

# MAINTAINING HOUSTON'S STREETS

## REPAIR, REHABILITATION, RECONSTRUCTION

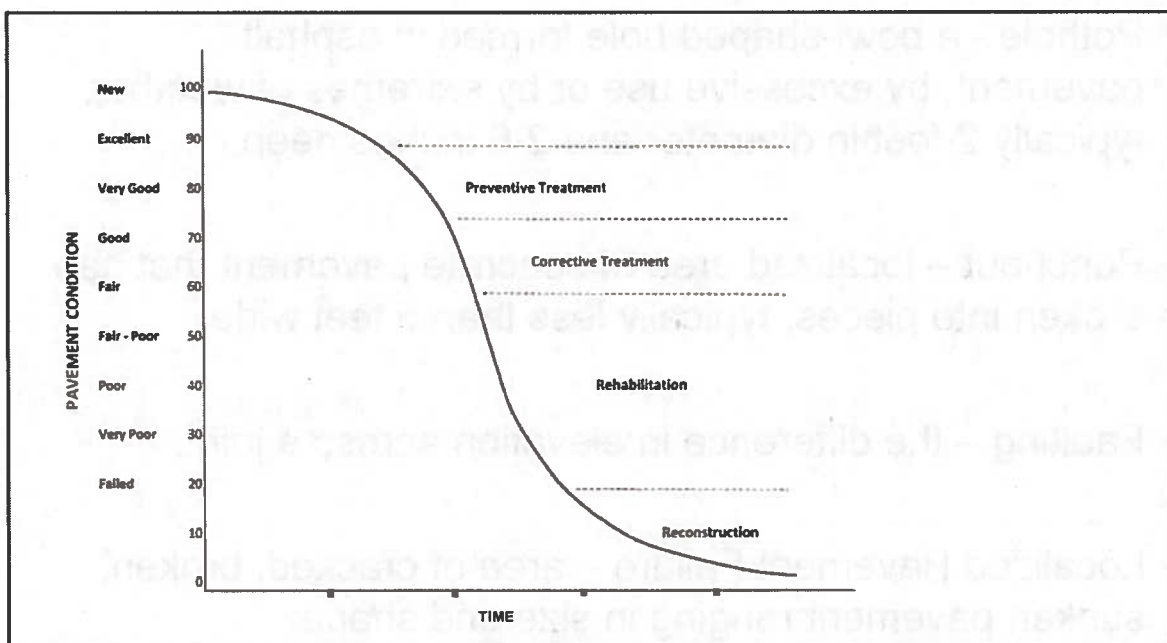
Using the Full Range of Tools for a Challenging Job

Report To: TTI Committee

May 13, 2014



## Pavement Management - Suggested Treatments



Source: American Association of State Highway and Transportation Officials (AASHTO)

## Definitions

Repair – to restore to safe condition after damage has occurred. Used for localized problems such as potholes, areas of pavement deterioration, concrete faulting. Typical repair methods include pothole filling, skin patching, partial depth patching/repair, full depth repair, or a single concrete panel repair.

Rehabilitation – to restore to near original condition. Used for distressed streets where the overall ride has degraded. Typical methods used are asphalt overlay or multiple concrete panel replacement.

Reconstruction – to comprehensively rebuild to a new condition with current criteria. Used to rebuild subgrade, roadway base, new roadway surface, roadway appurtenances, signalization, signage, marking, lighting, trees and plantings, and may also include replacement of utility lines located within the road right of way.

## Typical Pavement Conditions Requiring Repair

- Pothole - a bowl-shaped hole formed in asphalt pavement, by excessive use or by extremes of weather, typically 2 foot in diameter and 2-6 inches deep.
- Punchout – localized area of concrete pavement that has broken into pieces, typically less than 5 feet wide.
- Faulting – the difference in elevation across a joint.
- Localized Pavement Failure – area of cracked, broken, sunken pavement ranging in size and shape.



