Commuter Checks.

Free Eco Pass

This successful program is well underway in Santa Clara County. Employers purchase yearly transit passes for all their employees good for rides on any Valley Transportation Authority light rail vehicle or bus. It was started with support from the Silicon Valley Manufacturing Group (SVMG), and now covers over 46,000 employees.[13] Statistics from SVMG show an overall doubling in transit ridership at Eco Pass companies. For example, Varian Associates in Palo Alto, a firm with 1,300 employees, saw a 245% rise in transit ridership, increasing from 110 employees to 380.[14]

BUT WILL THEY WORK?

Several studies have evaluated the effectiveness of most of these mechanisms on Bay Area travel patterns, as well as other regions nationwide. An overview of results is presented in Table 7.3.

These mechanisms are effective at reducing motor vehicle travel and therefore congestion. The 6% decrease in miles of travel for the $0.40 per gallon pay-at-the-pump insurance would reap a much larger benefit. Again, both of these mechanisms could be designed so that the overall cost to consumers remains the same. For example, the California State income tax could probably be eliminated with a large gasoline tax, and the reduced driving would reduce the need for many costly road expansions. Pay-at-the-Pump insurance would greatly reduce administrative and advertising costs, which are part of the reason for current high insurance rates.

Table 7.3 Estimated Effectiveness of Pricing Mechanisms

Pricing Mechanism	Price	Change In:			% Change In Transit Trips	Notes
		Miles of Travel	Total Trips	Travel Time		
Pay-At-The-Pump Insurance	$0.40/gallon	-6.0%	NA	NA	-	a
Rush Hour Tolls	$0.13/mile	-2.8%	-2.7%	-8.2%	-	b
Bridge Tolls	$2 increase	NA	-7.0%	-40.0% (see note c)	-	c

[12] Oram, Richard L. and Stark, Stephen "Infrequent Riders: One Key to New Transit Ridership and Revenue" (Transportation Research Record: no. 1521): pp. 37-41.

[13] Silicon Valley Manufacturing Group. www.svmg.org/htm/transp_committee.htm 13 December, 1999.

[14] Gary Richards, "Free passes touted as transit enticement," *San Jose Mercury News* 16 February, 1998.

Gasoline Tax Increase	$0.50/gallon	-3.6%	-3.4%	-5.3%	-	d
	$2/gallon	-11.7%	-11.3%	-16.8%	-	
VMT Fee	$0.20/mile	-3.9%	-3.7%	-5.7%	-	d
Parking Charges	$1/day	-0.8%	-0.9%	-1.3%	-	e
	$3/day	-2.1%	-2.4%	-3.5%	-	
Commuter Checks	$20 and $30	NA	NA	NA	+33.9	f

Notes

a Conducted for the State of Washington for an analysis year of 1998.[15]

b Conducted for the San Francisco region for an analysis year of 2010.[16] Included tolls for bridge and non-bridge roadways.

c Conducted for the San Francisco region for an analysis year of 1994.[17] Included a toll increase for the Bay Bridge from the $1 toll that was collected at that time. The Study predicted that each $1 increase would reduce waiting time at the toll plaza by 20%. Since this wait is only a portion of the total trip time, the reduction in total trip time will be smaller. The reduction of trips is in the number of 1- and 2-passenger vehicles crossing during the peak times.

d Conducted for the San Francisco region for an analysis year of 2010[18].

e Conducted for the San Francisco region for an analysis year of 2010[19]. Charges are applied only to spaces used by drive-alone workers in the region.

f Conducted for the San Francisco region for an analysis year of 1993 based on an actual survey.[20]

The results shown in Table 7.3 offer a summary of a few recent studies conducted. Once a desired outcome is established, the possible mechanisms that specifically target the outcome should be thoroughly investigated.

ARE PRICING MECHANISMS FAIR?

Some pricing mechanisms may have undesirable equity implications unless they are designed to address the negative impacts some people may experience. The most common concern when

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[15] Litman, Todd, Komanoff, Charles, and Howell, Douglas, *Road Relief: Tax and Pricing Shifts for a Fairer, Cleaner, and Less Congested Transportation System in Washington State* (Energy Outreach Center: 1998).

[16] Deakin, Elizabeth and Harvey, Greig, Transportation Pricing Strategies for California: AN Assessment of Congestion, Emissions, Energy and Equity Impacts. (California Environmental Protection Agency, June 1995)

[17] Frick, Karen T., Heminger, Steve, and Dittmar, Hank, "Bay Bridge Congestion-Pricing Project: Lessons Learned to Date" (Transportation Research Record: no. 1558) pp. 29-38

[18] Deakin, Elizabeth and Harvey, Greig, Transportation Pricing Strategies for California: AN Assessment of Congestion, Emissions, Energy and Equity Impacts. (California Environmental Protection Agency, June 1995)

[19] Deakin, Elizabeth and Harvey, Greig, Transportation Pricing Strategies for California: AN Assessment of Congestion, Emissions, Energy and Equity Impacts. (California Environmental Protection Agency, June 1995)

[20] Oram, Richard L. and Stark, Stephen "Infrequent Riders: One Key to New Transit Ridership and Revenue" (Transportation Research Record: no. 1521): pp. 37-41.

considering pricing schemes is that low-income motorists will not be able to afford the additional costs and will thus be forced to find an alternative or eliminate automobile use altogether. In addition, the overall effect of a user-based fee should be assessed with consideration of how the revenue is spent.[21]

One study of higher rush hour tolls on the Bay Bridge found that the average income of drivers during the peak period was over $70,000.[22] In this case, higher tolls for additional Transbay transit service would probably help lower-income individuals. Furthermore, if a pricing mechanism is considered good for society but bad for lower-income users, then "lifeline" rates, or subsidies, should be considered.[23] In the Bay Bridge example, a possibility is to retain the existing toll rate for any family that qualifies for lifeline telephone rates. A comprehensive study of pay-at-the-pump insurance showed it would actually be beneficial to low-income drivers.[24]

Drivers and Transit Users Need Better Pricing

In a world-class transit system, travelers need reliable, convenient transit, but must also see the economic benefits of taking transit. Failure to charge motorists the true costs of their travel means they drive alone more than they would otherwise. All residents bear the costs of the automobile subsidy in the form of poor air quality and higher travel time. If forced to pay for their contribution to these and other impacts, people would certainly drive less often and use transit more (on average), and pollution and congestion would be reduced.

Unfortunately, Bay Area residents and elected officials often want it all: cheap gas, low tolls and no traffic congestion. That will never happen in the Bay Area. Leadership is needed to promote innovative pricing proposals, including pay-at-the-pump insurance, rush hour tolls, gas taxes, transit discount programs, and other price reforms described in this chapter. These mechanisms would vastly improve quality of life, save taxpayers money in the long run, and contribute a critical component to the area's World Class Transit System, a level playing field of economic incentives.

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[21] Deakin and Litman, Todd, Komanoff, Charles, and Howell, Douglas, *Road Relief: Tax and Pricing Shifts for a Fairer, Cleaner, and Less Congested Transportation System in Washington State* (Energy Outreach Center: 1998).

[22] Frick, Karen T., Heminger, Steve, and Dittmar, Hank, "Bay Bridge Congestion-Pricing Project: Lessons Learned to Date", *Transportation Research Record*, (Issue No. 1558, pp. 29-38).

[23] Metropolitan Transportation Commission, *Paying for What You Get & Getting What You Pay For*. (Oakland: MTC, 1995)

[24] Allen, Jeff & Roland Hwang, and Jane Kelly, *An Equity Analysis of "Pay-As-You-Drive" Automobile Insurance in California*, (Berkeley, CA: Union of Concerned Scientists, November 1994)

Chapter 8
The Role of Technological Innovations in Bay Area Transit

The transit industry has made a number of innovations to improve the overall operation of transit vehicles and to provide a higher level of service quality. Most innovations are based on Intelligent Transportation Systems (ITS) and new communications technologies, while others have focused on existing technologies, such as the development of transit stores or the introduction of subscription buses. Some of these new, exciting innovations are in the process of being developed or have already been implemented in the Bay Area, where they could significantly facilitate the use of transit and reduce auto dependency.

In the future, transit users will have a new set of resources at their disposal. Users will be able to choose the fastest or most direct transit route between two points and waiting, transfer and boarding times will be reduced. For example, in a few years, the following scenario could become commonplace: After a last-minute decision is made to travel via transit, the transit user logs onto the Internet and consults a website to explore possible routings, schedules, fares and estimated travel times. He learns that the bus he plans to take is five minutes late and calculates that he has enough time to finish his cup of coffee. Upon boarding, he does not need to search for spare change or bills to pay the fare, and instead uses his TransLink smart card on the onboard card reader which automatically deducts the fare. The following section details transit innovations that could change the face of Bay Area transit.

