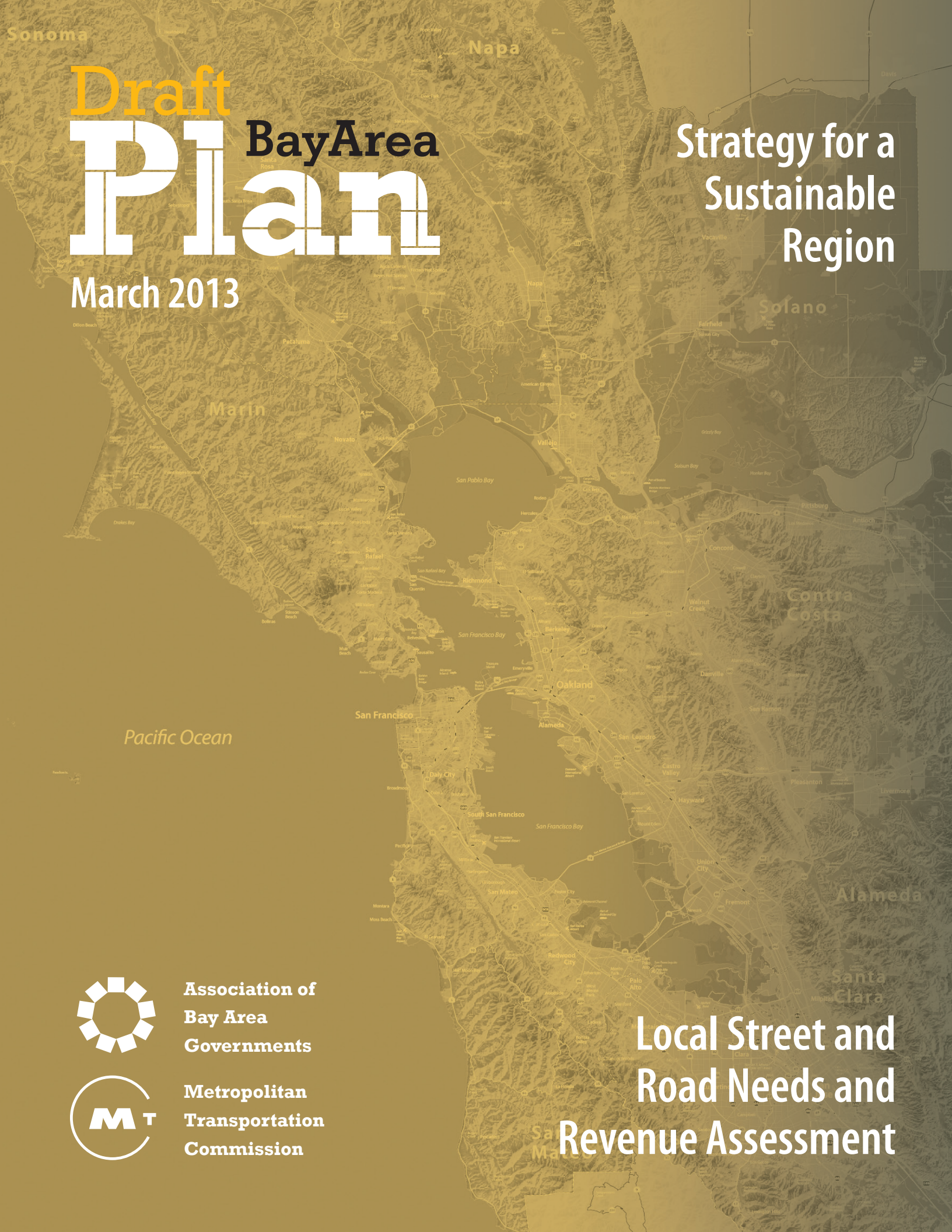
Draft Plan BayArea

Strategy for a Sustainable Region

March 2013



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Local Street and Road Needs and Revenue Assessment

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LOCAL STREETS AND ROADS NEEDS AND REVENUE ASSESSMENT

The Bay Area's local street and road (LS&R) network includes nearly 42,500 lane miles of roadway, and includes a lot more than just the paved surfaces used for travel by cars, buses, trucks and bicycles. The LS&R system also includes curbs and gutters, sidewalks, storm drains, traffic signs, signals and lights. These "non-pavement" items are necessary for functioning street and road network. All trips begin and end on a local street and road and all modes of surface travel rely on the local street and road infrastructure.