Pothole



Localized Pavement Failure



Faulting



Punchout

### Problems reported as a pothole for repair...





## Repair Potholes:

- Potholes – approximately 30% of pothole calls are actually pothole repairs.
- Response Time – 3 business days



## Repairs: Skin Patching

- A thin layer of asphalt applied over a deteriorated section of pavement to provide a responsive, effective repair.



## Repairs: Full Depth Patching

- Includes removal of a section of pavement down to the base material and replacing the area with new asphalt material and will generally be followed by panel replacement.



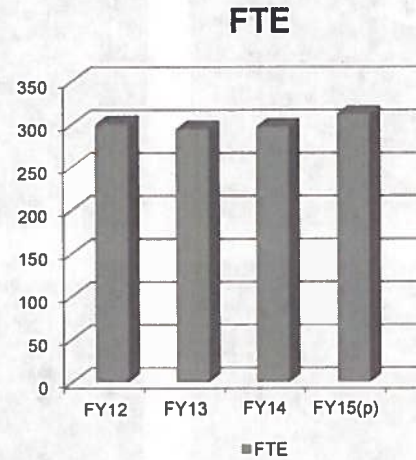
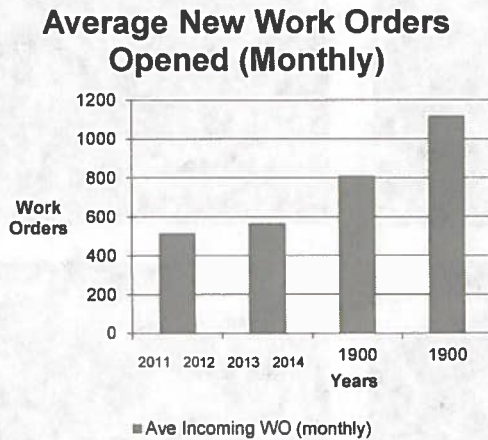
## Patching Repairs:

- Average Crew size – 5 for small patches; 8-10 for larger areas.
- FY 2014 Productivity – COH target 0.80 tons/crew hour based on benchmark agencies: Charlotte, North Carolina; Dunedin, Florida; Los Angeles County.
- Cost range – averages \$200 to \$600 for asphalt patch.



## Challenges in Repair ...

- Workload is increasing, same staffing.



## Rehabilitation

- Overlay – used for asphalt concrete (AC) pavement.
- Panel Replacement – used for jointed reinforced concrete pavement (JRCP).



## Overlay

- Mill off old asphalt.
  - Occasional base repair.
  - Level up performed.
  - Replace with new asphalt riding surface.
  - ADA Ramps.
- \$85,000 - \$125,000 per lane mile
- Expected Service Life – 6 to 12 years.
- Challenges:
- Reflective Cracking.
  - Does not improve overall drainage or correct ponding.
  - Does not address broken or subsided curbing, driveways, etc.
  - Does not correct for increased traffic since original pavement design.
  - Weather dependent.



## Panel Replacement

- Break up and remove old concrete.
  - Replace and/or re-compact base material.
  - Place new reinforced concrete.
- About \$20,000 per panel, dependent on size and location.
- Expected Service Life – 12 to 18 years.
- Challenges:
- Rebuild concrete street a few panels at a time.
  - Load transfer between panels.
  - Does not correct for increased traffic since original pavement design.
  - Costly.



# Assessment Process

- ✓ Street Surface Assessment Van – a technology driven inspection of pavements based on cracks, pavement deflections, and ride quality.
  - Performed every 2 to 3 years.
  - Generates a Pavement Condition Rating (PCR).
- ✓ Street Assessment – a visual inspection performed by trained Street Maintenance personnel based on ASTM standards and determined by PCR rating.
  - Used to determine if roadway condition falls within rehabilitation criteria/funding in Street Maintenance Operations.
- ✓ Assessment forwarded to Engineering and Construction Division – staff engineers evaluate for possible contract overlay, multiple panel replacement project, or further review under the Rebuild Houston Needs Assessment Process.

