Metropolitan Transportation Commission
Policy Advisory Council

December 11, 2019 **Agenda Item 7**

Plan Bay Area 2050: Draft Needs and Revenue Assessments for Transportation, Affordable Housing and Resilience

Subject: Overview of the draft financial needs associated with transportation, affordable housing, and resilience for Plan Bay Area 2050, the next-generation regional plan.

Background: Policy Advisory Council Agenda Item 7, Plan Bay Area 2050: Draft Needs and Revenue Assessments for Transportation, Affordable Housing and Resilience is attached. This report will be presented to the Joint MTC Planning Committee with the ABAG Administrative Committee on December 13, 2019.

Staff will be at your December 11 meeting to discuss this report. The Council's input is requested.

Attachments: Agenda Item 5b from the December 13, 2019 Joint MTC Planning Committee with the ABAG Administrative Committee

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Metropolitan Transportation Commission and the Association of Bay Area Governments

MTC Planning Committee and ABAG Administrative Committee

December 13, 2019 **Agenda Item 5b**

Plan Bay Area 2050: Draft Needs and Revenue Assessments for Transportation, Affordable Housing and Resilience

Subject: Overview of the draft financial needs associated with transportation, affordable housing, and resilience for Plan Bay Area 2050, the next-generation regional plan.

Background: As MTC and ABAG work to develop a more comprehensive regional plan, it is important to consider the financial needs and revenues for a broader array of issue areas. Building upon the successful work from prior iterations of Plan Bay Area, Plan Bay Area 2050 will include needs and revenue estimates for the traditional suite of transportation operations and maintenance (O&M), as well as equally critical needs for affordable housing and resilience.

Needs and revenue assessments have proven valuable in prior cycles of Plan Bay Area as they have identified what it would take to fully fund fundamental issue areas like roadway maintenance, as well as the reasonably anticipated funding that could fill those gaps. Draft needs assessments, as well as associated revenue forecasts, between 2021 and 2050 have been developed in consultation with stakeholders over the summer and fall. Additional information on each assessment can be found in the attachments to this memo.

Findings of the draft needs assessments are also summarized below, with all costs shown in year-of-expenditure (YOE) dollars for state of good repair:

Category	Anticipated Revenue	Anticipated Needs
Public Transit Operations	\$472 billion *or* \$544 billion (with optional new revenues)	\$218 billion
Public Transit State of Good Repair		\$88 billion
Roads*, Bridges, and Highways		\$117 billion
Affordable Housing	\$107 billion	\$473 billion
Resilience: Sea Level Rise	\$2 billion	\$20 billion
Resilience: Earthquake	< \$1 billion	\$17 billion (for residential units only)

Next Steps: Staff will continue to seek feedback from stakeholders and technical experts on each of the needs and revenue assessments through early 2020, before incorporating them into the Draft Blueprint for Plan Bay Area 2050 this winter.

Attachments:
Attachment A: Draft Transportation Needs Assessments
Attachment B: Draft Affordable Housing Needs Assessment
Attachment C: Draft Resilience Needs Assessments
Attachment D: Draft Transportation Revenue Forecast
- *Appendix 1 – Plan Bay Area 2050 Draft Revenue Forecast by Source*

Attachment E: Draft Affordable Housing Revenue Forecast
Attachment F: Draft Resilience Revenue Forecast
Attachment G: Presentation

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* includes on-system bicycle and pedestrian infrastructure but not dedicated off-system bicycle/pedestrian paths.

Draft Transportation Needs Assessments

Plan Bay Area 2050, the next-generation plan for transportation, housing, the economy, and the environment, will span 30 years from fiscal years 2021 through 2050. Plan Bay Area 2050 must meet or exceed federal and state requirements, including requirements related to fiscal constraint. This requires the estimation of costs and available revenues for the operation and preservation (capital maintenance) of the existing transportation system. The information presented below is a preliminary draft estimate of the region's transportation operations and preservation needs over the lifespan of the Plan. This information is being provided for your review in advance of being presented to the MTC/ABAG boards in December.

For the Local Streets and Roads and Transit Capital categories, the system preservation needs were calculated for two different "condition levels":

1. **Maintain Existing Conditions**
    - Local jurisdictions maintain the existing pavement condition index (PCI) and deferred maintenance costs are held relatively stable but continue to grow at the rate of inflation
    - Transit operators maintain the existing percentage of capital assets over useful life (PAOUL). The total backlog dollar maintains the present-day replacement cost value of all assets beyond their useful life, adjusting for inflation.

2. **State of Good Repair (SGR)**
    - Pavement conditions reach a "best management practices" level within the first ten years of the analysis period, and then maintain that level for the duration of the Plan period. A best management practices condition level equates roughly to a low-to-mid 80s pavement condition index (PCI). Deferred maintenance is eliminated.
    - All transit capital assets are replaced and rehabilitated within the first ten years of the analysis period--to 0% percent of assets over useful life (PAOUL)-- and then maintained at that level for the duration of the Plan period. all assets are replaced when they reach the end of their useful lives and existing assets that are in marginal or poor condition (TERM Lite Score 2 or 1) are replaced in the first decade.

Only one condition level was calculated for local bridges, state highways, and regional bridge capital maintenance and operations due to limited data availability and/or modeling capability. For transit operations, the only condition level calculated was the cost to maintain existing service levels, since expanded service levels would be proposed as part of the Plan's project submittal process.

Table 1 below shows the total transportation operations and preservation needs calculated for Plan Bay Area 2050. Results by mode and methodologies used to estimate the needs are contained in subsequent pages of this attachment.

Table 1. Plan Bay Area 2050 Draft Transportation Operation and System Preservation Needs (in millions of $YOE)

Mode	State of Good Repair	Maintain Conditions
Local Streets, Roads, and bicycle/pedestrian infrastructure	$68,395	$61,859
State Highways[2]	$24,427	$24,427
Local Bridges[2]	$2,554	$2,554
Regional Bridges[2,3]	$19,415	$19,415
Transit Capital	$84,561	$59,385
Transit Operating[4]	$217,819	$217,819
Total	$417,171	$385,460

Notes:

1) Includes $20.5 billion in operations costs/needs.
2) Needs associated with maintaining existing condition levels is not available for the state highway system or bridges.
3) The regional bridge category does not include the Golden Gate Bridge.
4) The transit operating needs assessment only considers what is needed to maintain existing service levels, therefore the transit operating needs are the same for both State of Good Repair and Maintain Conditions.

Local Streets and Roads

As shown in Table 2 below, to maintain existing conditions on the region's 43,500 lane miles of local streets, roads, and on-system bicycle/pedestrian, and other non-pavement infrastructure, approximately $41 billion is needed over the Plan period. To reach a state of good repair, with a corresponding condition level for non-pavement assets (signs, signals, sidewalks, storm drains, etc.), an investment of $48 billion is needed over the next 30 years. These costs do not include the estimated $20.5 billion in operations cost and overhead that will be needed to perform routine maintenance, pothole filling, street sweeping, and other requirements that keep local streets and roads serviceable.

For comparison, on *an annualized basis* (as each iteration of Plan Bay Area has a different number of years included within the planning horizon), the draft Plan Bay Area 2050 preservation needs for local streets and roads are approximately six percent higher than those estimated for Plan Bay Area 2040 (the current Plan). The increase in maintenance need is largely due to higher costs for maintenance materials and contract labor resulting from a strong economy and market competition.

Table 2. System Preservation Draft Needs for Local Streets, Roads, and bicycle/pedestrian infrastructure — By County (in millions of $YOE)

County	Maintain Conditions	State of Good Repair
Alameda	$7,940	$8,977
Contra Costa	$6,101	$6,878
Marin	$1,374	$1,676
Napa	$871	$1,290
San Francisco	$5,189	$5,759
San Mateo	$3,824	$4,220
Santa Clara	$10,186	$11,290
Solano	$2,838	$3,351
Sonoma	$3,028	$4,446
Total	$41,351	$47,886

To calculate the pavement maintenance need, MTC's pavement management software, StreetSaver® was used to determine how much funding would be needed for each jurisdiction to reach the condition level for Maintain Conditions and State of Good Repair. Average maintenance costs, a key input into the StreetSaver® model, were estimated by county, using information submitted by local jurisdictions to the 2018 California Local Street and Road Needs Assessment survey.

Non–pavement needs include the capital maintenance of assets that are required for a functioning street and road system. Primary examples of these assets include storm drains, sidewalks, curb & gutter, streetlights, signs, and signals. To estimate the Non-pavement needs on the local street and road system, MTC used a prediction model developed by consultants 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. It was determined that replacement costs can be predicted by the inventory of two non-pavement assets—curb and gutter and streetlights—using a regression formula. 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 to estimate an annual preservation cost. The regional totals are then distributed across all jurisdictions based on a formula comprised of population share and lane mileage. The prediction model was updated with asset inventory and replacement cost information provided by local jurisdictions in responses to the 2018 California Local Street and Road Needs Assessment survey.

State Highways

The needs assessment for the state highway system relies on information provided by the California Department of Transportation in its 2019 State Highway System Management Plan (SHSMP), and analysis of the District 4 (Bay Area) pipelined projects and remaining needs for all SHOPP expense categories. Future adjustments to the state highway needs assessment may be made to account for specific Bay Area operational and maintenance needs over and above the assumed Bay Area population share of these needs as incorporated in the SHOPP forecast, and additional input that may be provided on the estimate by Caltrans staff.

The SHSMP is produced every two years and integrates the maintenance, rehabilitation, and operation of the state highway system into a single management plan that incorporates state and federal asset management requirements. The SHSMP includes a 10-year needs assessment to achieve established performance targets for the following asset classes:

- Pavement
- Bridges and Tunnels
- Drainage
- Transportation Management Systems
- Supplementary assets including – drainage pump plants, highway lighting, overhead signs, weigh in motion scales, and other facilities of various types

To estimate the 30-year state highway need for Plan Bay Area 2050, MTC staff added pipe-lined projects in the District 4 Project Book, with the SHSMP reported cost associated with meeting stated performance targets for each of the above listed asset classes within District 4 by FY 2028-29. For FYs 2030-2050, staff took the annualized need over the first 10-year period and reduced it by 75%, then escalated the annual need by 2.2% from FY 2030 through FY 2050. This shift to a lower needs level after year 10 assumes that the needs estimated in the first 10 years are to bring the state highway system to a state of good repair, after which ongoing maintenance costs would be significantly lower. This assumption and the level of reduction applied is consistent with the those made in the local street and road and transit capital maintenance needs assessments.

Local Bridges

The nearly 2,000 locally-owned bridges in the San Francisco Bay Area are essential links that help connect the state's communities, provide mobility for travelers, support efficient movement of freight, and relieve traffic congestion. The 2018 California Local Streets and Roads Needs Assessment included the cost to maintain the locally owned bridges in the state over the next ten years, by county. The assessment used the Federal Highway Administration's National Bridge Investment Analysis System (NBIAS) system to develop the projections of capital maintenance need for the state's locally-owned bridges. Though NBIAS is populated with default costs, deterioration models and other parameters, these were calibrated to regional costs and conditions in order to provide as realistic a projection as possible of the cost to maintain locally-owned bridges.

Since the 2018 California Local Streets and Roads Needs Assessment only covered 10 years of maintenance needs, MTC staff extrapolated the needs to cover the 30-year Plan period.

Regional Bridges

The estimated operations, preservation, and replacement needs for the seven regional toll bridges was forecasted using information provided by the Bay Area Toll Authority (BATA). The BATA toll bridge maintenance, repair, and rehabilitation assessment incorporates cost information for major capital projects from the Caltrans 20-year maintenance plan and forecasted inspection and maintenance costs for lesser projects to estimate the capital costs per bridge through FY 2036. For FYs 2037 through 2050, staff assumed an annual average of the previous 15 years, adjusted for inflation.

Operations needs for the regional bridges includes those estimated by Caltrans in addition to BATA expenses for the FasTrak Customer Service Center, the ATCAS (toll-collection IT system) banking costs, and other indirect toll collection expenses. The operations costs budgeted for FY 2020, were adjusted for inflation and extrapolated to FY 2050.

Transit Operating

In spring 2019, MTC distributed a Transit Operating Needs Assessment survey to each of the Bay Area's 25 transit operators as well as the Transbay Joint Powers Authority. The Transit Operating Needs Assessment survey gathered information from transit operators on current and planned service levels; existing and projected operating costs; and existing and projected local operating revenues over the Plan Bay Area 2050 period.

The cost to operate and maintain existing service levels was projected by the transit operators. MTC requested a cost breakdown of expenses by mode (bus, paratransit, rail, etc.) and system-wide non-operating expenses including debt service by year-of-expenditure. Transit operators also provided planned service changes associated with committed capital projects and/or fully funded future increases in service hours over the Plan Bay Area 2050 period.

