

To: City of Davis Finance and Budget Commission  
From: Dan Carson  
Subject: Road and Bike Path Rehabilitation Cost Projections Are Overstated  
Date: December 3, 2014

**Introduction.** As you know, the work plan adopted by the commission created a subcommittee, of which Jack Zhu and I are members, to examine the city's deficit in funding for deferred maintenance and capital outlay needs and examine potential solutions. To better understand the situation, I have analyzed the cost projections that are currently the basis for city policy in this area – the *Pavement Management Final Report*, dated January 2013, prepared for the city by Nichols Consulting Engineers.

My analysis draws on my 17 years of experience as a fiscal and policy analyst, including oversight of state transportation programs. My conclusions and recommendations below represent my personal views only and not those of the commission.

**Conclusions.** My analysis shows that the inflation assumptions contained in the Nichols report significantly overstate the costs the city would incur in the future to fix its streets and bike paths. This is partly due to some technical problems with the original computations but mainly because economic trends have changed greatly in the nearly two years since the Nichols report was released. An index based on crude oil prices that the Nichols report relied upon heavily to project asphalt paving costs has declined dramatically since January 2013, the beginning of Nichols' projection period, rather than escalating rapidly as Nichols had forecast. Widely used private and government forecasts of crude oil prices indicate that these types of costs are unlikely to grow as rapidly in the future as they have sometimes done in the past.

I updated the original Nichols cost projection model by substituting more moderate and reasonable inflation estimates. My analysis indicates that the original Nichols report overestimated what it had identified as the "budget needs" for the road and bike path work by as much as a third. Rather than facing a \$154 million bill to do the needed work, the "budget needs" may be as low as \$103 million, or more than \$50 million less than estimated by Nichols. Moreover, the amount of city revenues likely to be available during that 20-year period to pay for such projects could be \$96 million or more – fairly close to the estimate of "budget needs."

Because the city does not have the financial resources in place to catch up immediately on the existing backlog of work, or to prevent any future backlogs from occurring, the true cost of the work is certain to exceed even my lower "budget needs" estimate. Costs will go up as projects are delayed for lack of funding. However, my analysis indicates that the Nichols report estimates of how costs would escalate because of constraints on available funding are, like their estimate of "budget needs," significantly overstated.

The adoption of more reasonable inflation assumptions, such as those I examined, means that the city's pavement rehabilitation problems are more manageable than presented previously and that the city has more options than it previously understood for addressing

these very real costs for ensuring mobility for Davis citizens. Among the possibilities you may wish to examine:

- The city may be able to forego an increase in parcel or utility taxes for pavement rehabilitation, at least for some time. Under this scenario, the city would accomplish the needed work with existing monies dedicated to such projects and a redirection of additional city monies in the future to these purposes. For example, a tax increase might be avoided if the existing city revenue base grew more than the city has been projecting and could be prioritized for this work along with grants from other agencies and other city resources.
- The city could move forward with a scaled-down tax increase dedicated to pavement rehabilitation. This would likely allow the city to improve the condition of roads and bike paths more quickly, to a higher pavement condition, and/or with a smaller backlog of projects than the city might otherwise have been able to achieve.
- The city could move forward with the same level of tax increases it has been considering, but be able to devote less of the new monies to pavement rehabilitation and more money to addressing other types of city deferred maintenance and capital outlay needs.

***Recommendations.*** I am not recommending that the city adopt my alternative estimates of these costs at this time. Rather, I propose that the city establish a deliberative process to review the key assumptions in the now almost two-year-old Nichols report and produce updated estimates of the costs of carrying out a long-term pavement rehabilitation program. I further recommend that the city not make any major long-term decisions about budgeting and the adoption of new taxes for these purposes until such an updated analysis has been completed. This additional information, in my view, is critical to the decision-making process.

To ensure the findings are trustworthy, I further recommend that the Finance and Budget Commission and the City Council be given the opportunity to review and comment on the key assumptions used in the updated projections, and the rationale for them, before updated estimates of these costs are finalized. (The city's Bicycling, Transportation, and Street Safety Commission could also be involved in this process.) These key assumptions should be revisited at least every few years to ensure that city leaders have the best information available to guide these major fiscal decisions.

