

Budget Engagement Commission

City of Arts & Innovation

TO: BUDGET ENGAGEMENT COMMISSION DATE: OCTOBER 13, 2022

FROM: PUBLIC WORKS DEPARTMENT WARDS: ALL

**SUBJECT: MEASURE Z – PAVEMENT MANAGEMENT PROGRAM UPDATE AND FISCAL
YEAR 2022-23 PROJECT SELECTION**

ISSUE:

Receive an update and provide input on the use of Measure Z funds for City roads and streets supporting the pavement management program.

RECOMMENDATION:

That the Budget Engagement Commission receive an update and provide input on the use of Measure Z funds for City roads and streets for the City's pavement management program.

BACKGROUND:

On December 20, 2016, the City Council approved a professional services agreement with Infrastructure Management Services (IMS) to facilitate a proactive street inspection analysis to better manage the City's Pavement Management Program (PMP).

On September 11, 2018, the City Council received a report on the Pavement Management Program Update. This report indicated the City's overall network condition was on the lower end of the national average. City Council received and filed the Pavement Management Analysis Report from IMS dated May 2018 which indicated additional funds were needed for the PMP.

On October 6, 2020, the City Council approved a professional services agreement with IMS to continue the street inspection analysis for the entire City network over the next five years. All arterial streets will be surveyed over a three-year cycle; all collector streets will be surveyed over a four-year cycle; and all minors (residential)/alley streets will be surveyed over a five-year cycle. IMS will provide an updated Pavement Management Analysis Report annually over the five-year period to help prioritize paving and maintenance projects.

The Public Works Department has engaged the Budget Engagement Commission (BEC) and City Council during the past several years to provide Pavement Management Program (PMP) updates, request Measure Z supplemental appropriations, and detail the City's investment to address paving and maintenance needs. Table "1" includes some of the history associated with the Measure Z funding allocations towards the PMP. Annual funding per the Measure Z

Spending Plan for the PMP is \$12.4 million in FY 2022/23 and \$10.9 million annually thereafter. However, \$2M in FY 2022/23 will be allocated to traffic safety improvements and \$10.4M will be allocated to maintenance projects. An additional \$3.5 million may be considered by City Council pursuant to Council direction with the May 2019 report described in the following table.

Table 1 - Measure Z Pavement Management Program Funding

Date	Action
5/2017	City Council approved a 5-year spending plan for Measure Z. The plan included \$2,875,000 in annual funding for streets and road rehabilitation to improve the City's Pavement Condition Index score.
6/2018	City Council approved the FY 2018-2020 two-year budget, inclusive of the \$2,875,000 annual funding for roadway paving and maintenance.
2/2019	The BEC received a report on the PMP and recommended that City Council allocate additional funding for road maintenance, in excess of the \$2.875 million.
4/2019	City Council approved an annual Measure Z supplemental appropriation of \$1.5 million for the Pavement Management Program through FY 2022-23.
5/2019	City Council approved a \$3.5 million supplemental appropriation for the PMP and directed the Public Works and Finance Departments to return to City Council each year through FY 2022-23 to provide an annual progress report on pavement conditions and assessment of finances. The annual reports will consider appropriations of \$3.5 million for the continued support of the PMP.
10/2021	City Council approved a \$3.5 million appropriation for the PMP for FY 2020-21.
11/2021	City Council approved a \$3.5 million appropriation for the PMP for FY 2021-22.
3/2022	The BEC received and provided input on the Fiscal Year 2022-2024 Budget.
5/2022	City Council approved an \$8 million annual increase in funding with the adoption of the Fiscal Year 2022-2024 Budget.

DISCUSSION:

Pavement management is the process of assessing, prioritizing, and preserving or rehabilitating pavements through an objective system that considers available funds to recommend paving and restorative projects in a cost-effective manner. The program utilizes detailed field measurements and pavement condition assessment to correct street surface problems and address issues when they first appear. That is one of the reasons some funds are targeted to streets rated in fair-to-good condition and thus prevent quick deterioration of streets which can cost significantly more to fix.

