Case Study
Vancouver StreetSaver® Implementation

Review and Analyze the City of Vancouver Pavement Management System

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applied pavement TECHNOLOGY

providing engineering solutions to improve pavement performance

Project Scope of Work

- Summarize current practices
- Evaluate commercially available software
- Conduct analysis of investment strategies
- Review & evaluate current pavement management process
- Conduct training
- Present findings to City Council

CoV Pavement System

- ~ 600 centerline miles (1,800 lane miles)
- Pavements segmented at intersections (approximately 7,000 segments)
  - Length, width, number of lanes, functional class, surface type, location & so on
- Pavement surface types: asphalt, concrete, surface seals, & gravel

Pavement Management Activities

- Conduct pavement condition surveys
- Determine treatment types & locations
- Prepare plans, specifications, & cost estimates
- Utility coordination, & associated ADA ramp improvements
- Manage permit program
- Assist construction w/ inspection duties & engineering support
- Budgeting & budget monitoring
- Respond to citizens

Condition Assessment

- Half of the network each year
- Walking survey (100% of pavement surface)
  - Trained temporary staff
  - Note distress type, extent, & severity
  - NWPMA Rating Manual
  - ASTM D6433 Pavement Condition Index
- Distress hand-entered into the pavement management database

Treatment Types

- Slurry seals
- Microsurfacing
- Chip seals
- Cape seals
- Mill & inlay
- Asphalt overlays (2 to 3 in)
- Pulverize & overlay

- ✓ PCI rating
- ✓ Previous treatment applications
- ✓ Pavements within specified area of city

Pavement Management Needs

- Data
  - Construction history
  - Traffic data
  - Future projects
  - Link to GIS
- Condition Assessment
  - PCI based on similar distresses
  - Similar values
- Budget Analysis
  - Evaluate long-term needs
  - Analyze multiple treatments over multiple years
  - Determine funding to meet PCI targets

Pavement Management Needs (cont.)

- Performance prediction
  - Agency-specified models
  - Improve process for defining project needs
- Treatments
  - Allow user-specified treatments & application rules
- Other
  - Generate maps of condition & recommended treatments
  - Agency-proven system
  - Export data/results to Microsoft Excel

Selected Programs

- StreetSaver®
  - Developed by MTC (San Francisco Bay Area)
  - First released in 1987
  - 300+ agencies (mostly on west coast)
- Paver™
  - Developed by Army Corps of Engineers
  - First released in the late 1970s
  - Roadway agencies & airport authorities worldwide

StreetSaver®

- Database
  - Microsoft SQL server
  - Web browser
  - Stored online
  - User login information
- Inventory & work history
  - Section characteristics
  - Routines for grouping segments

StreetSaver® (continued)

- Pavement Condition Index (PCI)
  - ASTM D6433
  - Modified version (7 distress types)
  - MobileRater™ application
- Performance prediction
  - Based on thousands of local agency segments
  - Hard-coded into software
  - Adjusted to pass through the latest PCI value and to account for treatment applications

StreetSaver® (continued)

- Maintenance & rehabilitation activities
  - Common and user-specified treatments
  - Decision trees (strategies & costs)
  - Assigned based on PCI, source of deterioration, surface type, and functional classification

- Budget analysis
  - Maintain pavement segments in very good condition by assigning the lowest cost effective treatment application

StreetSaver® (continued)

- GIS capabilities
- Reporting
  - Built-in and user-specified
  - Training through StreetSaver®

Paver™

- PC-based program
- Database
  - Microsoft Access
  - Use existing Shapefiles
- Inventory & work history
  - Organized by network, branches, & sections
  - Work history types
    - ➢Material and layer type
    - ➢Thickness

Paver™ (continued)

- GIS capabilities
- PCI (ASTM D6433)
  - FieldInspector™
- Performance prediction
  - Combines segments with similar attributes
  - User is able to generate/refine model

Paver™ (continued)

- Maintenance & rehabilitation activities
  - Localized stopgap (e.g., pothole repair)
  - Localized preventive (e.g., crack seal, patching)
  - Global preventive (e.g., surface seals)
  - Major (overlay, reconstruction)
- Budget analysis
  - Maintain network at or above a critical PCI
  - Consequence of localized distress maintenance
  - Major M&R based on minimum condition

