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Public Works Commission

ACTION CALENDAR
December 19, 2017

To: Honorable Mayor and Members of the City Council

From: Public Works Commission (PWC)

Submitted by: Margo Schueler, Chairperson, Public Works Commission

Subject: Public Works Commission Recommendation for the Five-Year Paving Plan

RECOMMENDATION

Adopt a Resolution that recommends approval of the first year (2018) of the Five-Year Paving Plan (2018-2019) as proposed by staff.

SUMMARY

Improved street quality numbers among the very few non-divisive issues of our time; everyone agrees that better streets make for a better community.

The PWC does not believe that this plan delivers better streets. The outcomes predicted by staff will be lower PCI by 2022, increased costs per mile of asphalt street treatment, no change in the grey vs. green nature of our travelled right of way and storm water management system, and no further understanding of innovative technologies or life cycle costs of paving methods. Without the expenditures from Measures M and T1, the PCI would have fallen even lower than projected with this plan.

Over the last year the PWC has worked with Public Works Staff to understand and review the proposed 2018-2022 Five-Year Paving Plan (Paving Plan) and the Measure T1 Implementation Plan. We have discussed Berkeley's many Plans that impact our goals for our streets, sidewalks, bus and bikeways. There has been a near complete transition of staff working on the Paving Plan over the last year. We have met with new staff to discuss Berkeley's concerns and desires and share concerns about resource limitations impacting our ability as a city to innovate in our right of ways. The PWC commends the new staff on their commitment to communication with the PWC and looks forward to future Plan improvements that emphasize durability and sustainable innovations that better optimize our limited Street Paving and Rehabilitation budget.

Staff has emphasized acceleration of current paving practices in the Paving Plan focusing on residential streets to address immediate improvement in the citywide Pavement Condition Index (PCI) while the PWC is increasingly concerned that all elements of the Paving Policy need to be addressed in the Paving Plan development. In completing our review of the proposed 5-Year Plan, we do not find that the Plan will achieve any improvement in the PCI over time. PCI using this historic approach will

continue to decline based on the City's consultant's projections. In addition, the PWC does not find the proposed Plan consistent the additional elements beyond the PCI prioritized in the 2009 Council approved Street Paving and Rehabilitation Policy.

Moving forward with the 2018 proposed projects will allow the City to proceed with urgently needed projects previously reviewed and recommended, while allowing projects not yet under design to address multiple elements of the Street Rehabilitation Program including:

- Update project designs to accommodate the effects of climate change, especially those stemming from the extremes in precipitation from drought to heavy rains, which have taken a toll on our existing streets and infrastructure;

- Optimize green infrastructure to provide multiple benefits by (e.g., street treatments which calm traffic, reduce pavement noise, recharge ground water, help reduce flooding and increase aesthetic value); and

- Evaluate full life-cycle costs of street treatments, especially when reconstructing streets.

The PWC would like to recognize the work of staff to update the 5-year paving plan, develop the T1 Implementation Plan, and complete Measure M work all with a 50% turnover of key staff involved in this work. Staff has reviewed Plan proposals and produced new maps and reports following public input. The PWC and staff have worked together to try to address street and watershed needs and public concerns.

We are falling short of our goals for both PCI and in the efforts to change our streets to reflect long-term cost effectiveness, long-run durability and environmental sustainability of our streets. Asphalt streets are expensive in the long-run and cannot be the sole reconstruction solution for all the areas of Berkeley, if we are to efficiently and effectively serve all citizens of Berkeley now and in generations to come. Further clarity and direction on our street program must come from the Council to prioritize goals and expected outcomes with resources that are insufficient to address the future demands in a changing world using historic methods and technology.

FISCAL IMPACTS OF RECOMMENDATION

Unknown.

CURRENT SITUATION AND ITS EFFECTS

In the 2015 Paving Plan Recommendation from PWC to the City Council it was stated that "When we step back and look at the whole City landscape, the infusion of Measure M funds has significantly improved the condition of our streets (as measured by an increase in streets paved and in the overall Pavement Condition Index (PCI)." This statement was based on the staff report to City Council on November 15, 2015, Draft Mid–Program Review Report for Measure M Integrated Streets Investment Plan and

Update of the 5-Year Street Paving Plan, FY 2016 to FY 2020 (Report). The Report stated: "The City's goal is a PCI of 75. After the Measure M investments and other funding utilized during the 2014-2018 five-year plan, Berkeley streets are expected have a PCI rating of 65. When Measure M funding ends in 2018, it is estimated that the PCI will remain slightly stable or decline." Staff projected that, with the additions of nonrecurring Measure M bond funding added to current expenditures, an average PCI of 65 would be attained by the end 2020.

A second report, the May 2, 2017, Measure M Information Report – Update 2017 by the Public Works Director, focused on expenditures, projected expenses and plans, and affirmed that 2018 will be the final year of expenditures of the $30 M Measure M funds. PCI attainment was not addressed, nor was the PWC given a preview of the report as part of their oversight responsibilities.

The questions outstanding are:

1. What is the current city-wide average PCI?
2. Can we maintain the current PCI?
3. What will it take to attain and maintain an aspirational goal of a city-wide average PCI of 70?

BACKGROUND

To better understand the long-term projections of city-wide PCI, the PWC asked what it would cost to attain and maintain a good PCI. City staff worked with Nichols Consulting Engineering (NCE) to conduct an analysis of city-wide PCI. An initial analysis (Table 1) looked at the city-wide PCI expected at the close of the 5-year budget to provide a baseline by Council District. They also looked at the PCI by category of attainment (Charts 1 & 2). Lastly, they looked at several different funding scenarios that would be required to achieve city-wide PCI outcomes over the next 30-year period. We evaluated the following funding scenarios to maintain the current PCI average (Chart 3) and attain and maintain a PCI goal of 70 (Chart 4). Currently the city-wide PCI average is 57, far from the initial Measure M projection of 65, and further from the City's PCI goal of 75.

Table 1 PCI by Council District – Current 5-Year Plan

	Council District								
Year	1	2	3	4	5	6	7	8	Overal l PCI
2017	58	50	57	53	62	58	60	62	57
2018	57	50	56	51	61	56	58	63	57
2019	56	51	56	48	59	55	56	61	55
2020	55	51	55	46	59	54	54	60	55
2021	54	49	53	45	59	52	56	59	54
2022	52	48	52	46	57	51	54	58	52

The following charts show the trend of current PW paving plan. Chart 1 shows that under the current PW street improvement plan, roads considered Very Good/Good and Very Poor/Failed PCI are steadily increasing, reflecting the conscious strategy of focusing paving activities on Poor and Fair streets before they fall into the Fail category.