The best method to optimize the usage of available funds or to determine the required funding to achieve a specific level of service is through the use of a PMP. An effective PMP can assist agencies in developing an organized catalog of pavement assets, store periodic condition

assessments, track spending and costs, compare trends in data, and assess the effectiveness of maintenance activities and new technologies.

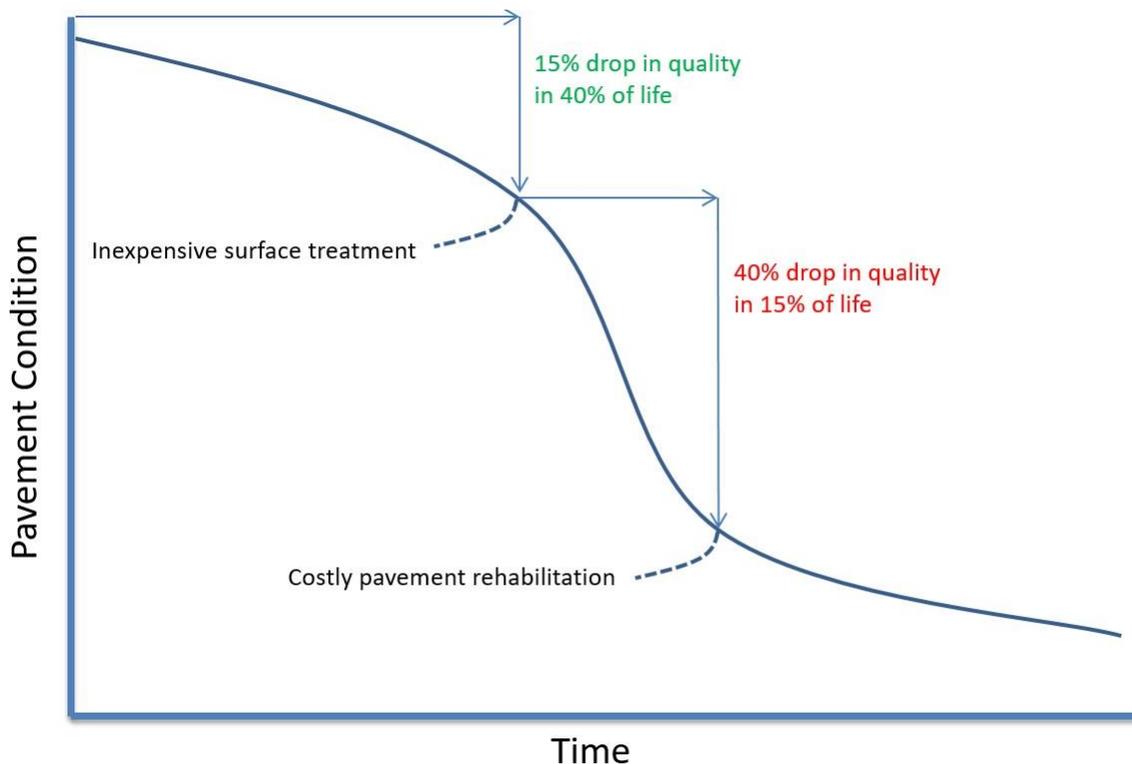
The practical implementation of a PMP requires that an agency have an accurate understating of the assets under its management. To fulfill this requirement IMS was contracted by the City to conduct a comprehensive pavement condition assessment and analysis on the roadway network using the Lucy pavement management software system.

Lucy will allow the city to catalog, classify, assess, track, and analyze condition data to aid in the processes of budget planning and pavement rehabilitation. More specifically the program will help the City through the process of pavement management by giving structure to the basic information required for a management system including:

- Pavement Section Inventory
- Pavement Deterioration Modeling
- Prioritization
- Funding Analysis
- Inspection Data
- Rehabilitation Selections & History
- Work Planning
- Reporting

Figure “1” below illustrates that pavements typically start deteriorating rapidly once they reach a specific threshold.