INNOVATIVE PROJECTS IN THE REGION

There are a number of technological breakthroughs in the Bay Area that could significantly impact the effective operation of transit in the future. These new innovations have the potential to eliminate many of the existing barriers to a smooth, seamless transit system. The principal projects can be divided into the following groups:

- real-time information systems;
- advanced vehicle location (AVL) systems;
- universal transit tickets; and
- transit information systems.

Real-Time Information Systems

A number of recently developed informational systems provide time-sensitive information on public transit in the Bay Area. These systems employ different types of technology and different media.

Internet regional transit page. A regional web page provides service, schedule and fare information on all transit services in the Bay Area. It includes system and route maps for almost all operators in the Bay Area and provides links to other operators in neighboring counties (e.g., Sacramento, San Joaquin). Originally developed by two Berkeley students in the early 1990s, this system is now

owned and updated by MTC, in conjunction with the numerous regional operators. The transit web page is located at: *www.transitinfo.org*.

TravInfo. This service features a regional telephone number (817-1717) that connects callers with transit information. This number is accessible at any time of the day from all area codes in the region, and has been expanded to include road and highway conditions and ridesharing arrangements. MTC developed and implemented TravInfo in the mid-1990s in response to the need for a central source of travel information. The principal objective of the TravInfo project is to provide alternative mode and route information to all interested Bay Area residents.

TransStar. This computer program provides comprehensive point-to-point transit information, allowing travelers to take advantage of the most direct and/or time-efficient routing. Although the program is licensed to BART, MTC is responsible for managing the project and four regional operators currently pay for system access: Muni, BART, AC Transit, and the County Connection. Operators at these transit agencies access the program to respond to telephone requests but in the future this information may be made available to the public via the Internet.

Advanced Vehicle Location Systems

A number of transit systems in the U.S. have introduced advanced vehicle location (AVL) systems in order to track transit vehicle availability. Through these systems, a transit agency can locate all system vehicles, allowing for more accurate estimation of transit travel times and improving schedule reliability. Although most transit systems provide timetables, vehicles sometimes arrive late or not at all. Transit users are sensitive to changes in arrival and departure times, and would benefit from dependable real-time information.

NextBus. In the past, a general lack of reliable, real-time schedule information caused many potential riders to avoid using transit. The NextBus system provides riders with accurate, real-time waiting times at selected bus stops or transit stations (on stationary and portable electronic displays) as well as on the World Wide Web.[1] This system has been implemented on the Emery-Go-Round shuttle service in Emeryville, and on Muni's 22-Fillmore Line. NextBus provides an array of incentives for taking transit:

- Changes in passenger perception of waiting time;
- Elimination of passenger uncertainty over late or early arrivals;
- Reduction in passenger exposure to harsh weather conditions or crime;
- Prompt notification of service irregularities;
- Prompt notification of existing seat availability; and
- Increased willingness to pass up an overcrowded bus for a closely following one.

Napa Valley Transit AVL Project. Napa Valley Transit has initiated a demonstration project to test a new AVL system. Service reliability has subsequently improved, allowing for timed transfers at key points of interchange (e.g., Vallejo Ferry Terminal). In addition, the AVL system has allowed managers to react quickly to vehicle problems.

[1] Nextbus Information Systems, *NextBus Home Page* (www.nextbus.com), 1998.

Universal Transit Ticket—TransLink

In conjunction with regional transit agencies from throughout the region, MTC has entered into a contract with Motorola to introduce a transit smart card for all transit operators in the Bay Area. Cardholders will pre-pay for this stored-value card and flash the card within close proximity of a reader whenever they take a transit trip. These readers will be installed on buses and rail system faregates throughout the network. Transaction-related data will be collected by the card reader and transferred to a regional clearinghouse, where operators will be able to access information.

The system could provide a major breakthrough in region-wide fare integration, encouraging inter-operator use, a high level of operating accountability, and pricing flexibility.[2] This project will promote better coordination of fares and revenue sharing. It will also provide a wealth of statistical information on regional transit trips, permitting individual operators to more accurately evaluate transit effectiveness for future planning.

In 2000, MTC will launch a demonstration project on selected transit routes of seven participating operators that will test TransLink's ability to attract private sector financing, meet operational needs, and assess cost-effectiveness. The TransLink Oversight Committee will evaluate the system based on user and operator satisfaction, vehicle performance, and cost. If successful, regionwide implementation of TransLink will begin in late 2001.

Transit Information Services

Berkeley TRiP. In 1986, this facility was established as a one-stop shop for transit information and the sale of many regional passes and tickets. The facility has expanded to provide trip planning services to UC-Berkeley students and in the future will market the TransLink card to students, employers, and the general public.

San Francisco Trip Store. Facilities at the Embarcadero and Montgomery BART stations in downtown San Francisco sell transit tickets and passes. In 1995, the San Francisco Planning Department assumed responsibility for the project and expanded it to include the provision of information about alternative travel modes and rideshare matches. Future services may include the sale of TransLink cards and the on-site use of TranStar trip planning.

POTENTIAL AREAS OF EXPANSION

In addition to some of the new electronic fare and information systems mentioned above, other technological innovations should be considered. For example, Muni, BART, VTA and Caltrain have studied ways to improve service through faster and more frequent operation, and to improve safety through the implementation of sensors to detect bodies or debris near rail tracks. For inter-regional journeys to and from points outside the Bay Area, the state has studied High Speed Rail to Los Angeles and the Central Valley in an effort to improve travel times and reduce congestion around airports.

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[2]Metropolitan Transportation Commission, *TransLink Program Summary.* (Oakland: MTC, 1998).

RECYCLING THE PAST

This is not the first time in the history of the Bay Area in which concerns about the livability of our neighborhoods, congestion on our streets, and the quality of our air have come to the forefront of public concern. By the 1960s, the elimination of some public transit services and the increasingly obvious negative impacts of auto usage were evident to many Californians. While advanced technologies are bringing new answers to new problems, we can learn much from the past, when the Bay Area had a world-class network of public transit.

In the first half of the 1900s, ferries whisked passengers to the Ferry Building at the foot of Market Street in San Francisco from other parts of the Bay Area. Following the construction of the Bay Bridge, trolleys ran from a terminal in downtown San Francisco directly to neighborhoods of the East Bay. Although this service was abandoned in 1958, at its peak it swiftly carried thousands across the bay. More recently, extensive school bus systems allowed children to ride to school while their parents were free to start their days. Some of these transit services are being reconsidered in the Bay Area in order to move people faster and more comfortably while easing congestion on the freeways.

Courtesy of Western Railway Museum
This midday view of Market Street in San Francisco shows the immense number of streetcars operated by the privately held Market Street Railway and the city-owned Municipal Railway. Note the Ferry Building in the background.

Streetcars

Streetcars were a fixture in nearly every city of the Bay Area through the 1940s. Quiet, clean, and fast, they used power from overhead wires and provided a highly effective way of traveling within cities. During the height of this period, San Francisco had two streetcar companies and over 50 streetcar lines. At rush hour, Market Street's four streetcar tracks carried an immense number of people, as can be seen in the photograph. Today, streetcars still ply the streets of San Francisco, but only seven lines are in service. With modern technologies, streetcars again offer promise as an efficient means of moving people.

Interurban Trolleys and Light Rail

Interurban trolleys, while visually and technologically similar to streetcars, tended to be larger and faster, and ran on private right-of-ways between cities. The Bay Area had several interurban systems, some reaching as far as Chico in the upper Sacramento Valley. In the East Bay, from 1903 to 1958, the Key System operated interurbans from Berkeley, Oakland and Piedmont to San Francisco. Combined with the services of its competitor, the Southern Pacific (which also operated in Alameda), the East Bay had a truly world-class network of commute trains to San Francisco.

Until 1939, these systems ran their trains onto long piers, where passengers transferred to ferry boats for a quick ride to downtown San Francisco. In 1939, the Key and Southern Pacific began operating their trains over the Bay Bridge to a terminal at First and Mission in downtown San Francisco. While the interurban died in the Bay Area in 1958 with the abandonment of the Key System, the concept of interurban rail is far from dead. The light rail lines of today borrow heavily from the streetcars and interurbans of past days in both technology and operating style, sometimes even operating over the right-of-ways of former interurbans. The Valley Transportation Agency is now pursuing an intensive light rail system throughout Santa Clara County.