The average condition of the Bay Area's LS&R network, rated on a scale of 0 to 100, is currently at 66. This pavement condition index (PCI) places the region's roadway network in the "fair" category. The classifications used to rate LS&R pavements are shown in the table below.

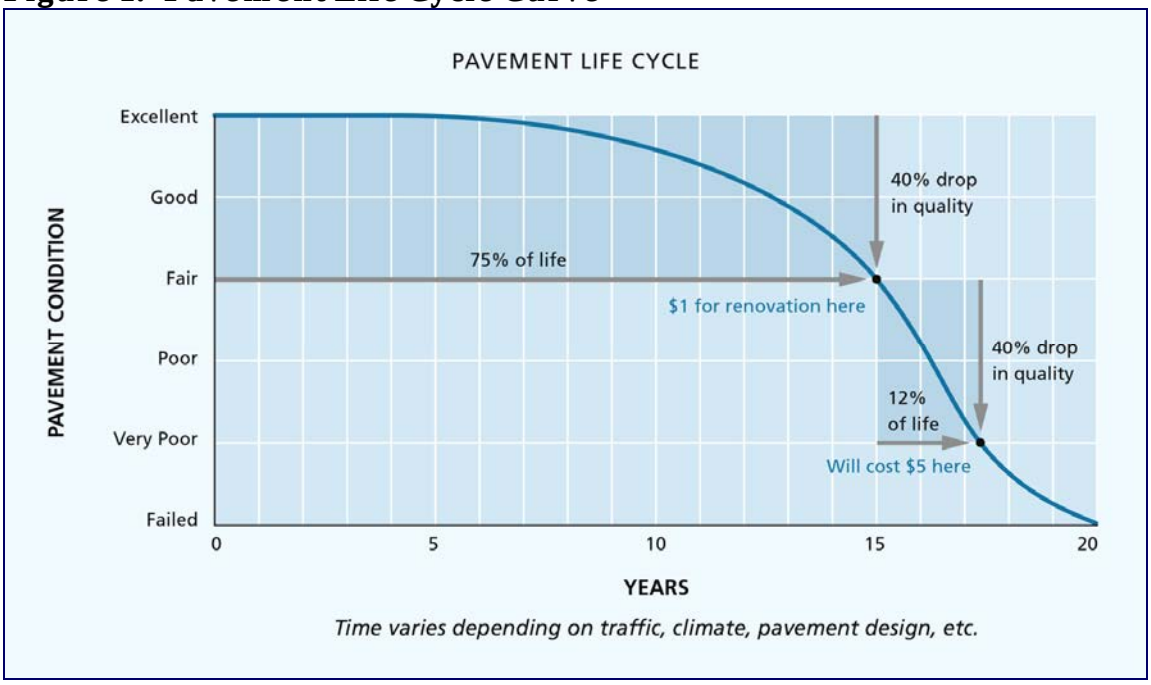
Table1: Pavement Condition Categories

Very Good-Excellent (PCI = 80-100)	Pavements are newly constructed or resurfaced and have few if any signs of distress
Good (PCI = 70-79)	Pavements require mostly preventive maintenance and have only low levels of distress, such as minor cracks or spalling, which occurs when the top layer of asphalt begins to peel or flake off as a result of water permeation.
Fair (PCI = 60-60)	Pavements at the low end of this range have significant levels of distress and may require a combination of rehabilitation and preventive maintenance to keep them from deteriorating rapidly.
At Risk (PCI = 50-59)	Pavements are deteriorated and require immediate attention including rehabilitative work. Ride quality is significantly inferior to better pavement categories.
Poor (PCI = 25-49)	Pavements have extensive amounts of distress and require major rehabilitation or reconstruction. Pavements in this category affect the speed and flow of traffic significantly.
Failed (PCI = 0-24)	Pavements need reconstruction and are extremely rough and difficult to drive on.

While the region's average pavement condition is still in the fair category, it is important to note that the deterioration curve of a typical pavement is exponential, and not linear. As shown in Figure 1 below, a new pavement will deteriorate slowly for the first 15 years of its standard 20 year life span. Once it reaches a PCI of 60, it will begin to deteriorate rapidly. Without any intervention, the pavement will drop from the fair category to the

"failed" category in the next five years. This deterioration holds serious implications for the cost of system preservation. Pavements that are still in good condition (a PCI of 70 or above) can be preventively maintained at a low cost, whereas pavements that need significant rehabilitation or reconstruction require five to 15 times the amount of funding.

