# MEASURE M
# Integrated Streets Investment Plan

**Submitted by the Public Works Commission**

*In collaboration with:*
*Community Environmental Advisory Commission*
*Transportation Commission*
*Parks and Waterfront Commission*

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# Executive Summary

## Introduction

In November 2012, the Berkeley voters passed Measure M, authorizing the City of Berkeley to invest $30 million in bond funds in street repaving/rehabilitation and related green infrastructure. With this additional funding source, the City of Berkeley (City) has an opportunity to develop an integrated street investment plan that ensures streets are in safe condition for all users, neighborhoods are protected from flooding and our environment is sustainable.

In March 2013, the Public Works Commission (PWC) as the lead commission, invited the Community Environmental Advisory Commission (CEAC), the Transportation Commission (TC) and the Parks & Waterfront Commission (P&WC) to collaborate in a community process to gather input on goals and priorities for investing Measure M funds. Representatives from each of the four commissions met over a series of intensive working sessions to review current City plans, structure the community process and outline preliminary ideas for how current policies could be coordinated in a more integrated approach to street improvements. Plans and policies considered include:

- The Street Rehabilitation and Repair Policy and the annual Five Year Street Rehabilitation Plan (see pages 2-3);
- The Watershed Management Plan and green infrastructure technologies (see pages 4-5); and
- Active Transportation initiatives (see pages 6-7).

Over the course of a few months, the commissions hosted three community meetings to share ideas and gather public input on goals and priorities for Measure M funding. The League of Women Voters – Berkeley, Albany, Emeryville provided support to ensure a transparent and inclusive process.

## Recommendations

The community engagement process has resulted in a series of recommendations for investing in Berkeley's most heavily used civic space – our street network. The outcome of this community dialogue is a set of criteria and a process for supporting a more integrated and sustainable street network. The specific recommendations are described on pages 9-11 and include:

- Goals and Outcome Targets
- Evaluation Criteria and Scorecard
- Planning Process
- Monitoring and Oversight

## Next Steps

Public Works staff will be working with the PWC to finalize the recommendations from this process for the proposed Five-Year Street Rehabilitation Plan for Council review. Program implementation is expected to begin in January 2014. This report summarizes the outcomes of the process including current initiatives related to implementing Measure M (pages 2-7), the community engagement process (page 8), recommendations (pages 9-11) and next steps (page 12).

*Public Works staff, including Public Works Director, Andrew Clough, answered questions during a public meeting. Photo credit: Miranda Maupin*

### Purpose of Measure M

Measure M authorizes the City of Berkeley to secure $30 million dollars in bond funds which will be used to construct the following Facilities and Improvements:

1. Street repaving and rehabilitation consistent with the 5 year street repaving plan as it is updated annually, and sufficient to significantly accelerate the implementation of that plan.

2. Installation of Green Infrastructure (GI), as it is defined in the Watershed Management Plan as part of the street work described in the preceding paragraph, when appropriate. GI includes, but is not limited to: (a) surface level bio-retention measures (rain gardens, swales, bio-retention cells, permeable paving, etc.) within the parking strip, planter area of sidewalks, red zone curb-extensions, and in street medians as feasible; and (b) large underground storage pipes, which would fill during storm events and then discharge metered flows into the existing storm drain pipelines.

# Paving Conditions and Policies

## Current Street Paving Planning Process

The City of Berkeley (City) currently maintains a rolling 5-Year Street Rehabilitation Plan for paving and reconstructing City streets. City staff updates the plan on an annual basis. The plan is presented to the Public Works Commission, which reviews and recommends action to City Council to ensure that the 5-year Street Plan is consistent with Berkeley's Street Rehabilitation and Repair Policy, Resolutions No. 55,384-N.S. and 64,733-N.S. The 5-Year Plan is generated with the aid of a computerized StreetSaver® program (developed by the Metropolitan Transportation Commission). StreetSaver® uses the following criteria: a) street pavement condition, b) type of repair required, c) road classification, e.g., arterial, collector, or residential, d) cost effectiveness, and e) budget constraints.

