Pavement Management System Implementation Introduction

City of Newberg

City Council Meeting

February 18, 2014

PAVEMENT SERVICES, INC.

John Duval, P.E
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Pavement Services, Inc. (PSI)

- Based in Portland, OR since 1985
- Specializes exclusively in engineering, management, testing, and investigation of pavements

VISION

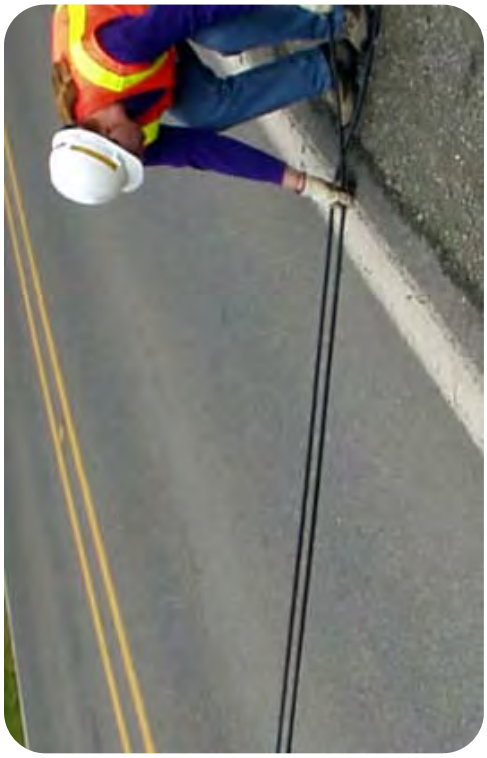
Working collaboratively with our clients to improve transportation safety and efficiency by providing unparalleled service in pavement engineering

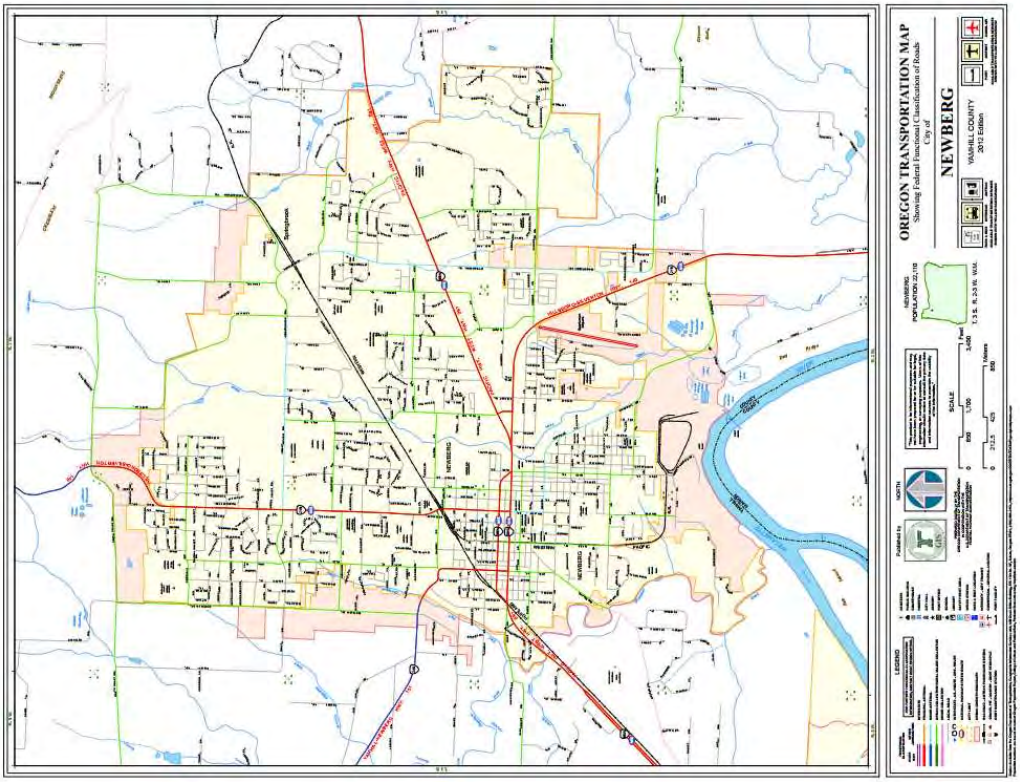
Project Details

- **Pavement Coring**
  - Create a database of the City's pavement structure
  - Fill in the gaps where there is no information on the asphalt and base aggregate thickness
- **Traffic Counts**
  - Collect Traffic Count Data at 60 locations and update vehicle classification
  - Validate the Federal Functional Classification (FFC)
    - Minor Arterial
    - Major Collector
    - Minor Collector
- **Pavement Management System Implementation**
  - Pavement Condition Index (PCI) Survey
  - Budgetary Analysis
  - Project Development
- **Newberg has 65.5 miles of paved streets (or 131 lane miles)**
- **Street Network Replacement Value is Approximately $150 million**