Finally, while I believe long-term decisions about the pavement rehabilitation should await better information, it is clear that the city should go "full steam ahead" with the pavement work in the short term using the \$5.9 million available for this purpose for 2014-15. The more work that can be accomplished without unduly disrupting city traffic in the short term, the lower the overall costs for the program will be over time.

The basis of my analysis and conclusions are detailed in the pages that follow.

***Problems with Certain Nichols Report Assumptions Now Evident.*** As I have stated previously in public discussions on this subject, the 2013 Nichols report offers a sound analytical tool for assessing the city's deferred maintenance and capital outlay needs. It provides city decision-makers with critical information on the tradeoffs of devoting different levels of resources for pavement rehabilitation versus the improvement in the condition of its roads and bike paths that would be purchased at those various levels of investment. In my opinion, the report correctly led the City Council to ramp up the city funding devoted to road and bike path pavement rehabilitation to about \$5.9 million in 2014-15.

However, nearly two years after Nichols completed its work, my analysis shows that key assumptions in the report about the costs of such a pavement rehabilitation program were dramatically overstated. My analysis focuses on the "budget needs" estimates contained in that document, which provided a snapshot of the costs over time of doing all the work needed to maintain roads and bike paths, assuming that the city had all the money it needed every year to do that work. The report estimates that, under that theoretical set of assumptions, \$142 million would be needed for preventative maintenance and rehabilitation of roads, and an additional \$12 million for bike paths, from 2013 through 2032 (over 20 years).

The Nichols model assumed that the costs of such projects would grow at an annual compounded rate of 8 percent. The report states that this rate was the weighted average of two specific inflators it examined – one prepared by the Sacramento Area Council of Governments (SACOG) and the other by the California Department of Transportation (Caltrans). My analysis shows there are problems with both inflation factors that Nichols used in its calculations and that the report overestimated the future growth in city pavement rehabilitation costs.

***SACOG Factor.*** The report attributes to SACOG an average inflation rate of 3.1 percent. However, I confirmed with SACOG staff that their measure of inflation is actually a year by year forecast of inflation, not an average annual inflation rate to be applied each year. That year by year forecast assumed a 1.9 percent growth of costs in 2013, 2 percent growth in costs in 2014, and a .1 percent incremental increase in the inflation rate each ensuing year until 2029, when the rate was assumed to stabilize at 3.2 percent.

The choice by Nichols to apply an average rate of inflation, rather than the actual year by year inflation forecast released by SACOG, somewhat exaggerates the increase in costs of the city's pavement rehabilitation program by applying a much larger inflation factor in the early years than SACOG actually forecast. Moreover, the average annual inflation rate stated by Nichols of 3.1 percent appears to be erroneous. My calculations using SACOG data indicate the true average growth rate was only 2.4 percent. City staff were not able to explain this discrepancy.

SACOG has not released an updated inflation projection since it issued the one cited by Nichols in 2012. However, using SACOG's methodology, I computed an updated

estimate, which shows the annual inflation rate would range from 1.5 percent in 2013 to 3.2 percent in 2032 at the end of the 20-year forecast period.

**CalTrans Factor.** The Nichols report cites 15 percent annual growth in the California Paving Asphalt Price Index as part of the basis for its assuming 8 percent annual growth in the city's pavement rehabilitation costs in the future. The index is used by Caltrans to adjust compensation for paving asphalt for state projects.

The Nichols report accurately reported in 2013 that the Caltrans index was increasing dramatically each year – by my calculation, the average annual increases from 1999 through 2012 were 23 percent, actually more than the 15 percent cited in the Nichols report. However, there are several problems with reliance on the Caltrans index for predicting future costs for a city pavement rehabilitation program.

First, the Caltrans index is not tracking with Nichols' projections for the forecast period that began January 2013. Nichols assumed that city project costs would cumulatively go up about 8 percent in 2013 and 8 percent again in 2014. However, the Caltrans index has not tracked upward in line with those projections. Instead, it has cumulatively dropped 28 percent during the past two years.

The second problem is that the Caltrans index does not actually measure asphalt prices. It is calculated using the median of posted crude oil prices in effect on the first business day of the month by Chevron, Exxon Mobil, and certain Union 76 oil fields. In effect, the Caltrans index used to calculate payments to its state contractors assumes that the price of asphalt, derived from the waste products of oil production, moves completely in sync with the price of crude oil. This assumption is not entirely correct.

