

# REPORT CARD

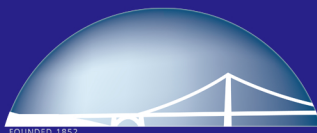
# 2011

*for*

## *Bay Area Infrastructure*



# CITIZEN'S ADVISORY



FOUNDED 1852  
AMERICAN SOCIETY OF CIVIL ENGINEERS  
**SAN FRANCISCO SECTION**  
1905-2005 CENTENNIAL CELEBRATION



## *Forward*

Since the last update of the American Society of Civil Engineer (ASCE)'s Bay Area Infrastructure Report Card in 2005, we have seen several major infrastructure failures: the gas line explosion in San Bruno, California with major loss of life in 2010; wastewater discharges from Marin County into the San Francisco Bay; and a collapse of the Interstate Route 35 Mississippi River Bridge in Minneapolis, Minnesota with significant loss of life in 2007. All of these are classic examples of aging infrastructure allowed to perform without sufficiently funded monitoring, rehabilitation, and replacement programs. The 2011 Bay Area Infrastructure Report Card for the San Francisco ASCE Section aims at bringing awareness to, and quantifying the need for, funding to upgrade our area's essential infrastructure to acceptable levels.

The ASCE San Francisco Section's Infrastructure Report Card Committee's reevaluation of the various infrastructure categories in 2011 resulted in an overall grade of "C", with some of the categories being as desperately low as a "D+". The Committee has determined that in order to bring all categories up to a grade of "B", which was deemed the minimum acceptable level, we will need additional annual funding of \$2.83 billion.

This update to the Report Card is more essential than ever due to the downturn in the economy and resulting budget constraints that are delaying the maintenance and replacement of critical facilities. Infrastructure only dominates the public awareness when there is loss of life or a catastrophic system failure has occurred, but only proactive measures can prevent them from happening in the first place. One of most important objectives of these Report Cards is to make all political leadership aware of the decaying state of our infrastructure and to be sure they hear our cry for funding before we experience another catastrophic infrastructure failure.

As stewards of the Bay Area's infrastructure, all professional civil engineers, whether public works department engineers, agency engineers, utility district engineers, or private sector consulting engineers, strive every day to bring the maximum value to our infrastructure from the limited funding available. However, existing funding levels are not proving adequate to allow for these professionals to upgrade our infrastructure systems to meet minimum acceptable standards. The citizens and political leadership of the Bay Area need to take appropriate action to increase funding for the various elements of their infrastructure to assure long-range maintenance, operation, and capacity for the facilities our children will inherit. To inform the public is the purpose for which we present the Bay Area Infrastructure Report Card. It's time to start paying our overdue infrastructure bills so that we may preserve the quality of life in our communities.

[Golden Gate Bridge Cover Photo: Used with permission from Golden Gate Bridge District, San Francisco, www.goldengate.org.](#)

## *Table of Contents*

<b>Forward</b>	<b><i>i</i></b>
<b>Table of Contents</b>	<b><i>ii</i></b>
<b>Our Region's Infrastructure - A Legacy in Peril</b>	<b>1</b>
<b>Who Pays for Infrastructure?</b>	<b>3</b>
<b>Preserving our Infrastructure</b>	<b>4</b>
<b>Grading Our Infrastructure</b>	<b>4</b>
<b>Understanding Infrastructure Issues</b>	<b>8</b>
<b>Roadways</b>	<b>10</b>
<b>Bridges and Structures Introduction</b>	<b>16</b>
<b>Aviation</b>	<b>26</b>
<b>Goods Movement</b>	<b>31</b>
<b>Urban Stormwater and Flood Control</b>	<b>36</b>
<b>Water</b>	<b>40</b>
<b>Wastewater</b>	<b>43</b>
<b>What You Can Do</b>	<b>46</b>
<b>About the American Society of Civil Engineers (ASCE)</b>	<b>47</b>
<b>Acknowledgements</b>	<b>48</b>

## Introduction

### *Our Region's Infrastructure - A Legacy in Peril*

Located in Northern California, the San Francisco Bay Area provides a wonderful place to live and work for its seven million residents. The area consists of 101 cities in the nine counties that touch the San Francisco Bay<sup>1</sup>.



FIGURE 1. THE SAN FRANCISCO BAY AREA'S NINE-COUNTY REGION

Like many urban areas, the Bay Area will continue to grow in the foreseeable future. By 2030, an estimated additional 1.7 million people will live here, over 1.6 million new jobs will be created, and 600,000 new homes will be built. This region faces the challenges of serving this growth with efficient transportation, housing, and infrastructure, while balancing it with the natural disasters that threaten our region and economy.

The economy of the Bay Area is diverse and dynamic. Major industries include high tech and information, professional services, financial, education and health services, agricultural, tourism, manufacturing and wholesale, construction and transportation. The high tech industry drives employment in the South Bay, while the University of California and two national laboratories drive employment in the East Bay. In the North Bay, tourism, agriculture, and distribution and manufacturing dominate employment. The Peninsula's economy, which receives spillover from San Francisco and the South Bay, is largely high tech and biotech. Major employers on the Peninsula include Oracle, Stanford University, and United Airlines (due to the presence of San Francisco International Airport and the Mineta San Jose International Airport).

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<sup>1</sup> Fassinger and others, 2003. *ABAG's Projections 2007 and 2009*. (Economy is based on annual Gross Regional Product (GRP).)

The combination of the normally vibrant economy, spectacular scenery, world-class universities, and cosmopolitan local communities enchants both visitors and residents. It is our roads, transit systems and ports, water and wastewater systems, flood control and water quality programs, and parks that allow people, ideas, and the products of commerce to move and thrive.

This infrastructure is a legacy to us from past generations and a gift to pass forward to our children and their children. What happens when we take our infrastructure for granted by failing to invest appropriate public funding in its continued upkeep?

The *Transportation 2035 Plan for the San Francisco Bay Area*, issued by the Metropolitan Transportation Commission (MTC) in 2009, shows that more than 85 percent of \$218 billion in revenues expected over the next 25 years would be devoted to basic maintenance needs and ongoing operations. The Report goes on to state, “The magnitude of the combined regional funding shortfall indicates many cities and counties will have to defer needed maintenance on some roadways thus increasing overall costs.” More funding is needed not only to provide full maintenance, but to provide adequate strategic expansion to improve travel conditions in the Bay Area.

Our transportation system isn't the only category in desperate need of attention. Much of our water transmission and distribution piping was constructed in the early 20<sup>th</sup> century, when the specter of earthquake and fire loomed large in the public imagination. These systems are not capable of meeting the demands of a new century, especially a century that demands environmental protection together with its sanitation. Aging water pipes are a common occurrence in many communities and frequently exacerbate the already poor condition of our roadways. Our sewage collection and treatment systems have benefited from the investment spurred by the federal Clean Water Act. However, while this federal mandate has shifted its focus to storm water, the commitment of public funds has not followed. Storm water infrastructure is woefully underfunded in the Bay Area, affecting our safety and the quality of our natural environment.

According to the California Infrastructure Coalition ([www.calinfrastructure.org](http://www.calinfrastructure.org)), public works infrastructure expenditures in the 1960s constituted nearly 20 percent of statewide spending, whereas today they comprise only about three percent despite the tremendous growth in our state. And remember, much of the major infrastructure that supports us is beginning to exceed 100 years of service.

Much of our infrastructure has now reached the end of its useful service life and can no longer support a population that has more than tripled since its construction. We cannot wait any longer. It's time to take action. If we fail to address the problems caused by years of neglect, the situation will only worsen. California's economy, the eighth largest in the world, cannot afford such an outcome. We must not only begin planning and financing new projects to meet existing and future needs, we must also begin paying attention to the maintenance of our existing infrastructure. To paraphrase the MTC's Transportation 2035 Plan, one dollar spent now for

proper maintenance can save five times that much in rehabilitation and replacement costs in just a few years.

The 2009 National ASCE Report Card ([www.asce.org/report card](http://www.asce.org/report_card)) reported, “America's infrastructure rates a cumulative grade of “D”. While not all categories fare badly or are plagued by the same problems, the delayed maintenance and chronic underfunding are the contributors to the low grades in nearly every category.” Shortfalls in federal and state funding and changing population patterns have placed a tremendous burden on our aging water and wastewater systems, airports, bridges and highway facilities. It's time to start paying our overdue infrastructure bills so that we may preserve the quality of life in our communities.

### *Who Pays for Infrastructure?*

As stated in the ASCE 2005 National Report Card,

"Our public works are public assets. We all have a stake in their upkeep and operation, and we all share in the expense of construction and maintenance. Sometimes, those who actually use the infrastructure most must pay for it through tolls, utility bills, or special taxes on gas, airline tickets, and other items. In California, particularly since the passage of Proposition 13 in 1978, it has become increasingly important for local residents to vote for the funding that supports their local infrastructure.

### **No Votes = No Dollars**

This creates an increasing backlog of ‘deferred’ maintenance. But because infrastructure improvements affect us all by supporting our economy and providing fundamental community services, the public usually bears a portion of the cost through general tax revenues."

All levels of government, from federal to state, county, regional, municipal and special districts, share in the responsibility of collecting and distributing funds for infrastructure improvements. At the local level, funds are often raised through the issuance of bonds or the collection of general, property, or sales taxes, or user fees. As noted in the National ASCE Report Card, "This places responsibility for infrastructure renewal and development squarely with the individual voters, who must approve bond issues and elect political leaders who will make our infrastructure needs a priority."

## *Preserving our Infrastructure*

The Bay Area is comprised of numerous communities, some dating back over two centuries, while others have been in existence for only a few decades. Yet the infrastructure everywhere, even in the relatively newer areas, requires continuous attention, maintenance, and ongoing replacement and expansion. As previously noted, we take many of these public works systems for granted, despite the fact that we so heavily rely on them to maintain our economic prosperity and quality of life.