Pavement Coring

Traffic Counts





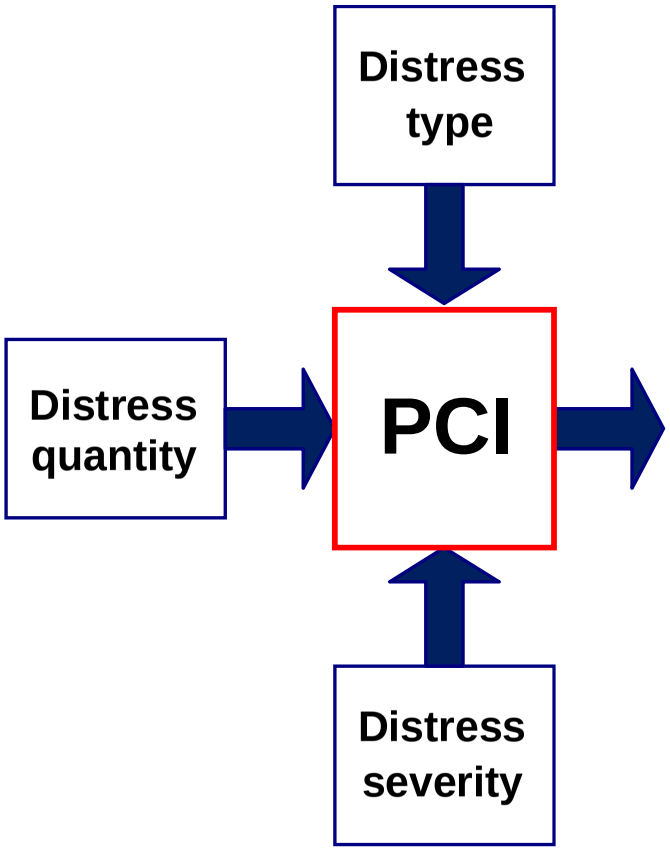
Pavement Management System Implementation

MicroPAVER Provides Pavement Management Capabilities To:

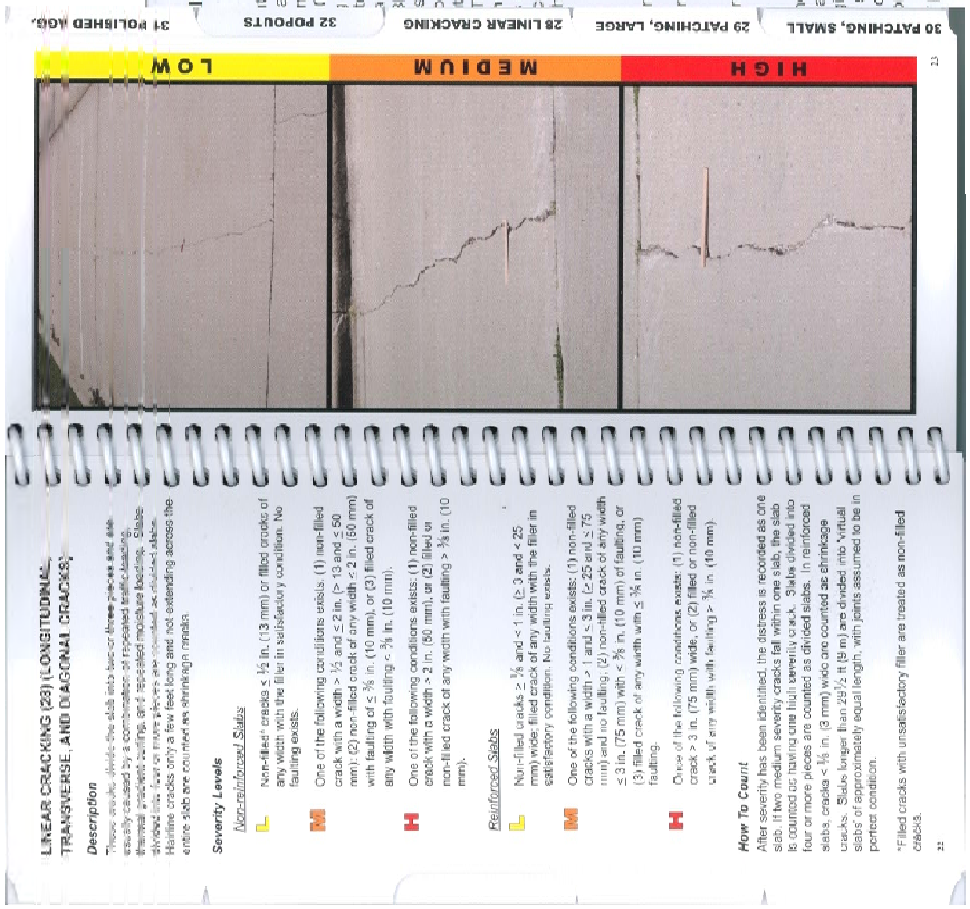
- Develop and organize the pavement inventory
- Assess the current condition of pavements
- Develop models to predict future conditions
- Report on past and predict future pavement performance
- Develop scenarios for Maintenance & Repair (M&R) based on budget or condition requirements
- Plan Projects

Pavement Condition Survey

Pavement Condition Index (PCI)



Roads & Parking : ASTM D 6433-11



LINEAR CRACKING (23) (LONGITUDINAL, TRANSVERSE, AND DIAGONAL CRACKS)

Description

These cracks divide the slab into two or three pieces and are usually caused by a combination of repeated traffic loading, thermal cracking, and repeated moisture loading. Slabs divided into four or more pieces are considered alligator cracking. Hairline cracks only a few feet long and not extending across the entire slab are not normally considered a distress.

Severity Levels

Non-reinforced Slabs:

L Non-filled cracks ≤ ½ in. (13 mm) or filled cracks of any width with the filler in satisfactory condition. No faulting exists.