The Bay Bridge Terminal was the terminus of the Southern Pacific, Key System and Sacramento Northern lines from the East Bay into San Francisco. *Courtesy of Western Railway Museum*

Ferries

Ferries once formed an integral part of the Bay Area's transportation network. Until the Bay Bridge Railway entered service in 1938, ferries from three piers in Oakland and Alameda carried the passengers of the Key System, Sacramento Northern and Southern Pacific to San Francisco's ferry building. Northwestern Pacific's commute trains connected with ferries in Sausalito, providing a link with Marin County. At their peak in 1930, over 50 boats operated on the bay, carrying 58.4 million passengers annually. Rail and ferry timetables were tightly integrated for smooth connections. Traffic through the San Francisco ferry building was so heavy that it ranked only second to London's Charing Cross station in daily flow of passengers.[3] The last passenger ferry service ended in 1958.

[3] Demoro, Harre W. and Sappers, Vernon J. *Rails to The San Francisco Bay* (New York: Quadrant Press, 1991).

School Buses

Reinstating school buses service—as has been suggested by ABAG—could significantly ease congestion and reduce emissions.[4] A recent study in Lafayette concluded that congestion during the morning peak can be reduced by 15% as a result of reinstating school buses. This could be a highly cost-effective method for congestion reduction in other areas as well.

Conclusion

The San Francisco Bay Area has changed over the years. The convenience and flexibility of the automobile has driven transit ridership to an all-time low in terms of share of trips taken. Now, transit must be reconsidered as freeways are increasingly congested and cars are less and less effective at moving people. The best transit solutions will come from past and future innovations. The Coalition views the implementation of the World Class Transit proposal as a key step towards reinstating an effective transit network and bringing back a piece of Bay Area history.

[4] ABAG, *Trends and Challenges, facing the future of the San Francisco Bay Area* (April 1998): p. 32.

Chapter 9
Developing Seamless Connections at Key Transit Centers

Transit centers have been places of activity and pride for generations. Names like Union Station, Penn Station, and Grand Central Station conjure up images of marble staircases, brass railings, and high painted ceilings. These names also remind us of a time when people took trains and buses because they were the best way to get where they were going. These stations were the central focus of a transit system that permitted and expected travelers to make transfers between routes in order to complete their journeys. The recent restorations of these landmarks proves that their era is re-emerging, and that the public is interested in bringing back an efficient transit system to be proud of. *The design, operation, and location of transit centers can play a vital role in an overall metropolitan transportation plan that encourages individuals to use transit services.*

Grand Central Station, New York City

Well-designed transit centers can dramatically improve the efficiency and attractiveness of transit service. By definition, a transit center is any location at which multiple routes or modes of public transportation intersect and that provides access for pedestrians to transfer from one mode or route to the next. A smooth flowing transit center can have the same effect on transit as a smooth flowing freeway interchange has on automobile use. An interchange in the strictest sense is simply a transfer from one route to another. Imagine replacing the MacArthur Maze with a stop sign and suddenly driving becomes as attractive as a bus trip with four transfers. "The ease with which transfers can be accomplished enhances the attractiveness of a transit mode to potential riders"[1].

REGIONAL CONTEXT—TRANSIT CENTER SYSTEM

Transit systems in the United States have always focused on service to the Central Business District (CBD) of the metropolitan region. However, with the geographical diversification of the regional job market and the increase in suburb to suburb commutes, direct CBD routes no longer provide adequate service. As an alternative, the concept of a transit center based system should be examined.

[1] Hoel, Lester A., et.al., *Criteria for Evaluating Alternative Transit Station Designs* (Department of Civil Engineering, University of Virginia, sponsored by the US DOT Program of University Research: February 1976)

The concept of a transit center-based system, examined in detail in past studies, is simple.[2] A direct radial pattern from the CBD connects to transit centers in major subregional activity centers. From each subregional transit center, feeder routes fan out into local neighborhoods, connecting most points in the subregion to the transit center. With such a system, travelers could theoretically reach any point within their own subregion, as well as the CBD, with a maximum of one transfer. Direct service that connects transit centers to each other would allow travelers to reach any point in the region with a maximum of two transfers. By combining local and direct inter-regional routes, an efficient and all-encompassing transit system is created. *Such a system would encourage the development of community centers around the transit centers, and provide transportation options for community members.*

The focus of this chapter will be logistical or *passenger flow* design features, operator coordination, and the environment of the center. The first section briefly describes examples of working transit centers in the San Francisco Bay Area. The following section details the general features and amenities required in most transit centers. The third section discusses the need for coordination between the schedules of the modes and consequently, their operators. The final section briefly describes how the transit center concept is related to the other chapters of this report.

> *"Each transit center should be the focal point of transit activity for a subregion of the metropolitan area and patrons would know that almost any destination in the region could be easily reached from any transit center."*
>
> *- Schneider, 1980*

SAN FRANCISCO BAY AREA TRANSIT CENTERS

There are a large number of transit centers in the San Francisco Bay Area. Several examples are discussed below.

Richmond Multimodal Center

The Richmond Center was built as part of the original BART system in 1972. The center is near downtown Richmond and serves as the northern terminus of BART, as well as an access point to AC transit bus routes and Amtrak's Capitol Corridor service. The center utilizes a central underground concourse which provides direct access to both BART and Amtrak without crossing tracks. The center is also easily accessible by bicycle with bicycle stalls in view of a station attendant. Recent improvements to circulation and bus bays allow smooth flow of vehicles and provide a safe pedestrian movement. Parking areas are situated outside of the transit flow patterns and good pedestrian connections are made between parking areas and the station.

[2] Schneider, Jerry B., *Planning and designing a transit center based transit system: guidelines and examples from case studies in twenty two cities*, (Seattle WA, Urban Transportation Program, University of Washington: 1980). Series title: University of Washington Urban Transportation Program Research report, no. 80-2

Transbay Terminal

The Transbay Terminal, originally built in the 1930s as the San Francisco terminus of the Key System, serves as a major center for Muni, AC Transit, Golden Gate Transit, SamTrans and Greyhound. Service is provided for downtown San Francisco and to the rest of the region. The Transbay Terminal has a number of positive attributes that set it apart from other regional transit centers. It is located only a few blocks from downtown San Francisco and is thus close to shopping and eating establishments. Unfortunately, the terminal is old, dirty, and confusing, with poor signage and dark areas that are a security problem at night.

The Transbay Terminal is old, dirty, and confusing.

A number of the operators accept inter-operator transfers, but the relocation of Golden Gate Transit and SamTrans from inside the terminal to poorly marked areas outside of the facility has created an obstacle to physical integration between operators. Many travelers simply get lost. Recently, there has been a significant amount of debate over possible relocation or refurbishing of the terminal and the extension of Caltrain to downtown.

San Jose Diridon Station

This station located west of downtown San Jose was established in 1864 as a rail station for the Southern Pacific Railroad. Presently it hosts three heavy rail operators, Caltrain, Amtrak, and ACE, as well as extensive bus service. The bus terminal is located on the east side of the main depot, and the train platforms are on the west side.

Despite its distance from downtown and major commercial and retail activity, the station serves as a major transit center. The location of the San Jose Arena only a block away greatly improved the connection between transportation and surrounding land use. Future plans for the VTA light rail include an extension from downtown to the Diridon Station.

Potential Development to Specific Transit Connections

There are several gaps in transit service around the Bay Area which make travel from one subregion to the next by transit unattractive.

- The most prominent transit gap is between the South Bay and the East Bay. Specifically, traveling north from San Jose on Amtrak, there is no convenient rail connection with BART until the train reaches the Richmond station. The closest connection is in Hayward where transfers must be made via a 1-mile walk through a residential neighborhood. A potential site for a multimodal station that would allow for more convenient connections is a few miles south of Union City, where the BART & Amtrak tracks cross.
- Capacity expansion is often used to improve highway flow, but is rarely thought of in rail service. Nearly all of BART's trains have to pass through Oakland, where BART transfers are frequently hindered by delays because the three tracks that run through those stations cannot accommodate

the large number of trains. The addition of another track to Oakland BART transfer stations would improve connections and service.

- The extension of Caltrain to the Transbay Terminal would increase Caltrain's attractiveness and possibly increase ridership from the peninsula cities into downtown San Francisco. Along with other improvements, the extension could revitalize the center and help turn the Transbay Terminal into an impressive regional transit center.

IMPORTANT COMPONENTS FOR THE EFFICIENT OPERATION OF A TRANSIT CENTER

Physical Connections

This section examines transit centers from a design perspective in order to provide citizen activists and others interested in better design of transit centers with enough information to become substantively involved in design issues.

The first question a designer must ask when planning a center is what transport modes will use this station now and in the future, from rail, bus, taxi, paratransit, and auto, to bicycle and pedestrian. The pedestrian interface is vitally important because all travelers become pedestrians as they move from one mode to the next.