Figure 1: Pavement Life Cycle Curve



Unfortunately, local and state revenues available for system preservation have not kept pace with the needs. In response, Plan Bay Area provides regional funding through the One Bay Area Grant (OBAG) program to help meet some of the LS&R system preservation needs in the region. Within OBAG, sufficient funding is provided to help the region maintain pavement quality in the fair condition.

LOCAL STREET AND ROAD PROJECTIONS

The Metropolitan Transportation Commission (MTC) has been documenting LS&R system preservation needs and revenues for cities and counties in the Bay Area since the early 1980s in order to understand the complete funding picture for LS&R. The following sections describes the projection process that was undertaken to determine the LS&R system preservation needs and revenues for Plan Bay Area and the resulting estimates.

Needs

For Plan Bay Area, MTC staff evaluated how much funding will be needed to preserve the LS&R system over the 28-year plan period (Fiscal Years 2013 to 2040). System

preservation consists of activities that extend the useful life of the roadway asset by five or more years. This category can be further broken down into preservation for pavements and non-pavement assets (sidewalks, storm drains, traffic signals, curb and gutter, etc.). It is important to note that system preservation needs do not include the cost of "operations" which consist of routine maintenance such as pothole filling, street sweeping and striping, as well as overhead expenses. Operations costs were calculated separately and total $14 billion for the region.

The system preservation needs were calculated for two different "condition level" scenarios in order to better inform future trade-off discussions related to Plan Bay Area.

1.) **Maintain Existing PCI** – Local jurisdictions maintain the existing pavement condition index (PCI) but deferred maintenance costs are allowed to grow.

2.) **State of Good Repair** – The LS&R system reaches the target condition level, a PCI of 75, within the first ten years and is maintained at that level for the duration of the Plan period

To maintain existing PCI conditions, approximately $32.5 billion is needed, and to reach the target PCI of 75 for pavement, with a corresponding condition level for non-pavement assets, an investment of nearly $45 billion is needed over the next 28 years.

In November, 2010, MTC staff surveyed all 109 local jurisdictions for information on pavement treatment unit costs, non-pavement asset inventories and revenues available for LS&R capital maintenance and operation activities. Survey information, combined with condition, inventory and cost data derived from jurisdiction's StreetSaver® pavement management system databases, is used to calculate the long-range LS&R needs and revenues.

<u>Pavement Need</u>

Maintain Current PCI Scenario:

For this scenario, staff utilized MTC's pavement management system software, StreetSaver®'s, "Target-PCI Driven" module to determine the needs over the 28-year plan period. With the Target-Driven scenario calculation, the pavement network is maintained at the desired state (in this case the current/existing PCI for each jurisdiction) at the minimum cost, while identifying the best combination of projects to maximize treatment effectiveness. The timing of applying treatments makes a significant difference in future investment needs. Each jurisdiction's target PCI was set to remain at the current level over the 28-year plan period. The costs were escalated at a 2.2% annual growth rate, consistent with the inflation rate that is assumed for Plan Bay Area. The 28-year total pavement need for each jurisdiction was then summed at the county level.

State of Good Repair Scenario:

The optimal scenario represents the cost of attaining the regional goal of a PCI of 75. To calculate this need, StreetSaver® was used to determine how much funding would be needed for each jurisdiction to reach a PCI of 75 within the first ten years of the analysis

period, and then to maintain that PCI level for the duration of the 28 years. Maintenance costs were escalated at a 2.2% annual growth rate.

Non-Pavement Need

To estimate the Non-Pavement needs on the LS&R system, MTC used a model prediction model that uses information provided by local jurisdictions on non-pavement asset inventory and useful life to estimate long term costs to maintain non-pavement assets. Through the development of the model, it was determined that replacement costs can be predicted by the inventory of two non-pavement assets - curb and gutter and streetlights. The total regional non-pavement asset replacement cost is then divided by the average useful life for each of the major non-pavement asset groups – storm drains, sidewalks, curb & gutter, street signs and street lights – in order to estimate an annual preservation cost. The regional totals are then divided into city non-pavement need and county non-pavement need. The city need is distributed across all jurisdictions based on relative population share and the county need is distributed across the unincorporated jurisdictions based on total lane mileage. San Francisco was considered as a city only.