City staff advised me that the Nichols report relied on the Caltrans index because direct measures of the price of asphalt were not available. However, specific data on paving asphalt costs is widely circulated and published monthly by a construction trade publication, the *Engineering News-Record*. A construction materials cost expert for the publication confirmed that the index was relevant to the types of costs that the city would incur in its pavement rehabilitation program. That data shows asphalt costs have grown only modestly since January 2013, the start of the Nichols forecast period, and are now dropping.

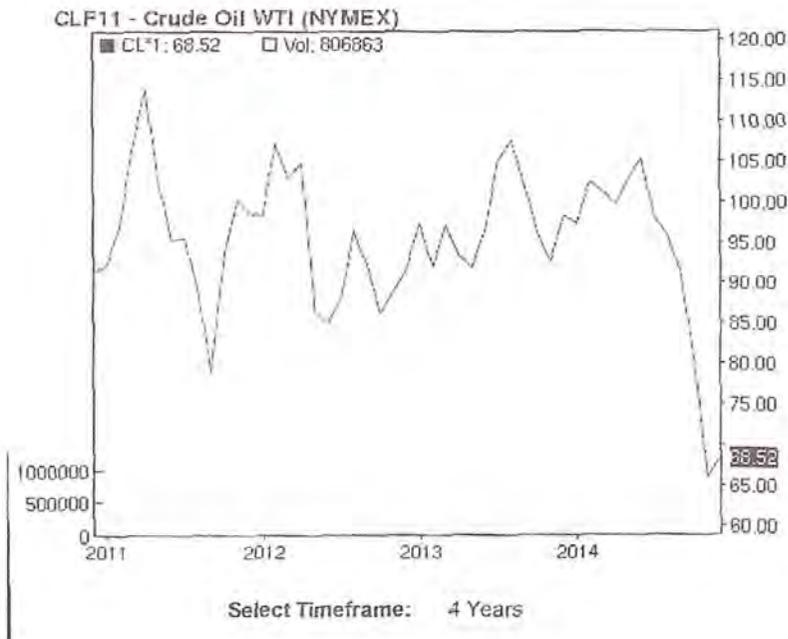
My analysis of historical data, including the *Engineering News-Record* data on asphalt costs, illustrates that while the price of asphalt paving materials has clearly been influenced by crude oil prices, asphalt prices are somewhat more stable and do not rise or sink as much as those for oil. Changes in oil prices since 2000 have typically resulted in corresponding changes in asphalt prices about three-fourths as great.

The third problem with reliance on the Caltrans index is that using long-term historical crude oil price data alone to project future costs of the city's pavement rehabilitation program does not take into account major changes that have occurred in the structure of the world economy since the 2008 recession. While there have been lots of volatile ups

and downs, crude oil prices have generally been on a downward slide, and plunged recently, as shown below.

### WTI September 2011 (NYMEX) Price

End of day Commodity Futures Price Quotes for Crude Oil WTI September 2011 (NYMEX)



City staff indicated to me that they were unaware of, and did not consider in the Nichols report, widely used projections of future crude oil prices that take these new economic realities into account. For example, projections released by the U.S. Energy Information Agency, which takes into account such economic variables, indicate that a benchmark price for crude oil is expected to drop modestly until 2017. After that, the projections suggest crude oil prices would then increase annually at a rate ranging from 2.7 percent to a peak of 4.4 percent, for an average annual percentage growth through 2032 of 2.9 percent.

The projections of an international forecast firm I have reviewed suggest the trend in crude oil prices through the year 2020 could be even more moderate – about 1.8 percent annually. If that is true, the increases in asphalt costs over time would probably be even lower than that for the reasons discussed above.

One Southern California oil driller told me that, when his firm develops its financial plans for long-term projects, it assumes that crude oil prices will remain flat for the foreseeable future because of the instability and uncertainty of the market.

In contrast with this industry practice, the 8 percent annual compounded growth rate used by Nichols for its estimates implicitly assumes that the price of crude oil would grow to about \$423 per barrel by 2032, the final year of the pavement rehabilitation program. The price of crude oil is currently about \$69 per barrel, by one widely used industry benchmark.

