Metropolitan Transportation Commission and the Association of Bay Area Governments
Joint MTC Planning Committee with the ABAG Administrative Committee

November 8, 2019 **Agenda Item 5a**

Horizon / Plan Bay Area 2050: Draft Project Performance Assessment Results

Subject: Presentation on the draft results from the Project Performance Assessment, which evaluated 93 projects against the three Futures to determine their cost-effectiveness, equity impacts, and alignment with Guiding Principles.

Background: The Project Performance Assessment has historically provided a key lens to understand the benefits and limitations of major infrastructure projects as we develop the regional plan; this cycle has incorporated substantive improvements to better capture resilience and equity in the assessment framework. The Horizon/Plan Bay Area 2050 Project Performance Assessment evaluates three primary types of transportation projects: capacity-increasing investments, operational strategies, and resilience projects to address sea level rise and seismic hazards. Committed projects—those that have full funding plans and environmental clearance—are exempt from project performance and were included in the analysis baseline. Uncommitted projects subject to assessment—generally capacity-increasing investments with total costs greater than $250 million—were all evaluated using a consistent evaluation methodology.

Methodology

Developed between summer 2018 and winter 2019 with input from working groups and committees, the methodology builds upon Plan Bay Area (2013) and Plan Bay Area 2040 (2017). All projects were evaluated consistently using three assessment types, identified below, with the results summarized in **Attachment A**.

1. **Benefit-Cost Assessments** (quantitative using Travel Model 1.5)
   Compares societal benefits against anticipated project costs under three different Futures.
2. **Equity Assessments** (quantitative using Travel Model 1.5)
   Examines distributive impacts of project-level accessibility benefits across income groups under three different Futures.
3. **Guiding Principles Assessment** (qualitative)
   Evaluates alignment with Horizon's five Guiding Principles using specific project-focused criteria, flagging areas of potential concern.

While the Project Performance Assessment is more robust than prior cycles, it should be noted that all models and analyses have limitations. This analysis reflects our best effort to provide a data-driven lens on how projects perform, but it is not the only consideration when crafting the fiscally-constrained Plan.

Initial Findings

Highlights from the analysis findings to-date are included in **Attachment F.** The draft Project Performance Assessment results include 77 of the 93 projects analyzed. Remaining projects will be analyzed in November and integrated into the final findings, slated for release at the end of the year.

Next Steps

Results for Transformative Projects submitted by the public, as well as any other projects that require additional evaluation, will be released after November. Project Performance will remain in draft form through the end of 2019 as we work towards next steps and integration with the Plan Bay Area 2050 Blueprint, which will include identification of high-performing projects and collaboration sessions with other project sponsors.

Issues: MTC is in the midst of developing Plan Bay Area 2050, the Bay Area's long-range fiscally-constrained plan for transportation, housing, the economy, and the environment. It is not feasible to include all of the proposed transportation investments using the region's forecasted revenues, even if new revenues become available. Fiscal constraint necessitates prioritization of investment priorities, which will be informed by MTC's ongoing Project Performance Assessment, as well as parallel work on strategies via the recently-completed Futures Planning effort.

Recommendation: In prior cycles of Plan Bay Area, MTC has used the Project Performance Assessment to identify outliers - both positive and negative - in order to inform the development of the regional plan's transportation investment strategy. Criteria were established to group projects into a status of low-, medium-, or high-performing. Project sponsors of low-performing projects were required to present a "compelling case" to the Commission in order to include their respective project into the fiscally-constrained regional plan, whereas high-performing projects were prioritized for their inclusion.

MTC remains committed to using performance data to inform key decisions in the context of the fiscally-constrained Plan Bay Area 2050. However, we are considering a fresh approach to move forward that focuses on finding solutions to projects' performance deficiencies, rather than requiring a "compelling case" for such projects.

For high-performing projects, MTC will work with Plan stakeholders to identify the appropriate criteria to identify the highest-performing projects. This will include cost-effectiveness across multiple Futures, support for social equity goals, and alignment with the Guiding Principles. This process will help showcase the projects that performed the best in the Project Performance Assessment so that these projects are strongly considered for inclusion when crafting the transportation component of the Plan Bay Area 2050 Draft Blueprint. Staff will propose a definition for high-performing projects in December or January for Commission approval.

For the remaining projects, staff is exploring alternative approaches focused on actions to boost a project's relative performance. Depending on the performance results, these solutions may take the form of complementary transportation strategies – like pricing or safety enhancements – as well as land use strategies or equity mitigations. As we begin to consider various project investments in the fiscally-constrained Plan, we would like to engage with each CTA, transit operator, and project sponsor in a collaborative dialogue to identify the appropriate supportive strategies to boost project performance to achieve a resilient, equitable and cost-effective Blueprint for Plan Bay Area 2050.

Attachments:
Attachment A: Overall Summary Table *(Draft)*
Attachment B: Guiding Principles & Equity Summary Table *(Draft)*
Attachment C: Detailed Table of Guiding Principle Flags *(Draft)*
Attachment D: Detailed Table of Lifecycle Benefits by Future *(Draft)*
Attachment E: Detailed Table of Lifecycle Costs *(Draft)*
Attachment F: Presentation

Therese W. McMillan

Horizon/Plan Bay Area 2050: Draft Project Performance Findings
Attachment A: Overall Summary Table
Benefit-Cost Ratios and Equity Scores across Three Futures, and Guiding Principle Flags

Note 1: Total number of rows: 93; 81 projects from public agencies, 12 projects from public/NGOs that were jury finalists from the Transformative Projects process
Note 2: Findings are not shown for 4 agency projects and 12 transformative projects due to modeling or cost estimation work underway.
Some projects are marked with an asterisk (*) to indicate that a cost review is ongoing and that the findings may be revised by end of 2019 with updated costs.
Some projects are marked with (^) to indicate that findings may be updated, in order to provide additional time for feedback from Sonoma County agencies directly affected by recent wildfire events.
(see notes on methodology at the bottom of the page)

							Benefit-Cost Ratio			Equity Score		
Project Type	Project ID	Row ID	Project	Project Source	Lifecycle Cost	Guiding Principle Flags	Rising Tides Falling Fortunes	Clean and Green	Back to the Future	Rising Tides Falling Fortunes	Clean and Green	Back to the Future
Build Core Rail	1004	1	New San Francisco-Oakland Transbay Rail Crossing - Commuter Rail (Crossing 5)	Crossings Study	$46.1B	2	0.7	2	2	Even	Even	Even
	1007	2	New San Francisco-Oakland Transbay Rail Crossing - BART + Commuter Rail (Crossing 7)	Crossings Study	$83.5B	2	0.6	1	1	Even	Even	Even
	1002	3	New San Francisco-Oakland Transbay Rail Crossing - BART (Crossing 3: Mission St)	Crossings Study	$36.2B	0	0.6	1	1	Even	Even	Even
	1003	4	New San Francisco-Oakland Transbay Rail Crossing - BART (Crossing 4: New Markets)	Crossings Study	$37.4B	0	0.6	1	1	Even	Even	Even
	2300	5	Caltrain Downtown Extension	TJPA	$4.8B	0	<0.5	0.7	0.6	Challenges	Challenges	Challenges
	2205	6	BART to Silicon Valley (Phase 2)	VTA	$6.0B	0	<0.5	<0.5	0.6	Advances	Advances	Even
	2310	7	Megaregional Rail Network + Resilience Project (Caltrain, ACE, Valley Link, Dumbarton, Cap Cor)	City of San Jose	$54.1B	2	<0.5	0.5	<0.5	Challenges	Challenges	Challenges
	2306	8	Dumbarton Rail (Redwood City to Union City)	SamTrans + CCAG	$3.9B	0	<0.5	<0.5	0.5	Even	Even	Challenges
	2208	9	BART Gap Closure (Millbrae to Silicon Valley)	VTA	$40.4B	0	<0.5	<0.5	<0.5	Advances	Advances	Even
	6002	10	SMART to Richmond via New Richmond-San Rafael Bridge *	Public/NGO Submission		2	cost estimation and modeling in progress			modeling in progress		
Extend Rail Network - High Cost	2308	11	Valley Link (Dublin to San Joaquin Valley)	TVSJVRRA	$3.0B	0	<0.5	1	1	Even	Even	Even
	2206	12	BART Extension from Diridon to Cupertino	VTA	$12.1B	0	<0.5	<0.5	<0.5	Even	Advances	Even
	2203	13	BART to Hercules & I-80 Bus from Vallejo to Oakland	CCTA	$5.8B	0	<0.5	<0.5	<0.5	Challenges	Challenges	Challenges
	2207	14	BART Extension from Diridon to Gilroy (replacing existing Caltrain)	VTA	$17.7B	1	<0.5	<0.5	<0.5	Even	Advances	Even
	2204	15	BART on I-680 (Walnut Creek to West Dublin/Pleasanton)	Caltrans	$11.0B	0	<0.5	<0.5	<0.5	Even	Even	Even
	2307	16	ACE Service Expansion and Capital Improvements (to San Joaquin Valley)	ACE Rail		0	modeling in progress			modeling in progress		
	2309	17	Altamont Vision Phase 1 (to San Joaquin Valley)	ACE Rail		0	modeling in progress			modeling in progress		
Extend Rail Network - Low Cost	2305	18	SMART to Solano (Novato to Suisun City, without sea level rise protections) ^	SMART	$1.6B	0	<0.5	<0.5	<0.5	Even	Challenges	Challenges
	2202	19	BART DMU Extension to Brentwood	CCTA	$0.6B	0	<0.5	0.5	<0.5	Advances	Challenges	Challenges
	2304	20	SMART Extension to Cloverdale ^	SMART	$0.5B	0	<0.5	<0.5	<0.5	Challenges	Even	Challenges
Optimize Existing Transit Network - High Cost	2201	21	BART Core Capacity	BART	$4.5B	0	1	2	2	Even	Even	Even
	2303	22	Caltrain Full Electrification and Blended System: High Growth	VTA, City of San Jose	$36.9B	2	<0.5	1	0.5	Challenges	Even	Challenges
	2302	23	Caltrain Full Electrification and Blended System: Moderate Growth	Caltrain + HSR	$24.6B	2	<0.5	0.9	0.5	Challenges	Even	Challenges
	2001	24	AC Transit Local Rapid Network: Capital Improvements + Service Increase	AC Transit	$8.4B	0	<0.5	0.5	0.6	Advances	Advances	Even
	2005	25	Alameda County BRT Network + Connected Vehicle Corridors	ACTC	$4.0B	0	<0.5	<0.5	0.6	Advances	Advances	Even
	2410	26	VTA LRT Systemwide Grade Separation and Full Automation	City of San Jose	$14.8B	1	<0.5	<0.5	0.7	Advances	Advances	Even
	2407	27	Muni Metro Southwest M-Line Subway	SFCTA	$5.6B	0	<0.5	<0.5	<0.5	Advances	Advances	Challenges
	2409	28	VTA LRT Systemwide Grade Separation	VTA	$11.6B	0	<0.5	<0.5	0.5	Advances	Advances	Even
	2411	29	VTA LRT Systemwide Grade Separation, Network Expansion, and Full Automation	City of San Jose and VTA	$44.2B	0	<0.5	<0.5	<0.5	Advances	Advances	Even
	2301	30	Caltrain Full Electrification and Blended System: Base Growth	Caltrain + HSR	$20.9B	2	<0.5	<0.5	<0.5	Even	Even	Even
	2401	31	North San Jose LRT Subway	VTA	$4.9B	0	<0.5	<0.5	0.5	Even	Advances	Even

Lifecycle Costs: This includes initial capital cost, annual O&M costs, rehabilitation and replacements costs, and a residual value of the investment at the end of the analysis period, calculated using discounted present value methodology. Refer to Attachment D for details, and for costs as reviewed with sponsors.
Guiding Principle Flags: Flags, based on qualitative analysis, are intended to draw attention to a direct adverse impact a project may have that may not be captured as part of other assessments. Refer to Attachment C for details.
Benefit-Cost Ratio: All project impacts are measured against a uniform base transportation and land use network in each future, except Resilience projects, which are measured against a baseline where that asset is out of service (hence n/a in some futures). Costs and Benefits to determine the ratio are detailed in Attachment D and E.
For inter-regional projects, since we are only able to model Bay Area benefits, we multiplied the benefits by a factor to reflect the ratio of expected ridership from outside the region. Valley Link benefit multiplier: 3.3; Caltrain/HSR benefit multiplier: 1.3 (the HSR multiplier is applied in Clean and Green only, the future where HSR is completely built out).
Equity Score:
"Advances" indicates that the project may benefit lower income individuals (below regional median income) more than higher income individuals.
"Challenges" indicates that project benefits skew towards higher income individuals.
"Even" indicates even distribution of benefits for all income groups.
Note on Bicycle Projects: We are not able to sufficiently model improvements to individual bicycle facilities using Travel Model 1.5 (except Bay Bridge West Span since this opens up a connection); Travel Model 2.0 (under development) may allow more advanced analysis in the future. As an interim solution, we modelled a single "Enhanced Regionwide Bike Infrastructure" (Project ID 6006), supported by off-model assertions based on research literature review. This project does not consider any specific improvements, but instead provides perspective on the benefits of a regionwide bike infrastructure investment (e.g. shared streets, trails, superhighways) on our transportation system.

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Optimize Existing Transit Network - Low Cost	3001	32	Treasure Island Tolling and Mobility Program (Muni and AC Transit, Free Island Shuttles, Ferry)	SF	$0.8B	1	8	7	>10	Challenges	Challenges	Challenges
	2209	33	Irvington BART Infill Station *	ACTC	$0.2B	0	1	1	9	Even	Even	Even
	3002	34	Downtown San Francisco Congestion Pricing	SF	$0.3B	1	2	3	4	Challenges	Challenges	Challenges
	2007	35	San Francisco Southeast Waterfront Transit Improvements *	SF	$0.6B	0	2	3	4	Even	Even	Even
	2100	36	San Pablo BRT	AC Transit	$0.5B	0	1	3	4	Advances	Advances	Even
	2008	37	Alameda Point Transit Network Improvements *	ACTC	$0.5B	0	0.7	3	4	Even	Even	Even
	2000	38	AC Transit Local Network: Service Increase	AC Transit	$2.6B	0	1	2	2	Advances	Advances	Even
	2101	39	Geary BRT (Phase 2)	SF	$0.6B	0	1	2	3	Even	Even	Challenges
	2105	40	Alameda County E14th St/Mission and Fremont Blvd Multimodal Corridor *	ACTC	$0.5B	0	1	2	2	Advances	Advances	Even
	2103	41	SamTrans El Camino Real BRT: Capital and Service Improvements *	CCAG	$0.4B	0	0.7	2	1	Advances	Even	Challenges
	2003	42	Muni Forward: Capital Improvements + Service Increase	SF	$2.9B	0	0.7	2	1	Even	Even	Even
	2004	43	Sonoma Countywide Bus: Service Increase ^	SCTA	$0.9B	0	<0.5	<0.5	1	Advances	Even	Even
	2400	44	Downtown San Jose LRT Subway	VTA	$1.9B	0	<0.5	<0.5	1	Even	Even	Even
	6100	45	Integrated Transit Fare System *	Public/NGO Submission		0	cost estimation and modeling in progress			modeling in progress		
	6101	46	Free Transit *	Public/NGO Submission		1	cost estimation and modeling in progress			modeling in progress		
Build Local Transit	4000	47	Oakland/Alameda Gondola Network	City of Oakland	$1.1B	1	0.7	<0.5	2	Even	Advances	Even
	2403	48	Vasona LRT Extension (Phase 2)	VTA	$0.3B	0	0.7	<0.5	1	Advances	Advances	Even
	4001	49	Mountain View AV Network (Free Fare, Subsidies from Companies)	City of Mountain View	$1.4B	1	<0.5	0.9	1	Advances	Advances	Advances
	2412	50	SR-85 LRT (Mountain View to US101 interchange)	City of Cupertino	$3.7B	0	<0.5	0.7	0.6	Even	Challenges	Even
	5003	51	I-680 Corridor Improvements (BRT, Express Bus, Shared AVs, Gondolas)	CCTA	$4.6B	0	<0.5	0.5	0.6	Even	Even	Even
	2408	52	Muni Metro T-Third Extension to South San Francisco	City of South San Francisco	$1.8B	0	<0.5	<0.5	1	Challenges	Challenges	Even
	4002	53	Contra Costa Autonomous Shuttle Program	CCTA	$3.4B	0	<0.5	<0.5	<0.5	Advances	Even	Challenges
	4003	54	Cupertino-Mountain View-San Jose Elevated Maglev Rail Loop	City of Cupertino	$8.1B	1	<0.5	<0.5	<0.5	Challenges	Challenges	Challenges
	2402	55	San Jose Airport People Mover	VTA	$1.4B	0	<0.5	<0.5	<0.5	Even	Challenges	Even
Enhance Alternate Modes	2600	56	WETA Ferry Service Frequency Increase	WETA	$0.4B	0	2	6	3	Challenges	Even	Even
	6006	57	Enhanced Regionwide Bike Infrastructure	MTC/ABAG	$12.6B	0	1	3	3	Advances	Advances	Advances
	2601	58	WETA Ferry Network Expansion (Berkeley, Alameda Pt, Redwood City, Mission Bay, Treasure Islan..	WETA	$1.0B	0	1	2	2	Even	Even	Even
	2700	59	Bay Bridge West Span Bike Path	MTC/ABAG	$0.8B	0	<0.5	1	0.5	Even	Challenges	Challenges
	4004	60	Regional Hovercraft Network *	CCAG		0	modeling in progress			modeling in progress		
	6004	61	Bay Trail Completion	Public/NGO Submission		0	cannot be modeled			cannot be modeled		
	6005	62	Regional Bicycle Superhighway Network	Public/NGO Submission		0	cannot be modeled			cannot be modeled		