This Bay Area Infrastructure Report Card and Citizens' Guide is intended to serve as a vehicle to engage our community and civic leaders in a call to action for stronger investment in our region's vital infrastructure. This has never been more important, as we stand on the brink of tremendous projected growth over the next few decades. Please use this guide to get involved in protecting our infrastructure investments and planning for the future. It's your community and your future at stake.

## *Grading Our Infrastructure*

The working groups and the review committee assigned letter grades to nine categories of Bay Area public infrastructure assessed in 2011. The grading is on a scale of "A" to "F" with an average passing grade being a "C". The Report Card reprinted on the following pages, shows how public infrastructure in the Bay Area measures up. This Report Card provides a general assessment. No individual jurisdiction's infrastructure systems were evaluated or graded.

Grades were prepared by first establishing criteria with four major categories that were consistently utilized throughout all infrastructure systems being reviewed as part of the Bay Area Infrastructure Report Card. Within each category, subcategories were developed to specifically apply to each system's evaluation. For each subcategory, points were assigned as a weighting factor within the category. A category grade was determined by a weighted average of the subcategories. The overall grade was determined by an averaging of each of the major categories. This report card is an update of the ASCE 2005 Bay Area Infrastructure Report Card and detailed surveys were not conducted in every category. In some cases, data was collected by e-mail survey, interviews with infrastructure operators, and by research of reports prepared by the various agencies in the Bay Area Region. Every effort was made to have the data and results represent more than 51 percent of the current population of the Bay Area except for the categories of water, wastewater, and parks where the response level was low. The survey responses, which generally represented the Bay Area, covered a wide range of conditions and system sufficiency, and the responses were weighted according to population served.



Grading paralleled that of the ASCE National Report Card’s approach of issued letter grades based on the criteria used to analyze the various infrastructure categories. The national report card grades were based on the following scale:

- “A” = 90-100 percent
- “B” = 80-89 percent
- “C” = 70-79 percent
- “D” = 41-69 percent
- “F” = 40 percent or lower

When determined letter grades were averaged, the following Grade Point Average values were utilized:

<b>Letter Grade</b>	<b>Grade Points</b>	<b>Letter Grade</b>	<b>Grade Points</b>
<b>“A”</b> .....	<b>4.00</b>	<b>“C”</b> .....	<b>2.00</b>
<b>“A-”</b> .....	<b>3.67</b>	<b>“C-”</b> .....	<b>1.66</b>
<b>“B+”</b> .....	<b>3.33</b>	<b>“D+”</b> .....	<b>1.33</b>
<b>“B”</b> .....	<b>3.00</b>	<b>“D”</b> .....	<b>1.00</b>
<b>“B-”</b> .....	<b>2.67</b>	<b>“D-”</b> .....	<b>0.67</b>
<b>“C+”</b> .....	<b>2.33</b>	<b>“F”</b> .....	<b>0.00</b>

## Report Card

### Roadways

“D+”

With an estimated value of \$45 billion, roadways are one of the region’s most expensive assets. However, local roads and highways rank in the top ten worst locations in the U.S. for pavement condition.

### Bridges and Structures

“C+”

The Bay Area is home to some of the most recognizable bridges in the world. The overall grade for bridges and structures reflects investments in seismic upgrades, concerns about capacity, and normal replacement which require additional investments.

### Transit

“C”

The Bay Area mass transportation system is a complex multi-modal system that is key to the Bay Area’s economy. The shortfalls in projected funding will translate into fewer improvements to services as the population grows. The net result will be poorer performance and delay of services by the various transit modes.

### Aviation

“B”

The aviation grade reflects a significant increase in funding over the last five years. However, there still remains a shortfall in funding levels and delays in strategic expansion. If allowed to continue, this will place the regional air transportation hubs in the position of creating major delays to the state and national air transportation systems.

### Goods Movement

“D+”

The overall grade of the Bay Area goods (freight and cargo) movement systems should have all concerned. This grade is reflective of the current capacity, forecasted capacity needs, and capability of goods movement access. Combined, these areas fall below average and could have a potentially serious impact on the local economy.

### Parks

“C-”

Significant investment is needed to assure functional park and open space availability in the future. Existing parks and open spaces will be negatively impacted without increased investments.

## Urban Stormwater and Flood Control

“D+”

Local storm drainage systems manage runoff from urban areas, often draining into local rivers and the Bay. While these systems typically have capacity to carry runoff, they do not have the capability to meet increasingly stringent water quality standards. California law places severe constraints on stormwater utility fees, whereas other states have no such constraints.

## Water

“B-”

The quality of our drinking water is good, but significant investments are needed to address the recommended renewal and replacement, maintenance, security and reliability funding for the Bay Area’s water infrastructure, as well as to prevent further deterioration of the existing systems. These investments are needed to increase sustainability and to insure water supply and infrastructure reliability into the future.

## Wastewater

“C+”

Significant investments are still needed to meet the area’s demands. With the current state of the economy and a large amount of the workforce retiring in the near future, agencies will struggle to do more with fewer resources. Funding is a serious issue.

### GRADE COMPARISON BETWEEN 2005 AND 2011:

Category	2005	2011
Roadways	“D+”	“D+”
Bridges and Structures	“C”	“C+”
Transit	“C”	“C ”
Aviation	“C-”	“B ”
Goods Movement	“D+”	“D+”
Parks	“C-”	“C-”
Urban Stormwater and Flood Control	“D+”	“D+”
Water	“C-”	“B-”
Wastewater	“A ”	“C+”
<b>Overall Grade</b>	<b>“C-”</b>	<b>“C”</b>

## *Understanding Infrastructure Issues*

Now that you have seen the Bay Area infrastructure report card, you may be asking how you can help improve our region's infrastructure. Our suggestions parallel those in the ASCE National Report Card.

Infrastructure is a complex network of public works, which includes roads, bridges, airports, dams, and utilities. The rules governing infrastructure planning, financing, construction, and upkeep are equally complex. Whether your goal is to shorten your daily commute, attract new business to your community, or protect the environment for your children, gaining a better understanding of these rules is the first step toward becoming an advocate for sustaining infrastructure at acceptable standards of condition in your community. As you read through this Citizen's Guide, please think about the following:

***Be an informed citizen.*** In order to influence public officials about infrastructure needs in your community, you must understand what those needs are. Consider the Bay Area Infrastructure Report Card. How does your community measure up?

***Demand continuous and timely maintenance.*** If transportation, water, and other infrastructure facilities are not kept in sound condition, they cannot support the level of service they are designed to handle. Regular maintenance prolongs use and minimizes the need for costly repairs, just as with your home or automobile. The money saved can be used to fund other community priorities. Unfortunately, policies often encourage new construction at the expense of maintenance.

***Think long-term.*** Renewing America's infrastructure is an ambitious goal that cannot be achieved overnight. Furthermore, the roads, bridges, water treatment plants, and other facilities built today must serve for decades to come. Comprehensive planning and long-term investment are absolutely necessary to make sound decisions about infrastructure.

***Consider all the factors influencing infrastructure decisions.*** For example, building a new highway has implications beyond the immediate highway corridor, e.g. concern that a new highway may displace wetlands must be balanced against the reduction in air pollution that will result from decreased traffic congestion.

***Demand local dedicated funding.*** How often do we hear of funds appropriated for certain measures going to different programs or projects? We can no longer afford to wait for state and federal budgets to take care of local issues. Specific monies need to be set aside to improve the grades reported in this update. When available funds are coupled with the commitment to provide for a sustainable future, we can ensure our infrastructure measures up to present and future demands.

***Do more with less.*** Clearly, money alone will not solve our infrastructure problems. Solutions to urban problems such as traffic congestion and contaminated water require new technologies and approaches. Research can help identify more efficient designs and longer lasting, low

maintenance materials. We can also change our behavior. For example, through recycling, telecommuting, or using mass transit, we can reduce the demand on our infrastructure.

***Be open to technological advances.*** The solutions of yesterday may not be the answer to the problems of today or tomorrow. We must be willing and open to support research and development efforts to bring us a more sustainable future.

***Preserve the environment.*** To use the nation's resources most effectively, we must balance environmental and economic goals. Land use and transportation patterns designed to foster economic growth and personal mobility *can* be developed in harmony with environmental benefits.

***Look at the big picture.*** Remember that beyond the immediate, individual benefits gained from infrastructure improvements, there are broader community benefits. For example, even though you may not use the new mass transit system, its construction will reduce traffic congestion on local roads and increase nearby property values.

## Roadways

### Introduction

Vital in facilitating the transportation of people and commodities, roadways need to meet or exceed capacity requirements while simultaneously providing quality driving surfaces. At \$46 billion in today's dollars, the roadways are one of the Bay Area's most valuable assets. The Road Infrastructure Project (TRIP)'s 2010 report, "Rough Ride Ahead," identified San Jose, Concord, Oakland, and San Francisco as being in the top 5 of the top 20 major US urban areas with the poorest pavement on major roads and highways, and the highest additional vehicle operating cost per driver due to poor pavement conditions. Concord was added since 2005. Congestion and delays within the Bay Area are among the highest in the nation. In total, the Bay Area cities and nine counties operate and maintain 13,900 and 5,100 miles of roadway, respectively, and the State Highway Administration (Caltrans) operates and maintains 1,368 miles of freeway network.

### Summary – Current Status Based on Criteria Categories

The roadway criteria have been established with four major categories to maintain consistency with the other infrastructure systems being reviewed as part of the Bay Area Infrastructure Report Card. Within each category, subcategories were developed to specifically apply to the roadways systems' evaluation. The importance of each subcategory is emphasized by the points that were assigned as a weighting factor. An overall grade was determined by applying the weighting factor to each subcategory and averaging each of the major categories.

### Condition

Roadway conditions were divided into two categories: state highway and local streets. State highways were evaluated for ride quality and structural conditions using data from the Pavement Management System (PMS). Local roadways were evaluated using the distressed condition Pavement Conditions Index (PCI) score. No independent condition surveys were conducted.