Inflation assumptions were checked for reasonableness across similar expense categories. The cost impact of projected changes in service levels during the plan period was accounted for only in instances where those changes are a result of the transit operators' policy directives. The operating cost projections included in Table 3 include existing service levels and cost projections for committed expansion projects. Over Plan Bay Area 2050 period, transit operators identified approximately $218 billion in costs associated with operating the existing system and committed expansions to the system.

Transit Capital

The information presented in Table 3 is a draft estimate of the cost to maintain the Bay Area's existing transit infrastructure in a state of good repair. The Transit Capital Needs are developed based on the operator submitted information housed in MTC's Regional Transit Capital Inventory (RTCI), covering existing transit assets. Operational (routine maintenance, cleaning, overhead, etc.) or expansion costs are not included in the estimate of capital maintenance needs and revenues.

To maintain existing transit capital conditions, approximately $62.9 billion is needed, and to reach a state of good repair (0% PAOUL), an investment of approximately $88.1 billion is needed over the next 30 years for the region.

To achieve a State of Good Repair, there is an increase of approximately $40 billion in total need as compared to the $47.6 billion from the 2016 Plan Bay Area SGR assessment included in Plan Bay Area 2040 (PBA 2040). Change between the analyses is not unexpected – agencies have had an additional three years to update and amend their data. Changes to cost, date built, and useful life have significant impacts on modeling. The increase is caused by multiple factors; the values below are rough estimates of the major causes of the increase:

- $17 billion (approx.) – due to six additional years in PBA 2050 vs PBA 2040.
- $5 to 10 billion (approx.) – new assets and new replacement cost information added to the inventory since 2016, including major new projects.
- $2 to 6 billion (approx.) – per TERM Lite calculations, the base inventory value has increased by 14% since 2016. All unit costs are escalated to the current year nominal value. $1,000 in 2016 dollars would be escalated to $1,144 for the 2020 model start year in TERM Lite. All subsequent modeling assumptions are then based on this elevated rate.
- $3 billion (approx.) – due to California legislation requiring phased replacement of diesel/hybrid buses to Zero Emission Vehicles.

Transit capital and operating needs projections by operator are shown in Table 3 on the following page.

Table 3. Draft Transit Capital and Operating Needs Projections – By Operator (in millions of $YOE)

Operator	Transit Capital Needs – SGR	Transit Capital Needs-Maintain Current Conditions	Transit Operating Needs
AC Transit	$6,951	$5,361	$22,043
ACE	$247	$163	$2,214
BART	$31,278	$21,824	$58,043
Caltrain	$5,375	$3,943	$8,349
CCCTA County Connection	$647	$582	$1,904
Clipper	$823	$773	TBD
Delta Breeze	$31	$20	$53
Dixon	$20	$12	$66
ECCTA Tri Delta Transit	$387	$343	$1,174
FAST	$278	$216	$1,179
Golden Gate Transit	$3,762	$2,052	$3,606
LAVTA	$378	$239	$1,068
Marin Transit	$403	$325	$1,472
NVTA	$225	$183	$975
Petaluma Transit	$84	$74	$123
SamTrans	$4,771	$2,545	$11,427
Santa Rosa CityBus	$185	$158	$661
SCT	$380	$291	$843
TJPA	$200	$200	$2,096
SFMTA	$22,022	$16,825	$67,139
SMART	$726	$601	$2,169
SolTrans	$357	$205	$795
UCT	$107	$95	$347
Vacaville City Coach	$112	$59	$205
VTA	$6,834	$4,812	$26,669
WestCAT	$447	$216	$740
WETA	$1,058	$855	$2,460
Grand Total	**$88,092**	**$62,973**	**$217,819**

Note: Sum of all agency values may not equal grand total due to rounding issues.

Draft Affordable Housing Needs Assessment

This attachment provides more details on the methodology and analysis results for estimating existing needs (through 2020) and future needs (2021 to 2050) for affordable housing. This assessment is designed to help quantify the needs for deed-restricted affordable housing in the context of Plan Bay Area 2050 with a similar aim to the parallel work for transportation – to understand the full needs to reach ideal conditions and then determine associated funding gaps.

There are two components to determining housing needs for low-income households – households that earn approximately less than $45,000 per year (in today's dollars). For both components, staff has assumed, for calculation purposes, that all low-income households may need to live in deed-restricted subsidized units, especially with the rising cost of living in the San Francisco Bay Area. While many low-income households currently live in what's referred to as "naturally affordable" units, these units are provided by the private market and may become unaffordable over time. Some units will also be protected through acquisition and rehabilitation (preservation). But since the level of subsidy needed for preservation is often comparable with production, this estimate does not differentiate between the two.

The two components of estimating housing needs for low-income households are:
- Forecasted household growth, or how many new low-income households will live in the region in future years; and
- Existing shortfall, or how many existing low-income households do not live in deed-restricted subsidized units.

To do this, staff used the household growth projections by income group for the Clean and Green Future from Horizon. These household forecast numbers will be updated with the Draft and Final Growth Forecasts for Plan Bay Area 2050 when available. Clean and Green was merely selected as a placeholder given that it was the moderate-growth Future explored in the predecessor Horizon process (for more information on Horizon, go to: https://www.planbayarea.org/2050-plan/horizon).

Table 2 below shows the forecasted household growth by four income categories, for the Clean and Green Future in Horizon. Key takeaways from this table include:
- There are anticipated to be roughly 766,000 low-income households in year 2020.
- These will grow by around 70,000 between 2020 and 2050, or on an annualized basis, a little more than 2,300 per year.
- Per the methodology described above, the first component of housing needs is therefore 2,300 new deed-restricted subsidized units per year between 2020 and 2050.

Table 2: Household Growth Forecast by Income Category for *Clean and Green* (Horizon)

Income Ranges	2020	2025	2030	2035	2040	2045	2050
Low (Q1)	**766,400**	**800,400**	**836,000**	**895,600**	**857,900**	**844,600**	**836,600**
Moderate-Low (Q2)	672,500	683,600	693,600	715,200	686,900	675,900	667,200
Moderate-High (Q3)	654,200	701,700	746,300	756,500	868,000	960,400	1,042,800
High (Q4)	843,200	922,400	996,900	1,020,600	1,183,100	1,345,000	1,488,800
Total	*2,936,300*	*3,108,200*	*3,272,800*	*3,387,900*	*3,595,900*	*3,826,000*	*4,035,400*

While there is no good data available on the total number of deed-restricted subsidized units in the Bay Area, estimates from NPH/CHPC put the number around 100,000 units. Additional takeaways from Table 2 include:

- Of the 766,00 low-income households, 100,000 currently live in affordable units.
- The remaining 666,000 households, per the methodology described above, constitute the existing shortfall.
- On an annualized basis, this would amount to around 22,200 new units per year between 2020 and 2050.

For this analysis, the housing need for lower-income households is therefore determined to be approximately 24,500 units per year. With an inflation rate of 2.2 percent and an anticipated per-unit subsidy of $450,000 (in today's dollars) as developed in CASA, the estimated affordable housing needs would total **$473 billion** through the year 2050 (in year of expenditure dollars).

Draft Resilience Needs Assessments

As part of creating a more comprehensive regional plan, Plan Bay Area 2050 is expanding the scope of the Needs & Revenue Assessment to include challenges related to seismic safety and sea level rise adaptation. Over the next three decades, the region will have to plan and adapt the expansive shoreline to rising sea levels with uncertain flooding timeframes, in addition to continuing to address the seismic safety challenge that has always been present in our earthquake-prone region. The Resilience Needs & Revenue Assessment will provide an underlying context/framework to consider strategies.

The Bay Area is not starting from scratch in understanding the level of need for resilience challenges, nor in raising revenues to address the challenges. In the three decades since the Loma Prieta earthquake, the Bay Area has leveraged an estimated $10.7 billion[1] in local, state, and federal dollars to upgrade the region's public and private infrastructure. Over that period, 11[2] local measures directly addressed seismic risk, and another 103[3] measures built seismic readiness into capital improvement of public buildings such as schools and libraries. The region has also invested in the mitigation of its transportation infrastructure, utilizing $650 million of 1996's Prop 192 going toward the seismic mitigation of the area's state-owned toll bridges. Additionally, the region has made strides toward addressing Sea Level Rise. The ground-breaking Measure AA, passed in 2016, provides $25 million a year for the explicit protection of the Bay, integrating a slew of restoration and green mitigation initiatives. Additionally, cities have taken on their own local projects, such as Foster City's $90 million bond initiative in 2018 to protect its entire city from becoming a FEMA designated Special Flood Hazard Area. In the same year, San Francisco passed a $425 million bond to repair the Embarcadero seawall that protects its downtown.

This draft Resilience Needs & Revenue Assessment is the first time ABAG and MTC have attempted to quantify the financial gap associated with these two important topic areas. Of course, resilience is more wide-ranging than just sea level rise and earthquakes. However, these two topics were seen as the highest priorities, due to the widespread vulnerability of the region to both of these risks, and their resulting community and economic impacts. The scope of this assessment focused further on the most significant needs, specifically residential seismic safety, and near-term sea level rise.

As previously mentioned, the region has been mitigating the public realm – including both infrastructure, public buildings, and transportation - for years regarding earthquakes. However, residential mitigation is both critical, and critically underfunded. None of the $10.7 billion has gone toward housing in the last few decades, and only two public programs: CEA's Brace and Bolt, and FEMA's grant programs, currently address private structures. Additionally, ABAG has identified the need for housing protection as a top priority in maintaining the communities and economy within the region.

Regarding Sea Level Rise, this assessment begins with only near-term coastal Sea Level Rise adaptation, in order to focus on the most immediate vulnerabilities and most significant impacts. Other forms of resilience, including wildfire, riverine flooding, extreme heat, and other hazards and climate impacts are important to consider, but have been left outside the scope of Plan Bay Area 2050. In the meantime, it is worth noting that there are additional resources to support local planning related to these other hazards through the MTC/ABAG resilience program, NGOs and the State of California. Additionally, other

[1] Including all direct local bonds and taxes, and all seismic FEMA grants. Assumptions include 20% of state seismic bonds, proportional to the Bay's share of population, and 10% of indirect local revenues – a broad assumption made on the case study of several local initiatives.
[2] Local direct bonds and taxes focused on seismic mitigation.
[3] Indirect local bonds and indirect special taxes.

hazards and refinements to this methodology may be recommended as key Implementation Actions of this Plan. Future iterations of Plan Bay Area may also utilize this assessment framework to integrate the additional hazards.

Draft Need: Seismic Needs for Residential Buildings

A major earthquake on one of the Bay Area's many faults can damage tens of thousands of homes in a matter of seconds, adding an acute housing crisis to the region's chronic one. Additionally, with a lack of historical funding for residential buildings, public infrastructure is well protected, but there is critical unmet need for housing mitigation. This significant housing vulnerability therefore makes up the Resilience Need for Earthquakes, in order to compensate for the crucial regional financial gap.
No regional data set is available that describes the structural characteristics of every building, but staff have used available building information in the region (primarily building use, year built, number of units, and number of stories) to develop high level estimates for the number of common seismically vulnerable building types. These include single-family cripple walls where an unbraced and unbolted crawl space can shift a house off its foundation, or multi-family soft stories where a weakened first floor, often with large garage openings, can pancake on the first floor. Additional assumptions, as well as a breakdown of seismic needs, can be found in Table 1.

Some cities in the region are actively requiring owners of soft-story multifamily buildings to retrofit, and the State of California is gradually expanding a grant program designed to incentivize single family homeowners with cripple walls to retrofit. Using assumptions about typical retrofit costs, combined with regional building information, the estimated cost to address these two known vulnerabilities is approximately $13.3 billion. An additional $3.3 billion was added to account for seismic retrofit of other vulnerable building types, primarily single family and multi-family buildings with fewer than 5 units built over a garage. These units suffer the same deficiency as the larger multi-family soft story challenge, and their inclusion leads to a total estimated need of approximately $16.6 billion.

Table 1: Earthquake Need for Residential Buildings (in millions of $YOE)

Vulnerability	Number of Units to Retrofit[4]	Unit Cost[5]	Inflation	Subtotal[6]
Cripple Wall (Single Family)	185,000	$12,000	2.2%	$3,003
ROG/HOG (Single Family)[7]	45,000	$25,000	2.2%	$1,530
Cripple Wall (Duplex)	31,000	$12,000	2.2%	$1,526
ROG/HOG (Duplex)	16,000	$30,000	2.2%	$1,984
Soft Story (5+ units)	24,000	$20,000	2.2%	$8,527
Total	**301,000**			**$16,570**

[4] Regional estimates by UrbanSim scan: it is assumed that this project may take approximately 15 years, leading to projected costs through 2035.
[5] Costs derived from SME guidance, shown in 2019 dollars.
[6] Rounded to the nearest million.
[7] Room over Garage (ROH); House over Garage (HOG).