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Guiding Principle Flags: Flags, based on qualitative analysis, are intended to draw attention to a direct adverse impact a project may have that may not be captured as part of other assessments. Refer to Attachment C for details.
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Build Road Capacity - High Cost	1001	63	Southern Crossing Bridge + New San Francisco-Oakland Transbay Rail Crossing - BART (Crossing 6)	Crossings Study	$47.1B	1	0.6	1	2	Even	Even	Even
	3000	64	Regional Express Lanes (MTC + VTA + ACTC + US-101)	MTC/ABAG	$12.1B	1	0.6	in progress	2	Challenges	in progress	Challenges
	1005	65	Mid-Bay Bridge (I-238 to I-380) (Crossing 2)	Crossings Study	$19.9B	2	<0.5	<0.5	1	Even	Challenges	Even
	1006	66	San Mateo Bridge Reconstruction and Widening (Crossing 1)	Crossings Study	$15.7B	1	<0.5	<0.5	<0.5	Advances	Challenges	Even
Build Road Capacity - Low Cost	3103	67	SR-4 Widening (Brentwood to Discovery Bay)	CCTA	$0.4B	1	<0.5	<0.5	6	Advances	Even	Challenges
	3101	68	I-680/SR-4 Interchange Improvements (Direct/HOV Connectors, Ramp Widening, Auxiliary Lanes)	CCTA	$0.4B	1	<0.5	2	3	Even	Challenges	Even
	3110	69	Union City-Fremont East-West Connector *	ACTC	$0.4B	1	0.7	1	3	Even	Even	Even
	3102	70	SR-4 Operational Improvements	CCTA	$0.5B	1	<0.5	1	2	Challenges	Challenges	Even
	3104	71	I-80/I-680/SR-12 Interchange + Widening (Phases 2B-7)	STA	$0.7B	2	<0.5	1	1	Challenges	Even	Even
	3106	72	SR-152 Realignment and Tolling	VTA	$1.9B	2	2	<0.5	<0.5	Even	Challenges	Even
	3109	73	SR-262 Widening and Interchange Improvements *	ACTC	$1.0B	2	<0.5	<0.5	1	Even	Even	Challenges
	3100	74	SR-239 Widening (Brentwood to Tracy including airport connector)	CCTA	$2.4B	1	<0.5	<0.5	0.9	Challenges	Advances	Challenges
	3105	75	SR-12 Widening (I-80 to Rio Vista)	STA	$2.5B	2	<0.5	<0.5	0.7	Even	Challenges	Even
Optimize Existing Freeway Network	5000	76	Bay Area Forward (Phase 1: Freeway Ramp and Arterial Components Only)	MTC/ABAG	$0.6B	1	7	in progress	6	Challenges	in progress	Challenges
	3003	77	San Francisco Arterial HOV and Freeway HOT Lanes	SF	$1.3B	0	0.5	0.9	3	Challenges	Challenges	Even
	2002	78	AC Transit Transbay Network: Capital Improvements + Service Increase	AC Transit	$6.5B	0	0.5	0.8	1	Challenges	Challenges	Challenges
	6001	79	Bus Rapid Transit (BRT) on All Bridges *	Public/NGO Submission		0	cost estimation and modeling in progress			modeling in progress		
	6003	80	I-80 Corridor Overhaul *	Public/NGO Submission		1	cost estimation and modeling in progress			modeling in progress		
	6020	81	Regional Express Bus Network + Optimized Express Lane Network *	Public/NGO Submission		1	cost estimation and modeling in progress			modeling in progress		
	6102	82	Higher-Occupancy HOV Lanes with VMT Fee for SOV *	Public/NGO Submission		1	cost estimation and modeling in progress			modeling in progress		
	6103	83	Demand-Based Tolls on All Highways *	Public/NGO Submission		1	cost estimation and modeling in progress			modeling in progress		
	6104	84	Reversible Lanes on Congested Bridges and Freeways *	Public/NGO Submission		1	cost estimation and modeling in progress			modeling in progress		
	6105	85	Freight Delivery Timing Regulation	Public/NGO Submission		1	cannot be modeled			cannot be modeled		
Resilience	7006	86	I-880 Resilience Project (South Fremont)	MTC/ABAG/BCDC	$0.1B	0	>10	n/a	n/a	Challenges	n/a	n/a
	7002	87	I-580/US-101/SMART Marin Resilience Project	MTC/ABAG/BCDC	$0.2B	0	>10	>10	>10	Challenges	Challenges	Challenges
	7004	88	SR-84 Resilience Project (Dumbarton Bridge, 101 interchange)	MTC/ABAG/BCDC	$0.2B	0	>10	n/a	n/a	Challenges	n/a	n/a
	7003	89	US-101 Peninsula Resilience Project (San Antonio Rd, Poplar Ave, Millbrae Ave)	MTC/ABAG/BCDC	$0.2B	0	>10	n/a	n/a	Challenges	n/a	n/a
	7005	90	SR-237 Resilience Project (Alviso)	MTC/ABAG/BCDC	$0.2B	0	>10	n/a	>10	Even	n/a	Even
	7001	91	VTA LRT Resilience Project (Tasman West)	MTC/ABAG/BCDC	$0.2B	0	5	5	8	Even	Advances	Even
	3200	92	SR-37 Long Term Project (Tolling, Elevation, Interchanges, Widening, Express Bus)	MTC/ABAG/North Bay Cou..	$5.4B	2	0.7	0.5	<0.5	Challenges	Challenges	Challenges
	7000	93	BART Caldecott Tunnel Resilience Project	BART		0	modeling in progress			modeling in progress		

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For inter-regional projects, since we are only able to model Bay Area benefits, we multiplied the benefits by a factor to reflect the ratio of expected ridership from outside the region. Valley Link benefit multiplier: 3.3; Caltrain/HSR benefit multiplier: 1.3 (the HSR multiplier is applied in Clean and Green only, the future where HSR is completely built out).
Equity Score:
"Advances" indicates that the project may benefit lower income individuals (below regional median income) more than higher income individuals.
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"Even" indicates even distribution of benefits for all income groups.
Note on Bicycle Projects: We are not able to sufficiently model improvements to individual bicycle facilities using Travel Model 1.5 (except Bay Bridge West Span since this opens up a connection); Travel Model 2.0 (under development) may allow more advanced analysis in the future. As an interim solution, we modelled a single "Enhanced Regionwide Bike Infrastructure" (Project ID 6006), supported by off-model assertions based on research literature review. This project does not consider any specific improvements, but instead provides perspective on the benefits of a regionwide bike infrastructure investment (e.g. shared streets, trails, superhighways) on our transportation system.

Horizon/Plan Bay Area 2050: Draft Project Performance Findings
Attachment B: Guiding Principles and Equity Summary Table

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Project ID	Row ID	Project	Project Type	Lifecycle Cost	Guiding Principle Flags	Provides Point of Access in CoC?	Equity Score		
							Rising Tides Falling Fortunes	Clean and Green	Back to the Future
4001	1	Mountain View AV Network (Free Fare, Subsidies from Companies)	Build Local Transit	$1.4B	1	No	Advances	Advances	Advances
6006	2	Enhanced Regionwide Bike Infrastructure	Enhance Alternate Modes	$12.6B	0	Yes	Advances	Advances	Advances
2100	3	San Pablo BRT	Optimize Existing Transit Network - Low Cost	$0.5B	0	Yes	Advances	Advances	Even
2001	4	AC Transit Local Rapid Network: Capital Improvements + Service Increase	Optimize Existing Transit Network - High Cost	$8.4B	0	Yes	Advances	Advances	Even
2000	5	AC Transit Local Network: Service Increase	Optimize Existing Transit Network - Low Cost	$2.6B	0	Yes	Advances	Advances	Even
2409	6	VTA LRT Systemwide Grade Separation	Optimize Existing Transit Network - High Cost	$11.6B	0	Yes	Advances	Advances	Even
2005	7	Alameda County BRT Network + Connected Vehicle Corridors	Optimize Existing Transit Network - High Cost	$4.0B	0	Yes	Advances	Advances	Even
2208	8	BART Gap Closure (Millbrae to Silicon Valley)	Build Core Rail	$40.4B	0	Yes	Advances	Advances	Even
2403	9	Vasona LRT Extension (Phase 2)	Build Local Transit	$0.3B	0	Yes	Advances	Advances	Even
2410	10	VTA LRT Systemwide Grade Separation and Full Automation	Optimize Existing Transit Network - High Cost	$14.8B	1	Yes	Advances	Advances	Even
2205	11	BART to Silicon Valley (Phase 2)	Build Core Rail	$6.0B	0	Yes	Advances	Advances	Even
2411	12	VTA LRT Systemwide Grade Separation, Network Expansion, and Full Automation	Optimize Existing Transit Network - High Cost	$44.2B	0	Yes	Advances	Advances	Even
2105	13	Alameda County E14th St/Mission and Fremont Blvd Multimodal Corridor	Optimize Existing Transit Network - Low Cost	$0.5B	0	Yes	Advances	Advances	Even
2004	14	Sonoma Countywide Bus: Service Increase	Optimize Existing Transit Network - Low Cost	$0.9B	0	Yes	Advances	Even	Even
4000	15	Oakland/Alameda Gondola Network	Build Local Transit	$1.1B	1	Yes	Even	Advances	Even
2206	16	BART Extension from Diridon to Cupertino	Extend Rail Network - High Cost	$12.1B	0	No	Even	Advances	Even
2401	17	North San Jose LRT Subway	Optimize Existing Transit Network - High Cost	$4.9B	0	Yes	Even	Advances	Even
7001	18	VTA LRT Resilience Project (Tasman West)	Resilience	$0.2B	0	No	Even	Advances	Even
2207	19	BART Extension from Diridon to Gilroy (replacing existing Caltrain)	Extend Rail Network - High Cost	$17.7B	1	Yes	Even	Advances	Even
2407	20	Muni Metro Southwest M-Line Subway	Optimize Existing Transit Network - High Cost	$5.6B	0	No	Advances	Advances	Challenges
2400	21	Downtown San Jose LRT Subway	Optimize Existing Transit Network - Low Cost	$1.9B	0	Yes	Even	Even	Even
2204	22	BART on I-680 (Walnut Creek to West Dublin/Pleasanton)	Extend Rail Network - High Cost	$11.0B	0	No	Even	Even	Even
1003	23	New San Francisco-Oakland Transbay Rail Crossing - BART (Crossing 4: New Markets)	Build Core Rail	$37.4B	0	Yes	Even	Even	Even
2209	24	Irvington BART Infill Station	Optimize Existing Transit Network - Low Cost	$0.2B	0	No	Even	Even	Even
1002	25	New San Francisco-Oakland Transbay Rail Crossing - BART (Crossing 3: Mission St)	Build Core Rail	$36.2B	0	Yes	Even	Even	Even
2007	26	San Francisco Southeast Waterfront Transit Improvements	Optimize Existing Transit Network - Low Cost	$0.6B	0	Yes	Even	Even	Even
2003	27	Muni Forward: Capital Improvements + Service Increase	Optimize Existing Transit Network - Low Cost	$2.9B	0	Yes	Even	Even	Even
1004	28	New San Francisco-Oakland Transbay Rail Crossing - Commuter Rail (Crossing 5)	Build Core Rail	$46.1B	2	Yes	Even	Even	Even
1007	29	New San Francisco-Oakland Transbay Rail Crossing - BART + Commuter Rail (Crossing 7)	Build Core Rail	$83.5B	2	Yes	Even	Even	Even
2301	30	Caltrain Full Electrification and Blended System: Base Growth	Optimize Existing Transit Network - High Cost	$20.9B	2	Yes	Even	Even	Even
1001	31	Southern Crossing Bridge + New San Francisco-Oakland Transbay Rail Crossing - BART (Crossing 6)	Build Road Capacity - High Cost	$47.1B	1	Yes	Even	Even	Even

