STAFF REPORT

DATE: October 27, 2020

TO: City Council

FROM: Gloria Partida, Mayor, Member of Pavement Subcommittee
Dan Carson, Council Member, Member of Pavement Subcommittee
Mike Webb, City Manager
Robert A. Clarke, Director of Public Works – Engineering & Transportation
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Melissa Marshall, Senior Civil Engineer
Elena Adair, Director of Finance
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Katherine McIntire, Financial Analyst
Michelle Weiss, Chair, Finance and Budget Commission

SUBJECT: Final Report and Recommendations of the 2020 Pavement Subcommittee

Recommendations

1. Adopt the recommendations of the Pavement Subcommittee to (a) maintain the city's goal of improving street and bike path conditions and (b) adopt a plan to fully fund road and bike path pavement rehabilitation over the next decade.
2. Direct city staff to return to council for authorization of the budget adjustments required in the 2020-21 fiscal year consistent with the ten-year plan.

Executive Summary

The Subcommittee recommends reprioritizing City funds over the next ten years to meet the City's pavement rehabilitation and maintenance needs for streets and bike paths. After scrutinizing existing revenues including Community Enhancement funds, grant opportunities, Transportation Development Act (TDA) Local Transportation Funds, and general fund monies, the shortfall would be met as shown in the below table. The background for this table is discussed in the body of this report and the detailed analysis shown in the table on page 6.

Road and Bike Path Funding (in millions of dollars)											
Fiscal Year	*2019 /20*	*2020 /21*	*2021 /22*	*2022 /23*	*2023 /24*	*2024 /25*	*2025 /26*	*2026 /27*	*2027 /28*	*2028 /29*	*Total*
Updated estimate of costs to improve road and bike path PCIs to current council goals											
	5.110	8.000	10.330	10.350	11.060	8.300	7.930	7.750	7.460	7.630	83.920
Current funding available to support road and bike path pavement work											
	5.067	5.248	5.105	5.106	5.377	5.379	5.380	5.381	5.382	5.384	52.809
Total fiscal impact of proposed solutions to meet shortfall [(a)]											
	-1.050	6.685	2.572	2.493	3.581	3.031	3.364	3.302	3.443	3.589	31.111
Total dollar amount spent on road and bike pavement work											
	4.017	11.933	7.677	7.599	8.958	8.410	8.744	8.683	8.825	8.973	83.920

(a) The negative in 19/20 is unspent funds that were carried over to 20/21

Fiscal Impact

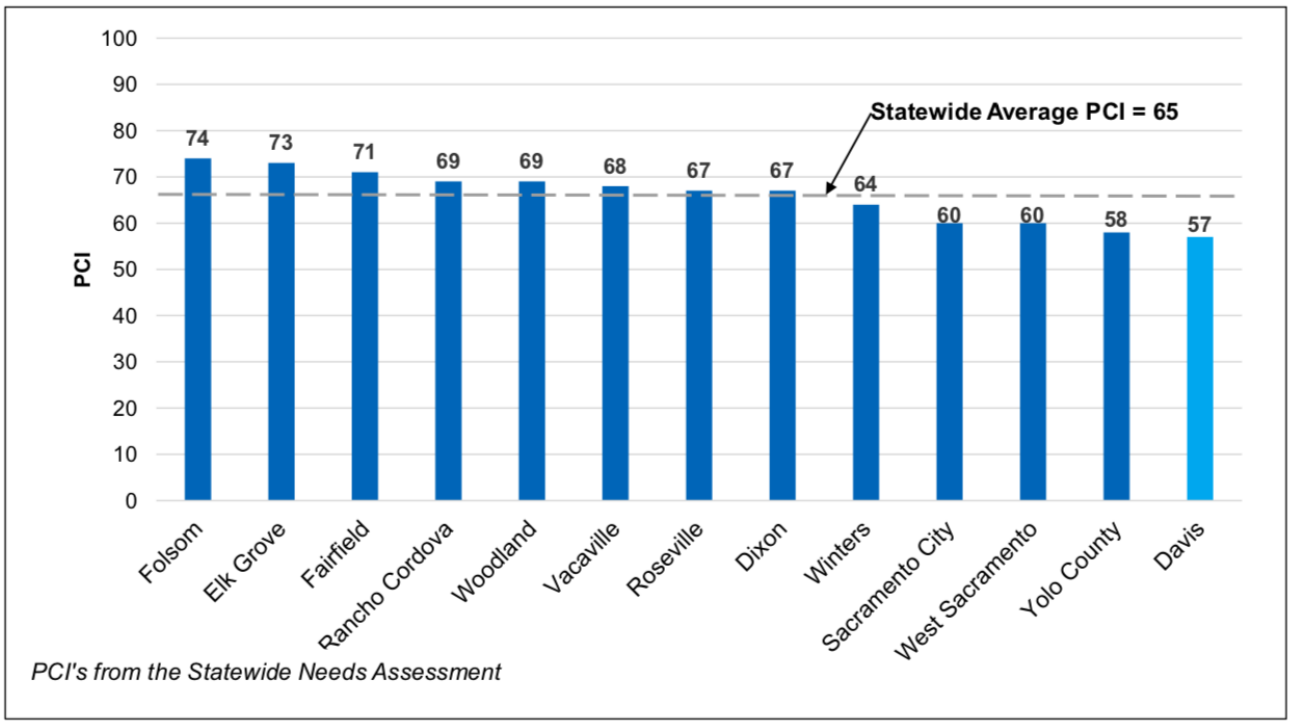
The Subcommittee recommendations do not increase overall city expenditures but instead prioritize and redirect the use of existing city revenues to address a funding gap for road and bike path maintenance identified by city consultants. However, if the City were financially able to afford the $84 million plan as proposed, we would prevent a significant escalation in long-term costs for rehabilitation and reconstruction of transportation infrastructure. Without that, we acknowledge that future costs are ultimately higher. Full reconstruction of pavement is estimated to cost up to 37 times more than a simple slurry seal project, on a per square yard basis.

