



Public Works Commission

## INFORMATION CALENDAR

July 24, 2018

To: Honorable Mayor and Members of the City Council

From: Dee Williams-Ridley, City Manager

Submitted by: Phillip L. Harrington, Director, Department of Public Works  
Ray Yep, Chairperson, Public Works Commission

Subject: Five-Year Street Rehabilitation Plan Update

### INTRODUCTION

Staff presented a Five-Year Street Rehabilitation Plan (Five-Year Street Plan) for approval by City Council on December 19, 2017. The Public Works Commission (PWC) and Public Works Staff (Staff) came to an agreement to recommend adoption of the Fiscal Year (FY) 2018 and FY 2019 Street Rehabilitation Plan (Street Plan) at the meeting. Council approved the recommended Street Plan, and directed Staff to coordinate with the Public Works Commission on the items outlined in their motion (Attachment 1). This report provides an update on the status of the efforts to date. The Public Works Commission, at its meeting on May 3, 2018, unanimously voted to approve the draft report with any subsequent revisions, if any, from its Paving Subcommittee, and to forward the report to Council.

### CURRENT SITUATION AND ITS EFFECTS

Below are the items the City Council requested that Staff coordinate with the PWC, including the Staff's responses to date:

1. Address all elements of the City of Berkeley's paving policy such that our Paving Plan clearly identifies and implements integrated solutions.

Such approaches would address the multiple demands on the street infrastructure that are designed for safety, environmentally sustainable and are economically efficient over the long run. Posited solutions would be consistent with:

- a. the City's General Plan policy of encouraging use of forms of transportation other than automobiles;

*Staff reviews the Street Plan for consistency with the Bicycle and Pedestrians Plans and Bus Routes, and incorporates planned improvements. In addition, to the extent possible, sidewalk issues adjacent to street paving are addressed. The Street Plan for FY 2018-22 proposes approximately \$2.5 million for bicycle and pedestrian improvements adopted from the Bicycle and Pedestrian Plan.*

- b. The Regional Water Quality Control Board (RWQCB) goals regarding water quality, the Bay, flooding potential and particularly runoff control;

*The Street Plan includes repair of the City's deteriorating storm drain infrastructure that reduces the degradation of water quality in local creeks and the Bay. These repairs are consistent with the City of Berkeley Watershed Management Plan.*

*Additionally, working with the Alameda Countywide Clean Water Program (ACCWP) and consultants, the City is developing a Green Infrastructure (GI) prioritization modeling tool that will guide the City in identifying the most suitable sites for GI based on multi-benefit metrics. This tool is being developed as part of the City's Green Infrastructure Plan (GI Plan), which will be completed in 2019, and will fulfill a Regional Water Quality Control Board requirement in the Municipal Regional Stormwater NPDES Permit. The GI Plan will include methodology for using the prioritization tool to review the City's Street Plan on a regular basis to identify the best opportunities for integrating GI into the Street Plan. The prioritization tool will be used to assist in selecting for the future street improvements.*

- c. The City's Measure G goal of an 80% reduction of greenhouse gas emissions by 2050. A broad scope would include consideration of reducing global warming (for example, dark vs. lighter paving materials).

*Staff is researching the use of alternative paving materials, including pervious concrete. The possible use of concrete pavement may be further evaluated using life cycle cost analysis.*

*Projects will continue to incorporate pavement technologies that will reduce greenhouse gas emissions over other conventional pavement rehabilitation methods, such as the incorporation of full depth reclamation (FDR).*

*FDR, a cost effective alternative to traditional street reconstruction methods, is planned for use in several of the street selected for rehabilitation in current projects. It recycles much of the existing pavement on site, and incorporates it into the pavement subgrade, thereby reducing truck trips to and from construction sites.*

2. Return with a 2019-22 Plan that directs 15% of available funds to Discretionary and Demonstration Projects with specific projects that address life cycle costs, pavement longevity, watershed impacts.

