R-20

James Johnson
City of Long Beach
Councilmember, Seventh District

Date: February 5th, 2013

To: Honorable Members of the City Council

From: Mayor Bob Foster
Councilmember Gary DeLong, Third District
Councilmember Patrick O'Donnell, Fourth District
Councilmember James Johnson, Seventh District

Subject: Maintaining our City Infrastructure

RECOMMENDATION:

Request that City Management present an updated report to the City Council on the status of our infrastructure and the funding of ongoing maintenance within 60 days.

DISCUSSION:

One of the core responsibilities of municipal government is to maintain our public infrastructure, such as streets, sidewalks, and public buildings. In addition to the safety and quality of life benefits of such infrastructure spending, maintenance saves considerable amounts of money over the long run by preventing costly repairs and replacements. Thus, maintaining our infrastructure is not only the right thing to do for current residents, but also our obligation to our children and other future residents for whom we should leave the city in at least as good a condition as we found it.

In addition to recognizing and addressing unfunded liabilities, proper infrastructure maintenance and repair is also part of prudent fiscal management. The City Council received a report on the status of our citywide infrastructure in 2011. Based in part on that report, the City Council has made positive changes to its approach to infrastructure. These include the re-institution of residential street maintenance (slurry seals) after ten years of deferring maintenance and the set aside of one-time funds for infrastructure funding. It is appropriate that we now receive an updated report regarding infrastructure and maintenance funding for our consideration.

Among other items, the update should include the ongoing shortfall for residential street repair and maintenance, sidewalk repairs, and public building maintenance. Analysis regarding future savings that could accrue from properly funding maintenance should

also be included. Moreover, spending on residential streets and sidewalks, both in the General Fund and in all funds, over the last ten years is requested to give context to our historical levels of investment for these critical pieces of public infrastructure.

As the Mayor highlighted in this year's State of the City address, much still needs to be done and infrastructure will be a focal point for the coming year. Our streets, sidewalks, public buildings, and systems all need repair. We need to plan now for how to most efficiently maintain and repair our infrastructure in a way that utilizes our resources for the greatest good.

FISCAL IMPACT:

There is no significant fiscal impact for this report. To the extent that infrastructure maintenance spending is increased, there could be a corresponding amount of long term cost savings from preventing deterioration. For example, the American Public Works Association estimated that cities save $6 in street repair costs for every $1 invested in maintenance.

Attachments:
May 24, 2011 Infrastructure Report
Excerpt from the American Public Works Association Re: Street Maintenance
Excerpt from the City Auditor Re: Street Maintenance and Repair

Infrastructure: Successes and Shortfalls

May 24, 2011

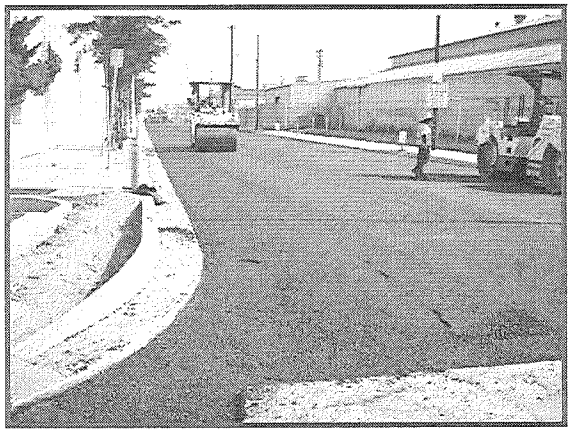
Introduction

- Successes:
  - Completed Projects - Past 3 Years
- Shortfalls:
  - Capital Projects Shortfalls
  - Maintenance Shortfalls
- Annual Funding Requirement
- Summary

Successes:
Completed Projects
(Past 3 Years)