Draft Need: Sea Level Rise through 2050

Sea level rise is a different challenge compared with earthquakes – with each year, it becomes progressively worse, with impacts spiking at times when coupled with king tides, and bad storms. For example, a five-year storm (an event that happens roughly every five years), coupled with just one-foot of sea level rise, would flood communities and infrastructure at three feet above today's sea level. To assess need, areas with flooding impacts at three feet were identified using the Bay Conservation and Development Commission's ART Bay Area mapper. Placeholder strategies of 16 different archetypes (including marsh restoration, traditional levees, and roadway elevations, among others) were then created to address communities vulnerable to that level of inundation, and subsequently edited using the input of various stakeholders. Costs were adjusted to account for the regional variance in construction costs. Additional assumptions can be found in Table 2.

The estimated cost to address sea level rise through year 2050 is approximately $19.8 billion. This preliminary cost estimate is focused primarily on shoreline protection measures to prevent flooding from the bay and ocean, and it does not fully consider upstream flooding impacts from streams and rivers, or the Delta. It does include marsh and subtidal restoration and adaptation projects that would provide ecosystem and flood protection benefits. Staff are working with a broader set of ecological, flood control, and sea level rise subject matter experts to further refine this estimate by January 2020.

Table 2: Sea Level Rise Need (in millions of $YOE)

Strategy[8]	Units[9]	Unit Cost[10]	Operations & Maintenance[11]	Inflation	Subtotal
Levee – Horizontal (Mild)	253,199	$5,800	1.5%	2.2%	$2,173
Levee – Horizontal (Steep)	31,667	$2,800	1.5%	2.2%	$131
Levee – Traditional (Minimum Trail)	29,034	$1,000	1.5%	2.2%	$43
Levee – Traditional (Average Trail)	92,534	$1,200	1.5%	2.2%	$164
Levee – Traditional (2-lane Roadway)[12]	129,661	$2,310	1.5%	2.2%	$443
Levee – Traditional (4-lane Roadway)	90,131	$3,520	1.5%	2.2%	$469
Levee – Raise Existing Levee	18,984	$770	1.5%	2.2%	$22
Seawall - Simple	42,779	$4,730	1.5%	2.2%	$299
Seawall – Berm or Amenities	9,174	$6,800	1.5%	2.2%	$92

[8] Does not include buyouts or relocation.
[9] Units are in linear foot for most strategy types, in acreage for marsh restoration, and indicate quantity for tidal gates.
[10] Cost assumptions stem from previous research with a consultant. Shown in 2019 dollars.
[11] Assumed to be 1.5%. Calculated onto the value of annual need before inflation.
[12] This estimate includes a high level assumption to protect Capitol Corridor, however, no costed archetype was available for railroads specifically. As a result, this estimate is included under Levee – Traditional (2-lane Roadway) for the railroad itself and Elevate Roadway (2-lane) for its bridges.

Elevate Roadway (2-lane)	12,186	$41,470	1.5%	2.2%	$748
Elevate Roadway (4-lane)	82,449	$75,790	1.5%	2.2%	$9,244
Elevate Highway (8-lane)	3,055	$116,050	1.5%	2.2%	$524
Marsh Restoration	74,884	$47,700	1.5%	2.2%	$5,284
Medium Tidal Gate	14	$3,000,000	1.5%	2.2%	$62
Large Tidal Gate	3	$20,000,000	1.5%	2.2%	$89
Total					**$19,788**

Additionally, there is a nexus for adaptation with transportation, as much of the region's infrastructure is susceptible to sea level rise. In some cases, an adaptation measure for transportation may have off-system benefits, as areas adjacent to the transportation asset would benefit from sea level rise protection. In this way, the financing of transportation is simultaneously mitigating the risk for private or public buildings. There may also be the potential for non-transportation adaptation measures to utilize flexible transportation funds if the sea level rise measure is seen to provide a co-benefit a transportation asset. In other situations, the transportation asset may be directly adapted, and provide no direct benefit to adjacent areas.

These transportation mitigation projects may have financial benefits for transportation funding. An example of this is the seismic mitigation of the seven state-owned Bay Area toll bridges, which were mitigated by a state seismic bond of in 1996. Today, half of the regular toll fare goes toward the state's Seismic Retrofit Program. In this way, the relationship between resilience and transportation can lead to a series of complex outcomes, which affect both resilience, and even the transportation "bank" of needs and revenues. It is estimated that approximately 60 percent of the regional need for sea level rise has either a direct or indirect nexus with regional transportation assets.

Table 3: Relationship of Sea Level Rise Need with Transportation Funding[13]

Direct Nexus	Indirect Nexus	No Nexus	Total
$7,806	$722	$4,769	$13,376[14]
58%	6%	36%	100%

[13] Shown in 2019 dollars in millions. Shown without operations and maintenance funding.
[14] Column may not add up to total as printed due to rounding.

Draft Plan Bay Area 2050 Transportation Revenue Forecast

The draft revenue forecast for Plan Bay Area 2050 (Plan), summarized in Table 1 below, draws upon data from MTC, transit operators, local jurisdictions, county transportation agencies, and other stakeholders. The funds in the Plan are divided into six categories: federal, state, regional, local, anticipated, and other. Each section of this memo details key issues impacting revenue from its relevant category. Total revenue in year-of-expenditure (YOE$) dollars for the 30-year Plan period of FY 2020-21 to FY 2049-50 is currently projected to be $471.7 billion or $544.4 billion if optional revenues are included.

For improved planning, transparency, and fiscal constraint, revenue has been segmented into "bins", based on the period of anticipated availability. The first two bins correspond to the years of the plan that the funds are expected to be available. The third bin is comprised of fund sources that are not received on an annual or formulaic basis (example -- New Starts, Anticipated). These funds can be applied to expenditures throughout the time period of the Plan.

Schedule
The draft revenue forecast will not be finalized until shortly before the Plan is adopted in 2017. It will be updated to reflect additional local revenues submitted through the call for projects, local value capture proposals submitted by congestion management agencies (CMAs), and possible new revenue sources approved before 2017 (including new county or transit operator ballot measures).

Table 1. Draft Plan Bay Area 2050 Revenue Estimate (in Billions of YOE $)

Revenue Category	Plan Bay Area 2050 Revenue (FY 2021 - FY 2050)	Revenue Bin 1 (FY 2021 – FY 2035)	Revenue Bin 2 (FY 2036 – FY 2050)	Revenue Bin 3 (Flexible)
Federal Funds	$45.8	$13.8	$20.8	$11.1
State Funds	$91.9	$38.5	$51.8	$1.6
Regional Funds	$67.2	$27.1	$40.1	$0
Local Funds	$243.4	$97.3	$146.1	$0
Anticipated	$23.5	$0	$0	$23.5
Other/Optional New Revenue	$72.8	$24.9	$47.9	$0
TOTAL w/o Optional	**$471.7**	**$176.7**	**$258.8**	**$36.2**
TOTAL w/ Optional	***$544.4***	***$201.6***	***$306.7***	***$36.2***

Appendix 1 contains projections for each revenue source included in the plan. The below sections of the memo discuss some of the key issues underlying the Plan Bay Area 2050 Draft Revenue Forecast.

General Assumptions

The Plan revenue forecast is based on the following time frame and inflation assumptions:

- Time Frame – The Plan covers the time period from FY 2020-21 through FY 2049-50 (30 years). All revenue projections are prepared in escalated year of expenditure dollars (YOE$).
- Inflation Rate – The Plan assumes a 2.2% inflation rate, the same inflation rate as was used for Plan Bay Area 2040. This rate is consistent with ten-year inflation forecasts for the Bay Area from the California Department of Finance, the U.S. Federal Reserve, and the federal Office of Management and Budget (OMB).

Federal Funds

Federal fund sources included in the revenue forecast are assumed to increase at a 2% annual growth rate for the period from FY 2020-21 to FY 2029-30 and at a 3% annual growth rate for the remainder of the Plan. These growth rates are applied to a base year of the actual federal funds received in the region in FY 2018-19.

- New Starts, Small Starts, and Core Capacity

The draft revenue forecast includes a total $11.15 billion for Federal Transit Administration (FTA) Section 5309 Fixed-Guideway Capital Investment Grants, usually referred to as the New Starts and Small Starts programs. The revenue forecast for the New/Small Starts program is based upon an analysis of the amount of funding the Bay Area has received from the programs over the last ten years which amounts to an average of nearly 10% of the overall national program. This represents an increase to the Bay Area share of the national program over the 7.6% share that was assumed in Plan Bay Area 2040. Over the Plan period MTC expects the Bay Area will perform well with Core Capacity-type projects given the age of fixed-guide way in our transit systems.

The $11.15 billion includes approximately $270 million in committed New Starts funding for Caltrain electrification. The remaining $10.9 million represents available discretionary funding in the Plan.

The Federal funding in the Plan assumes the framework and funding levels contained in 2015 the Fixing America's Surface Transportation (FAST) Act. Should a new federal transportation act be passed prior to the Plan's adoption, the revenue forecast will be updated to conform to the programs and policies contained in it.

State Funds

The majority of state funds for transportation are based on various motor vehicle fuel taxes. Assumptions underlying the prices and level of consumption for motor vehicle fuel used in the financial projections strive to be consistent with the driving cost assumptions used by MTC's travel model. The California Air Resources Board (CARB) developed a tool to for regions to estimate the per-mile cost of driving using energy demand and fuel price forecasts published by the California Energy Commission (CEC). Table 2 shows the fuel assumptions for price and consumption from the CEC's forecast that inform the revenue forecast.

Table 2 California Energy Commission Fuel Price and Consumption Forecast

Year	Gasoline Price (YOE $)	Diesel Price (YOE$)	Annual Gasoline Consumption (1,000 gallons)	Annual Diesel Consumption (1,000 gallons)	Change in Gas Consumption (1,000 gallons)	Change in Diesel Consumption (1,000 gallons)
2021	$3.59	$3.44	14,350	3,156	N/A	N/A
2050	$5.74	$5.87	12,053	3,314	-16%	+0.5%

Several MPOs in the state are using alternative fuel price assumptions in their own plans. MTC/ABAG joint staff are still considering whether to use the CEC energy demand forecast reflected in CARB's tool or to deviate to an alternative source, in which case, the revenue forecast for state funds could change significantly.

- State Transportation Improvement Program (STIP)

The STIP consists of two main parts, the Regional Transportation Improvement Program (RTIP) and the Interregional Transportation Improvement Program (ITIP). The RTIP is the 75% regional share of the capital improvement program that includes projects on and off the state highway system. The ITIP is the 25% interregional share that focuses on projects in the state that cross metropolitan boundaries or are generally more regional in scope. STIP revenue comes primarily from the supplemental 17.3 cent excise tax on gasoline. Prior to the passage of Senate Bill 1, the amount of this supplemental excise tax was variable, and would be adjusted annually based on the *price* of gasoline. Senate Bill 1 "reset" the excise tax in 2019 to 17.3 cents, to be annually indexed to inflation beginning in 2020.

- Cap and Trade

The draft revenue forecast currently includes projections for the various state Cap and Trade programs consistent with $2.9 billion in annual statewide generations, based on what Cap and Trade auctions are currently generating. Table 3 below provides details on the assumed Bay Area shares for the various Cap and Trade programs. The share assumptions detailed in Table 3 are based upon either state statute (for the Low Carbon Transit Operations Program) or upon MTC's retrospective analysis of the results of state awards for the other programs. The revenue forecast also includes $1.5 billion in revenue from the 40% of Cap and Trade revenues which have not been programmed by the state Legislature. This forecast assumes that 1/3 of the 40% un-programmed Cap and Trade funds will benefit transportation projects and that of those funds the Bay Area will receive its population share of 20%.

Table 3. Cap and Trade Bay Area Shares (in Billions of YOE $)

Cap and Trade Program	Revenue	Bay Area % Share of Total
Affordable Housing & Sustainable Communities Program (transportation projects)	$1.8	11% (30% of the 35% of total AHSC funds benefiting transportation projects)
Cap & Trade High Speed Rail	$0.9	4%
Low Carbon Transit Operations Program Population-Based	$0.4	20%
Low Carbon Transit Operations Program Revenue-Based	$1.1	52%
Transit and Intercity Rail Capital Program	$2.6	30%
40% Un-programmed Cap and Trade Funds	$2.3	6.5%
TOTAL	$9.1	N/A

- High Speed Rail

In 2019, Governor Newsom announced that while work on the Central Valley segment of the High Speed Rail project would continue, build-out of the rest of the system would be indefinitely postponed. Bay Area High Speed Rail revenue is still forecasted to be available for connectivity products already underway or planned, plus a small amount of state funding for future connectivity projects.

- Senate Bill 1 Revenue Programs

In 2017, the California Legislature passed Senate Bill 1, containing new fund sources and programs for transportation. Fund sources that inform the Senate Bill 1 program revenue forecast include fuel sales and excise taxes, a license fee-based transportation improvement fee, and an electric vehicle fee. The distribution of program funding is contained in statute and where the state has discretion over the funding shares of competitive programs, staff has assumed Bay Area shares based on past and predicted performance. Table 4 below contains the assumed Bay Area shares of Senate Bill 1 competitive programs.