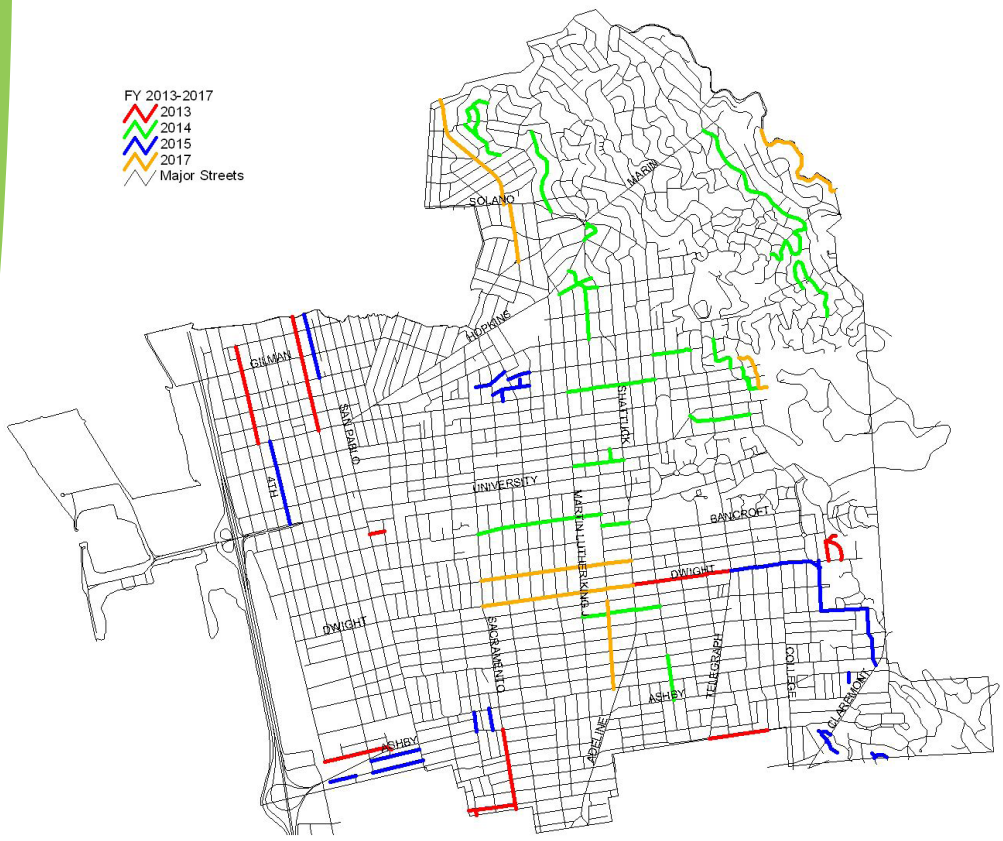



*Figure 1. 2013 5-Year Street Rehabilitation Plan for paving and reconstructing City streets*

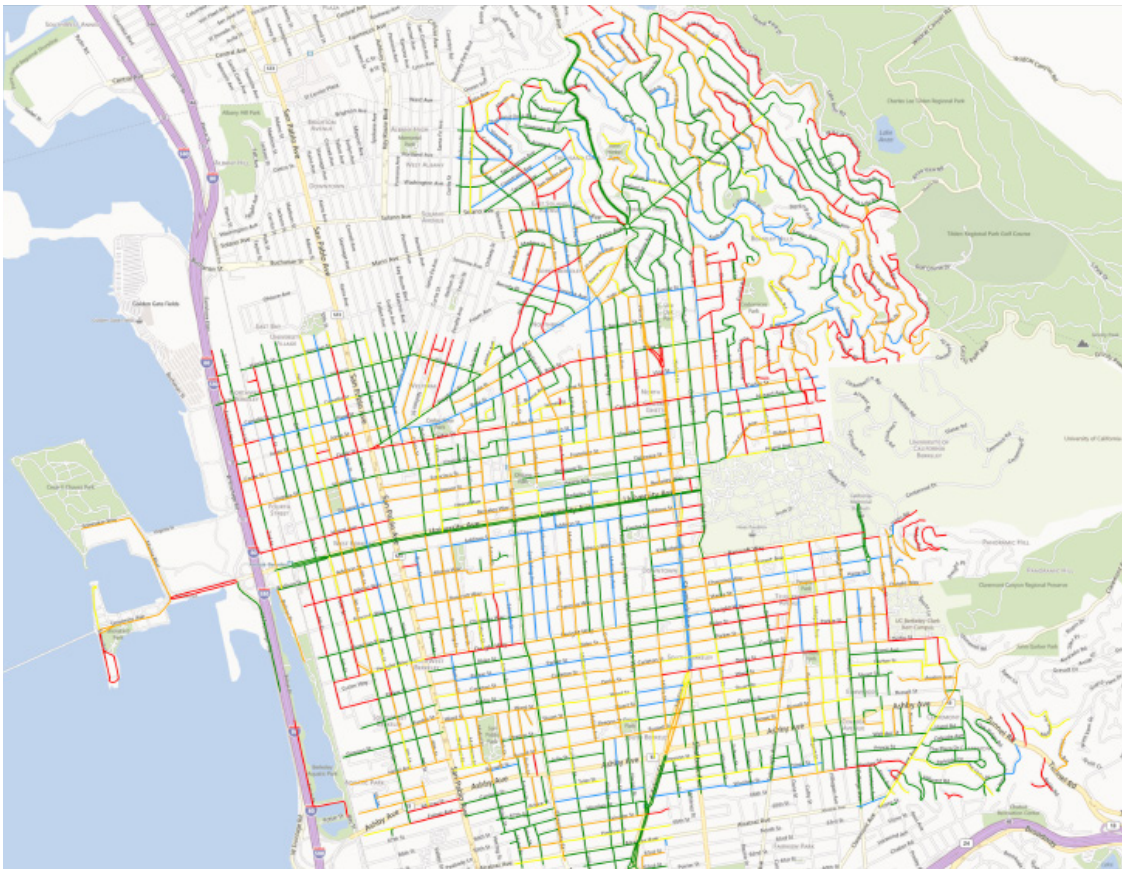
### Berkeley Street Paving Policy

Berkeley's Street Rehabilitation and Repair Policy provides criteria for developing the plan, including the following:

- Implement integrated solutions that address the multiple demands on the street infrastructure that are designed for safety, and are environmentally sustainable and economically efficient over the long run.
- Coordinate with other City programs, such as sanitary sewers, storm drains, sidewalks, utility undergrounding districts, city building upgrades, traffic signals and other traffic calming measures, bicycle improvements, park projects, and Street Maintenance Division activities.
- Coordinate with utility company work.
- Budget distributed to: arterials – 10%, collectors – 50%, residential – 25%, discretionary and demonstration – 15%
- Prioritize collector and residential streets with AC Transit bus routes or bicycle routes.
- Improve contiguous blocks rather than one block at a time as much as possible.

