*A*sphalt

*P*avement

*E*valuation
and

*P*reservation

(Part 1) APEP 1

FLEXIBLE PAVEMENT PRESERVATION

(Part 1) APEP 3

Introduction

Rehabilitation

- **Traffic loads / volumes**
- **Aging pavement system**
- **Limited financial resources**
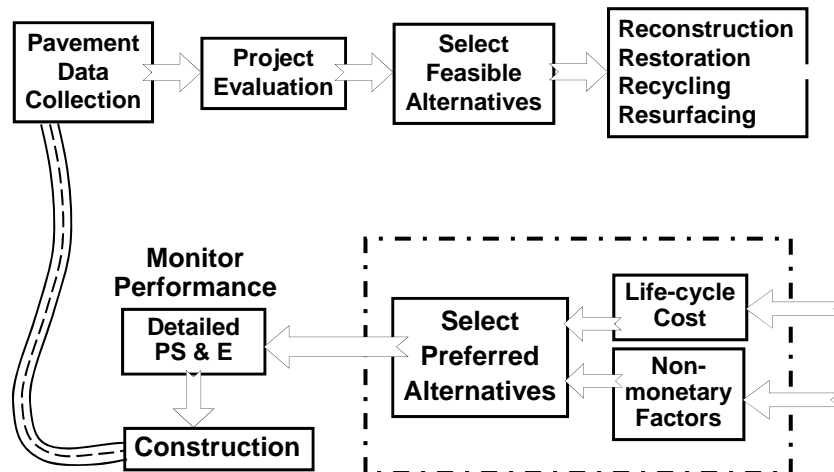
Need for training in rehabilitation

- **More difficult than new design**
- **Technology advancing rapidly**

(Part 1) APEP 4

Course Organization

1: **Introduction & data inventory**

2: **Pavement Condition Surveys**

3: **Project Evaluation**

4: **Maintenance Techniques**

5: **Surface Rehabilitation**

6: **Hot-Mix Asphalt Overlays**

(Part 1) APEP 5

Steps in the Preservation Process


```
Pavement          Project         Select          Reconstruction
Data       →     Evaluation  →    Feasible    →   Restoration
Collection                        Alternatives    Recycling
                                                  Resurfacing
```

Monitor
Performance

Detailed   ←   Select   ←   Life-cycle
PS & E   Preferred   Cost
                 Alternatives   Non-
                                  monetary
Construction   Factors

(Part 1) APEP 6

Importance of Pavements

➲ Pavements deteriorate with time

➲ Utah study

➲ Good roads cost less

   • If maintained at a reasonable level of service

   • If responsive to preventive maintenance

(Part 1) APEP 7

Effect of Treatment Timing on Costs

PCI

40% Time $ 0.70

70% Time $ 3.50

90% Time $ 6.15

$ 14.00

AGE
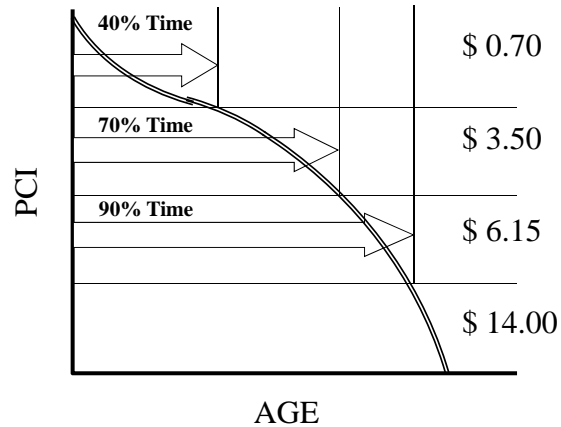
(Part 1) APEP 8

1990 AASHTO Guidelines for PMS

" A Pavement Management System is designated to provide *objective information* and useful data for analysis so that highway managers can *make consistent, cost-effective,* and defensible decisions related to the preservation of a pavement network"

(Part 1) APEP 9

Four Activities

➲ *Inventory*

- **Construction, maintenance and rehabilitation history**
- **Traffic**

➲ *Pavement condition survey*

➲ *Project prioritization*

➲ *Budget development*

(Part 1) APEP 10

Condition Survey

➲ *Combines the pavement distress data into a score or index*

➲ *Represents overall pavement condition*
- *Describes system condition*
- *Uses priority ranking scheme*
- *Uses decision tree approach as primary criteria to select project, timing and treatments*

(Part 1) APEP 11

Condition Survey Outputs

- ➔ *Ranking of pavement segments by condition index*
- ➔ *Identification of MR&R strategies and timing for individual pavement segments*
- ➔ *Estimate of funding needs for selected treatments*

(Part 1) APEP 12

Prioritization

- ➔ *Prioritized listing of projects requiring action*
- ➔ *Costs for MR&R treatments*
- ➔ *Funding needs to meet desired network condition*
- ➔ *Single-year and multi-year programs with segments treatment timing and cost identified*