M One of the following conditions exists: (1) non-filled crack with a width > ½ and ≤ 2 in. (> 13 and ≤ 50 mm); (2) non-filled crack of any width ≤ 2 in. (50 mm) with faulting of ≤ ⅜ in. (10 mm), or (3) filled crack of any width with faulting < ¾ in. (10 mm).

H One of the following conditions exists: (1) non-filled crack with a width > 2 in. (50 mm), or (2) filled or non-filled crack of any width with faulting ≥ ¾ in. (10 mm).

Reinforced Slabs:

L Non-filled cracks ≥ ½ and < 1 in. (≥ 3 and < 25 mm) wide, filled crack of any width with the filler in satisfactory condition. No faulting exists.

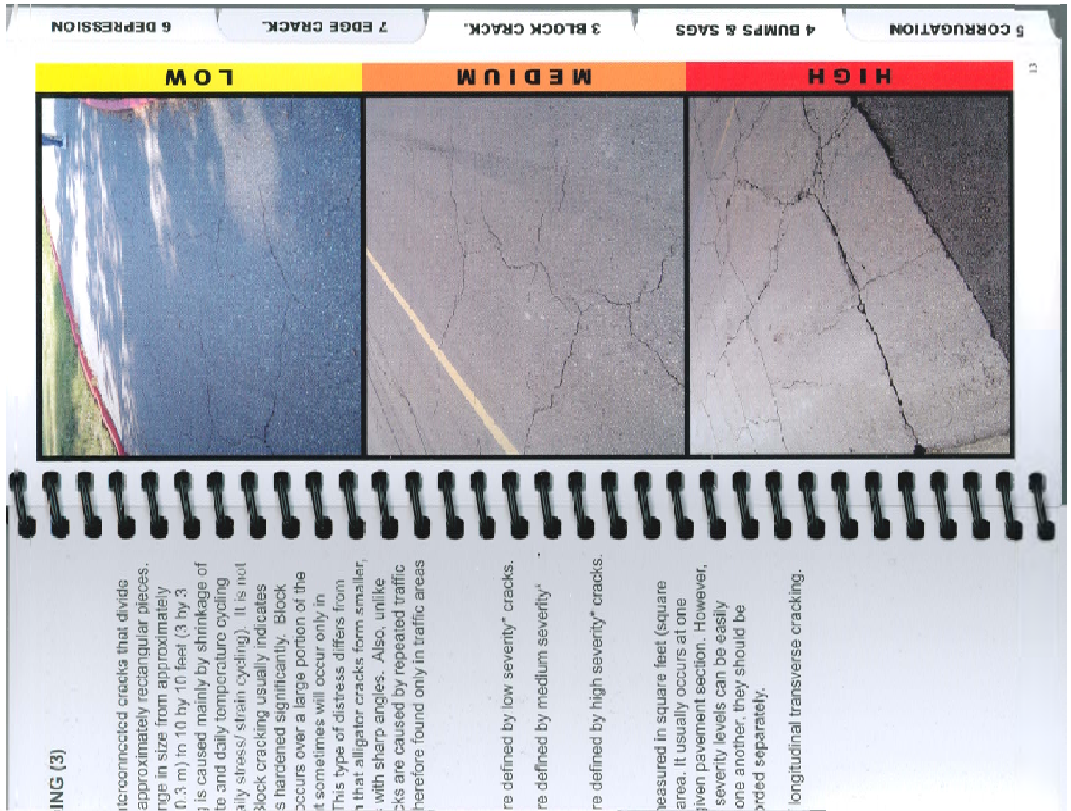
M One of the following conditions exists: (1) non-filled cracks with a width ≥ 1 and < 3 in. (≥ 25 and ≥ 75 mm) and no faulting, (2) non-filled crack of any width ≤ 3 in. (75 mm) with ≤ ⅜ in. (10 mm) of faulting, or (3) filled crack of any width with ≤ ¾ in. (10 mm) faulting.

H One of the following conditions exists: (1) non-filled crack ≥ 3 in. (75 mm) wide, or (2) filled or non-filled crack of any width with faulting ≥ ¾ in. (10 mm).

