ST CHARLES STREET REPAIR

- 81.72 miles maintained
- 269.29 miles total
- 187.57 miles deferred

At the current rate it will take 33 years to touch every subdivision road in the City
HOW TO KEEP UP?

Spend more

Lower treatment costs per area
OLD WORK PLAN

• Subdivision approach

• Annual Concrete ($1M), Annual Asphalt ($1M), Repair List ($600k)

• Local/Alleys maintained separately from Arterials/Collectors

• Arterials and Collectors are maintained with Federal funds when eligible

• Fix broken curb sections with the pavement when it obstructs flow

• Repair List is reactive to complaints, Annual Concrete and Annual Asphalt based on critical work plan
EXTENDED SERVICE LIFE OF TREATMENTS

FHWA Pavement Preservation Compendium

Source: American Association of State Highway and Transportation Officials

Now =

Later

Spending $1 on preservation here...

eliminates or delays spending $6 to $10 on rehabilitation or reconstruction here.
PAVEMENT PRESERVATION PLANNING PROCESS

• Inventory of Pavement Condition

• Selection of Pavement Preservation Methods based on cost effectiveness

• Put together a work plan that maximizes performance

• Restart the process about every 5 years
PAVEMENT CONDITION COLLECTION
PAVEMENT MANAGEMENT
PRINCIPLES

PAVEMENT PRESERVATION

PCI

Less expensive to work with good pavements

Surface Treatments
- Reclamite

Surface Treatments
- Liquid Road
- Micro-Surfacing

Surface Treatments
- Cape Seals
- Micro-Surfacing

Conventional Approach
- Overlay
- Mill & Overlay

Reconstruct/Rebuild

PAVEMENT AGE (Years)

Figure 3.2.1 Pavement Preservation
### EXTENDED SERVICE LIFE OF TREATMENTS

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Pavement Type</th>
<th>Extended Service Life (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overband crack filling</td>
<td>Flexible</td>
<td>Up to 2</td>
</tr>
<tr>
<td></td>
<td>Composite</td>
<td>Up to 2</td>
</tr>
<tr>
<td>Crack sealing</td>
<td>Flexible</td>
<td>Up to 3</td>
</tr>
<tr>
<td></td>
<td>Composite</td>
<td>Up to 3</td>
</tr>
<tr>
<td></td>
<td>Rigid</td>
<td>Up to 3</td>
</tr>
<tr>
<td>Single chip seal</td>
<td>Flexible</td>
<td>3 to 6</td>
</tr>
<tr>
<td></td>
<td>Composite</td>
<td>N/A&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Double chip seal</td>
<td>Flexible</td>
<td>4 to 7</td>
</tr>
<tr>
<td></td>
<td>Composite</td>
<td>3 to 5</td>
</tr>
<tr>
<td>Slurry seal</td>
<td>Flexible</td>
<td>N/A&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Composite</td>
<td>N/A&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Microsurfacing (single course)</td>
<td>Flexible</td>
<td>3 to 5&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Composite</td>
<td>N/A&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Microsurfacing (multiple course)</td>
<td>Flexible</td>
<td>4 to 6&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Composite</td>
<td>N/A&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ultrathin hot-mix asphalt, 0.75-in. (20-mm) overlay</td>
<td>Flexible</td>
<td>3 to 5&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Composite</td>
<td>3 to 5&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Hot-mix asphalt, 1.5-in. (40-mm) overlay</td>
<td>Flexible</td>
<td>5 to 10</td>
</tr>
<tr>
<td></td>
<td>Composite</td>
<td>4 to 9</td>
</tr>
<tr>
<td>Hot-mix asphalt, 1.5-in. (40-mm) Mill and overlay</td>
<td>Flexible</td>
<td>5 to 10</td>
</tr>
<tr>
<td></td>
<td>Composite</td>
<td>4 to 9</td>
</tr>
<tr>
<td>Joint resealing</td>
<td>Rigid</td>
<td>3 to 5</td>
</tr>
<tr>
<td>Spall repair</td>
<td>Rigid</td>
<td>Up to 5</td>
</tr>
<tr>
<td>Full-depth concrete repairs</td>
<td>Rigid</td>
<td>3 to 10</td>
</tr>
<tr>
<td>Diamond grinding</td>
<td>Rigid</td>
<td>3 to 5&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Dowel-bar retrofit</td>
<td>Rigid</td>
<td>2 to 3&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Concrete pavement restoration</td>
<td>Rigid</td>
<td>7 to 15&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

**Notes**

<sup>a</sup> The time range is the expected life-extending benefit given to the pavement, not the anticipated longevity of the treatment.

<sup>b</sup> Sufficient data are not available to determine life-extending value.

<sup>c</sup> Additional information is necessary to quantify the extended life more accurately.
Figure 4-5. Determination of long-term rate of deterioration for Portland Cement Concrete (PCC) pavements.