Arterial Streets

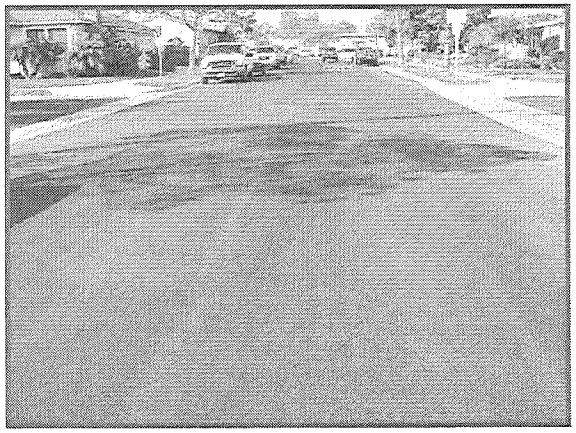
- 48 lane miles of arterial streets repaired
- Pavement Condition Index (PCI) increased from 45% to 68% "Good or Better"
- Best overall street condition in 10 years



Funding Source	3-Yr Amount
ARRA/Stimulus	$14,300,000
RDA	31,750,000
Prop. C	13,100,000
Prop. A	800,000
State Gas Tax	900,000
Federal Gas Tax	4,300,000
Total	**$65,150,000**

Residential Streets

- 84 lane miles of residential streets repaired
- Pavement Condition Index (PCI) increased from 36% to 52% "Good or Better"



Funding Source	3-Yr Amount
RDA	$2,500,000
Prop. 1B	14,300,000
State Gas Tax	5,350,000
Measure R	2,500,000
General Fund	2,000,000
Total	**$26,650,000**

Sidewalks & Alleys

- 22 miles of sidewalk replaced
- 4.8 miles of curbing replaced
- Euclid Alley paved

Funding Source	3-Yr Amount
ARRA/Stimulus	$620,000
RDA	200,000
CDBG	2,100,000
General Fund	6,800,000
Total	**$9,720,000**

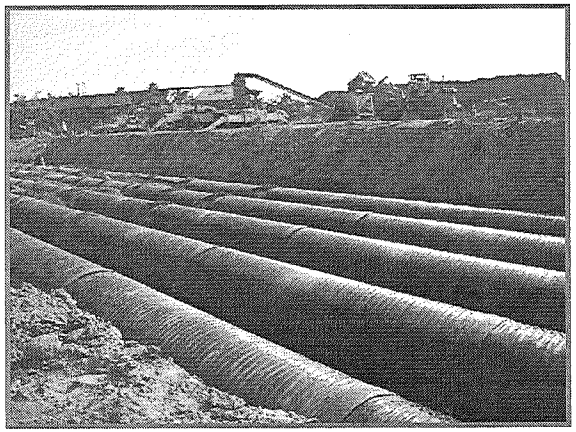
Parks

- 11 new parks or park expansions completed
- 5 new parks or park expansions under construction
- 6 new or renovated park buildings

Funding Source	3-Yr Amount
RDA	$28,900,000
Grants	13,000,000
CDBG	800,000
TDA	300,000
Park Impact Fees	1,250,000
Total	**$54,150,000**

Stormwater

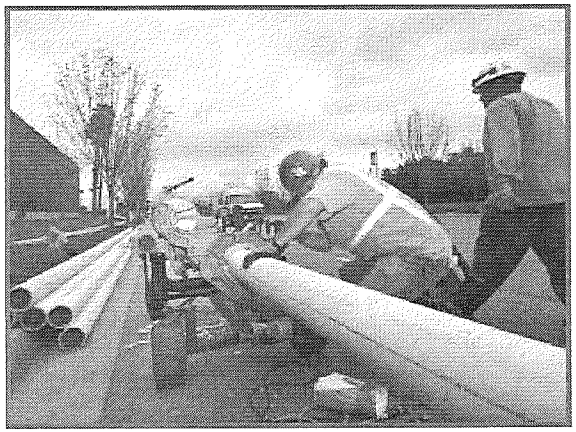
- 3 pump station water quality devices installed
- 688 automatic retractable screens installed
- Low flow diversions at new storm drains
- Westside, Arlington, and Termino Storm Drain projects



Funding Source	3-Yr Amount
ARRA/Stimulus	$5,150,000
RDA	3,200,000
Tidelands	1,175,000
Prop C	3,200,000
Federal Gas Tax	1,200,000
State Gas Tax	625,000
General Fund	1,850,000
Total	**$16,400,000**