Table 4. Senate Bill 1 Competitive Programs— Bay Area Shares (in Billions of YOE $)

Senate Bill 1	Revenue	Bay Area % Share of Total
Active Transportation Program (State)	$0.57	15%
Solutions for Congested Corridors	$3.8	30%
Transit and Intercity Rail	$6.4	30%
Trade Corridor Enhancement	$2.7	20%
TOTAL	$13.47	N/A

Regional Revenues

The majority of regional revenue for the Plan is attributed to bridge tolls and the AB 1107 sales tax in the three BART district counties. The Bay Area Toll Authority provides estimates of toll-paid vehicle growth on the seven regional bridges that are used to forecast revenue over the Plan period. Toll increases are assumed to satisfy the projected maintenance, rehabilitation, and replacement needs of the regional toll bridges.

Local Revenues

The major local fund sources in the Plan include transit fare revenues, street and road local revenue, and sales tax-based revenues.

- Sales Taxes

The revenue forecast includes revenues generated by county transportation sales taxes, transit district sales taxes, and the Transportation Development Act's (TDA) Local Transportation Fund ¼ cent sales tax which is collected in each Bay Area county. The forecast also includes revenues expected from the reauthorization of county and transit district sales taxes which are currently set to expire during the Plan period. Forecasts for county transportation sales taxes and transit district sales taxes are developed directly by the sales tax administrating agencies. Estimates for county sales tax and transit district measures were submitted by each county sales tax agency. These estimates are used in the revenue forecast to maintain consistency with sales tax expenditure and strategic plans. To maintain consistency, TDA growth rates also assume the same growth rates as those provided by the sales tax authorities in their respective counties. The sales tax forecast for Solano County is based on a ten-year historical analysis of actual TDA receipts. The AB1107 forecast is a weighted average of projected growth rates for Alameda, Contra Costa, and San Francisco counties.

Anticipated Revenue

Anticipated revenue represents funding that is likely to become available from federal or state sources over the course of the Plan period but is unspecified in terms of source or expenditure requirements. Reasonably anticipated revenues differ from new, specific revenue that would be generated under local or regional control such as sales tax reauthorizations or regional bridge toll increases. Examples of this revenue would be the American Recovery and Reinvestment Act (ARRA) transportation funding that was distributed by the federal government in FY 2009 in response to the national recession as well the recent Senate Bill 1 transportation revenue that became available in 2017 but was not incorporated in the revenue forecast for Plan Bay Area 2040. The revenue forecast includes $23.5 billion in anticipated revenues. This estimate is based upon an analysis of revenue sources that materialized over a fifteen-year period from FY 2005-06 through FY 2019-20.

Other/ New Optional Revenue

This category includes revenues associated with an optional "megameasure" transportation funding proposal currently under discussion in the Bay Area. This optional revenue assumes a 1% sales tax in all nine Bay Area counties beginning in 2025. Although the forecast was based on a 25 year, 1% sales tax, the revenue is not intended to be tied to a specific proposed.

This category will be updated to contain revenues associated with proposed pricing projects in downtown San Francisco and on Treasure Island, possible new tolling projects (apart from express lanes) such as State Route 37, developer and land sale revenues associated with projects that are included in Plan Bay Area 2050, as well as 2020 transportation ballot measure revenues. Revenues from these sources may be modified based on the projects included in Plan Bay Area 2050.

Next Steps

This draft transportation revenue forecast will inform the next phases of the Plan development process including the Transportation Element of the Plan Bay Area 2050 Blueprint. The financial projections, however, will not be finalized until shortly before the adoption of the Plan in 2021 in order to allow for updates to revenue estimates based on legislative or economic change

Draft Affordable Housing Revenue Forecast

Federal Funding

Existing

Low-Income Housing Tax Credits (LIHTCs)[15] are the primary source of funding for affordable housing projects across the country. The Great Communities Collaborative estimates that in 2017, federal LIHTCs accounted for about a third of the available total funding, or about $1 billion, for the production and preservation of affordable housing in the Bay Area.[16] Other important federal sources include the HUD Section 8 Project-Based Housing Choice Vouchers (Section 8) and the Affordable Housing Program (AHP). Overall, federal sources have been declining since 2003 with funding for some programs such as the Home Investment Partnership Program (HOME) and the Community Development Block Grant (CDBG) declining by over 50 percent between 2003 and 2015.[17]

Forecast

While total federal funding for affordable housing production and preservation has declined significantly over the last few decades, staff is taking a slightly more optimistic view and assuming a slow but steady increase of 1 percent each year for the next 30 years. After accounting for a 2.2 percent inflation rate though, this projection still anticipates a slow decline in real terms.

State Funding

Existing

Between 2016 and 2018, the state allocated $6 billion statewide in one-time funding for affordable housing production and preservation.[18] Staff estimates that a 10-year revenue stream for the Bay Area through these one-time allocations would yield around $110 million in 2019. The state also awarded around $76 million in grants to Bay Area affordable housing developers in 2018 through the Affordable Housing and Sustainable Communities (AHSC) Program, which is funded via the statewide cap and trade program.[19]

Forecast

The forecast assumes a moderate increase of 2.2 percent for the AHSC program, which is anticipated to be extended to 2050 in future years. The forecast does not assume a large increase in AHSC funds since total emissions should decline as the price of GHG emissions rises, keeping the total revenue generated through the program about the same, when adjusted for inflation.

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[15] See publication of the California Tax Credit Allocation Committee: https://www.treasurer.ca.gov/ctcac/program.pdf
[16] *Funding Affordable Housing Near Transit in the Bay Area Region*, May 2017, Strategic Economics, prepared for the Great Communities Collaborative. https://www.bart.gov/sites/default/files/docs/Funding-Affordable-Housing-Near-Transit-in-the-Bay-Area-Region_5917.pdf
[17] *California's Housing Future: Challenges and Opportunities*, Statewide Housing Assessment 2025, California Department of Housing and Community Development.
[18] Through the *No Place Like Home Program* and Proposition 1.
[19] MTC tabulation of awarded grants.

Regional/Local Funding

Existing

The Great Communities Collaborative estimates that in 2017 local jurisdictions allocated as much as $1.5 billion annually towards the production and preservation of affordable housing.[20] The funds were raised at the local level from in-lieu and impact fees, general funds and low- or no-cost sale or lease of public lands, among others. A detailed breakdown of the sources is not available at this time. MTC also contributes funding through its housing-transportation programs, which staff estimates at $10 million per year (including revolving loan funds and one-time grants).

Forecast

The forecast assumes a 1 percent annual increase for existing funds given that most sources of funding are almost fully tapped out and might decline as the regional economy grows at a slower rate over the long term.

Private Funding

Existing

The largest share of private funding for the production of deed-restricted affordable units is a result of inclusionary policies adopted by local jurisdictions. Staff estimates that this mechanism contributed the equivalent of around $200 million in 2018[21] (or 450 units annually, valued @ $450,000 per unit.) Furthermore, in recent months, major employers including Apple, Google, and Facebook committed to roughly $2.5 billion in funding for affordable housing between 2020 and 2029.

Forecast

The forecast assumes that through inclusionary policies, the region continues to add around 450 units annually to the deed-restricted affordable housing stock. The forecast assumes a 2.2 percent growth rate for private contributions. Staff have integrated funding already committed by major employers into the forecast as well for years 2021 through 2029.

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[20] See: Funding Affordable Housing Near Transit in the Bay Area Region, May 2017.

[21] Lacking reliable estimates for the number of inclusionary units build in each local jurisdiction, staff estimated the region-wide total based on data published for San Francisco (SF). Between 2013 and 2018, SF's inclusionary policy resulted in around 300 units per year. The number in 2018 was 163, which is more in line with the longer-term trend of around 200-250 units. Assuming that the region built as many units as SF through inclusionary requirements, the region could realistically anticipate that the private sector would provide 400-500 units annually in most years. Each unit is valued at $450,000 in subsidies. Source: Construction Industry Research Board and 2018 San Francisco Housing Inventory.

Table 1: Affordable Housing Revenues (2021-2050, in millions of $YOE)

Category	Source	Expected Revenue
Federal	LIHTC	$30,821
	HTF	$269
	Section 83	$3,763
	HOME	$717
	AHP	$2,330
	Other	$538
State	AHSC	$3,396
	Bonds	$993
Regional/Local	Bonds and Fees	$52,755
	TOAH/BAPP	$358
Private	Inclusionary	$9,052
	Major Employers	$2,250
Total		**$107,242**

Draft Resilience Revenue Forecast

Draft Revenue

Staff have estimated existing funding sources for resilience will generate **approximately $1.9 billion** for the Bay Area through year 2050. This estimate was aggregated from four different scales of revenue: local, regional, state, and federal – and then projected into the future using a set of assumptions. All sources gathered for this report were only included if they directly focused on flooding or seismic mitigation, and were further filtered to the specific needs of this assessment. Seismic mitigation revenues were only included if they protect residential structures, but Sea Level Rise revenues include all types of protection, as they hold a series of co-benefits for different sectors. Local elements include special taxes that have expiration dates within the frame of reference. As of this draft, the availability of local bond funds was not able to be determined, as many of the recent initiatives, such as San Francisco's Embarcadero bond, and Foster City's seawall bond, are committed, and therefore not considered available. State revenues consist of statewide seismic grants, as well as uncommitted bond funding from significant state water bonds.[22] US Army Corps funds constitute most of the federal element, as they have been involved in much of the regions flood protection efforts. Additionally, financial support from FEMA has been a consistent revenue for the region for decades, and this trend is expected to continue.

The Bay Area has seen seismic mitigation funding at all scales, and this trend is expected to continue into the future. It is estimated that the region will produce $310 million in revenue by 2050. Many municipalities have issued seismic bonds to protect schools and infrastructure, and the city of Hayward has even produced a seismic tax to retrofit the entirety of their public structures. However, there has not currently been a local funding source identified that provides protection for residential structures. At the state level, it is expected that the California Earthquake Authority (CEA) will continue to fund seismic retrofits within the region. The largest source of funding for this sector is currently the federal government, with reliable FEMA support expected to produce $266 million for seismic mitigation efforts.

The region has significantly more eligible funding for sea level rise, and it is expected to have $1.905 million worth of revenue by 2050. The funding distribution for this particular element is based on all scales – local, regional, state, and federal – but is most reliant on federal funding due to the large scale of revenue from USACE. Federal FEMA grants are expected to continue, and the region is also eligible for a share of state water bonds that are dedicated to flooding. However, a substantial source of expected revenue will come from Measure AA, a regional measure passed in 2016 to help protect and restore the Bay. Although its timeline does not extend the full length of the fundraising program[23], its funds, at $520 million[24] in projected revenue, will act as a critical element to help the region combat sea level rise.

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[22] Available state bond funds were adjusted with an assumption that the region will only receive funding proportional to its population.
[23] The tax is scheduled to expire in 2036.
[24] This number varies from some assessments of Measure AA due to the methodology for calculating inflation in this analysis (2.2%).

Table 5: Revenue Summary in Millions

Scale	Measure	Topic	Calculation Year[25]	Annual Value	Inflation	2021-2050 Total
Local	San Mateo Drainage Tax	Sea Level Rise	2019	$3	2.2%	$134
Regional	Measure AA	Sea Level Rise	2016	$25	2.2%	$520
State	CEA Home Retrofits	Earthquake	N/A	$1[26]	2.2%	$45
State	State Bond: Prop 68[27] (2018)	Sea Level Rise	N/A	N/A	N/A	$56[28]
State	State Bond: Prop 1 (2014)	Sea Level Rise	N/A	N/A	N/A	$52
State	State Bond: Prop 84 (2006)	Sea Level Rise	N/A	N/A	N/A	$14
State	State Bond: Prop 1E (2006)	Sea Level Rise	N/A	N/A	N/A	$25
Federal	FEMA Grants	Earthquake	1995-2019	$6	2.2%	$266
Federal	FEMA Grants	Sea Level Rise	1995-2019	$2	2.2%	$78
Federal	USACE Investments[29]	Sea Level Rise	2010-2019	$23	2.2%	$1,026
Total						**$2,216**

[25] Year(s) upon which the annual value is based.
[26] California Earthquake Authority (CEA) retrofits cover either 5% of investment income on CEA's invested funds, or $5 million, whichever is less. This assessment assumes the lesser number of $5 million. Also, the funds cover the entire state – therefore, as with other state initiatives in this analysis, it is assumed that the Bay Area receives 20% of state funding, proportional to its share of the population.
[27] State Bonds are only shown in this analysis if their flooding chapters have available funding in 2019. Due to staff constraints, detail to the project level is not currently available.
[28] State Bond totals are calculated as 20% of what funding was available in the fall of 2019. The 20% estimation assumes that the Bay Area receives a portion of state funding proportional to its share of population.
[29] Analysis on USACE investments assumes that those marked as navigation expenses do not relate to sea level rise, and are thus those funds not included in the total.