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Provides Point of Access in CoC (Plan Bay Area 2040/legacy equity methodology)
This analysis is similar to what was done in Plan Bay Area 2040, indicating whether a project provides an access point (such as a station or new roadway facility) in a Community of Concern (CoC definition updated with 2018 ACS data). However, unlike the equity score, this does not reflect which population groups might actually benefit from the project.
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Project ID	Row ID	Project	Project Type	Lifecycle Cost	Guiding Principle Flags	Provides Point of Access in CoC?	Equity Score		
							Rising Tides Falling Fortunes	Clean and Green	Back to the Future
2308	32	Valley Link (Dublin to San Joaquin Valley)	Extend Rail Network - High Cost	$3.0B	0	Yes*	Even	Even	Even
2008	33	Alameda Point Transit Network Improvements	Optimize Existing Transit Network - Low Cost	$0.5B	0	Yes	Even	Even	Even
2201	34	BART Core Capacity	Optimize Existing Transit Network - High Cost	$4.5B	0	Yes	Even	Even	Even
3110	35	Union City-Fremont East-West Connector	Build Road Capacity - Low Cost	$0.4B	1	No	Even	Even	Even
2601	36	WETA Ferry Network Expansion (Berkeley, Alameda Pt, Redwood City, Mission Bay, Treasure Islan..	Enhance Alternate Modes	$1.0B	0	Yes	Even	Even	Even
5003	37	I-680 Corridor Improvements (BRT, Express Bus, Shared AVs, Gondolas)	Build Local Transit	$4.6B	0	Yes	Even	Even	Even
7005	38	SR-237 Resilience Project (Alviso)	Resilience	$0.2B	0	No	Even	n/a	Even
4002	39	Contra Costa Autonomous Shuttle Program	Build Local Transit	$3.4B	0	Yes	Advances	Even	Challenges
3103	40	SR-4 Widening (Brentwood to Discovery Bay)	Build Road Capacity - Low Cost	$0.4B	1	Yes	Advances	Even	Challenges
2103	41	SamTrans El Camino Real BRT: Capital and Service Improvements	Optimize Existing Transit Network - Low Cost	$0.4B	0	Yes	Advances	Even	Challenges
1006	42	San Mateo Bridge Reconstruction and Widening (Crossing 1)	Build Road Capacity - High Cost	$15.7B	1	Yes	Advances	Challenges	Even
2101	43	Geary BRT (Phase 2)	Optimize Existing Transit Network - Low Cost	$0.6B	0	Yes	Even	Even	Challenges
2306	44	Dumbarton Rail (Redwood City to Union City)	Build Core Rail	$3.9B	0	Yes	Even	Even	Challenges
3109	45	SR-262 Widening and Interchange Improvements	Build Road Capacity - Low Cost	$1.0B	2	No	Even	Even	Challenges
2402	46	San Jose Airport People Mover	Build Local Transit	$1.4B	0	Yes	Even	Challenges	Even
3106	47	SR-152 Realignment and Tolling	Build Road Capacity - Low Cost	$1.9B	2	No	Even	Challenges	Even
3101	48	I-680/SR-4 Interchange Improvements (Direct/HOV Connectors, Ramp Widening, Auxiliary Lanes)	Build Road Capacity - Low Cost	$0.4B	1	No	Even	Challenges	Even
2412	49	SR-85 LRT (Mountain View to US101 interchange)	Build Local Transit	$3.7B	0	No	Even	Challenges	Even
1005	50	Mid-Bay Bridge (I-238 to I-380) (Crossing 2)	Build Road Capacity - High Cost	$19.9B	2	Yes	Even	Challenges	Even
3105	51	SR-12 Widening (I-80 to Rio Vista)	Build Road Capacity - Low Cost	$2.5B	2	Yes	Even	Challenges	Even
2600	52	WETA Ferry Service Frequency Increase	Enhance Alternate Modes	$0.4B	0	Yes	Challenges	Even	Even
3104	53	I-80/I-680/SR-12 Interchange + Widening (Phases 2B-7)	Build Road Capacity - Low Cost	$0.7B	2	Yes	Challenges	Even	Even
2202	54	BART DMU Extension to Brentwood	Extend Rail Network - Low Cost	$0.6B	0	No	Advances	Challenges	Challenges
3100	55	SR-239 Widening (Brentwood to Tracy including airport connector)	Build Road Capacity - Low Cost	$2.4B	1	No	Challenges	Advances	Challenges
2700	56	Bay Bridge West Span Bike Path	Enhance Alternate Modes	$0.8B	0	Yes	Even	Challenges	Challenges
2305	57	SMART to Solano (Novato to Suisun City, without sea level rise protections)	Extend Rail Network - Low Cost	$1.6B	0	Yes	Even	Challenges	Challenges
2304	58	SMART Extension to Cloverdale	Extend Rail Network - Low Cost	$0.5B	0	No	Challenges	Even	Challenges
2303	59	Caltrain Full Electrification and Blended System: High Growth	Optimize Existing Transit Network - High Cost	$36.9B	2	Yes	Challenges	Even	Challenges
2302	60	Caltrain Full Electrification and Blended System: Moderate Growth	Optimize Existing Transit Network - High Cost	$24.6B	2	Yes	Challenges	Even	Challenges
2408	61	Muni Metro T-Third Extension to South San Francisco	Build Local Transit	$1.8B	0	Yes	Challenges	Challenges	Even
3003	62	San Francisco Arterial HOV and Freeway HOT Lanes	Optimize Existing Freeway Network	$1.3B	0	Yes	Challenges	Challenges	Even

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							Equity Score		
Project ID	Row ID	Project	Project Type	Lifecycle Cost	Guiding Principle Flags	Provides Point of Access in CoC?	Rising Tides Falling Fortunes	Clean and Green	Back to the Future
3102	63	SR-4 Operational Improvements	Build Road Capacity - Low Cost	$0.5B	1	Yes	Challenges	Challenges	Even
7004	64	SR-84 Resilience Project (Dumbarton Bridge, 101 interchange)	Resilience	$0.2B	0	Yes	Challenges	n/a	n/a
7003	65	US-101 Peninsula Resilience Project (San Antonio Rd, Poplar Ave, Millbrae Ave)	Resilience	$0.2B	0	Yes	Challenges	n/a	n/a
7006	66	I-880 Resilience Project (South Fremont)	Resilience	$0.1B	0	Yes	Challenges	n/a	n/a
3000	67	Regional Express Lanes (MTC + VTA + ACTC + US-101)	Build Road Capacity - High Cost	$12.1B	1	Yes	Challenges	in progress	Challenges
5000	68	Bay Area Forward (Phase 1: Freeway Ramp and Arterial Components Only)	Optimize Existing Freeway Network	$0.6B	1	Yes	Challenges	in progress	Challenges
7002	69	I-580/US-101/SMART Marin Resilience Project	Resilience	$0.2B	0	Yes	Challenges	Challenges	Challenges
2300	70	Caltrain Downtown Extension	Build Core Rail	$4.8B	0	No	Challenges	Challenges	Challenges
2002	71	AC Transit Transbay Network: Capital Improvements + Service Increase	Optimize Existing Freeway Network	$6.5B	0	Yes	Challenges	Challenges	Challenges
2310	72	Megaregional Rail Network + Resilience Project (Caltrain, ACE, Valley Link, Dumbarton, Cap Cor)	Build Core Rail	$54.1B	2	Yes	Challenges	Challenges	Challenges
4003	73	Cupertino-Mountain View-San Jose Elevated Maglev Rail Loop	Build Local Transit	$8.1B	1	Yes	Challenges	Challenges	Challenges
2203	74	BART to Hercules & I-80 Bus from Vallejo to Oakland	Extend Rail Network - High Cost	$5.8B	0	Yes	Challenges	Challenges	Challenges
3001	75	Treasure Island Congestion Pricing	Optimize Existing Transit Network - Low Cost	$0.8B	1	Yes	Challenges	Challenges	Challenges
3002	76	Downtown San Francisco Congestion Pricing	Optimize Existing Transit Network - Low Cost	$0.3B	1	Yes	Challenges	Challenges	Challenges
3200	77	SR-37 Long Term Project (Tolling, Elevation, Interchanges, Widening, Express Bus)	Resilience	$5.4B	2	Yes	Challenges	Challenges	Challenges
4004	78	Regional Hovercraft Network	Enhance Alternate Modes		0	Yes	modeling in progress		
7000	79	BART Caldecott Tunnel Resilience Project	Resilience		0	No	modeling in progress		
2307	80	ACE Service Expansion and Capital Improvements (to San Joaquin Valley)	Extend Rail Network - High Cost		0	Yes	modeling in progress		
2309	81	Altamont Vision Phase 1 (to San Joaquin Valley)	Extend Rail Network - High Cost		0	Yes	modeling in progress		
6001	82	Bus Rapid Transit (BRT) on All Bridges	Optimize Existing Freeway Network		0	Yes	modeling in progress		
6002	83	SMART to Richmond via New Richmond-San Rafael Bridge	Build Core Rail		2	Yes	modeling in progress		
6003	84	I-80 Corridor Overhaul	Optimize Existing Freeway Network		1	Yes	modeling in progress		
6020	85	Regional Express Bus Network + Optimized Express Lane Network	Optimize Existing Freeway Network		1	Yes	modeling in progress		
6100	86	Integrated Transit Fare System	Optimize Existing Transit Network - Low Cost		0	Yes	modeling in progress		
6101	87	Free Transit	Optimize Existing Transit Network - Low Cost		1	Yes	modeling in progress		
6102	88	Higher-Occupancy HOV Lanes with VMT fee for SOV	Optimize Existing Freeway Network		1	Yes	modeling in progress		
6103	89	Demand-Based Tolls on All Highways	Optimize Existing Freeway Network		1	Yes	modeling in progress		
6104	90	Reversible Lanes on Congested Bridges and Freeways	Optimize Existing Freeway Network		1	Yes	modeling in progress		
6005	91	Regional Bicycle Superhighway Network	Enhance Alternate Modes		0	Yes	cannot be modeled		
6004	92	Bay Trail Completion	Enhance Alternate Modes		0	Yes	cannot be modeled		
6105	93	Freight Delivery Timing Regulation	Optimize Existing Freeway Network		1	Yes	cannot be modeled		

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Attachment C: Detailed Table of Guiding Principle Flags

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Project Type	Project ID	Row ID	Project	Affordable	Connected	Diverse	Healthy	Vibrant
Build Core Rail	1002	1	New San Francisco-Oakland Transbay Rail Crossing - BART (Crossing 3: Mission St)	Supports	Supports	Supports	Supports	Supports
	1003	2	New San Francisco-Oakland Transbay Rail Crossing - BART (Crossing 4: New Markets)	Supports	Supports	Supports	Supports	Supports
	1004	3	New San Francisco-Oakland Transbay Rail Crossing - Commuter Rail (Crossing 5)	Supports	Supports	Does Not Support	Supports	Does Not Support
	1007	4	New San Francisco-Oakland Transbay Rail Crossing - BART + Commuter Rail (Crossing 7)	Supports	Supports	Does Not Support	Supports	Does Not Support
	2205	5	BART to Silicon Valley (Phase 2)	Supports	Supports	Supports	Supports	Supports
	2208	6	BART Gap Closure (Millbrae to Silicon Valley)	Supports	Supports	Supports	Supports	Supports
	2300	7	Caltrain Downtown Extension	Supports	Supports	Supports	Supports	Supports
	2306	8	Dumbarton Rail (Redwood City to Union City)	Supports	Supports	Supports	Supports	Supports
	2310	9	Megaregional Rail Network + Resilience Project (Caltrain, ACE, Valley Link, Dumbarton, Cap Cor)	Supports	Supports	Does Not Support	Supports	Does Not Support
	6002	10	SMART to Richmond via New Richmond-San Rafael Bridge	Supports	Supports	Does Not Support	Supports	Does Not Support
Extend Rail Network - High Cost	2203	11	BART to Hercules & I-80 Bus from Vallejo to Oakland	Supports	Supports	Supports	Supports	Supports
	2204	12	BART on I-680 (Walnut Creek to West Dublin/Pleasanton)	Supports	Supports	Supports	Supports	Supports
	2206	13	BART Extension from Diridon to Cupertino	Supports	Supports	Supports	Supports	Supports
	2207	14	BART Extension from Diridon to Gilroy (replacing existing Caltrain)	Does Not Support	Supports	Supports	Supports	Supports
	2307	15	ACE Service Expansion and Capital Improvements (to San Joaquin Valley)	Supports	Supports	Supports	Supports	Supports
	2308	16	Valley Link (Dublin to San Joaquin Valley)	Supports	Supports	Supports	Supports	Supports
	2309	17	Altamont Vision Phase 1 (to San Joaquin Valley)	Supports	Supports	Supports	Supports	Supports
Extend Rail Network - Low Cost	2202	18	BART DMU Extension to Brentwood	Supports	Supports	Supports	Supports	Supports
	2304	19	SMART Extension to Cloverdale	Supports	Supports	Supports	Supports	Supports
	2305	20	SMART to Solano (Novato to Suisun City, without sea level rise protections)	Supports	Supports	Supports	Supports	Supports
Optimize Existing Transit Network - High Cost	2001	21	AC Transit Local Rapid Network: Capital Improvements + Service Increase	Supports	Supports	Supports	Supports	Supports
	2005	22	Alameda County BRT Network + Connected Vehicle Corridors	Supports	Supports	Supports	Supports	Supports
	2201	23	BART Core Capacity	Supports	Supports	Supports	Supports	Supports
	2301	24	Caltrain Full Electrification and Blended System: Base Growth	Supports	Supports	Does Not Support	Supports	Does Not Support
	2302	25	Caltrain Full Electrification and Blended System: Moderate Growth	Supports	Supports	Does Not Support	Supports	Does Not Support
	2303	26	Caltrain Full Electrification and Blended System: High Growth	Supports	Supports	Does Not Support	Supports	Does Not Support
	2401	27	North San Jose LRT Subway	Supports	Supports	Supports	Supports	Supports
	2407	28	Muni Metro Southwest M-Line Subway	Supports	Supports	Supports	Supports	Supports
	2409	29	VTA LRT Systemwide Grade Separation	Supports	Supports	Supports	Supports	Supports
	2410	30	VTA LRT Systemwide Grade Separation and Full Automation	Supports	Supports	Supports	Supports	Does Not Support
	2411	31	VTA LRT Systemwide Grade Separation, Network Expansion, and Full Automation	Supports	Supports	Supports	Supports	Supports
Optimize Existing Transit Network - Low Cost	2000	32	AC Transit Local Network: Service Increase	Supports	Supports	Supports	Supports	Supports
	2003	33	Muni Forward: Capital Improvements + Service Increase	Supports	Supports	Supports	Supports	Supports
	2004	34	Sonoma Countywide Bus: Service Increase	Supports	Supports	Supports	Supports	Supports
	2007	35	San Francisco Southeast Waterfront Transit Improvements	Supports	Supports	Supports	Supports	Supports
	2008	36	Alameda Point Transit Network Improvements	Supports	Supports	Supports	Supports	Supports

Questions to determine Guiding Principle flags:
Affordable: Does the project increase travel costs for lower income residents?
Connected: Does the project significantly increase travel times or eliminate travel options?
Diverse: Does the project displace lower-income residents or divide communities (as a direct impact of project construction)?
Healthy: Does the project significantly increase emissions or collisions?
Vibrant: Does the project directly eliminate jobs?

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Optimize Existing Transit Network - Low Cost	2100	37	San Pablo BRT	Supports	Supports	Supports	Supports	Supports
	2101	38	Geary BRT (Phase 2)	Supports	Supports	Supports	Supports	Supports
	2103	39	SamTrans El Camino Real BRT: Capital and Service Improvements	Supports	Supports	Supports	Supports	Supports
	2105	40	Alameda County E14th St/Mission and Fremont Blvd Multimodal Corridor	Supports	Supports	Supports	Supports	Supports
	2209	41	Irvington BART Infill Station	Supports	Supports	Supports	Supports	Supports
	2400	42	Downtown San Jose LRT Subway	Supports	Supports	Supports	Supports	Supports
	3001	43	Treasure Island Congestion Pricing	Does Not Support	Supports	Supports	Supports	Supports
	3002	44	Downtown San Francisco Congestion Pricing	Does Not Support	Supports	Supports	Supports	Supports
	6100	45	Integrated Transit Fare System	Supports	Supports	Supports	Supports	Supports
	6101	46	Free Transit	Supports	Supports	Supports	Supports	Does Not Support
Build Local Transit	2402	47	San Jose Airport People Mover	Supports	Supports	Supports	Supports	Supports
	2403	48	Vasona LRT Extension (Phase 2)	Supports	Supports	Supports	Supports	Supports
	2408	49	Muni Metro T-Third Extension to South San Francisco	Supports	Supports	Supports	Supports	Supports
	2412	50	SR-85 LRT (Mountain View to US101 interchange)	Supports	Supports	Supports	Supports	Supports
	4000	51	Oakland/Alameda Gondola Network	Supports	Supports	Supports	Supports	Does Not Support
	4001	52	Mountain View AV Network (Free Fare, Subsidies from Companies)	Supports	Supports	Supports	Supports	Does Not Support
	4002	53	Contra Costa Autonomous Shuttle Program	Supports	Supports	Supports	Supports	Supports
	4003	54	Cupertino-Mountain View-San Jose Elevated Maglev Rail Loop	Supports	Supports	Supports	Supports	Does Not Support
	5003	55	I-680 Corridor Improvements (BRT, Express Bus, Shared AVs, Gondolas)	Supports	Supports	Supports	Supports	Supports
Enhance Alternate Modes	2600	56	WETA Ferry Service Frequency Increase	Supports	Supports	Supports	Supports	Supports
	2601	57	WETA Ferry Network Expansion (Berkeley, Alameda Pt, Redwood City, Mission Bay, Treasure Isla..	Supports	Supports	Supports	Supports	Supports
	2700	58	Bay Bridge West Span Bike Path	Supports	Supports	Supports	Supports	Supports
	4004	59	Regional Hovercraft Network	Supports	Supports	Supports	Supports	Supports
	6004	60	Bay Trail Completion	Supports	Supports	Supports	Supports	Supports
	6005	61	Regional Bicycle Superhighway Network	Supports	Supports	Supports	Supports	Supports
	6006	62	Enhanced Regionwide Bike Infrastructure	Supports	Supports	Supports	Supports	Supports
Build Road Capacity - High Cost	1001	63	Southern Crossing Bridge + New San Francisco-Oakland Transbay Rail Crossing - BART (Crossing 6)	Supports	Supports	Does Not Support	Supports	Supports
	1005	64	Mid-Bay Bridge (I-238 to I-380) (Crossing 2)	Supports	Supports	Supports	Does Not Support	Does Not Support
	1006	65	San Mateo Bridge Reconstruction and Widening (Crossing 1)	Supports	Supports	Supports	Does Not Support	Supports
	3000	66	Regional Express Lanes (MTC + VTA + ACTC + US-101)	Supports	Supports	Supports	Does Not Support	Supports
Build Road Capacity - Low Cost	3100	67	SR-239 Widening (Brentwood to Tracy including airport connector)	Supports	Supports	Supports	Does Not Support	Supports
	3101	68	I-680/SR-4 Interchange Improvements (Direct/HOV Connectors, Ramp Widening, Auxiliary Lanes)	Supports	Supports	Supports	Does Not Support	Supports
	3102	69	SR-4 Operational Improvements	Supports	Supports	Supports	Does Not Support	Supports
	3103	70	SR-4 Widening (Brentwood to Discovery Bay)	Supports	Supports	Supports	Does Not Support	Supports
	3104	71	I-80/I-680/SR-12 Interchange + Widening (Phases 2B-7)	Supports	Supports	Supports	Does Not Support	Does Not Support
	3105	72	SR-12 Widening (I-80 to Rio Vista)	Does Not Support	Supports	Supports	Does Not Support	Supports

Questions to determine Guiding Principle flags:
Affordable: Does the project increase travel costs for lower income residents?
Connected: Does the project significantly increase travel times or eliminate travel options?
Diverse: Does the project displace lower-income residents or divide communities (as a direct impact of project construction)?
Healthy: Does the project significantly increase emissions or collisions?
Vibrant: Does the project directly eliminate jobs?