Gas & Oil

- 40 miles of gas main pipeline replaced
- 30 miles of residential gas pipeline replaced
- 5 underground pipeline pressure control stations replaced
- 24,500 of gas meters replaced



Funding Source	3-Yr Amount
Gas Fund	$24,000,000
Total	**$24,000,000**

Airport

- New parking structure
- New terminal under construction
- 320,000 square feet of taxiways replaced

Funding Source	3-Yr Amount
Airport Fund	$103,000,000
FAA Grants	$30,000,000
PFC	$5,000,000
Total	**$138,000,000**

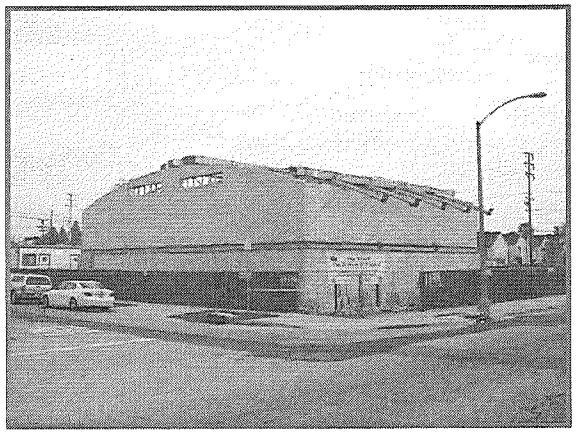
Mobility

- 32 miles of bike lanes added
- Sharrows, protected bike lanes, and a bike boulevard installed
- 1,500 bike racks installed
- New BikeStation
- New Transit Mall on 1st Street

Funding Source	3-Yr Amount
ARRA/Stimulus	$1,000,000
TMP	1,300,000
RDA	1,350,000
Grants	922,000
State Gas Tax (TDA)	450,000
Prop C	1,700,000
Total	**$6,722,000**

Public Safety

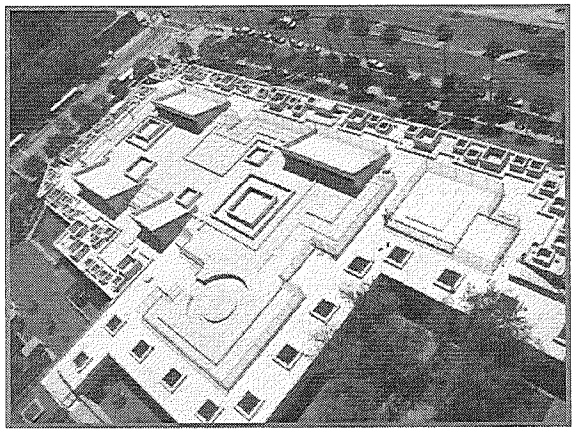
- New Fire Station 12
- Funding for new East Police Substation secured
- Fueling facilities upgrades
- Gender accommodations



Funding Source	3-Yr Amount
RDA	$26,000,000
Grants	500,000
Total	**$26,500,000**

Libraries & Other City Buildings

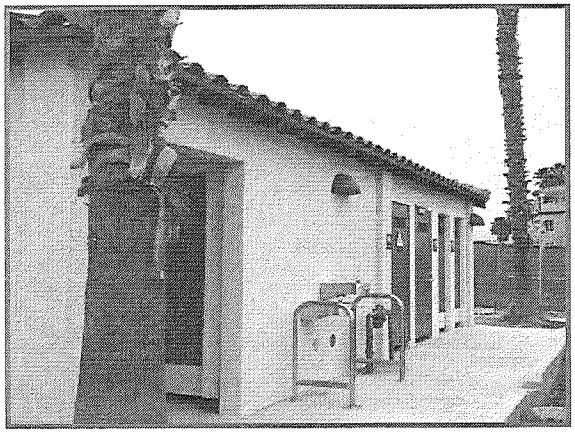
- New roof for Main Library
- Critical repairs to City facilities (Roofs, HVAC, etc.)
- Energy retrofits
- Library retro-fits and remodels



Funding Source	3-Yr Amount
Civic Center Fund	$2,300,000
General Fund	1,500,000
RDA	1,400,000
Grants	1,000,000
Total	**$6,200,000**

