

Capital Street Projects

Tulsa City Council Public Works Committee

October 26, 2022

Engineering Services Department
Streets and Stormwater Department





Capital Street Program - Items

Status Update (Schedules and Utilities) Handouts

Increased Costs – Capital Program

Pavement Management – Concepts

Scope / Budget Strategies

Discussion / Questions

SAMPLE COST INCREASE INFORMATION



ITEM	PRIOR PRICE	CURRENT PRICE	% CHANGE
STREET REPAIRS (POTHOLE)			
5x5 ASPHALT	\$ 1,663.50	\$ 3,739.80	125%
5X5 CONCRETE	\$ 1,918.00	\$ 4,091.80	113%
10X10 ASPHALT	\$ 2,841.90	\$ 4,938.40	74%
10X10 CONCRETE	\$ 3,812.90	\$ 6,267.40	64%
20X20 ASPHALT	\$ 6,971.30	\$ 9,223.50	32%
20X20 CONCRETE	\$ 10,384.80	\$ 13,623.50	31%
MILL AND OVERLAY (Routine/Prevent)			
ARTERIAL 5 LANE/MILE	\$ 434,002.00	\$ 636,064.00	47%
ARTERIAL 4 LANE/MILE	\$ 347,202.00	\$ 508,902.00	47%
ARTERIAL 2 LANE/MILE	\$ 173,600.00	\$ 254,451.00	47%
SIDEWALK (Routine/Prevent)			
SIDEWALK /SY	\$ 47.00	\$ 61.67	31%
4 FT NON-ARTERIAL/LF	\$ 104.00	\$ 145.25	40%
5 FT ARTERIAL/LF	\$ 132.00	\$ 171.44	30%
ADA RAMP WITH DOMES	\$ 913.75	\$ 1,500.00	64%
1 MILE WITH 14 RAMPS	\$ 159,838.52	\$ 201,898.67	26%
CRACK SEALING (Routine/Prevent)			
HOT RUBBER ARTERIAL	\$ 0.97	\$ 0.94	-3%
MICROSURFACING (Routine/Prevent)			
ARTERIAL MICROSURFACING/SY	\$ 3.31	\$ 3.87	17%
ARTERIAL 2 LANE/MILE	\$ 34,953.60	\$ 54,489.60	56%
ARTERIAL 4 LANE/MILE	\$ 69,907.20	\$ 108,979.20	56%

ITEM	PRIOR PRICE	CURRENT PRICE	% CHANGE
LIGHTING (HIGHWAY)			
LIGHT POLE AND BASE	\$ 9,500.00	\$ 15,950.00	68%
ROADWAY			
AGGREGATE BASE /CY	\$ 40.80	\$ 54.00	32%
ASPHALT (\$4) /TON	\$ 92.67	\$ 145.00	56%
CONCRETE PAVEMENT /CY	\$ 137.39	\$ 186.00	35%
TRAFFIC CALMING (CW Infrastructure)			
22 FT ASPHALT SPEED HUMP	\$ 7,800.00	\$ 10,342.00	33%
TRAFFIC SIGNALS (Street Maintenance)			
INTERSECTION	\$ 400,000.00	\$ 500,000.00	25%
MID BLOCK PED SIGNAL	\$ 225,000.00	\$ 250,000.00	11%
UTILITY RELATED			
SANITARY SEWER PIPE/IN-FT (DIAM)	\$ 24.00	\$ 32.00	33%
PLANT AND PROCESS WORK			35%
STORMWATER PIPE			50%
VERTICAL CONSTRUCTION*			
ROOFING MATERIALS			43% - 75%
TOTAL PROJECTS			30% - 32%
TOTAL PROJECTS (est through 1Q 2023)			12% - 14%
*Flintco & Federal Reserve Economic Data			



Pavement Management

**The “right” treatment
At the “right” time
On the “right” project**



“Right” Treatment depends on . . .

- **Thorough Inventory of the pavements:**

(categorized into sections)

- **Type**
- **Age**
- **Location**
- **Rehabilitation history**
- **Similar distresses**

When Do We Have to Fix Our Pavements?