Since the model only provides a total non-pavement need under an "unconstrained" scenario (assumes there are revenues available to meet required needs and deferred maintenance is not a factor) a ratio of unconstrained pavement to non-pavement need was calculated, by jurisdiction, and applied to the pavement need in both scenarios in order to estimate the corresponding non-pavement needs for each.

Revenues

Information derived from a recent survey of all Bay Area jurisdictions was used to determine revenues for LS&R maintenance derived from local and county sources, as well as to determine the categorical split—pavement maintenance, non-pavement, operations and new construction—by which each jurisdiction expends revenues available for LS&R maintenance. While all revenues available for LS&R maintenance and operations were estimated, only revenues available for pavement and non-pavement system preservation were used in this assessment. Revenues estimated to be used for operations and new construction, were not considered.

For the local and county generated revenue sources, an annual average was determined based on five years worth of each jurisdiction's budget data. In order to generate the annual average, only the values within one standard deviation were taken into account. This helps to eliminate any one-time spikes or severe reductions in funding. The annual average was then grown over the 28-year period. The growth rate used for locally generated revenue was 2.2% (based on the assumed inflation rate for Plan Bay Area) and the growth rate used for countywide sales tax measure revenue was based on information provided by the county sales tax authorities.

Projections of revenue for county vehicle registration fees, state gas tax subvention and AB 105 were prepared by MTC. The nominal growth rate for gas tax revenue averages about -0.2% annually, and for AB 105 funding, about 5% annually.

Assessment Results

As mentioned above, in order to maintain the LS&R System in a state of good repair, about $45 billion is needed over the 28-year Plan Bay Area period. Committed revenue available to meet that need over the same period, is approximately $15 billion. To maintain the region's *pavements* at current conditions (not including non-pavement assets), approximately $10 billion is needed in addition to committed revenues. Within the Plan Bay Area investment strategy, sufficient funding has been made available through the OBAG program to maintain the region's current PCI. The Investment Strategy distribution shown in Table 2 below is based on the OBAG distribution formula. It should be noted that within the OBAG program, each county's Congestion Management Agency has discretion over the total funding amounts directed towards OBAG eligible projects. The amounts invested in LS&R system preservation may be more or less than the amounts depicted in Table 2.

Table 2: Local Street and Road Needs and Revenues

Jurisidiction	Pavement Needs	Non- Pavement Needs	Total System Preservation Needs	Committed Revenue	Plan Bay Area Investment Strategy*	Remaining System Preservation Needs to Meet Performance Target
Alameda	$ 3,715,245	$ 4,082,437	$ 7,797,682	$ 2,147,587	$ 1,477,014	$ 4,173,081
Contra Costa	$ 3,111,346	$ 2,674,212	$ 5,785,558	$ 2,914,794	$ 1,078,936	$ 1,791,829
Marin	$ 864,832	$ 641,477	$ 1,506,309	$ 654,672	$ 332,981	$ 523,087
Napa	$ 1,087,116	$ 428,822	$ 1,515,938	$ 704,995	$ 457,632	$ 368,422
San Francisco	$ 2,415,717	$ 2,362,721	$ 4,778,438	$ 2,298,843	$ 487,602	$ 1,991,992
San Mateo	$ 1,929,281	$ 1,983,937	$ 3,913,217	$ 1,440,204	$ 919,297	$ 1,607,188
Santa Clara	$ 5,776,128	$ 5,117,758	$ 10,893,886	$ 3,373,599	$ 2,838,700	$ 4,695,585
Solano	$ 1,906,084	$ 1,288,751	$ 3,194,835	$ 487,841	$ 998,578	$ 1,708,415
Sonoma	$ 3,698,515	$ 1,319,208	$ 5,017,723	$ 994,268	$ 1,349,131	$ 2,674,323
REGION	**$ 24,504,263**	**$ 19,899,322**	**$ 44,403,585**	**$ 15,016,804**	**$ 9,939,872**	**$ 19,533,922**

Bicycle Infrastructure Need

In addition to pavement and non-pavement, the local street and road system also includes bicycle facilities. Bicycle facilities can consist of both on-road striped lanes and grade separated trails. The bicycle infrastructure needs were estimated at the regional level and are therefore not included in the table above.