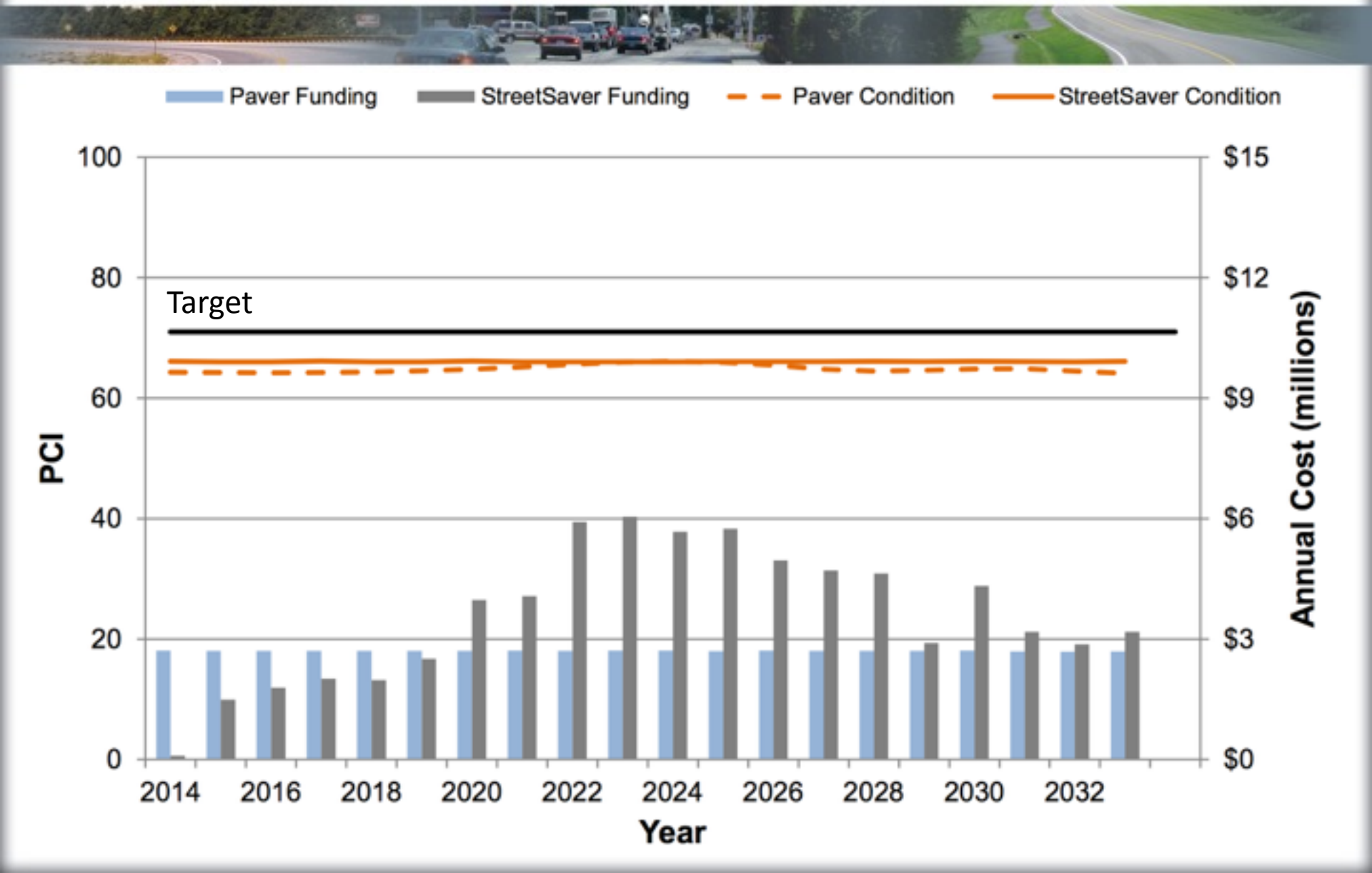
Paver™ (continued)

- Reporting
  - Built-in and user-specified
  - Export to Microsoft Excel
- Training through Colorado State University