#### Weighting Factor

Condition of state highway system maintained by Caltrans	15 pts
Condition of local streets and roads maintained by cities and counties	15 pts

### Capacity

Evaluation of the adequacy of capacity for the Bay Area's roadways was performed for each category. The lack of adequate capacity at peak periods significantly impacts our quality of life. State highway and local roads were combined for the evaluation. Data was available for State highways. Local roadways are known to experience congestion at a rate proportional to

highways. The evaluation is based on the cost of congestion to the local economy relative to average annual daily delays.

**Weighting Factor**

Existing capacity of state highway and local roadway systems	20 pts
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*Deferred Maintenance*

Deferred maintenance constitutes the renewal, replacement, and maintenance projects that have been postponed because of the perceived lower priority status than those projects completed within available funding. Delayed maintenance is forecasted by MTC to increase rehabilitation and replacement costs by five times if not performed before rehabilitation or reconstruction becomes required. Without effective intervention and prolonged deferred maintenance, the more unsuitable the facility will become over time to provide the intended services.

For roadway systems, one significant way the effect of deferred maintenance will show up is with regard to ride quality and pavement conditions. The evaluation looked at needs forecasted by the condition indices in PMS and PCI compared to the allocated or available funding for maintenance for state highway and local roads. Grades were developed based on general interpretation of the standard indexes.

**Weighting Factor**

Future funding needed to maintain existing Caltrans pavement infrastructure	20 pts
Future funding needed to maintain existing city and county pavement infrastructure	20 pts

*Safety*

Roadway safety is a priority for all State and local agencies. The most important group of statistics that indicate the relative safety of the roadway is crash and accident data. Safety was evaluated in two categories: crash rates; and personal injury and fatalities.

**Weighting Factor**

Crash rate	5 pts
Personal injuries and fatalities	5 pts

## *Infrastructure Assessment Methodology*

MTC complies and publishes an annual “Pavement Condition of Bay Area Jurisdiction” report based on reports submitted to them by local jurisdictions. The previous “Pothole Report” information is now included in the new report. The methodology the MTC and local jurisdiction employ is the PCI. The PCI has six classifications for pavement: excellent, very good, good, fair, poor, and very poor. A PCI ranking of “fair” or lower requires immediate repair and “poor” or “very poor” rankings require resurfacing or reconstruction.

Caltrans employs the International Roughness Index (IRI) method to determine ride quality on their network. An IRI score greater than 210 (inches of surface roughness per mile) would be considered unacceptable. An “excellent” ride would correspond to an IRI score of 60 or under.

Caltrans classifies congestion as a condition where the average speed drops below 35 mile per hour for 15 minutes or more on a typical weekday.

Numerous Caltrans documents and MTC documents were referred to in the assessment of the criteria.

## *Overall Roadway Grade*

The overall “D+” grade of the Bay Area’s Streets and Highway infrastructure should be a concern to all. This low grade is reflective of the current poor capacity despite a recent allocation of funds. Traffic congestion is now at levels comparable to that reported in 2005. Traffic volumes are 6.1 percent lower than reported in 2005. The Pavement Condition in 2009 had 24 percent of the local roadways either at risk or in poor condition. At the same time the shortfall in allocation of funds for operation and maintenance has increased from 20 percent in 2005 to more than 30 percent in 2010. With the lack of funding for full maintenance and operation, the already poor condition of the pavement will precipitously decline.

The overall reduction in vehicular traffic in the Bay Area over the last few years is due in large part to the economic downturn and a sluggish economic recovery. Additional reduction may be due to cultural and technological changes which have enabled employees to work remotely and not utilize roadways. While these two factors play a major effect in reducing the demand on the street and highway infrastructure, they are not expected to be long-term.

One factor that may better address future demand is a shift from public ownership and operation to private ownership and operation of the transportation systems in the Bay Area. As the Bay Area becomes ever more densely populated, a modal shift from private vehicular modes towards public transportation is not expected to occur. Both modes will see proportional increase with the population. Increased toll bridge fees and public transportation funding are not expected to radically reduce modal use rates. The Bay Area will need additional facilities to provide the capacity to alleviate projected congestion.



## *Recommended Policy*

The MTC’s Transportation 2035 Plan has focused on the basic issues the Bay Area must address: “The changes called for in the Transportation 2035 Plan are significant, and they will have a positive impact on the region. Still, when we measure the extent of their progress, we find it falls short of attaining the transportation 2035 performance objectives set by the Commission -in some cases, well short. While the plan does make meaningful headway when it comes to reducing delay and keeping our system in a state of good repair, achieving appreciable reduction in greenhouse gas emissions and vehicle travel proves to be more of an elusive goal. To continue making progress toward our performance objectives - to keep change in motion - the Bay Area must take additional bold steps beyond the Transportation 2035 Plan. Is the Bay Area ready for change?”

The Transportation Plan also states “...if the region is to close the vast gap between current conditions...[and the]...2035 performance objectives, we need to stop arguing over projects and start forging a united strategy to advance the two policy initiatives that really make a difference: road pricing and focused growth.”

We must secure maximum available funding from local, state, and federal programs. Implementing the “Call for Change” identified by the Transportation Plan should be a priority. This can be done by the following:

### ***1. Strengthen Proposition 42***

Proposition 42 permanently dedicated gasoline sales tax revenue to transportation including local roads; Proposition 42 should be strengthened so that its revenues cannot be routinely reallocated to pay for other needs.

### ***2. Congestion Pricing***

This new concept for the Bay Area would allow non-carpool qualified vehicles to use carpool lanes for a fee, thereby providing both additional relief during peak use periods, as well as providing additional revenues.

### ***3. Devote More Local Sales Tax***

Most Bay Area transportation sales taxes allocate 20 percent to 25 percent of revenues to the upkeep of local streets. Counties should increase their share to address projected maintenance shortfalls.

### ***4. Self Help for Every County***

Cities’ and counties’ continued reliance on their general funds to finance street rehabilitation is risky, particularly since the general funds are often tapped out by police, fire, and other needs. Cities and counties need to look to the voters to approve user charges such as vehicle license fees and fuel taxes to pay for pothole repair.

### *Investment needed*

According to the MTC Transportation 2035 Plan, there is a \$24 billion dollar funding gap over 25 years for maintenance, safety improvements, and roadway rehabilitation. This is almost double the 2005 forecasted funding gap. This means that in addition to the \$186 billion that will be allocated for Bay Area Transportation over the next 25 years, there will be a shortfall of \$24 billion in achieving the transportation needs. The 2009 State Highway Operation and Protection Program (SHOPP) forecasts an unfunded \$13 billion in safety and roadway rehabilitation needs. Local roadway maintenance is forecasted to be underfunded by \$11.1 billion. MTC's Transportation 2030 Plan had 20 percent of the required maintenance unfunded and the current Transportation 2035 Plan has more than 30 percent of required maintenance and operation unfunded. This downward trend in available funding should be a warning of critical pavement failures in the coming years.

### *Conclusion*

The Bay Area roadways are graded below average because of the shortfall in funding levels to sustain adequate maintenance, system efficiency and strategic expansion. It is absolutely necessary that adequate local, state, and federal funding be programmed. If the funding shortfall is allowed to continue, it will place the local economy at risk, and cost the public five times the forecasted cost to perform rehabilitation or reconstruction. The unfunded portion of the maintenance and operation for local roadways has increased from 20 percent in 2005 to more than 30 percent in 2010. This trend does not bode well for the future pavement condition of the roadways in the Bay Area.

REPORT CARD CRITERIA – ROADWAYS

<b>Major Grouping</b>	<b>Category Description</b>	<b>Weighting Factor</b>	<b>Grade</b>
<b>Condition</b>	Condition of state highway system maintained by Caltrans	15	“C”
	Condition of local streets and roads maintained by cities and counties	15	“D+”
<b>Capacity</b>	Existing capacity of state & local roads	20	“C”
<b>Deferred Maintenance</b>	Future funding needed to maintain existing Caltrans pavement infrastructure	20	“D”
	Funds needed to maintain existing city and county pavement infrastructure	20	“D”
<b>Safety</b>	Crash rate	5	“C-”
	Personal injuries & fatalities	5	“B”
<b>Overall Bay Area Roadway Grade</b>			<b>“D+”</b>

## BRIDGES AND STRUCTURES

### Introduction

The San Francisco Bay Area’s unique geography has made bridges necessary links for all nine Bay Area counties. There are an estimated 675 bridges within the jurisdictions of the counties, another 1200 within the cities, and an estimated 1000 bridges within the state highway system, several of which are world renowned. They include tunnels, viaducts, raised freeways, draw bridges, suspension bridges, freeway overpasses, and the typical small bridges over streams and rivers. Damage caused by the 17 seconds of the 1989 Loma Prieta earthquake served as a wakeup call for the Bay Area back in 1989. With the knowledge that the San Francisco/Oakland Bay Bridge retrofit and eastern span replacement cost is \$12 billion, it is clear that all of the bridges and structures represent a very significant asset value and as such need to be well protected and maintained.

### Summary – Current Status Based on Criteria Categories

The bridge and structure criteria have been established with three major categories that are similar to those of the other infrastructure systems being reviewed as part of the Bay Area Infrastructure Report Card. Within each category, subcategories were developed to evaluate state and local bridge systems. The importance of each subcategory is emphasized by the points that were assigned as a weighting factor. An overall grade was determined by applying the weighting factor to each subcategory grade and then averaging all results to determine the overall grade.

### Condition and Capacity

Condition and capacity of bridges and structures were evaluated in two categories: State highway and local bridges. Sufficiency ratings were used in the evaluation and they address: structural adequacy and safety, serviceability, functional obsolescence, critical facilities, and special reduction (i.e., special load ratings for weak structures).