## Berkeley Street Pavement Condition

In November 2011, the City Auditor released a report concluding that Berkeley's streets are in poor "at risk" condition. The report estimated an additional $54 million would be needed over five years to achieve an average pavement condition of good.



### How is Pavement Condition Rated?

The City of Berkeley has approximately 217 miles of streets. The Public Works Department currently estimates that 155 miles of Berkeley streets need rehabilitation or repairs. The condition of the streets is characterized by a Pavement Condition Index (PCI). New streets have a PCI of 100 and a target PCI of 75 is generally accepted as streets in good condition.

*Figure 2. Current Pavement Condition of Berkeley streets. Condition ranges from very poor (shown in red) to very good (shown in green).*

## What Paving Projects may be Eligible for Measure M Funding?

Measure M funding may be used for street paving and rehabilitation consistent with the 5-Year Street Rehabilitation Plan as it is updated annually and to sufficiently accelerate the implementation of that plan.

Measure M funded: A bond is a long-term loan and is traditionally used to fund capital improvements that are intended to last longer than the repayment period. The PWC recommends allocating Measure M funds for capital street construction projects with the potential to last at least the life of the bond repayment (minimum 30 years).

Maintenance funded: Direct tax monies are typically paid annually and are used to pay for ongoing operations and maintenance. The PWC recommends allocating the current direct tax monies to maintenance treatment to prolong the life of the pavement. This would allow for 2 to 3 times more street overlays over the next five years to comply with the Measure M language of "significant acceleration of street rehabilitation."

# Watershed Management Plan

## Overview of the Watershed Management Plan

The Watershed Management Plan (WMP) was developed to identify opportunities to reduce flooding, improve water quality and enhance waterways and habitat. The WMP outlines general goals for managing stormwater across the city and identifies specific capital projects in two watersheds, Potters and Codornices, to address specific flooding and water quality issues. In addition, the WMP outlines a role for green infrastructure in supplementing the existing engineered storm drain infrastructure with greener developments that mimic natural hydrologic processes including filtration and infiltration by soils and plants.

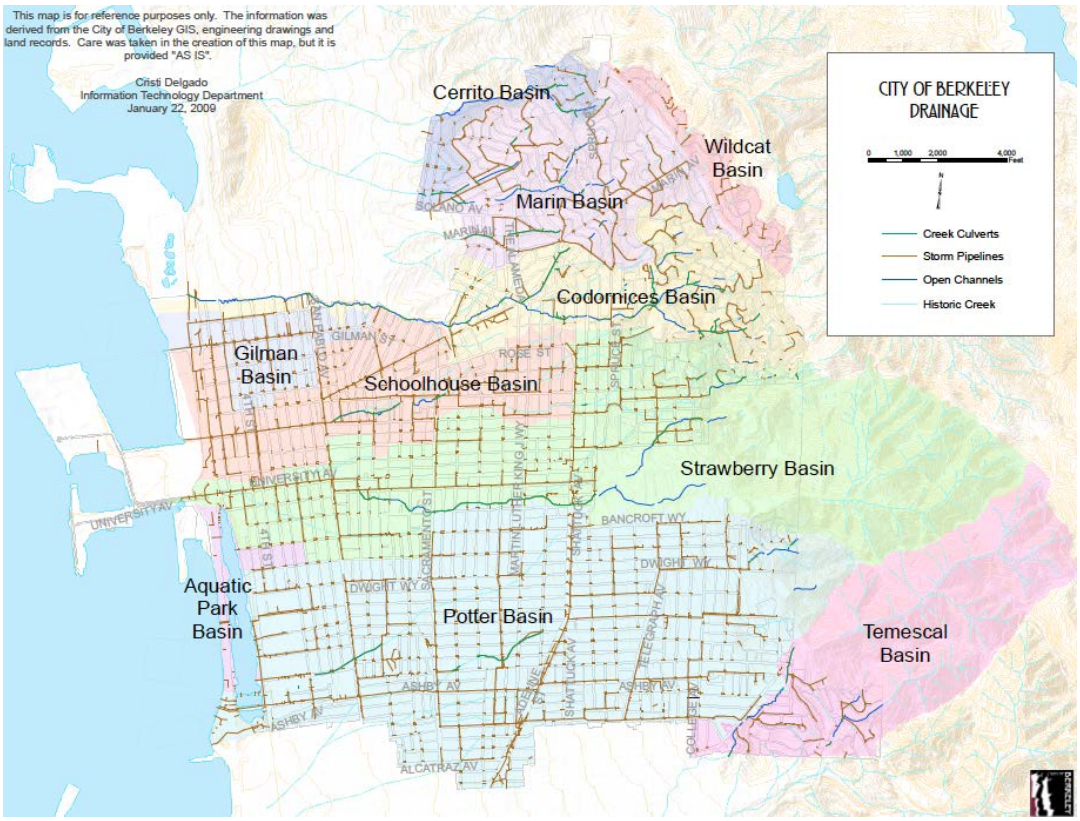



*Figure 3. Watersheds in the City of Berkeley.*

**Examples of flooding locations identified in the WMP:**

- San Pablo Avenue, between Ward and Murray
- California Street, between Woolsey and Harmon
- Woolsey Street, between California and Adeline; at Dana
- Ashby Avenue, between California and King
- Martin Luther King, Jr. Way, between Russell and Woolsey
- Parker Street, between Seventh and Fourth
- Fulton Street at Derby
- Ellsworth Street between Blake and Parker
- Telegraph Avenue between Ashby and Woolsey; at Stuart
- College Avenue at Dwight