Council Goal(s)

This plan is consistent with the City Council's Goal to Fund, Maintain, and Improve the Infrastructure of the City.

Background and Analysis

On January 14, 2020, City staff presented the 2019 Pavement Management Program (PMP) update to the City Council prepared by its consultant, Nichols Consulting Engineers (NCE). The report raised concerns about a decline in the condition of roads and bike paths documented in the PMP update draft report, and found that the city was underfunding its pavement rehabilitation program. A statewide needs assessment, summarized in the graphic below, found that the City of Davis had the worst pavement condition of 13 local government agencies in our region and that its Pavement Condition Index (PCI) of 57 was well below the statewide average of 65**.** (NCE subsequently adjusted the estimated road PCI to 59 to reflect recent roadwork in progress.)



In response, the City Council established a City Council Pavement Subcommittee (Partida/Carson), to work with City staff and the Finance and Budget Commission, to (a) assess

the draft analysis prepared by NCE and (b) identify opportunities and mechanisms to increase funding for pavement maintenance and report its findings and recommendations to the City Council. Since the beginning of February, the Pavement Subcommittee has been meeting regularly to examine these issues.

NCE's Projections Revised to Reflect Subcommittee Recommendations. The Subcommittee provided an interim informational report to City Council on June 30th (see Attachment 1) on its assessment of the assumptions used in the pavement management update, as these assumptions can have a significant impact on the funding gap identified in the PMP update. After much discussion and research, that report noted, the Subcommittee determined that there were several model inputs that should be modified. These inputs included the annual inflation rate in pavement rehabilitation costs, the "soft cost" project delivery cost (specifically, the assumed amount of contingency funding that should be built into the model), the addition of an inflation factor for SB 1 funding, and a change in bike path replacement material.

Based on the Subcommittee's findings and decisions, and Council subsequent approval, staff directed NCE to complete additional model runs with these new assumptions. The updated NCE analysis is presented in the city staff report as sub-item B of this agenda item.

Notably, under the projection of *bike path maintenance* costs originally presented in January, NCE estimated that the ten-year cost of improving the PCI from the current level of 52 to 68 would cost $38.7 million and that the City would accumulate a $22.5 million backlog of projects at the end of the ten-year period. However, the updated NCE projections, reflecting some revised assumptions described below, indicate that accomplishing the same task of improving the PCI to 68 would cost $12.2 million over ten years with a much smaller remaining backlog of $8.2 million.

The new assumptions used by NCE also reflect a downward adjustment in *road pavement maintenance* costs. The January 2020 NCE estimates had assumed that a program to improve the PCI for roads to 68 would cost $79 million over ten years with a remaining backlog of $65.9 million in deferred maintenance. The revised NCE estimates now before council indicate a reduced cost estimate of $70.2 million and a smaller backlog of roads projects than before of $53.1 million at the end of the ten-year period.