Following are key parameters in physical connections between pedestrians and transit modes:

- The terminal areas for boarding and alighting passengers for each mode must be located on the site and designed to function smoothly and interact with the other modes. All terminals would ideally be located around a central location. This space serves as the main concourse or depot for travelers passing between modes.
- Parking areas can be nearby but should not be located between any other transit mode and the central area. Safe, well-marked paths should funnel pedestrians from parking to the central transit area without the need to traverse large parking lots.
- Kiss-and-ride facilities (for motorists dropping off passengers) should be located at the entrance to the main concourse and designed for quick vehicle flow directly to and from the street.
- Direct access to and from the street should be provided to allow smooth vehicle flow into and out of the transit center. Bus terminals should be located beside the central concourse and not interfere with the other modes or pedestrian flow within the transit center.
- Rail stations should connect to the main transit center concourse and use as few platforms as possible. Not only is this cheaper due to the high cost of train platforms, but it facilitates easier transfers between trains and reduces the number of decisions and possible confusion for travelers.
- Bicycle facilities are necessary. These facilities should include bicycle parking and lockers in sight of the center's ticket or security booth as well as safe, well-lit bicycle paths from the street to the center.

Timed Transfers

An important part of providing direct, convenient transfers is minimization of waiting times between connections. The arrival and departure of transit vehicles that have large numbers of transfers or that are along a common or continuing route should be scheduled to occur simultaneously or within a short layover period. Timed transfers facilitate easy connections between routes are admittedly difficult to coordinate. However, well-timed transfers are very important.

> *"Large transit centers complicate the 'timed transfer.' To be successful, timed transfers require sufficient time for the interchange between the most distant stop locations at the transit center."*
>
> *- Larwin, 1997*

Signing and Information

Knowing where to go to reach a transfer is vitally important to the transit passengers, especially those unfamiliar with the system. This information is provided through informational displays, directional signs, and public announcements.[3]

- **The main concourse** should include schedules, route information, fares, and maps for all operators. These maps should be detailed enough to allow travelers to navigate the center and determine the correct routes for their trip. Maps should also locate activity centers and points of interest in the area surrounding the transit center.
- **Repeater displays** located at the specific terminals should show the same information as the main maps.
- **Directional signs** tell the traveler where to go, where they are, and what is down a hall, staircase, or through a door. These signs should be located at every change of direction in the center.
- **Common graphics**, coloring, and lettering increase the readability, and usefulness of signs.
- **Sign maintenance** is of extreme importance. Information needs to be current and consistent.

Fare Collection and Ticketing

Paying for a transit ride is often the most confusing part of the journey.

- Ticket booths, machines, and gates should be simple to use, efficient, and easily identifiable.
- Fare and ticket information should be posted at both the purchase and collection area.
- A common transit ticket (discussed in the "Innovative Projects in the Region" section in Chapter 8) could greatly simplify the transition between one fare system and another.

Special Passenger Needs

It is imperative and required by law to consider all persons when designing any public space. For example, ramps, doors, and hallways need to be designed to meet Americans with Disabilities Act standards and station platforms should come as close to the transit vehicle floor as possible.

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[3] This information was taken from "Metro Travel Interchange Bradford," Issued by West Yorkshire Passenger Transport Executive, 1977.

The Transit Center Environment

The environment of a transit center is important in creating a positive experience for the traveler. Attention to details such as personal safety, general aesthetics, amenities and conveniences will encourage the use of public transit.[4]

- Safety (and perceived safety). The design of the facility needs to include adequate lighting, clearly marked exits and accessible transit employees and security officers.
- General aesthetics. It is important to keep the transit center and vehicles clean. Air temperature, architecture, and distinguishing decor and artwork make any public space more comfortable and inviting.
- Amenities and conveniences. All transit centers should include benches and appropriate shelter. In addition, larger centers should additionally include telephones, restrooms, drinking fountains, and possibly food services. Each additional service provided will increase the attractiveness of the center and increase ridership.

Transit facilities are part of a larger community, and improvements to these transit facilities should benefit the community at large. Integrated facilities of a transit center include those features not directly related to the transfer process or the center's environment. These facilities can include shopping, child care, and community centers. Chapter 6 includes details of community development that supports transit systems.

CONNECTIONS THROUGH TRANSIT AGENCY COOPERATION AND PLANNING

At transit centers throughout the region there is a clear need for coordination among operators. This coordination may take the form of route, fare or institutional integration, depending on the economic and political commitment involved.

While the provision of seamless travel is a key objective in any transit system, in some urban areas, regional transit planning and coordination are not conducted on an ongoing basis, leaving operators to incur many of the associated costs. To preserve operator integrity and to satisfy the need for transfer services, it is essential that regional transit be integrated.[5] One step in this direction was the approval of 1996 California Senate Bill (SB) 1474 supporting the improvement of transit integration in the Bay Area. The bill authorized MTC to withhold state funding from operators unwilling to cooperate in regional integration efforts[6].

In the past few decades, transit planners have identified the role that integration can play in improving quality of service, reliability and surrounding land use. Through better fare and schedule integration, passengers benefit from shorter travel times, less waiting, and lower out-of-pocket expenses.

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[4] Information taken from Hoel, Lester A., et.al., *Criteria for Evaluating Alternative Transit Station Designs*, Department of Civil Engineering, University of Virginia, sponsored by the US DOT Program of University Research, February 1976.

[5] Nash, Christopher, "Integration of public transport: an economic assessment," in Dodgson (ed.) *Bus Deregulation and Privatization*, Aldershot (U.K.): Gower Publishing Company, 1988

[6] Rivasplata, Charles, and Josefina Florez, "Improving Regional Mobility Through Transit Integration," in *ASCE Conference on Transportation, Land Use and Air Quality* (Portland : 1998).

Past Attempts To Strengthen Coordination Through Consolidation

To improve coordination between operators, there have been several attempts at operator consolidation. While there exists a confounding list of reasons for and against consolidation, most attempts have been doomed by a lack of political support. For example, in the 1980s, Senator Quentin Kopp proposed state legislation that would have restructured the transit sector into five or six super-agencies in each major subregion of the Bay Area. While proponents claimed that consolidation would result in economies of scale and greater efficiencies, others were unsure that it would ultimately improve the regional network as a whole and the legislation failed.

Efforts of MTC and RTCC

The expansion of BART service and the entry of new operators into the regional transit market intensified the need for better coordination between operators. Since the late 1970's, MTC has played an active role in encouraging inter-operator coordination, without direct involvement in inter-operator negotiations. In time, low-cost arrangements have been developed between operators as a direct result of the efforts of MTC and the Regional Transit Coordinating Council (RTCC).

In the past decade, the RTCC has expanded to include additional operators and has identified four major areas of network development: fare coordination; schedule and service coordination; public information and marketing coordination; and administrative coordination[7].

Due in large part to these efforts, a number of coordination projects have been developed by MTC and Bay Area operators. These projects have included the introduction of inter-operator passes (e.g., BARTPlus Pass); the publication of a regional transit guide; timed transfers at key points; the provision of TravInfo, a central information line; and the development of TransLink.

Over the past decade, MTC has laid the groundwork for greater cooperation. However, in order to continue to generate further improvements efforts must be sustained over the long-term through political commitment and the identification of funding opportunities.

Transit Centers—One Ingredient of the Bay Area Transportation Plan

Many items are required to create a functional transit center. Some of these items were covered in this chapter. However, appropriate land use, zoning laws, and pricing as discussed in other chapters in this report are necessary in addition to the functional transit center. The location of housing, retail, and office space within walking distance of transit stations can increase their appeal and their use. This is happening all over the Bay Area. However, a "sea" of parking still separates most transit and the activity centers they serve. Auto-centric pricing structures and land use should be reformed as an integral step toward developing World Class Transit in the Bay Area.

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[7] Metropolitan Transportation Commission (MTC), *Regional Transportation Plan for the San Francisco Bay Area* (Oakland: MTC, 1991): pp. 149-150.

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Chapter 10
The Bottom Line Benefits of Transit

"The bottom line is this: investment in public transportation makes dollars, and it makes sense. The benefits to motorists, to businesses, to transit riders and to American society as a whole far outweigh the costs."[1](Donald H. Camph, *Dollars and Sense: The Economic Case for Public Transportation in America*)

The benefits of public transit are numerous and can be felt throughout society. Transit provides an affordable, high-quality alternative to the automobile for commuters to work and other destinations; reduces congestion on the roads and improves mobility for motorists; cuts auto-related air pollution and decreases fuel consumption; provides low-cost mobility for people who cannot afford to own or are unable to drive a car; increases the vitality of neighborhoods; and improves the productivity of business centers.