*Staff is working with the PWC to identify technologies and projects in the FY 2020–22 street rehabilitation plan to provide 15% funding to discretionary and demonstration projects. As mentioned, Staff is researching the use of pervious concrete as a future*

*demonstration project. The PWC suggested Shattuck Avenue from University Avenue to Vine Street be analyzed as a candidate for permeable pavers. Staff is currently working with University of California at Davis (UC-Davis) on a life-cycle cost analysis (LCCA) of Shattuck.*

3. The 2019-22 Plan would reflect the following policies:

a. Long-term cost effectiveness, long-term street pavement durability and aesthetics are important for priority setting and repair methodology selection;

*UC-Davis is expanding its LCCA model so that it works in conjunction with the StreetSaver model as an enhancement in preparing paving plans with a planning horizon of five or more years. Berkeley will be one of four cities that will perform in a trial, and model selected streets in the new UC-Davis comparative tool. The model will take at least six months to enhance. Staff and PWC will be using the updated LCCA model to analyze street rehabilitation method life and durability, and selection of streets for the City's FY 2020-22 Street Plan.*

*In addition, Staff has retained a consultant to assess the performance of the Allston Way Permeable Pavement Pilot Project. The assessment will include conducting a topographic survey of the street surface and updating the Pavement Condition Monitoring Report. The project's effectiveness at reducing stormwater runoff and removing pollutants from runoff will also be measured and assessed. The assessment will provide maintenance recommendations to address localized settlements and loss of sand and infill material. The data from this study will be used to inform a site-specific LCCA for permeable pavers. Results from this work and other permeable paver installation in Berkeley will be made available to the UC-Davis Pavement Research Center.*

*The recently constructed permeable paver bus pad at the corner of Shattuck and University is also being evaluated after experiencing significant settlement. Staff and the contractor implemented a revised design. The performance of the pavers will continue to be monitored to evaluate the paver performance.*

b. Street rehabilitation shall be coordinated with utility, sewer and other activities associated with addressing water contamination runoff, and with other underground activities to minimize the cost and maximize the effectiveness of rehabilitation and improve the environment.

*Staff will continue to coordinate the Street Plan with utility company work and City underground utility work in advance of street rehabilitation and reconstruction. Typically, utility companies require at least two-to-three years of advance notice to replace or relocate their facilities in advance of a street rehabilitation project. A multi-year Street Plan is necessary, and requested by Council annually.*

4. Identify and work with consultants who have accomplishments and a track record in long-lasting, innovative, watershed integrative paving technologies.

*Staff issued a Request for Qualifications for On-Call Civil Engineering Services on April 9, 2018. Consultants which have demonstrated experience with incorporating green infrastructure in street projects are being recommended for contract award for upcoming projects.*

5. Report back to Council with revisions that address the above and provide for multiple benefit, durable demonstration projects on at least 15% of available funding for the 2019-22 projects by June 2018.

*Staff is working with the PWC to identify technologies and projects in the FY2020– 22 Street Rehabilitation Plan to provide 15% funding to discretionary and demonstration projects. The PWC has suggested Shattuck Avenue from University to Vine be analyzed as a candidate for permeable pavers. Staff and PWC are working with UC Davis on the analysis. Also, Staff is researching other technologies for example, pervious concrete, cold-in-place asphalt recycling, and pervious pavers.*

6. Develop a process that incorporates life cycle cost analysis.

*The PWC contacted the UC-Davis Department of Civil Engineering to assist with this. The Department, led by Professor John Harvey, has done extensive research through its Pavement Research Center. He had organized a Permeable Pavement Workshop in November 2017. PWC members attended the workshop and came to understand the extent of his work. PWC members and City Staff met with Professor Harvey again in April 2018 to learn about “Best Practices in Pavement for Local Government”, with a special emphasis on LCCA. Professor Harvey’s team has developed a computerized LCCA model, and a copy was provided to the City to use. It includes the ability to evaluate the life cycle cost of different paving technologies and treatments, sequencing of street surface treatment, cost parameters, and planning period. Staff has already started testing out the model. Also, as part of a pilot project, UC-Davis will apply the LCCA model to the reconstruction of Shattuck (between University and Vine).*

*As briefly discussed in item 3.a., Staff and the PWC are working with UC-Davis to expand the LCCA model so that it works in conjunction with the current StreetSaver model as an enhancement in preparing street rehabilitation plans with a planning horizon of five or more years. Berkeley will be one of the four cities that will participate in a trial and model selected streets with the new UC-Davis comparative LCCA tool. Enhancement of the model is expected to take at least six months.*

#### BACKGROUND

The Street Rehabilitation Policy (Policy), Resolution No. 55,384-N.S., was approved May 22, 1990. It requires a Five-Year Street Plan for the entire City be adopted by City

Council. Annually, Staff prepares an updated Five-Year Plan, which is reviewed and approved by the City Council with advice of the Public Works Commission (PWC).