These revised assumptions for roads and bike paths reduce the overall fiscal challenge facing the city by about $3.5 million per year on average over the next decade. While these updated estimates mean the problem is more manageable than previously estimated, they also indicate that the city still faces a significant funding gap for road and bike path maintenance over the next decade.

A Ten-Year Funding Plan for Road and Bike Path Pavement Maintenance

Summary of Our Proposed Approach. For the reasons discussed above, the Subcommittee recommends that the City Council adopt a ten-year $84 million road and bike path pavement rehabilitation funding plan that would help ensure the city stays on track to properly maintain the critical transportation network that our residents and local businesses depend upon. While this plan is a fiscal forecast and not a budget, its adoption would provide guidance and direction to city staff for the preparation of future budget plans for City Council consideration.

Under our proposed ten-year plan:

- The city would stay the course on the previously approved City Council goal of improving pavement conditions for both roads and bike paths.
- A $31 million funding gap to achieve this goal would be addressed by (a) taking into account new monies that are already going towards pavement rehabilitation efforts, (b) investing additional General Fund monies for this purpose after the current recession is over, (c) directing a modest share of uncommitted special funds to road and bike path pavement rehabilitation projects and (d) doing the same with community enhancement funds generated by development projects.
- City tax rates would not be increased. However, some additional revenues generated from economic development efforts would be directed to road and bike path repair.
- No currently budgeted program or infrastructure project would lose funding because of the adoption of this plan. The ramp-up of road and bike path rehabilitation work would still allow other important transportation infrastructure and repair projects to proceed, although this reprioritization of funding could slow the funding of *new* programs or projects.

We propose a balanced approach that ensures that significant new resources would remain available in the future for new high-priority transportation improvements such as improved Safe Routes to School for bicyclists and pedestrians as well as for repairs of the other types of transportation infrastructure like traffic lights. Given the concern expressed by the City Council in January that the City of Davis now has the worst roads in the region, we believe the choice to invest more heavily in its critical transportation infrastructure is reasonable and necessary.

Delays in pavement rehabilitation projects have caused the decline in pavement conditions and have increased the bill facing taxpayers by transforming simple resurfacing projects into costly road reconstruction projects at up to 37 times the cost on a per square foot basis.

The most recently approved Financial Forecast indicates that prior actions taken by the City of Davis have reduced an annual long-term funding gap for operations and infrastructure in the General Fund. The adoption of this ten-year plan for roads and bike paths would likely result in a further improvement in the city's overall financial condition in the future by addressing the maintenance of the roads and bike paths before they deteriorate to the point of full reconstruction.

Maintain Goal of Improving Pavement Condition. As noted above, the most recent survey of the condition of the city's streets and bike paths indicate that the condition of roads and bike paths has declined, as measured in PCI calculations, despite a longstanding City Council goal of improving the current PCI to 63 for roads and to 68 for bike paths.

The updated NCE report now with the modified assumptions proposes that the council maintain its goal of improving the PCI of bike paths to 68. But, in light of the current fiscal challenges, NCE suggested that the council goal for roads be changed to seek to maintain the current pavement condition of 59 instead of seeking an improvement at this time.

The Pavement Subcommittee recommends instead that the council maintain its current commitment to improving the condition of both street and bike path infrastructure, and to keep the same targets it previously adopted. As we demonstrate below, we believe this goal is realistic and achievable under the ten-year plan outlined below.

Adopt Ten-Year Cost and Revenue Projections. The Subcommittee recommends that the council adopt the revised projections of pavement rehabilitation program costs shown in the updated NCE modeling and associated staff report. As discussed earlier, these updated projections reflect the revised assumptions recommended by the Subcommittee related to the

annual inflation rate in pavement rehabilitation costs, the "soft cost" project delivery cost, the addition of an inflation factor for SB 1 funding, and a change in bike path replacement material.

The original NCE modeling presented to the council in January 2020 projected almost $118 million in costs for the pavement rehabilitation program over the ten-year period from 2019-20 through 2028-29. The revised NCE assumptions discussed above significantly reduce the cumulative ten-year cost of the pavement rehabilitation program to about $82 million.

We recommend one further adjustment that modestly increases the cost of the proposed ten-year plan to $84 million – an assumption that Portland concrete cement would be used on a targeted basis for specific bike path routes where reconstruction with such building materials would be particularly beneficial.