Chart 1

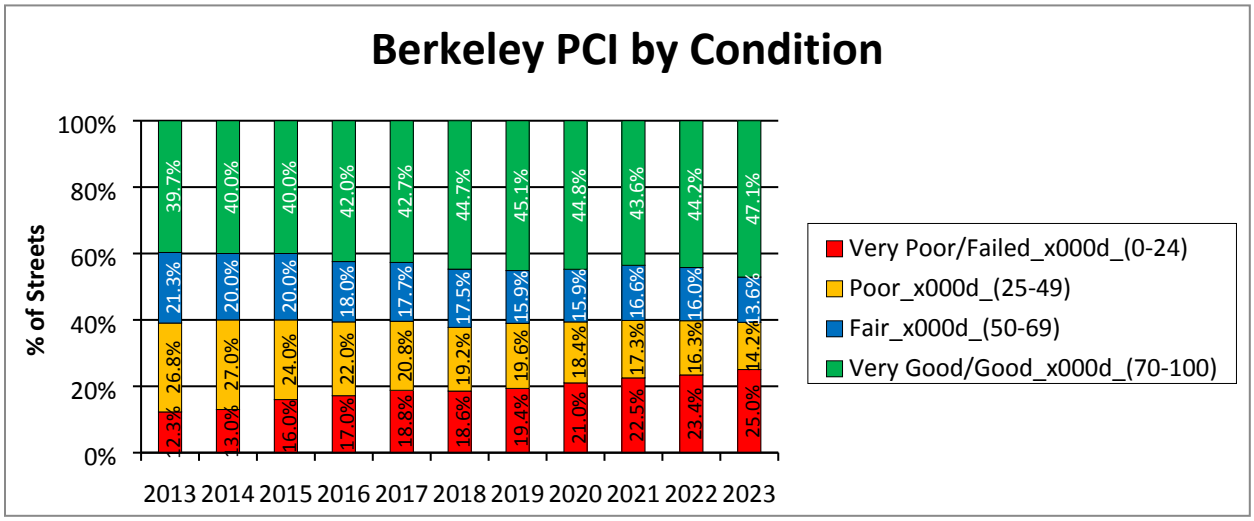
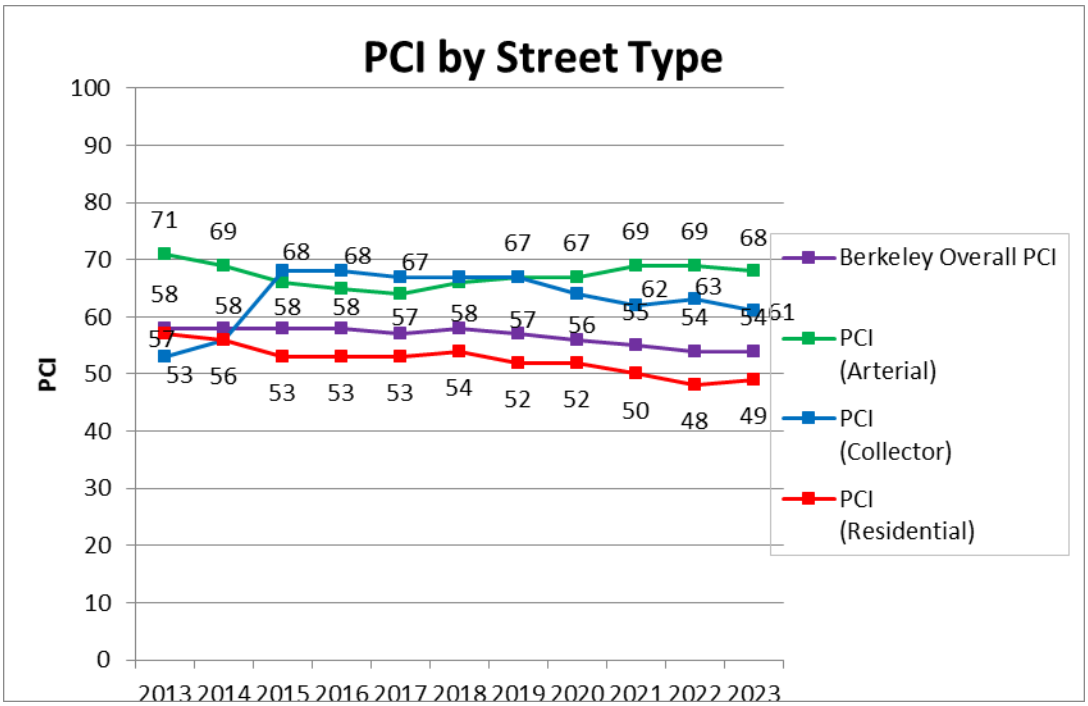


Chart 2 shows 2017 citywide PCI at 57 with collector streets seeing the largest increase, with all the recent paving activity driven primarily by the infusion of funds from Measure M. The declines after 2018 reflect the anticipated backslide in PCI addressed in the 2015 Mid-Program Review Report. Recall, this mid-program review projected a citywide average PCI of 65; however, the NCE projections indicate by 2022 our PCI will be 54, a decline from our current 57.

Chart 2



30 YEAR SCENARIO AND COST ANALYSIS

NCE provided 30 year costs for two alternative scenarios shown in the following Charts 3 through 6:

1. Maintain the current average PCI of 57 (Charts 3 and 4); and
2. Attain and maintain streets for the next 30-years with a "useful life" PCI goal of 70 (Charts 5 and 6).

The analysis conducted did not include any funding from Measure T-1. This analysis also looked to find the least cost approach to meet the citywide targets listed. Since asphalt pavement has a “useful life” of 20 years, if the analysis below was extended to 40 years and not just 30 years, the capital and maintenance capital costs increases could be even greater than displayed, as those streets would potentially be reconstructed twice, not just once, during that 40 years to attain and maintain the same PCI.