How To Count

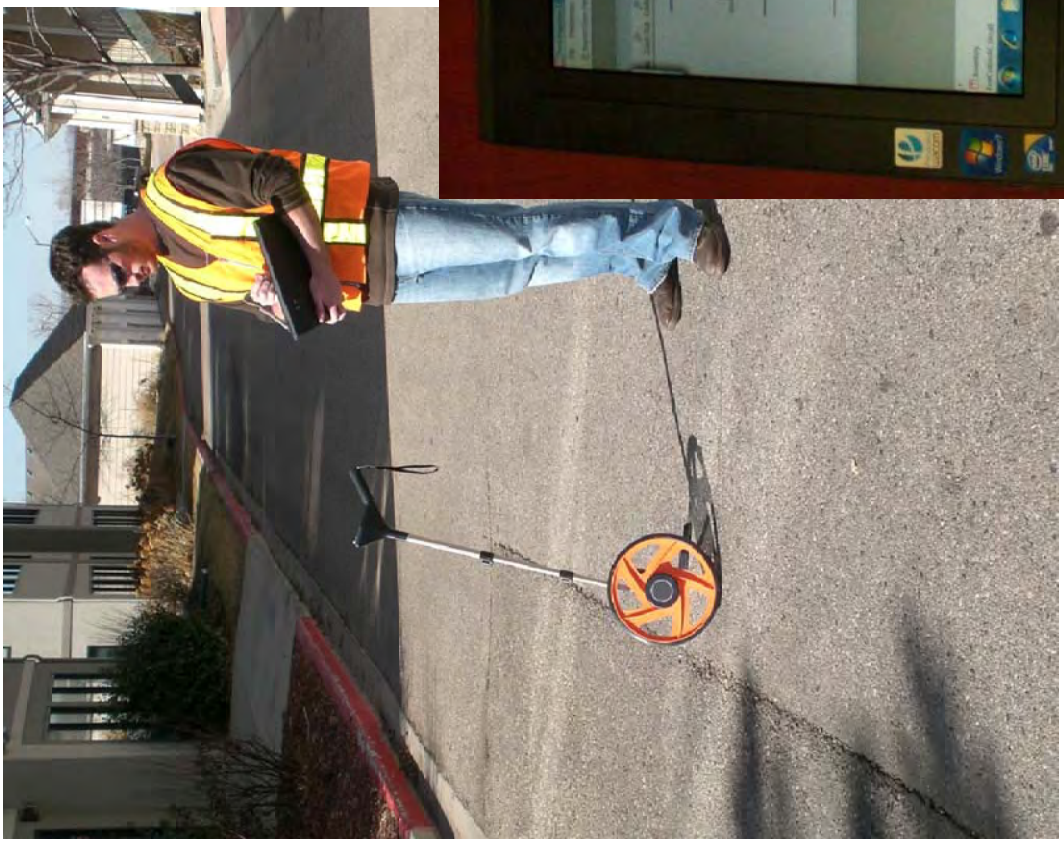
After severity has been identified, the distress is recorded as one slab. If two medium severity cracks fall within one slab, the slab is counted as having one high severity crack. Slabs divided into four or more pieces are counted as divided slabs. In reinforced slabs, cracks < ½ in. (3 mm) wide are counted as shrinkage cracks. Slabs larger than 25 ft² (9 m²) are divided into "virtual slabs" of approximately equal length, with joints assumed to be in perfect condition.

"Filled cracks with unsatisfactory filler are treated as non-filled cracks.

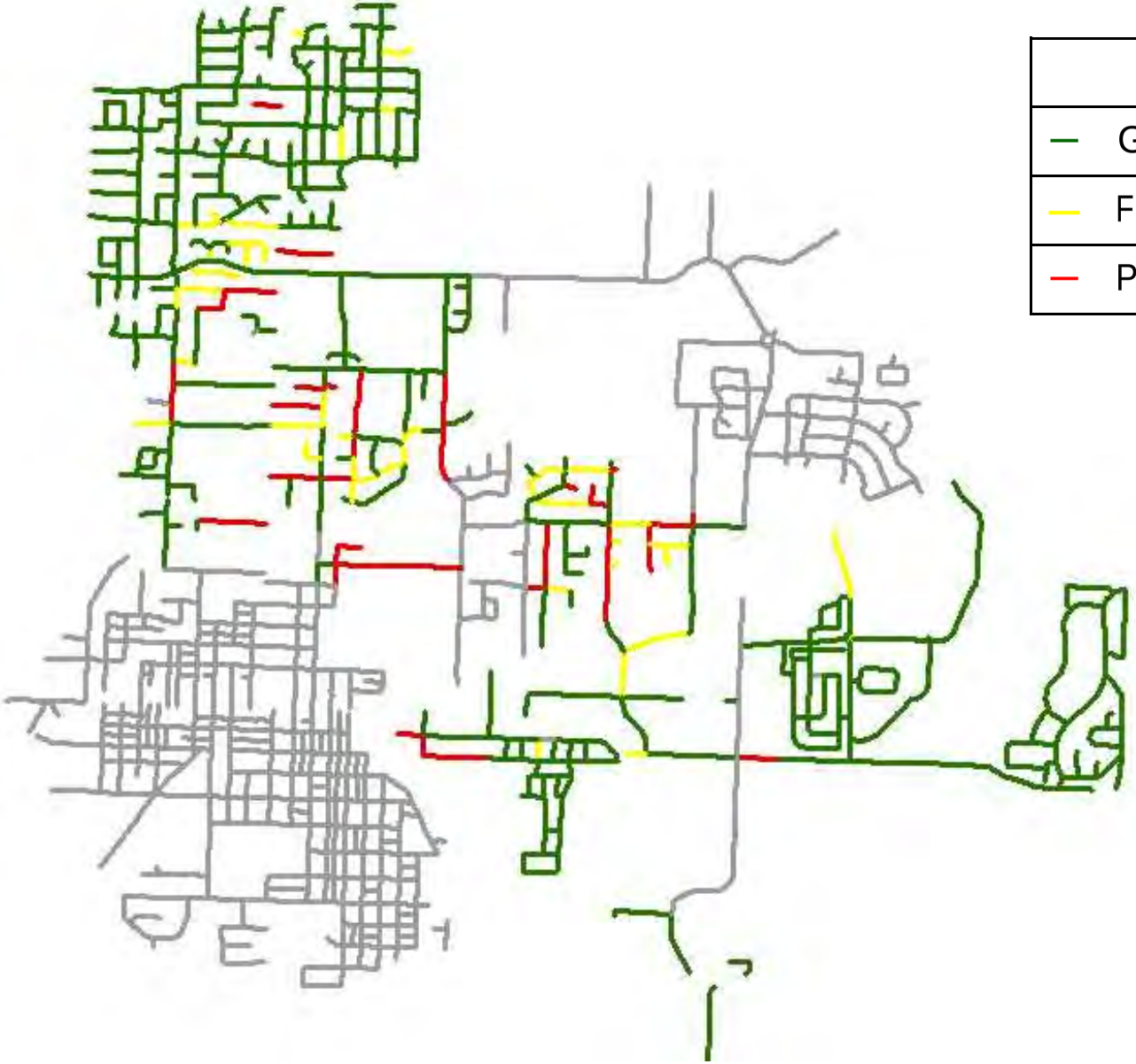


31 POLISHED AGG.
32 POPOUTS
28 LINEAR CRACKING
29 PATCHING, LARGE
30 PATCHING, SMALL
5 CORRUGATION
4 BUMPS & SAGS
3 BLOCK CRACK.
7 EDGE CRACK
6 DEPRESSION