Tidelands

- Seawall repairs
- Convention Center investments
- 5 new or renovated beach buildings
- Alamitos Bay Marina Rebuild



Funding Source	3-Yr Amount
Tidelands Fund	$23,790,000
Marina Fund	6,200,000
DB&W	18,970,000
Total	**$48,960,000**

Summary of Infrastructure Funding

Funding Source	3-Yr Amount	%
Airport Fund	$103,000,000	31.6%
RDA	69,350,000	16.9%
ARRA/Stimulus	47,070,000	11.4%
FAA Grants	30,000,000	7.3%
Tidelands Operating Fund	24,965,000	6.1%
Gas Fund	24,000,000	5.8%
Department of Boats & Waterways	18,970,000	4.6%
Prop C	18,000,000	4.4%
Grants	14,500,000	3.5%
Prop. 1B	14,300,000	3.5%
General Fund	12,150,000	3.0%
State Gas Tax	6,875,000	1.7%
Marina Fund	6,200,000	1.5%
Federal Gas Tax	5,500,000	1.3%
Passenger Facility Fee	5,000,000	1.2%
CDBG	2,800,000	0.7%
Measure R	2,500,000	0.6%
Civic Center Fund	2,300,000	0.6%
Transportation Management Plan	1,300,000	0.3%
Park Impact Fees	1,250,000	0.3%
Prop. A	800,000	0.2%
Transportation Development Act	750,000	0.2%
Total	**$411,580,000**	**100.0%**

Shortfalls:
Capital Improvement

Arterial Streets

- 68% of arterial streets currently have a rating of "Good or Better"
- Arterial street funding comes from a variety of County, State and Federal sources
- Arterial street funding amounts are closely aligned with need

	Amount
Annual investment needed to maintain arterial streets in current current condition	$10,000,000
Estimated annual funding for arterial street	($8,000,000)
Annual unmet funding needs	**$2,000,000**

Residential Streets

- 52% of residential streets currently have a rating of "Good or Better"
- Residential street repair funding is currently limited to County Measure R tax revenues
- Residential street funding needs currently exceed available funding

	Amount
Annual investment needed to maintain residential streets in current current condition	$10,000,000
Estimated annual funding for residential street	($4,100,000)
Annual unmet funding needs	**$5,900,000**

Alleys

- The City has 221 miles of alleys - 209 miles are paved and 12 miles unimproved
- 90% of asphalt alleys and 12% of concrete alleys need to be replaced
- 10% of asphalt alleys and 88% of concrete alleys could be salvaged with overlays or spot concrete replacement

	Amount
Annual investment needed to repair/replace 10% of the City's alleys	$4,000,000
Estimated annual funding for alleys	($0)
Annual unmet funding needs	**$4,000,000**

Sidewalks

- The City maintains 1,160 miles of sidewalks
- Approximately 160 miles (or 40,000 locations) need repairs
- Repairing 10% per year will require $4.8 million

	Amount
Annual investment needed to repair 10% of the known locations requiring repair	$4,800,000
Estimated annual funding for sidewalks	($3,000,000)
Annual unmet funding needs	**$1,800,000**

Stormwater

- The City maintains over 180 miles of storm drain pipelines and channels, including over 3,800 catch basins
- The vast majority of the storm drain pipeline is concrete, and is in good condition.
- Approximately 30 miles of the storm drain pipelines are undersized, requiring repairs estimated at $111 million

	Amount
Annual investment needed to replace pipeline	$11,000,000
Estimated annual funding for pipeline	($500,000)
Annual unmet funding needs	**$10,500,000**

City Buildings

- The Facility Condition Index (FCI) describes the relative state of building condition against a cost model of a similar building as if it were at the beginning of its useful life, fully "renewed" to today's standards

- The FCI for each facility is the result of a complex formula involving individual condition ratings for numerous systems (e.g., roofs, structural, HVAC, plumbing)

FCI	Condition
0% - 5%	Good
6% - 10%	Fair
11% & Above	Poor

City Buildings

- The overall FCI for City buildings (not including City Hall) in 2007 Assessment was 15.9% (Poor)
- The repair value of City building deficiencies in 2007 was $124 million
- The repair value of City building deficiencies in 2011 is estimated to be $156 million