## What WMP Projects may be Eligible for Measure M Funding?

WMP projects (identified in the plan or consistent with the goals) that are constructed as part of a street improvement may be eligible for Measure M funding. Creek restoration activities identified in the Watershed Management Plan may only be funded under Measure M if they are directly related to street improvements, such as a creek culvert upgrade. Criteria for prioritizing WMP projects and green infrastructure in Measure M funding street improvements are included in the recommended scorecard on page 11.

## Green Infrastructure

Green infrastructure (GI) and low impact development (LID) projects mimic the natural environment by allowing rainwater to collect and infiltrate through permeable media. This can serve numerous purposes including: (1) removing pollutants, (2) decreasing stormwater flow and flooding, and (3) replenishing groundwater supplies. GI and LID can be a cost effective solution for improving water quality and reducing flooding. Examples of such projects include rain gardens, permeable pavement, and infiltration basins.

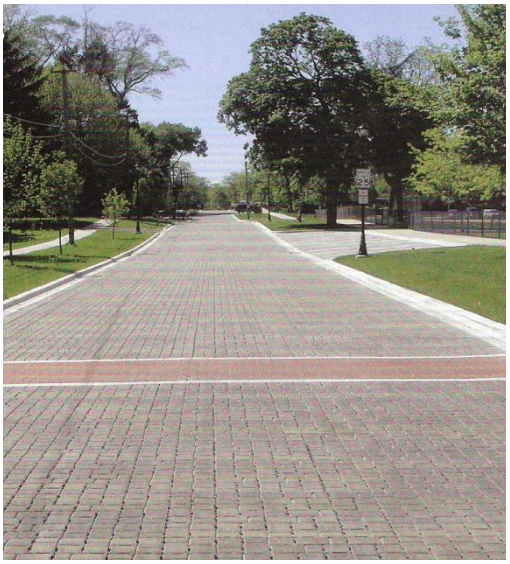
### Benefits of Green Infrastructure

1. Pollution Abatement
2. Protection of Natural Waterways
3. Groundwater Recharge
4. Water Quality Improvements
5. Reduced Sanitary Sewer Overflows
6. Habitat Improvements
7. Reduced Flooding and Property Damage
8. Aesthetic Value
9. Public Spaces and Public Participation

Berkeley has implemented green infrastructure at the Berkeley Animal Shelter. Green infrastructure components include a rain garden, permeable paving and bicycle friendly elements.

*Photo credit: Ray Yep*

## Green Infrastructure Examples



**Permeable paving** refers to paving materials that allow stormwater to filter through to the soil below.

*Photo credit: Public Works Superintendent, Warrenville, Illinois*

**Vegetated swales (bioswales)** are broad, shallow channels designed to convey and filtrate stormwater runoff.

*Photo credit: Bluegreenbldg.org*

**Raingardens, or Bioretention Cells** are vegetated depressions that can resemble miniature ponds or long strips.

*Photo credit: Bluegreenbldg.org*

## Berkeley's Active Transportation Plans

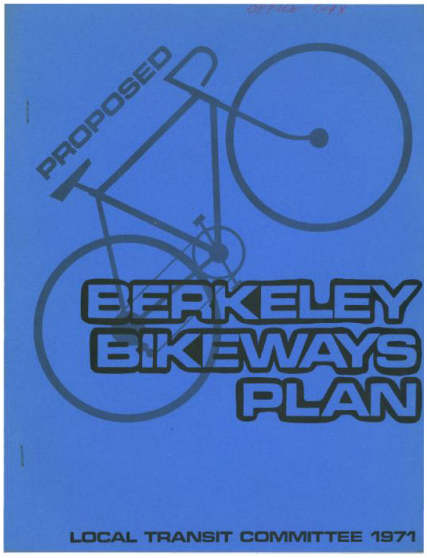
Street reconstruction to improve paving offers an opportunity to incorporate other features to promote biking and walking in Berkeley. The City of Berkeley currently has a number of initiatives, totalling more than $47 million, to promote active transportation. Current plans and policies include:

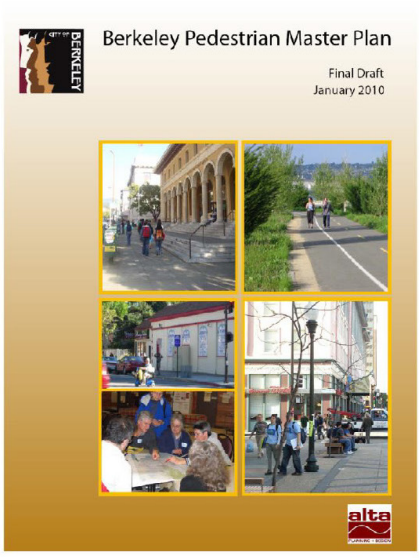
1) **Bicycle and Pedestrian Master Plans.**
Guides the development of new bicycle and pedestrian facilities, and the improvement of existing facilities by developing a plan with a list of priority projects for the City.
http://www.ci.berkeley.ca.us/transportation/