Horizon/Plan Bay Area 2050: Draft Project Performance Findings
Attachment C: Detailed Table of Guiding Principle Flags

Note 1: Total number of rows: 93; 81 projects from public agencies, 12 projects from public/NGOs that were jury finalists from the Transformative Projects process
Note 2: Flags are based on a qualitative analysis. They are intended to draw attention to an adverse impact a project may have that may not be captured as part of other assessments.
(see high-level description of methodology at the bottom of the page)

Project Type	Project ID	Row ID	Project	Affordable	Connected	Diverse	Healthy	Vibrant
Build Road Capacity - Low Cost	3106	73	SR-152 Realignment and Tolling	Does Not Support	Supports	Supports	Does Not Support	Supports
	3109	74	SR-262 Widening and Interchange Improvements	Supports	Supports	Does Not Support	Does Not Support	Supports
	3110	75	Union City-Fremont East-West Connector	Supports	Supports	Supports	Does Not Support	Supports
Optimize Existing Freeway Network	2002	76	AC Transit Transbay Network: Capital Improvements + Service Increase	Supports	Supports	Supports	Supports	Supports
	3003	77	San Francisco Arterial HOV and Freeway HOT Lanes	Supports	Supports	Supports	Supports	Supports
	5000	78	Bay Area Forward (Phase 1: Freeway Ramp and Arterial Components Only)	Supports	Supports	Supports	Does Not Support	Supports
	6001	79	Bus Rapid Transit (BRT) on All Bridges	Supports	Supports	Supports	Supports	Supports
	6003	80	I-80 Corridor Overhaul	Does Not Support	Supports	Supports	Supports	Supports
	6020	81	Regional Express Bus Network + Optimized Express Lane Network	Supports	Supports	Does Not Support	Supports	Supports
	6102	82	Higher-Occupancy HOV Lanes with VMT fee for SOV	Does Not Support	Supports	Supports	Supports	Supports
	6103	83	Demand-Based Tolls on All Highways	Does Not Support	Supports	Supports	Supports	Supports
	6104	84	Reversible Lanes on Congested Bridges and Freeways	Supports	Supports	Supports	Does Not Support	Supports
	6105	85	Freight Delivery Timing Regulation	Supports	Does Not Support	Supports	Supports	Supports
Resilience	3200	86	SR-37 Long Term Project (Tolling, Elevation, Interchanges, Widening, Express Bus)	Does Not Support	Supports	Supports	Does Not Support	Supports
	7000	87	BART Caldecott Tunnel Resilience Project	Supports	Supports	Supports	Supports	Supports
	7001	88	VTA LRT Resilience Project (Tasman West)	Supports	Supports	Supports	Supports	Supports
	7002	89	I-580/US-101/SMART Marin Resilience Project	Supports	Supports	Supports	Supports	Supports
	7003	90	US-101 Peninsula Resilience Project (San Antonio Rd, Poplar Ave, Millbrae Ave)	Supports	Supports	Supports	Supports	Supports
	7004	91	SR-84 Resilience Project (Dumbarton Bridge, 101 interchange)	Supports	Supports	Supports	Supports	Supports
	7005	92	SR-237 Resilience Project (Alviso)	Supports	Supports	Supports	Supports	Supports
	7006	93	I-880 Resilience Project (South Fremont)	Supports	Supports	Supports	Supports	Supports

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Connected: Does the project significantly increase travel times or eliminate travel options?
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Horizon/Plan Bay Area 2050: Draft Project Performance Findings
Attachment D: Detailed Table of Lifecycle Benefits by Future

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All values in billions of 2019 dollars discounted present value

Project Type	Project ID	Row ID	Project	Future	Grand Total	Accessibility Benefits	Transit Crowding Benefits	Freeway Reliability and Vehicle Ownership Benefits	Environmental Benefits	Health Benefits	Safety Benefits
Build Core Rail	1002	1	New San Francisco-Oakland Transbay Rail Crossing - BART (Crossing 3: Mission St)	Rising Tides Falling Fortunes	**$21.3B**	$6.6B	$7.9B	$1.9B	$0.1B	$4.1B	$0.6B
				Clean and Green	**$45.4B**	$19.0B	$18.8B	$2.0B	$0.0B	$5.2B	$0.5B
				Back to the Future	**$42.3B**	$19.9B	$15.3B	$2.1B	$0.1B	$4.4B	$0.6B
	1003	2	New San Francisco-Oakland Transbay Rail Crossing - BART (Crossing 4: New Markets)	Rising Tides Falling Fortunes	**$21.6B**	$7.0B	$7.2B	$1.9B	$0.2B	$4.6B	$0.7B
				Clean and Green	**$47.3B**	$19.3B	$19.8B	$1.8B	$0.0B	$6.0B	$0.5B
				Back to the Future	**$42.7B**	$19.2B	$15.8B	$2.1B	$0.1B	$4.9B	$0.7B
	1004	3	New San Francisco-Oakland Transbay Rail Crossing - Commuter Rail (Crossing 5)	Rising Tides Falling Fortunes	**$30.7B**	$14.0B	$7.1B	$1.6B	$0.3B	$5.8B	$1.9B
				Clean and Green	**$79.3B**	$48.4B	$18.6B	$2.1B	$0.0B	$8.6B	$1.6B
				Back to the Future	**$98.0B**	$64.6B	$17.8B	$3.7B	$0.2B	$9.1B	$2.6B
	1007	4	New San Francisco-Oakland Transbay Rail Crossing - BART + Commuter Rail (Crossing 7)	Rising Tides Falling Fortunes	**$47.1B**	$20.9B	$10.6B	$3.0B	$0.4B	$9.7B	$2.4B
				Clean and Green	**$121.0B**	$68.0B	$34.2B	$3.6B	($0.1B)	$13.1B	$2.1B
				Back to the Future	**$114.0B**	$71.8B	$22.0B	$5.3B	$0.2B	$11.9B	$2.7B
	2205	5	BART to Silicon Valley (Phase 2)	Rising Tides Falling Fortunes	**$0.5B**	$0.3B	($0.3B)	$0.2B	$0.0B	$0.1B	$0.2B
				Clean and Green	**$2.3B**	$1.8B	($0.1B)	$0.2B	$0.0B	$0.3B	$0.2B
				Back to the Future	**$3.7B**	$3.5B	($1.5B)	$1.1B	$0.0B	$0.4B	$0.2B
	2208	6	BART Gap Closure (Millbrae to Silicon Valley)	Rising Tides Falling Fortunes	**$0.5B**	$0.3B	($0.2B)	$0.1B	$0.0B	$0.1B	$0.1B
				Clean and Green	**$3.8B**	$1.7B	$1.3B	$0.4B	$0.0B	$0.3B	$0.2B
				Back to the Future	**$5.4B**	$3.7B	$0.1B	$1.0B	$0.0B	$0.3B	$0.3B
	2300	7	Caltrain Downtown Extension	Rising Tides Falling Fortunes	**$1.9B**	$1.4B	$0.2B	$0.0B	$0.0B	$0.2B	$0.1B
				Clean and Green	**$3.4B**	$3.2B	($0.1B)	$0.0B	$0.0B	$0.1B	$0.1B
				Back to the Future	**$3.0B**	$2.4B	$0.8B	($0.3B)	$0.0B	$0.0B	$0.1B
	2306	8	Dumbarton Rail (Redwood City to Union City)	Rising Tides Falling Fortunes	**($0.5B)**	$0.3B	($0.2B)	($0.6B)	($0.3B)	$0.1B	$0.1B
				Clean and Green	**$0.8B**	$0.9B	($0.3B)	$0.3B	($0.3B)	$0.1B	$0.1B
				Back to the Future	**$1.9B**	$1.7B	$0.3B	$0.0B	($0.3B)	$0.0B	$0.1B
	2310	9	Megaregional Rail Network + Resilience Project	Rising Tides Falling Fortunes	**$9.0B**	$5.6B	$1.9B	$0.7B	($0.7B)	$0.9B	$0.6B

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Horizon/Plan Bay Area 2050: Draft Project Performance Findings
Attachment D: Detailed Table of Lifecycle Benefits by Future

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All values in billions of 2019 dollars discounted present value

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Build Core Rail	2310	9	Megaregional Rail Network + Resilience Project (Caltrain, ACE, Valley Link, Dumbarton, Cap Cor)	Clean and Green	**$26.8B**	$14.0B	$10.7B	$1.0B	($0.8B)	$1.3B	$0.6B
				Back to the Future	**$21.5B**	$14.6B	$4.4B	$1.6B	($0.8B)	$1.1B	$0.7B
Extend Rail Network - High Cost	2203	10	BART to Hercules & I-80 Bus from Vallejo to Oakland	Rising Tides Falling Fortunes	**$0.4B**	$0.8B	($1.0B)	$0.1B	$0.1B	$0.3B	$0.2B
				Clean and Green	**$0.1B**	$1.4B	($1.6B)	($0.1B)	$0.0B	$0.2B	$0.1B
				Back to the Future	**$1.4B**	$1.4B	($0.6B)	$0.3B	$0.0B	$0.1B	$0.1B
	2204	11	BART on I-680 (Walnut Creek to West Dublin/Pleasanton)	Rising Tides Falling Fortunes	**($0.2B)**	($0.1B)	($0.2B)	$0.2B	$0.0B	$0.0B	$0.0B
				Clean and Green	**$1.6B**	$0.6B	$1.0B	$0.0B	$0.0B	$0.0B	$0.0B
				Back to the Future	**$0.2B**	$0.3B	$0.0B	$0.0B	$0.0B	$0.0B	$0.0B
	2206	12	BART Extension from Diridon to Cupertino	Rising Tides Falling Fortunes	**$1.1B**	$0.6B	($0.2B)	$0.3B	$0.0B	$0.2B	$0.1B
				Clean and Green	**$2.9B**	$1.8B	$0.4B	$0.0B	$0.0B	$0.4B	$0.2B
				Back to the Future	**$5.1B**	$4.5B	($0.4B)	$0.3B	$0.0B	$0.5B	$0.2B
	2207	13	BART Extension from Diridon to Gilroy (replacing existing Caltrain)	Rising Tides Falling Fortunes	**$0.3B**	$0.3B	($0.1B)	$0.1B	$0.0B	$0.0B	$0.0B
				Clean and Green	**$2.0B**	$0.8B	$0.6B	$0.4B	$0.0B	$0.2B	$0.1B
				Back to the Future	**$3.0B**	$1.9B	$0.2B	$0.5B	$0.0B	$0.3B	$0.1B
	2308	14	Valley Link (Dublin to San Joaquin Valley)	Rising Tides Falling Fortunes	**($0.3B)**	$0.7B	($0.4B)	($1.4B)	$0.0B	$0.5B	$0.2B
				Clean and Green	**$4.1B**	$2.0B	$2.0B	($0.1B)	$0.0B	$0.2B	$0.1B
				Back to the Future	**$3.9B**	$3.2B	($0.6B)	$0.6B	$0.0B	$0.3B	$0.3B
Extend Rail Network - Low Cost	2202	15	BART DMU Extension to Brentwood	Rising Tides Falling Fortunes	**($0.2B)**	$0.1B	($0.1B)	($0.2B)	$0.0B	$0.1B	$0.0B
				Clean and Green	**$0.3B**	$0.3B	($0.2B)	$0.1B	$0.0B	$0.1B	$0.0B
				Back to the Future	**($0.1B)**	$0.1B	($0.2B)	$0.0B	$0.0B	$0.0B	$0.0B
	2304	16	SMART Extension to Cloverdale	Rising Tides Falling Fortunes	**$0.1B**	$0.2B	($0.1B)	($0.2B)	$0.0B	$0.1B	$0.0B
				Clean and Green	**$0.1B**	$0.0B	$0.1B	($0.1B)	$0.0B	$0.0B	$0.0B
				Back to the Future	**($0.4B)**	($0.4B)	($0.4B)	$0.2B	$0.0B	$0.1B	$0.0B
	2305	17	SMART to Solano (Novato to Suisun City, without sea level rise protections)	Rising Tides Falling Fortunes	**($0.1B)**	$0.1B	($0.1B)	($0.1B)	$0.0B	$0.0B	$0.0B
				Clean and Green	**$0.2B**	$0.2B	$0.0B	($0.1B)	$0.0B	$0.0B	$0.1B