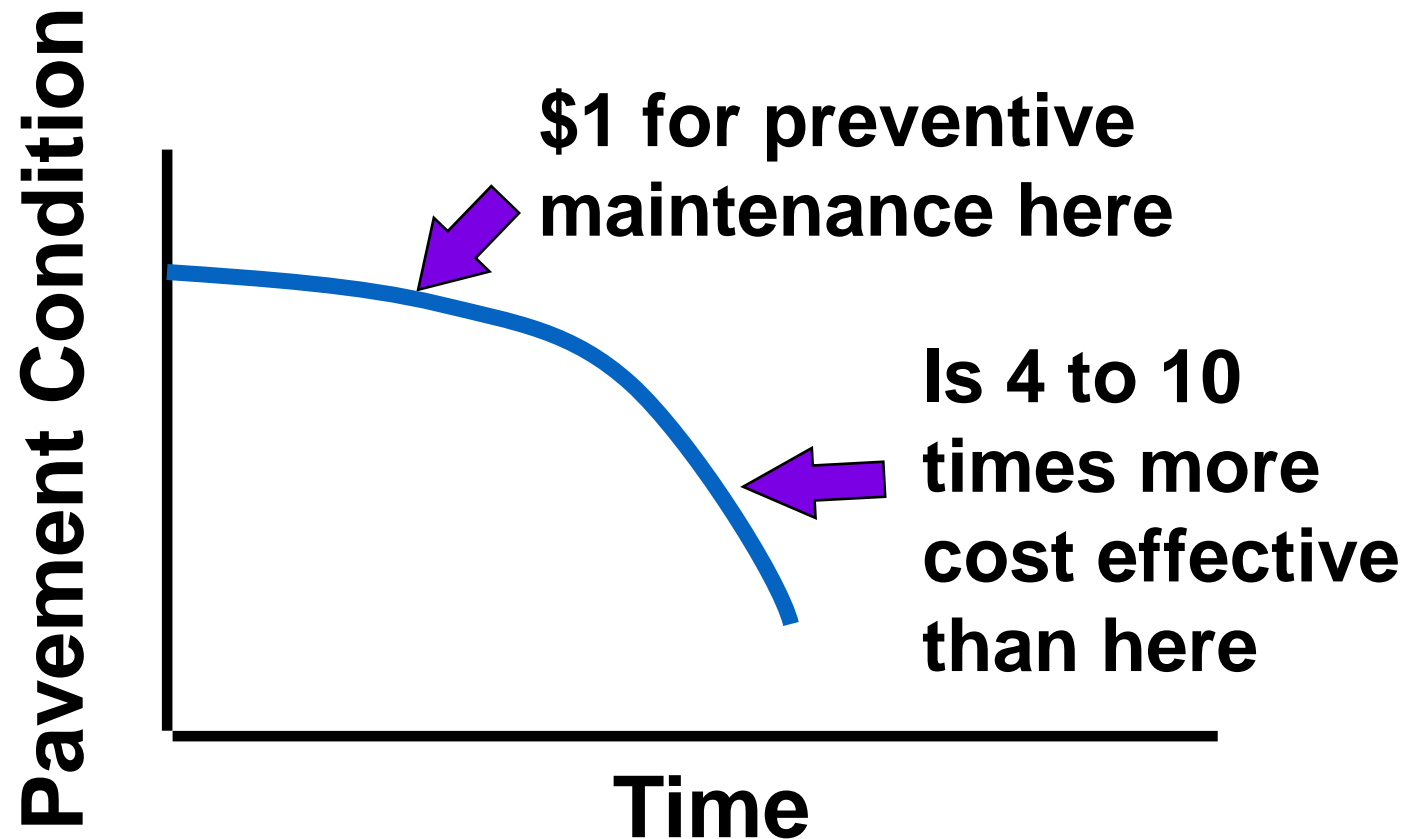


- **Pavement Management** – preserves good-condition pavement
- **2 Categories / with 2 Strategies Each:**
 - **PRESERVATION:** Routine and Preventive Maintenance
 - **CORRECTIVE:** Rehabilitation and Reconstruction
 - When the pavement loses:
 - Load carrying ability (excessive deflection)
 - Surface rutting
 - Pavement distresses (severe cracking/potholes)
 - Ride quality