Per our direction, the NCE model assumes no use of Portland concrete cement because its high cost would result in the completion of very few projects, create a large backlog of bike path rehabilitation projects, and dramatically drive up the eventual costs of completing that backlogged work. However, we recognized that projects to renovate particular bike path routes – for example, those prone to disruption by tree roots or drainage issues – might be good candidates for Portland concrete cement. Accordingly, the ten-year plan assumes that $250,000 annually on average would be committed to a more targeted list of projects once the current recession is over.

After taking account some technical adjustments, the Pavement Subcommittee estimates that the "baseline" funding available for support of the pavement rehabilitation program (that is, the amount available under current law and policies) for that ten-year period would be about $53 million. We believe that the updated cost and revenue projections presented in this report are reasonable and recommend that council adopt them. This means that the City of Davis would need to achieve an $31 million in fiscal solutions to fully fund the pavement rehabilitation program over this ten-year period. Accordingly, we recommend that council incorporate into the ten-year plan the $31 million in solutions outlined below.

The fiscal solutions cited below in the text in boldface type are cumulative ten-year fiscal estimates, not annual amounts of funding and are summarized in the table below

Road and Bike Path Ten-Year Funding Plan

(Dollars in millions)

	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	Total
Updated estimate of costs to improve road and bike path PCIs to current council goals [a]	5.110	8.000	10.330	10.350	11.060	8.300	7.930	7.750	7.460	7.630	83.920
Funding available to support road and bike path pavement work	5.067	5.248	5.105	5.106	5.377	5.379	5.380	5.381	5.382	5.384	52.809
Funding gap to be solved with ten-year plan	0.043	2.752	5.225	5.244	5.683	2.921	2.550	2.369	2.078	2.246	31.111
Proposed funding solutions											
Increase General Fund baseline and match General Fund revenue growth	0.000	0.085	0.172	0.262	1.589	1.719	1.852	1.990	2.131	2.277	12.077
Carryover of unspent 2019-20 funding	-1.050	3.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.450
Solid waste management funding	0.000	0.000	0.000	0.312	0.312	0.312	0.312	0.312	0.312	0.312	2.184
Additional General Fund and grants	0.000	1.000	1.000	0.500	0.500	0.500	0.500	0.500	0.500	0.500	5.500
One-time use of unallocated TDA-LTF	0.000	0.600	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.600
Ongoing use of a share of TDA-LTF	0.000	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	4.500
One-time use of unallocated gas tax funding	0.000	0.000	0.900	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.900
Unallocated community enhancement funds	0.000	1.000	0.000	0.919	0.680	0.000	0.200	0.000	0.000	0.000	2.798
Total fiscal impact of proposed solutions	-1.050	6.685	2.572	2.493	3.581	3.031	3.364	3.302	3.443	3.589	31.111 [b]

(a) Source: General Fund, Construction Tax, and Roadway Impact Fees

(b) Implementation of "best practices" in pavement rehabilitation would provide additional savings to ensure full funding of the ten-year plan.

Grey 1 = Increase General Fund baseline support for pavement work

Grey 2 = Recognize funding already going for pavement projects

Grey 3 = Direct a share of uncommitted special funds to pavement projects

Grey 4 = Dedicate unallocated community enhancement funds to rehab work

Recognize Funding Already Going for Pavement Projects -- $10.1 million. The council has previously taken certain actions to expand pavement rehabilitation program that have not been recognized in the NCE modeling. Some of these actions are significant and we believe the availability of these resources should be recognized in the ten-year plan.

For example, about $3.5 million in funding for CIP 8250, that the council included in the 2019-20 budget for pavement rehabilitation, has since been carried over to 2020-21 and will be spent in this fiscal year. Similarly, the council built an increased funding allocation into solid waste rates to offset the impacts of heavy garbage trucks and other equipment on city roads. This money is expected to be available for this purpose after the financial reserves of the waste treatment fund have restored to planned levels.

In addition, almost every year the council approves projects to make transportation system improvements that effectively take the place of road and bike path rehabilitation projects. However, these investments are not always “counted” toward or included in the official Capital Improvement Program (CIP) Item 8250 that is the main budget item for pavement rehabilitation. For example, the $1 million project now underway to rebuild the bike path along Russell Boulevard west of Highway 113, is reflected in a separate CIP item even though it will result in significant future savings on city maintenance of that segment of the bike path system.