The bicycle infrastructure need was estimated by using the current inventory of Class I, II and III facilities defined by the California Highway Design Manual with an assumption that growth of these facilities would occur in the future. The Bay Area currently has 700 miles of Class I facilities, over 2,000 miles of Class II facilities, and over 1,300 miles of Class III facilities. Costs for these three facility types were estimated using the total cost which included the project development costs, right-of-way acquisition and constructions costs. MTC's Regional Bikeway Network was also included in the total bicycle infrastructure needs at a cost of $500 million. The costs were escalated with a 2.2% annual growth rate to the mid-year of the 28 year plan period. The growth of the network of bicycle facilities was estimated at a 50% increase over the base year for a total need of $4.5 billion for Plan Bay Area. Pedestrian infrastructure needs were not estimated since it was assumed that these costs would be included in the non-pavement needs.

Local Bridge Needs and Revenue Assessment

Another component of the Bay Area's local street and road system is the over two thousand bridges that span 20 or more feet. Local bridges are an integral part of the transportation system. While relatively rare, local bridge failures can have significant consequences. Aside from the threat to public safety, many local bridges are the only access to homes and communities, and a failure can result in lengthy detours and economic losses.

The local bridge needs estimate for Plan Bay Area utilized the Caltrans bridge management system, Pontis, to assess and forecast the health and preservation needs of the local bridges over the 28-year Plan Bay Area period. Pontis is designed to analyze bridge data to predict future bridge conditions and needs, determine optimal policies, and recommend projects and schedules within budget and policy limitations. For this update, MTC staff trended the needs derived from a 2008 analysis to reach the 2011 base year and then escalated the costs over 28 years at the rate of 2.2 percent.

The estimate of revenues available to meet the system preservation needs consist of federal Highway Bridge Program (HBP) funds in addition to local match as well as a small amount of Proposition 1B funds for seismic retrofitting. Since HBP program funds are competitive and at the state's discretion to allocate, revenue estimates were developed based on historic shares of funding received in the region. The revenue was then distributed among the counties according to the prioritization recommendations from the Pontis bridge model. Other assumptions include allocating a 50-50 share of HBP funding between local and transit/state bridges in the region.

As seen in the table below, the estimated need for local bridge maintenance over the Paln Bay Area time frame is $2.4 billion. Approximately $1 billion in revenue was identified over the same time period, leaving a remaining need of $1.4 billion.

Table 3: Comparison of Local Bridge Funding Need by County (In Millions)

County	Needs	Revenue	Additional Funding Need
Alameda	$295	$186	$109
Contra Costa	$326	$93	$232
Marin	$122	$9	$113
Napa	$149	$105	$44
San Francisco	$276	$99	$177
San Mateo	$206	$118	$89
Santa Clara	$587	$239	$348
Solano	$190	$61	$129
Sonoma	$278	$115	$162
TOTAL	**$2,430**	**$1,026**	**$1,404**

Note: Only non-transit local bridges were included in the financial analysis above.

Local Bridge Sufficiency Rating and Health Index

Sufficiency rating (SR) is the standard measure used to evaluate whether a bridge is sufficient to remain in service. The SR ranges from zero to 100 where,

- Zero is entirely insufficient;
- Sixty to 80 is the acceptable range of sufficiency; and
- Greater than 80 is sufficient.

For Federal Highway Bridge Program (HBP) funding eligibility, bridges must be rated Structurally Deficient (SD) or Functionally Obsolete (FO) with the SR less than or equal to 80 to be eligible candidates for rehabilitation. Bridges must be rated SD or FO with the SR < 50 to be eligible candidates for replacement (See 23 CFR 650.409 for details).

The 2010 average SR for the Bay Area is 78.4, down from 80.7 in 2008. The average age for the Bay Area local bridges is 51 years. Table 4 represents the average SR, age of structures by county. Local bridges exclude transit bridges.

