



**City of Dallas**

# **Discussion of the City's Pavement Treatment Selection Manual**

**City Council Briefing  
June 2, 2021**

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- Street Selection Manual
- Street Rating Methodology
- Examples of A-E Street Conditions
- Decision Trees
- Funding Sources for Street Treatment Types
- Discussion/Questions





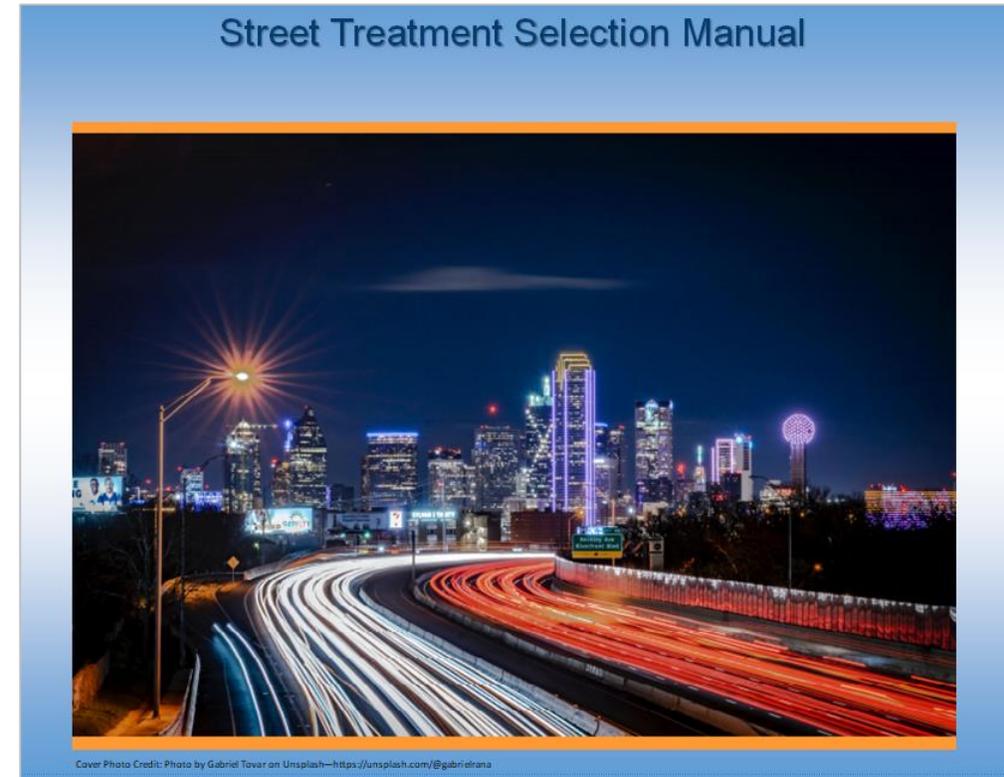
# Street Selection Manual



# Pavement Treatment Selection Manual



- Serves as guide to lay out street selection process.
- Located on the Public Works Pavement Management Web Page.
- Reviews all aspects of street selection:
  - Pavement Materials, and
  - Functional Class, and
  - Decision Trees/Modeling.



# Pavement Treatment Selection Manual



- Each treatment type has its own page.
- Helps to answer the question, “Why is that street getting fixed when mine is in worse shape?”

## Types of Street Treatments

### Resurfacing

for “D” rated Streets



Candidate streets are usually in "poor" condition. Resurfacing is done in house or by contract and includes curb and gutter replacement <50% of total curb length.

**Asphalt** - This treatment removes the entire asphalt surface and pulverizes and recycles the old material with a new asphalt binder. Any place there was alligator cracking or other base failures are observed, the base is fixed and compacted. The new asphalt surface, typically 2-inches, is then placed over the entire surface, compacted and smoothed to a proper finish. Barrier Free Ramp and curb and gutter repair, if needed, is accomplished with the resurfacing efforts.