The primary purpose of the street rehabilitation program is to maintain a safe surface conveyance system in the public right-of-way for vehicles, bicycles, transit, and pedestrians. The right-of-way also provides ancillary functions of a water conveyance system and location of public utilities.

Per the Policy, the City strives to identify and implement integrated solutions that address the multiple demands on the street infrastructure that are designed for safety, environmentally sustainable and economically efficient over the long run.

#### ENVIRONMENTAL SUSTAINABILITY

Projects considered for the FY 2019-22 Street Plan are incorporating pavement technologies that will reduce greenhouse gas emissions and integrate water quality improvements, promote use of other modes of transportation, and provide durability.

#### POSSIBLE FUTURE ACTION

Staff plans to come back to Council in November 2018 with an updated Five-Year Street Plan incorporating Council's recommendations.

#### FISCAL IMPACTS OF POSSIBLE FUTURE ACTION

Management of the Street Plan development will be conducted by the PWC's Paving Subcommittee and existing Staff. Consultant resources will be from on-call contracts for the planning and design of Berkeley's street rehabilitation work. Staff will be working with the Pavement Research Center at UC-Davis on further development of LCCA and evaluation of sustainable technologies using Berkeley-specific data at no cost to the City.

#### CONTACT PERSON

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#### Attachments:

1. December 19, 2017 Council Action on Five-Year Street Rehabilitation Plan

## Attachment 1

Council Action at the December 19, 2017 Meeting  
Regarding the Five Year Street Rehabilitation Plan

**Action:** 0 speakers. M/S/C (Maio/Worthington) to 1) adopt Resolution No. 68, 279–N.S. amended to include the projects in FY 2018 and FY 2019; and 2) Request that staff coordinate with the Public Works Commission on the items listed below.

*1. Address all elements of the City of Berkeley's paving policy such that our Paving Plan clearly identifies and implements integrated solutions. Such approaches would address the multiple demands on the street infrastructure that are designed for safety, environmentally sustainable and are economically efficient over the long run. Posited solutions would be consistent with:*

- a. the City's General Plan policy of encouraging use of forms of transportation other than automobiles;*
- b. the Regional Water Quality Control Board (RWQCB) goals regarding water quality, the Bay, flooding potential and particularly runoff control;*
- c. the City's Measure G goal of an 80% reduction of greenhouse gas emissions by 2050. A broad scope would include consideration of reducing global warming (for example, dark vs. lighter paving materials).*

*2. Return with a 2019-22 Plan that directs 15% of available funds to Discretionary and Demonstration Projects with specific projects that address life cycle costs, pavement longevity, watershed impacts.*

*3. The 2019-22 Plan would reflect the following policies:*

- a. Long-term cost effectiveness, long-term street pavement durability and aesthetics are important for priority setting and repair methodology selection;*
- b. Street rehabilitation shall be coordinated with utility, sewer and other activities associated with addressing water contamination runoff, and with other underground activities to minimize the cost and maximize the effectiveness of rehabilitation and improve the environment.*

*4. Identify and work with consultants who have accomplishments and a track record in long-lasting, innovative, watershed integrative paving technologies.*

*5. Report back to Council with revisions that address the above and provide for multiple benefit, durable demonstration projects on at least 15% of available funding for the 2019-22 projects by June 2018.*

*6. Develop a process that incorporates life cycle cost analysis.*

**Vote:** Ayes – Maio, Davila, Bartlett, Harrison, Wengraf Worthington, Droste, Arreguin; Noes – None; Abstain – None; Absent – Hahn.