#### Weighting Factor

State (highway and other state owned and/or maintained structures)	15 pts
Local (city, county, and other locally owned and/or maintained structures)	15 pts

*Funding (Non-Seismic Retrofit)*

This criterion is used to establish the adequacy of funding for non-seismic retrofit and was divided into two categories: defined needs for retrofit and replacement of all structures that require work, and the funds allocated for retrofit and replacement work. These were in turn divided into subcategories of state highway and local bridges and structures. State highway needs and funding were evaluated based on reported findings. Need/funding availability for the local structures in the Bay Area was evaluated using the bridge maintenance system points.

**Needs:**

**Weighting Factor**

State (highway and other state owned and/or maintained structures)	10 pts
Local (city, county, and other locally owned and/or maintained structures)	10 pts

**Funding Allocation:**

**Weighting Factor**

State (highway and other state owned and/or maintained structures)	15 pts
Local (city, county, and other locally owned and/or maintained structures)	15 pts

*Seismic Sufficiency*

This criterion was divided into two categories: State and Local. The agency’s timeline for addressing all seismically vulnerable structures was used to evaluate seismic sufficiency.

**Weighting Factor**

State	10 pts
Local	10 pts

## *Overall Bridges and Structures Grade*

The overall “C+” grade of the Bay Area's Bridge/Structure infrastructure is reflective of the current capacity and recent allocation of funds.

Even with a sluggishly recovering economy and a shift in transportation patterns, the state and local governments must appropriate enough funding to maintain a minimum level of seismic safety and mandate replacement for all aging bridges and structures.

## *Recommended Policy*

The MTC's Transportation 2035 Plan has focused on the basic issues the Bay Area must address: “The changes called for in the Transportation 2035 Plan are significant, and they will have a positive impact on the region. Still, when we measure the extent of their progress, we find it falls short of attaining the transportation 2035 performance objectives set by the Commission---in some cases, well short. While the plan does make meaningful headway when it comes to reducing delay and keeping our system in a state of good repair, achieving appreciable reduction in greenhouse gas emissions and vehicle travel proves to be more of an elusive goal. To continue making progress toward our performance objectives - to keep change in motion - the Bay Area must take additional bold steps beyond the Transportation 2035 Plan. Is the Bay Area ready for change?”

The Transportation Plan also states “...if the region is to close the vast gap between current conditions... [and the]...2035 performance objectives, we need to stop arguing over projects and start forging a united strategy to advance the two policy initiatives that really make a difference: road pricing and focused growth.”

We must secure maximum available funding from local, state, and federal programs. Implementing the “Call for Change” identified by the Transportation Plan should be a priority. This can be done by the following:

### **1. *Strengthen Proposition 42***

Proposition 42 permanently dedicated gasoline sales tax revenue to transportation including local roads; Proposition 42 should be strengthened so that its revenues cannot be routinely reallocated to pay for other needs.

### **2. *Congestion Pricing***

This new concept for the Bay Area would allow non-carpool qualified vehicles to use carpool lanes for a fee, thereby providing both additional relief during peak use periods, as well as providing additional revenues.

### **3. *Invest More Revenues in Local Infrastructure***

Most Bay Area transportation sales taxes allocate 20 percent to 25 percent of revenues to the upkeep of local streets. Counties should increase their share to address projected maintenance shortfalls. In addition, the state and federal government's allocation should be increased.

#### ***4. Self Help for Every County***

Cities' and counties' continued reliance on their general funds to finance street rehabilitation is risky, particularly since the general funds are often tapped out by police, fire, and other needs. Cities and counties need to look to the voters to approve user charges such as vehicle license fees and fuel taxes to pay for pothole repair. Local special taxes should be dedicated to fund local infrastructure projects.

#### ***Investment needed***

Continued and increased investment in the bridge and structure infrastructure is absolutely required. An estimated 500 million dollars is needed annually to bring the bridges and structures up to a "B" grade.

#### ***Conclusion***

The Bay Area bridges/structures are graded slightly above average. The shortfall in funding levels to sustain adequate maintenance, system efficiency, and strategic expansion, if allowed to continue, will place the local economy at risk and could ultimately cost the public five times more in rehabilitation and reconstruction costs if not addressed within the near term.

REPORT CARD CRITERIA – BRIDGES AND STRUCTURES

Major Grouping	Category Description	Weighting Factor	Grade	
Capacity & Condition	State (highway and other state owned and/or maintained structures)	15	“B-”	
	Local (city, county, and other locally owned and maintained structures)	15	“C+”	
Funding (Non-Seismic)	Needs	State (highway and other state owned and/or maintained structures)	10	“C-”
		Local (city, county, and other locally owned and maintained structures)	10	“C+”
	Funds	State (highway and other state owned and/or maintained structures)	15	“C-”
		Local (city, county, and other locally owned and maintained structures)	15	“C”
Seismic Sufficiency	State	10	“C+”	
	Local	10	“C+”	
<b>Overall Bay Area Bridges and Structures Grade</b>			<b>“C+”</b>	



## *Transit*

### *Introduction:*

Sustaining and developing the Bay Area’s public transportation infrastructure is paramount for a healthy and robust Bay Area economy. The landscape of the Bay Area is becoming increasingly more urbanized, and as such, the congestion of our local streets and highways will increase as the population grows. During the congested commute hours, public transit provides an alternative to driving, which helps reduce the number of vehicles on the roads. Only a substantial public transportation infrastructure can ease both freeway and local roadway congestion, and will at the same time transport people using less space, less fuel, emitting less air pollution, and provide travel for the youth, disabled, elderly, and low-income individuals. According to the MTC’s Transportation 2035 Plan, “The cost of buying the fuel, paying the drivers, mechanics, dispatchers and others necessary to operate a transit system and paying for the replacement of buses, cars, fare machines, and other capital equipment - far outpaces available funds.” They go on to indicate that delayed maintenance of the transit system leads to an even costlier rehabilitation down the road. MTC has made funding for transit vehicles and track/guideway replacement and rehabilitation a higher investment priority than proposed service expansions. As transit funding becomes scarcer, the challenge is to find ways to sustain and maintain today’s core transit system. The prudent expenditure of transit operating and capital replacement funds is necessary to balance operating and capital replacement costs with reduced revenues.

Transit system criteria were utilized to evaluate bus, rail, and ferry public transportation modes. The criteria have been established with four major categories to maintain consistency with the other infrastructure systems being reviewed as part of the Bay Area Infrastructure Report Card. Within each category, subcategories were developed to evaluate primary components of the transit system. For each subcategory, points were assigned as a weighting factor. A category grade was determined by applying the weighting factor to each subcategory grade, and then averaging all results to determine the overall grade.

### *Condition*

Condition was divided into three categories: rolling stock/vessels, stations, and tracks. Condition was determined by review of available reports prepared by the various agencies and regional data.

#### **Weighting Factor**

Condition of bus/rail/ferry cars (rolling stock and vessels)	9
Condition of bus/rail/ferry stations	9
Condition of rail tracks	9

### *Capacity*

Capacity was evaluated in four categories: (1) ability to meet future ridership levels; (2) reliability of on-time arrivals; (3) capacity of local facilities; and (4) capacity of regional facilities.

**Weighting Factor**

Ability to meet future ridership levels on trains/buses/ferries	12
Reliability of trains/busses/ferries (i.e., on-time arrivals)	12
Capacity of local facilities	12
Capacity of regional facilities	12

### *Deferred Maintenance*

Deferred maintenance refers to the maintenance of cars/vessels and trackage that is postponed due to lack of funds. This was evaluated by reviewing compliance with state and federal regulations and design life of equipment.

**Weighting Factor**

Trains/buses/ferries: rolling stock, vessels, or tracks that require maintenance or replacement	10
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### *Security and Safety*

Security and safety was divided into two categories: (1) seismic security and (2) terrorism protection. Each was evaluated based on available reports by local agencies and regional data.

**Weighting Factor**

Seismic security	7.5
Terrorism protection	7.5

### *Assessment Methodology*

Review of various reports from local and regional agencies supported the assessment of the criteria for each mode of transit. Each mode was graded and then averaged for the overall subcategory and category.

## *Overall Grade*

The overall “C” grade of the Bay Area transit infrastructure reflects the current financial constraints all public works are facing in today's economy. The need to provide transit service with increasing labor costs, necessary fleet replacement, and escalating maintenance and operation costs presents a significant challenge to provide the required services within today's budget constraints. Several of the Bay Area transit agencies have and are rethinking the service they are providing. Many have reduced schedules to maximize ridership while reducing costs to meet forecasted funding shortfalls.

Significant improvements to transit systems are on the horizon for the Bay Area and include the following:

- BART has begun a \$3 billion fleet replacement
- BART is proceeding with seismic upgrades to their many structures
- MUNI is constructing the Central Subway project
- The Transbay Authority is constructing the new Transbay Terminal which will be a multi-modal hub that will interconnect bus and rail with downtown San Francisco and the surrounding Bay Area
- The high-speed rail connection to Southern California appears to be receiving significant funding but has many issues to resolve before it will become a reality

Although these improvements are significant to the transit infrastructure, they will be decades in construction.

Review of transit ridership shows that the economy has caused a 4.5-percent drop in ridership between 2009 and 2010. Between 2005 and 2009 ridership generally increased at one percent per year for most agencies. Some transit agencies experienced an increase of four to seven percent in 2009 but experienced a dramatic reduction in 2010 due to the economy. The 2010 ridership is one percent below 2005 levels due to the economic conditions of 2010.

## *Recommended Policy*

MTC's Transportation Plan looks to the future and will require significant additional funding to be successful. The Plan has focused on the basic issues the Bay Area must address: “The changes called for in the Transportation 2035 Plan are significant, and they will have a positive impact on the region. Still, when we measure the extent of their progress, we find it falls short of attaining the transportation 2035 performance objectives set by the Commission---in some cases, well short. While the plan does make meaningful headway when it comes to reducing delay and keeping our system in a state of good repair, achieving appreciable reduction in greenhouse gas emissions and vehicle travel proves to be more of an elusive goal. To continue making progress toward our performance objectives - to keep change in motion - the Bay Area must take additional bold steps beyond the Transportation 2035 Plan. Is the Bay Area ready for change?”