## Street and Drainage Division follows Standard Operating Procedures.

For job type:

- Labor needed.
- Equipment needed.
- Materials needed.
- In process developing time/productivity components.
- Procedural steps for work completion.

The image shows three overlapping Standard Operating Procedure (SOP) forms from the Department of Public Works and Engineering. The forms are for Pothole Repair, Skin Patch Repair, and Street Overlay With Hot Mix Asphalt. Each form includes fields for job name, date, location, and a detailed description of the work.

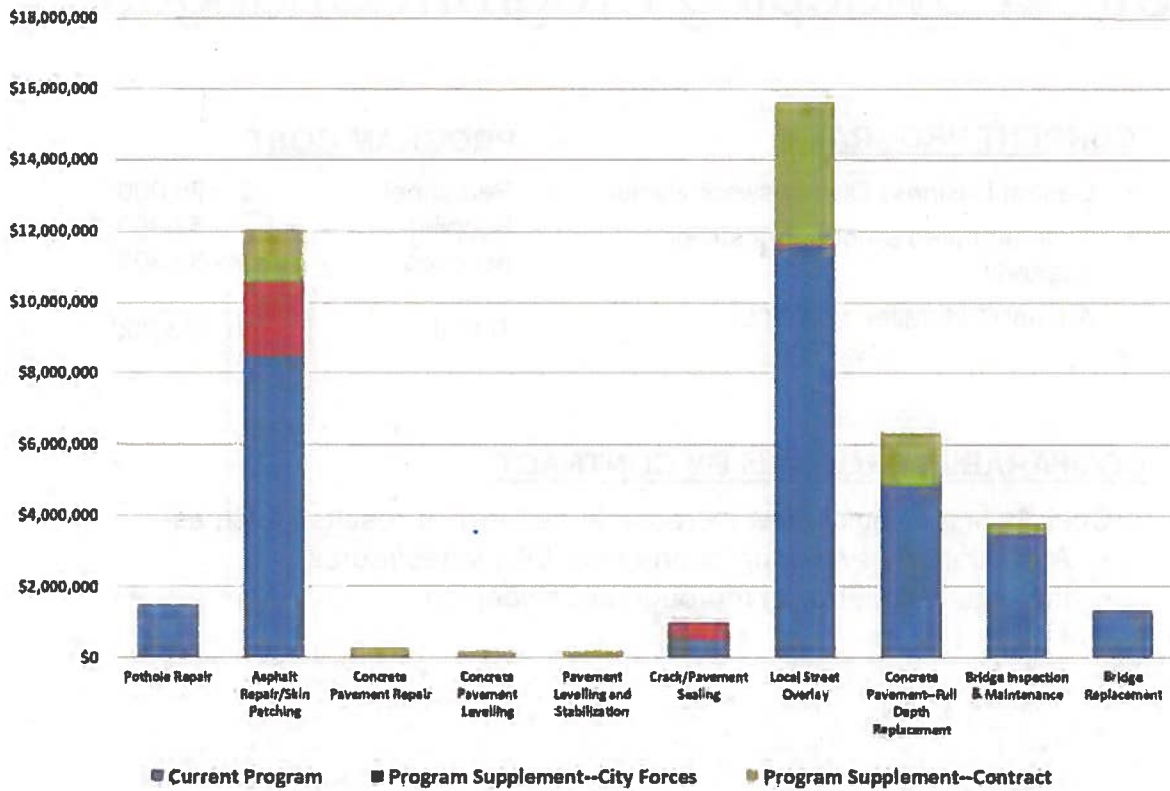
**Form 1: Pothole Repair**  
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
 STANDARD OPERATING PROCEDURE  
 POT HOLE REPAIR  
 STREET & DRAINAGE DIVISION/STREET & BRIDGE MAINTENANCE  
 BRANCH/STREET MAINTENANCE SECTION

**Form 2: Skin Patch Repair**  
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
 STANDARD OPERATING PROCEDURE  
 SKIN PATCH REPAIR  
 STREET & DRAINAGE DIVISION/STREET & BRIDGE MAINTENANCE  
 BRANCH/STREET MAINTENANCE SECTION

