MicroPAVER Comes of Age: Lessons Learned in Pavement Management

APWA International Congress & Exposition
September 11, 2005

Brian Amundson
Director of Public Works
City of Eau Claire, Wisconsin
Eau Claire Background

- Population – 65,000
- 120,000 Metropolitan Area
- Located in 2 Counties (Eau Claire & Chippewa)
- 1 City, 1 Village, 5 Towns Abut the City Limits
- Confluence of 2 Rivers - Downtown
  - Chippewa River
  - Eau Claire River
- 32 sq. miles in City Limits
- 324 centerline miles of streets

Eau Claire Streets

Functional Classification
- 44 mi – Arterial (13.6%)
- 42 mi – Collector (12.9%)
- 238 mi – Local Residential (73.5%)

Street Network
- 1,588 Branches
- 3,457 Sections

Pavement Type
- 16 mi. Concrete (5%)
- 282 mi. Asphalt (87%)
- 26 mi. Surface Treatment – Oiled (8%)
Why not more Concrete?
- Good soil conditions – sand & gravel
- Poor performance experience
- Significant joint failures

Pavement Management

What is a Pavement Management System?
- Systematic collection & storing of data
- Objective & repeatable system for evaluating pavement
- Retrievable data that can be analyzed on a network & project level basis
- Create maintenance policies and "what-if" scenarios
- Data base can be updated – flexible

Pavement Management is NOT
- A "cure-all" for your pavement woes
- Doesn't actually build anything
- Done without a commitment
- Done without "boots on the ground"
- A sprint
  - MARATHON
History of Why

- Appointed City Engineer – February 1986
- Former City Engineer retired 6 months earlier after over 30 years with the City
- DPW left job – last Friday in January 1986
- City Manager DEMANDS that Proposed 1986 Street Improvement Program be submitted to the City Council in March
- 3”x5” note cards - work history on each block
- No proposed program or methodology
- Drive the streets each spring – then decide

1940 – 1989 Pavement Management System
“Has to be a better way”

- APWA Pavement Management class in Hayward, CA - 1988
- Purchased MicroPAVER - 1988
- Pilot Project in the "Planets" - 1989
- Decided to proceed
- First full inspection completed – 1991
  - 3 yrs – 95 miles +/- inspected per year
  - 2 seasonal employees 3 mo. in summer
- Full data analyzed - 1992

Lesson #1

Be careful with names and descriptions
- FAILED can mean different things
- Explain the difference between a PCI of 9 & 11
- Combined categories for presentations
  - Excellent (100 – 86)
  - Good (85 – 56)
  - Fair (55 – 26)
  - Poor (25 – 0)
Lesson #2

“WINDSHIELD” vs. “SHOE LEATHER”

- Have to get out of vehicle
- Walk the street to truly understand
- Engineers & Inspectors
  - See failures close up
  - Better understanding of why the deterioration
What is the PCI of this Street?

Excellent Manual

Lesson #3

Streets are not created equal
- "Family of Curves"
- Not the "pretty" curve picture
- First 15 years
- Type of Pavement (drop below PCI = 55)
  - Concrete (45 yrs.)
  - Asphalt (30 yrs.)
  - Surface Treatment – Oil (5 yrs.)
  - Classification of Street
Lesson #3
Changes Implemented

- Eliminated Street Oiling Program (Surface Treatment)
- Increased thickness of residential streets from 1-2” lift to 2-1½” lifts
- Increased minimum thickness of collector and arterial streets from 4” to 6”
- Accommodate future mill and overlay
- Mill & overlay funding at $500,000/yr

Lesson #4
Maintenance Has an Impact

- Instituted chip sealcoat program
- Oiling Funds used for chip sealing
- Average 10 to 14 miles per yr
- Funding increased in 1998
- Increased crack sealing program
- Established concrete joint repair program
Lesson #5

Show me the money

- Public must believe it is a problem "YOU" should be solving
- FIX vs. PROACTIVE – How government works
- 1997 EC Leader Telegram – 4 part series
  - How bad are our streets?
  - How did our streets get so bad?
  - What is being done to fix our streets?
  - Who is paying for street improvements?
- PAVER information helped the news media
Lesson #6

Need a champion – PAVER guru
- Staff has to buy into merits
- Can’t be just a DPW mandate – idea
- Our computer guru just retired
- Make sure the system is sustainable

Lesson #7

Utilities impact the annual street program in an urban area
- 100-yr-old sewer and water facilities
- Drainage problems
- Match the various funding sources
- Impacts decision making
- Pavement management system can assist but may not be the decision driver
Lesson #8

Moving Target

<table>
<thead>
<tr>
<th>Section</th>
<th>1992</th>
<th>2005</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sections</td>
<td>2,999</td>
<td>3,457</td>
<td>15%</td>
</tr>
<tr>
<td>Sq. Ft. Pavement (mil.)</td>
<td>46.5</td>
<td>53.1</td>
<td>18%</td>
</tr>
<tr>
<td>Centerline Miles</td>
<td>280</td>
<td>324</td>
<td>16%</td>
</tr>
<tr>
<td>Surface Treatment – Oil (%)</td>
<td>31.5</td>
<td>8.0</td>
<td>(74%)</td>
</tr>
<tr>
<td>Street Type (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arterial</td>
<td>15.3</td>
<td>13.9</td>
<td></td>
</tr>
<tr>
<td>Collector</td>
<td>14.3</td>
<td>12.9</td>
<td></td>
</tr>
<tr>
<td>Local – Residential</td>
<td>70.4</td>
<td>73.5</td>
<td></td>
</tr>
</tbody>
</table>

Lesson #9

Decision makers need pictures and graphs

- PAVER graphs and charts not the best – have gotten better
- Use PAVER as a tool to keep data, calculate and predict PCI
- Export data to Access and Excel for manipulation, charts, graphs, and reports
- Conversion to GeoMedia
- Tried M & R modules too cumbersome and numbers generated didn't help financing

Pavement Condition Trend

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Accomplishments

- POOR lowered from 28% to 10%
- Still 32 miles in need of reconstruction ($30 million)
- EXCELLENT increased from 28% to 56%
- New developments required to build street (1990)
- Total Network – Average PCI
  - 1992 – 60
  - 2005 – 89
- State “MANDATED” rating program – 2003
  - PAVER determined to be a “sophisticated” program
  - Only required to inspect every 6 yrs. Vs. 2 yrs.
  - PASSER only uses a rating of 1 to 10 and is visual
  - No additional cost to meet mandate - doing it
  - Only had to change from/to

Lesson #10

GIS Integration may not be seamless

- Originally “Ultimap” system
- Converted to Microstation/Integraph
- Everyone seems to base around ESRI products
- Now use GeoMEDIA
- Export Predicted PCI to Access database
- Map based queries