A fourth problem with the Nichols report's heavy reliance on the Caltrans index is that the index is based unilaterally on crude oil and asphalt costs even though city pavement rehabilitation projects include significant costs for other types of building materials and labor. Construction project and labor costs have grown much more moderately than the 8 percent compounded inflation rate the Nichols report assumed in its projections. The Building Cost Index published by the *Engineering News-Record*, for example, shows an average annual growth rate of 3 percent since 1999, and an even slower growth rate of 2.2 percent since the 2008 recession. The publication's index of common labor costs likewise shows an historical annual growth rate of 3.6 percent since 1999, tapering to 3.2 percent since the 2008 recession.

Based upon these findings, I believe the inflation assumptions used in the Nichols report are outdated and technically flawed and significantly overstate how city costs for such projects will grow in the future.

***How I Updated The Cost Estimates.*** I updated the Nichols model to use moderate inflation assumptions that are much more in line with the available evidence to create an alternative estimate of how city project costs would grow over time.

Specifically, I updated and used SACOG projections of inflation using the same method SACOG had used in calculating their original forecast. However, instead of creating an average annual inflation rate over 20 years as Nichols assumed, I used the specific annual increases in costs to determine how costs would grow year by year. This approach was recommended to me by SACOG staff as being the most appropriate one. Thus, I assumed that pavement rehabilitation costs would initially grow by 1.5 percent but by the end of the 20-year life of the program would escalate to 3.2 percent annually. Given current economic trends and projections of much lower crude oil prices, I did not use the Caltrans index as a factor to estimate future costs for the city's pavement rehabilitation program. Current projections of crude oil costs are generally in line with SACOG inflation estimates.

I made no other changes to the Nichols cost-estimate model. I assumed the exact same set of road and bike path rehabilitation projects, and the exact same timing as to when those projects were needed.

***Project Cost Total Could Be Much Lower.*** Based on the adjustments discussed above, my estimates of what it would take to address the city's pavement rehabilitation needs are much lower than the ones contained in the Nichols report.

The Nichols report implicitly assumed, for example, that the cost of applying slurry seal to prevent road damage would grow from \$4 per square yard in 2013 to \$17.26 per square yard by 2032. My more modest inflation assumptions suggest that the \$4 per square yard cost would grow to \$6.20 per square yard in 2032 – a 55 per cent increase in costs rather than the 331 percent increase in costs assumed in the Nichols estimates. Under my assumptions, the 20-year price tag for slurry seal preventative maintenance would be about \$15 million, or almost \$10 million less than Nichols estimated. My calculations are shown in Attachment A at the end of this report.

I used the same approach to calculate each component of the projects included by Nichols in the city pavement rehabilitation program, as shown on the Cost Summary shown in Attachment B. As noted above, my estimates show the “budget needs” for various road pavement projects total about \$94 million, or \$48 million lower than the Nichols report estimate of \$142 million. My estimates show that the “budget needs” for bike path pavement projects total about \$8.8 million, or \$3.5 million less than the \$12.3 million price tag put on this work by the Nichols report. In all, my estimates identified about \$103 million in “budget needs” to carry out all the needed projects, almost \$52 million less than the \$154 million estimate presented in the Nichols report.

*City Revenues Would Also Grow Significantly Over Time.* As discussed earlier, the “budget needs” estimate prepared by Nichols takes into account the inflation that would occur, year by year, in the costs of these projects. The forecast that the city would need \$154 million between 2013 and 2032 is represented in the nominal dollars that Nichols estimates would be required after inflation has increased that cost total. To allow an apples-to-apples comparison of the numbers, my recalculation of the costs at about \$103 million during that same period likewise is presented in nominal dollars after inflation has increased the total.

However, the amount of city revenues available to meet the city’s infrastructure needs is actually highly likely to grow over that 20-year period. The city has budgeted about \$5.9 million in 2014-15 from various ongoing and one-time sources to carry out its pavement rehabilitation program. Of that total, about \$3.9 million represents funding that is expected to be ongoing, including \$3 million from the General Fund. In my view, it is reasonable to assume that the General Fund monies now earmarked for these projects will grow over time commensurately with the overall rate of growth in city General Fund revenues. In my view, it is also reasonable to assume that some combination of funding from other available sources – SACOG, Community Development Block Grants (CDBG), development impact fees, and construction taxes – will continue in the aggregate at the level currently available. Of course, as the recent dramatic improvements in city finances suggest, additional General Fund revenues – primarily from property and sales taxes -- could eventually become available that could be prioritized for road and bike path work once city General Fund reserves have been replenished to historical levels.