Table 10.1 provides estimated benefits of transit, based on national data. Each benefit is explained in more detail in the remainder of this chapter.

Table 10.1 Benefits of Transit[2]

Transit Benefit	Estimated Benefit
Congestion Reduction	10¢ - 30¢ / peak driving mile reduced
Net Cost to Transit Rider/Driver	5¢ - 10¢ / mile traveled; up to 40¢/mile if household can get rid of their car
Stress Reduction	Incalculable.
Regional Economic Development	50¢ per dollar of transport expenditure, compared to auto costs
Reduced Parking Costs	$6 - $12 per commute trip shifted from driving to transit; $1 per non-commute trip
Increased Safety	4¢ - 8¢ / mile shifted from driving to transit
Reduced Roadway Service and Facility Costs	5¢ / mile shifted from urban driving to transit
Reduced Land Used for Roads	5¢ / mile shifted from urban driving to transit; savings are long term and indirect
Environmental and Public Health Benefits	Difficult to measure.

[1]Camph, Donald H. *Dollars & Sense: The Economic Case for Public Transportation in America* (Washington, D.C.: Campaign for Efficient Passenger Transportation, 1997).

TRANSIT REDUCES CONGESTION

"Transit is often a cheaper way to reduce congestion than increasing road capacity."

Buses typically operate with 40 to 60 passengers during peak periods, providing significant congestion reduction compared with the same trips made by automobile. Rail transit and busways reduce congestion on parallel highways because people shift to transit if congestion delays increase for cars. Nationally, the best estimates suggest that reducing urban congestion frees up about 10¢-30¢ per mile of peak period, based on reduced road user costs and avoiding the cost of increasing road capacity.

Transit is often a cheaper way to reduce congestion than increasing road capacity because widening highways actually generates traffic. It simply is not possible to "build our way out of congestion." According to a recent study of California highways, new highway capacity becomes 60-90% full within only five years.[3] The more urban the area, the quicker the new highway capacity is filled. This happens because new highway capacity encourages transit passengers to become drivers and causes people to make more trips than they otherwise would have. Transit improvements, in contrast, have greater long-term benefits.[4]

TRANSIT SAVES YOU MONEY

Vehicle costs typically rank second only to housing in household expenditures. This can be a major financial burden, especially for lower-income households, which tend to spend more of their income on transportation. Good public transit could save money and time for many Bay Area residents.

Although most people spend only about 10¢ per mile on out-of-pocket expenses for driving (gas, parking, tolls), the total cost of extra driving is typically about 20¢/mile when repairs, insurance, and depreciation are included. For a commuter with a 20-mile, one-way commute, replacing that trip with a $5 round-trip transit ride would save over $750 in commuting costs per year. In total, national estimates suggest that, even after accounting for paying transit fares, individuals save about 5¢-10¢ per mile of driving avoided by taking transit. The savings can be even higher if transit allows a household to own fewer cars or delay replacing their car due to decreased wear-and-tear, since fixed ownership costs average about $3000 per year.[5]

TRANSIT REDUCES STRESS

Driving in congested traffic is miserable. Many people prefer to ride as a passenger than to drive on congested roads because it reduces stress and they can use their travel time to read or relax. As a

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[2] Todd Litman, *Evaluating Public Transit Benefits and Costs*, Victoria Transport Policy Institute, December 1999. National estimates cited in this chapter are largely drawn from this report.

[3] Mark Hansen and Yuanlin Huang, "Road Supply and Traffic in California Urban Areas" (*Transportation Research* vol. 31 no.3, 1997) pp. 205-218.

[4] Litman, 1999.

[5] Litman, 1999.

result, national studies suggest that average travelers would be willing to spend 30% to 100% (depending on congestion levels) more time, door-to-door, on a convenient transit trip rather than driving alone through congested traffic.[6]

And when public transit has bus/carpool lanes, separate rights-of-way, and/or preferential traffic controls, transit save time compared to driving. In "The Great Race", an AC Transit express bus spent less than half as much time as a solo driver to get from the Richmond Parkway Park and Ride to downtown San Francisco, because the bus could use the bus/carpool lanes on I-80 (see Chapter 3). Good transit can help Bay Area commuters reduce their stress and spend more time with their families.

TRANSIT SUPPORTS ECONOMIC DEVELOPMENT

Public transit can improve regional economic development, including job creation, local expenditures, and productivity gains. Car expenses typically do not benefit the regional economy: the manufacturer gets the purchase price, oil companies get the fuel costs, and insurance companies get the monthly premiums. Transit expenses, by contrast, are typically distributed more locally: drivers, mechanics, and administrators all return their wages to the regional economy, and transit is labor intensive. A 1999 Texas case study examined the effect of shifting 1% of the region's travel from cars to public transit. Applying those results to the Bay Area, a similar 1% shift in travel would keep approximately $15 million in regional income circulating within the Bay Area's economy and result in an additional 1200 jobs.[7]

> *"By the year 2005, it is estimated that 180,000 employees will be within walking distance of a light rail station or shuttle service to and from light rail."*
>
> -VTA fact sheet on Tasman West Project

Development along San Jose's new light rail lines provides a good example of the right match between compact development and transit. Over 4,500 high-density, sprawl-busting townhouses, condominiums and houses, and nine million square feet of office space have been put up during the three years of the construction of the new Tasman West extension to Mountain View. Much of this development is along previously underutilized or vacated urban sites, insuring that diverting crucial economic investment remains in existing areas.

[6] Litman, 1999.

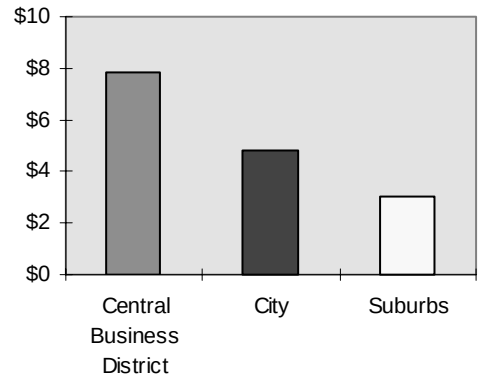
[7] Study cited in Litman, 1999. In the Texas study, a 1% shift in travel reduced auto travel by 53 million miles, saved $2.9 million, and added 226 jobs to the regional economy.

TRANSIT REDUCES PARKING COSTS

Parking accounts for a large and often ignored cost of driving. Parking costs are often ignored because 95% of automobile commuters nationwide park for free at work.[8] Considering parking fees as well as the employer or city-borne costs of providing free parking, average parking costs are about $7-8 per day in central business districts where parking structures are cost-effective, and $3 per day in the suburbs.

In addition to these monetary costs, the large parking requirements associated with solo commuting increase overall land costs, cause urban sprawl, discourage walking, and impose significant environmental costs.

Figure 10.2 Average Daily Parking Costs Per Auto Commuter



Source: Litman, 1999

TRANSIT INCREASES SAFETY

"City residents are overall safer than suburban residents: higher automobile fatality rates in the suburbs more than offset the increased crime rates associated with urban areas."

Transit is safer than auto travel, both for passengers and for other road users. Public transit has 0.66 fatal accidents per billion vehicle miles, *twenty times lower* than the accident rate for cars. Accident costs due to cars average about 12¢/mile driven (including property damage, medical services, lost productivity, as well as non-market costs such as pain, grief, and reduced quality of life, based on people's willingness to pay to avoid injuries and death). Further, car accidents typically injure or kill pedestrians, bicyclists, and motorcyclists, not the drivers themselves. Disturbingly, a recent study of road rage found that "places with low aggressive driving death rates were more likely to have high transit use, many people who walked or bike to work, and fewer miles of highway per resident."[9] Further, increased transit usage often increases overall safety by providing more "eyes on the street," one of the major indicators of community safety. As a result, another study found that city residents are overall safer than suburban residents: higher automobile fatality rates in the suburbs more than offset the increased crime rates associated with urban areas.[10]

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[8] Shoup, Donald C. *Cashing Out Employer-Paid Parking: An Opportunity to Reduce Minimum Parking Requirements* (Working Paper UCTC: 1995 no. 204)

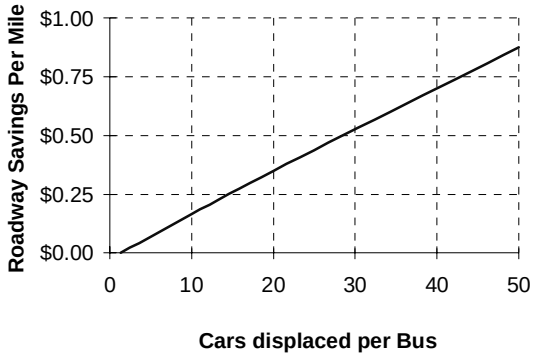
[9] Surface Transportation Policy Project, *Aggressive Driving: Are You At Risk?*, (www.transact.org), 1999.

