

Module 3-11

Identification of Feasible Alternatives

Objectives

Describes what a decision tree or chart is, and how it's developed

Describe how to analyze a specific project and develop a list of treatments that best fit the needs of that project

Discusses some limitations associated with the strict use of decision trees

Introduction

Decision trees are developed as an aid to help the engineer sort through the many items that should be considered in treatment selection

They help account for the specific distress encountered and the basic mechanisms that are at work within a pavement section

Pavement Condition

Pavement condition is usually the single most important piece of information to be considered when assessing a pavement and it's rehabilitation needs

Pavement Condition

- Fatigue cracking
- Transverse cracking
- Rutting
- Raveling or wearing

Use of Decision Trees

Example estimating distress mechanism from table of distress groups

- Distress group - Fracture
- Distress Mode - Flexible Pavement cracking
- Distress Mechanisms
 - Excessive loading
 - Repeated loading (i.e. Fatigue)
 - Thermal changes/Moisture changes
 - Slippage/Shrinkage

Use of Decision Trees

Example estimating cause and treatment from table of pavement distress and possible causes and treatments

- Distress
 - Rutting
- Possible Causes
 - HMA mix design
 - Structural deficiency
 - Stability of pavement layers
 - Compaction

Use of Decision Trees

Example estimating cause and treatment from table of pavement distress and possible causes and treatments

- Distress
 - Rutting
- Rehabilitation Alternatives
 - Cold milling with profile requirements, with or without overlay
 - Heater scarification or milling with overlay
 - Replacement

Use of Decision Trees

Example estimating cause and treatment from table of pavement distress and possible causes and treatments

- Distress
 - Raveling
- Possible Causes
 - Low asphalt content
 - Excessive air voids
 - Water susceptibility
 - Aggregate characteristics
 - Hardness and durability of aggregate

Use of Decision Trees

Example estimating cause and treatment from table of pavement distress and possible causes and treatments

- Distress
 - Raveling
- Rehabilitation Alternatives
 - Dilute emulsion fog seal
 - Sand seal
 - Slurry seal
 - Thin HMA overlay

Use of Decision Trees

Example estimating cause and treatment from table of pavement distress and possible causes and treatments

- Distress
 - Alligator cracking
- Possible Causes
 - Structural deficiency
 - Excessive air voids in HMA
 - Asphalt cement properties
 - Stripping of asphalt from aggregate

Use of Decision Trees

Example estimating cause and treatment from table of pavement distress and possible causes and treatments

- Distress
 - Alligator cracking
- Rehabilitation Alternatives
 - Seal coat
 - Replacement (full depth patching with HMA)
 - Structural HMA overlay
 - Recycle
 - Reconstruction

Limitation of Decision Trees

Decision trees should be treated as an analysis aid, helping the engineer sort through a large amount of project related information to provide conformation of possible cause for the distress, and the possible treatments that could be used

Decision trees should not be used as mandatory requirements