PLAN BAY AREA 2050 - DRAFT TRANSPORTATION REVENUE FORECAST BY SOURCE
In *Billions of Year of Expenditure $ - 30 Year Forecast Period FY 2020-21 to FY 2049-50*

Revenue Source	Plan Bay Area 2050 Revenue Assumptions	PBA 2040 (For Reference -- 24 Year Forecast)	Plan Bay Area 2050 Total Revenue	Revenue Bucket 1 FY 2021 - FY 2035	Revenue Bucket 2 FY 2036 - FY 2050	Revenue Bucket 3 Flexible Availability
FEDERAL						
FHWA Construction of Ferry Boats & Ferry Terminal Facilities Formula Program	Base Year: FY 2018-19 Data Source: FHWA Growth Rate: 2%-3%	$0.04	$0.09	$0.03	$0.05	$0.00
FHWA/FTA Section 5303 Metropolitan Planning	Base Year: FY 2018-19 Data Source: FHWA Growth Rate: 2%-3%	$0.03	$0.52	$0.21	$0.31	$0.00
FHWA STP/CMAQ - Regional	Base Year: FY 2018-19 Data Source: FHWA Growth Rate: 2%-3%	$3.26	$4.62	$1.84	$2.78	$0.00
FHWA Highway Safety Improvement Program (HSIP)	Base Year: FY 2018-19 Data Source: FHWA Growth Rate: 2%-3%	$0.31	$0.84	$0.34	$0.51	$0.00
FHWA STP/CMAQ - County	Base Year: FY 2018-19 Data Source: FHWA Growth Rate: 2%-3%	$2.18	$3.08	$1.23	$1.85	$0.00
FTA Passenger Ferry Grant Program	Base Year: FY 2018-19 Data Source: FTA Growth Rate: 2%-3%	$0.10	$0.15	$0.06	$0.09	$0.00
FTA Sections 5307 & 5340 Urbanized Area Formula (Capital)	Base Year: FY 2018-19 Data Source: FTA Growth Rate: 2%-3%	$7.08	$10.48	$4.18	$6.31	$0.00
FTA Section 5309 Fixed-Guideway Capital Investment Grants - New Starts and Core Capacity	Base Year: FY 2018-19 Data Source: FTA Growth Rate: 2%-3%	$5.02	$9.17	$0.00	$0.00	$9.17
FTA Section 5309 Fixed-Guideway Capital Investment Grants - Small Starts	Base Year: FY 2018-19 Data Source: FTA Growth Rate: 2%-3%	$0.70	$1.98	$0.00	$0.00	$1.98
FTA Section 5310 Enhanced Mobility of Seniors & Individuals with Disabilities	Base Year: FY 2018-19 Data Source: FTA Growth Rate: 2%-3%	$0.16	$0.24	$0.10	$0.14	$0.00
FTA Section 5311 Non-Urbanized Area Formula	Base Year: FY 2018-19 Data Source: FTA Growth Rate: 2%-3%	$0.07	$0.07	$0.03	$0.04	$0.00
FTA Section 5337 State of Good Repair Formula	Base Year: FY 2018-19 Data Source: FTA Growth Rate: 2%-3%	$6.56	$10.50	$4.19	$6.31	$0.00
FTA Section 5339 Bus & Bus Facilities Program	Base Year: FY 2018-19 Data Source: FTA Growth Rate: 2%-3%	$0.40	$0.71	$0.28	$0.43	$0.00
FTA Bus and Bus Facilities Discretionary Program	Base Year: FY 2018-19 Data Source: FTA Growth Rate: 2%-3%	$0.38	$0.12	$0.05	$0.07	$0.00
National Highway Freight Program	Base Year: FY 2018-19 Data Source: FHWA Growth Rate: 2%-3%	$0.77	$1.16	$0.46	$0.70	$0.00
National Significant Freight and Highway Projects Discretionary Program	Base Year: FY 2018-19 Data Source: FHWA Growth Rate: 2%-3%	$1.53	$2.01	$0.80	$1.21	$0.00
Federal Total		**$28.59**	**$45.8**	**$13.8**	**$20.8**	**$11.1**

Revenue Source	Plan Bay Area 2050 Revenue Assumptions	PBA 2040 (For Reference -- 24 Year Forecast)	Plan Bay Area 2050 Total Revenue	Revenue Bucket 1 FY 2021 - FY 2035	Revenue Bucket 2 FY 2036 - FY 2050	Revenue Bucket 3 Flexible Availability
STATE						
Active Transportation Program (ATP) - State Program	Assumption Base: FY 2017-18 Distribution Base: Bay Area receives 20% of funds	$0.28	$0.57	$0.26	$0.31	$0.00
Affordable Housing & Sustainable Communities Program	Assumption Base: $2.9 billion per year in Cap and Trade auction proceeds Distribution Base: Bay Area receives 30% of funds	$1.08	$1.83	$0.91	$0.91	$0.00
Cap & Trade Goods Movement (from 40% Uncommitted Funds)	Assumption Base: $2.9 billion per year in Cap and Trade auction proceeds Distribution Base: Bay Area receives	$0.50	$2.26	$1.13	$1.13	$0.00
Freeway Service Patrol	Assumption Base: Bay Area share of prescribed statewide set-aside from the Road Maintenance and Rehabilitation Account	$0.00	$0.15	$0.07	$0.07	$0.00
Gas Tax Subvention + RMRA	Assumption Base: Estimate of Fuel excise tax and Road Maintenance and Rehabilitation Account revenue Distribution Base: Bay Area share of registered vehicle, road mileage, and population	$8.29	$24.07	$9.85	$14.22	$0.00
High Speed Rail	Assumption Base: Bay Area current + anticipated connectivity projects.	$9.26	$ 1.56	$0.00	$0.00	$ 1.56
Local Partnership Program	Assumption Base: Bay Area population share of prescribed statewide set-aside from the Road Maintenance and Rehabilitation Account	$0.00	$1.17	$0.59	$0.59	$0.00
Local Planning	Assumption Base: Bay Area population share of prescribed statewide set-aside from the Road Maintenance and Rehabilitation Account	$0.00	$0.15	$0.07	$0.07	$0.00
Low Carbon Transit Operations Program Population-Based	Assumption Base: $2.9 billion per year in Cap and Trade auction proceeds Distribution Base: Bay Area receives 19% of funds	$0.29	$0.42	$0.21	$0.21	$0.00
Low Carbon Transit Operations Program Revenue-Based	Assumption Base: $2.9 billion per year in Cap and Trade auction proceeds Distribution Base: Bay Area receives	$0.80	$1.13	$0.57	$0.57	$0.00
Proposition 1B	N/A	$0.01	$0.00	$0.00	$0.00	$0.00
Solutions for Congested Corridors	Assumption Base: Senate Bill 1 program revenue Distribution Base: Bay Area receives 30% of funds	$0.00	$3.82	$1.46	$2.35	$0.00
State Bridges and Culverts	Assumption Base: Bay Area population share of prescribed statewide set-aside from the Road Maintenance and Rehabilitation Account	$0.00	$2.34	$1.17	$1.17	$0.00
State Highway Operations & Protection Program (SHOPP)	Assumption Base: 2019 SHSMP and estimate of gas tax revenue Distribution Base: Bay Area receives 20% of funds	$13.75	$26.59	$11.47	$15.13	$0.00
State Transit Assistance (STA) Population-Based	Assumption Base: FY 2018/19 Distribution Base: Bay Area receives 20% of funds	$1.79	$2.95	$1.25	$1.71	$0.00
State Transit Assistance (STA) Revenue-Based	Assumption Base: 2018-19 Distribution Base: Bay Area receives 52% of funds	$5.12	$7.88	$3.33	$4.55	$0.00

Revenue Source	Plan Bay Area 2050 Revenue Assumptions	PBA 2040 (For Reference -- 24 Year Forecast)	Plan Bay Area 2050 Total Revenue	Revenue Bucket 1 FY 2021 - FY 2035	Revenue Bucket 2 FY 2036 - FY 2050	Revenue Bucket 3 Flexible Availability
State of Good Repair (SGR) Program - Population Based	Assumption Base: FY 2018/19 Distribution Base: Bay Area receives 20% of funds	$0.00	$0.52	$0.20	$0.32	$0.00
State of Good Repair (SGR) Program - Revenue Based	Assumption Base: 2018-19 Distribution Base: Bay Area receives 52% of funds	$0.00	$1.39	$0.53	$0.86	$0.00
State Transportation Improvement Program (STIP): Regional Transportation Improvement Program (RTIP) County Shares	Assumption Base: 2020 STIP FE and estimate of gas tax revenue Distribution Base: Bay Area historical share of total funds	$3.11	$3.19	$1.27	$1.92	$0.00
STIP: Interregional Road/Intercity Rail (ITIP)	Assumption Base: 2020 STIP FE and estimate of gas tax revenue Distribution Base: Bay Area historical share of total funds	$0.71	$0.77	$0.30	$0.46	$0.00
Trade Corridor Enhancement	Assumption Base: Senate Bill 1 program revenue Distribution Base: Bay Area receives 20% of funds	$0.00	$2.68	$1.11	$1.56	$0.00
Transit and Intercity Rail	Assumption Base: $2.9 billion per year in Cap and Trade auction proceeds + Senate Bill 1 program revenue Distribution Base: Bay Area receives	$3.00	$6.35	$2.74	$3.61	$0.00
University Research	Assumption Base: Bay Area population share of prescribed statewide set-aside from the Road Maintenance and Rehabilitation Account	$0.00	$0.04	$0.02	$0.02	$0.00
Workforce Development	Assumption Base: Bay Area population share of prescribed statewide set-aside from the Road Maintenance and Rehabilitation Account	$0.00	$0.03	$0.01	$0.01	$0.00
State Total	**State Total**	**$47.99**	**$91.9**	**$38.5**	**$51.8**	**$1.6**
REGIONAL						
2% Toll Revenues	Base Year: FY 2018-19 Source: BATA Growth Rate: 0.3%-0.6%	$0.10	$0.12	$0.06	$0.06	$0.00
5% State General Funds	Base Year: FY 2018-19 Source: BATA Growth Rate: 0.3%-0.6%	$0.09	$0.12	$0.05	$0.06	$0.00
Active Transportation Program (ATP) - Regional Program	Assumption Base: FY 2017-18 Distribution Base: Bay Area share based on ATP formula	$0.31	$0.57	$0.26	$0.31	$0.00
AB 1107 ½-cent Sales Tax in three BART counties (25% MTC Administered Share)	Assumption Base: Weighted average of county sales tax authority estimates for the three counties of the BART District	$2.61	$4.68	$1.84	$2.84	$0.00

Revenue Source	Plan Bay Area 2050 Revenue Assumptions	PBA 2040 (For Reference -- 24 Year Forecast)	Plan Bay Area 2050 Total Revenue	Revenue Bucket 1 FY 2021 - FY 2035	Revenue Bucket 2 FY 2036 - FY 2050	Revenue Bucket 3 Flexible Availability
AB 1107 ½-cent Sales Tax in three BART Counties (75% BART Share)	Assumption Base: Weighted average of county sales tax authority estimates for the three counties of the BART District	$8.67	$14.03	$5.51	$8.51	$0.00
AB 1171	Base Year: FY 2018-19 Source: BATA Growth Rate: 0.3%-0.6%	$0.10	$0.54	$0.27	$0.27	$0.00
AB 434 (Transportation Fund for Clean Air – Regional) – 60% of funding	Base Year: FY 2018-19 Source: DMV data Growth Rate: MTC estimate based on Vehicle Registration data	$0.37	$0.46	$0.23	$0.23	$0.00
AB 664	Base Year: FY 2018-19 Source: BATA Growth Rate: 0.3%-0.6%	$0.38	$0.49	$0.24	$0.25	$0.00
BATA Base Toll Revenues	Base Year: FY 2018-19 Source: BATA Growth Rate: 0.3%-0.6%	$3.60	$4.63	$2.25	$2.39	$0.00
Regional Measure 3 (RM3)	Base Year: FY 2018-19 - Assumes indexing of toll after 2025 Source: BATA Growth Rate: 0.3%-0.6%	$5.10	$14.47	$5.73	$8.75	$0.00
Regional Express Lane Network Revenues	Model based on MTC's 2011 CTC application for the Express Lanes system	$5.08	$9.85	$2.26	$7.59	$0.00
Regional Measure 2 (RM2)	Base Year: FY 2018-19 Source: BATA Growth Rate: 0.3%-0.6%	$3.18	$4.08	$1.98	$2.10	$0.00
RM1 Rail Extension Reserve	Base Year: FY 2018-19 Source: BATA Growth Rate: 0.3%-0.6%	$0.05	$0.37	$0.18	$0.19	$0.00
Service Authority for Freeway and Expressways (SAFE)	Base Year: FY 2018-19 Source: DMV data Growth Rate: MTC estimate based on Vehicle Registration data	$0.15	$0.19	$0.10	$0.10	$0.00
Seismic Surcharge with Carpool	Base Year: FY 2018-19 Source: BATA Growth Rate: 0.3%-0.6%	$3.43	$4.41	$2.15	$2.27	$0.00
Seismic Retrofit Account (Caltrans)	Base Year: FY 2018-19 Source: BATA Growth Rate: 0.3%-0.6%	$3.18	$4.08	$1.98	$2.10	$0.00
Seismic Retrofit	Base Year: FY 2018-19 Source: BATA Growth Rate: 0.3%-0.6%	$3.18	$4.08	$1.98	$2.10	$0.00
Regional Total	**Regional Total**	**$39.56**	**$67.2**	**$27.1**	**$40.1**	**$0.0**
LOCAL						
AB 434 (Transportation Fund for Clean Air – County Program Manager) – 40% of funding	Base Year: FY 2018-19 Source: DMV data Growth Rate: MTC estimate based on Vehicle Registration data	$0.26	$0.31	$0.15	$0.15	$0.00
County Sales Tax Measures	Estimates provided by county sales tax authorities	$33.15	$56.86	$30.72	$26.13	$0.00
County Sales Tax Measures - Reauthorizations	Estimates provided by county sales tax authorities	$5.98	$22.71	$0.94	$21.77	$0.00
County Vehicle Registration Fees	Base Year: FY 2018-19 Source: DMV data Growth Rate: MTC estimate based on Vehicle Registration data	$1.02	$1.21	$0.66	$0.55	$0.00

