



CASTLE PINES
METROPOLITAN DISTRICT

Long Range Road Maintenance Planning

Infrastructure Committee
February 4, 2021

Introduction

Infrastructure Committee

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Overview of the Presentation

- **What is the current condition of our roadways?**
- **How do we currently maintain them?**
- **How can we use objective criteria for planned management of roadways?**

Current Conditions

- **Asset Value of the Village Roadways**
 - **88 Paved Lane Miles = 671,147 SY Pavement**
 - **Replacement Value = \$80/SY**
 - **Existing Roadway Asset Value = \$53.7 Million**
- **Average Pavement Condition Index (PCI) = 91.3**
 - **Average CPMD Goal = 85**
 - **South Metro communities Average PCI = 76.5**
- **PCI Range 64 – 100**

(Based on 2018 Data from Colorado Asphalt Pavement Association)

Current Roadway Management Approach

- **Two separate plans:**
 - **Long Range Road Maintenance Plan**
 - **Pavement Management Analysis Report from 2018**
- **Reactive maintenance plan**
- **Projects behind or deferred**

Objectives

- **Preserve structural integrity and functionality**
- **Objective, proactive management**
- **Optimize the budget**

Strategy to Achieve a Better Approach

- **Define roadway classes**
- **Establish minimum standards**
- **Assist in developing infrastructure budget**

Overview

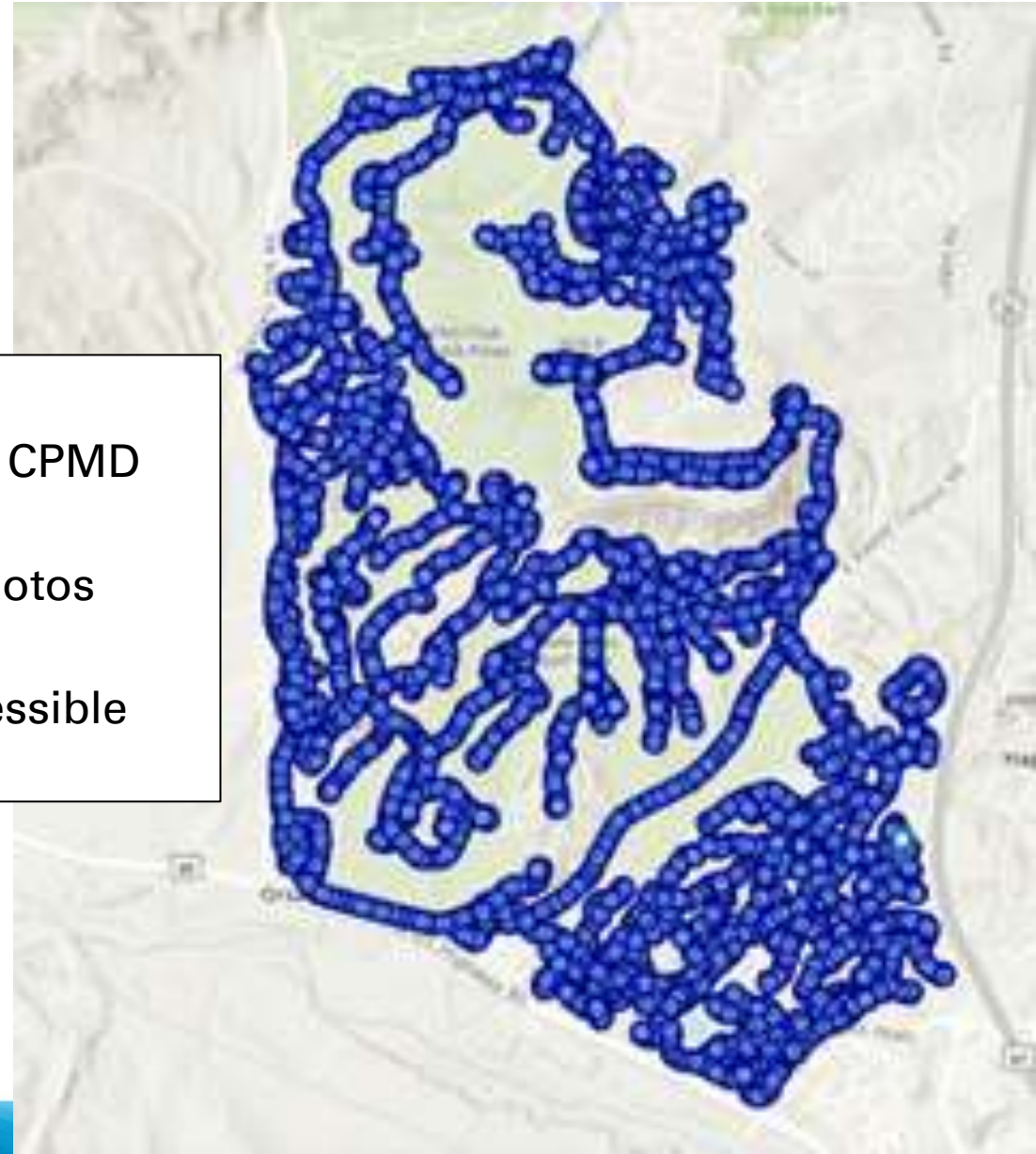
- I. Data
- II. Pavement Condition Index (PCI)
- III. Drainage Considerations
- IV. Roadway Classifications
- V. Rankings
- VI. Road Prioritization & Treatments
- VII. Committee Overview