Chart 3

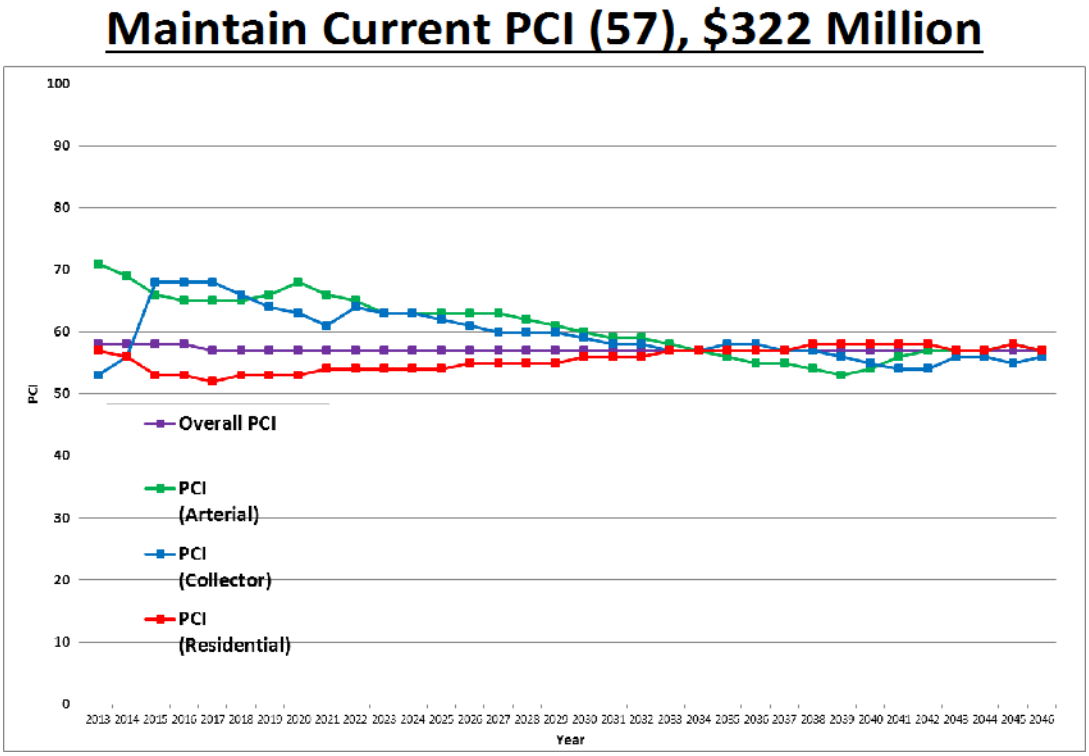


Chart 4

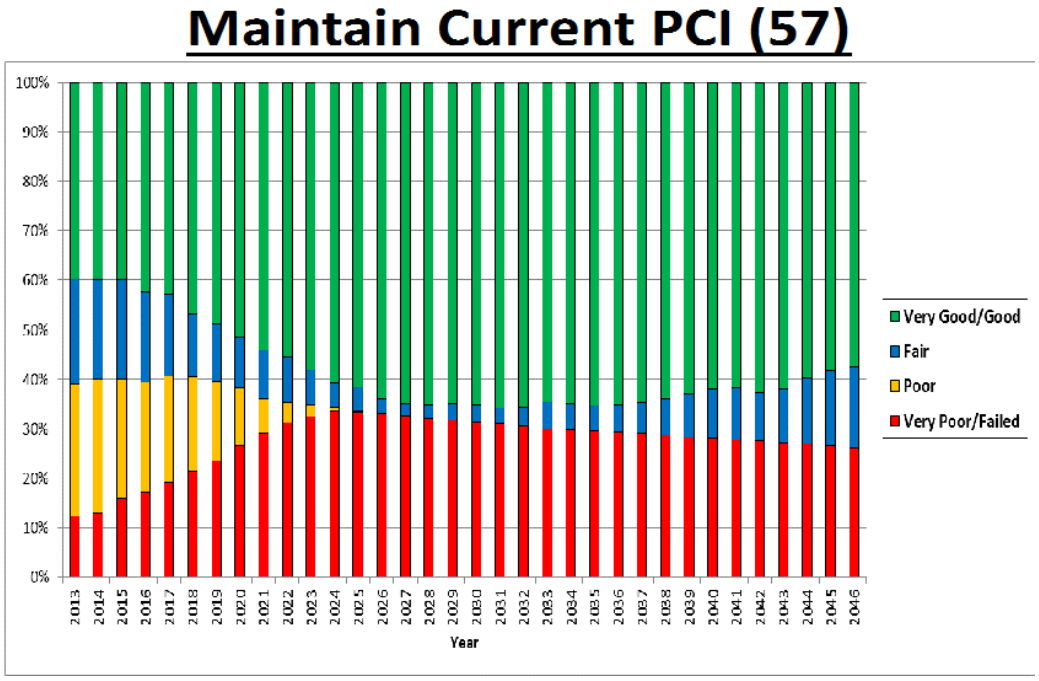


Chart 5

Increase PCI to 70, $416.3 Million

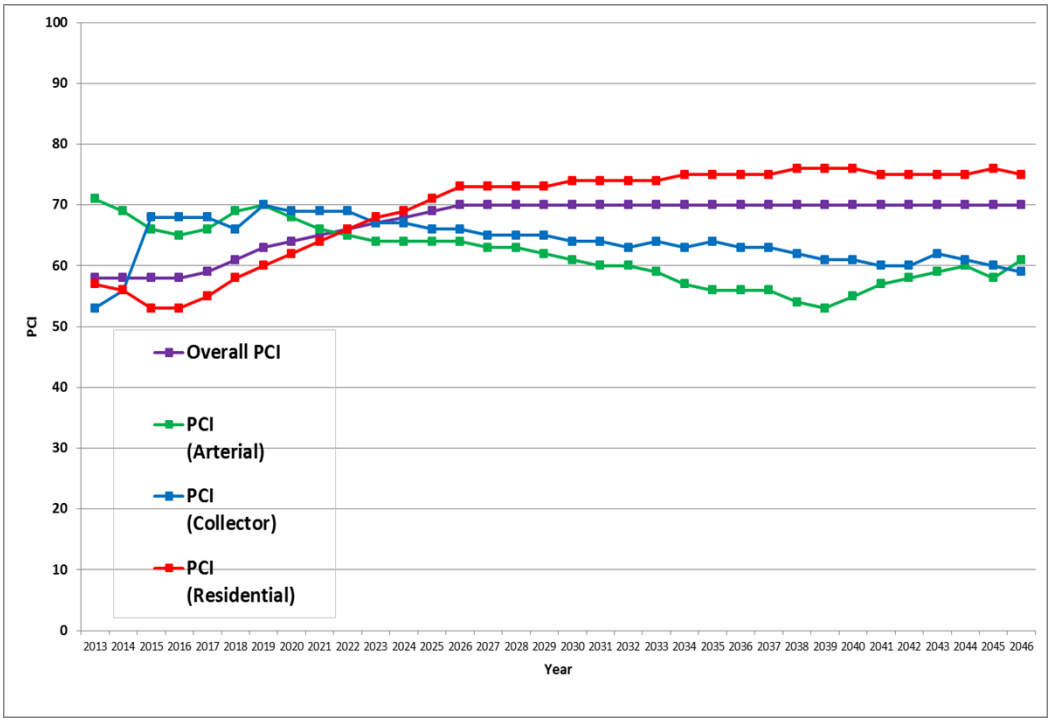
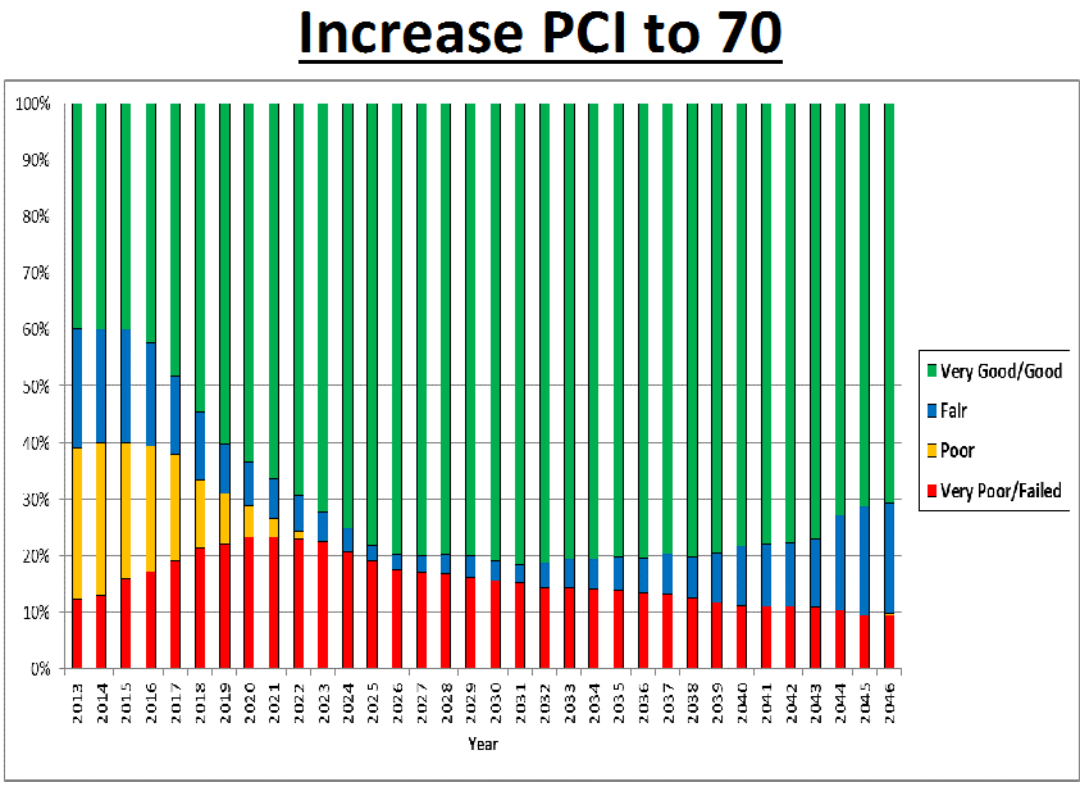


Chart 6



The 30-year analysis demonstrates that to maintain the current city-wide PCI using the current paving strategy, the city will need continue to expand the number of Very Good/Good streets while letting number of Very Poor roads expand. Achieving this goal will require $322 million over the next 30 years, or an average of $11-12 million annually (Table 2). Berkeley currently spends ~$7 million annually on street improvements, which means to maintain the current PCI, the city will need an additional $3-4 million annually. The funding needs almost double to achieve and maintain a PCI of 70 (Table 2). To put these costs into context, the City of Berkeley has already doubled the street paving budget since 2012 from $2.7 million per year to the current $6-7 million per year.