	Amount
Annual investment needed to repair City buildings	$16,000,000
Estimated annual funding for buildings	($500,000)
Annual unmet funding needs	**$15,500,000**

LBGO

- LBGO maintains 1,900 miles of pipeline, the majority of which was installed between 1950-1959
- 550,000 feet of pre-1950 pipeline in system
- 300 miles of main and 140 miles of service pipelines need replacement over the next 10 years
- Repairing 10% per year will require $14.4 million annually

	Amount
Annual investment needed to repair 10% of the 440 miles of pipe needing repair	$14,400,000
Estimated annual funding for pipeline repair	($7,100,000)
Annual unmet funding needs	**$7,300,000**

Annual Shortfalls: Capital Improvement

Funding Need	Annual Unmet Funding Need
Streets	$11,000,000
Alleys	4,000,000
Sidewalks	1,800,000
Stormwater	10,500,000
City Buildings	15,000,000
LBGO	7,300,000
Total	**$49,600,000**

Shortfalls: Maintenance

Streets and Alleys

- If repaved streets were slurry sealed every 5 years, their useful life could be extended by 50%, saving $30 million over 20 years
- Repaved, repaired and newly constructed alleys should be similarly maintained

	Amount
Annual investment needed to maintain streets and alleys	$3,000,000

Stormwater

- The City's corrugated metal storm drains, and to a lesser extend, concrete culverts, are subject to ongoing deterioration
- Providing periodic maintenance can protect the existing system for the foreseeable future

	Amount
Annual investment needed to maintain storm drains	$1,000,000

City Buildings

- Without ongoing maintenance, our buildings will continue to deteriorate at an ever increasing rate

- Maintenance cost are far less expensive than replacement costs, and can extend the useful life of many building systems

	Amount
Annual investment needed to maintain buildings	$1,600,000

Annual Shortfalls: Maintenance

To Maintain Current Conditions

Funding Need	Annual Unmet Funding Need
Streets & Alleys	$3,000,000
Stormwater	1,000,000
City Buildings	1,600,000
Total	**$5,600,000**

Summary

- Like many cities across the nation, Long Beach has struggled to keep up with its infrastructure demands
- The City has not issued any infrastructure bonds since the early 1960's
- The Public Works Department has successfully demonstrated that, when funding is available, significant capital improvement projects are quickly completed
- To address both our ongoing capital and maintenance shortfall, Council may need to consider new or alternate funding sources

Infrastructure: Successes and Shortfalls

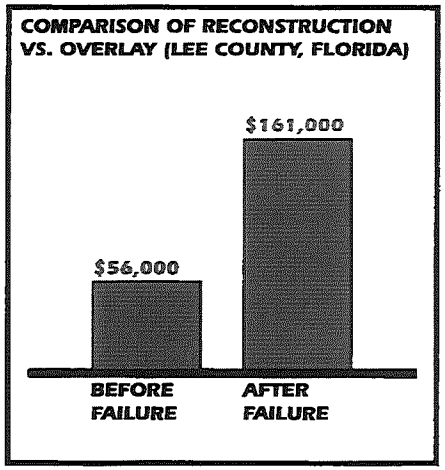
May 24, 2011

resurfacing before rapid deterioration begins extend the pavement life for a fraction of the cost of those who wait 'just a couple of years'...Ask why they waited and the universal answer is 'to save funds.'"