The Transportation Plan also states “...if the region is to close the vast gap between current conditions...[and the]...2035 performance objectives, we need to stop arguing over projects and start forging a united strategy to advance the two policy initiatives that really make a difference: road pricing and focused growth.”

We must secure maximum available funding from local, state, and federal programs. Implementing the “Call for Change” identified by the Transportation Plan should be a priority. This can be done by the following:

**1. *Strengthen Proposition 42***

Proposition 42 permanently dedicated gasoline sales tax revenue to transportation including local roads; Proposition 42 should be strengthened so that its revenues cannot be routinely reallocated to pay for other needs.

**2. *Congestion Pricing***

This new concept for the Bay Area would allow non-carpool qualified vehicles to use carpool lanes for a fee, thereby providing both additional relief during peak use periods, as well as providing additional revenues.

**3. *Accelerate the Transit Priority Program***

Place the program on an accelerated schedule to enhance service as quickly as possible

**4. *MTC Resolution 3434***

Continue to implement Resolution 3434 to expand bus, rail, and ferry service within the Bay Area

**5. *Restore State Transit Assistance***

State Transit Assistance revenue that is currently suspended until fiscal year 2013–14 should be restored as quickly as possible

**6. *Renew Transit Sales Tax Measures***

Renew Transit Sales Tax Measures that will be expiring within next few years to meet the unfunded needs of the transit infrastructure

### *Investment Needs*

Transit has a 25-year unfunded need of \$25.2 billion according to the MTC. This is nearly a fivefold increase in projected shortfall from 2005. The Bay Area needs an additional \$1 Billion per year to meet the forecasted needs.

### *Conclusion*

Shortfalls in projected funding will translate into fewer improvements to services as the population grows, and greater deferred maintenance. The deferred maintenance will incur five times the original cost if delayed until rehabilitation and reconstruction are required. The net

result will be poorer performance and delay of services by the various transit modes. Increased funding is absolutely needed to assure maintenance is not deferred and that funds are available for service improvements and fleet replacements.

REPORT CARD CRITERIA – TRANSIT INFRASTRUCTURE CRITERIA

Major Grouping	Category Description	Weighting Factor	Grade
Condition	Age & condition of bus/rail/ferry cars, known materials issues	9	“C”
	Age & condition of bus/rail/ferry stations, known materials issues	9	“C”
	Age & condition of tracks	9	“C”
Capacity	Sufficient capacity and track availability for 20-year demand, ability to meet future ridership levels on trains/buses/ferries	12	“B-”
	Storage, flexibility, redundancy to deal with planned and unplanned outages; reliability of trains/buses/ferries (i.e. on-time arrivals)	12	“C”
	LOCAL facilities – capacity of trains/buses/ferries to meet peak weekday and weekend demands	12	“C”
	REGIONAL facilities - capacity of trains/buses/ferries facilities to meet peak day demand.	12	“C”
Deferred Maintenance	Compliance with state/federal regulations, design life of equipment for cars or tracks that require maintenance or replacement	10	“C”
Security and Safety	Seismic security upgrades/retrofits to rail/track systems	7.5	“C-”
	Terrorism protection	7.5	“C-”
<b>Overall Bay Area Transit Grade</b>			<b>“C”</b>

## Aviation

### Introduction

The Bay Area has airports that serve the major airlines, general aviation, and the military. The report card evaluated only the four regional facilities that serve San Francisco, Oakland, San Jose, and Sonoma County. The 2005 Bay Area Infrastructure Report Card was based upon the Regional Airport Study Plan (RASP) prepared for the Regional planning agencies, MTC, Association of Bay Area Governments (ABAG), and the Bay Conservation and Development Commission (BCDC).

The RASP had air passenger projections which had been compiled prior to September 11, 2001. Those projections forecast a doubling of air passenger traffic to over 111 Million Annual Passengers (MAP) by the 2020. The regional planning agencies recently had the RASP updated. The updated RASP now forecasts passenger traffic to reach 79 MAP by the 2020.

In comparison to the 2005 Bay Area Infrastructure Report Card, the airports have much greater capacity to handle projected 2020 passenger demand because of the 30 percent drop off in demand.

### Summary - Current Status Based On Criteria Categories

The airport criteria have been established with four major categories to maintain consistency with the other infrastructure systems being reviewed as part of the Bay Area Infrastructure Report Card. Within each category, subcategories were developed to specifically review major components of airport facilities. The importance of the subcategory was emphasized by the points that were assigned as a weighting factor. The overall grade was determined by applying a weighting factor to subcategory grades, then averaging all results to determine the overall grade.

### Condition

Condition was divided into two categories: age and serviceability of runways and terminals, and age and serviceability of highway/ roadway access.

#### Weighting Factor

Age and serviceability of runways and terminals	10
Age and serviceability of highway/roadway access	10

### *Capacity*

Evaluation of the adequacy of capacity for the Bay Area’s airports was performed using five subcategories. These subcategories were identified as: terminal facilities’ capability to handle projected 20-year passenger demand; local ground transportation/parking capacity projected to handle the 20-year passenger demand; runway capability to handle projected 20-year aircraft demand; major highway/transit systems that connect airport - capacity to meet peak demands; and bottlenecks that need upgrades.

**Weighting Factor**

Terminal facilities capability to handle projected 20-year passenger demand	10
Local ground transportation/parking capacity projected to handle the 20-year passenger demand	10
Runway capability to handle projected 20-year aircraft demand	10
Major highway/transit systems that connect to airport - capacity to meet peak demands	10
Bottlenecks that need upgrades	10

### *Deferred Maintenance*

Deferred maintenance refers to renewal, replacement, and maintenance projects that have been postponed because of the perceived “Less Priority” status than those completed within available funding. It represents the lack of funding necessary to meet its needs. Delayed maintenance is forecasted to generally cost five times the cost predicted before delay. Deferred maintenance is handled by a single category entitled “Ability to provide for safe and reliable passenger distribution, system reliability, and efficiency”.

**Weighting Factor**

Ability to provide for safe and reliable passenger distribution, system reliability, and efficiency	10
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### *Security and Safety*

Since September 11, 2001, the safety of airport facilities and the traveling public has been dominated by the setting up of physical security measures. This category has been divided into two subcategories: "National: ability to fund terminal security guidelines and provide protection against terrorist acts," and "Regional requirements: to protect local access roads, airport facilities, access points, baggage screening, and passenger screening".

#### **Weighting Factor**

National: ability to fund terminal security guidelines and provide protection against terrorist acts	10
Regional: ability to protect local access roads, airport facilities, access points, baggage screening, and passenger screening	10

### *Infrastructure Assessment Methodology*

The Regional planning agencies MTC, ABAG, and BCDC, completed a joint updated RASP, dated July 26, 2010. Data was obtained from this RASP, as well as individual airport Capital Improvement Programs, FAA reports on its proposed improvements to air traffic control systems and procedures, and interviewing key airport planning personnel.

Each airport was then graded for each subcategory and then weights were assigned in proportion to each airport’s annual passenger forecast to arrive at a combined weighted average for each subcategory.

### *Overall Aviation Grade*

The overall “B” grade of the Bay Area airport infrastructure reflects the current capacity and funding availability for the airport facilities to address improvements to the various components of their operations as evaluated by the criteria described above.

Improving from a “C-” to a “B” grade is a result of every airport embarking upon major capital improvement programs during the last decade. However, there are still deficiencies with local airports’ runways capacity during Instrument Flight Rules (IFR) conditions. Another negative factor is the present uncertainty facing new screening requirements for air cargo. The impact on air travel will not be known until the FAA/TSA has come up with the new air cargo screening requirements.

Terminal capacity at one local airport is presently 112 gates and is expected to “max out” by the 2018.

Improvements are needed at another local airport at its taxiway connections to its primary runway, and will need to build a new taxiway as the runways’ capacity “maxes out” by 2020. There is a plan in place for a third terminal which will expand the airport’s terminal capacity



(from 29 gates to 46-50 gates) which will enable the airport to handle passenger projection demands out to 2035.

Runway capacity at another local airport can handle passenger traffic demands beyond the year 2020. Its terminal capacity (28 gates) is expected to “max out” by 2019. Likewise, they will need expanded parking capacity to meet the increased passenger traffic by 2019.

Reports also show that another airport needs to extend its primary runway to make it possible to handle regional jets (in excess of 60,000 lbs). This will have a beneficial effect on air traffic at the major airports in the Bay Area by removing the small regional jets from their respective take off/landing workloads.

### *Investment Needed*

The immediate major funding that is required, an estimated \$3 billion, is for the airlines to equip their aircraft and train their flight crews in handling the FAA’s new “NexGen” Air Traffic Control technologies and procedures:

- Wake Vortex Advisory System (WVAS)
- Airport Surface Detection Equipment (ASDE-X)
- Required Navigational Performance (RNP)
- Automated Dependent Surveillance-Broadcast (ADS-B)
- Cockpit Display of Traffic Information (CDTI)
- Enhanced Simultaneous Offset Instrument Approaches (SOIA).

### *Conclusion*

With exception of one airport’s runway capacity during inclement weather, all airports have above average grades for meeting the passenger traffic demands up to 2020. However, every airport will “max out” at about that same time. What this means is a new wave of funding will be needed to make it possible for the airports’ infrastructure to handle the increased passenger traffic demands. The proposed increases in Passenger Facility Charges from \$4.50 to \$7 and increases in Airport Improvement Grants (AIP) will be absolutely necessary to meet future demands.