PAVER FieldInspector™



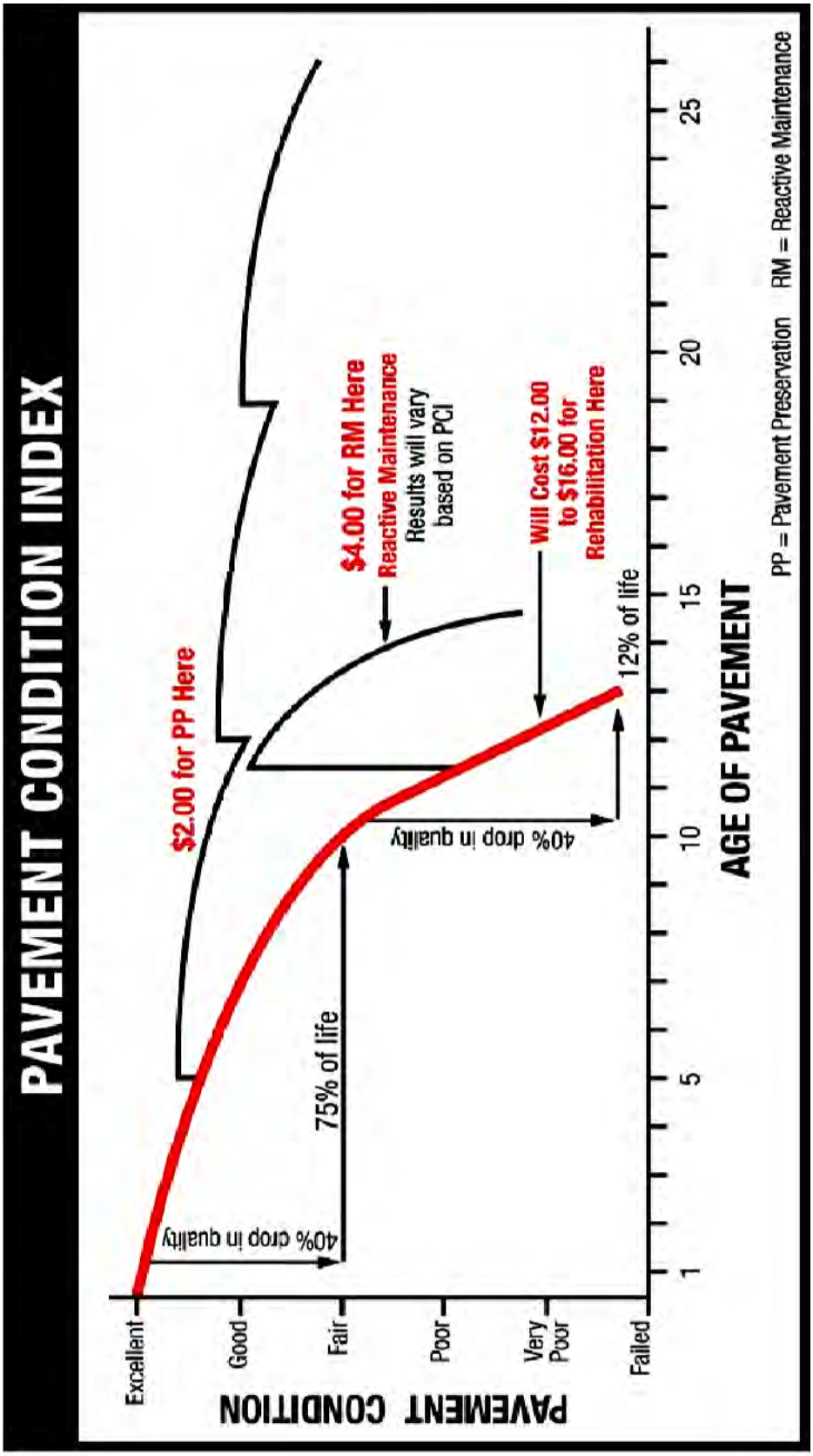
In Progress PCI Survey Results



PCI Rating
Good (71 – 100)
Fair (56 – 71)
Poor (0 – 55)