Figure 1 - Pavement Deterioration and Life Cycle Costs



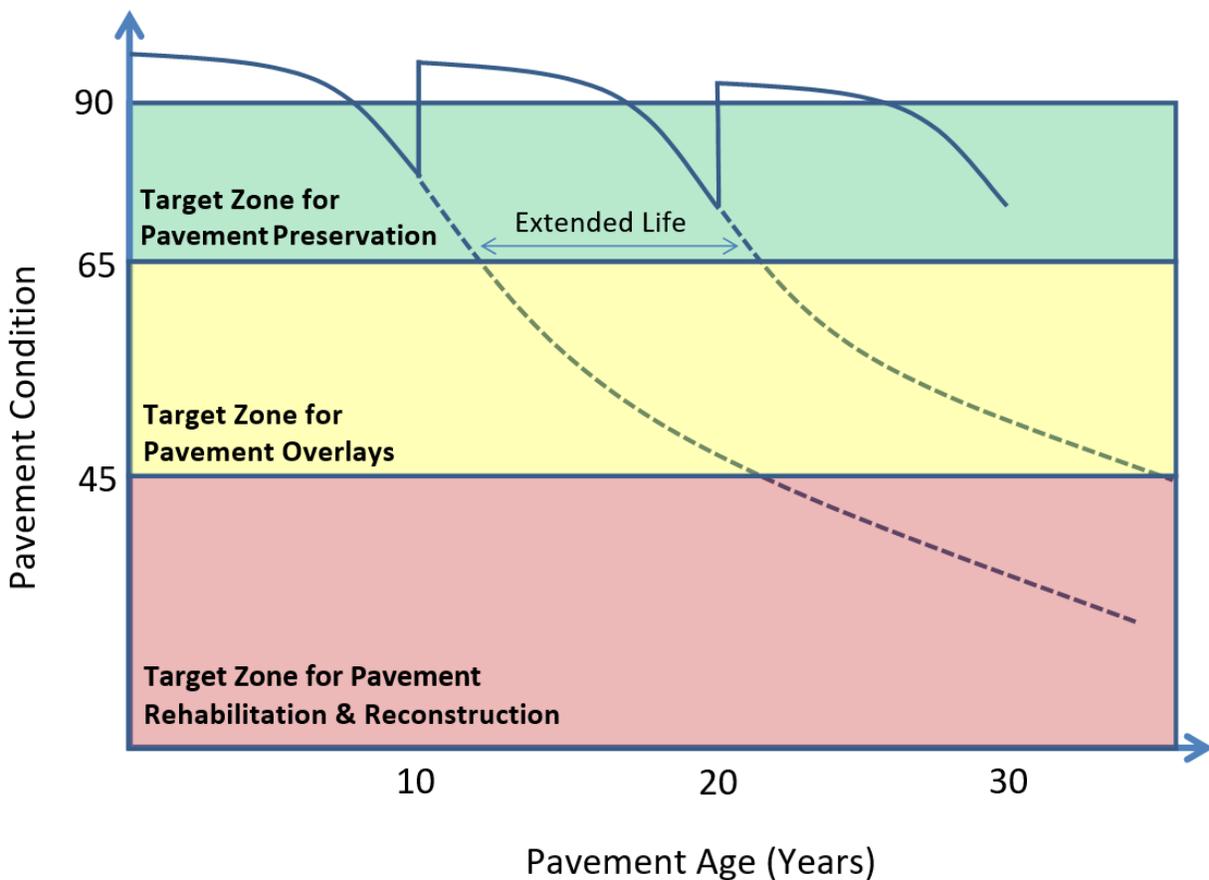
A nominal investment in cheaper surface treatments at 40% lifespan is much more cost-effective than deferring maintenance until heavier overlays or possibly reconstruction is required just a few years later. Streets that are repaired while in good condition will have an extended lifetime and will cost less over their lifetime than those left to deteriorate to a poor condition. Without an

adequate routine pavement maintenance program, streets will require more frequent reconstruction, thereby requiring significantly greater funding.