Table 4: 2010 Bridge Condition by County

County	# of Bridges	Avg Age (Yr)	Avg Sufficiency Rating	Structures with SR >80	Structures with SR <=80	Structures with SR <50	No SR data
Alameda	225	46	83.2	129	64	9	23
Contra Costa	345	45	82.8	197	76	16	56
Marin	118	59	77.0	56	45	11	6
Napa	104	63	73.0	49	38	17	0
San Francisco	61	60	64.6	15	18	5	23
San Mateo	133	52	79.0	69	45	10	9
Santa Clara	531	47	79.1	310	140	51	30
Solano	194	40	87.4	144	37	6	7
Sonoma	425	49	79.1	246	135	42	2
Average		51	78.4				
Total	2,136			1,215	598	167	156
%				57%	28%	8%	7%

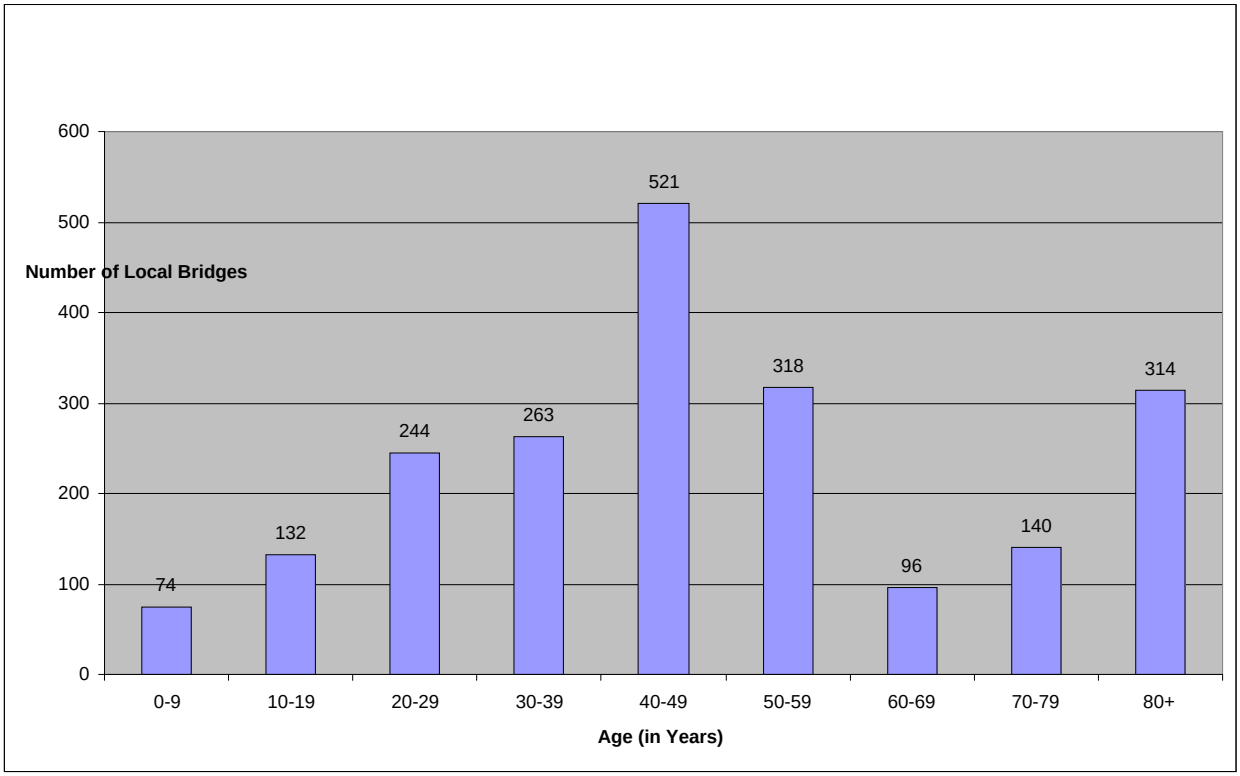
As shown, counties with older bridges tend to have a lower sufficiency rating, while young jurisdictions tend to have higher SR.

Another common measure for demonstrating bridge performance over time is the bridge health index (BHI) developed by Caltrans. The BHI measures the condition of each element on a structure, with a range of zero to 100, with 100 representing the best

condition. In 2008 assessment, the BHI for the region then was 91. Based on projected needs and available funding, the BHI will drop to 77 by 2038.

Figure 1 represents the age distribution of the local bridges in the Bay Area. As shown, the local bridges are aging – more than 75 percent of the structures are 30 years or older. Over 40 percent of the structures are 50 years or older and 15 percent are over 80 years old.

Figure 2: Age Distribution of Local Bridges



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