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Project Type	Project ID	Row ID	Project	Future	Grand Total	Accessibility Benefits	Transit Crowding Benefits	Freeway Reliability and Vehicle Ownership Benefits	Environmental Benefits	Health Benefits	Safety Benefits
Extend Rail Network - Low Cost	2305	17	SMART to Solano (Novato to Suisun City, without sea level rise protections)	Back to the Future	**$0.0B**	($0.4B)	$0.2B	$0.2B	$0.0B	$0.1B	$0.0B
Optimize Existing Transit Network - High Cost	2001	18	AC Transit Local Rapid Network: Capital Improvements + Service Increase	Rising Tides Falling Fortunes	**$3.5B**	$0.6B	$0.0B	$2.1B	$0.1B	$0.3B	$0.4B
				Clean and Green	**$3.9B**	$1.3B	($0.6B)	$2.4B	$0.0B	$0.4B	$0.4B
				Back to the Future	**$5.3B**	$2.7B	($1.3B)	$2.8B	$0.0B	$0.4B	$0.7B
	2005	19	Alameda County BRT Network + Connected Vehicle Corridors	Rising Tides Falling Fortunes	**$1.0B**	$0.4B	($0.2B)	$0.3B	$0.0B	$0.3B	$0.1B
				Clean and Green	**$1.5B**	$0.4B	($0.2B)	$1.0B	$0.0B	$0.2B	$0.1B
				Back to the Future	**$2.6B**	$1.6B	$0.1B	$0.7B	$0.0B	$0.1B	$0.2B
	2201	20	BART Core Capacity	Rising Tides Falling Fortunes	**$4.4B**	$0.7B	$3.0B	$0.4B	$0.0B	$0.2B	$0.1B
				Clean and Green	**$9.8B**	$1.5B	$7.9B	$0.0B	$0.0B	$0.3B	$0.1B
				Back to the Future	**$10.2B**	$2.8B	$6.6B	$0.6B	$0.0B	$0.2B	$0.1B
	2301	21	Caltrain Full Electrification and Blended System: Base Growth	Rising Tides Falling Fortunes	**$3.1B**	$1.1B	$1.2B	$0.1B	$0.0B	$0.1B	$0.6B
				Clean and Green	**$4.9B**	$3.5B	$0.6B	$0.0B	$0.0B	$0.1B	$0.8B
				Back to the Future	**$4.4B**	$2.4B	$1.2B	$0.2B	$0.0B	$0.0B	$0.6B
	2302	22	Caltrain Full Electrification and Blended System: Moderate Growth	Rising Tides Falling Fortunes	**$6.8B**	$3.6B	$1.7B	$0.3B	$0.1B	$0.3B	$0.8B
				Clean and Green	**$22.9B**	$12.2B	$8.5B	$0.4B	$0.0B	$0.8B	$1.0B
				Back to the Future	**$12.7B**	$7.8B	$2.7B	$0.8B	$0.0B	$0.5B	$0.8B
	2303	23	Caltrain Full Electrification and Blended System: High Growth	Rising Tides Falling Fortunes	**$9.9B**	$5.5B	$2.0B	$0.5B	$0.1B	$0.6B	$1.3B
				Clean and Green	**$35.8B**	$18.6B	$13.3B	$0.9B	$0.0B	$1.3B	$1.7B
				Back to the Future	**$19.2B**	$11.7B	$4.1B	$1.2B	$0.1B	$1.0B	$1.2B
	2401	24	North San Jose LRT Subway	Rising Tides Falling Fortunes	**$0.0B**	($0.1B)	($0.2B)	$0.3B	$0.0B	$0.0B	$0.1B
				Clean and Green	**$0.7B**	($0.4B)	$0.7B	$0.1B	$0.0B	$0.2B	$0.2B
				Back to the Future	**$2.4B**	$1.2B	$0.2B	$0.6B	$0.0B	$0.3B	$0.2B
	2407	25	Muni Metro Southwest M-Line Subway	Rising Tides Falling Fortunes	**$0.4B**	($0.2B)	$0.4B	$0.1B	$0.0B	$0.0B	$0.0B
				Clean and Green	**$1.4B**	($0.3B)	$1.7B	($0.1B)	$0.0B	$0.0B	$0.0B
				Back to the Future	**$2.0B**	$0.2B	$1.2B	$0.4B	$0.0B	$0.2B	$0.0B

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Project Type	Project ID	Row ID	Project	Future	Grand Total	Accessibility Benefits	Transit Crowding Benefits	Freeway Reliability and Vehicle Ownership Benefits	Environmental Benefits	Health Benefits	Safety Benefits
Optimize Existing Transit Network - High Cost	2409	26	VTA LRT Systemwide Grade Separation	Rising Tides Falling Fortunes	**$0.7B**	($0.1B)	($0.2B)	$0.4B	$0.0B	$0.2B	$0.4B
				Clean and Green	**$2.6B**	$1.1B	$0.5B	$0.3B	$0.0B	$0.3B	$0.4B
				Back to the Future	**$5.6B**	$2.9B	$1.1B	$0.7B	$0.0B	$0.3B	$0.5B
	2410	27	VTA LRT Systemwide Grade Separation and Full Automation	Rising Tides Falling Fortunes	**$1.9B**	$0.6B	($0.6B)	$0.9B	$0.0B	$0.4B	$0.6B
				Clean and Green	**$5.7B**	$3.4B	($0.4B)	$1.3B	$0.0B	$0.8B	$0.7B
				Back to the Future	**$10.2B**	$6.2B	($0.1B)	$2.3B	$0.0B	$1.0B	$0.7B
	2411	28	VTA LRT Systemwide Grade Separation, Network Expansion, and Full Automation	Rising Tides Falling Fortunes	**$4.2B**	$1.9B	($0.9B)	$1.1B	$0.1B	$1.1B	$0.9B
				Clean and Green	**$9.1B**	$5.6B	($1.9B)	$2.4B	$0.0B	$2.1B	$0.8B
				Back to the Future	**$16.0B**	$10.3B	($0.9B)	$3.0B	$0.1B	$2.5B	$1.1B
Optimize Existing Transit Network - Low Cost	2000	29	AC Transit Local Network: Service Increase	Rising Tides Falling Fortunes	**$3.2B**	$0.5B	$0.5B	$1.6B	$0.0B	$0.3B	$0.3B
				Clean and Green	**$5.9B**	$1.7B	$1.9B	$1.7B	$0.0B	$0.3B	$0.2B
				Back to the Future	**$5.9B**	$3.5B	($0.2B)	$1.9B	$0.0B	$0.3B	$0.2B
	2003	30	Muni Forward: Capital Improvements + Service Increase	Rising Tides Falling Fortunes	**$2.0B**	$0.6B	$0.8B	$0.1B	$0.0B	($0.1B)	$0.6B
				Clean and Green	**$4.4B**	$0.7B	$2.8B	$0.5B	$0.0B	($0.1B)	$0.6B
				Back to the Future	**$3.4B**	$0.6B	$2.1B	$0.3B	$0.0B	($0.1B)	$0.6B
	2004	31	Sonoma Countywide Bus: Service Increase	Rising Tides Falling Fortunes	**$0.2B**	$0.0B	$0.0B	$0.0B	$0.0B	$0.1B	$0.1B
				Clean and Green	**$0.2B**	$0.0B	($0.2B)	$0.4B	$0.0B	$0.0B	$0.1B
				Back to the Future	**$1.3B**	$0.7B	$0.2B	$0.4B	$0.0B	$0.0B	$0.0B
	2007	32	San Francisco Southeast Waterfront Transit Improvements	Rising Tides Falling Fortunes	**$1.0B**	$0.4B	$0.5B	$0.2B	$0.0B	($0.1B)	$0.0B
				Clean and Green	**$1.6B**	$0.2B	$1.4B	$0.0B	$0.0B	($0.1B)	$0.0B
				Back to the Future	**$2.2B**	$0.8B	$1.1B	$0.4B	$0.0B	($0.1B)	$0.0B
	2008	33	Alameda Point Transit Network Improvements	Rising Tides Falling Fortunes	**$0.4B**	$0.2B	$0.1B	$0.0B	$0.0B	$0.1B	$0.0B
				Clean and Green	**$1.4B**	$0.3B	$1.0B	$0.0B	$0.0B	$0.0B	$0.0B
				Back to the Future	**$1.8B**	$1.5B	$0.0B	$0.3B	$0.0B	$0.1B	$0.0B
	2100	34	San Pablo BRT	Rising Tides Falling Fortunes	**$0.6B**	$0.2B	($0.1B)	$0.0B	$0.0B	$0.2B	$0.3B

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Optimize Existing Transit Network - Low Cost	2100	34	San Pablo BRT	Clean and Green	**$1.2B**	$0.2B	$0.5B	$0.2B	$0.0B	$0.1B	$0.3B
				Back to the Future	**$1.6B**	$0.6B	$0.2B	$0.3B	$0.0B	$0.2B	$0.3B
	2101	35	Geary BRT (Phase 2)	Rising Tides Falling Fortunes	**$0.9B**	$0.1B	$0.5B	($0.1B)	$0.0B	$0.1B	$0.3B
				Clean and Green	**$1.0B**	$0.1B	$0.8B	$0.0B	$0.0B	$0.1B	$0.1B
				Back to the Future	**$1.8B**	$0.7B	$0.4B	$0.4B	$0.0B	$0.1B	$0.1B
	2103	36	SamTrans El Camino Real BRT: Capital and Service Improvements	Rising Tides Falling Fortunes	**$0.3B**	($0.1B)	$0.0B	$0.1B	$0.0B	$0.1B	$0.1B
				Clean and Green	**$0.7B**	$0.5B	$0.0B	$0.2B	$0.0B	$0.0B	$0.1B
				Back to the Future	**$0.4B**	$0.3B	$0.3B	($0.3B)	$0.0B	$0.0B	$0.0B
	2105	37	Alameda County E14th St/Mission and Fremont Blvd Multimodal Corridor	Rising Tides Falling Fortunes	**$0.6B**	$0.3B	($0.3B)	$0.2B	$0.0B	$0.2B	$0.2B
				Clean and Green	**$1.1B**	$0.3B	$0.0B	$0.5B	$0.0B	$0.1B	$0.1B
				Back to the Future	**$0.8B**	$0.4B	($0.2B)	$0.3B	$0.0B	$0.1B	$0.2B
	2209	38	Irvington BART Infill Station	Rising Tides Falling Fortunes	**$0.3B**	$0.1B	$0.2B	$0.0B	$0.0B	($0.1B)	$0.1B
				Clean and Green	**$0.2B**	$0.8B	($0.9B)	$0.1B	$0.0B	$0.1B	$0.1B
				Back to the Future	**$2.1B**	$2.1B	$0.2B	($0.2B)	$0.0B	$0.0B	$0.1B
	2400	39	Downtown San Jose LRT Subway	Rising Tides Falling Fortunes	**$0.2B**	$0.0B	($0.2B)	$0.4B	$0.0B	$0.0B	$0.0B
				Clean and Green	**$0.3B**	$0.2B	($0.2B)	$0.2B	$0.0B	$0.1B	$0.0B
				Back to the Future	**$2.5B**	$1.5B	$0.1B	$0.6B	$0.0B	$0.2B	$0.1B
	3001	40	Treasure Island Congestion Pricing	Rising Tides Falling Fortunes	**$6.2B**	$5.4B	($0.6B)	$0.7B	$0.1B	$0.3B	$0.3B
				Clean and Green	**$5.6B**	$5.4B	($0.6B)	$0.3B	$0.0B	$0.3B	$0.1B
				Back to the Future	**$11.3B**	$9.2B	$0.2B	$1.2B	$0.1B	$0.2B	$0.4B
	3002	41	Downtown San Francisco Congestion Pricing	Rising Tides Falling Fortunes	**$0.7B**	$0.2B	$0.3B	$0.2B	$0.0B	$0.0B	$0.0B
				Clean and Green	**$0.9B**	$0.4B	$0.4B	($0.1B)	$0.0B	$0.1B	$0.0B
				Back to the Future	**$1.4B**	$0.5B	$0.4B	$0.4B	$0.0B	$0.1B	$0.0B
Build Local Transit	2402	42	San Jose Airport People Mover	Rising Tides Falling Fortunes	**$0.4B**	$0.1B	$0.0B	$0.2B	$0.0B	$0.0B	$0.1B
				Clean and Green	**$0.6B**	$0.1B	$0.4B	$0.2B	$0.0B	($0.1B)	$0.0B

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Build Local Transit	2402	42	San Jose Airport People Mover	Back to the Future	**($0.7B)**	($0.8B)	$0.0B	$0.1B	$0.0B	$0.1B	$0.0B
	2403	43	Vasona LRT Extension (Phase 2)	Rising Tides Falling Fortunes	**$0.2B**	($0.1B)	($0.1B)	$0.4B	$0.0B	$0.0B	$0.0B
				Clean and Green	**$0.1B**	$0.2B	$0.0B	($0.1B)	$0.0B	$0.0B	$0.0B
				Back to the Future	**$0.4B**	$0.4B	($0.4B)	$0.4B	$0.0B	$0.0B	$0.0B
	2408	44	Muni Metro T-Third Extension to South San Francisco	Rising Tides Falling Fortunes	**($0.2B)**	$0.0B	($0.4B)	$0.2B	$0.0B	$0.0B	$0.0B
				Clean and Green	**$0.6B**	$0.0B	$0.5B	$0.0B	$0.0B	$0.1B	$0.1B
				Back to the Future	**$1.7B**	$1.0B	$0.2B	$0.4B	$0.0B	$0.0B	$0.1B
	2412	45	SR-85 LRT (Mountain View to US101 interchange)	Rising Tides Falling Fortunes	**$1.0B**	$0.5B	$0.0B	$0.2B	$0.0B	$0.3B	$0.1B
				Clean and Green	**$2.5B**	$0.8B	$1.1B	$0.2B	$0.0B	$0.3B	$0.1B
				Back to the Future	**$2.3B**	$1.8B	$0.0B	$0.3B	$0.0B	$0.2B	$0.1B
	4000	46	Oakland/Alameda Gondola Network	Rising Tides Falling Fortunes	**$0.8B**	$0.5B	($0.1B)	$0.1B	$0.0B	$0.2B	$0.1B
				Clean and Green	**$0.3B**	$0.1B	($0.1B)	$0.0B	$0.0B	$0.3B	$0.1B
				Back to the Future	**$2.4B**	$2.0B	($0.6B)	$0.5B	$0.0B	$0.4B	$0.1B
	4001	47	Mountain View AV Network (Free Fare, Subsidies from Companies)	Rising Tides Falling Fortunes	**$0.4B**	$0.1B	($0.1B)	$0.0B	$0.0B	$0.2B	$0.1B
				Clean and Green	**$1.2B**	$0.8B	($0.1B)	$0.4B	$0.0B	$0.0B	$0.0B
				Back to the Future	**$1.5B**	$0.8B	$0.2B	$0.3B	$0.0B	$0.1B	$0.1B
	4002	48	Contra Costa Autonomous Shuttle Program	Rising Tides Falling Fortunes	**$0.7B**	$0.1B	($0.1B)	$0.4B	$0.0B	$0.2B	$0.1B
				Clean and Green	**$1.2B**	$0.1B	$0.0B	$0.6B	$0.0B	$0.3B	$0.1B
				Back to the Future	**$0.9B**	$0.4B	($0.1B)	$0.2B	$0.0B	$0.3B	$0.1B
	4003	49	Cupertino-Mountain View-San Jose Elevated Maglev Rail Loop	Rising Tides Falling Fortunes	**$0.4B**	$0.5B	($0.2B)	$0.0B	$0.0B	$0.0B	$0.0B
				Clean and Green	**$2.5B**	$0.9B	$1.2B	$0.3B	$0.0B	$0.1B	$0.0B
				Back to the Future	**$2.7B**	$0.9B	$1.3B	$0.2B	$0.0B	$0.2B	$0.0B
	5003	50	I-680 Corridor Improvements (BRT, Express Bus, Shared AVs, Gondolas)	Rising Tides Falling Fortunes	**$1.2B**	$0.7B	($0.3B)	$0.4B	$0.0B	$0.2B	$0.1B
				Clean and Green	**$2.1B**	$1.1B	($0.5B)	$1.2B	$0.0B	$0.2B	$0.1B
				Back to the Future	**$2.8B**	$1.6B	$0.8B	$0.5B	$0.0B	$0.1B	$0.0B