**AOC** - Partial with an asphalt cap; not mill and resurface. This is a method used on AOC or concrete streets. This treatment removes the entire asphalt surface and removes and replaces large, failed base and sub-base sections, including breakout and removal of old pavement, repair of any base failures, and placing new concrete. To be a candidate for this repair, residential and thoroughfare streets must have less than 25% - 50% of failed area. Barrier free ramps, curb and gutter replacement is also included in this repair method as needed.

**Concrete** - Removal and replacement of failed concrete panels of concrete panels, as described in "Partial Reconstruction" up to 50% of the street panels. Barrier free ramps, curb and gutter replacement is also included in this repair method as needed.

**Cost:** \$325K per lane-mile. **Life:** 20-25 years (with maintenance).

**Typical Next Treatment:** Reconstruction to concrete street per current City of Dallas Guidelines.



# Pavement Treatment Selection Manual



The guide includes:

- Description of all pavement treatments utilized by the City of Dallas, and
- The current per lane mile cost per treatment, and
- Phasing of follow up treatments – maintenance cycles.

## Types of Street Treatments

### Light Slurry

for "A" & "B" Streets



Application Examples

**Light Slurry / Onyx**— Spray applied high polymer modified (two applications) include crack sealing prior to application. This is a preservation treatment to keep streets in "Good" condition in that condition for as long as possible. City of Dallas will be using a gravity applicator.

**Cost:** \$20.3K per lane-mile. **Life:** 5-7 years.

**Typical next Treatment:** Slurry Seal.

The city added this treatment type to its maintenance plan in 2021 as a way to increase the ways to preserve streets in "A" condition.





# Street Rating Methodology

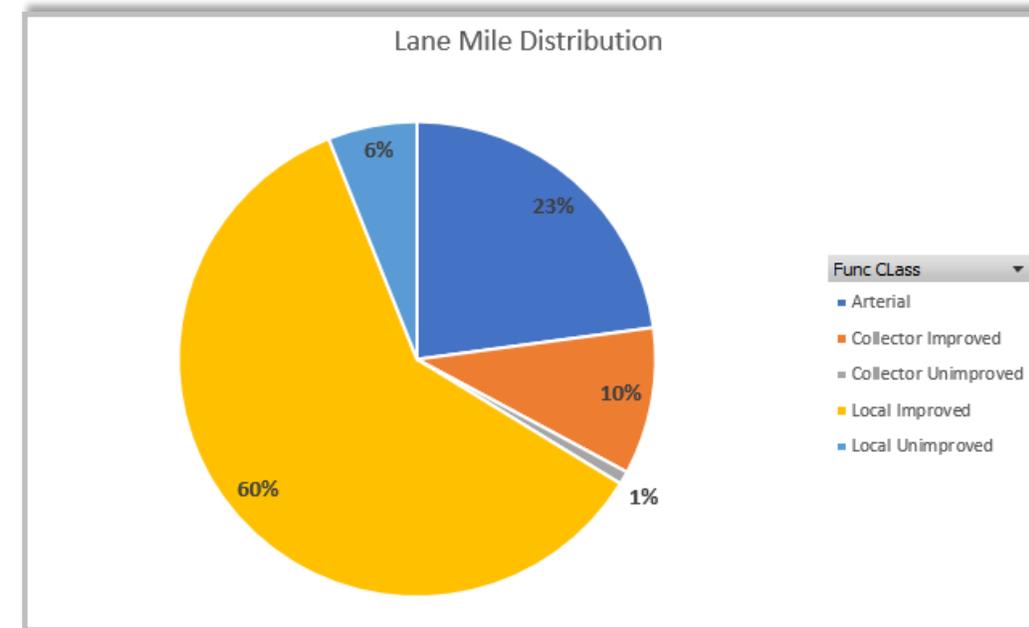


# Pavement Treatment Selection Manual



The Street Treatment Selection Manual provides:

1. Details of the overall process.
2. Review of the development of the annual maintenance program.
3. Addressing how items like pavement materials, functional classification, deterioration curves and field verifications impact the street treatment selection.



# Pavement Treatment Selection Manual



- Street assessment survey completed in FY 20.
- Next street assessment survey cycle – FY 22-23:
  - Will coincide with street selection for potential next bond program – (FY 24?)
- Street assessment survey also collects data on:
  - Sidewalks.
  - Barrier Free Ramps.
  - Curb and gutter data.