Revenue Source	Plan Bay Area 2050 Revenue Assumptions	PBA 2040 (For Reference -- 24 Year Forecast)	Plan Bay Area 2050 Total Revenue	Revenue Bucket 1 FY 2021 - FY 2035	Revenue Bucket 2 FY 2036 - FY 2050	Revenue Bucket 3 Flexible Availability
County Vehicle Registration Fees - Reauthorization	Base Year: FY 2018-19 Source: DMV data Growth Rate: MTC estimate based on Vehicle Registration data	$0.03	$0.10	$0.00	$0.10	$0.00
Express Lane Revenue (county managed)	Revenue forecast will be updated based on county managed express lane projects included in Plan Bay Area 2050	$3.61	TBD	TBD	TBD	$0.00
Golden Gate Bridge Toll	Estimates based on data from the Golden Gate Bridge, Highway and Transportation District	$3.43	$5.59	$2.77	$2.82	$0.00
Local Funding for Streets and Roads	Source: 2018 CA Statewide Local Streets & Roads Needs Assessment.	$14.76	$24.97	$10.47	$14.51	$0.00
Property Tax/Parcel Taxes	Base Year: FY 2018-19 Data Source: AC Transit, BART, Marin Transit, WETA	$5.42	$10.85	$4.02	$6.84	$0.00
San Francisco Municipal Transportation Agency (SFMTA) General Fund and Parking/Fine Revenues	Estimates based on data from the SFMTA	$10.10	$33.35	$13.33	$20.02	$0.00
San Francisco Transportation Sustainability Fee	Estimates based on data from the City and County of San Francisco	$0.80	$0.43	$0.21	$0.21	$0.00
SMART Sales Tax in Marin and Sonoma Counties	MTC estimate based on weighted averages of Marin and Sonoma sales tax revenue as forecast by TAM and SCTA	$0.54	$0.37	$0.37	$0.00	$0.00
SMART Sales Tax in Marin and Sonoma Counties - Reauthorization	MTC estimate based on weighted averages of Marin and Sonoma sales tax revenue as forecast by TAM and SCTA	$0.64	$1.51	$0.40	$1.11	$0.00
Transit Fare Revenues	Base Year: FY 2018-19 Data Source: Each operator Growth Rate: Based on operators' estimates	$39.78	$52.89	$20.57	$32.32	$0.00
Transit Non-Fare Revenues	Base Year: FY 2018-19 Data Source: Each operator Growth Rate: Based on operators' estimates	$19.96	$12.08	$4.60	$7.48	$0.00
Transportation Development Act (TDA)	Estimates based on sales tax forecasts developed by county sales tax authorities (for Solano County is based on a ten year retrospective analysis of actual TDA receipts)	$12.58	$20.16	$8.03	$12.13	$0.00
Local Total	**Local Total**	**$155.86**	**$243.4**	**$97.3**	**$146.1**	**$0.0**

Revenue Source	Plan Bay Area 2050 Revenue Assumptions	PBA 2040 (For Reference -- 24 Year Forecast)	Plan Bay Area 2050 Total Revenue	Revenue Bucket 1 FY 2021 - FY 2035	Revenue Bucket 2 FY 2036 - FY 2050	Revenue Bucket 3 Flexible Availability
ANTICIPATED/UNSPECIFIED						
Anticipated/Unspecified	Growth Rate: 2.2% Data Source: Retrospective analysis of a 15 year period (FY 2005-06 to FY 2019-20)	$14.00	$23.48			$23.48
Anticipated/Unspecified Total	**Anticipated Total**	**$14.00**	**$23.5**	**$0.0**	**$0.0**	**$23.5**
OTHER/OPTIONAL NEW REVENUE						
Optional/Megameasure	Assumes a 1% sales tax in all nine counties, starting in FY 2024-25. Estimates based on sales tax forecasts developed by county sales tax authorities (for Solano County is based on a ten year retrospective analysis of actual TDA receipts)		$72.77	$24.91	$47.87	$0.00
2020 Ballot Measures, Pricing, and Toll Projects	Revenue forecast will be updated based on 2020 ballot measures and pricing and toll facility projects included in Plan Bay Area 2050	$13.57	TBD	TBD	TBD	TBD
Other Total	**Other Total**	**$13.57**	**$72.8**	**$24.9**	**$47.9**	**$0.0**
GRAND TOTAL without Optional	**Grand Total without Megameasure**	**$299.57**	**$471.7**	**$176.7**	**$258.8**	**$36.2**
GRAND TOTAL with Optional	***Grand Total with Megameasure***	***$299.57***	***$544.4***	***$201.6***	***$306.7***	***$36.2***

PLAN BAY AREA 2050

Draft Needs & Revenue Assessments

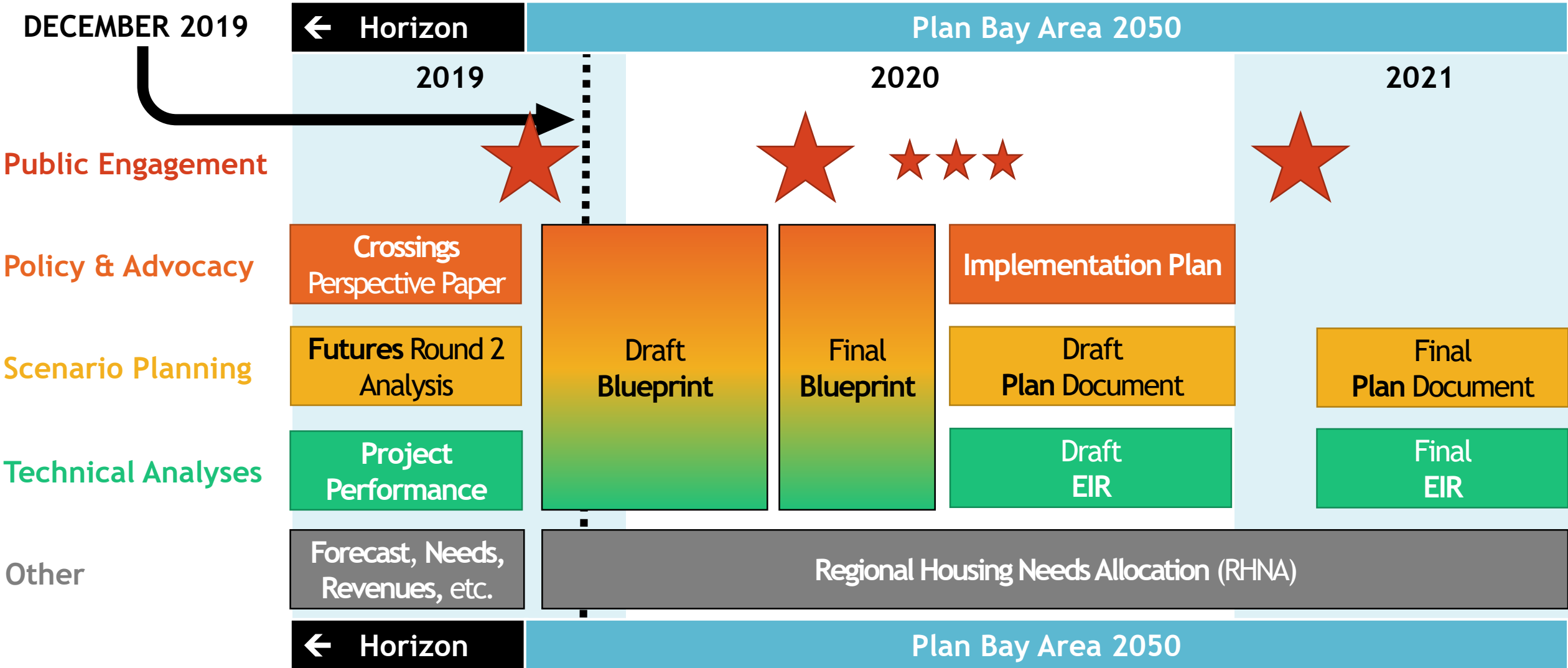
Transportation O&M: William Bacon

Affordable Housing: Dave Vautin

Resilience: Rachael Hartofelis

December 2019

Plan Bay Area 2050 Schedule



Needs and Revenue: Objectives & Definitions

Objectives: to understand the unconstrained financial needs related to critical expenditure categories for Plan Bay Area 2050, as well as baseline available revenues.

What do we mean by "financial needs"?

- *Transportation:* investment needed to operate and maintain the *existing* (publicly owned) transportation system
- *Resilience:* investment needed to protect existing infrastructure and communities from hazards
- *Housing:* investment needed to ensure low-income households have an affordable housing option

What do we mean by "baseline available revenues"?

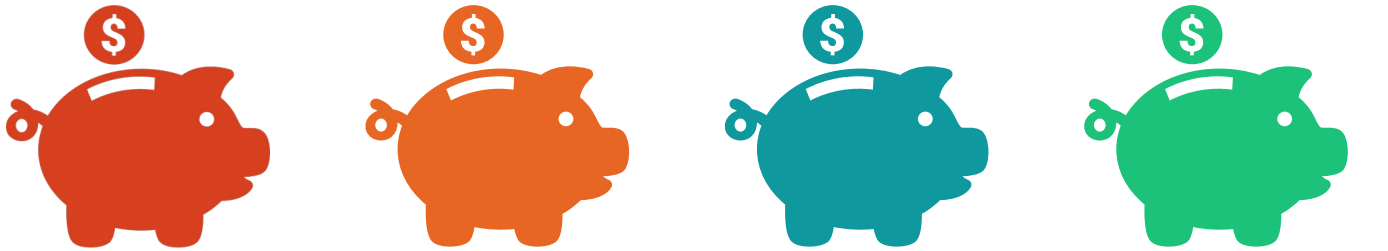
- Revenue from local, regional, state, and federal sources that are reasonably expected to be available over the Plan period

Needs and Revenue: Scope of Work

- **No assessment of baseline needs and revenue will capture everything.** Not every critical investment is reflected here; for example, resilience investments go beyond preparing for sea level rise and earthquakes. That being said, we feel it is important to create a "version 1.0" for these critical topic areas.
- **The future is uncertain.** As explored in Horizon, future needs and revenues could be influenced by external forces beyond our control. Despite the uncertainty of the world today, we are doing our best to come up with a likely estimate based on information available today.
- **Consistency is key.** All needs and revenue data is shown in year-of-expenditure dollars with an escalation rate of 2.2%.

Needs and Revenue: The Role of "New Revenues"

Transportation | Housing | Economy | Environment



Plan Bay Area 2050 **Blueprint Basic**
Includes projected available revenues, but does not include New Revenues from future regional measures

Plan Bay Area 2050 **Blueprint Plus**
Includes projected available revenues + additional New Revenues distributed to one or more topic areas of the Plan

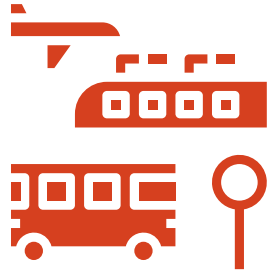
This approach will provide more flexibility over the next year, should the MTC/ABAG boards wish to integrate new revenues to create a more aspirational Plan.

Either could be adopted as the Preferred Alternative in 2020 or 2021.

Important Caveat:

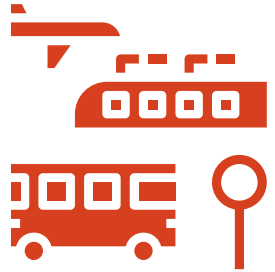
All needs and revenue estimates are in **draft** form at this early stage of Plan Bay Area 2050.