Our analysis "counts" such projects toward meeting the ten-year funding plan goals and, given the steady track record of making such expenditures, assumes that similar projects continue in future years. Altogether, these types of actions are projected to amount to $10.1 million in road and bike path rehabilitation spending that we recommend be recognized in the ten-year plan.

***Increase General Fund Baseline Support for Pavement Work* – $12.1 million.** The baseline amount of funding for road and bike path rehabilitation has not changed from the $3 million level established eight years ago (2013-14). We believe an increase in the city's General Fund support for this work is warranted and achievable and should be incorporated into the ten-year plan.

Specifically, the Pavement Subcommittee has concluded that, after the current recession has passed, the city could afford an ongoing increase of $1.2 million in the baseline funding for this purpose. Part of the $1.2 million could be achieved through a modest redirection of part of the funding available each year for other transportation purposes. Additional funding for this purpose is also likely to result from economic development projects supported by the council, such as the recently approved University Commons and the Davis Innovation & Sustainability Campus now pending before voters. We recommend that these General Fund baseline augmentations begin in 2023-24, after the city is projected to recover from the current recession, to ensure that existing programs or other capital projects that depend on General Fund support are not affected by this change.

Given that pavement repair costs escalate over time, we further recommend that the ten-year plan reflect a decision, starting now, to allow General Fund support for road and bike path rehabilitation to grow each year at the same rate as the overall growth rate of General Fund revenues. The initial impact of these adjustments would initially be small – about $85,000 in 2020-21 – but would increase by the end of the ten-year plan to $1 million annually because they would also be applied to the new $1.2 million in base funding proposed above.

We estimate that these combined actions would provide an additional $12.1 million in funding for the pavement program over the next decade. Accordingly, we recommend that these additional revenues be recognized in the ten-year plan.

Direct a Share of Uncommitted Special Funds to Pavement Projects -- $6.0 million. We believe certain special funds that have not been committed to other purposes should be recognized in the ten-year plan as resources that are available to improve the condition of road and bike paths.

Each year the City of Davis receives regular funding (under a set formula) from the Transportation Development Account – Local Transportation Fund (TDA – LTF). The city also receives allocations of gas tax funding under a specific allocation formula. State law permits these funds to be used for road and bike path rehabilitation projects as well as other types of transportation programs and projects. In the past, these funds traditionally have not been budgeted for Item 8250 pavement work. Sometimes they were set aside and not allocated in the budget plan in case they are needed for other unanticipated transportation purposes.

The Pavement Subcommittee identified $900,000 in gas tax funds and $600,000 in one-time TDA-LTF funds that are not committed to any other programs or projects and thus currently could be used on a one-time basis for pavement rehabilitation. We also concluded that, partly because of the recent availability of other grant funding for public transit agencies, about

$500,000 annually in TDA-LTF funding is likely to be available to support pavement rehabilitation in future years.

Thus, we recommend that the ten-year plan recognize the availability of an additional $6 million in special funds for the pavement program over the next decade. No current program or project would be affected by this decision and significant amounts of gas tax and TDA-LTF funding would remain available in the future for other transportation purposes.

Direct a Share of Community Enhancement Funding to Pavement Work -- $2.8 Million. The Pavement Subcommittee identified community enhancement funds that have not been committed to any other projects and recommends that a share of these monies to recognized in the ten-year plan to support pavement rehabilitation efforts.

In addition to development impact fees, the city regularly collects additional funds from developers of housing and commercial projects often referred to as community enhancement funds. Some development agreements dedicate part of the funds to particular purposes, like art projects or the city's rental resources program. But these agreements often come with only generally worded or no specific commitments at all for the use of the funding paid to the city. In the past, the council has provided general direction that part of the funding be used to support "fix it first" programs for infrastructure and that part be invested in various types of civic improvements.

In keeping with that past council direction, the Subcommittee has reviewed more than $13 million commitments of community enhancement funds contained in prior development agreements. We identified $2.8 million in community enhancement funds from the Cannery, Target, Lincoln 40, Davis Live, and Nishi projects that are not committed to other purposes and could appropriately be used for pavement rehabilitation efforts that would benefit the residents of those projects and the city as a whole.

We recommend that the availability of these resources for road and bike path rehabilitation efforts be recognized in the ten-year plan. Our proposal would not redirect any funding committed by development agreements to specific programs or projects. More than $10 million would remain available for other types of civic improvements under our proposed approach.