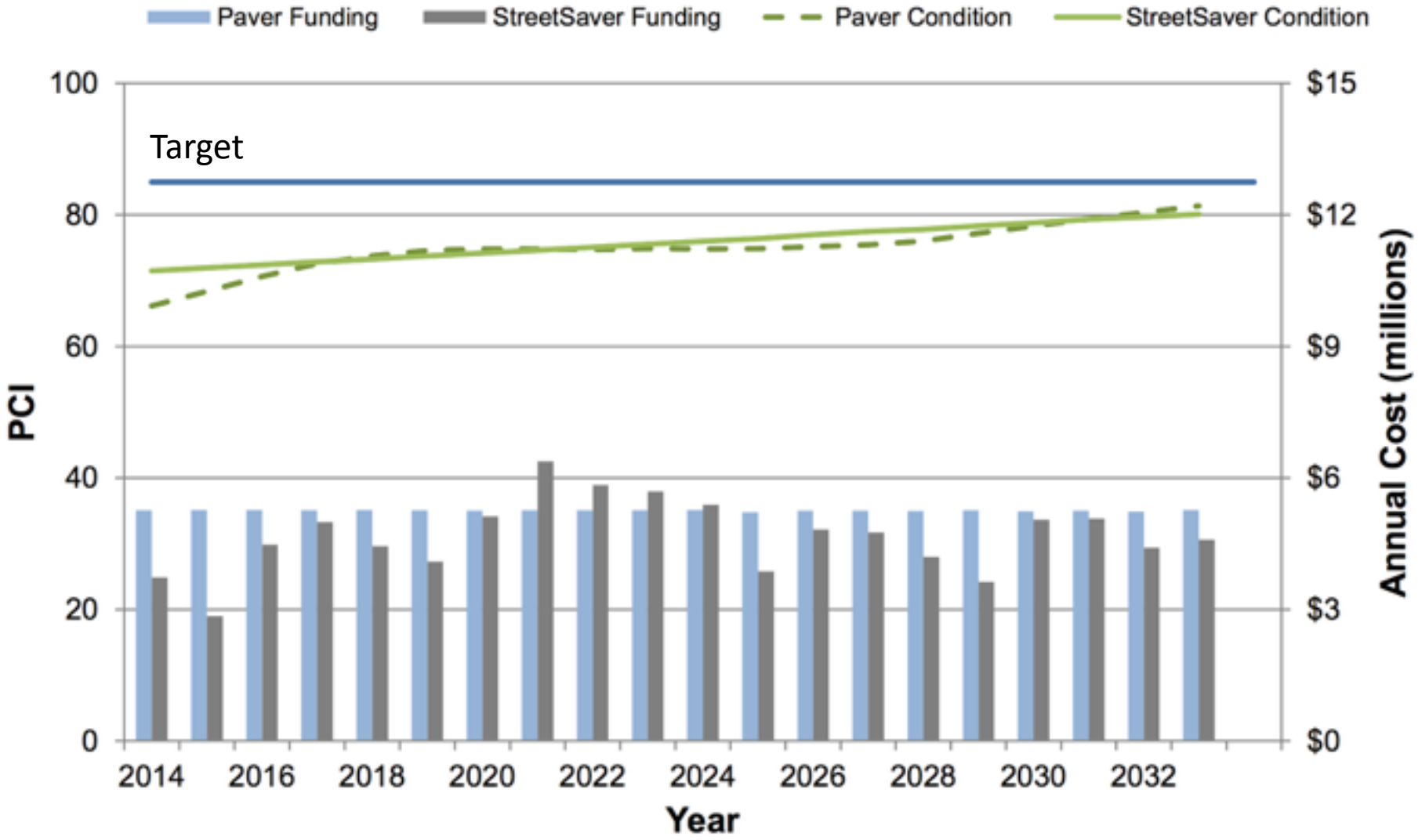
Budget Analysis

- Budget needed to maintain current PCI levels
  - Arterials – 71
  - Collectors – 66
  - Residential – 65
- Target budget scenarios
  - $6 million per year
  - $10 million per year
- Budget needed to achieve benchmark PCI levels
  - Arterials – 85
  - Collectors – 75
  - Residential – 70