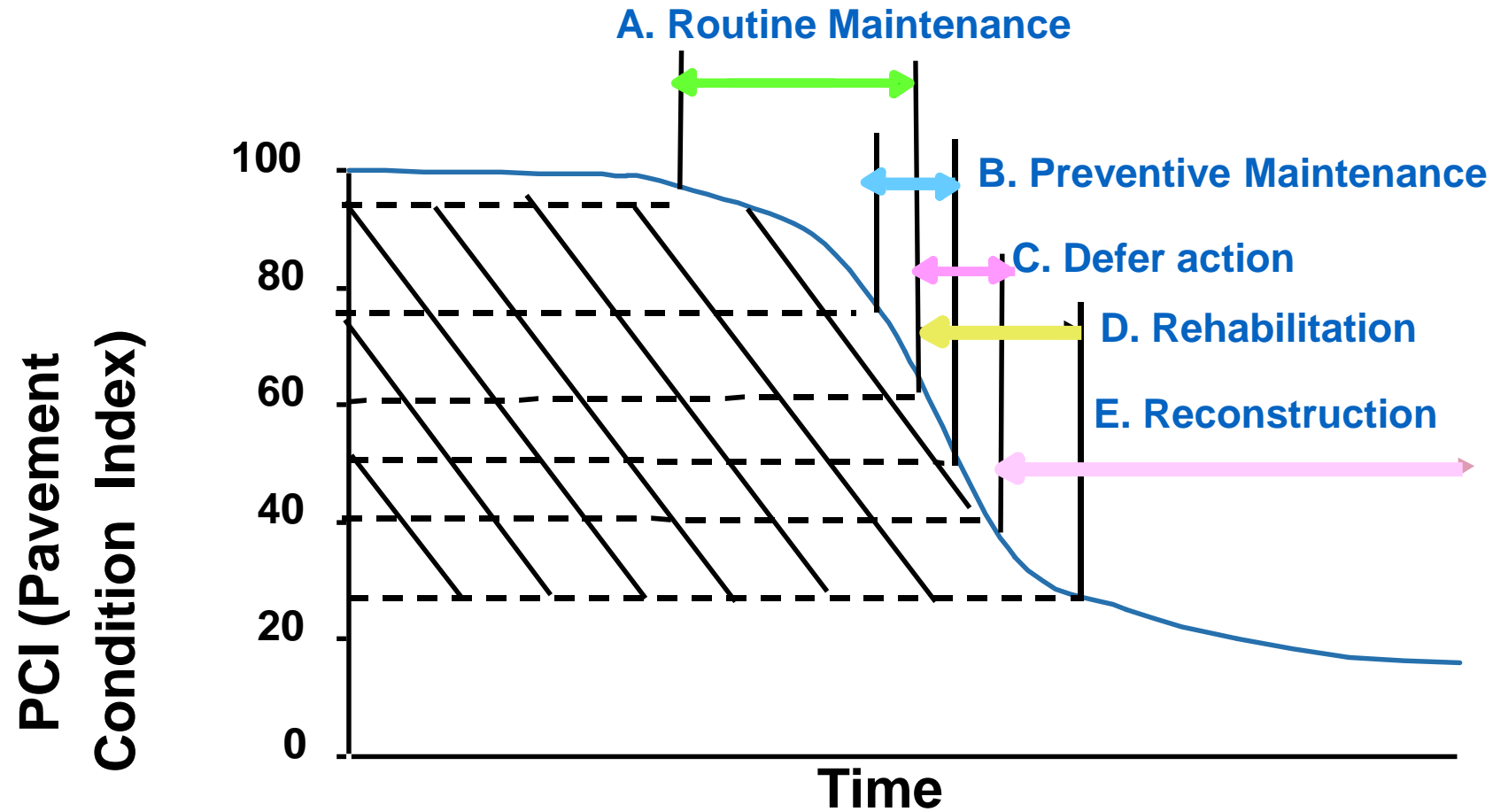
Effective Preventive Maintenance

(performance curves)