# Pavement Treatment Selection Manual



- Assessment Survey will include driving at least one lane on every City street utilizing the Pavement Assessment Equipment.
- Streets wider than 40-ft will be driven one lane in each direction.
- Realistically, it is cost prohibitive to drive every lane on all streets.
- Standard practice is to drive the far-right lane:
  - Tends to be the bus lane.
  - Most activities happen on that lane; i.e. gets the stop/start/turning right traffic.
  - Generally, this lane is the most stressed pavement section on a typical street.





# Examples of A-E Street Conditions



# Pavement Treatment Selection Manual



The Pavement Condition Index ranges from an “A” or Excellent condition to an “E” or failed condition. The “A” - “D” streets all have a 15-point range and the “E” category has a 40-percent range. One of the major changes recently made to the paving model was to evaluate the “E” streets to determine if a repair other than reconstruction could be applied. This also aligned with the results of the inspections from the construction managers. Streets with a high “E” can be resurfaced, saving Dallas money and time.

City of Dallas PCI Ranges		
Rating	Description	PCI Range
A	Excellent	100-85
B	Good	70-84.9
C	Fair	55-69.9
D	Poor	40-54.9
E	Failed	0-39.9



*Example of resurfacing an asphalt street at 8th Street between Madison & Zang.*



# Pavement Treatment Selection Manual



- PCI range examples
  - Asphalt streets



# Pavement Treatment Selection Manual



- PCI range examples
  - Concrete streets





# Decision Trees





- 18 Decision Trees are included in Street Treatment selection guide.
- The decision trees outline how the model chooses a treatment for a street segment, such as:
  - Age-based.
  - Type of distress-based.
  - Rideability-based.