Data Overview



Visual Data Collection

- Photo data collected for CPMD road network
- Over 8000 panorama photos collected and evaluated
- Georeferenced and accessible via a cloud database



Data Overview continued

Factors Evaluated

- **PCI**
- **Transverse Cracking**
- **Rideability**
- **Visual Appearance**
- **Drainage Issues**
- **Crack Seal**

Data Overview continued

Transverse Cracking

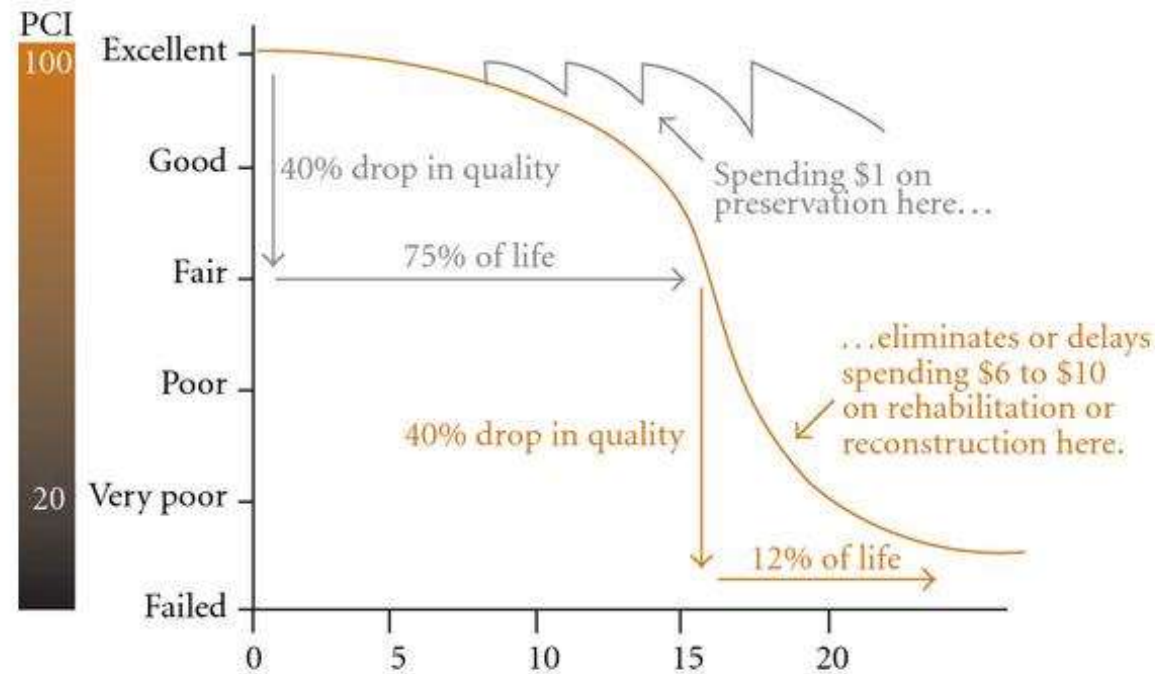
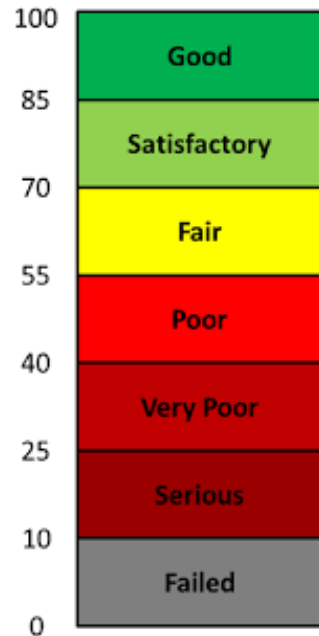


Depressed Manhole



Pavement Condition Index (PCI)

0  100, General condition of pavement section.