Transportation Needs Methodologies



- **Local street & road and bridge** maintenance needs were estimated using StreetSaver®, a pavement management system used by all Bay Area jurisdictions in combination with input and estimates from the 2018 California LSR Needs Assessment.
- **Bicycle/pedestrian and other non-pavement infrastructure** maintenance needs estimated using StreetSaver® and prediction models for accompanying local street and road infrastructure
- **Regional bridge** needs were estimated using the Bay Area Toll Authority's bridge maintenance, rehab, and replacement schedules and cost estimates.
- **State highway and bridge** needs were estimated using information for District 4 (San Francisco Bay Area) in Caltrans' 2019 State Highway System Management Plan and Fiscal Year 2019/20 Project Book.

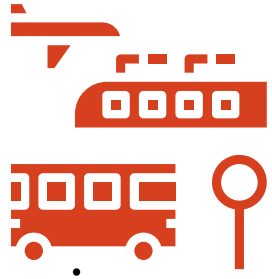
Transportation Needs Methodologies



- **Transit capital** maintenance needs were developed using the Regional Transit Capital Inventory – an inventory of every public transit asset in the region- and TermLite, a software that models the cost of replacing transit assets over time based on the assets' useful life. Assumes replacement of existing bus fleet with zero emission buses in compliance with CARB's Innovative Clean Transit Regulation. Assumes in-kind replacement, without major upgrade, of other assets.

- **Transit operating** needs are estimated using information provided by the region's public transit operators on the cost of maintaining today's current level of service (16.8 million service hours per year) over the Plan period.

Transportation Summary



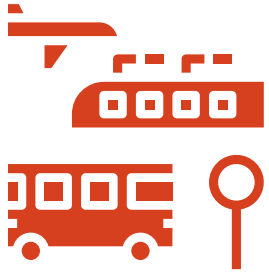
- **$426 billion** to improve and maintain the system in a state of good repair
- **$392 billion** to prevent further deterioration / maintain existing conditions

30-Year Transportation Operations and Capital Maintenance Needs (in billions of $YOE)

	Local Streets, Roads,& Local Bridges	Regional Bridges	State Highway & Bridge	Transit Capital	Transit Operating	Total Operations and Capital Maintenance Needs
Maintain Existing Conditions	$64.4	$21.9	$24.4	$63.0	$217.8	$391.5
State of Good Repair	$71.0	$21.9	$24.4	$88.1	$217.8	$423.2

Note: Two condition scenarios could only be calculated for Local Streets, Roads, and Local Bridges, and Transit Capital

Looking Back at Plan Bay Area 2040



- PBA 2050 includes ten additional years at the back end of the Plan
- 33% increase in transit service hours in PBA 2050 (12.6 million hr/year to 16.8 million hr/year).
- 6% increase in annual need to maintain local streets, mostly due to higher material + labor costs
- Approx. $10 billion (YOE$) in additional transit capital assets added to regional inventory since PBA 2040

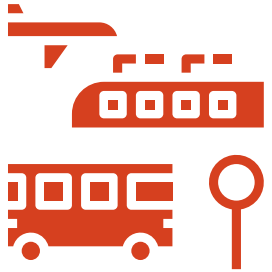
Transportation Operations and Capital Maintenance Needs (in billions of $YOE)

PBA 2050: 30-Years (2021-2050) | PBA 2040: 24-Years (2017-2040)

		Local Streets, Roads,& Local Bridges	Regional Bridges	State Highway & Bridge	Transit Capital	Transit Operating	Total Operations and Capital Maintenance Needs
Maintain Existing Conditions	PBA 2050	$64.4	$21.9	$24.4	$63.0	$217.8	$391.5
	PBA 2040	***$45.1***	***$14.0***	***$20.0***	***$28.9***	***$119.8***	***$227.8***
State of Good Repair	PBA 2050	$71.0	$21.9	$24.4	$88.1	$217.8	$423.2
	PBA 2040	***$51.1***	***$14.0***	***$20.0***	***$47.0***	***$119.8***	***$251.9***

Note: Two condition scenarios could only be calculated for Local Streets, Roads, and Local Bridges, and Transit Capital

Transportation Revenue



- **Key Revenue Assumptions**
  - Inflation = 2.2%
  - Fuel price and consumption = CARB model (may change)
  - Federal funds growth rate = 2% through FY 2029 and 3% thereafter
  - Sales tax growth = Tied to sales tax authority provided assumptions
- **New to Revenue Forecast**
  - Revenue Buckets by time period
  - New Revenues *(Optional)*

Transportation Revenue

Draft Plan Bay Area 2050 Revenue (in billions of Year of Expenditure $)

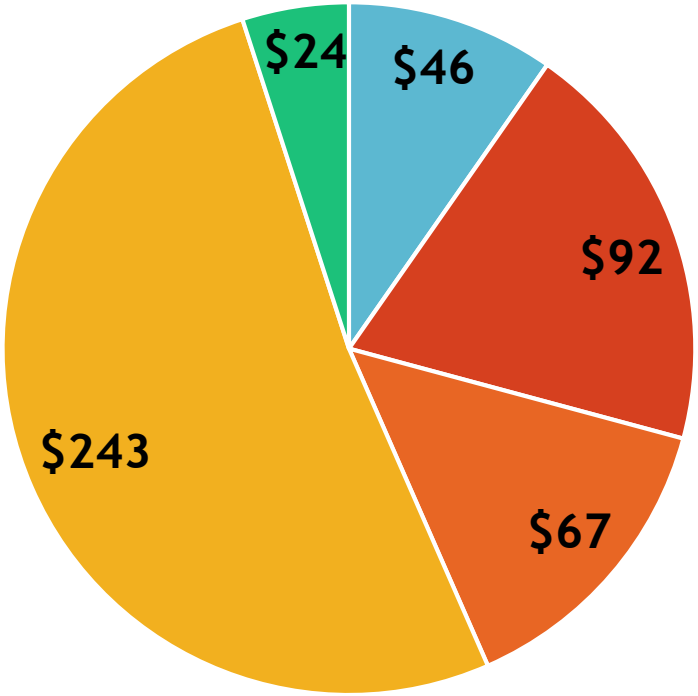
Revenue Source	Total Revenue
Federal Funds	$45.8
State Funds	$91.9
Regional Funds	$67.2
Local Funds	$243.4
Anticipated	$23.5
New Revenues	$72.8
TOTAL without New Revenues	**$471.7**
TOTAL with New Revenues	***$544.4***

Note: Numbers may not sum not sum due to rounding.

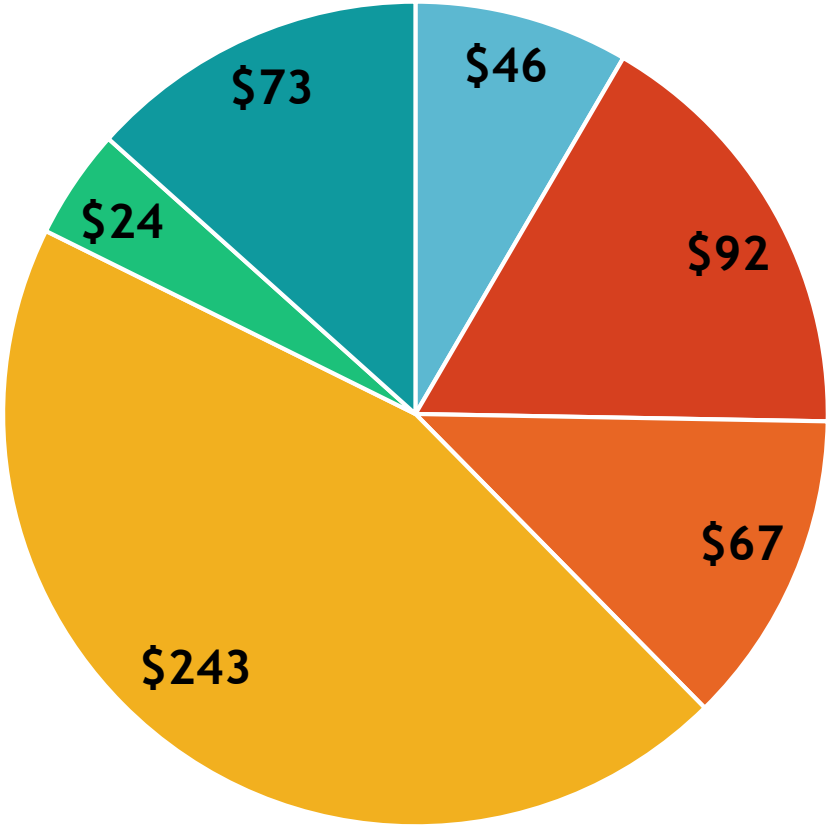
Transportation Revenue

Draft Plan Bay Area 2050 Revenue (in billions of Year of Expenditure $)

$472 Billion
Total without New Revenues



$544 Billion
Total *with New Revenues*



Federal Funds | State Funds | Regional Funds | Local Funds | Anticipated | Other/Megameasure

Needs and Revenue

Affordable Housing Overview

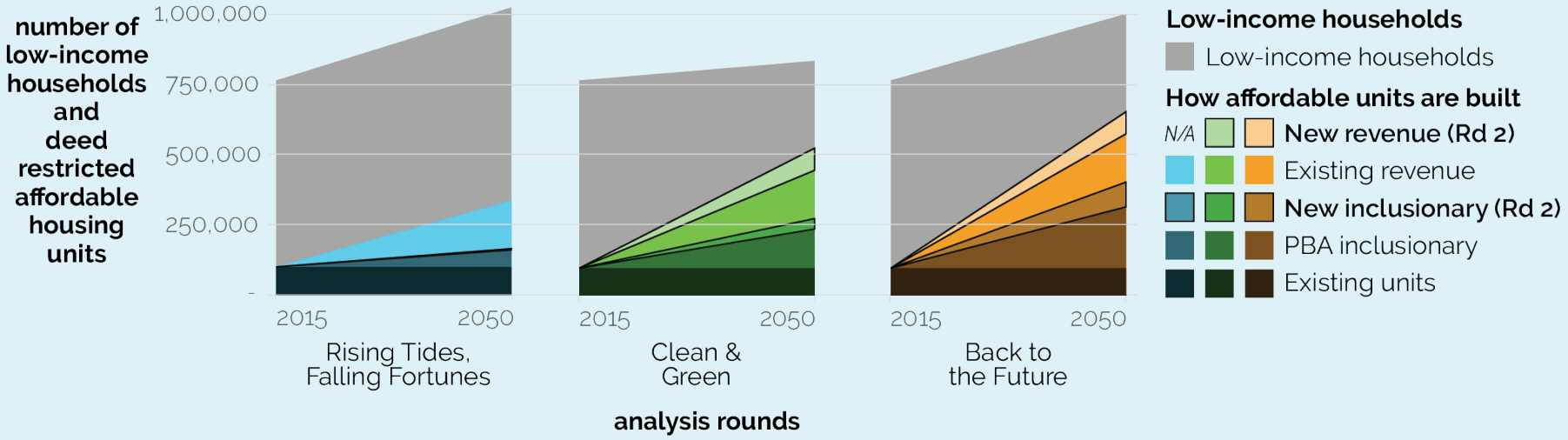
- **Key caveat:** this is the first time MTC/ABAG has conducted a Needs & Revenue Assessment for affordable housing; we expect these draft estimates to be further refined this cycle and in future cycles of the long-range plan.
- **Goal:** identify the gap between existing affordable housing and future needs for low-income households, building upon work from the CASA effort.
- **Note:** low-income households are defined as those earning less than $45,000, who are least likely to be served by market-rate development.

Building Upon Work from…

HORIZON

Futures Analysis
Rounds 1 & 2

Number of deed restricted affordable housing units and the number of low-income households



Affordable Housing Needs Methodology

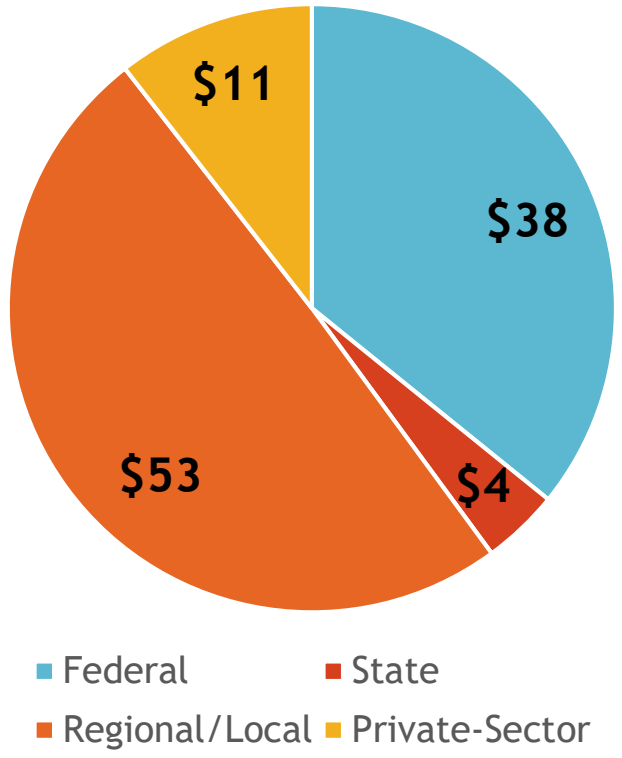
- There are **roughly 100,000 existing deed-restricted affordable housing units** in the Bay Area today. *(source: NPH/CHPC)*
- As of 2020, we expect there will be approximately 766,000 low-income households* in the Bay Area - **an existing gap** of 666,000 deed-restricted units**.
- Between 2020 and 2050, we expect there will be an additional 70,000 low-income households added to the Bay Area* - **yielding a combined gap of 736,000 deed-restricted units by 2050.**
- **A per-unit subsidy of $450,000** - which could come from a variety of different existing and future revenue sources - was assumed to estimate associated financial needs. *(source: CASA)*

* The analysis uses the growth forecast for the Clean and Green Future from Horizon as a placeholder until the Draft Regional Forecast is released.
** Assuming that all low-income households live in a deed-restricted unit by 2050.