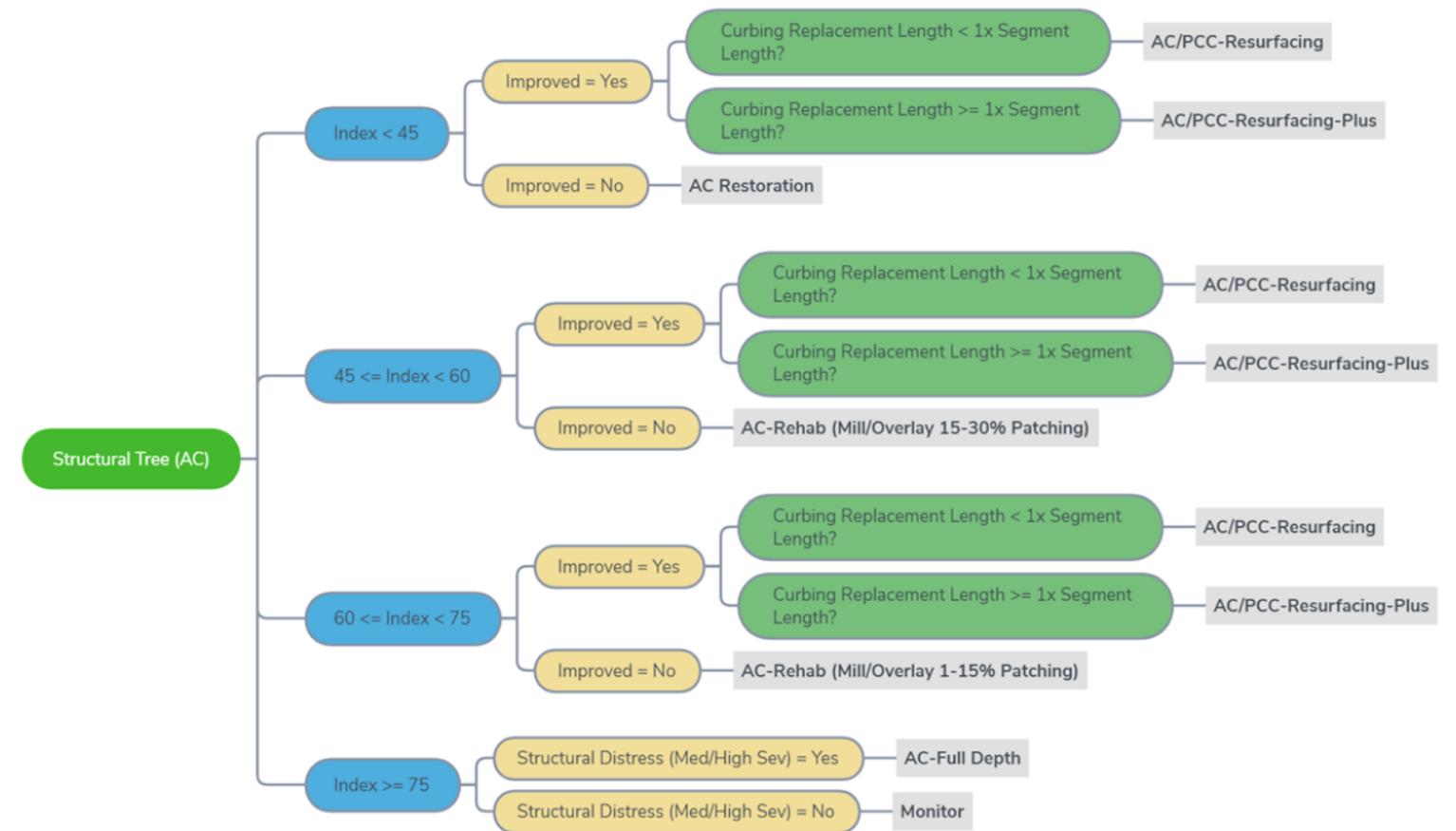


# Pavement Treatment Selection Manual



Examples of a decision tree:  
(Structural distress tree for in-house projects)