Table 2

Current Asphalt Paving Technology	Current annual spending on street improvements	Estimated spending needed to maintain the current PCI of 57 for 30 years*	Estimated spending needed to attain & maintain PCI of 70 for 30 years*
Current annual capital budget	~$7M	$11-12M	$14-15M
Shortfall from annual budget	NA	($3-4M)	($6-7 M)

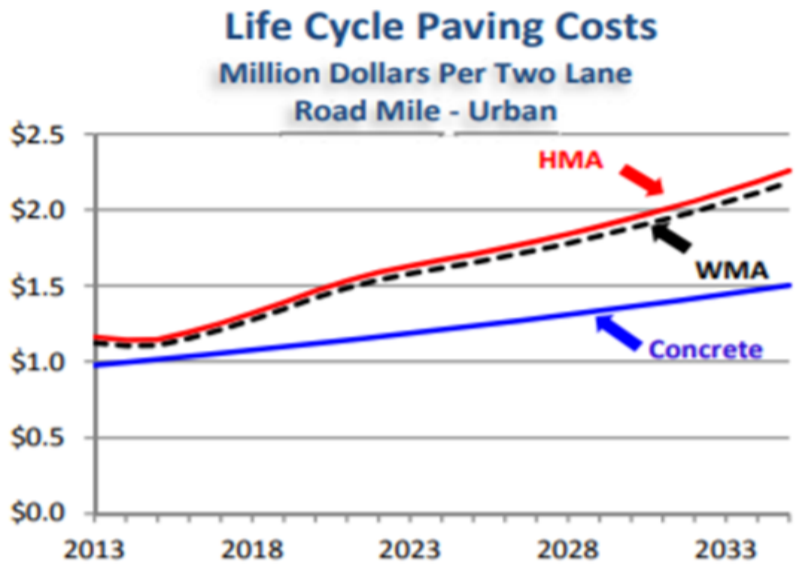
Source: NCE 4-25-2017 using StreetSaver

ENVIRONMENTAL SUSTAINABILITY

The City of Berkeley needs to identify and take full advantage of lessons learned from prior test sites such as Allston Way Paver demonstration and Measure M Green Infrastructure (GI) installations through monitoring and evaluation of data to enhance future alternative design.

The PWC recommends that staff explore opportunities to include alternatives to asphalt when conducting a full road reconstruct, but continue to use asphalt to maintain the integrity of our current capital investment in streets that do not need full reconstruction. Case studies around the country have demonstrated that there are alternative paving materials (other than asphalt) that last 2-3 times longer, but do come with a higher initial capital cost.

Public Works staff recently presented to the PWC paving subcommittee an analysis that demonstrates that concrete streets are essentially at a breakeven cost with asphalt streets after 30 years when reconstructing a street. We know that streets like Marin Avenue east of Oxford Street are over 50 years old. Assuming this local demonstration of durability would hold true for future projects, the city could recognize long term cost savings by reducing the need to repave roads by replacing asphalt streets with alternatives such as concrete where feasible. Other street treatments like the Allston Way permeable pavers, are anticipated to have a useful life is 50-80+ years and have multiple other benefits, should also be considered where appropriate. This recommendation is in accordance with the City Paving and Rehabilitation Policy for long-term cost effectiveness. Across the nation, transportation departments are looking to identify materials that will address durability, with the costs of asphalt streets v. concrete being higher when viewed thru a life cycle cost lens rather than initial construction costs alone.



The PWC believes that the current 5-year planning cycle for street repair is a key driver for the projected PCI backslide. Limited funds are being directed towards maintaining the highest city-wide PCI over the planning term. This method favors the prioritization of low initial capital cost, single benefit paving treatments that require a high level of ongoing maintenance.

A long-term plan that approaches the 2050 vision and plan recently proposed to Council by former Councilperson Gordon Wozniak for our City's infrastructure is needed for our streets. Planning for long-term cost effectiveness, long-term street pavement durability and aesthetics, are key criteria in the 'Street Rehabilitation and Repair Policy" adopted in 2009 policy. The long-term cost effective inputs are current capital and ongoing capital plus maintenance funds - not just the current capital needed to attain a PCI goal but also ongoing capital plus maintenance costs to maintain that street going forward with the same PCI.

Long-term cost effectiveness, as in a 40-year inter-generational bond, is an opportunity to effectively and efficiently manage capital investments, so that the useful life of that street investment is inter-generational. The PWC recommends that the Public Works Department prepare a plan that will:

1. Outline a 40-year capital street paving and maintenance plan;
2. Evaluate the true life-cycle costs associated with the different paving technologies;
    - Street Saver, the City's street paving optimization model, currently allows for planning using the cost of a rebuild or repair.
    - The PWC recommends normalizing those costs by the expected life of the road repair or rebuild useful life. By doing so, the model will select road treatments that offer the best life cycle value for the city[1].
3. Include long-term costs and benefits that are not easily quantified, especially those associated with future regional green infrastructure mandates, and with the aesthetic values of alternative paving technologies;
    - After applying analytical tools to determine the most cost effective approach, an additional cost benefit premium of 25% could be applied to alternative designs and materials which provide multiple benefits (permeable pavers are traffic calming, esthetically pleasing, provide groundwater recharge, etc.), as well as being longer lasting.
4. Completion of underground utility improvements should be a key factor in determining paving reconstruction priorities as stated in the city's pavement policy;

[1] Paving materials have the following design useful life. Asphalt Cement (AC) = 20yrs, Portland Concrete Cement(PCC) = 50 yrs., and Permeable Interlocking Concrete Pavers (PICP)= 80yrs

- Coordinate with all utility agencies and working towards "complete utility upgrades" on a street by street basis to reduce the incidence of pave, excavate, and repave scenarios;

5. Coordinate street improvements with Berkeley's Strategic Transportation Plan (BeST) and Berkeley's Bicycle Plan;
6. Outline the capital reconstruction projects that will use current and future funding sources to reduce future maintenance costs and that provide multiple benefits beyond smooth streets; and
7. Outline a process and a schedule to attain and maintain a PCI of 70+.

ALTERNATIVE ACTIONS CONSIDERED

1. Approve the 5 Year Paving Plan as proposed by staff. Implementation of the 5 Year Plan will result in a PCI of 52, well below the goal of 75 and below the regional average PCI of 66. No progress on longer lived pavements or environmental improvements of the road surface will be made in the next five years.

2. Do not approve any elements of the 5 Year Paving Plan. The 2018 projects previously approved and designed will not be constructed. The City will be unable to use available state and regional funds available for 2017 road work.

CITY MANAGER

See companion report.

CONTACT PERSON

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Joe Enke, Supervising Civil Engineer, Department of Public Works, (510) 981-6411

Attachments:

1: Resolution

Exhibit A: Street Paving Plan for FY 2018

RESOLUTION NO. ##,###-N.S.