The types of rehabilitation activities that the City chooses to deploy can have a significant effect on the longevity of a pavement. Depending on the PCI zone for the pavement, a detailed rehabilitation strategy set needs to be formed. Maintenance activities typically include Preventative Maintenance, Overlays, and Reconstruction. Popular examples of cost-effective Preventative Maintenance activities include Crack Sealing, Patching, and Slurry Seals.

Pavement overlays help maintain and repair the surface integrity, which can slow deterioration and extend the life of a pavement. The outcome of this exercise is the long-term cost savings and an increase in network-level pavement quality over time. Figure “2” illustrates the concept of extending pavement life through the application of timely maintenance activities.

Figure 2 - Pavement Life Cycle Curve



PCI values provide an indication of the surface conditions and structural integrity of a pavement. The 0 to 100 PCI range is commonly divided into various categories using descriptive terms. Divisions between the terms are not fixed but are meant to reflect common perceptions of pavement conditions. Table “2” below summarizes the City’s PCI assessment ranges and the corresponding typical pavement distresses and maintenance needs within each range.

Table 2 - Pavement Life Cycle Curve

Category	Typical Distresses and M&R Recommendations	PCI Range
Excellent	Like new condition – little to no maintenance required Monitor condition or preventive maintenance.	(85-100)
Very Good	Minor cracking, raveling, and other non-load associated distresses Routine or preventive maintenance. <i>E.g., Crack sealing, surface treatment</i>	(70-85)
Good	Minor to moderate cracking and low severity load associated distresses such as alligator cracking and rutting. Surface treatments with localized repairs and overlays <i>E.g., Surface treatments, localized surface patching, thin overlay</i>	(60-70)
Fair	More extensive and severe longitudinal and transverse cracking, as well as moderate severity load associated distresses Localized repairs or major rehabilitation. <i>E.g., Localized surface and/or full-depth patching, overlays</i>	(50-60)
Marginal	Localized high-severity alligator cracking, and rutting. Major rehabilitation. <i>E.g., Localized full-depth patching, mill and overlay, traditional overlay</i>	(40-50)
Poor	A greater extent of severe alligator cracking and rutting Major rehabilitation. <i>E.g., More extensive full-depth patching, mill and overlay</i>	(25-40)
Very Poor	Extensive and severe alligator cracking, more extensive and deeper rutting, and potholes. Major rehabilitation. <i>E.g., Full-depth reclamation, reconstruction</i>	(0-25)

A number of parameters must be determined or assumed to properly design or evaluate a street pavement. Good designs, followed by good construction practices with a proper inspection/observation program, are critical to realize the full performance potential. A couple key parameters include the traffic volume, specifically for large trucks, and the existing subgrade condition.