2) **Complete Streets Policy.**
Ensures that each time the City does construction on a street, it builds a "complete street," or a street that accommodates all users and all modes of transportation, regardless of age or ability.
http://www.ci.berkeley.ca.us/transportation/

3) **Downtown Streets and Open Space Improvement Plan (SOSIP).**
Includes plans to make downtown Berkeley more "livable," by creating features such as pedestrian plazas, improved bicycle connections, and more parks and greenery.
http://www.cityofberkeley.info/sosip/

4) **Climate Action Plan.**
Calls for an increase in walking and bicycling in order to achieve a significant reduction in vehicle trips in Berkeley, which account for about half of all greenhouse gas emissions.
http://www.ci.berkeley.ca.us/climate/



## Promoting Active Transportation

Active transportation, such as walking, biking, and taking transit, is a healthy, sustainable, and affordable way to travel throughout Berkeley and the Bay Area. Berkeley has some of the highest rates of bicycling and walking in the country, and was awarded the "Most Accessible City in the Nation" by disability experts in 2007. The walking and bicycling experience in Berkeley can be improved by:

- **Building Complete Streets.**
  The Complete Streets Policy, passed in December 2012, will ensure that all future street repairs are built for all modes of transportation, including biking and walking.

- **Prioritizing the Bicycle Network.**
  Many of Berkeley's bikeways need resurfacing as soon as possible. Pavement condition is a key concern of cyclists. Paving a street improves one's ability to travel more safely and easily by bike. The current method of repaving streets ("the 5-year paving plan") uses a formula that prioritizes streets with heavy auto traffic. Some bikeways are captured through this method, but many are missed because they are on residential streets. Approximately 22% of the City's roadways are existing or planned bikeways.

- **Traffic Calming.**
  Safety for all roadway users can be improved by integrating priority traffic calming measures (e.g. neighborhood traffic circles, speed tables, etc.) as streets are repaved. Permeable pavers are another alternative for slowing traffic.

Bicycle Lanes on the heavily-travelled Milvia Street Bicycle Boulevard were widened and refreshed as part of a recent repaving project.

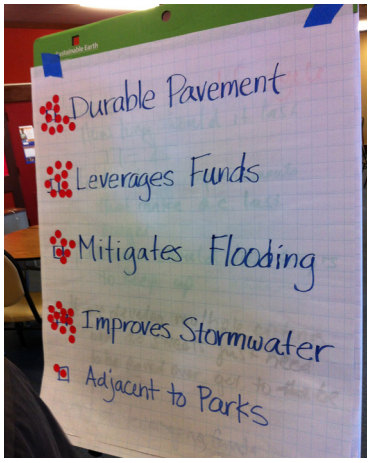
The University Avenue repaving project added High Visibility Crosswalk markings and Advance Stop Bars to improve pedestrian visibility and safety.

## What Projects may be Eligible for Measure M Funding?

Measure M provides funding for street repaving and rehabilitation and the installation of green infrastructure as part of street work. However, Berkeley's complete streets policy requires that when a street is repaved all "related" improvements to the street must be made. This could include funding for bicycle, pedestrian, traffic safety (calming), and drainage improvements for that street. Measure M does not provide for "related" improvements to be funded on a standalone or individual basis; they must be integrated into a street repaving and rehabilitation project. Criteria for prioritizing active transportation improvements in Measure M funding street projects are included in the recommended scorecard on page 11.

# Community Process

During the course of the community engagement process, three public meetings were held to share information and gather input. The meetings included an open house portion to share information on related city initiatives, as well as break out discussions to facilitate meaningful dialogue and gather community suggestions. Participants offered valuable input for both the process and the recommendations. A summary of the meetings is included below for reference. Meeting agendas, materials, and comment summaries are available on the Public Works Department website: http://www.ci.berkeley.ca.us/Public_Works/Sidewalks-Streets-Utility/Measure_M__The_Public_Works_Commission_and_the_Public_Process.aspx




### Meeting #1: Overview of the Process and Background

***Thursday, May 2, 2013***

- Background on Berkeley's infrastructure needs
- Overview of City Paving, Watershed and Active Transportation policies
- Overview of the process and how to get involved
- Gather input on goals and priorities