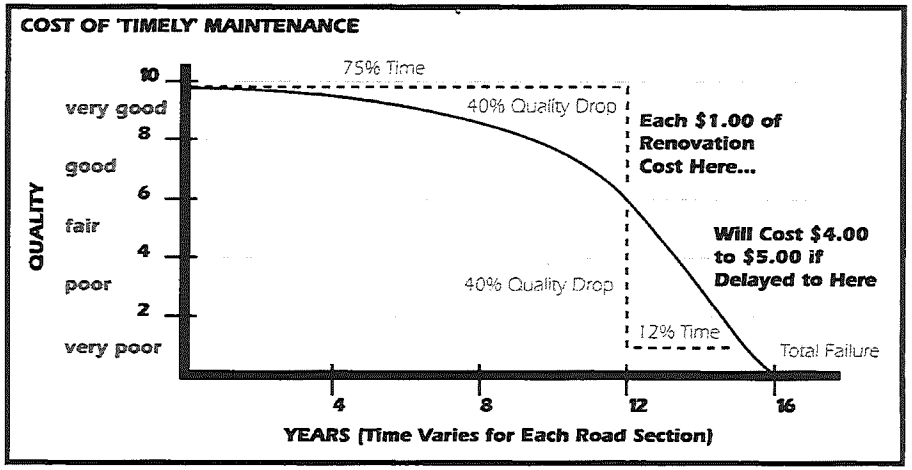
Deferring maintenance has been a popular solution during recent periods of revenue shortfall, and now local governments are facing the consequences. The street for which an overlay was deferred several years ago now needs a complete rehabilitation or reconstruction at five times the cost.

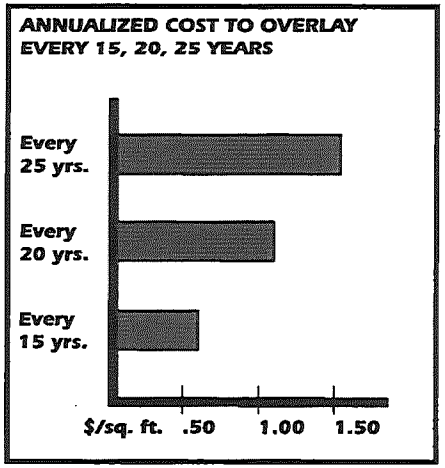
Research and field experience have repeatedly shown that over the long run maintaining good roads in good condition costs substantially less per year than allowing them to deteriorate to the point that major rehabilitation or reconstruction is required. The Michigan Department of Transportation recently issued a report that documented overall budget savings of $6 for every $1 spent performing timely preventive maintenance actions. Copies of this study and the MI DOT Highway Preventive Maintenance Program Guidelines can be obtained from APWA.

WHY? The cost of a rehabilitation effort in terms of time and materials is substantially higher than the cost of routine maintenance and timely resurfacing. In Lee County, Florida, it



costs $175,660 to reconstruct one mile of 24-foot wide collector roadway and it costs $34,860 to overlay the same type of roadway with 1.5 inches of asphalt concrete. In terms of materials and work effort an overlay placed before failure involves only the thickness of the overlay whereas after failure, reconstruction of the same roadway involves 12-inches of subbase material, 8-inches of base material and the thickness of the asphalt surface. Clearly, periodic maintenance of a good road is less expensive than reconstructing it. However, what about the cumulative cost of periodic maintenance? Won't several seal coats or overlays add up to the cost of a rehabilitation project? Fort Collins, Colorado, compared two maintenance strategies: one involved performing high quality maintenance coupled with "appropriately timed" overlays; the other involved deferring overlays several years





and then carrying out a major rehabilitation. Their analysis found the second strategy to be four times as expensive as the first. Another, more comprehensive study conducted by Thomas R. McDonald, a noted pavement maintenance consultant and author, found that the cumulative cost of a well maintained pavement over a 15 year design life was 3.4 times less than a non-maintained pavement.

In addition to being less costly, the periodic "upward bumps" in the appearance and ride quality of a well maintained pavement give the public a positive perception of the stewardship being exercised over public property.

Don't my driving costs go up on poor pavements?

YES! Poorly maintained roads mean direct out-of-pocket costs to you and every other vehicle owner. Motorists "pay" for poorly maintained pavements in damaged tires, more frequent front-end alignments, more frequent

Executive Summary

This report was commissioned by the Office of the City Auditor of Long Beach and was prepared by Public Financial Management (PFM). The report represents Phase II of the Long Beach Streets Review ("the Review"). In Phase I of the Review, PFM conducted an assessment of the Long Beach Streets Capital Improvement Program (CIP) that identified how the City could make more effective and full use of Streets CIP funding sources; improve budget practices; reduce project backlogs; improve project tracking; and address staffing levels.