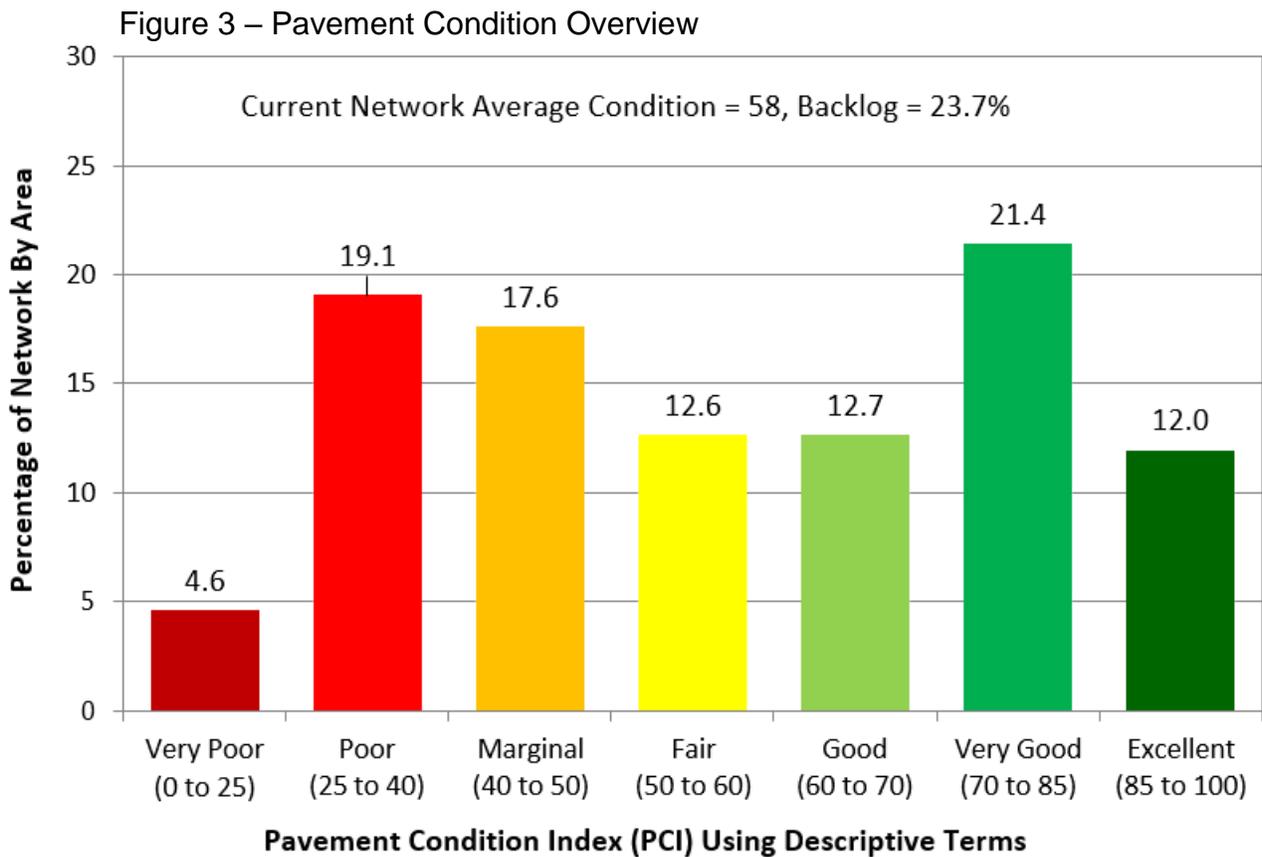
Designs that improve the foundation will extend the pavement life, improve the level of service throughout the life of the pavement, and provide more economical rehabilitation strategies at the end of the pavement’s life. However, the initial cost to construct the pavement will be higher than placing the pavement on natural subgrade, the overall life cycle costs will be greatly improved.

Streets throughout the City consist of pavement that was constructed on natural subgrade as well as on a crushed aggregate base material. Street cores are often obtained when completing projects and our findings have indicated that many of the streets are under-designed considering the traffic volume they receive, which will impact the pavement service life.

The Pavement Management Analysis Report prepared by IMS in 2018 for the citywide data collected in 2017 indicated the following:

- The City’s network PCI scored a **61** out of 100.
- **13.2%** of City streets scored in “Excellent” condition (PCIs between 85 and 100).
- **12.7%** of City streets scored in “Very Poor” and “Poor” condition (PCIs between 0 and 40). The streets in these conditions are considered the City’s “backlog”.
- A **\$13.5 million** maintenance budget would decrease the average network score to **57** but the backlog would increase to **18.8%**.
- A **\$24 million** maintenance budget was required to maintain the network PCI score of **61** but the backlog would increase to 18.8%.
- A **\$30 million** maintenance budget was **recommended** to increase the PCI to **63** but the backlog would increase to **15.2%**.

Under its new contract with the City, IMS completed the first cycle of partial network surveys in March 2021. IMS prepared an updated Pavement Management Analysis Report in July 2022. Figure “3” indicates the summary of the pavement conditions throughout the City.