*An Example from Preliminary Analysis, January 2014

Benefits of Knowing your Network



Maintenance & Repair (M&R) Work Planning

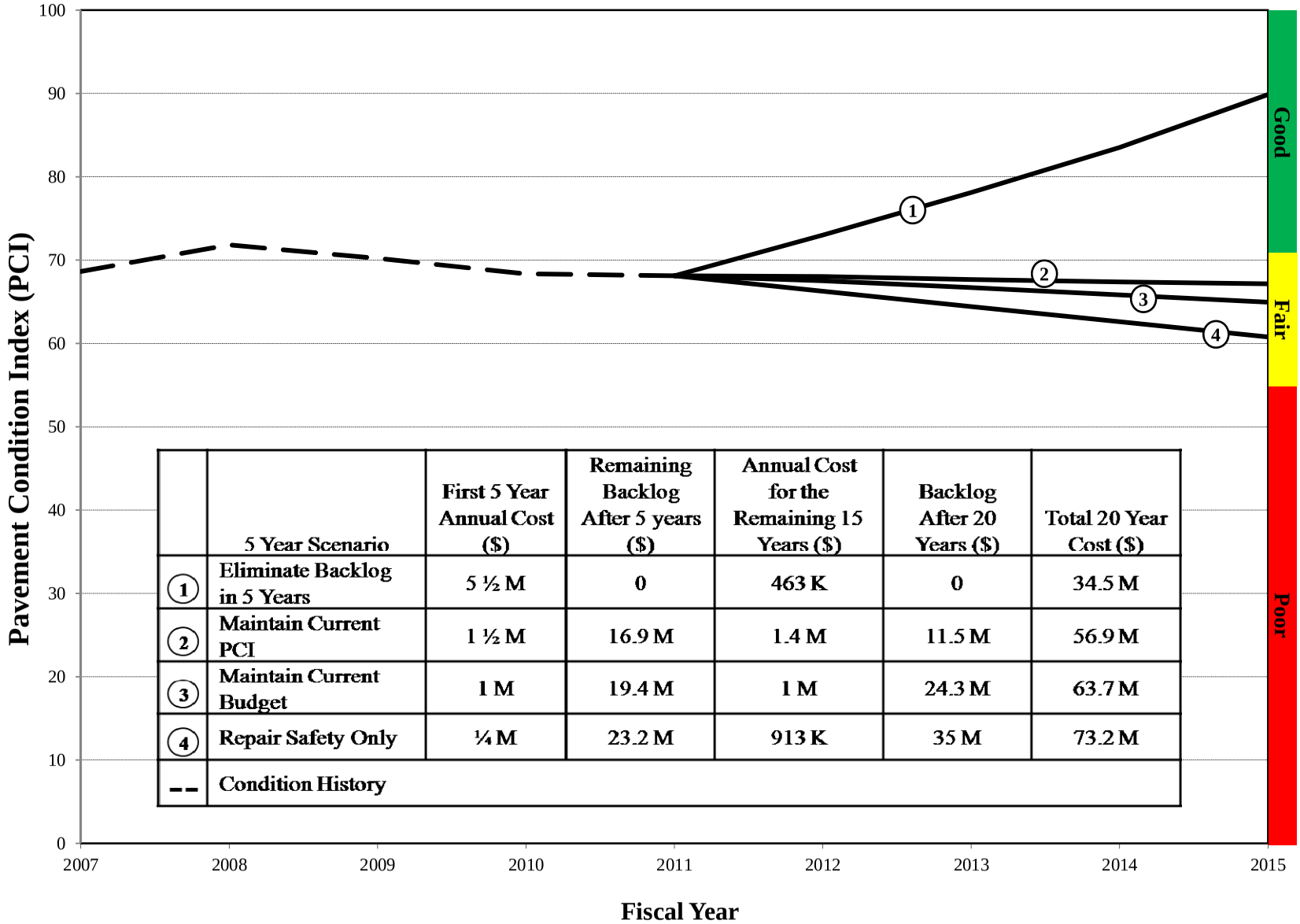
Determine Budget Consequence:

- Consequence of different budgets on condition and backlog of M&R

Determine Budget Requirement:

- Eliminate backlog of major M&R in a specified period of time
- Maintain current area-weighted PCI over a specified period of time
- Reach desired area-weighted PCI in a specified period of time