In light of these assumptions, I estimated the amount of monies that would be available for these purposes if (1) the ongoing funding from the Construction Tax Fund,

development impact fees, and grants such as those from SACOG and CDBG remained level through 2032 but (2) the \$3 million General Fund base committed to these projects grew moderately and in sync with the five-year General Fund forecast published in April 2014 – about 2.7 percent annually. If these assumptions held true, the city would have more than \$96 million available between now and 2032 to carry out its road rehabilitation program. That is fairly close to my updated projections of the “budget needs” for those projects during that time of \$103 million.

***Funding Scenarios Assuming Constrained Resources Also Overstate Costs.*** Any update of the Nichols report should incorporate new and more reasonable assumptions into the various spending scenarios that reflect the fact that the city resources available to fix its roads and bike paths will be limited.

For example, the Nichols report assumed that \$31 million should already have been spent in 2013 and 2014 for road and bike path maintenance and rehabilitation. Because sufficient resources were not actually available to keep those early projects on that schedule, the Nichols report assumed that some of the projects would be pushed out into later years and would escalate in cost because of inflation. The Nichols report accurately noted that more money would be needed to carry out the full 20-year rehabilitation program than the theoretical “budget needs” figure because of the delays that will occur in these projects due to constraints in available funding.

The Nichols report tested various specific assumptions about how much city funding would be devoted to such projects and when. For example, one scenario considered by the City Council (known as Scenario Mod-B for streets and Scenario A for bike paths) assumed an up-front injection of \$25 million in funding for road and bike path projects in the first two years, with an average of \$8.3 million spent annually for both types of projects in subsequent years. With these assumptions, the 20-year cost of the road rehabilitation was estimated in the Nichols report to be \$166 million (\$153 million for roads and \$13 million for bike paths). This amount is greater than the Nichols report “budget needs” estimate because, even with sizeable up-front funding, some projects that should have been scheduled in the early years would have to be delayed.

My analysis indicates, however, that this and other scenarios described in the Nichols report significantly overstate the costs of the pavement rehabilitation program because, just like the “budget needs” estimate, they rely on an unrealistically high assumption that inflation in future project costs. The assumption that these costs would compound at a rate of 8 percent per year exaggerates the future cost of completing each backlogged projects that would be delayed. It further exaggerates the size of the backlog of projects that would occur during the 20-year pavement rehabilitation program. That is because the money that would be available for such projects in the early years of the program would actually “go further” in getting the work done than Nichols had assumed, holding down the size of the backlog.

For these reasons, it will be important that any updating of the projections not stop at the “budget needs” analysis but also revise the various scenarios to show the true cost of the pavement program with more realistic assumptions about how costs will grow over time.

***The Implications for Planning an Infrastructure Package.*** I believe this analysis demonstrates that it would be unwise to rely on the current cost projections prepared by Nichols two years ago as a basis for making long-term project funding decisions. While the structure of the Nichols cost-modeling is sound, the huge variance I found between the Nichols cost estimates and mine suggests that the city should update these projections before it determines, for example, the size and purposes of a future city tax measure to address city facility needs.

I am not suggesting that the city reduce funding below the current substantial level it has committed to the pavement rehabilitation program. My analysis suggests, to the contrary, that all of those monies and then some will be needed to address the city’s road and bike path pavement rehabilitation needs. For example, the city should go ahead as quickly as possible in using the \$5.9 million allocated by the city for these projects for 2014-15. The more “ready-to-schedule” work that can be done at the “front end” of the program without unduly disrupting city traffic and commerce, the lower the overall long-term cost of the pavement rehabilitation program will probably be.

However, my recalculation of these funding needs and the revenues likely to be available to support these projects suggests that it may be possible to fund the city’s pavement rehabilitation projects, at least for some time to come, without a tax increase. This assumes, however, that the city (1) supplements the General Fund monies it has already dedicated for road and bike path rehabilitation with a proportional share of the growth in General Fund revenues that will flow to the city budget over time, (2) increases General Fund support for these activities even more if these revenues grow faster than the city has been projecting, (3) continues to succeed in obtaining grants from SACOG, CDBG, and other agencies that could be used, at least in part, for the pavement program, (4) looks for opportunities to use monies from development agreements, construction tax funding, and other city sources, and (5) focuses on the goal of maintaining the existing condition of roads and bike paths rather than setting a quite different and more expensive goal of significantly improving their overall condition above where it stands now.