The Public Works Department did receive annual increases in Measure Z funds, however the City was not operating on the recommended budget from the 2018 Report. Due to these funding deficiencies some of the key metrics declined. The following is a general summary of results from the 2022 Report:

- The City’s network PCI scored a **58** out of 100
- **12.0%** of City streets scored in “Excellent” condition (PCIs between 85 and 100)

- The City's backlog increased to **23.7%** (PCIs between 0 and 40)
- A **\$31.5 million** annual maintenance budget for the next five years is **recommended** to slightly increase the network PCI to **59** with minimal backlog increase.
- A **\$21 million** annual maintenance budget for the next five years would decrease the network PCI to **55** and the backlog would increase to **31%**.
- A **\$37 million** annual maintenance budget for the next five years would increase the network PCI to **60** and the backlog would decrease to **23%**.
- A **\$80 million** annual maintenance budget for the next five years would increase the network PCI to **70** and the backlog would decrease to **9%**.

Although an insufficient budget contributes to the lowering of the average network PCI, there are many factors that can contribute to the premature failing of asphalt surfaces which accelerates the PCI decline. Southern California, including the City of Riverside, is car-centric and residents and visitors rely heavily on vehicles as their primary mode of transportation. Additionally, the City is located adjacent to SR-91, SR-60, and I-215, and during Sigalerts or heavy congestion, motorists may exit the freeway to "cut-through" the City which places added demand on the roadway network leading to premature failure.

Pavements are engineered to carry truck traffic during the pavement design life. Truck traffic, which includes transit vehicles, trucks, and truck-trailer vehicles is the primary factor affecting pavement design life. The City has developed a Traffic Index Map which is a calculated factor assigned to the City streets that equates to the estimated single-axle truck loads anticipated over the pavement design life. Pavement designs utilize the Traffic Index along with the subgrade analysis to determine the required pavement section for a particular street. Therefore, changes to the truck loading and subgrade stability can affect the life of a pavement.

The City has determined the current Traffic Index Map is outdated and no longer accurately represents the truck data for the City. As previously indicated, street core samples collected for projects indicate many of our streets are under-designed. The City of Riverside is an old city and the original designs of streets do not meet current standards. The City also has old utility water lines that have potential for leaking that can affect the subgrade integrity. These may all be contributing factors towards our pavement treatments not providing the expected longevity.

Funding and FY 2022-23 Projects

Since the inception of the City's Measure Z sales tax funding program, City Council increased the funding significantly for street maintenance in subsequent years to support the PMP. With these Measure Z funds and the additional gas tax revenues allocated to the City through the State's Senate Bill 1 Road Repair and Accountability Act of 2017 to support road maintenance for local streets networks, the PMP budget for FY 2022-23 has reached a budget of approximately \$24 million. Table "3" indicates the total funding allocated to the PMP increased by approximately 18% (\$3.7) million from FY 2021-22 to FY 2022-23.

Table 3 - Paving Fund Sources for Fiscal Years 2021-2022 and 2022-23

Fund Source	FY 2021-22 (million)	FY 2022-23 (million)
Measure A	\$2.0	\$2.4
Gas Tax	\$2.8	\$2.1
SB1 Gas Tax	\$6.4	\$7.2
CDBG Allocation	\$1.2	\$1.9
Measure Z – FY Appropriation	\$7.9	\$10.4
Total	\$20.3 Million	\$24.0 Million*

* Does not include \$2M of Measure Z funds allocated for traffic safety improvements.

In May 2019, the City Council directed the Public Works and Finance Departments to return to City Council each year through FY 2022-23 to provide an annual progress report on pavement conditions and assessment of finances. The next annual report will consider an additional appropriation of \$3.5 million in FY 2022/23 for the continued support of the PMP, which is not reflected in Table “3”. If approved, FY 2022-23 Measure Z funding would total \$13,875,000 net of \$2 million allocated for traffic safety improvements, resulting in a one-year increase of 35% in total funding for PMP over the prior year. Subsequent years of Measure Z funding are currently programmed at \$10,875,000 annually to be allocated to the PMP and traffic safety improvements.