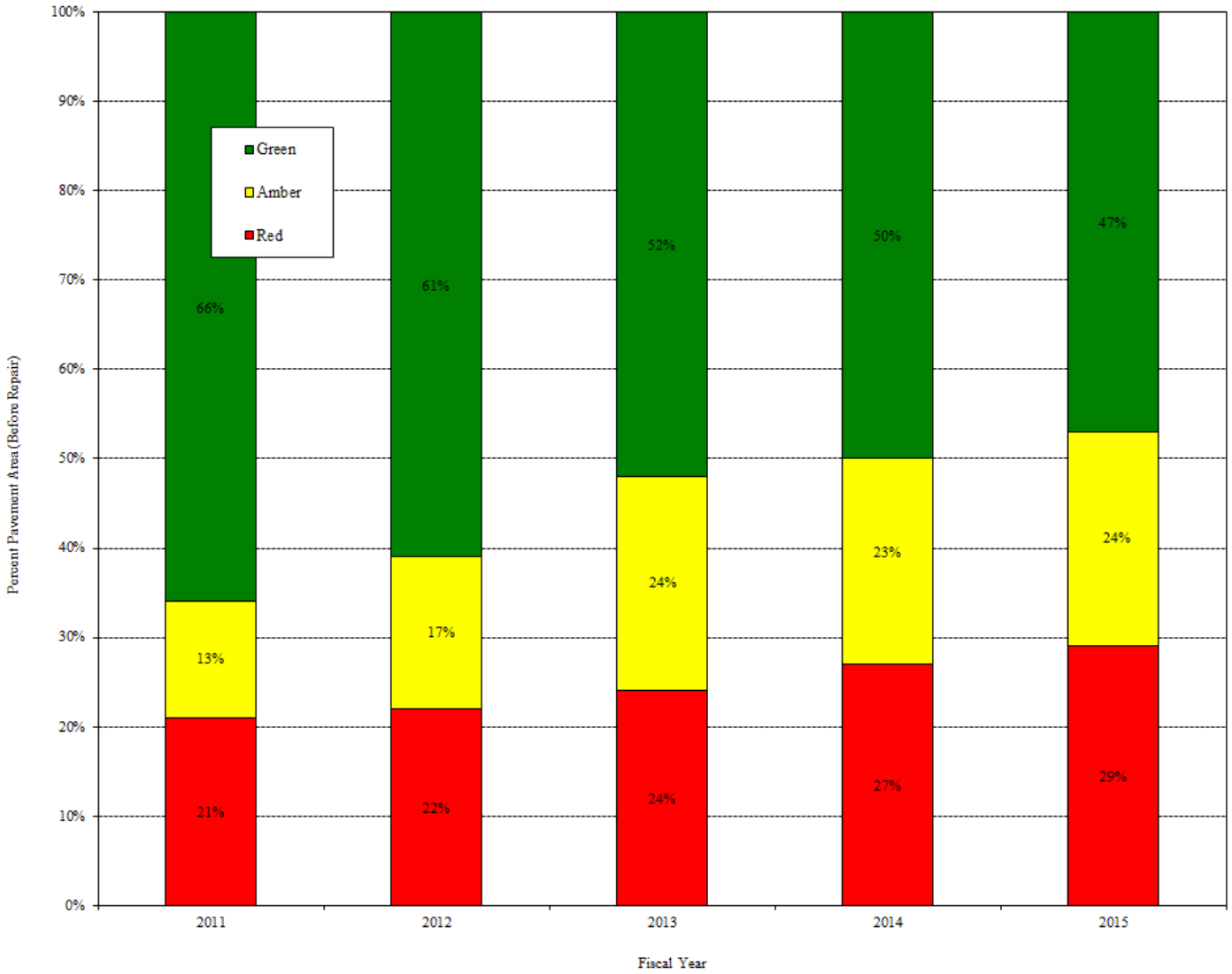
Effect of M&R Budget on PCI



	5 Year Scenario	First 5 Year Annual Cost ($)	Remaining Backlog After 5 years ($)	Annual Cost for the Remaining 15 Years ($)	Backlog After 20 Years ($)	Total 20 Year Cost ($)
1	Eliminate Backlog in 5 Years	5 ½ M	0	463 K	0	34.5 M
2	Maintain Current PCI	1 ½ M	16.9 M	1.4 M	11.5 M	56.9 M
3	Maintain Current Budget	1 M	19.4 M	1 M	24.3 M	63.7 M
4	Repair Safety Only	¼ M	23.2 M	913 K	35 M	73.2 M
--	Condition History					