### Meeting #2: Develop Preliminary Criteria

***Saturday, June 8, 2013***

- Share draft goals and priorities
- Gather input on criteria

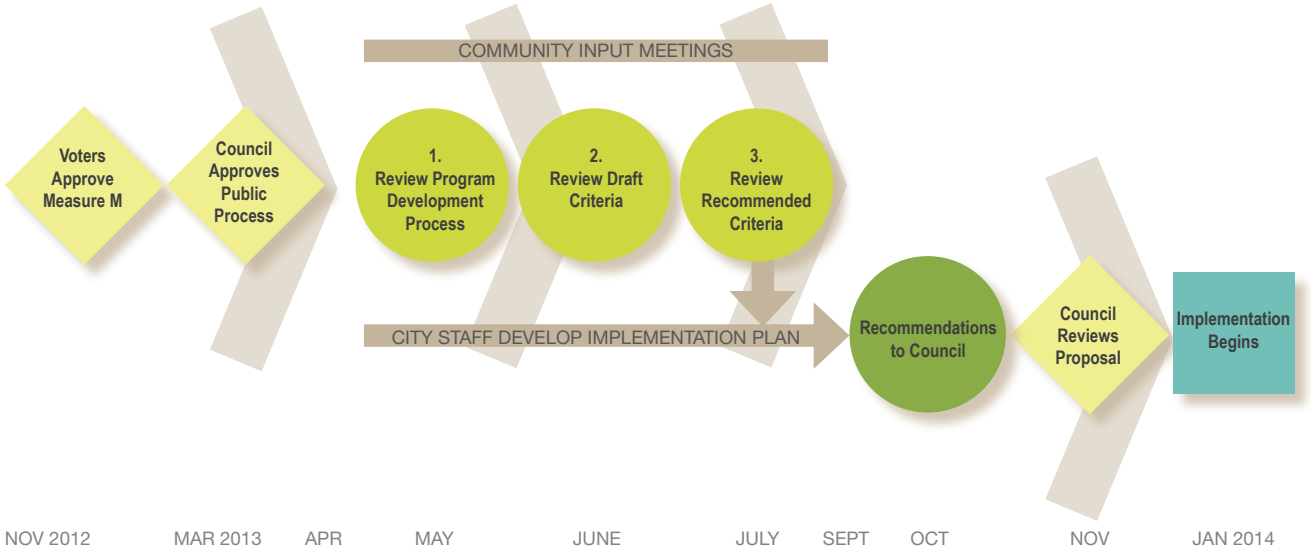
### Meeting #3: Share Draft Recommendations

***Thursday, July 18, 2013***

- Share draft scorecard and gather input
- Share recommendations on planning process
- Gather input on ranking

*During the 2nd public meeting, community members participated in breakout groups and dot voted to share their priorities for street upgrades. Public Works staff, including Public Works Deputy Director, Phil Harrington answered questions during the comment period. Photo credit: Miranda Maupin and Nancy Bickel*

In addition to the three public meetings, community members submitted comments by letter and email. Input from the second public meeting resulted in the development of a scorecard. Input from the third community meeting informed the final recommended ranking in the scorecard.



# Recommendations

The community engagement process resulted in several specific recommendations for Measure M investment which are summarized below. The Berkeley Public Works Department is integrating these recommendations into the annual Five-Year Street Rehabilitation Plan. These recommendations along with the Five Year Street Rehabilitation Plan will be presented to the City Council for consideration.

*During the community meetings, participants shared goals and priorities for street improvements and learned about ideas to develop a more integrated, sustainable street network. Photo credit: Nancy Bickel*

## Goals and Target Outcomes

Measure M funds should make strides toward the following goals:

- Streets are in good safe condition for all users
- Reduced neighborhood flooding
- Our environment becomes more sustainable

## Evaluation Criteria

The community engagement process resulted in a recommended scorecard to prioritize and select streets for improvement. The recommended scorecard is included on page 11. The criteria and weighting for the scorecard were developed based on the following:

- Public input from the community meetings
- Elements from the Envision framework (see textbox for more detail)
- Criteria suggested by the Public Works Department

## Planning Process

The planning process included on page 10 outlines recommendations for how to incorporate the scorecard into the street improvement planning process. The process recommends the Measure M funds should be focused on street capital improvement projects and green infrastructure, and not be used for maintenance functions. The planning process diagram also indicates when to consider green infrastructure and permeable paving design elements, as well as how to track progress through a series of performance metrics and reporting.

### Envision Assessment Tools

The scorecard uses applicable elements of the Envision™ framework. Similar to the LEED system for evaluating sustainable building, Envision™ provides a holistic framework for evaluating the community, environmental and economic benefits of infrastructure projects. Envision™ can be used to track sustainability goals, recognize achievement in sustainability, prioritize investment of scarce resources and integrate community priorities.

Envision™ is the product of a joint collaboration between the Zofnass Program for Sustainable Infrastructure at the Harvard University Graduate School of Design and the Institute for Sustainable Infrastructure. www.sustainableinfrastructure.org

## Monitoring and Oversight

Each year, the Public Works Commission reviews the annual Five Year Street Rehabilitation Plan and submits recommendations for approval by City Council. The current Five Year Street Rehabilitation Plan report includes metrics for proposed miles of street improvement, as well as the type of paving. In order to track performance, an annual report summarizing the following additional metrics is recommended:

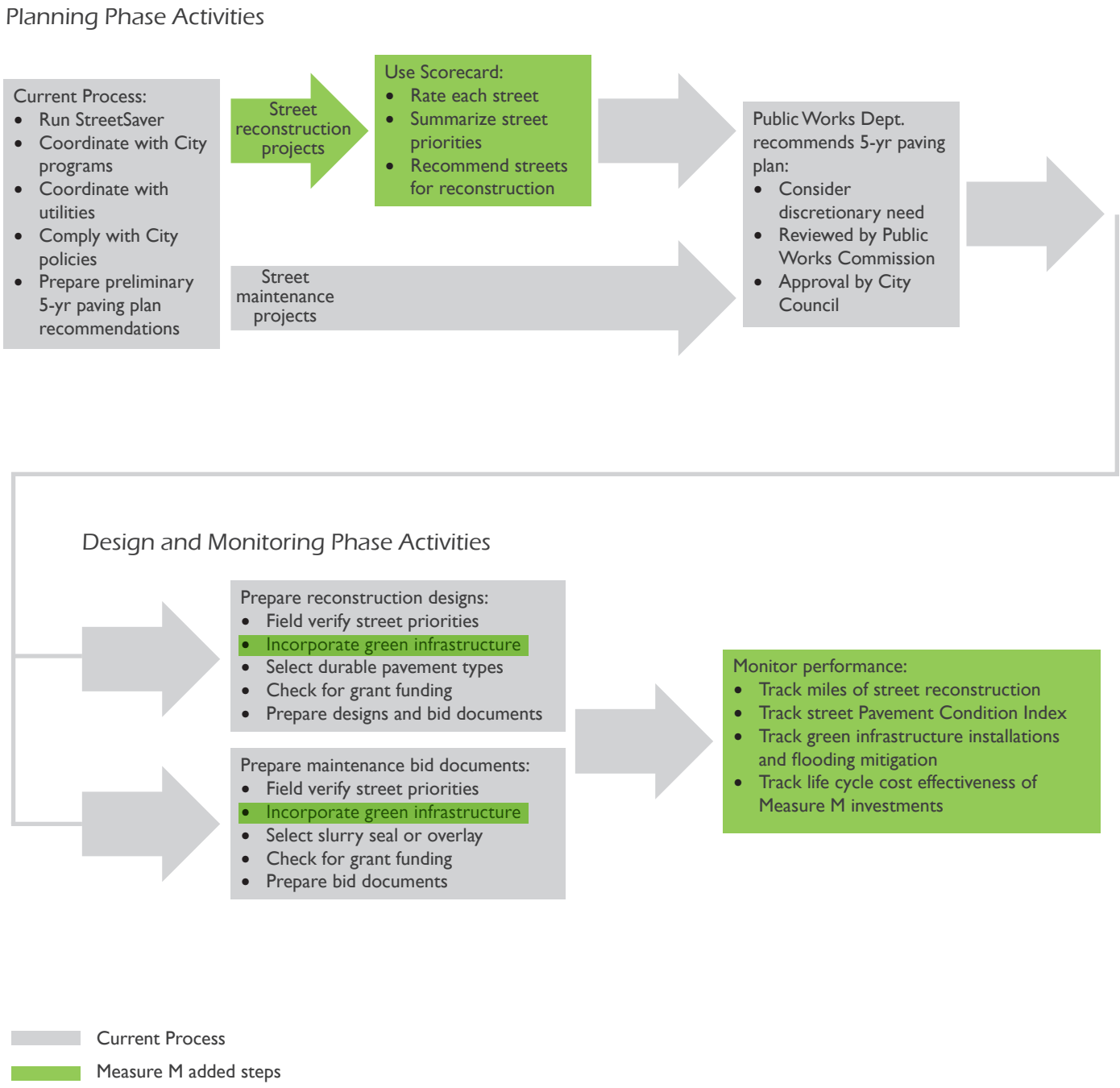
- Track miles of street reconstruction
- Track street Pavement Condition Index
- Track green infrastructure installations and flooding mitigation
- Track life cycle cost effectiveness of Measure M investments

The Commissions recommend that the PWC in coordination with the TC, CEAC and P&WC, monitor the progress of Measure M implementation to evaluate alignment with the goals, evaluation criteria and performance metrics. In addition, the Commissions recommend continuing to engage the public annually to report on progress and gather additional input.

# Recommendations

## Proposed Planning Process

The planning process below outlines how to incorporate the scorecard into the street improvement planning process. The planning process diagram also indicates when to consider green infrastructure and permeable paving design elements, as well as how to track progress through a series of performance metrics and reporting.



## Scorecard Evaluation Criteria

The primary outcome of the community engagement process is the recommendation to use the following scorecard in the annual street prioritization process. Each street proposed for reconstruction will be rated according to the criteria and points outlined. Points will be given for sub categories and rolled up where applicable. The total assigned points will be tabulated to develop an overall prioritization of streets and watershed improvements.

| No. | Evaluation Criteria | Project Rating | |
|---|---|---|---|
| | | Max. Points | Rating |
| **Resource Allocation and Durability** | | | |
| **RAD 1** | **Rates high on StreetSaver® output for complete "reconstruction"** | **10** | |
| **RAD 2** | **Leverages funds** | **10** | |
| RAD 2.1 | Secures grant funds | | |
| RAD 2.2 | Cost effective in the long run | | |
| RAD 2.3 | Spend money on things that will solve multiple problems | | |
| **RAD 3** | **Candidate for durable or permeable paving -- long lasting** | **10** | |
| RAD 3.1 | Use durable pavement systems | | |
| RAD 3.2 | Use durable permeable pavement where advantageous | | |
| **RAD 4** | **Ready to implement** | **10** | |
| RAD 4.1 | Involves few utility interferences | | |
| RAD 4.2 | Engineering and evaluations can be done quickly | | |
| | **Subtotal** | **40** | |
| **Overall Community Improvement** | | | |
| **OCI 1** | **Enhances public health and safety** | **10** | |
| OCI 1.1 | Improves traffic safety | | |
| OCI 1.2 | Advances traffic calming | | |
| OCI 1.3 | Enhances equitable community benefits | | |
| **OCI 2** | **Advances Berkeley Complete Streets Policy** | **5** | |
| **OCI 3** | **Advances bicycle and pedestrian plans** | **10** | |
| **OCI 4** | **Integrates with other City Plans** | **5** | |
| OCI 4.1 | Advances SOSIP, DAP, CAP, and/or Area plans* | | |
| | **Subtotal** | **30** | |
| **Environment and Climate** | | | |
| **EC 1** | **Consistent with Watershed Management Plan** | **15** | |
| EC 1.1 | Improves stormwater quality | | |
| EC 1.2 | Mitigates flooding | | |
| **EC 2** | **Includes Green Infrastructure** | **10** | |
| **EC 3** | **Consistent with Climate Action Plan Goals** | **5** | |
| EC 3.1 | Reduces greenhouse gas emissions | | |
| EC 3.2 | Prepares for long term adaptability | | |
| | **Subtotal** | **30** | |
| | **TOTAL** | **100** | |