[10] Cited in Litman, 1999.

TRANSIT REDUCES ROADWAY SERVICE AND LAND COSTS

Cars generally require much larger roadway expenses to build and maintain local roads. This is especially important in California, where local governments are strapped for local streets and roads maintenance funding. Particularly in urban areas, transit-induced road costs per passenger-mile are much lower than auto-induced costs. By improving transit and reducing auto use, municipalities can reduce their expenses on maintaining local streets and roads, in addition to the reduced costs of maintaining freeways. Figure 10.3 shows the cost savings as a function of reduced auto travel, averaged across all of California; savings would be greater in the more heavily urbanized Bay Area, resulting in an estimate of 5¢ saved per mile shifted from urban driving to transit.[11]

Figure 10.3 Net Road Savings Per Mile of Bus Travel



Source: California Energy Commission cost estimates, cited in Litman, 1999.

Cars also require nearly *10 times more road space* than buses per passenger trip. Road space is economically very inefficient—it earns no rent, produces no taxes, causes significant environmental costs, and prevents that land from being used for other productive uses. Shifting more trips to transit will reduce the amount of land that has to be acquired for roads and allow more productive uses of that land, resulting in a savings of about 5¢ per vehicle-mile.

TRANSIT ENHANCES THE ENVIRONMENT AND PROTECTS PUBLIC HEALTH

Motor vehicle use in the Bay Area is increasing much faster than population, as is the amount of open space consumed by development. MTC projects this trend will continue indefinitely, and this will happen if we maintain existing transportation investment and development patterns. By contrast, developing a World Class Transit system for the Bay Area would significantly reduce air and water pollution and other environmental damage that threatens our health and quality of life. Reducing auto use will benefit public health here and will contribute to improved environmental conditions nationally and globally.

[11] California Energy Commission cost estimates, cited in Litman, 1999.

Preserving Open Space

The Bay Area is renowned for its natural beauty. But this beauty is rapidly slipping away as the region loses open space at a tremendous rate. Furthermore, local agriculture suffers, biodiversity declines, and sensitive species lose their habitat. By contrast, developing good public transit paired with compact development can create vibrant, accessible, livable communities and reduce pressure to develop in the greenbelt.

The development along San Jose's new light rail lines (see "Transit Supports Local Economic Development", above) shows how compact development and transit can combine to protect open space. The 4,500 residential units and nine million square feet of office space built during the construction of the new light rail line, if they had been built at average densities in the suburbs, would have gobbled up over 1,200 acres of open space.[12]

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Air Pollution

Motor vehicles are the largest source of air pollution in the Bay Area. Although air quality in the Bay Area has improved since the 1960s, the region still exceeds national standards for ozone (or "smog") and exceeds State standards for ozone and fine particulate matter. High levels of these pollutants can irritate the lungs and airways and aggravate existing respiratory conditions such as asthma, bronchitis and emphysema. Extended exposure to these pollutants can permanently damage lung tissue and increase the risk of chronic respiratory disease. In the Bay Area, particulates cause approximately 1,270 deaths every year (compared with 414 from automobile collisions).[13] Based on national data, it is estimated that about 20,000 asthma attacks occur in the Bay Area every year due to pollution from cars and trucks. Although motor vehicles and fuels are cleaner than they used to be, increasing vehicle use is negating much of the benefit of the cleaner technology. For some pollution, such as fine particulate matter, emissions per mile are not going down, so reduced vehicle use is essential.

Switching to transit can significantly reduce the human and environmental health impacts of transportation. Pollution from rail vehicles is typically insignificant compared to auto air pollution. Per passenger tailpipe emissions for all transit vehicles are at least 66% lower than pollution by single-occupancy vehicles, except for particulates from diesel buses. And even bus emissions are expected to decline significantly due to engine design improvements and increasing use of electric trolleys and alternative fuels.[14]

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[12] Based on average density of 4 residential units per acre and 10,000 square feet of office space per acre.

[13] Deborah Sheiman Shprentz, *Breath Taking: Premature Mortality Due to Particulate Air Pollution in 239 American Cities*. Natural Resources Defense Council, 1996.

[14] Litman, 1999.

Water Pollution

Motor vehicles also pollute our streams and the Bay. Oil, fuel, coolant, metal, rubber, paint and other dangerous fluids that leak or are spilled onto streets and roads are then washed into streams, rivers, ground water, and ultimately the Bay. This "non-point source" pollution contributes up to 70%[16] of toxic pollutants entering the Bay, threatening wildlife as well as humans that eat fish and mollusks from the Bay.

Bay Area Water Pollution from Motor Vehicles[15]

- More than 10,000 tons of hazardous liquids
- About 2,000 tons of car batteries
- Over 4,000 tons of benzene (carcinogen)
- Over 3 million gallons of waste oil
- 4,000 tons of oil and grease deposited on roads

These numbers are expected to grow every year as more and more driving occurs. The most effective way to reduce this destructive pollution is to simply reduce the amount of driving we all do.

[15] U.S. Environmental Protection Agency, "Indicators of the Environmental Impacts of Transportation" (EPA 230-R-99-001), October, 1999. Estimates are extrapolated from national figures.

[16] Jim Mayer, Changing the Course of California's Water (Lindsay Museum, 1995).

Chapter 11
How To Fund the Vision

THE FUTURE OF TRANSPORTATION FUNDING

A clearly articulated vision of the nature of the Bay Area's future development is a crucial step to improving the region's transit system. An equally important step is the identification of funding sources for proposed programs and projects. The purpose of this chapter is to link the vision for the Bay Area to existing and future funding sources, with a focus on federal, state and local sources with substantial capital. Although many of the funding sources described here involve very complex rules and restrictions, funds for a World Class Transit system do exist.

The year 2000 may be the year remembered for the largest amount of new transportation investments in California's history. Most proposals must be approved by voters, offering an exciting opportunity for community, environmental, social justice and other public interest groups to help shape the proposals and have input into their passage.

Some funding mechanisms could address transportation problems by correcting existing economic inefficiencies. For example, gas taxes could be increased rather than sales taxes. Revenue derived from value pricing at bridges, in which a higher toll is charged during rush hour in order to reduce congestion, could be used to fund transit alternatives. In contrast, bonds merely defer the cost of infrastructure improvements, which obscures true transportation costs for users of transportation infrastructure. Unfortunately, fees that are preferable from a planning and efficiency standpoint are not always popular with the public. The Coalition will urge lawmakers to support policies that charge fees that not only raise revenue but also use economic incentives to help create a better transportation system.

POTENTIAL NEW SOURCES

Funding for World Class Transit will be possible through a variety of the following measures:

Gas Tax

In 1997 (AB 595, Chapter 878) the state legislature authorized MTC to place a proposal for a regional gasoline tax (up to 10-cents per gallon) for nine Bay Area counties on a future general election ballot. However, public and political support for such a tax is low and currently such a tax would be subject to a two-thirds majority requirement in order to be approved. Reducing the requirement to a simple majority would be an important first step in passing this tax. The Coalition strongly favors the use of gas taxes over sales taxes.

Sales Taxes

Funding the transportation system by charging sales taxes on items unrelated to the use of transportation infrastructure is not economically efficient. Nonetheless, voter-approved sales taxes are historically crucial for public transit funding, particularly to support transit operating costs. Currently, five counties in the Bay Area (Alameda, Contra Costa County, Santa Clara County, San Francisco and San Mateo County) have local half-cent sales taxes for transportation, although many of these taxes will expire over the next few years and must be renewed by voters.

Since voters in Alameda County will likely be presented with the chance to approve the renewal of the county's existing half-cent transportation sales tax in November 2000, the Coalition is leading an effort there to increase public support for funding of World Class Transit project components. In addition, state legislation to extend or enact these sales taxes by simple majority vote on a future statewide ballot was debated by the California Legislature in 1999, and the issue will likely be taken up again in 2000. Such a debate could improve the likelihood that these taxes will pass, given that votes on such taxes based on the current 2/3 majority rule recently failed in Alameda, Marin, and Sonoma Counties.

State Infrastructure Funding

In 1998, Senator John Burton announced that he would introduce a proposal for a $16 billion general obligation revenue bond for transportation. Although this bill failed, the state Legislature is considering a variety of new funding proposals, ranging from ongoing general fund support to bond measures that may appear on the November 2000 ballot.