*PCI and Cost Data Example from a project in another city

Condition Reaction to Different Budgets

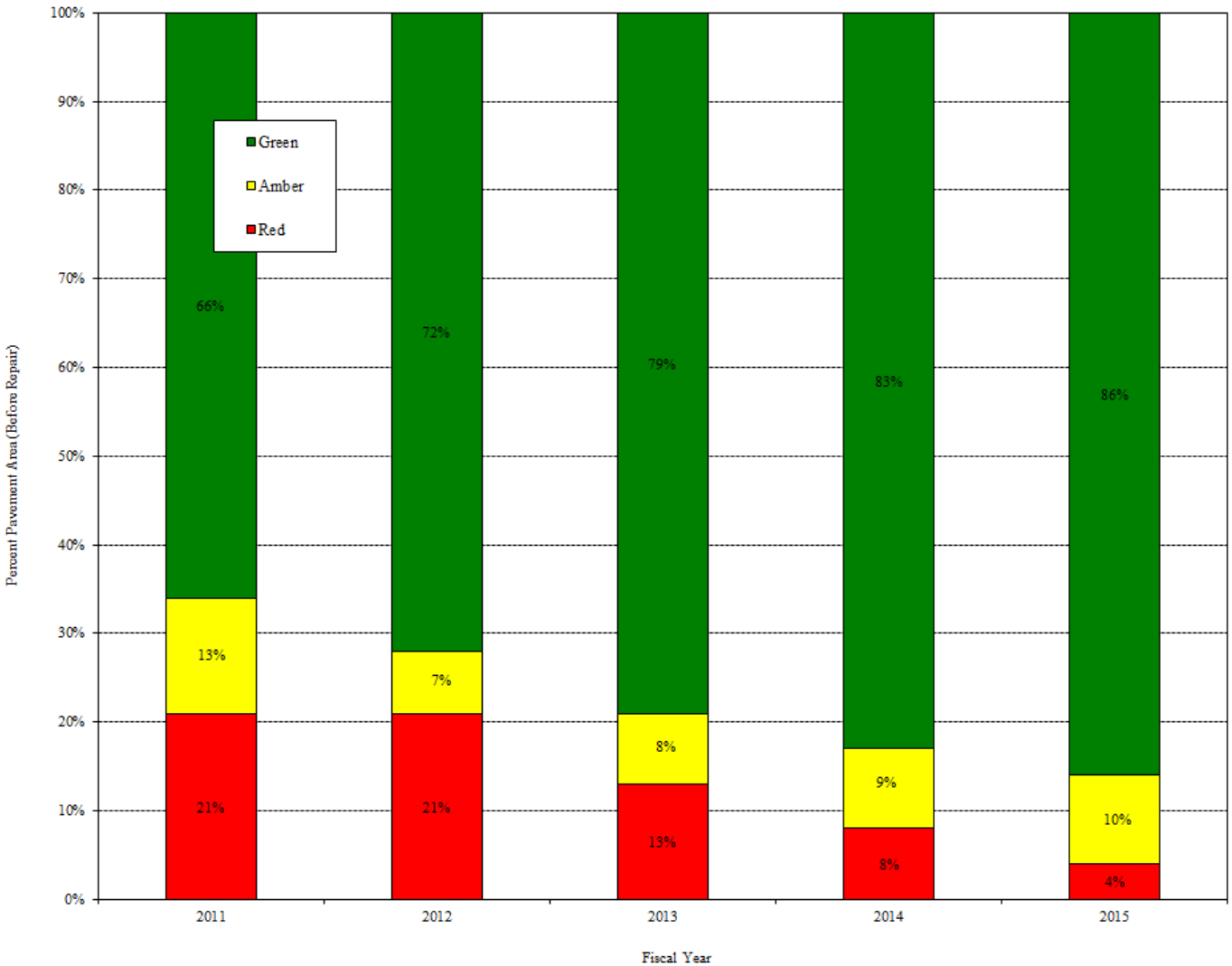


Stopgap/ Safety Work Funded Only ($230K/ Year for 5 Years)

*PCI and Cost Data Example from a project in another city

EXHIBIT "A"
Update regarding pav eval proj & pav mgmt sys implementation
Council mtg on 2014_0218

Condition Reaction to Different Budgets



Backlog Eliminating Budget ($17M/ Year for 5 Years)

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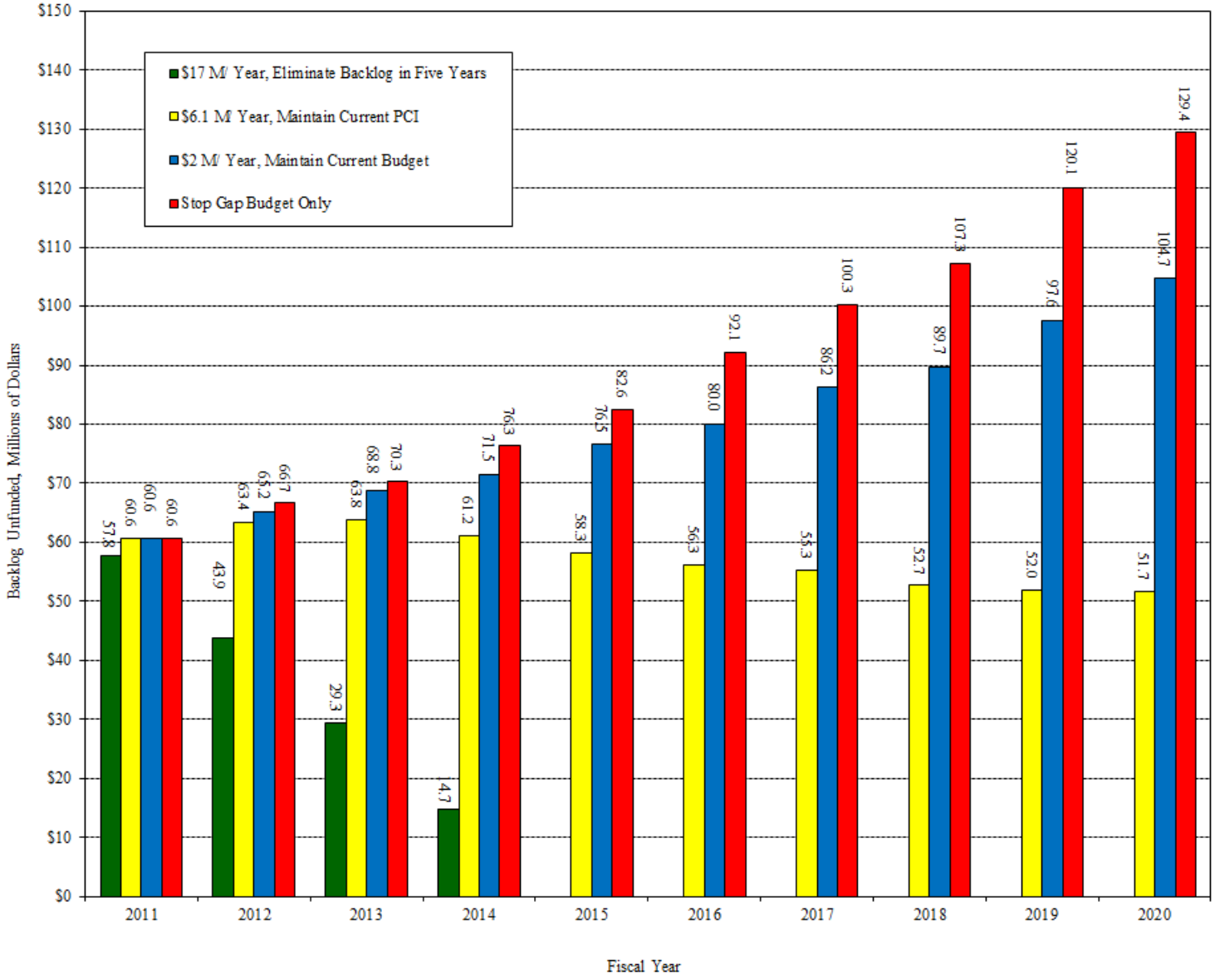
Budget Backlog Based on Various Budget Scenarios



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Thank You

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