**Street and Open Space Improvement Plan (SOSIP), Downtown Area Plan (DAP), Climate Action Plan (CAP).*

# Looking Ahead

## Next Steps

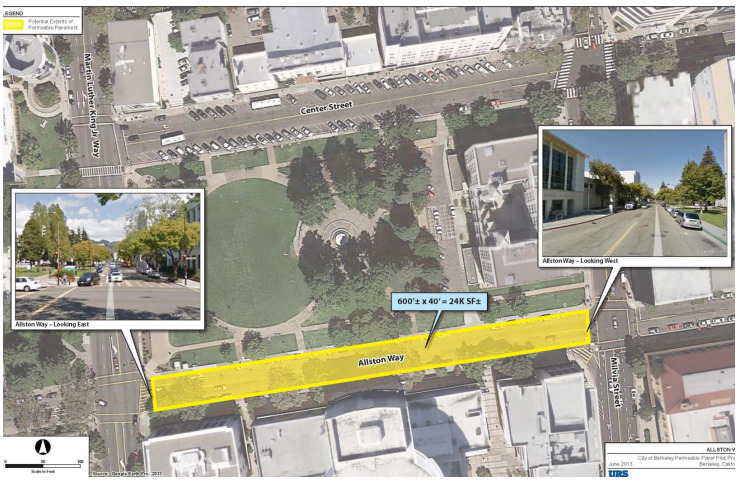
The Measure M community engagement process has provided an opportunity for Berkeley residents to re-envision a more sustainable, integrated street network. The process has facilitated collaboration across Commissions, integrated Public Works staff expertise, and engaged the community in meaningful dialogue about the future of Berkeley's most heavily used civic space – our street network. This process has resulted in a set of recommendations for Measure M investment that can be incorporated directly by Public Works Department into the 2014 Five Year Street Paving Plan, as well as each year going forward. These recommendations, along with the 2014 Five Year Street Paving Plan will be presented to Council for consideration and implementation which may begin as soon as January 2014.

## Measuring Success

The purpose of Measure M funding is to significantly accelerate the implementation of the 5 year street repaving plan as it is updated annually and to install green infrastructure as part of this street improvements when appropriate. The table below shows anticipated increased funding levels over the next five years.

## Example Street Improvement Funding Level

| Program (figures are rounded) | FY 2014 | FY 2015 | FY 2016 | FY 2017 | FY 2018 |
|---|---|---|---|---|---|
| Current Pavement Management Funding | $3.4M | $3.4M | $3.4M | $3.4M | $3.4M |
| New Measure M Funding | $2.5M | $6.0M | $6.0M | TBD | TBD |




*Berkeley is constructing a permeable paver project on Allston Way next to Martin Luther King Jr. Civic Center Park.*

*For more information on case studies and benefits of pavers, see the "Permeable Interlocking Concrete Paver" report by the PWC on the Public Works Department Measure M website.*

## Acknowledgements

The Measure M community engagement process was conducted largely through volunteer time. Special thanks to all community leaders who helped make the Measure M community engagement process possible. Many of these representatives participated countless hours of volunteer time on evenings and weekends and contributed significant skills, perspective and expertise to the process.

Ray Yep, Public Works Commission
Larry Henry, Public Works Commission
Margo Schueler, Public Works Commission
Diz Swift, Public Works Commission
Mikhail Haramati, Public Works Commission
Laura August, Community Environmental Advisory Commission
Andy Torkelson, Community Environmental Advisory Commission
Max Gomberg, Community Environmental Advisory Commission
Terry Roberts, Transportation Commission
Nicole Schneider, Transportation Commission
Toni Mester, Parks and Waterfront Commission
Andrew Clough, City of Berkeley Public Works Director
Phil Harrington, City of Berkeley Public Works Deputy Director
Jeff Egeberg, City of Berkeley Public Works Engineering Manager
Ken Emeziem, City of Berkeley Public Works Engineering
Sherry Smith, League of Women Voters - Berkeley, Albany, Emeryville
Carol Stone, League of Women Voters - Berkeley, Albany, Emeryville
Alisa Hefner, Skeo Solutions
Miranda Maupin, Skeo Solutions

*Commission members and Public Works staff engage the community to gather input over the course of three public meetings.*
*Photo credit: Nancy Bickel*

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## Contact

Please provide written comments to
PWEngineering@cityofberkeley.info

For more information, please contact
Ray Yep, Chair,
Public Works Commission
at rayyep1@gmail.com

*Report and technical support provided by Skeo Solutions.*