Institute "Best Practices" Management of Our Streets and Roads Program. The Subcommittee also identified other recommended steps the city should incorporate into its ten-year plan that would reduce pavement rehabilitation costs and generate fee revenue to offset part of those costs, but for which specific costs or fee estimates are not yet available.

We recommend the adoption of a city ordinance that would generally impose a moratorium on "trench cuts" on recently paved streets (within the last five years) and establish higher permit fees (placed into a special fund for street maintenance) that fully reimburse the city for the damage to pavement when exceptions to the moratorium are needed. A more detailed analysis of this proposal is included in a separate item on today's City Council agenda.

We further recommend that city management ensure that its Public Works staff are trained in "best practices" for inspection of pavement work that is ordinarily completed by private contractors. For example, studies by UC Davis experts indicate that ensuring appropriate compaction of roadwork can extend its life and reduce long-term maintenance costs. We also support continued implementation of an innovative program developed by city staff that invites

Davis citizens to spot and report "potholes" and deploy city crews to fill them before they grow and result in more extensive damage to our roadways.

Finally, we recommend that the city create an internal city account to recapture unspent funding from completed transportation projects that could be repurposed for maintenance of roads and bike paths. While it is difficult to estimate specific fiscal impacts of these measures, the Subcommittee concluded they were sufficient to ensure that full funding would be available to carry out the ten-year plan.

Strengthen Accountability and Flexibility. The ten-year funding plan proposed by the subcommittee would provide valuable direction to city staff in the preparation of the two-year budget plan that will come before the council in May 2021. This plan is intended to help to ensure that the City of Davis stays on track toward providing sustainable funding for city infrastructure that is critical to our quality of life of our residents and the competitiveness of our business community.

However, the ten-year plan, if adopted, would not in itself constitute a budget. Each year, the actual revenues the city receives that would be dedicated to road and bike path maintenance would vary from these projections, up or down. For example, if the Covid-19 emergency continued longer than expected, or resulted in a larger revenue loss than assumed in the city's current budget plan, it is possible that city revenues would suffer a further decline and less investment would be possible in road and bike path work. On the other hand, the reduction in the cost of roadwork in the current recession may allow more work to be accomplished with less funding in the short term. Each budget cycle, the City Council would retain its discretion to modify the budget to address the city's fiscal challenges and priorities.

Accordingly, we recommend that staff regularly audit road and bike path expenditures to see if they are tracking with this ten-year plan and the reasons for any variances. The draft budget plan presented to the council for its consideration every two years could provide a transparent accounting of the audit results. The City Council would have the information it needs to assess what changes in the budget were warranted, and City of Davis residents would better understand whether the ten-year plan was being implemented as intended. We further recommend that the city manager carefully assess and maintain the city staffing levels needed to put the funding available for pavement rehabilitation to its intended purpose.

In addition, it is possible that the NCE modeling, including the council-approved modifications of the model estimates, may over time overstate or understate the resources needed to sustain our road and bike path infrastructure. Accordingly, the subcommittee proposes that the ten-year plan include an update of the fiscal modeling scheduled to coincide with the road assessment cycle. The road assessment, which determines the PCI of our roads and bike paths, is updated every six years for all roads and bike paths, and every three years for arterial roads only. This update every three years will assess how the conditions of roads and bike path system has changed since the last such review and if adjustments to the fiscal modeling require adjustment. This would allow for appropriate and periodic corrections to the model and to the ten-year plan itself.

Conclusion. We welcome the opportunity to respond to any questions other council members may have about the ten-year plan. If it meets with council approval, we recommend that the council adopt the plan and further direct city staff to bring a budget adjustment to council that would align the existing 2020-21 budget with this new ten-year plan.

Attachment(s)

1. June 30, 2020 City Council Agenda Item 04P, 2020 Pavement Management Subcommittee Update

STAFF REPORT

DATE: June 30, 2020

TO: City Council

FROM: Dan Carson, Council Member, Member of Pavement Subcommittee
Gloria Partida, Mayor Pro Temp, Member of Pavement Subcommittee
Robert A. Clarke, Director of Public Works – Engineering & Transportation
Dianna Jensen, City Engineer
Michael Mitchell, Principal Civil Engineer
Melissa Marshall, Senior Civil Engineer

SUBJECT: 2020 Pavement Management Subcommittee Update

Recommendations

This is an informational staff report to provide an update on the progress and status of the Pavement Management Subcommittee, comprised of City Council Fiscal Subcommittee (Partida/Carson), City staff, and the chair of the Finance and Budget Commission.

