DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
STANDARD OPERATING PROCEDURE

Pavement Management

STREET & DRAINAGE DIVISION/STREET & BRIDGE MAINTENANCE BRANCH

ORIGINAL APPROVED BY	Signature: Eric Dargan Print Name: Eric K. DARGAN	**DATE**	01-14-13
REVISION APPROVED BY	Signature: Print Name:	**REVISION DATE**	
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APWA PRACTICE # 24.4-24.5	**POLICY REFERENCE: None**	**CODE OF ORDINANCE SECTION: 2-278 (Duties)**
SOP PREPARED/REVISED BY: Diane Lowery-Binnie		

PURPOSE
The purpose of this Standard Operating Procedure (SOP) is to establish a formalized Branch procedure regarding Pavement Programming.
SCOPE
All SDD employees and contractors are covered by and are required to comply within the parameters of this SOP.
HEALTH AND SAFETY
All Public Works and Engineering employees are required to comply with the Health and Safety procedures within this SOP.
PROCEDURE (SEE ATTACHED)

Department of Public Works and Engineering

Subject: **Pavement Management**	Street & Drainage Division SOP
	Effective: **Upon Approval**

I. Purpose

The purpose of this document is to provide a framework in which to plan a multi-year pavement management program based on the right maintenance and rehabilitation methods for the right pavement at the right time. The Pavement Management System provides a process used to annually assess, predict, analyze, plan, and revise the pavement program to accommodate ever changing roadway conditions. In addition, this document includes the pavement management decision trees used to correlate pavement condition to treatment and criteria for prioritization of projects.

Pavement Management encompasses two overarching approaches: a reactive on demand program and a proactive planned program. The reactive program is initiated by customer calls into a call center and often includes pothole filling and skin patching as necessary for right-of-way safety. This portion of pavement management is documented in a Standard Operational Procedure (SOP) for the City of Houston Public Works and Engineering Department titled '311 Service Request Response.' This document does not further elaborate on the reactive program, but focuses on the proactive program of planning long term maintenance and life extension of the pavement and includes the three areas of pavement treatment: preventive maintenance; corrective maintenance; and pavement rehabilitation/reconstruction.

II. Scope

Some of the benefits from the Pavement Management System are:

A. Achieve a street pavement system that provides an acceptable level of service at the least life cycle cost.
B. Ability to determine the best combination of maintenance and rehabilitation tactics to provide extended system life at the lowest cost.
C. Achieve the capability to predict consequences of various levels of funding.
D. Aid in the selection and prioritization of rehabilitation projects.
E. Ensure a repeatable, systematic method for programming the pavement treatments to meet the above objectives.