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Enhance Alternate Modes	2600	51	WETA Ferry Service Frequency Increase	Rising Tides Falling Fortunes	**$0.7B**	$0.1B	$0.4B	$0.2B	$0.0B	$0.0B	$0.0B
				Clean and Green	**$2.4B**	$0.5B	$1.5B	$0.2B	$0.0B	$0.2B	$0.1B
				Back to the Future	**$0.9B**	$0.4B	$0.5B	$0.1B	$0.0B	$0.0B	($0.1B)
	2601	52	WETA Ferry Network Expansion (Berkeley, Alameda Pt, Redwood City, Mission Bay, Treasure Island)	Rising Tides Falling Fortunes	**$1.1B**	$0.3B	$0.5B	($0.1B)	$0.0B	$0.3B	$0.2B
				Clean and Green	**$1.6B**	$0.5B	$1.0B	$0.1B	$0.0B	$0.0B	$0.0B
				Back to the Future	**$2.1B**	$1.0B	$1.3B	($0.1B)	$0.0B	($0.1B)	$0.0B
	2700	53	Bay Bridge West Span Bike Path	Rising Tides Falling Fortunes	**($0.5B)**	($0.2B)	$0.0B	($0.2B)	$0.0B	$0.0B	$0.0B
				Clean and Green	**$1.1B**	$0.7B	$0.2B	$0.1B	$0.0B	$0.0B	$0.0B
				Back to the Future	**$0.4B**	$0.1B	($0.2B)	$0.4B	$0.0B	$0.1B	$0.0B
	6006	54	Enhanced Regionwide Bike Infrastructure	Rising Tides Falling Fortunes	**$13.7B**	$9.8B	$1.0B	$0.0B	$0.2B	$1.2B	$1.4B
				Clean and Green	**$36.1B**	$28.5B	$4.3B	$0.6B	$0.0B	$1.6B	$1.2B
				Back to the Future	**$40.0B**	$31.1B	$4.0B	$1.3B	$0.1B	$1.8B	$1.7B
Build Road Capacity - High Cost	1001	55	Southern Crossing Bridge + New San Francisco-Oakland Transbay Rail Crossing - BART (Crossing 6)	Rising Tides Falling Fortunes	**$26.3B**	$11.9B	$7.6B	$1.2B	$0.1B	$5.0B	$0.5B
				Clean and Green	**$60.3B**	$30.4B	$18.6B	$1.7B	($0.2B)	$9.2B	$0.5B
				Back to the Future	**$73.2B**	$47.8B	$17.7B	$1.6B	$0.1B	$5.2B	$0.8B
	1005	56	Mid-Bay Bridge (I-238 to I-380) (Crossing 2)	Rising Tides Falling Fortunes	**$4.3B**	$4.3B	$0.2B	$0.3B	($0.1B)	($0.2B)	($0.3B)
				Clean and Green	**$7.9B**	$7.1B	$1.3B	($0.2B)	($0.1B)	($0.1B)	($0.2B)
				Back to the Future	**$21.1B**	$21.3B	$1.6B	($0.3B)	$0.0B	($1.4B)	($0.2B)
	1006	57	San Mateo Bridge Reconstruction and Widening (Crossing 1)	Rising Tides Falling Fortunes	**$0.1B**	($0.1B)	$0.1B	$0.0B	$0.0B	$0.1B	$0.0B
				Clean and Green	**($0.8B)**	($1.1B)	$0.3B	$0.2B	$0.0B	($0.1B)	$0.0B
				Back to the Future	**$2.4B**	$2.4B	$0.6B	$0.1B	$0.0B	($0.6B)	($0.1B)
	3000	58	Regional Express Lanes (MTC + VTA + ACTC + US-101)	Rising Tides Falling Fortunes	**$7.6B**	$6.3B	$0.1B	$1.7B	($0.2B)	($0.1B)	($0.2B)
				Back to the Future	**$18.8B**	$21.8B	$0.7B	$0.8B	($0.5B)	($0.9B)	($3.2B)
Build Road Capacity - Low Cost	3100	59	SR-239 Widening (Brentwood to Tracy including airport connector)	Rising Tides Falling Fortunes	**$0.7B**	$0.6B	$0.0B	$0.2B	($0.1B)	$0.0B	$0.1B
				Clean and Green	**$1.0B**	$0.8B	$0.4B	($0.2B)	($0.1B)	$0.1B	$0.1B

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(see high-level description of methodology at the bottom of the page)

All values in billions of 2019 dollars discounted present value

Project Type	Project ID	Row ID	Project	Future	Grand Total	Accessibility Benefits	Transit Crowding Benefits	Freeway Reliability and Vehicle Ownership Benefits	Environmental Benefits	Health Benefits	Safety Benefits
Build Road Capacity - Low Cost	3100	59	SR-239 Widening (Brentwood to Tracy including airport connector)	Back to the Future	**$2.3B**	$2.3B	$0.0B	$0.0B	($0.1B)	$0.1B	$0.0B
	3101	60	I-680/SR-4 Interchange Improvements (Direct/HOV Connectors, Ramp Widening, Auxiliary Lanes)	Rising Tides Falling Fortunes	**($0.1B)**	$0.1B	$0.1B	($0.1B)	$0.0B	($0.1B)	$0.0B
				Clean and Green	**$1.0B**	$0.8B	$0.1B	$0.0B	$0.0B	$0.0B	$0.1B
				Back to the Future	**$1.4B**	$1.2B	$0.0B	$0.2B	$0.0B	$0.0B	$0.0B
	3102	61	SR-4 Operational Improvements	Rising Tides Falling Fortunes	**$0.0B**	$0.1B	($0.1B)	($0.1B)	$0.0B	$0.0B	$0.1B
				Clean and Green	**$0.5B**	$0.0B	$0.2B	$0.1B	$0.0B	$0.0B	$0.2B
				Back to the Future	**$1.1B**	$0.8B	($0.2B)	$0.2B	$0.0B	$0.1B	$0.1B
	3103	62	SR-4 Widening (Brentwood to Discovery Bay)	Rising Tides Falling Fortunes	**($0.3B)**	$0.1B	$0.0B	($0.4B)	$0.0B	$0.1B	$0.1B
				Clean and Green	**$0.1B**	$0.2B	($0.2B)	$0.2B	$0.0B	($0.1B)	$0.0B
				Back to the Future	**$2.5B**	$1.5B	$0.6B	$0.3B	$0.0B	$0.1B	$0.1B
	3104	63	I-80/I-680/SR-12 Interchange + Widening (Phases 2B-7)	Rising Tides Falling Fortunes	**$0.3B**	$0.1B	$0.0B	$0.0B	$0.0B	$0.0B	$0.2B
				Clean and Green	**$0.9B**	$0.3B	$0.4B	$0.0B	$0.0B	$0.0B	$0.2B
				Back to the Future	**$0.7B**	$0.3B	($0.2B)	$0.3B	$0.0B	$0.1B	$0.2B
	3105	64	SR-12 Widening (I-80 to Rio Vista)	Rising Tides Falling Fortunes	**$0.2B**	$0.1B	$0.0B	$0.2B	$0.0B	$0.0B	$0.0B
				Clean and Green	**$0.7B**	$0.5B	$0.0B	$0.1B	$0.0B	$0.1B	$0.1B
				Back to the Future	**$1.8B**	$1.6B	($0.4B)	$0.5B	$0.0B	$0.0B	$0.1B
	3106	65	SR-152 Realignment and Tolling	Rising Tides Falling Fortunes	**$4.5B**	$4.1B	$0.0B	$0.2B	$0.0B	$0.0B	$0.2B
				Clean and Green	**$0.1B**	$3.3B	$0.9B	($2.5B)	($0.4B)	($0.2B)	($0.9B)
				Back to the Future	**($0.9B)**	$4.9B	($0.6B)	($1.8B)	($0.6B)	$0.0B	($2.7B)
	3109	66	SR-262 Widening and Interchange Improvements	Rising Tides Falling Fortunes	**$0.2B**	$0.2B	($0.2B)	($0.4B)	$0.0B	$0.2B	$0.4B
				Clean and Green	**$0.4B**	$0.4B	$0.0B	($0.1B)	$0.0B	($0.1B)	$0.1B
				Back to the Future	**$1.2B**	$1.4B	$0.4B	($0.8B)	$0.0B	$0.0B	$0.1B
	3110	67	Union City-Fremont East-West Connector	Rising Tides Falling Fortunes	**$0.3B**	$0.1B	$0.1B	$0.1B	$0.0B	$0.0B	$0.1B
				Clean and Green	**$0.5B**	$0.2B	$0.1B	$0.2B	$0.0B	$0.0B	$0.0B
				Back to the Future	**$1.2B**	$1.1B	$0.2B	($0.1B)	$0.0B	$0.0B	$0.0B

Methodology Overview: All project impacts are measured against a uniform base transportation and land use network in each future, except Resilience projects, which are measured against a baseline where that asset is out of service (hence n/a in some futures).
Inter-regional projects: Since we are only able to model Bay Area benefits, we multiplied the benefits by a factor to reflect the ratio of expected ridership from outside the region. Valley Link benefit multiplier: 3.3; Caltrain/HSR benefit multiplier: 1.3 (the HSR multiplier is applied in Clean and Green only, the future where HSR is completely built out).
Description of benefits:
Accessibility Benefits: Represents change in accessibility benefits to all Bay Area residents as a result of the project
Transit Crowding Benefits: Captures the (dis)benefits associated with increase/decrease in crowding, since people may change their travel choices or be denied boarding, or experience discomfort in a crowded vehicle
Freeway Reliability and Vehicle Ownership Benefits: Reflects change in non-recurring vehicle delay on freeways, and the costs of change in vehicle ownership as a result of the project
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Health Benefits: Represents benefits from increased physical activity due to more walking/biking and reduction in air pollutants and noise
Safety Benefits: Captures decrease in injuries and collisions due to reduced VMT as well as operational and safety improvements such as freewayramp redesign or grade separations
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Horizon/Plan Bay Area 2050: Draft Project Performance Findings
Attachment D: Detailed Table of Lifecycle Benefits by Future

Note 1: Total number of projects: 93; 81 projects from public agencies, 12 projects from public/NGOs that were jury finalists from the Transformative Projects process
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All values in billions of 2019 dollars discounted present value

Project Type	Project ID	Row ID	Project	Future	Grand Total	Accessibility Benefits	Transit Crowding Benefits	Freeway Reliability and Vehicle Ownership Benefits	Environmental Benefits	Health Benefits	Safety Benefits
Optimize Existing Freeway Network	2002	68	AC Transit Transbay Network: Capital Improvements + Service Increase	Rising Tides Falling Fortunes	**$3.2B**	$0.8B	$1.3B	$0.5B	$0.0B	$0.2B	$0.3B
				Clean and Green	**$4.9B**	$0.7B	$2.8B	$1.0B	$0.1B	$0.2B	$0.2B
				Back to the Future	**$6.2B**	$2.7B	$2.6B	$0.5B	$0.0B	$0.1B	$0.3B
	3003	69	San Francisco Arterial HOV and Freeway HOT Lanes	Rising Tides Falling Fortunes	**$0.7B**	$0.8B	$0.2B	($0.1B)	$0.0B	($0.1B)	$0.0B
				Clean and Green	**$1.1B**	$0.8B	$0.5B	($0.1B)	$0.0B	($0.1B)	$0.1B
				Back to the Future	**$3.2B**	$2.5B	$0.8B	$0.0B	$0.0B	($0.1B)	$0.1B
	5000	70	Bay Area Forward (Phase 1: Freeway Ramp and Arterial Components Only)	Rising Tides Falling Fortunes	**$4.3B**	$3.8B	$0.1B	$1.2B	($0.1B)	$0.0B	($0.7B)
				Back to the Future	**$3.5B**	$5.9B	$1.1B	$1.5B	($0.5B)	($0.6B)	($3.9B)
Resilience	3200	71	SR-37 Long Term Project (Tolling, Elevation, Interchanges, Widening, Express Bus)	Rising Tides Falling Fortunes	**$3.6B**	$2.1B	$0.7B	$0.3B	$0.5B	($0.2B)	$0.2B
				Clean and Green	**$2.5B**	$4.1B	$1.0B	($2.0B)	$0.4B	($0.3B)	($0.7B)
				Back to the Future	**($4.7B)**	($1.4B)	($0.1B)	($1.2B)	$0.4B	($0.3B)	($2.1B)
	7001	72	VTA LRT Resilience Project (Tasman West)	Rising Tides Falling Fortunes	**$1.0B**	$0.3B	$0.2B	$0.5B	$0.0B	$0.1B	$0.0B
				Clean and Green	**$1.1B**	$0.7B	($0.4B)	$0.3B	$0.0B	$0.3B	$0.1B
				Back to the Future	**$1.6B**	$1.6B	($1.2B)	$0.8B	$0.0B	$0.3B	$0.1B
	7002	73	I-580/US-101/SMART Marin Resilience Project	Rising Tides Falling Fortunes	**$12.0B**	$11.6B	$1.2B	$0.2B	($0.2B)	($0.5B)	($0.2B)
				Clean and Green	**$17.7B**	$17.1B	$1.6B	$0.0B	($0.3B)	($0.4B)	($0.3B)
				Back to the Future	**$20.0B**	$21.0B	$1.6B	($1.7B)	$0.0B	($0.8B)	$0.0B
	7003	74	US-101 Peninsula Resilience Project (San Antonio R..	Rising Tides Falling Fortunes	**$2.7B**	$2.8B	$0.6B	$0.1B	($0.1B)	($0.3B)	($0.4B)
	7004	75	SR-84 Resilience Project (Dumbarton Bridge, 101 in..	Rising Tides Falling Fortunes	**$4.7B**	$4.8B	$0.4B	$0.6B	($0.1B)	($0.3B)	($0.6B)
	7005	76	SR-237 Resilience Project (Alviso)	Rising Tides Falling Fortunes	**$2.2B**	$1.9B	$0.0B	$0.3B	$0.0B	($0.1B)	$0.2B
				Back to the Future	**$11.1B**	$11.8B	$1.9B	($1.7B)	($0.1B)	($0.7B)	($0.1B)
	7006	77	I-880 Resilience Project (South Fremont)	Rising Tides Falling Fortunes	**$4.0B**	$2.9B	$0.1B	$1.1B	($0.1B)	($0.1B)	$0.3B

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Horizon/Plan Bay Area 2050: Draft Project Performance Findings
Attachment E: Detailed Table of Lifecycle Costs

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Lifecycle costs in billions of 2019 dollars discounted present value; Project costs in billions of 2019 dollars