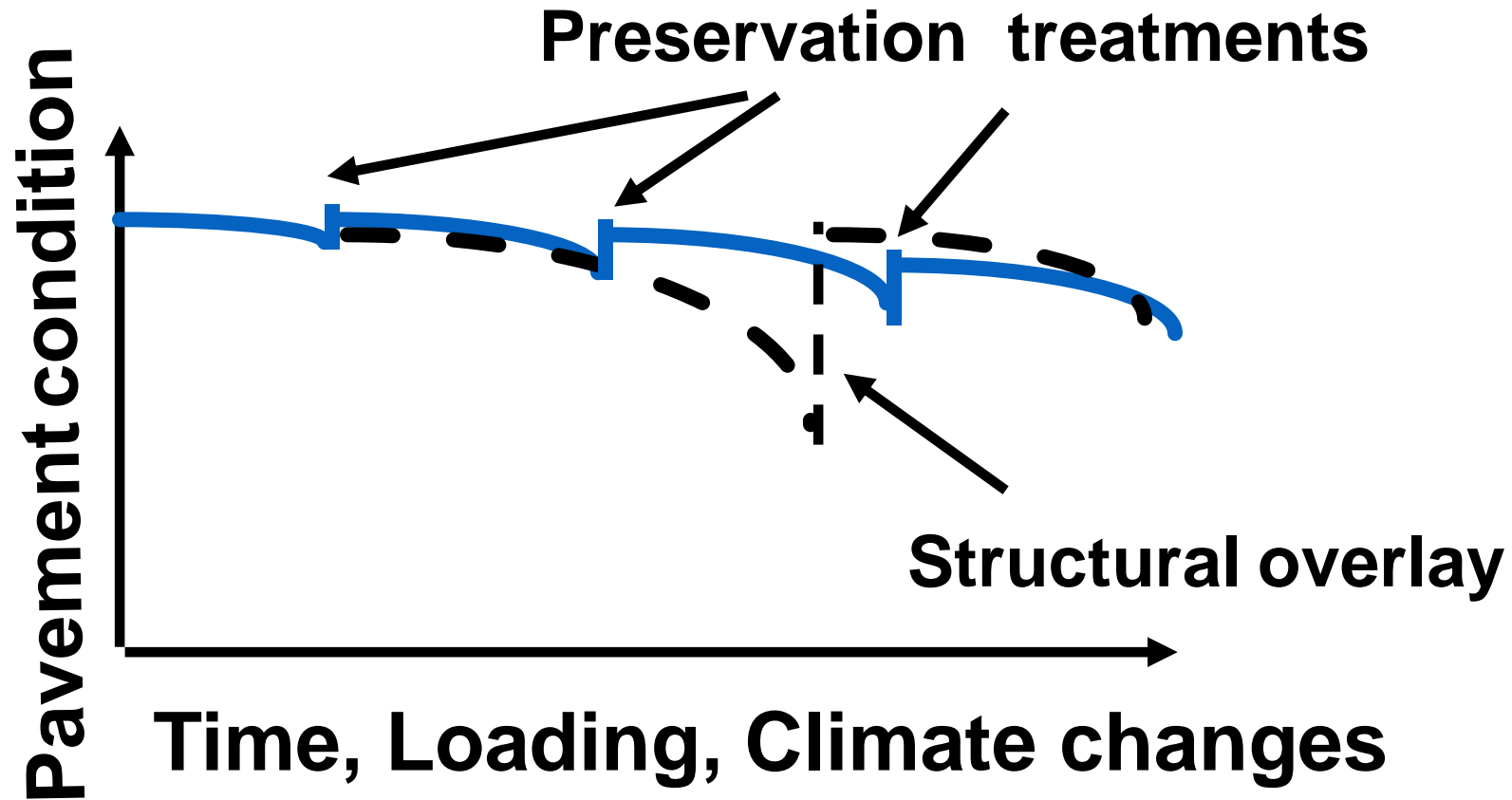


Pavement Management Maintenance & Rehab Strategies





Strategy to Minimize Costs



Scopes of Work by Maintenance Strategy



- **ROUTINE MAINTENANCE**
 - Crack Sealing
 - Pothole repairs
 - Patching (low)
- **PREVENTIVE MAINTENANCE**
 - Mill / Patch (low) / and Overlay
 - Microsurfacing
 - Sidewalks / Ramps (when applicable or need)

Scopes of Work by Maintenance Strategy



- **REHABILITATION**
 - Patching (<35%-45%)
 - Milling of asphalt
 - Curb and gutter replacement (partial to whole)
 - Structural overlays
 - Isolated areas of reconstruction
 - Driveway approaches
 - Sidewalks / Ramps (multi-modal)
 - Water, Sewer, Stormwater (underdrains)
 - Utility relocations

Scopes of Work by Maintenance Strategy



- **RECONSTRUCTION**
 - Pavement section removal and replacement
 - Curb and gutter replacement
 - Driveway approaches
 - Sidewalks / Ramps (multi-modal)
 - Water, Sewer, and Stormwater (underdrains)
 - Utility Relocations

Scope / Approach Modifications



- **Routine and Preventive –**
 - Funding package establishes budget to be expended
 - Pavement Management System defines candidate roadways for treatment (not funded for total coverage)
 - These work zones are not identified on maps for funding packages
 - Maximize coverage area with available budget
 - Reduce total number of big-ticket projects and/or reduce areas, i.e. concrete patching and mill / patch / overlays
 - Increase projects that still provide increase in PCI, i.e. Microsurfacing, crack sealing, and overlays

Scope / Approach Modifications



- **Rehabilitation and Reconstruction (Corrective) –**
 - Funding package establishes budget to be expended
 - Pavement Management System defines specific work zones
 - These work zones are identified on maps for funding packages
 - Work zone limits have not been reduced
 - Maintain planned coverage area with available budget to achieve planned PCI