Bridge Tolls

Bridge tolls could play an increasingly important role in funding of public transit. Although a majority of the revenue from recent toll increases have been dedicated to seismic retrofits, some may be used for purposes such as refurbishing the Transbay Terminal. In addition, a $1 toll increase was one of the most frequently discussed funding possibilities for proposed expansion of the ferry system. Most importantly, variable toll pricing based on traffic congestion levels will be much easier to implement once the electronic toll collection system is installed in the near future.

Development Impact Fees

Typically, these fees are an exaction placed on square footage of commercial, residential or industrial development. The revenue from these fees is usually used to fund essential services such as police, fire, schools, or sewer facilities. Because these funds are very scarce, it can be difficult to generate support for using them to support transit projects. In addition, since impact fees are most often levied on new auto-focused suburban developments, revenue from these fees are usually used to fund highway projects. However, the use of these fees for right-of-way procurement and other transit improvements has been accepted as appropriate by transportation agencies.

Innovative Financing Measures

Chapter 7 reviews many methods to raise additional transportation funding. These measures, which include VMT fees and parking charges, could provide critical funds for the development of a World Class Transit system. Some transit advocates are calling for charges at BART parking lots to fund seismic retrofits of BART stations.

LARGE EXISTING FUNDING PROGRAMS

Some of the largest discretionary funding programs are listed below. These can all be used to fund a variety of discretionary programs, and as such can easily be geared towards the cost-effective proposals put forward in the Coalition's proposal.

Surface Transportation Program

The Intermodal Surface Transportation Act (ISTEA, 1991) and its successor, the Transportation Equity Act for the 21st Century (TEA-21, 1998), were designed to induce major transformations in transportation by expanding the types of projects eligible for federal funding. For example, Surface Transportation Program (STP) funds can be used for traditional highway projects or alternative modes of transportation (e.g. pedestrian and bicycle). The Metropolitan Transportation Commission (MTC) has begun to explore possibilities for obtaining these funds for alternative transportation. In response to a state funding program that focused on highway projects[1], MTC passed a policy that flexible STP funds will not be used for expansion projects for the next three years, but can be used for road and rail maintenance and operations, as well as safety projects. TEA-21 also earmarks 18.1% of funds for public transit, a 0.8% increase from previous legislation[2].

CMAQ

In addition to STP, TEA-21 contains several programs that support the projects outlined in this report. First, the Congestion Mitigation and Air Quality Improvement Program (CMAQ) allocates funding to urban areas that the U.S. EPA determines to be out of compliance with air quality standards. CMAQ funds must be used for projects that help reduce ozone, carbon monoxide or particulate matter. Other regions may also receive CMAQ funds for environmentally beneficial transportation projects [3]. The Bay Area typically receives $40 million per year for CMAQ projects[4].

During the first three-year federal funding cycle (1998-2001), transit projects fared poorly in the Bay Area. Based on the project scoring criteria approved by MTC, synchronization of traffic lights and other arterial management activities received the majority of funds. Greater public participation in the development of project scoring criteria and decision-making regarding funding priorities could help ensure more funding for public transit in the next funding cycle.

Transportation Enhancement

Another way TEA-21 reinforces the vision presented in previous chapters is through its Transportation Enhancement program, which was continued from ISTEA. This program supports alternative modes of travel, and scenic and historic preservation, in order to link transportation and communities. Funds for Transportation Enhancement projects are taken from the STP funds (10 percent). The Transit Enhancement Program, a new program added in TEA-21, funds projects that improve the public transit experience with better shelters for riders, improved accessibility for handicapped, rehabilitation of historic transit facilities and vehicles, public art, landscaping, and bicycle and pedestrian facilities[5]. The Bay Area receives approximately $10 million per year for projects covered by both enhancement programs.

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[1] The 1998 State Transportation Improvement Program contained a predominance of highway projects for the Bay Area. These lists were developed by the county Congestion Management Agencies and forwarded to MTC for approval.

[2] Surface Transportation Policy Project, *TEA-21 User's Guide: Making the Most of the New Transportation Bill* (Washington, DC. : 1998).

[3] Ibid.

[4] Metropolitan Transportation Commission, *Moving Costs: A Transportation Funding Guide for the San Francisco Bay Area* (Oakland, January 1999).

[5] Ibid.

Special Programs

Finally, TEA-21 includes programs that address the connection between land use and transportation. For example, "Access to Jobs" provides grants to transit services that address low-income city residents' need to travel to reach jobs in the suburbs. TEA-21 also reduced tax barriers for employers to offer parking "cash-outs" and commuter checks to employees (e.g. transit and vanpool vouchers)[6].

On a broader planning level, TEA-21 created the Transportation and Community and System Preservation Pilot program (TCSP). One of the stated purposes of TCSP is to "increase the efficiency of the transportation system while decreasing its impacts on the environment, lessening the need for costly future investments and providing efficient access to jobs." MTC submitted joint proposals for TCSP funds in cooperation with other regional agencies in both 1998 and 1999, but did not receive grants for either year. The 1998 "Partnership for Smart Growth" proposal would have convened a broad range of interest groups and local officials to identify obstacles to better planning and development, and to create incentives for overcoming these obstacles.

In addition to these innovative programs, TEA-21 includes earmarked funds and funds for federal demonstration projects, both of which fund various projects determined annually and by the passage of major transportation legislation. Demonstration projects are a feasible method to test innovative pricing strategies such as those mentioned in Chapter 7 (*e.g.* pay at the pump insurance). In addition, the potential funding in these categories could be substantial. Establishing a clear vision for the Bay Area can help make projects more competitive for these federal dollars.

State Funds

The California State Transportation Improvement Program (STIP) primarily funds new capital projects, maintenance of the existing transportation system, and operating costs[7]. These state funds are distributed through two main programs: the Interregional Transportation Improvement Program (ITIP)—which can be used for inter-city rail projects such as BART or the Capitol Corridors, but are often targeted towards highway expansion—and the more flexible Regional Improvement Program (RIP) funds. RIP funds can be used for high occupancy vehicle lanes, rail lines, and transit station rehabilitation. California also has a State Transit Assistance (STA) funding program for mass transit operations and capital projects. The Bay Area receives about $37 million in STA funds annually.

Conclusion

This Chapter highlights existing and future revenue sources for a World Class Transit system. Through a clear vision of cost-effective investments, the Bay Area will be able to leverage public support for transportation investment and create the opportunities to utilize existing and new revenue sources.

MTC used this strategy in 1988 to gain state and local support for new funding for a Regional Rail Program. The rail program resulted in 30 percent federal support for the rail program[8]. The

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[6] STPP: 1998.

[7] Ibid.

[8] Metropolitan Transportation Commission, *Memorandum: Post Resolution 1876 Regional Rail Program* (Oakland, CA : January 1998).

Coalition's vision can play a similar role. The challenge will be to develop a consensus between the public and regional leaders in order to guarantee adequate funding for a World Class Transit system in the Bay Area.

Table 11.1

Funding Source	Annual Amount (existing & future)	Transit Oriented Develop-ment	Equipment / Facilities (rail, bus, van, ferry)	Transit Operations / Planning	Maintenance of Transit Facilities	ADA & Paratransit Services	Pedestrian / Bike Facilities	Congest. Manag.
FEDERAL								
FTA	$220.3 million plus discretionary funds		***	* (only for bus ops, in rural)		***		
STP	$57 million		***	***	** * (rehab)			
CMAQ	$40 million	***	***	***	***		***	***
Transp. & Transit Enhancement	$10 million	**	**		**	***	***	
TCSP & TLC	$5 million & Discretionary	***	**	*	*	*	***	**
STATE								
RIP	$110 million		***		***			***
STA	$37 million		***	***	***	***		**
IIP	Discretionary		***	*	**	*	*	*
New State Bonds	(Potential amount unknown)	***	***	***	***	***	***	***
LOCAL								
TDA	$240 million		***	***	***	***	***	
Bridge Tolls	$309 million		**	*	*		**	***
Property Tax	$88 million		***	***				
Vehicle Registration Fees	$20 million		* (clean fuel buses)	**			***	***
Transit Fares	$370 million		***	***	***	***		
Development Impact Fees	Varies based on local governments	***					***	

Source: Metropolitan Transportation Commission. Moving Costs: A Transportation Funding Guide for the San Francisco Bay Area. January 1999.