REPORT CARD CRITERIA – AVIATION

<b>Major Grouping</b>	<b>Category Description</b>	<b>Weighting Factor</b>	<b>Grade</b>
<b>Condition</b>	Age & condition of runway and terminal facilities	10	“A-”
	Age & condition of landside access – highways	10	“A-”
<b>Capacity</b>	Terminal facility's capability to handle projected 20-year passenger demand	10	“B”
	LOCAL ground transportation/parking capacity to handle projected 20year passenger demand	10	“B+”
	Runway capability to handle projected 20year aircraft demand	10	“D”
	Major highway/transit systems that connect to airport - capacity to meet peak demands	10	“B+”
	Bottlenecks that need upgrades	10	“D”
<b>Deferred Maintenance</b>	Ability to provide for safe and reliable passenger distribution, system reliability, and efficiency	10	“B+”
<b>Security and Safety</b>	National: ability to fund terminal security guidelines and provide protection against terrorist acts	10	“D”
	Regional: ability to protect local access roads, airport facilities, access points, baggage screening, and passenger screening	10	“A-”
<b>Overall Bay Area Aviation Grade</b>			<b>“B”</b>

## Goods Movement

### Introduction

According to MTC, goods movement is critical to the Bay Area's economy. Many Bay Area businesses and residents could not function without a robust goods movement system. Nearly half of all goods moved into, out of, or within the Bay Area have both an origin and a destination within the region. Goods movement is supported by highway access, railroad access, and capacity of ports. The lifeblood of our economy is our capacity to move goods quickly and cost-effectively.

### Summary - Current Status Based On Criteria Categories

The goods movement criteria have been established with three major categories to maintain consistency with the other infrastructure systems being reviewed as part of the Bay Area Infrastructure Report Card. Within each category, subcategories were developed to specifically address major components of the goods movement facilities. The importance of each subcategory was emphasized by the points that were assigned as a weighting factor. An overall grade was determined by applying the weighting factor to each subcategory grade and then averaging all results to determine the overall grade.

### Condition

Condition was divided into four subcategories: waterside and terminal activities, air cargo and terminal activities, landside access - highways, and landside access - railroads.

#### Weighting Factor

Waterside and terminal activities	8
Air cargo and terminal activities	8
Landside access - highways	8
Landside access - railroads	8

### Capacity

Determining the adequacy of capacity of the Bay Area's goods movement system was performed by evaluating five subcategories: marine terminal capability to handle projected 20-year cargo demand - waterside and terminal activities; air-cargo terminal capacity to handle projected 20-year cargo demand; local landside access capability to handle projected 20-year cargo demand by local ground transportation; capability of major highways connected to port facilities to meet peak goods movement demands; and regional rail system capacity to meet peak demands.

**Weighting Factor**

Marine terminal capability to handle projected 20-year cargo demand - waterside and terminal activities	8
Local landside access capability to handle projected 20-year cargo demand by local ground transportation	8
Air-cargo terminal capacity to handle projected 20-year cargo demand	8
Capability of major highways connected to port facilities to meet peak goods movement demands	8
Regional rail system capacity to meet peak demands	8

*Deferred Maintenance*

Deferred maintenance refers to renewal, replacement, and maintenance projects that have been postponed because of the perceived “Less Priority” status than those completed within available funding. Late maintenance is forecasted to generally cost five times the original cost if delayed until rehabilitation and reconstruction are required. Deferred maintenance is handled by a single category entitled, “Ability to provide for safe and reliable goods movement, system reliability, and efficiency”.

**Weighting Factor**

Ability to provide for safe and reliable goods movement, system reliability, and efficiency	10
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*Security and Safety*

Since September 11, 2001, there has been the express concern of security measures within, around, and protecting all aspects of the goods movement system across the United States. Safety and security has been divided into two subcategories: "NATIONAL security program mandates" (i.e., the ability to fund vessel and marine terminal and air cargo security guidelines), and "REGIONAL requirements" (i.e., the ability to protect local access roads, port access points, airport access points, fencing, detection systems, and all other aspects of security).

**Weighting Factor**

NATIONAL security program mandates	9
REGIONAL requirements	9

## *Infrastructure Assessment Methodology*

Goods movement infrastructure was evaluated by reviewing numerous reports published in the Bay Area which included documents from MTC, the various ports, and the various airports. No independent surveys or data gathering were conducted.

## *Overall Goods Movement Grade*

The overall “D+” grade of the Bay Area goods movement systems should have all concerned. This grade is reflective of the current capacity, forecasted capacity needs, and capability of goods movement access.

Generally, the Bay Area ports are constrained not by their loading or container capacity but by the inbound/outbound rail capacity to move the goods.

According to the MTC, “...If current trends continue, by 2035 only 60 percent of the goods movement industry demand for industrial land in the inner East Bay and north Peninsula will be accommodated. This will result in less industrial activity in the future compared to today, and over time large numbers of Bay Area goods movement businesses and jobs serving the central Bay Area will have to locate outside the region.” " Local planners, industrial developers, and business enterprise should do all possible to maximize the use of the port facilities for industrial purposes which is a solid base for good jobs and economic longevity. Current planning is attempting to provide for this as well as a long-range goal to allow trucking transport of goods from the Oakland Harbor/San Francisco Bay to future intermodal facilities and port facilities located in the Sacramento Valley.

## *Recommended Policy*

The MTC Transportation 2035 Plan provides improvements necessary for goods movement.

The Trade Corridors Improvement Fund (TCIF) program should be supported in the legislature to provide improvements on two major northern California trade corridors: 1) the Central Corridor along Interstate 80 in the Union Pacific rail line from the Port of Oakland to the California/Nevada border, and 2) the Corridor along the Union Pacific rail line and Interstates 580, 880, and 238 in the Bay Area.

Have the legislature take action to authorize local fee setting authority for container fees at the State's three largest ports including Oakland.

## *Corridor Improvements*

- Improve incident management and fund centrally controlled ramp metering and traveler information systems
- Reduce operational difficulties facing trucks through interchange improvements, auxiliary lane improvements, truck lane continuity improvements, and spot capacity increases to improve safety and traffic flow conditions along the freeway segments with high truck volumes

- Oakland Army Base - Seventh Street grade crossing needs to be a priority improvement
- Provide viable alternatives to the freeway for trucks serving the major industrial corridor along I-880, such as parallel arterials and rail or inland barge options
- Expand capacity of the I-580 corridor
- Improve access to all port facilities
- Air cargo projects - develop land use/industrial land preservation plan for the region's major commercial airports. Improve cross-bay connections among the airports and shippers concentrated in the South Bay/East Bay, as well as international and domestic air cargo facilities
- Develop land use strategies and incentives to encourage local communities to preserve land for freight-related uses
- Any security improvements required by government regulations at the ports should be funded by Transportation Security Funds

### ***Regional Improvements***

The primary regional improvements needed to the infrastructure to improve Goods Movement for the Bay Area are the following:

- Union Pacific Railroad alignment - Donner Summit improvements
- Union Pacific Railroad/Burlington Northern Santa Fe railroad - Tehachapi Pass improvements

### ***Investment Needed***

Investment to improve goods movement will need to come from private-sector and public agency funding. The MTC Transportation 2035 Plan possibly provides \$400 million for local improvements projects for goods movement over the next 25 years. It is absolutely necessary to have this critical component of the infrastructure improved sooner than 2035 to take advantage of the current goods movement business opportunities and build infrastructure parallel to any economic recovery in order to support the growth of the local economy. The annual needed improvements to infrastructure are estimated to be \$75 million per year for five years.

### ***Conclusion***

The Bay Area goods movement is graded below average because of the need for additional capacity and funding availability.

## *Parks*

### *Introduction*

As a follow up to the 2005 Bay Area Infrastructure Report Card, ASCE conducted a five year update to the Report Card. A Parks Systems Subcommittee was formed and charged with developing an updated report on the Bay Area's Parks, Recreation, and Open Space infrastructure. The committee contacted 10 Bay Area Park's providers to solicit self-assessments of the current status of the Bay Area's Parks infrastructure. The following sections describe the background, the process used to collect new data, and the conclusions for the current status and outlook for Bay Area Parks systems.

### *Background*

In 2005, 35 returned surveys were analyzed and it was determined that the Bay Area grade for Parks was a "C-". In 2010, a new committee was formed to update the current status with a particular focus on understanding what has changed in the past five years, what the current challenges are, and what the future may hold. The process in 2010 was to ask parks professionals if there has been any measurable increase or decrease in the "C" grade since 2005.

### *Current Status of Parks Infrastructure*

Using responses gathered from emailed questionnaires, the overall grade for the Bay Area Parks System Infrastructure remains at "C-" for 2011. Approximately 10 e-mailed questionnaires were sent out and there were four responses. All four responses confirmed that the grade should remain at "C-". Although a number of local successful capital parks improvements were mentioned, the respondents uniformly confirmed that, in general, there had not been measurable improvements in Bay Area parks over the last five years.

In November of 2006, California voters approved Proposition 84, which released \$5.4 billion in bond sales for a wide variety of projects related to water safety, rivers, beaches, levees, watersheds, parks, and forests. Although these funds will assist with the construction and renovation of parks throughout California, there will not be a measurable improvement in park facilities due to chronic underfunding. Additional parks bond measures, such as Proposition 84 in 2006, Proposition 12 in 2000, and Proposition 40 in 2002 are still needed. Unfortunately, Proposition 21, presented to California Voters in November of 2010 and intended to fund the current level of operations of State Parks based upon a premium to the vehicle license fee, was not supported by voters.

### *Investment Needed*

Investment to parks will need local dedicated funding if not state and federal sources. The estimated annual need to improve this infrastructure is \$50 million per year for five years.

### *Conclusion*

The Bay Area Parks are graded below average because of the need for additional funding.