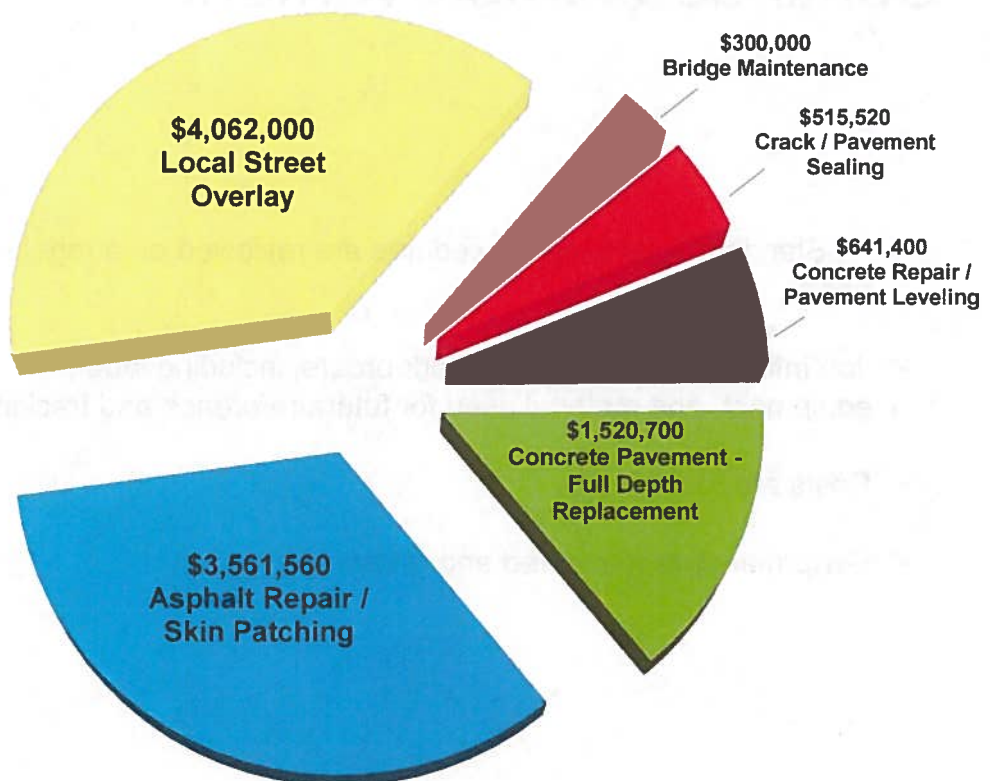
**Form 3: Street Overlay With Hot Mix Asphalt**  
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
 STANDARD OPERATING PROCEDURE  
 Street Overlay With Hot Mix Asphalt  
 STREET & DRAINAGE DIVISION/STREET AND BRIDGE MAINTENANCE  
 BRANCH/STREET MAINTENANCE SECTION



**FY2015 Expansion of Street Maintenance Program**



**TOTAL INCREASE \$10,601,180**



# Street Sweeping Program Changes

## CURRENT PROGRAM

- Central Business District swept weekly
- Thoroughfares & collectors swept quarterly
- Annual Curb Miles = 21,500

## PROGRAM COST

Personnel	\$ 585,000
Supplies	52,900
Services	485,300
<b>TOTAL</b>	<b>\$1,123,200</b>

## COMPARABLE PROGRAM BY CONTRACT

Cost Savings would allow increase in deliverable results, such as--

- Add quarterly sweeping of on-street bike lanes/routes
- Increase frequency of thoroughfare sweeping

# Continuous Improvement

- ✓ All Standard Operating Procedures are reviewed on a regular basis.
- ✓ Job Information captured in work orders, including labor, equipment, and material used for future reference and tracking.
- ✓ Costs are monitored.
- ✓ Performance is measured and reviewed monthly.