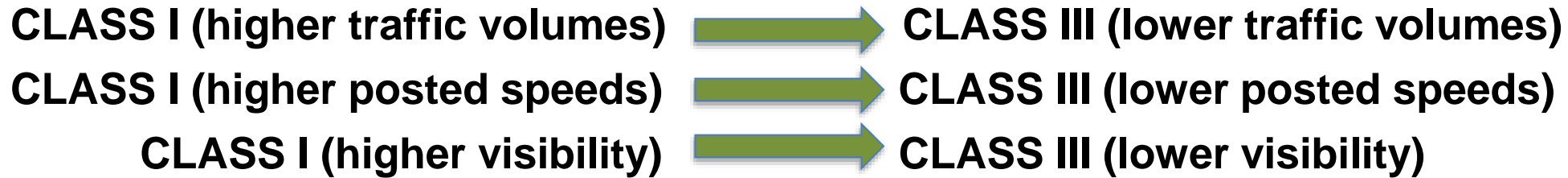


Drainage Considerations

Observed areas with potential drainage issues

- **Field evaluation of potential problem areas**
- **Identify additional data needs or potential solutions**

Roadway Classifications



I

- Primary residential collectors for the community

II

- Secondary “through” roads or long cul-de-sacs (greater than 1000 LF)

III

- No outlet or cul-de-sac roads (less than 1000 LF or less than 12 units/homes)

IV

- Parking lots

Rankings

- Rating calculated for each criteria
- Combined weighted rating is calculated based on specified weight factors
- Roadway priorities ranked within each class

Criteria Used

- Class I & II (PCI=3, Rideability=2, Visual Appearance=1)
- Class III & IV (PCI only)

Road Prioritization & Treatments

Class I (higher \$\$/Ln Mi)  Class III (lower \$\$/Ln Mi)

Reconstruction	\$\$\$\$\$\$\$\$\$\$\$\$
Mill & Overlay	\$\$\$\$\$\$
Thin Overlay	\$\$
Micro Surface	\$
Seal Coat	\$

Roadway Prioritization Model – Long Term

- **Develop a long-term schedule of maintenance**
- **Create a long-term budget to ensure we can meet those needs**

ANNUAL BUDGET BASED ON SCHEDULED MAINTENANCE PROGRAM								
	CRACK SEAL		SEAL COAT		MILL & OVERLAY			
	Cost (\$\$/SY)=	\$0.90	Cost (\$\$/SY)=	\$2.75	Cost (\$\$/SY)=	\$16.02		
Roadway Class	Frequency (Yrs)	Cost	Frequency (Yrs)	Cost	Frequency (Yrs)	Cost	Total	\$\$/Lane Mi.
Class I	2	\$80,000	4	\$150,000	15	\$230,000	\$460,000	\$15,576
Class II	3	\$60,000	5	\$130,000	18	\$220,000	\$410,000	\$12,535
Class III	3	\$45,000	6	\$75,000	21	\$125,000	\$245,000	\$10,417
							\$1,115,000	\$12,843

Roadway Prioritization Model – Short Term

- **Annually identify the top 20 projects for each classification**
- **Use minimum standards for each classification to plan for the projects that are top priority**

Effective Management is Critical

- **Designated Roadway Project Manager**
- **Job functions would include but not be limited to:**
 - **Evaluating and overseeing top 20 projects**
 - **Inspecting new construction**
 - **Ensuring quality control of repairs**
 - **Acting as the liaison to the Infrastructure Committee**
 - **Keeping database current**

Meeting our Objectives

- **Preserve Structural Integrity and Functionality**
By setting minimum standards for each road we ensure the pavement conditions in the entire network never fall below an irreparable level
- **Objective, Proactive Management**
The Roadway Prioritization Model enables a data driven approach and ability to plan projects for each year proactively
- **Optimize the Budget**
By allocating dollars to the greatest need while also allowing for planned frequency of maintenance we are ensuring we maximize the efficiency of the budget



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**Thank you for your time and attention.
Any questions or comments?**