## *Urban Stormwater and Flood Control*

### *Introduction*

The Bay Area has a land area of 4.4 million acres (excluding bay waters and large lakes). The major type of land use varies strongly by county, from completely urbanized San Francisco County to Napa County, which has only a few medium-sized towns and one small city. Contra Costa, Alameda, and Santa Clara Counties are all highly urbanized along the Bayshore, with varying degrees of development further inland. San Francisco County is by far the most urbanized county in the region with virtually all of its land characterized as urban in 2005.

### *Urban Stormwater*

In the wake of Hurricane Katrina, FEMA's perception of flood zones changed. As a result, mapping has changed and parcels within flood zones have increased, thereby encouraging homeowners to obtain flood insurance. Some local municipalities have been successful at implementing funding mechanisms. In Burlingame, the city added a special district to collect taxes to fund levee projects along the shoreline. However, in most cases, local populations are unwilling to invest in stormwater management. In other cases, municipalities have been able to impose taxes but increasing the taxes had been unsuccessful.

### *Flooding*

Awareness of the consequences of flooding has dramatically increased since Governor Schwarzenegger drew attention to the State's flood problem in January 2005. Since that time, Hurricane Katrina and the resulting flooding in New Orleans provided a vivid reminder of levee vulnerability and consequences of urban areas flooding. California's own flooding in 2006 was produced by storms with recurrence intervals of as little as five to ten years, emphasizing the fragile and deteriorating nature of our system. Emergency appropriations and the repair of critical levee erosion sites necessary before the winter of 2006 contributed to furthering public awareness of potential flooding.

The unprecedented funding through Propositions 1E and 84 in November 2006 demonstrated the public's willingness to invest in flood management. These propositions and other emergency appropriations (e.g. Assembly Bill 142) place California flood funding at an all time high. At the same time, the Administration has made it clear that the current funding is only a substantial down payment on flood improvements that will require additional public support for future bond measures.

The need for adequate flood management is more critical now than ever before. Over the years, major storms and flooding have taken many lives, caused significant property losses, and resulted in extensive damage to public infrastructure. However, a combination of recent factors has put public safety and the financial stability of the state government at risk. California's flood protection system, comprised of aging infrastructure with major design deficiencies, has been further weakened by deferred maintenance. Escalating development in floodplains has increased



the potential for flood damage to homes, businesses, and communities. Further, court decisions have resulted in greater state government liability for flood damages.

### *Flooding probabilities, location, and extent*

The Federal Emergency Management Agency (FEMA) has mapped flooding hazards in the Bay Area's low-lying areas. These flood hazard maps have built-in probability information for both the 100-year floodplain and the 500-year floodplain. In general, these maps are based on the updated and improved FEMA digital Flood Insurance Rate Maps (D-FIRMs). However, as of June 2010, only the older Q3 data were available for San Mateo County. D-FIRMs for San Mateo County are not expected to be released until September 2011.

Since the 2005 ASCE Bay Area Infrastructure Report Card, extensive flooding occurred in 2006 and 2008. Potential impacts of extensive flooding are detailed below:

- Of the 4.39 million acres of land in the Bay Area, 9.7 percent is in the 100-year flood zone, while only 3.5 percent is in the 500-year flood zone or areas of other flooding concern
- 6.4 percent of the urban land is in the 100-year flood zone versus 10.8 percent of the non-urban land
- 10.7 percent of the urban land is in the 500-year flood zone or area of other concern versus only 1.0 percent of the non-urban land. The fact that over ten times the percentage of urban versus non-urban land is in these areas is because lands protected from 100-year flooding zone are in these areas of "other flooding concerns"
- Types of existing urban land uses with the highest percentages in 100-year flood zones are mixed commercial-industrial complexes (18.5 percent), industrial (15 percent), and military use (12.2 percent)
- The percentage of urban land located in the 100-year flood zone ranged from a high of 11.5 percent in Solano County and 10.9 percent in Marin County to lows of 0 percent in San Francisco and 4.7 percent in San Mateo County

Flooding and exposure of existing infrastructure:

- Rail infrastructure is disproportionately located in 100-year flood zones with 15.9 percent of the miles of track located in these areas
- Pipelines, as underground lines, should not be impacted by flooding even though 3.7 percent of the miles of pipelines in the region are in these areas
- 9.7 percent of the transit lines are in these areas including 14.5 percent of ACE, 21 percent of Amtrak, two percent of BART, 6.5 percent of Caltrain, zero percent of SF MTA (MUNI), and 4.8 percent of the VTA lines. This statistic points to a need for further assessment on the part of transit operators.
- Of the 840 critical health care facilities in the Bay Area, 1.7 percent are in 100-year flood zones

- Of the 2,805 public schools in the Bay Area, 2.5 percent are in 100-year flood zones
- Of the 6,153 critical facilities owned by cities, counties, and other districts, 6.7 percent are in 100-year flood zones

### *Steps in the Right Direction:*

- **Greater Taxpayer Liabilities.** The legal decision in the November 2003 case, *Paterno vs. State of California*, found that when a public entity accepts a flood control system built by someone else, it accepts liability as if it had planned and built the system. The *Paterno* ruling held the State responsible for defects in a Yuba County levee foundation that existed when the levee was constructed by local agricultural interests in the 1930s.
- **Expanded Flood Programs.** After years of reduced budgets for state flood programs, substantial funding increases are now available for system repair and improvement, emergency response, and Delta levee programs.
- **Reminders from Hurricane Katrina.** Hurricane Katrina and the resulting flooding in New Orleans provided a vivid reminder of levee vulnerability and long-lasting consequences of flooding urban areas.
- **Federal Programs.** Since late 2005, the U.S. Army Corps of Engineers and the Federal Emergency Management Agency (FEMA) have cooperated to develop fully coordinated federal flood management programs and policies through the Interagency Flood Risk Management Committee. The resulting efforts, partly resulting from reviews of practices and policies in the aftermath of the flooding of New Orleans, are resulting in stricter standards for levee design, construction, operations, and maintenance – linked to floodplain mapping and stricter levee accreditation requirements under FEMA’s Map Modernization Program.
- **California Flooding 2006.** Many regions of California experienced dangerous and costly flooding in early 2006 from flood events that were neither powerful nor rare.
- **Critical Levee Repair.** In February 2006, Governor Schwarzenegger declared a State of Emergency for the California levee system, resulting in an expenditure of \$190 million to repair critically eroded levees.
- **Climate Change.** In July 2006, DWR released *Progress on Incorporating Climate Change into Management of California’s Water Resources* that highlights rising sea level, earlier spring snowmelt, and increasing flood peaks as conditions that will impact the flood management system.
- **Delta Investigations.** Several investigations including the Delta Risk Management Strategy identified the high risk of Delta levee failure and estimated that the risk will increase in the future.
- **Flood Management Reform Legislation.** In 2007, new flood bills were passed focusing on responsible floodplain land use planning, proactive cost sharing rules, shared responsibility for flood safety, and ensuring that adequate maintenance is performed.

- **Funding.** Emergency appropriations in May 2006 and ballot propositions in November 2006 provided over \$5 billion to enhance flood safety statewide – a record amount, but still far less than needed.

On November 14, 2008, Governor Schwarzenegger issued Executive Order S-13-08, directing state agencies to plan for sea level rise. In particular, the California Natural Resources Agency was directed to develop a statewide adaptation strategy. Since the Executive Order was issued, state CAT-funded sea level rise assessments have used 16 inches and 55 inches of sea level rise to analyze the statewide impacts.

### *Overall Urban Stormwater & Flood Control Grade*

The overall “D+” grade for Urban Stormwater and Flood Control reflects the vulnerability and lack of funding to address the infrastructure needs.

### *Investment Needed*

Investment in Urban Stormwater and Flood Control will require local dedicated funding, if not state and federal sources. The estimated annual need to improve this infrastructure is \$100 million.

### *Conclusion*

The Bay Area Urban Stormwater and Flood Control Systems are graded below average because of the need for additional funding.

## *Water*

### *Introduction*

As a follow up to the 2005 Bay Area Infrastructure Report Card, ASCE conducted a five year update to the Report Card. A Water Systems Subcommittee was formed and charged with developing an updated report on the Bay Area's water infrastructure. The committee contacted Bay Area water providers to solicit self-assessments of the current status of the Bay Area's water infrastructure. The following sections describe the background, the process used to collect new data, and the conclusions for the current status and outlook for Bay Area water systems.

### *Background*

In 2005, 125 surveys were mailed to water providers in the nine-county Bay Area. The response represented agencies serving over 80 percent of the Bay Area's population and was considered significant enough to support Bay Area-wide conclusions about the status of the water infrastructure. The Delta is not covered in this report card and is discussed in the Sacramento Section's report card. The 2005 survey considered four major groupings: Condition, Capacity, Deferred Maintenance, and Security and Safety. Using statistical and weighted measures for each of the major groupings, the responses were collated and evaluated. It was determined in 2005 that the Bay Area grade for water was a "C-".

In 2010, a new committee was formed to update the current status with a particular focus on understanding what has changed in the past five years, what the current challenges are, and what the future may hold.

The process was to email a questionnaire to water providers in the nine-county Bay Area to request self-assessment by the providers. The responses are from the major Bay Area retailers and reflect approximately 30 percent of the Bay Area's current population which included most of the larger purveyors. The questionnaire asked each respondent to grade their system overall, identify key items that have changed in the past five years, identify levels of funding needed to get the grade up to a "B" level if applicable, and the outlook for the next five years.

### *Current Status of Water Infrastructure*

Using responses gathered from emailed questionnaires, the overall grade for the Bay Area Water System Infrastructure is a "B-" for 2011. The improvement in the grade is mainly due to significant (multi-billion dollar) investments and progress by several large agencies in capital improvement programs. Those agencies that have made the investments increased their overall grade by a full letter grade or more. However, many agencies either have not identified their needed improvements or have not secured the funding for major improvements and their grade has not improved.