Figure 16: Decision Tree- AC Structural- In-House

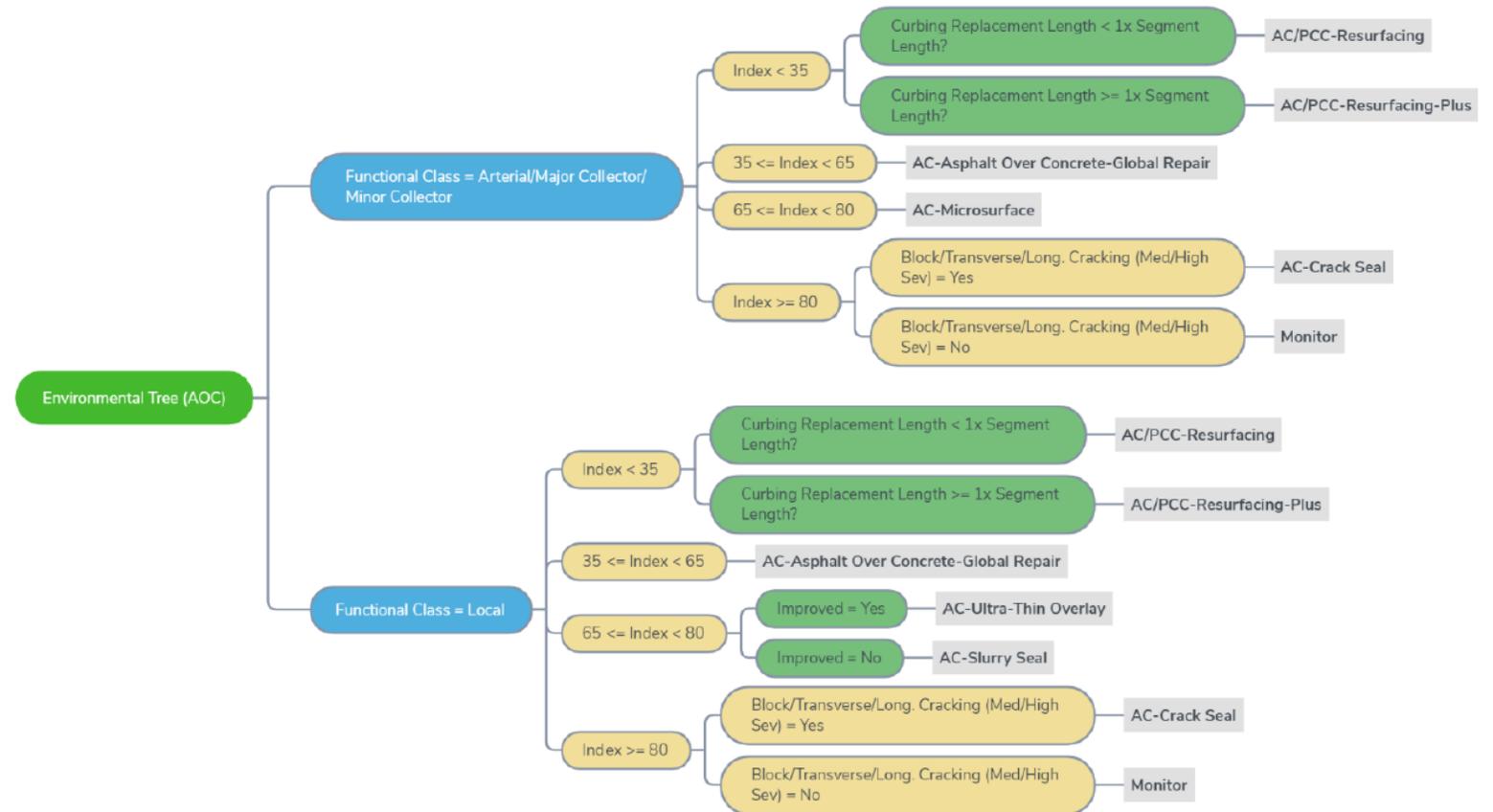


# Pavement Treatment Selection Manual



Another example on Environmental distress tree (for contractual work)

Figure 17: Decision Tree- AOC Environmental-Contract





# Funding Sources for Street Treatment Types





## Funding Sources for treatment types

### Capital/Bond Fund

Bond Funds - Treatment Types		
Reconstruction		
Treatment	Anticipated Life of Treatment	Cost per Lane mile*
Resurfacing	20-25*	\$350,000-\$400,000
Reconstruction	30+ *	\$1,500,000**

\*Note: Life of treatment refers to the next time a resurfacing or reconstruction is needed. There will be maintenance repairs on the street to maintain or extend the life of the street.

\*\*Average reconstruction cost presented can vary based upon variables such as complete street features and drainage needs.

### General Fund

General Funds - Treatment Types		
Preservation		
Treatment	Anticipated Life of Treatment	Cost per Lane mile*
Light Slurry/Onyx	5-7	\$20,300
Slurry Seal	5-7	\$18,730
Microsurfacing	5-7	\$26,950
Maintenance		
Full Depth Asphalt	5-7	\$82,500
Asphalt over Concrete	10-15	\$231,000
Partial Reconstruction (Concrete)	10-12	\$156,200
Rehabilitation(Asphalt)	10-12	\$198,000
Restoration (Asphalt)	18-20	\$200,200
Resurfacing (Asphalt or Concrete)	20-25	\$350,000-\$400,000**

\*Note:2019 Contract pricing. Anticipate a new Preservation contract to be let this summer and may see higher unit prices.

\*\*Cost for resurfacing will vary based upon needs for extensive base repair and curb and sidewalk repairs.





## Overall life costs of 1 lane mile of roadway

### Asphalt

Evaluate for:	Year	Cost
Initial Construction	0	
Warranty	<1	\$0
Crack seal	2	\$12,000
Light Slurry	4-5	\$20,300
Slurry Seal	5-7	\$18,730
Slurry Seal	10	\$18,730
Slurry/full depth repairs	15	\$82,500
Mill and overlay	20	\$400,000

\$548,260

Average Cost per year

\$27,413

### Concrete

Evaluate for:	Year	Cost
Initial Construction	0	
Warranty	<1	\$0
Partial Reconstruction	15	\$156,200
Enhanced Partial Reconstruction	20	\$186,000
Reconstruction	30	\$1,500,000

\$1,842,200

Average Cost per year

\$61,407





# Discussion/Questions





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