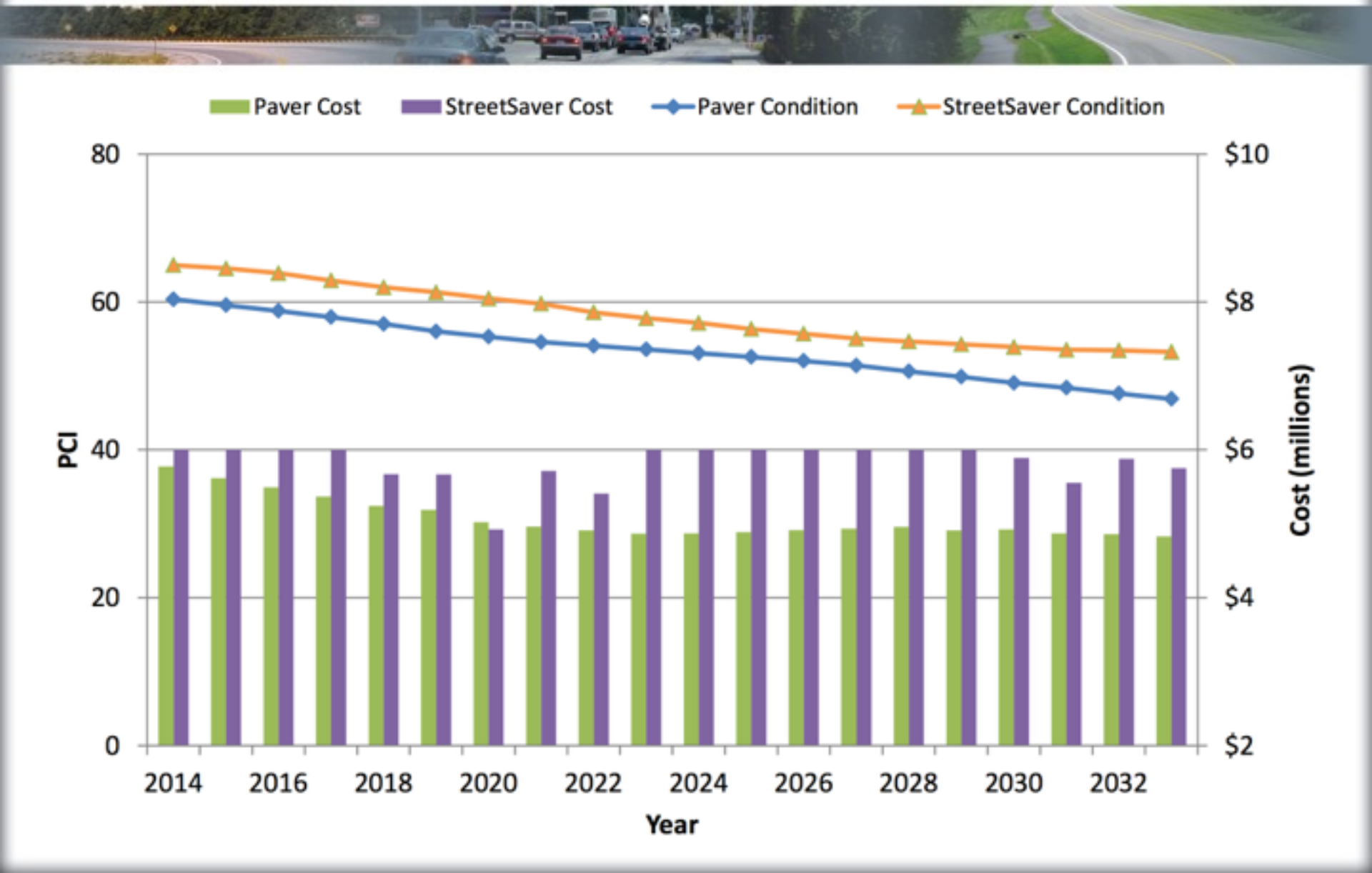
Maintain Current PCI Level (Arterials)