Affordable Hsg. Revenue Methodology

- **Sources integrated into the affordable housing revenue forecast include:**
  - **Federal:** Low-Income Housing Tax Credits, Housing Trust Fund, Section 8 Vouchers, Home Investment Partnership Program, Community Development Block Grants
  - **State:** Affordable Housing & Sustainable Communities Program, State Housing Bonds
  - **Regional/Local:** Bonds and Impact Fees; Transit-Oriented Affordable Housing Program; Bay Area Preservation Pilot (Does not include new revenue authorized by AB 1487)
  - **Private-Sector:** Inclusionary Zoning; Funding from Major Employers
- While most funding sources were estimated to grow at the rate of inflation, federal housing programs were estimated to grow more slowly (at a rate of one percent per year), given recent relative uncertainty about federal support in the decades ahead.
- **Estimated affordable housing revenues total $107 billion between 2021 and 2050, whereas estimated affordable housing needs total $473 billion** - a substantial funding gap that could be partially met through New Revenues to be generated on the state or regional levels.

Existing Housing Revenues
(in billions of $YOE through 2050; DRAFT)



Needs and Revenue

Resilience Overview

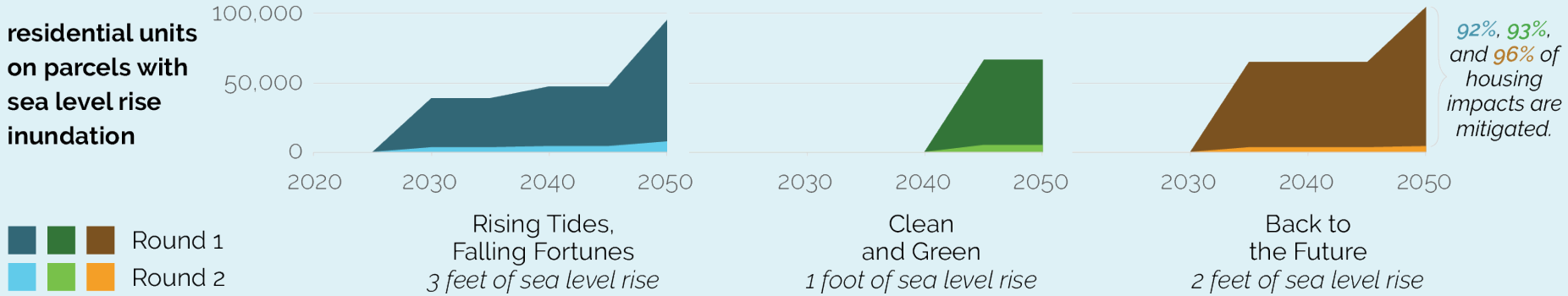
- **Key caveat:** this is the first time MTC/ABAG has conducted a Needs & Revenue Assessment for environmental resilience; we expect these draft estimates to be further refined this cycle and in future cycles of the long-range plan.
- Therefore, the Resilience Needs & Revenue Assessment focuses on two specific high-priority resilience issue areas:
  - **Sea Level Rise** *(focus on protecting most of the region's shoreline through 2050)*
  - **Earthquakes** *(focus on residential buildings, given recent investments in transportation infrastructure)*

Building Upon Work from…

HORIZON

Futures Analysis
Rounds 1 & 2

Residential sea level rise impacts in Futures round 1 (without adaptation) and round 2 (with adaptation)



Resilience Needs Methodologies

Sea Level Rise (SLR)

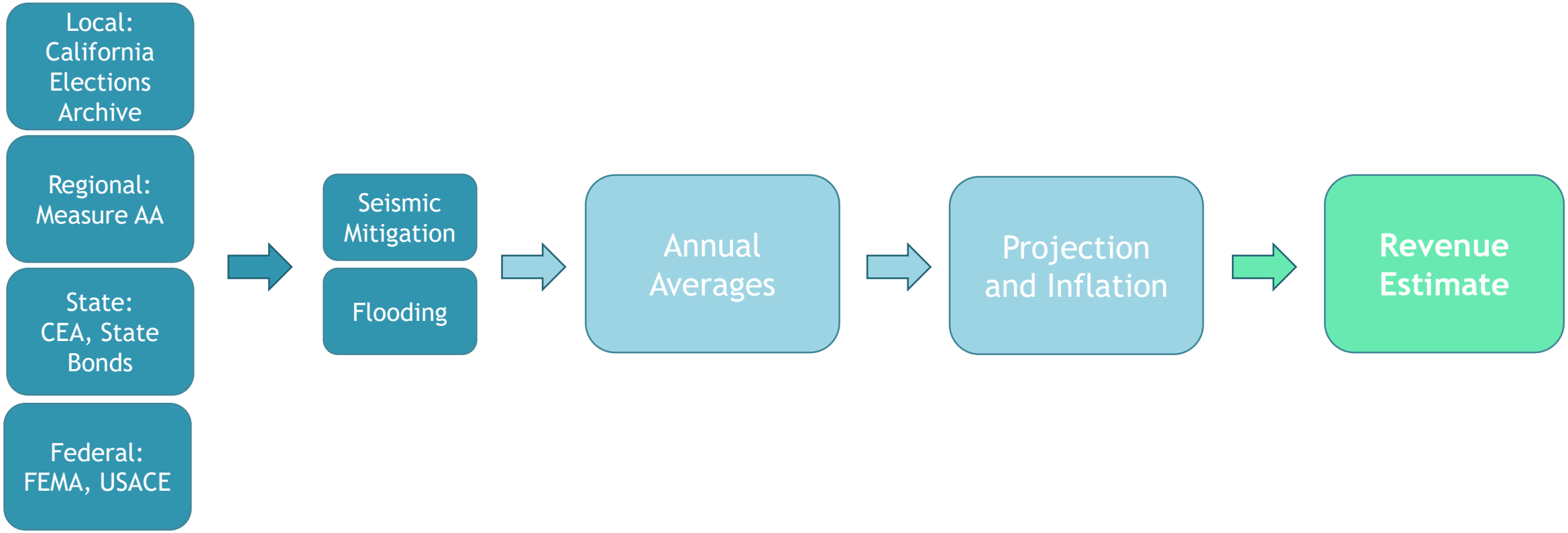
- Strategies include both “gray infrastructure” (seawalls, levees, etc.) and “green infrastructure” (marsh restoration, etc.).
- Sea level rise protection height is based upon two feet of permanent inundation and one foot of temporary flooding from a storm. BCDC’s ART Bay Shoreline Flood Explorer was used to identify areas of inundation.

Resilience Needs Methodologies

Earthquakes

- No regional structural dataset is available, so high level estimates were created with existing building data. Estimates were determined by UrbanSim.
- Vulnerable types include structures with cripple walls, soft stories, and/or house/room over garage.

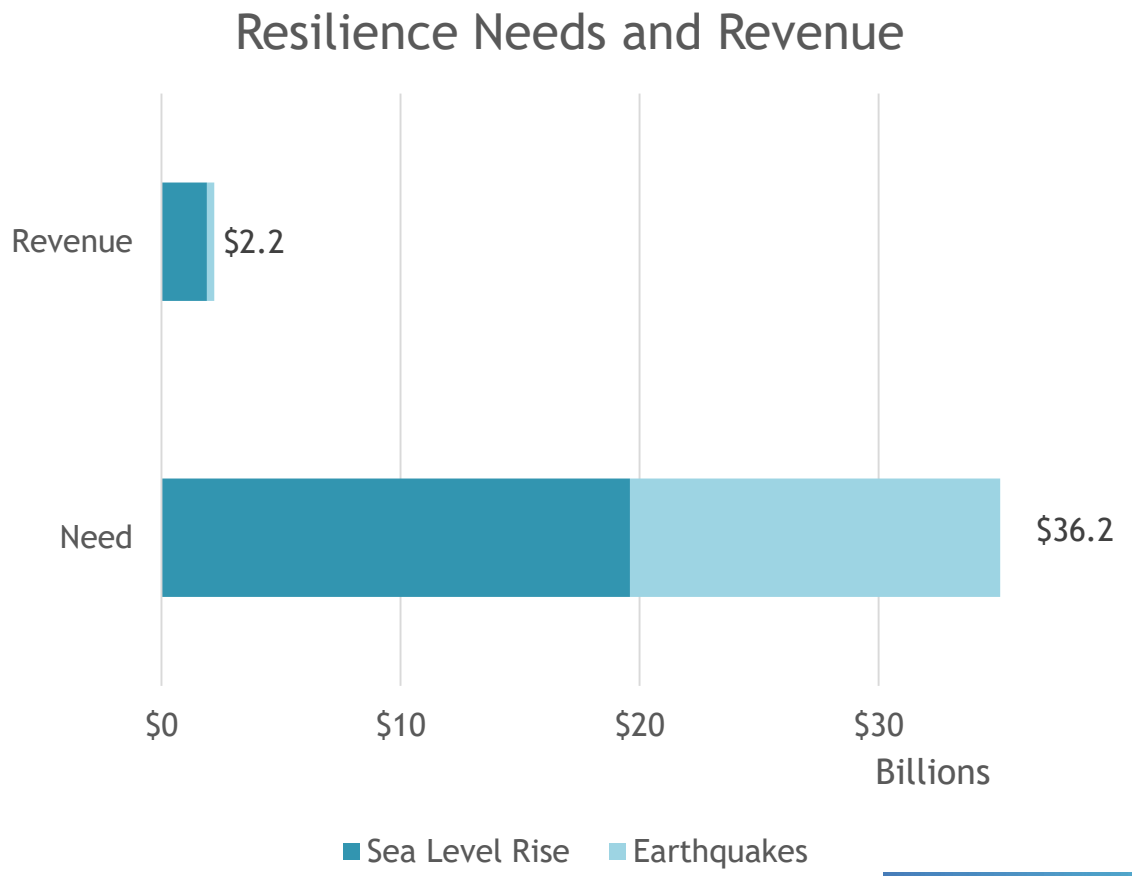
Resilience Revenue Methodology



- Revenue sources are limited to only the most cohesive datasets.
- State revenues, including for CEA and state bonds, assume that the region sees a share of funding proportional to its population (~20%).

Resilience Summary

- There is a major gap between the needs and revenue for both earthquakes and sea level rise. **An estimated $34 billion is needed to close this gap through year 2050.**
- **Local and regional efforts will be critical to financing resilience.** Measure AA, while modest, is projected to be one of the most significant funding sources for the region's Sea Level Rise effort. Furthermore, the region has a history of locally raising significant bond and tax initiatives for these risks.
- **There are additional needs that are not able to be quantified at this time.** For example, there remain seismic needs for certain infrastructure, sea level rise could cause more riverine flooding that's not captured, etc.



Category		*All costs are in billions of YOE dollars*		
		Anticipated Revenue[1]	Anticipated Needs	Anticipated Gap
	Public Transit Operations	$472 billion	$218 billion	N/A
	Public Transit State of Good Repair[2]		$88 billion	
	Local Streets & Bridges State of Good Repair[2]		$71 billion	
	Highways State of Good Repair		$24 billion	
	Bridges State of Good Repair		$22 billion	
	Affordable Housing[3]	$107 billion	$473 billion	$365 billion
	Sea Level Rise Adaptation	$2 billion	$20 billion	$18 billion
	Seismic Mitigation[4]	<$1 billion	$17 billion	$17 billion
TOTAL		**$581 billion**	**$933 billion**	

Technical Footnotes:

1. *Revenue column aligns with Blueprint Basic, which does not include New Revenues for transportation, housing, or resilience.*
2. *Need reflects funding to get to an ideal state of good repair, rather than simply maintaining existing conditions.*
3. *Need reflects funding to provide deed-restricted affordable housing to all low-income households by year 2050.*
4. *Need is focused solely on residential buildings.*