(Part 1) APEP 13

Budget

⮥ *Provide an estimate of budget requirements*

⮥ *At prescribed levels of performance*

⮥ *Primary objective is to provide information for specific pavement segments:*
 •*Preferred MR&R for each project*
 •*MR&R costs*
 •*Expected MR&R performance*

(Part 1) APEP 14

Inventory Plan

⮥ *Inventory process is foundation of a PMS*
⮥ *Data must be:*
 • *Relevant*
 • *Reliable*
 • *Cost effective to collective*
 • *Cost effective to maintain*

(Part 1) APEP 15

Inventory Plan Factors

➲ **What decisions are to be made ?**

➲ **What data is necessary to make decisions ?**

➲ **Size of pavement network**

➲ **Type and characteristics of agency**

(Part 1) APEP 16

Inventory Plan Factors

➲ **Type and cost of data acquisition and processing**

➲ **Required accuracy of data**

➲ **Required frequency of data collection**

➲ **Database capabilities**

(Part 1) APEP 17

2/4/2012

Two Important Rules

Collect only the data you need !

Collect the data only when you need it !

(Part 1) APEP 18

Typical Data Element

Pavement

- *Location*
- *Geometry*
- *Pavement Structure & History*
- *Traffic*

Pavement Condition

(Part 1) APEP 19

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Additional Data Elements

Drainage information

Geographical / environmental classification

Proposed work / work-in-progress

Other information

(Part 1) APEP 20

Defining Sections

*T*he length or size of sections will determine volume of data to be collected

Large sections
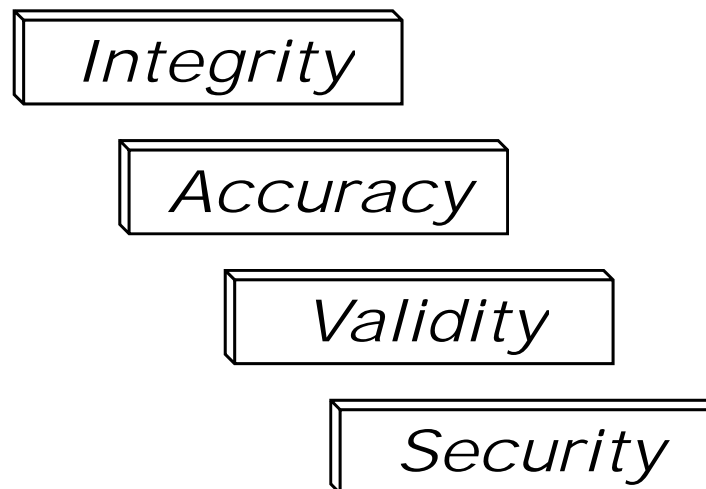
Small sections

Section requirements

(Part 1) APEP 21

Homogeneous Sections

➲ **Change in pavement type**

➲ **Change in pavement structure**

➲ **Change in traffic**

➲ **Boundary between previous construction**

➲ **Change in subgrade**

➲ **Geographical of political boundaries**

➲ **Change in pavement condition**
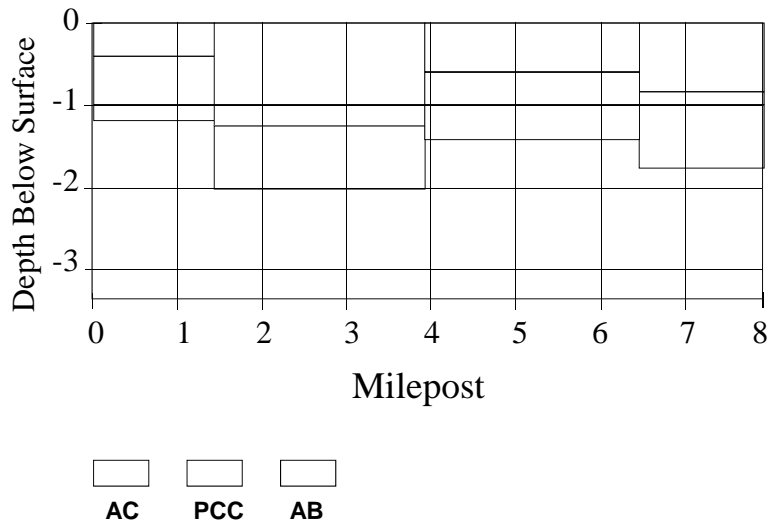
(Part 1) APEP 22

Quality Control of Data

Integrity

Accuracy

Validity

Security

(Part 1) APEP 23

Strip Maps

- ➲ **Profiles of inventory data**
- ➲ **Requires a well developed linear referencing system**
- ➲ **Must be able to perform dynamic segment segmentation**
- ➲ **Common uses**
  - – **traffic data**
  - – **pavement structure**
  - – **section boundaries**

(Part 1) APEP 24

Pavement Structure Strip Map

AC   PCC   AB

(Part 1) APEP 25

12

Coffee

***B**reak*

(Part 1) APEP 26