APPROVAL OF THE PAVING PLAN FOR FY 2018

WHEREAS, the Street Rehabilitation Policy, Resolution No. 55,384-N.S. approved on May 22, 1990, requires there be a 5-Year Street Paving Plan for the entire City to be adopted by the City Council, with the advice of the Public Works Commission; and

WHEREAS, on October 5, 2017, the Public Works Commission voted to recommend approval of only the first year of the 5 Year Paving Plan recommendation drafted by the Paving Subcommittee and to request additional time for Commission review of the Paving Policy; and

WHEREAS, the Public Works Commission recommends Council adopt the FY 2018 portion of the proposed 5 Year Paving Plan, attached as Exhibit A.

NOW THEREFORE, BE IT RESOLVED by the Council of the City of Berkeley that the FY 2018 Street Paving Plan attached as Exhibit A hereof, is hereby adopted.

BE IT FURTHER RESOLVED that by the Council of the City of Berkeley that the FY 2018 Street Paving Plan attached as Exhibit A hereof, is hereby adopted.

Exhibits
A: Street Paving Plan for FY 2018

EXHIBIT A
5-YEAR STREET REHABILITION PLAN FOR FY 2018 TO FY 2022

Revised: 10/31/2017

Fiscal Year	Street Name	From	To	Class	Treatment	Total Cost	District	P	Mileage	Current PCI	Last M&R Date	Last Paved
2018	ARDEN RD	MOSSWOOD RD	PANORAMIC WAY	R	Reconstruct	$ 152,165	8	N	0.12	4		
2018	BANCROFT WAY	PROSPECT ST	PANORAMIC WAY	R	Reconstruct	$ 67,352	8	N	0.03	41	9/1/1993	RECONSTRUCT STRUCTURE (AC)
2018	BONAR ST	ADDISON ST	ALLSTON WAY	R	Reconstruct	$ 198,374	2	N	0.13	6	10/1/1992	MILL AND OVERLAY W/FABRIC
2018	BONAR ST	ALLSTON WAY	DWIGHT WAY	R	Reconstruct	$ 599,331	8	3E*	0.38	25	9/1/1991	MILL AND OVERLAY W/FABRIC
2018	BONAR ST	UNIVERSITY AVE	ADDISON ST	R	Reconstruct	$ 92,969	2	N	0.06	17	10/1/1992	MILL AND OVERLAY W/FABRIC
2018	CANYON RD	PANORAMIC WAY	RIM ROAD (UC CAMPUS)	R	Reconstruct	$ 137,198	8	N	0.05	21	9/1/1993	RECONSTRUCT STRUCTURE (AC)
2018	CANYON RD	RIM ROAD (UC	DEAD END	R	Reconstruct	$ 145,429	8	N	0.11	0		
2018	CORNELL AVE	CEDAR ST	VIRGINIA ST	R	Reconstruct	$ 79,992	1	N	0.13	0	10/1/1992	MILL AND OVERLAY W/FABRIC
2018	CORNELL AVE	HOPKINS ST	CEDAR ST	R	Reconstruct	$ 40,420	1	N	0.07	0	10/1/1992	MILL AND OVERLAY W/FABRIC
2018	DWIGHT WAY	HILLSIDE AVE	DEAD END ABOVE	R	Reconstruct	$ 353,221	8	N	0.11	0	9/1/1993	RECONSTRUCT SURFACE (AC)
2018	DWIGHT WAY	PANORAMIC WAY	EAST CITY LIMIT	R	Reconstruct	$ 46,564	8	N	0.02	66		
2018	DWIGHT WAY	PIEDMONT AVE	HILLSIDE AVE	R	Reconstruct	$ 457,990	7, 8	N	0.14	3	9/1/1993	MILL AND OVERLAY W/FABRIC
2018	FOLGER AVE	3RD ST	HOLLIS ST	R	Reconstruct	$ 149,961	2	N	0.12	13		
2018	HENRY ST	ROSE ST	VINE ST	R	Reconstruct	$ 188,470	5	C	0.13	0	6/1/1995	MILL AND OVERLAY W/FABRIC
2018	HENRY ST	VINE ST	CEDAR ST	R	Reconstruct	$ 187,042	4, 5	N	0.12	0	10/1/1992	MILL AND OVERLAY W/FABRIC
2018	HILGARD AVE	LA VEREDA	DEAD END	R	Reconstruct	$ 60,547	6	N	0.06	12	9/8/1999	RECONSTRUCT STRUCTURE (AC)
2018	JONES ST	4TH ST	6TH ST	R	Overlay	$ 139,987	1	N	0.13	1		
2018	JONES ST	EASTSHORE HWY	2ND ST	R	Overlay	$ 58,891	1	N	0.05	58		
2018	JOSEPHINE ST	THE ALAMEDA	HOPKINS ST	R	Reconstruct	$ 135,100	5	3C*	0.11	16	7/23/1997	MILL AND THICK OVERLAY
2018	MODOC ST	SOLANO AVE	MARIN AVE	R	Overlay	$ 102,301	5	N	0.11	46	7/1/1995	RECONSTRUCT STRUCTURE (AC)
2018	MOSSWOOD RD	PANORAMIC WAY	DEAD END ABOVE ARDEN RD	R	Reconstruct	$ 199,560	8	N	0.15	0		
2018	MURRAY ST	7TH ST	SAN PABLO AVE	R	Reconstruct	$ 193,896	2	N	0.25	2		
2018	PAGE ST	3RD ST	6TH ST	R	Reconstruct	$ 84,258	1	N	0.18	45	12/1/1989	RECONSTRUCT SURFACE (AC)
2018	PANORAMIC WAY	1ST TURN	ARDEN RD	R	Reconstruct	$ 303,082	8	N	0.23	15		
2018	PANORAMIC WAY	ARDEN RD	EAST CITY LIMIT	R	Reconstruct	$ 422,818	8	N	0.32	10		
2018	PANORAMIC WAY	CANYON RD	1ST TURN	R	Reconstruct	$ 189,416	8	N	0.13	9	10/13/1998	THIN AC OVERLAY(1.5 INCHES)
2018	POE ST	BONAR ST	DEAD END (BONAR ST)	R	Reconstruct	$ 80,383	2	N	0.03	2	10/1/1995	RECONSTRUCT SURFACE (AC)
2018	PRINCE ST	TREMONT ST	TELEGRAPH AVE	R	Reconstruct	$ 649,950	3, 8	3E*	0.45	48	7/31/2002	RECONSTRUCT SURFACE (AC)
2018	PROSPECT ST	UC CAMPUS (STADIUM)	HILLSIDE AVE	R	Reconstruct	$ 425,063	7, 8	N	0.13	10	9/1/1993	RECONSTRUCT SURFACE (AC)
2018	RUGBY AVE	NORTH CITY LIMIT (VERMONT)	VERMONT AVE	R	Reconstruct	$ 49,928	5	N	0.04	0	6/1/1994	RECONSTRUCT SURFACE (AC)
2018	VERMONT AVE	NORTH WEST DEAD END (RUGBY)	MARYLAND AVE	R	Reconstruct	$ 305,320	5	N	0.15	6	6/1/1994	RECONSTRUCT SURFACE (AC)

Note: Column P denotes presence of bike facility type (1 paved path, 2A 2B bike lane, 3A sign-only, 3C Sharrows, 3E bike blvd, 4 cycle track); C for bus route; and N for none.

*Proposed bike facilities from 2017 Bike Plan.