Most respondents who were not at a “B” grade cited funding as their concern. In the past five years, the Bay Area has had drought conditions and experienced a significant economic downturn. Larger agencies with larger Capital Improvement Programs (CIPs) were forced to adjust some of the priorities in order to keep within available budgets. Smaller agencies were struggling to meet basic regulatory and service needs in light of the economic downturn.

### *Outlook and Future Expectations*

In past years, projections for growth were the primary driver for water system planning. In current times, the growth has been significantly reduced and water usage has stabilized. Additional interest and actions taken for increased water conservation have also reduced the demand for new supplies, but there still is a need to stabilize the long-term water supply for the Bay Area. Advances in trenchless replacement of retailer distribution pipe are reducing the cost of pipe replacement and upgrades by water retailers and increasing the life of these systems to greater than 100 years. Added emphasis by agencies on cathodically protecting and maintaining coatings on large diameter pipelines and underground infrastructure is also further extending the life of these assets. The respondents mentioned various issues that are of concern for the future, including the following (in no particular order):

- Water supply, particularly in light of the debate about the reliability of water supplies derived from the Sacramento-San Joaquin River Delta region and tributary rivers
- Seismic vulnerability (dams, reservoirs, pipelines, pump stations, levees, etc.)
- Environmental (diversions) for aquatic ecosystems
- Climate change (potentially reducing the Sierra snowpack)
- Economic slow-down (and its trickle-down effect on water providers)
- Regulatory requirements (agencies cite additional requirements and increasing cost for meeting existing requirements)

There is also tension between the statewide objective of 20 percent conservation by 2020 and reduced overall water sales revenue. Currently, water demand following the end of mandatory and voluntary water use restrictions (due to the drought) have not rebounded to pre-drought levels, further affecting revenue. Public agencies and private water companies are more constrained in raising rates due to the economic downturn. The good news is that water providers across the Bay Area are focusing on maximizing operational efficiency by embracing infrastructure asset management, master planning, and carefully scrutinizing all capital improvements. The biggest challenge for the foreseeable future is securing the political will to support increased water rates to fund needed infrastructure improvements.

### *Investment Needed*

Investment in water will need to increase local dedicated funding, if not state and federal sources. While larger agencies have larger revenue programs and asset management programs to maintain their systems, smaller agencies need assessment and additional funding. Water infrastructure is faced with the challenge to comply with unfunded state and federal mandates. The estimated annual need to improve this infrastructure is \$20 million.

### *Conclusion*

The Bay Area Water System is graded slightly above average.

## *Wastewater*

### *Introduction*

As a follow up to the 2005 Bay Area Infrastructure Report Card, ASCE conducted a five year update to the Report Card. A Wastewater Systems Subcommittee was formed and charged with developing an updated report on the Bay Area's water infrastructure. The committee contacted Bay Area wastewater providers to solicit self-assessments of the current status of the Bay Area's wastewater infrastructure. The following sections describe the background, the process used to collect new data, and the conclusions for the current status and outlook for Bay Area wastewater systems.

### *Background*

In 2005, 104 surveys were mailed and 28 were returned. It was determined in 2005 that the Bay Area grade for Wastewater was an "A-". In 2010, a new committee was formed and the focus is on updating the current status with particular focus on understanding what has changed in the past five years, what the current challenges are, and what the future may hold.

The process in 2010 included review of the responses from the 2005 effort, updating the list of contacts, distributing 55 self-assessment surveys, and review of responses received. The responses are from several Bay Area wastewater agencies and reflect approximately 15 percent of the Bay Area's current population including some of the larger agencies. The questionnaire asked each respondent to grade their system overall, identify key items that have changed in the past five years, identify levels of funding needed to maintain a grade "B" level, and the outlook for the next five years.

### *Current Status of Wastewater Infrastructure*

Using responses gathered from emailed questionnaires, the overall grade for the Bay Area Wastewater System Infrastructure is a "C+" for 2011. The degradation in the grade is mainly due to the respondent agencies being more conservative of their estimated performance these last few years. While some agencies feel their treatment has improved, they also feel that their collection systems have declined, or vice versa, which produced an average grade of "C" or better. However, in the last five years, significant (multi-billion dollar) investments and progress have been made by the agencies (small and large) in capital improvement programs. Those agencies that have made the investments increased their overall grade by a full letter grade or more. Yet, because of the lack of response to the questionnaires, a good majority of the Bay Area Wastewater Agencies have not identified accomplished goals, future improvements, or budgets.

In the past five years, the Bay Area wastewater agencies have identified major CIP projects and pushed forward with certain projects. For example, agencies have targeted infiltration and/or inflow (I/I) issues including performing CCTV inspections to assess the existing collection systems and identify major pipeline structural issues. Thereby identifying and executing major

rehabilitation and replacement projects which have resulted in far less sanitary sewer overflows (SSOs). They have also worked towards complete wet weather overflow elimination. Agencies have evaluated their offices and treatment plants for seismic safety which has resulted in significant seismic retrofitting. Treatment plants have undergone major upgrades to meet the projected population needs. Agencies continue to perform spot repairs and pipeline replacements.

This level of improvements agrees with the “C+” grade earned. It is likely that only in these last two years, larger agencies with larger CIPs were forced to adjust some of the priorities in order to keep within the available budgets. Smaller agencies were struggling to meet basic regulatory and service needs in light of the economic downturn. The courts have recently directed several communities in the East Bay to dramatically reduce their sewage overflow into the San Francisco Bay.

### *Outlook and Future Expectations*

In past years, projections for growth, aging infrastructure, and SSO regulations were the primary drivers for wastewater system planning. In current times, the growth has been significantly reduced and wastewater usage has stabilized. However, these last five years have not corrected all the issues. One respondent noted that the current system, despite the improvements undertaken, is as leaky as it was five years ago. While certain problems have been corrected, others have appeared which cannot be so easily funded and therefore corrected.

In the coming years, agencies face impending stricter regulations regarding SSOs (i.e., less than two SSOs/100 miles of pipe versus six SSOs/100 miles), greenhouse gas emissions, ammonia removal, nutrient removal, and incinerator emission limits. At the same time, agencies have noted a disconnect between the environmental regulations and what is feasible in this economy.

Agencies want more staff to handle the work but funds are low all around. Public agencies and private water companies are more constrained in raising rates due to the economic downturn and a significant slowdown in development, which in the past had yielded significant funding through connection fees. The good news is that wastewater providers across the Bay Area are focusing on maximizing operational efficiency by embracing infrastructure asset management and master planning and carefully scrutinizing all capital improvements. The biggest challenge is securing the political will to support increased wastewater rates to fund needed infrastructure improvements and to identify new funding sources elsewhere.

### *Investment Needed*

Investment in wastewater will require local dedicated funding, if not state and federal sources. Like water infrastructure, larger agencies have larger revenue programs and asset management programs to maintain their systems, smaller agencies need assessment and additional funding. Wastewater infrastructure is also faced with the challenge to comply with unfunded state and federal mandates. The estimated need to improve this infrastructure is \$80 million per year.



## *Conclusion*

Since 2005, the Bay Area Wastewater System grade decreased to average. The number of sewage overflows into the bay has dramatically increased since 2005. The sanitary sewer districts are under much more pressure to reduce overflows into the bay.

## *What You Can Do*

This guide offers solid proof that much more needs to be done to ensure adequate infrastructure for our region. It is now up to concerned citizens like you, who understand the economic and quality of life benefits of a healthy infrastructure, to push for action.

You have seen the big picture of what's happening in the Bay Area. Here are some steps you can take help sustain and improve our infrastructure:

- Learn all you can about the infrastructure problems in your area.
- Contact the California Department of Transportation, your county and city governments, and other sources to learn about plans for ensuring adequate roads, sewers, parks, and water systems.
- Work to help pass local ballot initiatives to repair, replace, and expand your roads, parks, water systems, and other infrastructure.
- Express your concern to public officials, such as city managers, council members, and supervisors. Ask them how they plan to solve infrastructure problems. Urge your neighbors to support your cause.
- Regularly attend meetings held in your community about pressing infrastructure problems.
- When you see a problem, find out what level of government has jurisdiction over it. Sometimes various levels of government deal with different aspects of the same problem.
- Search the Internet. Agencies at all levels of government now have websites that list laws and regulations pertaining to your issue of concern. These websites can be a helpful link to other government and advocacy group resources. If you know of an interest group that deals with the area you're interested in, visit its site.
- Ask business groups, such as your Chamber of Commerce, to examine the infrastructure in your community and its effect on local businesses, employment, and the economy.
- Write letters to the editor of your newspaper, your state representatives, and members of Congress, expressing your concerns and opinions on infrastructure.
- Organize or volunteer for citizen advisory committees dealing with your community's infrastructure issues.
- Support local, state, and federal officials who understand and are committed to infrastructure preservation. Ask them to make infrastructure an election issue, just as they would education, crime, or health care.
- Talk to civil engineers in your area about solutions and needs.

## *About the American Society of Civil Engineers (ASCE)*

The American Society of Civil Engineers enhances the welfare of humanity by advancing the science and profession of engineering. The Society offers continuing education courses and technical specialty conferences; develops technical codes and standards for safer buildings, water systems, and other civil engineering works; publishes technical and professional journals, manuals, and a variety of books; works closely with Congress, the White House, and federal agencies to build sound national policy on infrastructure and engineering issues; and supports research of new civil engineering technology and materials.

Founded in 1852, ASCE has more than 125,000 members worldwide and is America's oldest national engineering society. The Society recently celebrated its 150th anniversary.

The San Francisco Section of the ASCE was formed in 1905 and recently celebrated its 100th year. Covering the nine Bay Area counties and including a Young Member Forum, the Section provides a wide range of activities and opportunities for developing leaders. Regular meetings of Section members are held and technical groups have been formed to serve the needs and interests of members in specialized fields of engineering. The Section provides career guidance and scholarships at the pre-college level, and curriculum and career selection assistance to civil engineering students. Information on Section activities is available at: [www.asce-sf.org](http://www.asce-sf.org).

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