The Phase II Review builds on Phase I and focuses on other issues regarding the delivery of streets capital improvements. The Phase II Review is organized into five main sections:

- An assessment of the current condition of Long Beach's streets, and an analysis of how various levels of investment in Long Beach's streets infrastructure may affect the condition of the City's streets over time.
- A comparison of Long Beach's street conditions and streets maintenance practices in relation to other California cities.
- A review of DPW's contracting practices and general approach to contract management.
- A comparison of DPW costs relative to those of other California cities.
- An examination of DPW's streets infrastructure performance measure practices.

The following are PFM's key findings and recommendations for Phase II. These recommendations are followed by the recommendations for Phase I for reference.

- **Invest early in preventive street maintenance in order to realize the greatest potential cost savings.** Extensive research has demonstrated that it is more economical in the long run to invest early in maintaining streets that are still in good condition than it is to defer maintenance until streets have deteriorated and more expensive repairs are needed. According to a March 2008 The Road Information Program (TRIP) report, a preventive approach to street maintenance can reduce the life cycle costs of a pavement surface by approximately one-third over a 25-year

period.[1] Specifically in the case of Long Beach, the cost of deferring street maintenance at critical junctures in a street's life cycle can mean the difference between applying a slurry seal treatment at a cost of $0.30 per square foot for a street still in good condition and applying an overlay treatment at a cost of $2.34 per square foot for a street in deteriorating condition – an expense almost 7 times as great.

- **Improve oversight mechanisms for contractor work.** Given current DPW staffing levels, any proposed increase in engineering and/or maintenance project volume would require DPW to delegate more management responsibility to its contractors. In order to ensure proper contractor oversight under this arrangement, DPW should increase its use of project tracking reports and electronic communication technology, such as a comprehensive project website. Such a website would include all deliverables and important notifications, as well as a publicly accessible portion to keep citizens aware of traffic delays and construction progress. DPW can further increase contractor oversight through the use of quantitative performance measures, many of which are outlined in this report.

- **Implement a comprehensive kick-off meeting prior to the beginning of every project.** This kickoff meeting should establish clear objectives, expectations, and lines of accountability for all involved parties in order to improve communication and coordination. Problems and solutions should be documented as they occur and posted on an open forum for the group to review. Following the completion of a project, a project coordinator should use the project tracking system and log to prepare reports that will aid future project managers and build institutional knowledge.

- **Extend the use of performance measurements.** While DPW currently publishes a list of several qualitative and quantitative metrics which it uses to measure performance, PFM recommends that this list be expanded in order to enable DPW to more efficiently allocate scarce resources; aid DPW in the development and justification of budget proposals; and hold DPW more accountable to the general public for its stewardship of Long Beach's streets. Specifically, DPW should track more detailed information on an annual basis regarding the average pavement condition of its streets infrastructure by street type and geographic area, as well as the total number of lane miles that are slurry sealed, repaved, and reconstructed. In addition, DPW should make greater use of efficiency metrics to gauge the cost effectiveness of key performance outputs. For ease of analysis, DPW should reclassify its expenditure costs in order to better reflect the relationship between street repair costs and street types.

[1] The Road Information Program (TRIP) Report (March 2008), "Keep Both Hands on the Wheel: Metro Areas with the Roughest Rides and Strategies to Make our Roads Smoother," 19. http://www.tripnet.org/UrbanRoadsReportMarch2008.pdf.

The Importance of Investing in Preventive Street Maintenance

It is important to recognize that while deferring street maintenance in the short run may result in a temporary decrease in expenditures, the long run costs of adopting such an approach will almost always exceed the short run savings.

Two key drivers help to explain why deferring street maintenance typically results in significant increases in long run total costs. The first concerns the rate at which street quality declines over time. Controlling for climate and traffic volume, streets tend to deteriorate only 40 percent in quality in the first 75 percent of their useful life, but then experience another 40 percent drop in quality in the next 12 percent of their useful life.[8]

The second concerns the pronounced cost differential between repairing a street in poor condition and repairing a street in good condition. It has been estimated that deferred street repair can cost up to five times as much as early street repair.[9] As the preceding section explains, due to rising construction prices, this gap could potentially widen further.