EXHIBIT A
5-YEAR STREET REHABILITION PLAN FOR FY 2018 TO FY 2022

Revised: 10/31/2017

Fiscal Year	Street Name	From	To	Class	Treatment	Total Cost	District	P	Mileage	Current PCI	Last M&R Date	Last Paved
2019	5TH ST	HARRISON ST	CAMELIA ST	R	Surface Seal	$ 292,320	1	N	0.25	60	4/1/2001	RECONSTRUCT STRUCTURE (AC)
2019	6TH ST	ALLSTON WAY	DWIGHT WAY	C	Overlay	$ 857,533	2	N	0.37	48	10/1/1994	MILL AND OVERLAY W/FABRIC
2019	6TH ST	NORTH CITY LIMIT	GILMAN ST	R	Surface Seal	$ 90,440	1	2B	0.22	66	8/31/2004	MILL AND OVERLAY W/FABRIC
2019	BURNETT ST	MABEL ST	ACTON ST	R	Surface Seal	$ 47,872	2	N	0.13	55	7/1/1988	MILL AND OVERLAY W/FABRIC
2019	BYRON ST	ADDISON ST	BANCROFT WAY	R	Surface Seal	$ 89,760	2	N	0.25	69	7/1/1988	THIN OVERLAY w/FABRIC
2019	CARLETON ST	SAN PABLO AVE	MATHEWS ST	R	Surface Seal	$ 112,000	2	N	0.09	67	9/1/1991	MILL AND OVERLAY W/FABRIC
2019	CATALINA AVE	COLUSA AVE	THE ALAMEDA	R	Reconstruct	$ 235,200	1, 5	N	0.19	38	7/1/1993	RECONSTRUCT SURFACE (AC)
2019	DELAWARE ST	CALIFORNIA ST	MARTIN LUTHER KING JR WAY	R	Surface Seal	$ 136,000	1	N	0.38	54	12/15/2004	RECONSTRUCT SURFACE (AC)
2019	DERBY ST	SAN PABLO AVE	MABEL ST	R	Overlay	$ 259,372	2	N	0.20	58	10/1/1992	MILL AND OVERLAY W/FABRIC
2019	DWIGHT CRESCENT	6TH ST	7TH ST	C	Overlay	$ 168,000	2	N	0.08	49	7/1/1988	MILL AND OVERLAY W/FABRIC
2019	FOREST AVE	COLLEGE AVE	CLAREMONT BLVD	R	Surface Seal	$ 420,000	8	N	0.36	52	8/1/1996	RECONSTRUCT STRUCTURE (AC)
2019	HIGHLAND PL	RIDGE RD	HEARST AVE	R	Overlay	$ 74,827	6	N	0.07	27		
2019	LINCOLN ST	SACRAMENTO ST	GRANT ST	R	Surface Seal	$ 433,440	1	N	0.37	56	10/1/1992	MILL AND THICK OVERLAY
2019	RIDGE RD	LA LOMA AVE	HIGHLAND PL	R	Overlay	$ 82,960	6	N	0.06	0		
2019	STATION PL	CATALINA AVE	SOUTH DEAD END	R	Reconstruct	$ 63,467	5	N	0.04	11		
2019	STUART ST	FULTON ST	HILLEGASS AVE	R	Surface Seal	$ 548,800	7	N	0.46	56	11/13/1998	RECONSTRUCT STRUCTURE (AC)
2019	WALNUT ST	EUNICE ST	CEDAR ST	R	Surface Seal	$ 604,980	5	3A to 3E*	0.50	51	5/17/2006	RECONSTRUCT STRUCTURE (AC)
2020	ACTON ST	ASHBY ST	66TH ST	R	Surface Seal	$ 83,640	2	N	0.23	62	8/29/2007	RECONSTRUCT STRUCTURE (AC)
2020	ARCADE AVE	GRIZZLY PEAK BLVD	FAIRLAWN DR	R	Surface Seal	$ 63,378	6	N	0.06	10	6/1/1995	MILL AND OVERLAY W/FABRIC
2020	CEDAR ST	6TH ST	SAN PABLO AVE	C	Overlay	$ 683,169	1	3C*	0.31	30	10/1/1994	MILL AND OVERLAY W/FABRIC
2020	DEAKIN ST	ASHBY AVE	PRINCE ST	R	Surface Seal	$ 45,920	3	N	0.16	77	4/3/2008	RECONSTRUCT STRUCTURE (AC)
2020	DEAKIN ST	RUSSELL ST	ASHBY AVE	R	Surface Seal	$ 35,700	3	N	0.10	58	7/1/1988	MILL AND OVERLAY W/FABRIC
2020	DOHR ST	ASHBY AVE	PRINCE ST	R	Surface Seal	$ 123,598	2	N	0.14	54	10/1/1992	RECONSTRUCT STRUCTURE (AC)
2020	GILMAN ST	8TH ST	SAN PABLO AVE	A	Surface Seal	$ 111,440	1	C	0.19	66		
2020	GILMAN ST	SAN PABLO AVE	SANTA FE AVE	A	Reconstruct	$ 121,380	1	C	0.27	53	7/8/2008	MILL AND THICK OVERLAY
2020	MICHIGAN AVE	MARYLAND AVE	SPRUCE ST	R	Overlay	$ 447,937	5	N	0.28	33	11/1/1988	RECONSTRUCT SURFACE (AC)
2020	MILVIA ST	BLAKE ST	RUSSELL ST	R	Reconstruct	$ 770,800	3	3E	0.44	31	9/1/1993	RECONSTRUCT SURFACE (AC)
2020	PERALTA AVE	COLUSA AVE	SOLANO AVE	R	Surface Seal	$ 114,964	5	3C*	0.43	67	9/13/2002	RECONSTRUCT STRUCTURE (AC)
2020	ROOSEVELT AVE	CHANNING WAY	DWIGHT WAY	R	Surface Seal	$ 172,480	4	N	0.13	66	12/1/1989	RECONSTRUCT SURFACE (AC)
2020	ROSE ST	LE ROY AVE	LA LOMA AVE	R	Reconstruct	$ 100,000	6	N	0.14	0		
2020	SAN LORENZO AVE	PERALTA AVE	THE ALAMEDA	R	Surface Seal	$ 347,013	5	N	0.41	56	9/8/1999	RECONSTRUCT STRUCTURE (AC)
2020	SANTA FE AVE	GILMAN ST	CORNELL AVE & PAGE	R	Overlay	$ 314,705	1	3C*	0.27	51	7/1/1995	RECONSTRUCT STRUCTURE (AC)
2020	SANTA FE AVE	NORTH CITY LIMIT	GILMAN ST	R	Surface Seal	$ 37,355	1	3C*	0.11	62	8/31/2004	MILL AND THIN OVERLAY
2020	SHASTA RD	GRIZZLY PEAK BLVD	PARK GATE	C	Reconstruct	$ 86,667	6	N	0.05	19	11/1/1988	RECONSTRUCT SURFACE (AC)
2020	SHASTA RD	PARK GATE	EAST CITY LIMIT (GOLF	C	Reconstruct	$ 150,667	6	N	0.11	16	11/1/1988	RECONSTRUCT SURFACE (AC)
2020	WALNUT ST	CEDAR ST	HEARST AVE	R	Surface Seal	$ 114,240	4	N	0.32	54	12/15/2004	RECONSTRUCT SURFACE (AC)
2020	WEST ST	BANCROFT WAY	DWIGHT WAY	R	Surface Seal	$ 263,822	2	N	0.25	66	10/1/1994	MILL AND OVERLAY W/FABRIC

Note: Column P denotes presence of bike facility type (1 paved path, 2A 2B bike lane, 3A sign-only, 3C Sharrows, 3E bike blvd, 4 cycle track); C for bus route; and N for none.

*Proposed bike facilities from 2017 Bike Plan.