*** Very Good fit
** Good fit
* OK fit
Discretionary Funds: vary annually

How to Use the Table

Table 11.1 can be used to find funding for a particular program of interest. For example, if you want to identify revenue for a Transit Oriented Development (TOD) project, simply look at the TOD column. CMAQ, TCSP & TLC, Burton Bonds and Development Impact Fees are identified as an "excellent fit." This rating means that these sources specifically mention TOD in their text. Transportation & Transit Enhancement funds are a "good fit" because TOD can be linked to what is specified in these fund sources or is mentioned as a lower priority. An "OK fit" means the program will help meet the goals of the funding source, but is not specifically mentioned.

As mentioned previously, the funds listed have additional restrictions and characteristics. For example, Section 5310 of the FTA is dedicated to the purchase of paratransit vans and related equipment for elderly and disabled persons. In addition, there smaller sources of funding that were not included in the table. Therefore, the table should be viewed as a general guideline. For a more detailed description of funding sources and the agencies that control the specific funds please refer to the MTC publication *Moving Costs: A Transportation Funding Guide for the San Francisco Bay Area* (January 1999) or contact the Transportation Choices Forum.

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Appendix A
Costs of County and Regional Proposals

Project	Capital Cost ($ millions)	Annual Operating Cost ($ millions)
ALAMEDA COUNTY		
Local Bus and Light Rail in Urban Alameda County		
Evening Service Enhancement	N/A	4.7
Weekend Service Enhancement	N/A	3.5
Overnight Service Maintenance and Enhancement	N/A	1.6
Enhanced Bus/Trolley/Light Rail on Foothill/Bancroft, Broadway/College/ University, and East 14th/Mission	90.9	TBD
Enhanced Bus/Trolley/Light Rail on MacArthur Boulevard Corridor	0.35	2.12
Enhanced Bus/Trolley/Light Rail on San Pablo and Telegraph corridors	64 - 79.5	3.92
Express Buses From Urban Alameda County to San Francisco		
Increase Frequencies on Existing Transbay Express Buses	4.18	3.6
New Express Buses for I-80 HOV Lane Service	See Solano Cty.	See Solano Cty.
Tri-Valley And I-580 Corridor		
Create a Demand-Responsive Express Bus and Vanpool System	2 - 4	0.7 - 1.4
Enhance Rapid Bus Service on Stanley Boulevard in Livermore and Pleasanton	2.11	.87
West Dublin BART Station	43	N/A
I-880 Corridor		
Improved Tansit Connection from BART to the Oakland Airport	30	TBD

Project	Capital Cost ($ millions)	Annual Operating Cost ($ millions)
ALAMEDA COUNTY (cont.)		
Improved Tansit Connection from BART to the Oakland Airport	130	TBD
Improved Access to Cal State Hayward (CSUH)	2 - 2.5	0.4 - 0.65
Union City Intermodal Station	30	N/A
CONTRA COSTA COUNTY		
Transit Alternatives to the Caldecott Tunnel Fourth Bore		
Employer Shuttles to and from Contra Costa BART Stations	.7	.035
Free Transit Passes for Reverse Commuters	N/A	0
Add Bus/Carpool Lane on existing Tunnel Approaches	TBD	0
Express Bus and Vanpools Through Caldecott Tunnel	3.9	0.96
Express Buses on Contra Costa's HOV Lanes		
Express Bus Service in Route 4 HOV lanes (East County to Pittsburg/Bay Point BART)	2.8	.65
Subscription Bus Service on Vasco Road to I-580 (Brentwood/Antioch to the Tri-Valley)	3	.192
New Express Buses for I-80 HOV Lane Service	See Solano Cty.	See Solano Cty.
New and More Frequent Buses and New Lines on Major Arterials		
West Contra Costa Intercity Bus Service	5.28	3.72
Improved Bus Transit on San Pablo Dam Road (San Pablo to Orinda)	1.2	.56

Project	Capital Cost ($ millions)	Annual Operating Cost ($ millions)
MARIN AND SONOMA COUNTIES		
New Commuter Rail Service	101 - 131	5.4 - 12.5
Expanded Express And Inter-City Bus Service	20.8	17.7
Enhanced Local Bus Service	11.62	3.7
NAPA COUNTY		
Increase Express Bus Service to BART Link/Vallejo Ferry	.450	.150
Express Bus Service to San Rafael and San Francisco	1.25	.375
New Express Bus Service between Fairfield and Napa via Route 12	1.05	.278
SAN FRANCISCO COUNTY		
Expand Muni Bus Services		
Expanded Muni Rapid Bus Corridors	31.6	22.3
Converstion to/Extension of electric trolley bus routes	16	10.9
Build New Muni Light Rail		
Geary Corridor	600	TBD
North Beach Corridor	900	TBD
Van Ness Corridor	675	TBD
CalTrain Downton Extension	See San Mateo Cty	See San Mateo Cty
Transbay Terminal Improvements	130	N/A
Non-vehicle Improvements for Muni Buses		
Transit-Preferential Streets	TBD	N/A
NextBus Implementation	6.5	N/A

Project	Capital Cost ($ millions)	Annual Operating Cost ($ millions)
SAN MATEO COUNTY		
Caltrain Improvements		
Electrify Caltrain	375	0 - 7.4
Caltrain Downtown SF Extension	700	7.9
Caltrain Mass Transit Service	36	47
Caltrain Rapid Rail Improvements	82.7	N/A
Expand Caltrain Service to Gilroy	51.5	9 - 14
Caltrain Station Reconfigurations	590	N/A
Increase Express Buses on Dumbarton & San Mateo Bridges	12.7	4.5
Dumbarton Rail Service	120	TBD
Enhanced Express Bus Service	31.3	18
Local Bus Service Reinstatements	6	4
SANTA CLARA COUNTY		
Bus and Light Rail Recommendations Within Santa Clara County		
Greatly Expand VTA Bus Service	77.25	72.10
Rapid Bus on VTA Line 22	20	TBD
East Valley Rapid Transit: East San Jose/Evergreen Area to San Jose	30 - 65	TBD
East Valley LRT: East San Jose/Evergreen Area to San Jose	309 - 412	TBD
Vasona LRT: Campbell to Winchester Station	20.6	.845
Express Buses to Silicon Valley		
Express Bus Service from the Tri-Valley	7.37	6.2
Expand LAVTA Subscription Buses from	.54	0

Project	Capital Cost ($ millions)	Annual Operating Cost ($ millions)
Tri-Valley		
Expand Express Bus Service from Fremont BART to Santa Clara County	1.75	1.2

SANTA CLARA COUNTY (cont.)		
Commuter Rail Improvements to Silicon Valley		
Upgrade ACE Service	30 - 40	6 - 8
Expanded VTA Commuter Rail Service	536	TBD
South Bay Rail Loop	N/A	TBD
SOLANO COUNTY		
New Express Bus Service for I-80 HOV Lane Service	78.19	88.43
Express Bus Service from Solano County to Contra Costa Country via I-680	4.92	1.57
Service within Solano County and to Sacramento		
Vacaville/Fairfield Service	11.5	3.73
Sacramento to Vallejo Service	6.7	1.84
Solano Intercity Service	7	2.08

Regional Projects		
WELFARE TO WORK/LIFELINE TRANSIT		
Transit discounts fro low-income residents	N/A	7 - 35
24/7 Lifeline Transit Services	N/A	TBD
Reverse Commute Services	TBD	TBD
Child Care Centers at Transit Hubs	20 - 30	0 - 13
Child Care Shuttle Program	0.45 - 0.75	0.5 - 1.6

Project	Capital Cost ($ millions)	Annual Operating Cost ($ millions)
School Bus Service Program	TBD	24

BICYCLE AND PEDESTRIAN IMPROVEMENTS		
Regional Bicycle Network	750	N/A
Pedestrian Safety/ADA Improvements	250	N/A
Livable Community Improvements	1000	N/A
Neighborhood Traffic Calming Improvements	500	N/A
Bay Trail Completion	450	N/A
Other Regional Trails	350	N/A
Safe Routes to Schools	200	N/A
FERRIES		
Ferry Projects	85.5	TBD
BART		
BART Seismic Retrofit	800	N/A
BART Car Replacements	1237	N/A
Advanced Automatic Train Control (AATC) System	271	N/A
AMTRAK/CAPITOL CORRIDOR		
Amtrak/Capitol Corridor Service	25	10

TOTAL CAPITAL COSTS ($ millions)		
Total Costs for Bus Projects	780	
Total Costs for Rail Maintenance	2,037	
Total Costs for Rail Upgrades	3,001	
Total Costs for Rail Expansions	2,738	
Total Costs for Other Projects	3,646	
Grand Total	12,202	

Note: Capital costs are listed for all but five projects. The five projects listed as "To Be Determined" (TBD) are expected to add less than 1% to the totals listed above. Totals are not listed for Total Annual Operating Costs because many of these costs are still TBD.