Accordingly, **a short-term targeted investment in maintaining streets that are still in good condition will yield significant cost savings over their useful life.**

DPW engineers estimate that an average street in Long Beach will last approximately 20 years. Using current DPW data, the following chart depicts an average Long Beach street's expected life cycle, along with associated maintenance costs at various pavement condition levels. The chart reinforces the general notion that a preventive approach to street maintenance is preferable to a "worst-first" approach, given that the marginal cost of rehabilitating a street accelerates as the quality of a street deteriorates. In addition, the chart indicates specific points along the curve where a targeted investment in street maintenance can realize significant savings. For example, the chart shows that the last opportunity in an average street's life cycle to apply a slurry seal treatment at a cost of $0.30 per square foot is approximately 16.5 years, after which time the cost of maintenance increases 680 percent to $2.34 per square foot for an overlay treatment.

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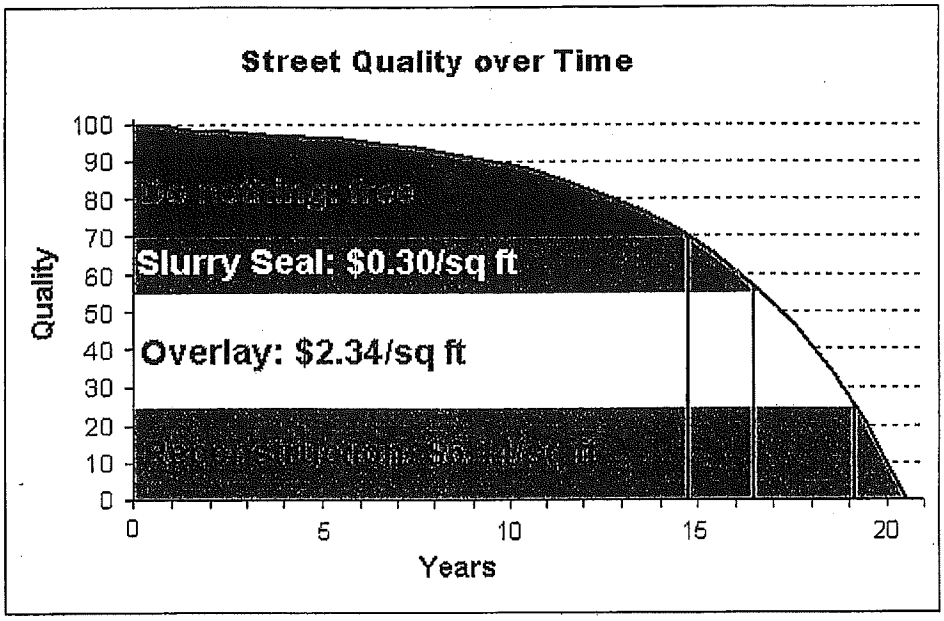
[8] Metropolitan Transportation Commission (March 2000). *The Pothole Report: An Update on Bay Area Pavement Conditions,* 11. http://www.mtc.ca.gov/library/pothole/pothole.pdf.
[9] Ibid.



The Effect of Different Funding Scenarios on Long Beach's Average Street Condition

The preceding discussion has shown why the return on investment in street maintenance is sensitive not only to size but also to timing. In order to illustrate how Long Beach's average street quality might be affected by both of these investment considerations, PFM worked with DPW's pavement management engineer to run several different funding scenarios through Paver to see what their effects would be on the average condition of Long Beach's streets over a 15-year period. Given the uncertainty of future PPI levels, we ran each scenario assuming 4, 6, and 8 percent annual inflation. These inflation assumptions are generally in line with recent economic forecasts.[10]

It should be noted that the following simulations assume a fully optimized use of street rehabilitation resources. In other words, resources are allocated based on their relative rate of return on investment on a citywide basis, without regard to other potential policy considerations. If a different approach were taken to prioritize how resources are allocated, then the street quality curves presented below would have a different shape. It is important for the City to weigh these potential trade-offs between equity and efficiency in the course of developing its overall street maintenance investment strategy.

[10] The Association of General Contractors (AGC), *Construction Inflation Alert* (March 2008), 14. http://www.agc.org/galleries/econ/AGC_CIA08_webFinal.pdf.