EXHIBIT A
5-YEAR STREET REHABILITION PLAN FOR FY 2018 TO FY 2022

Revised: 10/31/2017

Fiscal Year	Street Name	From	To	Class	Treatment	Total Cost	District	P	Mileage	Current PCI	Last M&R Date	Last Paved
2021	BANCROFT WAY	BOWDITCH ST	COLLEGE AVE	C	Overlay	$ 161,036	7	3C*	0.13	63	12/1/1990	MILL AND OVERLAY W/FABRIC
2021	BANCROFT WAY	COLLEGE AVE	PIEDMONT AVE	C	Overlay	$ 178,336	7	3C*	0.13	59	12/1/1990	MILL AND OVERLAY W/FABRIC
2021	CRESTON RD	GRIZZLY PEAK BLVD	SUNSET LANE	R	Surface Seal	$ 140,067	6	N	0.36	68	6/1/1995	RECONSTRUCT STRUCTURE (AC)
2021	CRESTON RD	SUNSET LANE	GRIZZLY PEAK BLVD	R	Surface Seal	$ 98,047	6	N	0.36	65	11/1/1988	RECONSTRUCT SURFACE (AC)
2021	DANA ST	BANCROFT WAY	DWIGHT WAY	R	Overlay	$ 352,700	7	2A to 2B*	0.25	53	12/1/1989	MILL AND OVERLAY W/FABRIC
2021	EL DORADO AVE	THE ALAMEDA	SUTTER ST	R	Reconstruct	$ 366,933	5	N	0.24	6	10/1/1996	RECONSTRUCT SURFACE (AC)
2021	FULTON ST	DWIGHT WAY	PARKER ST	R	Overlay	$ 167,540	3	3E*	0.13	62	6/1/1993	MEDIUM AC OVERLAY (2 INCHES)
2021	FULTON ST	PARKER ST	STUART ST	R	Overlay	$ 334,092	3	3E*	0.25	62	2/1/1992	THIN AC OVERLAY(1.5 INCHES)
2021	LATHAM LANE	MILLER AVE	GRIZZLY PEAK	R	Surface Seal	$ 38,500	6	N	0.10	63	6/1/1994	RECONSTRUCT STRUCTURE (AC)
2021	MC GEE AVE	CEDAR ST	VIRGINIA ST	R	Surface Seal	$ 144,480	1	N	0.12	53	6/1/1995	MILL AND OVERLAY W/FABRIC
2021	MILLER AVE	HILLDALE AVE	SHASTA RD	R	Surface Seal	$ 245,700	6	N	0.66	60	6/1/1994	RECONSTRUCT STRUCTURE (AC)
2021	OTIS ST	RUSSELL ST	ASHBY AVE	R	Surface Seal	$ 156,800	3	N	0.13	63	4/1/2001	RECONSTRUCT STRUCTURE (AC)
2021	PAGE ST	10TH ST	SAN PABLO AVE	R	Surface Seal	$ 62,533	1	N	0.06	58	12/1/1989	RECONSTRUCT SURFACE (AC)
2021	PAGE ST	SAN PABLO AVE	CORNELL AVE	R	Surface Seal	$ 171,360	1	N	0.14	50	12/1/1989	RECONSTRUCT SURFACE (AC)
2021	REGENT ST	ASHBY AVE	CITY LIMIT (WOOLSEY ST)	R	Surface Seal	$ 67,760	8	N	0.23	71	11/1/1986	THICK OVERLAY W/FABRIC
2021	REGENT ST	DWIGHT WAY	DERBY ST	R	Overlay	$ 328,180	8	N	0.25	51	11/20/1998	RECONSTRUCT STRUCTURE (AC)
2021	REGENT ST	WILLARD PARK	ASHBY AVE	R	Surface Seal	$ 322,560	8	N	0.27	54	11/24/1998	MILL AND OVERLAY W/FABRIC
2021	SHATTUCK AVE	EUNICE ST	ROSE ST	R	Surface Seal	$ 169,100	5	N	0.25	64	5/17/2006	RECONSTRUCT STRUCTURE (AC)
2021	SHATTUCK AVE	LOS ANGELES AVE	EUNICE ST	R	Surface Seal	$ 111,300	5	N	0.30	69	11/6/2003	RECONSTRUCT STRUCTURE (AC)
2021	TELEGRAPH AVE	BANCROFT WAY	DWIGHT WAY	C	Overlay	$ 299,900	7	3C*	0.25	55	7/1/1988	MILL AND OVERLAY W/FABRIC
2021	VIRGINIA ST	6TH ST	SAN PABLO AVE	R	Overlay	$ 418,100	1	3E	0.31	54	4/1/2001	MILL AND OVERLAY W/FABRIC
2021	VIRGINIA ST	GRANT ST	MARTIN LUTHER KING	C	Overlay	$ 220,900	1	3E	0.13	59	6/1/1995	MILL AND OVERLAY W/FABRIC
2022	BEVERLY PL	WEST CITY LIMIT (MERCED)	HOPKINS ST	R	Surface Seal	$ 124,440	5	N	0.35	59	12/1/1989	MILL AND OVERLAY W/FABRIC
2022	BROWNING ST	ADDISON ST	DWIGHT WAY	R	Reconstruct	$ 911,600	2	N	0.50	64	10/1/1995	MILL AND OVERLAY W/FABRIC
2022	CHANNING WAY	MARTIN LUTHER KING	MILVIA ST	R	Reconstruct	$ 253,880	4	2A to 2B*	0.13	10	5/1/1995	THIN AC OVERLAY(1.5 INCHES)
2022	CHANNING WAY	MILVIA ST	SHATTUCK AVE	R	Reconstruct	$ 267,640	4	2A to 2B*	0.13	29	9/1/1991	MILL AND OVERLAY W/FABRIC
2022	CHANNING WAY	ROOSEVELT AVE	MARTIN LUTHER KING	R	Reconstruct	$ 353,500	4	3E	0.19	4	9/1/1991	MILL AND OVERLAY W/FABRIC
2022	CHANNING WAY	SACRAMENTO ST	ROOSEVELT AVE	R	Reconstruct	$ 572,780	4	3E	0.31	25	9/1/1991	MILL AND OVERLAY W/FABRIC
2022	COLLEGE AVE	ASHBY AVE	SOUTH CITY LIMIT	A	Overlay	$ 698,220	8	N	0.41	54	8/23/2000	RECONSTRUCT STRUCTURE (AC)
2022	EMERSON ST	ADELINE ST	SHATTUCK AVE	R	Surface Seal	$ 180,320	3	N	0.15	67	4/1/2001	RECONSTRUCT STRUCTURE (AC)
2022	ESSEX ST	ADELINE ST	TREMONT ST	R	Surface Seal	$ 76,160	3	N	0.06	77	4/1/2001	RECONSTRUCT STRUCTURE (AC)
2022	ESSEX ST	TREMONT ST	SHATTUCK AVE	R	Surface Seal	$ 129,920	3	N	0.11	64	4/1/2001	RECONSTRUCT STRUCTURE (AC)
2022	MC GEE AVE	DERBY ST	RUSSELL ST	R	Surface Seal	$ 300,832	3	N	0.25	61	12/10/1998	RECONSTRUCT STRUCTURE (AC)
2022	MC GEE AVE	DWIGHT WAY	DERBY ST	R	Surface Seal	$ 302,400	3	N	0.26	61	7/1/1988	THIN OVERLAY w/FABRIC

Note: Column P denotes presence of bike facility type (1 paved path, 2A 2B bike lane, 3A sign-only, 3C Sharrows, 3E bike blvd, 4 cycle track); C for bus route; and N for none.