The relatively high percentage of roads potentially deteriorating in the future, coupled with the City’s current underfunded pavement program will negatively impact the City’s street network. Postponing or neglecting roadway maintenance would result in higher costs as eventually road repairs may require a thick asphalt resurfacing or partial or full reconstruction. The City is also experiencing increasingly higher construction costs. Recent bids received are indicating costs that are 25% higher than bids received last year. Without increased annual funding, the roadway network condition’s decline will become increasingly challenging to rectify. The recommended annual maintenance budget of \$31.5 million to achieve a network PCI of 59 did not consider the recent increase in construction costs. The next Pavement Management Analysis Report for the partial network pavement surveys collected this year will likely indicate a considerably higher recommended annual maintenance budget.

The allocated funds are utilized to complete numerous maintenance projects throughout the City. The City will also be completing a number of traffic safety enhancement related improvements. The Public Works Department attempts to balance the cumulative total of allocated funds as evenly as possible annually throughout all Council Wards as outlined in Table “4”.

Table 4 – FY 2022-23 Funding Allocations per Council Ward

Council Ward	FY 2022-23
1	\$3.4
2	\$3.2
3	\$3.3
4	\$3.7
5	\$3.4
6	\$3.4

7	\$3.6
Total	\$24.0 Million*

* Does not include \$2M of Measure Z funds allocated for traffic safety improvements.

Funding is typically not completely balanced because recommended project areas vary in size, therefore some project areas will require more funding than others to complete. However, Public Works will consider these differences when selecting future fiscal year project locations in an attempt to reconcile these differences.

Arterial streets will receive 2.3 miles of resurfacing. Collector streets will receive 5.8 miles of resurfacing and 0.6 miles slurry preservation. Minor streets will receive 22.1 miles of resurfacing and 38.5 miles of slurry preservation. Finally, 0.8 miles of alleys will be reconstructed. A complete list of all maintenance locations proposed for Fiscal Year 2022-23 is included as Attachment 1.

STRATEGIC PLAN ALIGNMENT:

This item contributes to **Strategic Priority 6 - Infrastructure, Mobility and Connectivity** and **Goal 6.2** – Maintain, protect, and improve assets and infrastructure within the City’s built environment to ensure and enhance reliability, resiliency, sustainability, and facilitate connectivity.

This item aligns with each of the five Cross-Cutting Threads as follows:

1. **Community Trust** – The proposed improvements are part of a more significant endeavor to improve the City’s roadway network and quality of life for residents and visitors. The Public Works Department has provided numerous presentations to the City Council, Transportation Committee, and Budget Engagement Commission as part of the City’s Pavement Management Program.
2. **Equity** – Public Works strives to improve the City’s roadway network to provide safe and reliable transportation to all areas of the City. Additionally, staff meets with each City Councilmember to discuss goals, budgets, recommendations for street improvements, and obtain feedback on the requests received from their constituents. These improvements encompass street maintenance in all Wards and includes work within alleys, local, collector, and arterial roadways.
3. **Fiscal Responsibility** – Public Works responsibly manages a variety of funding sources to complete projects included in the City’s Capital Improvement Program. Public Works is a prudent steward of public funds and construction projects are always awarded to the lowest responsive bidders.
4. **Innovation** – The PMP utilizes Fiber Reinforced Asphalt Concrete, a synthetic fiber technology used to increase the strength, durability, and performance of a resurfaced street. The PMP will also utilize an Asphalt Rubber Aggregate Membrane interlay that has proven to extend the life of a street by creating an impenetrable barrier blocking rainwater from penetrating into the subgrade.
5. **Sustainability & Resiliency** – The construction materials specified for the PMP are considered best practices in the industry. The use of rubberized and recycled material

greatly benefits the environment, reducing wasted storage, providing extra layers of protection, and adding longevity to our resurfaced streets.

FISCAL IMPACT:

There is no fiscal impact associated with this report.

Prepared by: Gilbert Hernandez, Public Works Director
Certified as to
availability of funds: Edward Enriquez, Interim Assistant City Manager/Chief Financial Officer/City Treasurer
Approved by: Kris Martinez, Assistant City Manager
Approved as to form: Phaedra A. Norton, City Attorney

Attachments:

1. Project Locations List
2. Presentation