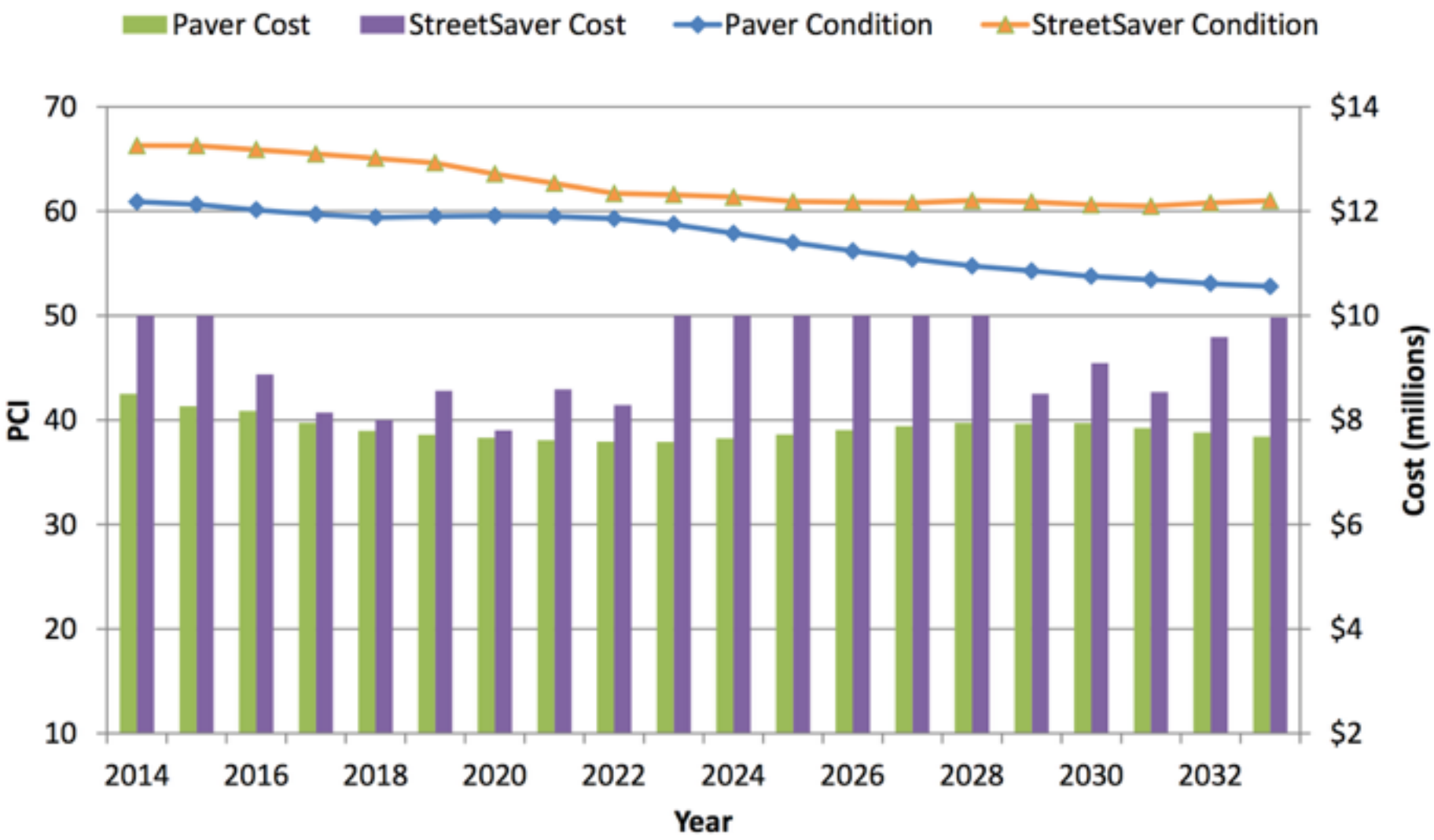
Achieve PCI Targets



Target Budget - $6 million



Target Budget - $10 million



Observations - PCI

StreetSaver®

- ✓ Calculated using either ASTM D6433 or 7 distress types
- ✓ Calculated as an arithmetic average
- ✓ Increases with each treatment application (value dependent on treatment type)

Paver™

- ✓ Calculated using ASTM D6433
- ✓ Calculated as an area-weighted average
- ✓ Reset to 100 for only major treatment application

Observations – Performance Models

StreetSaver®

- ✓ Not specific to individual agency data
- ✓ Requires MTC modification

Paver™

- ✓ Based on agency-specific data
- ✓ User developed/ modified

Observations – Treatments/Budget

StreetSaver®

- ✓ Agency-specific treatment types and costs
- ✓ Capable of maintaining an annual budget, requires an iterative approach

Paver™

- ✓ Treatment categories
- ✓ Budget estimate based on a uniform application of annual funding needs

Observations – Other

StreetSaver®

- ✓ Generate GASB report
- ✓ Technical support, training programs, & user workshops
- ✓ Widely used on the west coast
- ✓ Used by Portland, Olympia, Port Angeles, and Seattle

Paver™

- ✓ No GASB reporting
- ✓ Training from Colorado State University
- ✓ Online software subscriber user forum
- ✓ Worldwide user base