Fiscal Impact

A $10,000 additional task was submitted for the pavement consultant to run additional analysis requested by the subcommittee. The only additional cost to report at this time is the staff time that has been allotted to attending the meetings and working on resulting action items, which is absorbed into departmental budgets. The final recommendation, which may include increasing the funding towards our pavement rehabilitation, will come before Council within the next few months.

Council Goal(s)

While this project does not meet a specific task, it is consistent with the City Council's Goal to Fund, Maintain, and Improve the Infrastructure of the City.

Background and Analysis

On January 14, 2020, City staff presented the 2019 Pavement Management Program (PMP) update to the City Council. The report raised concerns about a decline in the condition of roads and bike paths documented in the PMP update draft report, and found that the city was underfunding its pavement rehabilitation program. In response, the City Council established a City Council Subcommittee (Partida/Carson), to work with City staff and the Finance and Budget Commission, to identify opportunities and mechanisms to increase funding for pavement maintenance and directed that they report back to the City Council. Since the beginning of February, the Pavement Management subcommittee has been meeting regularly on a bi-weekly basis to examine this issue.

The PMP assists the City in making decisions on how the network is to be maintained and rehabilitated. The PMP model is a valuable tool for the City that allows assessments of the costs of maintaining critical infrastructure to achieve a desirable quality of roads and bike paths. However, any model is subject to scrutiny, especially given the huge amount of funding at stake for the City and the importance of the transportation system to quality of life.

In accordance with City Council direction, the subcommittee began by assessing the findings of the Nichols Consulting Engineers (NCE) PMP report and then exploring potential options for additional funding to fix the City's roads and bike paths.

The first step was to review the assumptions used in the pavement management update, as these assumptions can have a significant impact on the funding gap identified in the PMP update. After much discussion and research, the subcommittee determined that there were several model inputs that should be modified. These inputs included the annual inflation rate in pavement rehabilitation costs, the "soft cost" project delivery cost (specifically, the assumed amount of contingency funding that should be built into the model), the addition of an inflation factor for SB 1 funding, and a change in bike path replacement material.

Inflation
An annual inflation rate of 4% was used in the PMP model presented in January 2020. The Subcommittee was advised that the consultant had not completed a new analysis of the inflation factors used in their previous model but had carried over into the new report the assumption used in their prior 2015 report of 4% that had been approved by the City Council at the time. Notably, Caltrans and most cities and counties had been using a 3-4% inflation rate for model analysis, which is in line with this assumption.

However, changing cost and economic trends led the Subcommittee to recommend a lower inflation rate assumption of 2%. The consumer price index (CPI) had averaged 2.9% annually over the past ten years. However, asphalt prices are generally linked by industry experts to the price of oil, and oil prices have sharply declined. A Caltrans asphalt price index (which is based on the price of oil) had eroded steadily over an 18-month period, then dropped nearly 70% since January, influenced by the pandemic and the sudden recession.

Even before the recession and the collapse in oil prices occurred, however, the U.S. Energy Information Agency been projecting a 1.6% to 1.9% annual average growth in oil prices in the next decade. Given the current economic climate, the subcommittee determined that an inflation rate of 2% for the PMP model was appropriate at this time.

Soft Costs
The paving costs for the model for both streets and bike paths are based upon the City's recent bid tabulations, as well as, planning, design, inspection, construction management, materials testing and contingency costs for these recent pavement maintenance and rehabilitation projects. This results in an assumption that 35% of the project costs are comprised of these so-called "soft costs." The 35% is comprised of 10% for contingency, 5% for planning/study, 10% for engineering and design, and 10% for construction administration and inspection. A 10% contingency is typical for most construction projects and sometimes a 15%-20% contingency is necessary for more complex projects.

However, for routine maintenance and rehabilitation projects, a lower contingency may be justified as the scope of one project to the next is usually very similar. In addition, a departmental review of past pavement projects indicated that it ordinarily did not need to use the full amounts of contingency funding budgeted for them. The subcommittee determined in consultation with city staff that, a 6% contingency would be a more appropriate, bringing the total assumption of soft costs down from 35% to 31%.