 - Reduce concrete patching, e.g. Memorial 81st to 91st
 - Reduce total reconstruction limits and increase rehabilitation, i.e. mill / patch / overlay

Scope / Approach Modifications



- **Rehabilitation and Reconstruction (Corrective) – Con't**
 - **Eliminate full width milling for edge milling – 2 benefits:**
 - Reduces large equipment loading on existing subgrade (creates failures and breakthroughs)
 - Increases thickness of structural overlay for majority of lane width
 - **Utilizing geosynthetic structural interlayer materials.**
 - Minimizes propagation of cracks through structural overlays
 - Allows using less asphalt thickness to achieve strength or provides additional strength to enhance lesser subgrades
 - **Reduce total sidewalk replacement and fix only tripping hazards or required gaps**

Scope / Approach Modifications



- **Rehabilitation and Reconstruction (Corrective) – Con't**
 - Reduce driveway approach replacements – eliminate aesthetic only requests.
 - Reduce curb removal and replacements – eliminate aesthetic only requests.
- **Supplement budgets**
 - Federal funding, e.g. Surface Transportation Program, Transportation Enhancements, etc.
 - IOT2 Arterials required \$12.4 m federal match at time of vote, i.e. package funded 20%-25% local match



Objective

**Keep pavement condition such that
corrective maintenance is minimized**



Lessons learned ...

- ***Maintenance strategy must be consistent in defined logical termini***
- ***Predict pavement conditions for timing of funding***
- ***Communicate work level vs. citizen expectations, I.e. routine vs. reconstruction***
- ***Must use all strategies, **BALANCED, PROPORTIONAL APPROACH** to street network***



Benefits of Pavement Management

- **Extended life or serviceability of pavements**
- **Lower life-cycle costs**
- **Better budget planning (inventory)**
- **Public support**
- **Quantitative evaluation to identify needs**



Thank You

