CITY OF RICHMOND

Engineering Services Department
City Council Presentation

Pavement Management Program
September 27, 2011
Presentation Outline

- Pavement Management Overview
- The State of the Pavement Network
- From Planning to Construction
- Questions & Answers
Pavement Management Overview

- Why a Pavement Management Program?
- StreetSaver® Pavement Software
- Pavement Condition Index
- Pavement Management Philosophy
Why a Pavement Management Program?

- Asset Management Practices
- Database of Pavement History
- Current Condition
- Cost-Effective Pavement Program
- Forecast Long-Term Trends
- Eligibility for Funding
StreetSaver® Pavement Management Software

- Developed by Metropolitan Transportation Commission
- All Bay Area Cities & Counties Utilize Software
- Consistent Reporting
- Regional Planning Tool
Pavement Condition Index (PCI)

- Standardized
- Observed Surface Distresses
  - 7 Types
  - 3 Severities
  - Quantity
- Rating of pavement condition
  - Scale of 100 to 0
  - PCI 100 = Brand New
  - PCI 0 = Completely Failed
Types of Pavement Distresses

- Alligator cracking
- Block cracking
- Longitudinal or transverse cracking
- Distortions
- Rutting
- Weathering & raveling
- Patches
Pavement Condition Index (PCI)

<table>
<thead>
<tr>
<th>Condition Category</th>
<th>Pavement Condition</th>
<th>PCI Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Excellent</td>
<td>100</td>
</tr>
<tr>
<td>II/III</td>
<td>Good</td>
<td>90</td>
</tr>
<tr>
<td>IV</td>
<td>Fair</td>
<td>70</td>
</tr>
<tr>
<td>V</td>
<td>Poor</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Very Poor/Failed</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
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</tbody>
</table>
PCI – 100 (Excellent)

Barrett Avenue
PCI – 74 (Good)

Alta Mira Drive
PCI – 52 (Fair/Poor)
PCI – 20 (Failed)

Barrett Avenue
Pavement Management Philosophy

Pavement Condition

- Excellent
- Good
- Fair
- Poor
- Very Poor
- Failed

% of Pavement Life

- Seal Cracks & Slurry
  - Seal $1/sy
- Thin AC Overlay
  - $25/sy
- Thick AC Overlay
  - $42/sy
- Reconstruction
  - $80/sy

Reconstruction

% of Pavement Life
Pavement Management Philosophy

- Slurry Seal
- Overlay
- Reconstruct
- Paint
- Siding
- Framing
State of the Pavement Network

- Network Summary
- Historical Trends
- Budget Scenarios
- Funding Options
## Network Summary

Network Replacement Cost: $450 Million

**Functional Class** | **Lane Miles**
---|---
Arterial | 162.0
Collector | 205.7
Residential/Local | 200.3
**Total** | 568.0
## Network Summary

<table>
<thead>
<tr>
<th>Functional Class</th>
<th>2008 Average PCI</th>
<th>2011 Average PCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arterial</td>
<td>72</td>
<td>80</td>
</tr>
<tr>
<td>Collector</td>
<td>60</td>
<td>68</td>
</tr>
<tr>
<td>Residential/Local</td>
<td>44</td>
<td>60</td>
</tr>
<tr>
<td>All</td>
<td>58</td>
<td>68</td>
</tr>
</tbody>
</table>
Network Summary

- Good/Excellent: 54.8%
- Fair: 15.6%
- Poor: 27.4%
- Very Poor: 2.2%
Richmond Pavement Condition Index* by Year

*3-Year Moving Average Reported by MTC

Year:
- 2006: 46
- 2007: 50
- 2008/2009: 53
- 2010: 55

Pavement Condition Index (PCI)
Budget Scenarios

- What-if Scenarios
- Impact of Different Funding Levels
- MTC Certification and Grant Funding
- MTC Regional Planning
Budget Scenarios 1: Unlimited Distributed ($19M/Yr)