						Lifecycle Costs (billions of discounted present value 2019 dollars)				Project Costs (2019$B) (as reviewed with sponsor)	
Project Type	Project ID	Row ID	Project	Project Source	Total Lifecycle Cost (billions of discounted present value 2019$)	Initial Capital Cost	O&M	Rehab + Replacement	Residual Value	Initial Capital Cost	Annual O&M
Build Core Rail	1002	1	New San Francisco-Oakland Transbay Rail Crossing - BART (Crossing 3: Mission St)	Crossings Study	$36.2B	$33.8B	$4.8B	$2.6B	($5.0B)	$39.6B	$0.3B
	1003	2	New San Francisco-Oakland Transbay Rail Crossing - BART (Crossing 4: New Markets)	Crossings Study	$37.4B	$34.9B	$4.9B	$2.7B	($5.1B)	$40.9B	$0.3B
	1004	3	New San Francisco-Oakland Transbay Rail Crossing - Commuter Rail (Crossing 5)	Crossings Study	$46.1B	$39.2B	$7.4B	$4.2B	($4.7B)	$45.9B	$0.4B
	1007	4	New San Francisco-Oakland Transbay Rail Crossing - BART + Commuter Rail (Crossing 7)	Crossings Study	$83.5B	$74.1B	$12.4B	$6.9B	($9.8B)	$86.8B	$0.7B
	2205	5	BART to Silicon Valley (Phase 2)	VTA	$6.0B	$4.7B	$1.3B	$0.5B	($0.5B)	$5.2B	$0.1B
	2208	6	BART Gap Closure (Millbrae to Silicon Valley)	VTA	$40.4B	$43.2B	$1.1B	$2.2B	($6.0B)	$50.7B	$0.1B
	2300	7	Caltrain Downtown Extension	TJPA	$4.8B	$4.4B	$0.7B	$0.1B	($0.5B)	$4.9B	$0.0B
	2306	8	Dumbarton Rail (Redwood City to Union City)	SamTrans + CCAG	$3.9B	$2.7B	$1.1B	$0.4B	($0.3B)	$3.0B	$0.1B
	2310	9	Megaregional Rail Network + Resilience Project (Caltrain, ACE, Valley Link, Dumbarton, Cap Cor)	City of San Jose	$54.1B	$47.0B	$9.9B	$2.4B	($5.1B)	$55.9B	$0.6B
Extend Rail Network - High Cost	2203	10	BART to Hercules & I-80 Bus from Vallejo to Oakland	CCTA	$5.8B	$4.1B	$0.5B	$1.5B	($0.3B)	$4.5B	$0.0B
	2204	11	BART on I-680 (Walnut Creek to West Dublin/Pleasanton)	Caltrans	$11.0B	$9.4B	$0.9B	$1.4B	($0.7B)	$10.2B	$0.0B
	2206	12	BART Extension from Diridon to Cupertino	VTA	$12.1B	$11.1B	$1.5B	$0.9B	($1.5B)	$13.0B	$0.1B
	2207	13	BART Extension from Diridon to Gilroy (replacing existing Caltrain)	VTA	$17.7B	$14.2B	$2.9B	$2.3B	($1.7B)	$16.6B	$0.2B
	2308	14	Valley Link (Dublin to San Joaquin Valley)	TVSJVRRA	$3.0B	$2.0B	$0.7B	$0.5B	($0.2B)	$2.2B	$0.0B
Extend Rail Network - Low Cost	2202	15	BART DMU Extension to Brentwood	CCTA	$0.6B	$0.4B	$0.1B	$0.1B	$0.0B	$0.4B	$0.0B
	2304	16	SMART Extension to Cloverdale	SMART	$0.5B	$0.3B	$0.1B	$0.1B	$0.0B	$0.4B	$0.0B
	2305	17	SMART to Solano (Novato to Suisun City, without sea level rise protections)	SMART	$1.6B	$1.1B	$0.2B	$0.4B	($0.1B)	$1.2B	$0.0B
Optimize Existing Transit Network - High Cost	2001	18	AC Transit Local Rapid Network: Capital Improvements + Service Increase	AC Transit	$8.4B	$2.5B	$4.5B	$1.6B	($0.1B)	$2.6B	$0.2B
	2005	19	Alameda County BRT Network + Connected Vehicle Corridors	ACTC	$4.0B	$1.1B	$2.2B	$0.7B	($0.1B)	$1.2B	$0.1B
	2201	20	BART Core Capacity	BART	$4.5B	$2.8B	$1.2B	$0.8B	($0.4B)	$3.2B	$0.1B
	2301	21	Caltrain Full Electrification and Blended System: Base Growth	Caltrain + HSR	$20.9B	$19.0B	$3.4B	$0.5B	($2.1B)	$22.6B	$0.2B
	2302	22	Caltrain Full Electrification and Blended System: Moderate Growth	Caltrain + HSR	$24.6B	$21.8B	$4.4B	$0.8B	($2.3B)	$25.9B	$0.2B
	2303	23	Caltrain Full Electrification and Blended System: High Growth	VTA, City of San Jose	$36.9B	$29.3B	$8.2B	$1.6B	($2.1B)	$30.6B	$0.3B
	2401	24	North San Jose LRT Subway	VTA	$4.9B	$5.3B	$0.1B	$0.1B	($0.7B)	$5.8B	$0.0B
	2407	25	Muni Metro Southwest M-Line Subway	SFCTA	$5.6B	$3.7B	$2.2B	$0.2B	($0.5B)	$4.1B	$0.1B
	2409	26	VTA LRT Systemwide Grade Separation	VTA	$11.6B	$12.2B	$0.2B	$0.7B	($1.5B)	$14.2B	$0.0B
	2410	27	VTA LRT Systemwide Grade Separation and Full Automation	City of San Jose	$14.8B	$15.4B	$0.2B	$0.8B	($1.6B)	$17.3B	$0.0B
	2411	28	VTA LRT Systemwide Grade Separation, Network Expansion, and Full Automation	City of San Jose and VTA	$44.2B	$44.1B	$2.1B	$2.9B	($4.9B)	$49.6B	$0.1B
Optimize Existing Transit Network - Low Cost	2000	29	AC Transit Local Network: Service Increase	AC Transit	$2.6B	$0.2B	$2.2B	$0.2B	$0.0B	$0.2B	$0.1B
	2003	30	Muni Forward: Capital Improvements + Service Increase	SF	$2.9B	$0.4B	$2.1B	$0.4B	$0.0B	$0.5B	$0.1B
	2004	31	Sonoma Countywide Bus: Service Increase	SCTA	$0.9B	$0.3B	$0.4B	$0.3B	$0.0B	$0.3B	$0.0B
	2007	32	San Francisco Southeast Waterfront Transit Improvements	SF	$0.6B	$0.2B	$0.3B	$0.1B	$0.0B	$0.2B	$0.0B
	2008	33	Alameda Point Transit Network Improvements	ACTC	$0.5B	$0.1B	$0.4B	$0.0B	$0.0B	$0.1B	$0.0B
	2100	34	San Pablo BRT	AC Transit	$0.5B	$0.3B	$0.0B	$0.2B	$0.0B	$0.3B	$0.0B
	2101	35	Geary BRT (Phase 2)	SF	$0.6B	$0.2B	$0.3B	$0.2B	$0.0B	$0.2B	$0.0B

Lifecycle Costs (calculated using discounted present value methodology):
Initial Capital Cost: Capital cost of constructing/implementing the project
O&M: Annual operating and maintenance costs of the project over the full analysis period
Rehab + Replacement: Rehabiliation costs of pavement and roadway structures; replacement costs of roadway and transit assets after their useful lives (e.g. bus replacement every 14 years, roadway technology every 20 years)
Residual Value: Represents useful value of assets/infrastucture at the end of the analysis period (based on straight line depreciation)
Project Costs (as reviewed with sponsor):
Reflects sponsor submitted costs of projects. These were revised in some cases when a high-level cost review of all projects using an independent cost consultant and a uniform methodology flagged sponsor costs that may have been underestimated (such cases were discussed with the sponsors individually).
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Optimize Existing Transit Network - Low Cost	2103	36	SamTrans El Camino Real BRT: Capital and Service Improvements	CCAG	$0.4B	$0.2B	$0.0B	$0.1B	$0.0B	$0.2B	$0.0B
	2105	37	Alameda County E14th St/Mission and Fremont Blvd Multimodal Corridor	ACTC	$0.5B	$0.3B	$0.0B	$0.2B	$0.0B	$0.3B	$0.0B
	2209	38	Irvington BART Infill Station	ACTC	$0.2B	$0.1B	$0.1B	$0.0B	$0.0B	$0.1B	$0.0B
	2400	39	Downtown San Jose LRT Subway	VTA	$1.9B	$2.2B	($0.1B)	$0.1B	($0.3B)	$2.4B	$0.0B
	3001	40	Treasure Island Congestion Pricing	SF	$0.8B	$0.1B	$0.6B	$0.1B	$0.0B	$0.1B	$0.0B
	3002	41	Downtown San Francisco Congestion Pricing	SF	$0.3B	$0.0B	$0.3B	$0.0B	$0.0B	$0.1B	$0.0B
Build Local Transit	2402	42	San Jose Airport People Mover	VTA	$1.4B	$1.1B	$0.2B	$0.2B	($0.1B)	$1.2B	$0.0B
	2403	43	Vasona LRT Extension (Phase 2)	VTA	$0.3B	$0.2B	$0.0B	$0.0B	$0.0B	$0.2B	$0.0B
	2408	44	Muni Metro T-Third Extension to South San Francisco	City of South San Francisco	$1.8B	$1.1B	$0.4B	$0.3B	($0.1B)	$1.2B	$0.0B
	2412	45	SR-85 LRT (Mountain View to US101 interchange)	City of Cupertino	$3.7B	$2.6B	$0.5B	$0.8B	($0.2B)	$2.9B	$0.0B
	4000	46	Oakland/Alameda Gondola Network	City of Oakland	$1.1B	$0.7B	$0.2B	$0.3B	$0.0B	$0.7B	$0.0B
	4001	47	Mountain View AV Network (Free Fare, Subsidies from Companies)	City of Mountain View	$1.4B	$1.3B	$0.2B	$0.0B	($0.1B)	$1.4B	$0.0B
	4002	48	Contra Costa Autonomous Shuttle Program	CCTA	$3.4B	$1.3B	$0.9B	$1.2B	($0.1B)	$1.4B	$0.0B
	4003	49	Cupertino-Mountain View-San Jose Elevated Maglev Rail Loop	City of Cupertino	$8.1B	$7.2B	$0.3B	$1.1B	($0.6B)	$7.9B	$0.0B
	5003	50	I-680 Corridor Improvements (BRT, Express Bus, Shared AVs, Gondolas)	CCTA	$4.6B	$1.3B	$2.6B	$0.8B	($0.1B)	$1.4B	$0.1B
Enhance Alternate Modes	2600	51	WETA Ferry Service Frequency Increase	WETA	$0.4B	$0.0B	$0.3B	$0.0B	$0.0B	$0.0B	$0.0B
	2601	52	WETA Ferry Network Expansion (Berkeley, Alameda Pt, Redwood City, Mission Bay, Treasure Isla..	WETA	$1.0B	$0.3B	$0.7B	$0.0B	$0.0B	$0.3B	$0.0B
	2700	53	Bay Bridge West Span Bike Path	MTC/ABAG	$0.8B	$0.5B	$0.1B	$0.3B	$0.0B	$0.5B	$0.0B
	6006	54	Enhanced Regionwide Bike Infrastructure	MTC/ABAG	$12.6B	$7.4B	$0.8B	$4.8B	($0.4B)	$8.3B	$0.0B
Build Road Capacity - High Cost	1001	55	Southern Crossing Bridge + New San Francisco-Oakland Transbay Rail Crossing - BART (Crossing 6)	Crossings Study	$47.1B	$45.0B	$5.7B	$3.0B	($6.5B)	$52.7B	$0.3B
	1005	56	Mid-Bay Bridge (I-238 to I-380) (Crossing 2)	Crossings Study	$19.9B	$14.8B	$0.8B	$5.6B	($1.3B)	$17.4B	$0.0B
	1006	57	San Mateo Bridge Reconstruction and Widening (Crossing 1)	Crossings Study	$15.7B	$11.4B	$0.6B	$4.6B	($1.0B)	$13.4B	$0.0B
	3000	58	Regional Express Lanes (MTC + VTA + ACTC + US-101)	MTC/ABAG	$12.1B	$5.6B	$3.7B	$3.1B	($0.2B)	$6.1B	$0.2B
Build Road Capacity - Low Cost	3100	59	SR-239 Widening (Brentwood to Tracy including airport connector)	CCTA	$2.4B	$1.8B	$0.0B	$0.7B	($0.1B)	$2.1B	$0.0B
	3101	60	I-680/SR-4 Interchange Improvements (Direct/HOV Connectors, Ramp Widening, Auxiliary Lanes)	CCTA	$0.4B	$0.3B	$0.0B	$0.1B	$0.0B	$0.3B	$0.0B
	3102	61	SR-4 Operational Improvements	CCTA	$0.5B	$0.3B	$0.0B	$0.2B	$0.0B	$0.4B	$0.0B
	3103	62	SR-4 Widening (Brentwood to Discovery Bay)	CCTA	$0.4B	$0.3B	$0.0B	$0.2B	$0.0B	$0.3B	$0.0B
	3104	63	I-80/I-680/SR-12 Interchange + Widening (Phases 2B-7)	STA	$0.7B	$0.5B	$0.0B	$0.3B	$0.0B	$0.5B	$0.0B
	3105	64	SR-12 Widening (I-80 to Rio Vista)	STA	$2.5B	$1.7B	$0.1B	$0.9B	($0.1B)	$1.8B	$0.0B
	3106	65	SR-152 Realignment and Tolling	VTA	$1.9B	$1.2B	$0.1B	$0.7B	($0.1B)	$1.2B	$0.0B
	3109	66	SR-262 Widening and Interchange Improvements	ACTC	$1.0B	$0.7B	$0.0B	$0.4B	$0.0B	$0.7B	$0.0B
	3110	67	Union City-Fremont East-West Connector	ACTC	$0.4B	$0.3B	$0.0B	$0.1B	$0.0B	$0.3B	$0.0B
Optimize Existing Freeway Network	2002	68	AC Transit Transbay Network: Capital Improvements + Service Increase	AC Transit	$6.5B	$2.2B	$2.8B	$1.6B	($0.2B)	$2.4B	$0.1B
	3003	69	San Francisco Arterial HOV and Freeway HOT Lanes	SF	$1.3B	$0.7B	$0.1B	$0.5B	($0.1B)	$0.8B	$0.0B
	5000	70	Bay Area Forward (Phase 1: Freeway Ramp and Arterial Components Only)	MTC/ABAG	$0.6B	$0.3B	$0.1B	$0.2B	$0.0B	$0.3B	$0.0B

Lifecycle Costs (calculated using discounted present value methodology):
Initial Capital Cost: Capital cost of constructing/implementing the project
O&M: Annual operating and maintenance costs of the project over the full analysis period
Rehab + Replacement: Rehabiliation costs of pavement and roadway structures; replacement costs of roadway and transit assets after their useful lives (e.g. bus replacement every 14 years, roadway technology every 20 years)
Residual Value: Represents useful value of assets/infrastucture at the end of the analysis period (based on straight line depreciation)
Project Costs (as reviewed with sponsor):
Reflects sponsor submitted costs of projects. These were revised in some cases when a high-level cost review of all projects using an independent cost consultant and a uniform methodology flagged sponsor costs that may have been underestimated (such cases were discussed with the sponsors individually).
(The full methodology can be found on our website)

Horizon/Plan Bay Area 2050: Draft Project Performance Findings
Attachment E: Detailed Table of Lifecycle Costs

Note 1: Total number of projects: 93; 81 projects from public agencies, 12 projects from public/NGOs that were jury finalists from the Transformative Projects process
Note 2: Costs are not shown for 4 public agency projects and the 12 jury finalists, since modelling and/or cost review are in progress
(see high-level description of methodology at the bottom of the page)

Lifecycle costs in billions of 2019 dollars discounted present value; Project costs in billions of 2019 dollars

						Lifecycle Costs (billions of discounted present value 2019 dollars)				**Project Costs (2019$B) (as reviewed with sponsor)**	
Project Type	Project ID	Row ID	Project	Project Source	Total Lifecycle Cost (billions of discounted present value 2019$)	Initial Capital Cost	O&M	Rehab + Replacement	Residual Value	Initial Capital Cost	Annual O&M
Resilience	3200	71	SR-37 Long Term Project (Tolling, Elevation, Interchanges, Widening, Express Bus)	MTC/ABAG/North Bay Count..	$5.4B	$3.7B	$0.3B	$1.7B	($0.3B)	$4.1B	$0.0B
	7001	72	VTA LRT Resilience Project (Tasman West)	MTC/ABAG/BCDC	$0.2B	$0.1B	$0.0B	$0.1B	$0.0B	$0.1B	$0.0B
	7002	73	I-580/US-101/SMART Marin Resilience Project	MTC/ABAG/BCDC	$0.2B	$0.1B	$0.0B	$0.1B	$0.0B	$0.1B	$0.0B
	7003	74	US-101 Peninsula Resilience Project (San Antonio Rd, Poplar Ave, Millbrae Ave)	MTC/ABAG/BCDC	$0.2B	$0.1B	$0.0B	$0.1B	$0.0B	$0.1B	$0.0B
	7004	75	SR-84 Resilience Project (Dumbarton Bridge, 101 interchange)	MTC/ABAG/BCDC	$0.2B	$0.1B	$0.0B	$0.0B	$0.0B	$0.1B	$0.0B
	7005	76	SR-237 Resilience Project (Alviso)	MTC/ABAG/BCDC	$0.2B	$0.1B	$0.0B	$0.1B	$0.0B	$0.1B	$0.0B
	7006	77	I-880 Resilience Project (South Fremont)	MTC/ABAG/BCDC	$0.1B	$0.0B	$0.0B	$0.0B	$0.0B	$0.0B	$0.0B

Lifecycle Costs (calculated using discounted present value methodology):
Initial Capital Cost: Capital cost of constructing/implementing the project
O&M: Annual operating and maintenance costs of the project over the full analysis period
Rehab + Replacement: Rehabiliation costs of pavement and roadway structures; replacement costs of roadway and transit assets after their useful lives (e.g. bus replacement every 14 years, roadway technology every 20 years)
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(The full methodology can be found on our website)

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Horizon/Plan Bay Area 2050:

Draft Project Performance Findings

Anup Tapase, MTC/ABAG

November 2019

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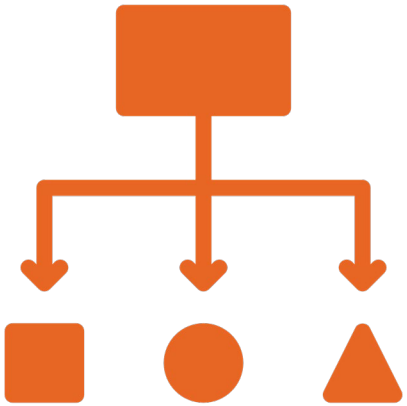
The Project Performance Assessment is **one key lens to understand how our major transportation investments would fare in an uncertain future**, in combination with Futures Planning which explored synergies between individual projects and strategies.