III. Policy

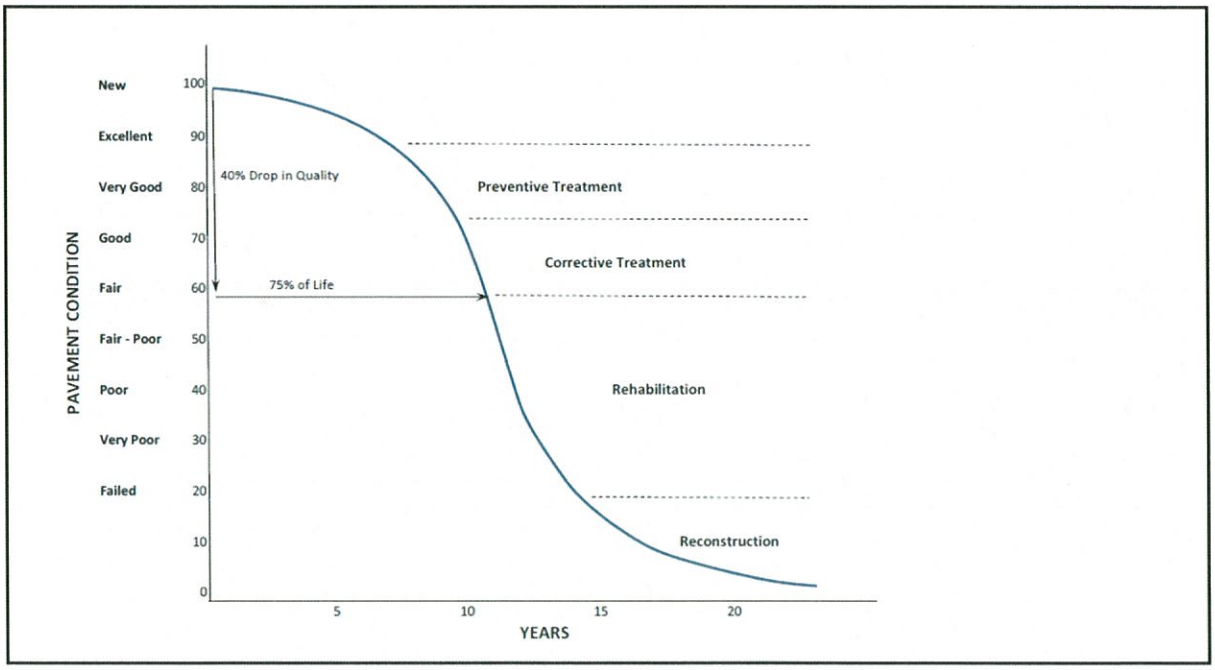
For long term planning and pavement life extension, pavement management consists of three phases:

1. Condition assessment of pavement segments, resulting in a pavement condition rating.
2. Analysis of condition ratings and determination of appropriate treatment.
3. Program and budget projects.

The City of Houston utilizes a Street Surface Assessment Van (SSAV) for condition assessment which ensures objective and repeatable results. The assessment van is equipped with a surface profiler, a crack scope, an accelerometer, a distance measuring instrument, GPS ability, and 360 degree video. From the data, a final composite pavement condition rating is obtained.

Based on the condition rating, best treatment options are considered following the American Association of State Highway and Transportation Officials (AASHTO) pavement curve which suggests appropriate treatment categories for each rating grouping.

Recommendations are sent to the appropriate divisions to program and budget as funding allows.



Pavement Curve – adapted from AASHTO

DEFINITION OF TREATMENTS

Preventive Treatment: Low-cost maintenance techniques to preserve and extend pavement life by reducing the effects of water and sunlight and include, but not limited to, crack treatments, surface treatments such as pavement seals coats and thin overlays. These treatments should be used on structurally sound pavements and may extend pavement life from four to ten years depending on level of treatment.

Corrective Treatment: Low-cost maintenance techniques aimed at repairing or improving pavement condition when low level distresses are present, such as cracking or surface raveling, but the overall structure of the roadway is still sound. Treatments may include crack sealing, minor base issues, patching, mill and overlay, micro-surfacing, and in-place recycling.

Rehabilitation/Reconstruction: More costly repair or restoration techniques aimed at rebuilding a new roadway.

PROCESS

The pavement management process begins with assessment of the streets within the City of Houston. Once the data has been collected and pavement condition ratings (PCR) computed, treatment choices are determined through use of several decision trees. There are four main branches, starting with PCR groupings:

- $90 \leq PCR \leq 100$: Excellent to new pavement, do nothing.
- $75 \leq PCR < 90$: Very good pavement, preventive maintenance treatments such as crack sealing, pavement sealing, joint sealing or joint stitching as necessary.
- $60 \leq PCR < 75$: Fair to good pavement, corrective treatments such as patching, minor base failure repair, milling and overlay, panel replacement for concrete pavements.
- $PCR < 60$: Failed to poor pavement, rehabilitation to reconstruction techniques considered.

When appropriate treatments have been chosen, resources and budget are determined and projects are prioritized based on traffic loads, service requests, area groupings, and available funding. The area grouping criteria is based on minimizing mobilization costs by planning projects within neighborhoods rather than several disassociated streets.

IV. Compliance

Adherence to the above is mandatory. Any employee who violates this procedure may be subject to disciplinary action.