Unfunded Backlog ($ Millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Unfunded Backlog</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>$31.5</td>
</tr>
<tr>
<td>2011</td>
<td>$13.5</td>
</tr>
<tr>
<td>2012</td>
<td>$7.4</td>
</tr>
<tr>
<td>2013</td>
<td>$7.9</td>
</tr>
<tr>
<td>2014</td>
<td>$7.4</td>
</tr>
<tr>
<td>2015</td>
<td>$0.0</td>
</tr>
</tbody>
</table>

Pavement Condition Index (PCI)

Bar chart showing the unfunded backlog in millions and the PCI over the years 2010 to 2015.
Budget Scenarios 2: Increase PCI by 5 Pts ($9.5M/Yr)

Unfunded Backlog ($ Millions)

2010: $31.5
2011: $22.3
2012: $21.8
2013: $29.3
2014: $38.2
2015: $42.0

Pavement Condition Index (PCI)

2010: 68
2011: 72
2012: 72
2013: 72
2014: 72
2015: 73
Budget Scenarios 3: Maintain PCI ($6M/Yr)

Unfunded Backlog ($ Millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Unfunded Backlog</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>$31.5</td>
</tr>
<tr>
<td>2011</td>
<td>$25.7</td>
</tr>
<tr>
<td>2012</td>
<td>$27.4</td>
</tr>
<tr>
<td>2013</td>
<td>$36.6</td>
</tr>
<tr>
<td>2014</td>
<td>$47.4</td>
</tr>
<tr>
<td>2015</td>
<td>$54.7</td>
</tr>
</tbody>
</table>

Pavement Condition Index (PCI)

- 2010: 68
- 2011: 71
- 2012: 70
- 2013: 69
- 2014: 68
- 2015: 68

Unfunded Backlog vs PCI
Funding Options

- Utility Cut Fee
- Sales Tax
- Pavement Assessment Districts
- Federal Grants
From Planning to Construction

- Coordination
- Pavement Testing & Design
- Field Data Collection
- Plans, Specifications, & Cost Estimate
- Construction
Coordination

EAST BAY MUNICIPAL UTILITY DISTRICT

WEST COUNTY WASTEWATER DISTRICT

comcast

PG&E

SSD
Coordination

City Projects
- Sewer Projects
- Storm Drain Projects
- Redevelopment Projects

City Programs
- Pedestrian Master Plan
- Bicycle Master Plan
- ADA Compliance
Pavement Testing & Design

\[ T = \frac{0.0032(\text{TI})}{G_f} \times (100 - R) \]
## Pavement Testing & Design

- Structural Calculations
- Conventional vs. Alternate Treatments

<table>
<thead>
<tr>
<th>Conventional</th>
<th>Alternate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slurry Seal</td>
<td>Cape Seal (Chip Seal + Slurry Seal)</td>
</tr>
<tr>
<td>Overlay</td>
<td>Rubberized Overlay</td>
</tr>
<tr>
<td>Reconstruction</td>
<td>Full Depth Rehabilitation</td>
</tr>
</tbody>
</table>
Field Data Collection

- Concrete Repairs (Curb & Gutter, Sidewalk, etc.)
- Tree Roots
- ADA Curb Ramps
- Localized Asphalt Failures
- Locations of Utilities
- Crown Lowering
Plans, Specifications, & Estimate

- Inflation
- Localized Repairs
- Mature Tree Roots
- ADA Compliance
- Bicycle Master Plan
- Oil Price Increase
- Unsuitable Soils
- Concrete Repairs
- Utility Protection
- Pedestrian Master Plan

Aging Infrastructure = Higher Repair Costs
Asphalt prices increased nearly six-fold from 1999 to 2009.
Plans, Specifications, & Estimate
Construction

- Contract Paving Program
- In-House Paving Program
- Special Paving Projects
Conclusion

○ Summary
  ● Pavement Management Overview
  ● The State of the Pavement Network
  ● Funding Options
  ● From Planning to Construction

○ Recommendations
  ● Continue StreetSaver® Approach
  ● Update Program Regularly & Remain Certified
  ● Preserve Roadway Infrastructure
Questions?