Key Objectives of Project Performance

- Understand how project benefits vary under different conditions.
- Learn how the performance of projects could be enhanced.
- Start a collaborative dialogue with all stakeholders.

Process to Date



Requested projects for consideration in Plan Bay Area 2050

Spring 2018 to Spring 2019

Develop evaluation methodology with input from RAWG/RMWG

Summer 2018 to Winter 2019

Evaluated benefits & costs of 93 projects using three Futures

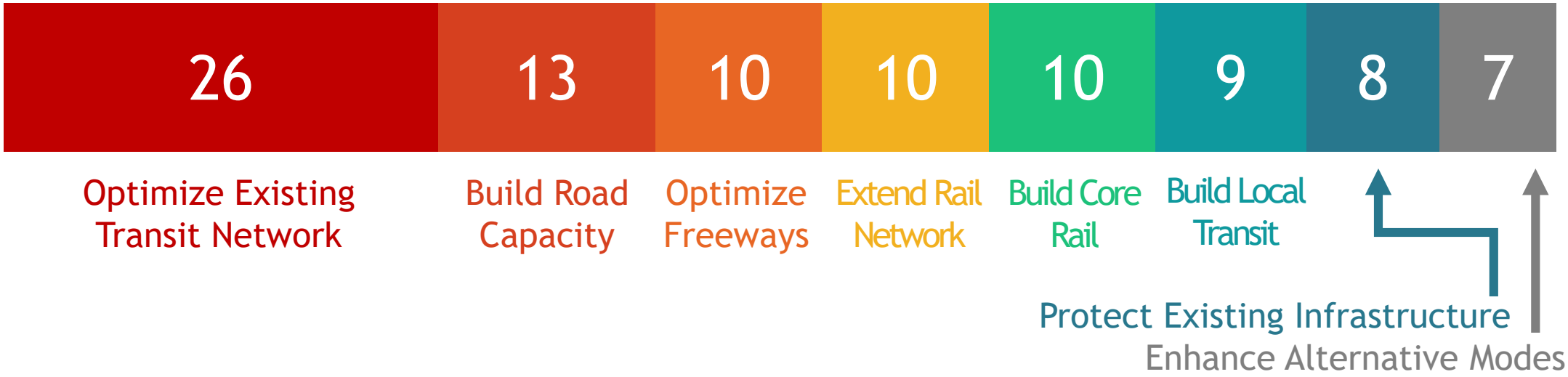
Spring 2019 to Fall 2019

Identify findings/next steps to prioritize projects & strategies

Fall 2019 & beyond

Which Projects Did We Evaluate?

Number of Projects by Objective



Capital Cost Breakdown of Projects*

86% of capital costs are for rail investments

3% of capital costs are for bus investments

7% of capital costs are for road investments

* **Does not include public submissions of transformative projects selected by the jury**; costs for these projects are still under development.

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Which Projects Did We Not Evaluate?

Committed Projects
(not exhaustive list; included in baseline network for analysis)

- **BART:** Silicon Valley Phase 1; Fleet Modernization
- **Caltrain:** Modernization
- **Muni:** Central Subway; Muni Forward; Van Ness BRT; Geary BRT Phase 1
- **SMART:** Larkspur and Windsor Extensions
- **VTA:** Eastridge Extension; Next Network
- **AC Transit:** International Blvd BRT; AC Go
- **Express Lanes:** Committed Segments Only
- **Interchanges:** I-680/SR-4 (initial phases); I-80/I-680/SR-12 (initial phases)

Projects Less than $250 Million or Not Capacity-Increasing
(exempt from Project Performance)

How Were Projects Evaluated?

Benefit-Cost Assessment *(x 3 Futures)*: **is the project cost-effective & resilient?**

If benefit-cost ratio in a given Future is greater than 1, then benefits exceed costs.

- List of benefits and costs provided on following slide

Equity Assessment *(x 3 Futures)*: **is the project advancing equity?**

If greater than 60% of project access benefits benefit lower-income households, then it advances equity.

- Quantitative assessment: reflected in equity score
- Geographic assessment: showcased as secondary legacy assessment *(similar to Plan Bay Area 2040)*

Guiding Principles Assessment: is the project aligned with Plan Bay Area 2050's vision?

If no Guiding Principles "flags" are identified, then it is generally aligned with the Guiding Principles.

- Qualitative assessment based on the five Guiding Principles:
  - Affordable, Connected, Diverse, Healthy, Vibrant

How Were Projects Evaluated: *Benefit-Cost*

Benefits

Accessibility Benefits

- Travel time - in vehicle
- Travel time - out of vehicle
- Vehicle operating costs
- Travel costs
- Mode choice availability

- **Freeway Reliability + Vehicle Ownership**
- Transit Crowding
- **Environmental** (Emissions; Natural Land Loss)
- **Health** (Physical Activity; Air Pollutants; Noise)
- **Safety** (Collisions/Injuries; on-model & off-model/ operational benefits)

Costs

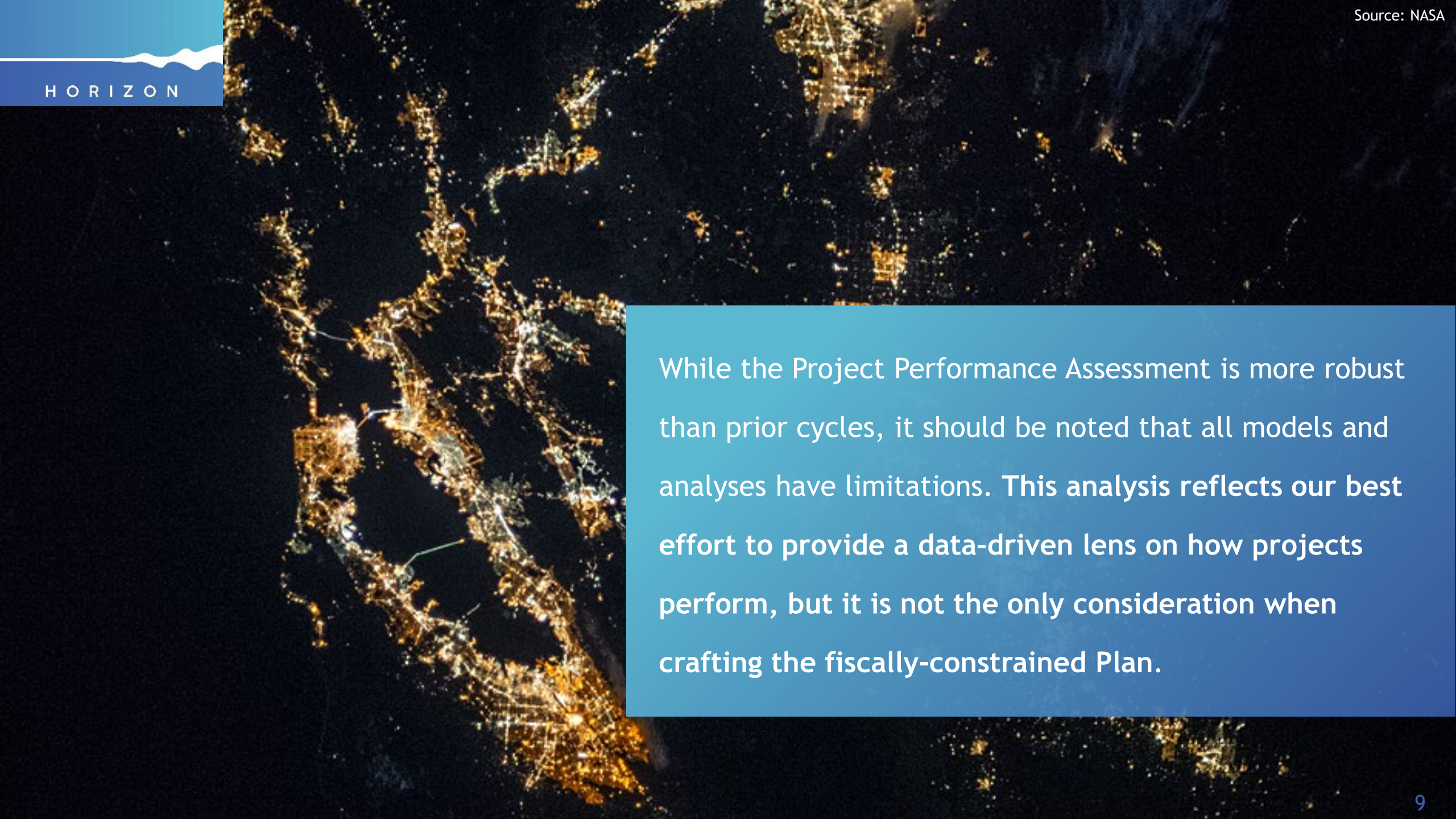
Capital Costs

- Initial investment
- Rehab/Replacement Costs
- Residual value

Operating & Maintenance Costs (annual)

Benefit-Cost Ratio = $\frac{\text{Benefits}}{\text{Costs}}$

Major Enhancements from Plan Bay Area 2040



Source: NASA

While the Project Performance Assessment is more robust than prior cycles, it should be noted that all models and analyses have limitations. **This analysis reflects our best effort to provide a data-driven lens on how projects perform, but it is not the only consideration when crafting the fiscally-constrained Plan.**

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DRAFT

Key Findings & Next Steps

Integrating Performance Findings into
Plan Bay Area 2050's Transportation Element

KEY FINDING

1

Costs of projects evaluated totaled more than $400 billion, well exceeding the fiscal constraints of the Bay Area.

Not only have existing megaprojects grown in costs, but bold new ideas are increasingly expensive. Plan Bay Area 2050 should recommend regional reforms to speed project delivery and manage capital and O&M costs.

KEY FINDING

2

Project performance will be significantly affected by uncertain future conditions.

Projects should be planned along with complementary strategies that enhance their performance and resilience, such as enhanced land use strategies near new stations or pricing strategies to boost demand.

KEY FINDING

3

Lower-cost transit improvements, such as urban BRT lines, and sea level rise protections for heavily-used freeways are the best bet in an uncertain future.

Such projects should be seen as low-hanging fruit and advanced to implementation expeditiously.

KEY FINDING

4

High-cost commuter rail projects have mixed performance outcomes, predominantly benefiting higher-income groups.

Rail projects should be evaluated alongside lower-cost bus improvements. Such projects should be paired with complementary strategies to ensure that all Bay Area residents benefit from them.

KEY FINDING

5

Some projects have synergies, while other projects compete with each other.

In a fiscally-constrained environment, we should focus on complementary investments and strategies, while being careful before including projects that degrade benefits of others.

KEY FINDING

6

Pricing is the most powerful tool to affect traffic congestion and travel patterns - but it must be done in an equitable manner.

Rather than adding highway capacity, Plan Bay Area 2050 should integrate pricing strategies - but only if meaningful toll discounts or other mitigations are integrated for those of lesser means.

Early Finding
Full assessment still in progress

KEY FINDING 7

Transit fare reforms could meaningfully change travel behavior.

Reforming the Bay Area's complex fare systems could significantly grow ridership. However, this strategy must be paired with service and capacity increases to accommodate the robust growth in demand.

KEY FINDING

8

Greater investment in micromobility can have significant regional benefits for the overall transportation network.

The region should consider including a much more significant investment in active transportation than prior iterations of Plan Bay Area.

KEY FINDING

9

A new Transbay Rail Crossing emerged as the most cost-effective transit expansion megaproject.

To relieve crowding, support focused growth, and enhance mobility across the Bay Area, Plan Bay Area 2050 should consider a new rail and/or BART crossing between San Francisco and the East Bay as a critical new investment.

Findings on Select Corridors

- **Peninsula/US-101.** The region should carefully consider the sequencing of investments on this corridor, especially given a potential nexus with a New Transbay Rail Crossing.
- **Altamont Pass.** Rather than adding auto capacity, combining Valley Link with complementary pricing strategies presents a promising path forward.
- **South Bay.** Some of the aspirational transit improvements in Santa Clara County fell short on cost-effectiveness in most Futures, but there may be land use benefits of such projects that cannot be fully reflected.
- **SR-4/SR-239.** Operational improvements yield meaningful benefits to travelers along this freeway corridor, but expansions are less resilient in an uncertain future.
- **SR-37.** For this east-west connection, the proposed resilience project had higher costs and lower benefits than other transportation facilities requiring protection from rising sea levels.

Snippet from Attachment A: Summary Table of Projects

	Benefit-Cost Ratio			Equity Score		
Guiding Principle Flags	Rising Tides Falling Fortunes	Clean And Green	Back To The Future	Rising Tides Falling Fortunes	Clean And Green	Back To The Future
2	0.7	2	2	Even	Even	Even
2	0.6	1	1	Even	Even	Even
0	0.6	1	1	Even	Even	Even
0	0.6	1	1	Even	Even	Even
0	<0.5	0.7	0.6	Challenges	Challenges	Challenges
2	<0.5	0.6	0.5	Challenges	Challenges	Challenges
0	<0.5	<0.5	0.6	Advances	Advances	Even
0	<0.5	<0.5	0.5	Even	Even	Challenges
0	<0.5	<0.5	<0.5	Advances	Advances	Even
0	cost review in progress			cost review in progress		
0	<0.5	1	1	Even	Even	Even
0	<0.5	<0.5	<0.5	Even	Advances	Even
0	<0.5	<0.5	<0.5	Challenges	Challenges	Challenges
1	<0.5	<0.5	<0.5	Even	Advances	Even
0	<0.5	<0.5	<0.5	Even	Even	Even
0	modeling in progress			modeling in progress		
0	modeling in progress			modeling in progress		
0	<0.5	<0.5	<0.5	Even	Challenges	Challenges
0	<0.5	0.5	<0.5	Advances	Challenges	Challenges
0	<0.5	<0.5	<0.5	Challenges	Even	Challenges
0	1	2	2	Even	Even	Even
2	<0.5	1	0.5	Challenges	Even	Challenges
2	<0.5	0.9	0.5	Challenges	Even	Challenges
0	<0.5	0.5	0.6	Advances	Advances	Even
1	<0.5	<0.5	0.7	Advances	Advances	Even
0	<0.5	<0.5	<0.5	Advances	Advances	Challenges
0	<0.5	<0.5	0.5	Advances	Advances	Even
0	<0.5	<0.5	<0.5	Advances	Advances	Even
2	<0.5	<0.5	<0.5	Even	Even	Even
0	<0.5	<0.5	0.5	Even	Advances	Even
1	8	7	>10	Challenges	Challenges	Challenges
0	1	1	9	Even	Even	Even
1	2	3	4	Challenges	Challenges	Challenges

Moving Forward

- **During Plan Bay Area and Plan Bay Area 2040,** MTC has used the Project Performance Assessment to categorize projects as high-, medium- and low-performing - with low-performing projects required to submit a "compelling case" if they wished to include it in the fiscally-constrained Plan.
- **For Plan Bay Area 2050, we are proposing a solutions-oriented approach instead.** This would continue the identification of high-performing projects, but for all remaining projects, MTC would work collaboratively with sponsors to identify project refinements or complementary local or regional strategies to address performance shortcomings.

Moving Forward

LATE JANUARY

Commission & Board Workshop:
Plan Bay Area 2050 Draft Blueprint
Transportation Tradeoffs Discussion

November

- Finish analysis of remaining projects
- Continue to address questions raised by project sponsors
- Start conversation on "high-performing" project definition

December

- Refine definition of "high-performing" project
- Begin conversations with project sponsors on refinements & complementary strategies

January

- Incorporate high-performing projects into Transportation component of Draft Blueprint
- Continue conversations with project sponsors on remaining projects

HORIZON

Questions?

Thank you to our transportation partners from across the Bay Area for their continued collaboration - as we work together to make our major investments even better in the coming months.