*Proposed bike facilities from 2017 Bike Plan.

EXHIBIT A
5-YEAR STREET REHABILITION PLAN FOR FY 2018 TO FY 2022

Revised: 10/31/2017

FISCAL YEAR 2018 TOTALS

Total Estimated Cost and Miles **$ 6,296,975** **4.23 miles**

	MILEAGE	ESTIMATED COST	% COST	% MILE
ARTERIALS	0	$0	0%	0%
COLLECTORS	0	$0	0%	0%
RESIDENTIALS	4.23	$6,296,975	100%	100%
SURFACE SEALS	0	$0	0%	0%
OVERLAYS	0.29	$265,178	4%	7%
RECONSTRUCTS	3.94	$5,709,204	91%	93%
BIKE WAY	0.94	$22,592	0%	22%
PED		$ 300,000	5%	
BIKE WAY + PED		$322,592		

20% of Measure BB ($1.6 Million)

District	
1	0.56
2	0.91
3	0.23
4	0.06
5	0.59
6	0.06
7	0.12
8	1.71
	4.23

(BIKE costs are interim cost estimated from 2017 Bike Plan. PED costs are curb ramps)
%Cost round to nearest %. Bikeway % cost less than 0.5% so it is rounded to 0%.

Note: Column P denotes presence of bike facility type (1 paved path, 2A 2B bike lane, 3A sign-only, 3C Sharrows, 3E bike blvd, 4 cycle track); C for bus route; and N for none.

*Proposed bike facilities from 2017 Bike Plan.

EXHIBIT A
5-YEAR STREET REHABILITION PLAN FOR FY 2018 TO FY 2022

Revised: 10/31/2017

FISCAL YEAR 2019 TOTALS

Total Estimated Cost and Miles **$ 4,516,971** **4.01 miles**

	MILEAGE	ESTIMATED COST	% COST	% MILE	District	
ARTERIALS	0.00	$0	0%	0%	1	1.46
COLLECTORS	0.45	$1,025,533	23%	11%	2	0.97
RESIDENTIALS	3.56	$3,491,437	77%	89%	3	0.00
					4	0.00
SURFACE SEALS	3.01	$2,433,112	54%	75%	5	0.63
OVERLAYS	0.83	$1,353,963	30%	21%	6	0.18
RECONSTRUCTS	0.23	$286,667	6%	6%	7	0.46
					8	0.36
BIKE WAY	0.72	$35,900	1%	18%		4.07
PED		$ 432,000	9%			
BIKE WAY + PED		$467,900				

29% of Measure BB ($1.6 Million)

(BIKE costs are interim cost estimated from 2017 Bike Plan. PED costs are curb ramps)

FISCAL YEAR 2020 TOTALS

Total Estimated Cost and Miles **$ 4,188,876** **4.40 miles**

	MILEAGE	ESTIMATED COST	% COST	% MILE	District	
ARTERIALS	0.46	$232,820	6%	11%	1	1.16
COLLECTORS	0.47	$920,503	22%	11%	2	0.63
RESIDENTIALS	3.47	$3,035,553	72%	79%	3	0.70
					4	0.44
SURFACE SEALS	2.52	$1,240,995	30%	57%	5	1.11
OVERLAYS	0.87	$1,286,931	31%	20%	6	0.36
RECONSTRUCTS	1.01	$1,117,513	27%	23%	7	0.00
					8	0.00
BIKE WAY	1.57	$45,436	1%	36%		4.40
PED		$ 498,000	11%			
BIKE WAY + PED		$543,436				

34% of Measure BB ($1.6 Million)

(BIKE costs are interim cost estimated from 2017 Bike Plan. PED costs are curb ramps)

Note: Column P denotes presence of bike facility type (1 paved path, 2A 2B bike lane, 3A sign-only, 3C Sharrows, 3E bike blvd, 4 cycle track); C for bus route; and N for none.

*Proposed bike facilities from 2017 Bike Plan.

EXHIBIT A
5-YEAR STREET REHABILITION PLAN FOR FY 2018 TO FY 2022

Revised: 10/31/2017

FISCAL YEAR 2021 TOTALS

Total Estimated Cost and Miles **$ 4,555,924** **5.08 miles**

	MILEAGE	ESTIMATED COST	% COST	% MILE	District	
ARTERIALS	0.00	$0	0%	0%	1	0.77
COLLECTORS	0.63	$860,172	19%	12%	2	0.00
RESIDENTIALS	4.45	$3,695,752	81%	88%	3	0.51
					4	0.00
SURFACE SEALS	3.04	$1,748,627	39%	60%	5	0.80
OVERLAYS	1.82	$1,837,392	40%	36%	6	1.49
RECONSTRUCTS	0.24	$342,933	8%	4%	7	0.75
					8	0.76
BIKE WAY	1.63	$82,972	2%	32%		5.08
PED		$ 522,000	11%			
BIKE WAY + PED		$604,972				

38% of Measure BB ($1.6 Million)
(BIKE costs are interim cost estimated from 2017 Bike Plan. PED costs are curb ramps)

FISCAL YEAR 2022 TOTALS

Total Estimated Cost and Miles **$ 4,171,692** **2.85 miles**

	MILEAGE	ESTIMATED COST	% COST	% MILE	District	
ARTERIALS	0.41	$698,220	17%	14%	1	0.00
COLLECTORS	0.00	$0	0%	0%	2	0.50
RESIDENTIALS	2.44	$3,473,472	83%	86%	3	0.84
					4	0.76
SURFACE SEALS	1.18	$832,072	20%	42%	5	0.35
OVERLAYS	0.41	$638,220	15%	14%	6	0.00
RECONSTRUCTS	1.26	$2,143,600	50%	44%	7	0.00
					8	0.41
BIKE WAY	1.54	$167,000	4%	54%		2.85
PED		$ 486,000	11%			
BIKE WAY + PED		$653,000				

41% of Measure BB ($1.6 Million)

Note: Column P denotes presence of bike facility type (1 paved path, 2A 2B bike lane, 3A sign-only, 3C Sharrows, 3E bike blvd, 4 cycle track); C for bus route; and N for none.

*Proposed bike facilities from 2017 Bike Plan.

EXHIBIT A
5-YEAR STREET REHABILITION PLAN FOR FY 2018 TO FY 2022

Revised: 10/31/2017

FISCAL YEAR 2018 to 2022 TOTALS

Total Estimated Cost and Miles **$ 23,730,437** **20.57 miles**

	MILEAGE	ESTIMATED COST	% COST	% MILE
ARTERIALS	0.87	$931,040	4%	4%
COLLECTORS	1.55	$2,806,208	12%	8%
RESIDENTIALS	18.15	$19,993,189	84%	88%
SURFACE SEALS	9.74	$6,254,806	26%	47%
OVERLAYS	4.22	$5,381,685	23%	21%
RECONSTRUCTS	6.69	$9,599,918	40%	32%
BIKE WAY	6.39	$353,900	1%	31%
PED		$2,238,000	9%	
BIKE WAY + PED		$2,591,900		

District	
1	3.94
2	3.01
3	2.27
4	1.26
5	3.48
6	2.09
7	1.34
8	3.23
	20.63

32% of Measure BB ($1.6 Million x 5 years)

(BIKE costs are interim cost estimated from 2017 Bike Plan. PED costs are curb ramps)

Note: Column P denotes presence of bike facility type (1 paved path, 2A 2B bike lane, 3A sign-only, 3C Sharrows, 3E bike blvd, 4 cycle track); C for bus route; and N for none.

*Proposed bike facilities from 2017 Bike Plan.