It is unlikely that the city will be in a position to expand General Fund support for the pavement rehabilitation program until the city’s General Fund reserve has been restored to prior levels consistent with long-standing policy. However, if the city continues to make the kind of financial progress that has been occurring recently, the provision of some supplemental funding for roads and bike path projects might be possible within the next few years.

If city leaders instead wish to set a goal of improving the overall condition of paved roads and bike paths above current levels, at a faster pace than is now planned, or to significantly reduce the city’s future backlog of projects, some increase in city taxes probably would be needed for the program. For example, providing a significant up-front

investment in funding for pavement work along the lines called for in the Mod-B/A scenario through a bond issue would probably require a tax increase. Additional tax revenues would also be needed if city leaders were not able, because of competing cost pressures, to take the steps outlined above to prioritize future available funding for pavement rehabilitation. However, the adoption of more reasonable cost-inflation assumptions for the program might permit the size of that tax measure to be less than would otherwise be the case. That could, in turn, make it easier for it to win voter approval.

In the alternative, city leaders could stay the course and seek a larger tax measure of the magnitude they have been considering, but have more “room” to use some of the new revenues to address other types of deferred maintenance and capital facilities projects needed to ensure the delivery of high-quality city services. The full potential list of such projects would involve costs that are likely to exceed the revenues available from a new tax measure that could pass muster with Davis voters. More reasonable estimates of future road and bike path renovation costs could allow city leaders to go further down their “list” to address other types of high-priority public infrastructure needs within the confines of a larger tax measure that voters may still be willing to accept.

***Good Fiscal Planning Starts with Having Better Information.*** Whatever course is ultimately decided for fixing roads and bike paths, the adoption of more reasonable set of updated cost estimates for the pavement management program will provide better information for the City Council to choose how to proceed.

As noted earlier, I am not recommending that the city adopt my projections of rehabilitation project costs at this time. Instead, I recommend that the city complete its own more comprehensive review of the key assumptions contained in the Nichols report and produce its own updated fiscal estimates of the costs for a long-term road and bike path pavement rehabilitation program. This includes reviewing:

- How the costs of such projects will grow over time.
- What it would actually cost to accomplish to accomplish such projects now.
- The amount of city resources likely to be available to carry out such projects in the future, including from grants and other funding sources, absent a tax increase for this purpose as well as with voter approval of tax measures of various sizes.
- The various cost scenarios prepared by Nichols for moving forward with such a program if funding resources are constrained.

Toward this end, I recommend that the City Council direct staff to complete a review of these key components of the Nichols report. I further recommend that the council await the receipt of that information before making critical long-term decisions on financing the pavement rehabilitation program, such as a determination of the size and purposes of a tax measure to address these and other infrastructure needs.

To ensure the findings are trustworthy, the key assumptions “driving” the numbers should be vetted with this commission and the City Council prior to their incorporation

into the city's strategies for financing road and bike path improvements. The newly created Bicycling, Transportation, and Street Safety Commission could also participate in this vetting process. In order to ensure sound analysis of the city's funding needs for this key component of city infrastructure, city staff (or city consultants like Nichols Engineering) could use "sensitivity analysis" to examine several alternative sets of inflation assumptions that they consider reasonable and the reasons for considering them as a measure of future growth in costs in the program.

Once a long-term financing plan has been put in place, these key assumptions should be periodically reviewed and updated to ensure the city remains on track to provide the available resources needed to maintain the city's critical transportation infrastructure.

While it studies its long-term program needs more closely, the city should move ahead without delay in using the monies it already has available in the budget to maintain and rehabilitate its roads and bike paths. The more work that can be accomplished early on, the lower the overall cost of the pavement rehabilitation program will be.

It is my intention to draft a draft resolution for this commission that would contain these recommendations. I welcome your questions about my analysis and a more in-depth discussion of these ideas after you and city staff have had a chance to digest my findings.