SB 1 Inflation Adjustments
The SB 1 gas tax increase law took effect in November 2017. SB 1 funding allocations to cities such as Davis for local road maintenance did not increase in 2018-19 or 2019-20. However, SB 1 mandated that annual inflation adjustments to local funding begin starting July 1, 2020.

The NCE model did not take these statutorily required inflation adjustments into account. The subcommittee felt it was necessary to model assuming such an inflation, so an average annual increase in revenue of 2.9%, consistent with the average annual CPI inflation, was included in the model starting in 2020-21.

Bike Path Paving Method
The NCE modeling presented to the City Council in January assumed that all work would be accomplished using Portland cement concrete (PCC).

Recently the Public Works Engineering and Transportation department has been re-evaluating the use of PCC to replace bike paths. While the life cycle is longer for PCC, and generally requires less maintenance than asphalt concrete (AC), PCC is much more expensive than AC to place and repair.

Notably, new NCE modeling conducted at the request of the Subcommittee showed that, because an all-PCC approach would result in only a small portion of bike path work being accomplished each year, the backlog of such projects and the cost of completing would grow dramatically over the next ten years if the City pursued such a strategy. Moreover, the PMP analysis indicated that the decision to continue with PCC replacement, absent a sizable increase in the city budget for such work, would result in a decline in the city's pavement condition (as measured by the Pavement Condition Index, or PCI) over the next 10 years.

By contrast, additional model runs conducted by NCE at the request of the Subcommittee indicated that switching to all or mostly AC bike path placement would allow the City to maintain or improve the overall bike path PCI over the next 10 years, within the currently available city budget for such work. Therefore, the subcommittee believes the city should assume that bike paths will generally be replaced with AC rather than PCC in order to better manage these costs with the exception of a few locations where such additional costs for PCC are warranted. Staff has proposed that the city budget set aside a specified allowance for the placement of PCC in such areas of high bike/pedestrian traffic, high frequency of maintenance vehicles accessing the path, and areas with drainage issues.

Summary of Model Assumption Analysis
Based on the subcommittee's findings and decisions, staff directed NCE to complete additional model runs with these new assumptions. The model runs have been completed and NCE is working on finalizing the PMP update that was presented in draft form in January. Staff expects the final report in June. After staff and the subcommittee have an opportunity to review and make any final changes, the final report will be submitted to City Council for its review.

This additional modeling effort and analysis was an additional one-time cost but a necessary expense given the magnitude of the funding shortfall for street and bike path maintenance. The new modeling approach now under consideration could have significant fiscal benefit for the City at a time when it is facing a severe and sudden recession and budget shortfall of as much as

$20 million over the next several years.

Under the projection of bike path maintenance costs originally presented in January, NCE provided a preliminary estimate that the ten-year cost of improving the PCI to 68 would cost $38.7 million and that the City would accumulate a $22.5 million backlog of projects. However, the revised assumptions being proposed by the Subcommittee, accomplishing the same task of improving the PCI to 68 is projected to cost $12.2 million over ten years with a remaining backlog of $8.2 million.

Preliminary modeling by NCE suggests that the revised assumptions will reduce the fiscal challenge facing the city by about $3 million per year on average over the next decade. While that is helpful, that is not enough to close a still formidable funding gap for road and bike path maintenance that the city faces over the next decade.

Work to Close the Funding Gap Continues
In addition to reviewing and modifying the model assumptions to gain a more accurate estimate of the City's pavement budgetary needs, the Subcommittee has been working diligently to identify opportunities to set aside additional funding for the road and bike path pavement rehabilitation program. This has included looking at internal borrowing, redirection of one-time and on-going special funds, implementing best practices to reduce maintenance needs, and front-loading project funding to reduce the escalation of costs that occurs from deferred maintenance.

Once the PMP report is completed, the Subcommittee will finalize a plan to reduce the funding gap for road and bike path maintenance and address the City's goal to improve street and bike path pavement condition to the City's PCI values.

It will be some time before the City is able to obtain an accurate estimate of the deficit due to the changing COVID-19 situation and its dramatic effect on city finances. Some funding strategies the Subcommittee has been evaluating may not be available over the next couple of years because of the threat of serious budget deficits. However, given that the funding gap is a long-term problem that could continue after the short-term budget problems are resolved, the Subcommittee has concluded that a long-term and realistic plan to improve the City's pavement infrastructure is still needed. Accordingly, the subcommittee plans to provide a further update on its work once the PMP report is finalized and a new city budget has been adopted.