Attachments

**Attachment A**

**Example: Grow slurry seal costs using updated SACOG factor instead of 8% assumed by Nichols**

	Nichols cost factor (per square yard )	Area treated (square yards)	Nichols estimate of costs	SACOG annual growth factor	Updated cost factor	Revised estimate of costs
2013	\$4.00	475,289.33	\$1,901,243		\$4.00	\$1,901,157
2014	\$4.32	14,685.89	\$63,445	1.5%	\$4.06	\$59,625
2015	\$4.67	30,370.22	\$141,702	1.6%	\$4.12	\$125,276
2016	\$5.04	19,031.00	\$95,899	1.7%	\$4.20	\$79,837
2017	\$5.44	16,019.67	\$87,182	1.9%	\$4.27	\$68,481
2018	\$5.88	506,724.44	\$2,978,275	1.9%	\$4.36	\$2,207,298
2019	\$6.35	500,979.78	\$3,180,054	1.9%	\$4.44	\$2,223,737
2020	\$6.86	174,850.44	\$1,198,682	2.0%	\$4.53	\$791,644
2021	\$7.40	155,157.22	\$1,148,765	2.1%	\$4.62	\$717,234
2022	\$8.00	99,857.11	\$798,479	2.2%	\$4.72	\$471,758
2023	\$8.64	92,367.67	\$797,674	2.3%	\$4.83	\$446,412
2024	\$9.33	539,902.44	\$5,035,511	2.4%	\$4.95	\$2,671,966
2025	\$10.07	141,536.33	\$1,425,676	2.5%	\$5.07	\$717,972
2026	\$10.88	128,158.44	\$1,394,189	2.6%	\$5.20	\$667,013
2027	\$11.75	81,061.89	\$952,394	2.7%	\$5.35	\$433,285
2028	\$12.69	95,627.11	\$1,213,401	2.8%	\$5.49	\$525,450
2029	\$13.70	104,088.78	\$1,426,424	2.9%	\$5.65	\$588,532
2030	\$14.80	59,186.33	\$875,974	3.0%	\$5.82	\$344,687
2031	\$15.98	11,630.00	\$185,897	3.1%	\$6.00	\$69,830
2032	\$17.26	2,016.67	\$32,814	3.2%	\$6.20	\$12,496
<b>Total</b>			<b>\$24,935,680</b>			<b>\$15,123,689</b>
Potential overstatement of costs						<b>\$9,811,991</b>
Percentage costs may be overstated						<b>39.35%</b>

**Attachment B -- Cost Summary**

	Original estimate	Updated estimates
<b>ROADS</b>		
<i>Preventative maintenance</i>		
Slurry seal	\$24,935,680	\$15,123,689
<i>Rehabilitation</i>		
AR cape seal	\$1,490,115	\$1,384,337
FDR 4" AC	\$4,536,643	\$3,760,226
FDR 6" AC	\$11,157,251	\$9,564,050
Local repairs	\$327,178	\$200,437
Local repairs with AC overlay	\$8,186,290	\$6,559,439
Mill and fill 1.5" AC	\$15,540,886	\$11,549,785
Mill and fill 2" AC	\$15,498,086	\$9,358,078
Mill and fill 2.5" AC	\$20,605,021	\$11,572,768
Mill and fill 3" AC	\$418,417	\$418,417
Surface seal	\$884,371	\$737,967
Thin overlay 2"	\$13,285,493	\$7,710,965
Thick AC overlay 2.5"	\$12,588,093	\$8,175,642
Thin AC overlay 1.5"	\$10,075,867	\$5,761,070
Slurry seal	\$2,570,047	\$2,202,944
<b>Subtotal ROADS</b>	<b>\$142,099,438</b>	<b>\$94,079,816</b>
Overestimate amount		\$48,019,622
Overestimate percentage		33.8%
<b>BIKE PATHS</b>		
<i>Preventative maintenance</i>		
	\$0	\$0
<i>Rehabilitation</i>		
Cape seal	\$18,486	\$8,270
Crack seal	\$300,705	\$195,146
Patch	\$4,051,900	\$2,145,998
Reconstruct structure (PCC)	\$7,914,141	\$6,419,454
Reconstruct surface (PCC)	\$11,341	\$7,930
<b>Subtotal BIKE PATHS</b>	<b>\$12,296,573</b>	<b>\$8,776,798</b>
Overestimate amount		\$3,519,775
Overestimate percentage		28.6%
<b>Grand total</b>	<b>\$154,396,011</b>	<b>\$102,856,614</b>
Overestimate amount		\$51,539,397
Overestimate percentage		33.4%