Figure 4-3. Determination of long-term rate of deterioration for asphalt concrete (AC) pavements.
<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>STREET A</td>
<td>PCI</td>
<td>PCI</td>
<td>PCI</td>
</tr>
<tr>
<td>STREET B</td>
<td>STREET A</td>
<td>70.0</td>
<td>-</td>
</tr>
<tr>
<td>STREET C</td>
<td>STREET B</td>
<td>-</td>
<td>51.7</td>
</tr>
<tr>
<td>STREET A</td>
<td>STREET C</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STREET B</td>
<td>STREET A</td>
<td>$100,000.00</td>
<td>$</td>
</tr>
<tr>
<td>STREET C</td>
<td>STREET B</td>
<td>$</td>
<td>-</td>
</tr>
<tr>
<td>ANNUAL TOTAL</td>
<td>STREET C</td>
<td>$</td>
<td>-</td>
</tr>
</tbody>
</table>

**ANNUAL TOTAL**

$100,000.00  $450,000.00  $690,000.00

**GRAND TOTAL**

$1,240,000.00

**TOTAL COST DIFFERENCE OF $230,000**
ST CHARLES NEW TREATMENTS

• HIGH DENSITY MINERAL BOND
• THINLAY ASPHALT
• UNDERSEALING CONCRETE
HIGH DENSITY MINERAL BOND

- Closed to traffic for 24 hours
  - Contractor plans for ingress and egress during this period
- 7 year design life
- No milling required
- Surface looks uniformly new when complete
- Used in 14 states including Kansas, Tennessee, Utah, Nevada, Texas
THINLAY ASPHALT

- Open to traffic immediately
- 9 year design life
- Minimal milling required
- Surface looks uniformly new when complete
UNDERSEALING CONCRETE
• Open to traffic in one hour
• Can be used remove localized low spots (bird baths)
• Used to level joint and crack displacements (bumps)
• Provides a stable base for future pavement performance
• Surface looks the same as prior to treatment
EXISTING TREATMENT APPLICATION

- Do more:
  - Cracksealing

- Do less:
  - Full depth concrete repair
  - 2 inch mill and fill
  - Full depth replacement
<table>
<thead>
<tr>
<th>Maintenance Task</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crack and Joint Sealing</td>
<td>$1.08/sqyd.</td>
</tr>
<tr>
<td>Undersealing</td>
<td>$2.62/sqyd.</td>
</tr>
<tr>
<td>Novachip Overlay</td>
<td>$13.85/sqyd.</td>
</tr>
<tr>
<td>Slab Replacement</td>
<td>$65.00/sqyd.</td>
</tr>
</tbody>
</table>
## ASPHALT MAINTENANCE COSTS

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Density Mineral Bond</td>
<td>$2.75/sqyd.</td>
</tr>
<tr>
<td>Thinlay</td>
<td>$6.80/sqyd.</td>
</tr>
<tr>
<td>Novachip</td>
<td>$13.85/sqyd.</td>
</tr>
<tr>
<td>2 Inch Mill /Fill</td>
<td>$25.55/sqyd.</td>
</tr>
<tr>
<td>Full depth replacement</td>
<td>$60.00/sqyd.</td>
</tr>
</tbody>
</table>
EXISTING CONCRETE SUBDIVISION APPROACH

$1.1 MILLION ANNUALLY

City of St. Charles Concrete Pavement
PROPOSED CONCRETE SUBDIVISION APPROACH

$800 THOUSAND ANNUALLY
(28% SAVINGS)

City of St. Charles Concrete Pavement
EXISTING ASPHALT SUBDIVISION APPROACH

$1.3 MILLION ANNUALLY

City of St. Charles Asphalt Pavement
PROPOSED ASPHALT SUBDIVISION APPROACH

$1.1 MILLION ANNUALLY (15% SAVINGS)

City of St. Charles Asphalt Pavement
PAVEMENT PRESERVATION VS. REPLACEMENT

$315 MILLION SAVED OVER 30 YEARS
PERCEPTION OF PAVEMENT CONDITION

2016 Concrete Project

2016 Asphalt Project
NEW WORK PLAN

Arterials and Collectors (Annually)

• Crackseal $535,000
• Slab Replacement $320,000
• High Density Mineral Bond $ 60,000
• Thinlay $480,000
• Novachip $300,000
• Mill/Fill $ 90,000

Total $1,775,000
NEW WORK PLAN

Subdivision Streets and Alleys (Annually)

- Crackseal $480,000
- Slab Replacement $320,000
- High Density Mineral Bond $200,000
- Thinlay $400,000
- Novachip $350,000
- Mill/Fill $160,000
- Full Depth Asphalt $10,000

Total $1,920,000

GRAND TOTAL WITH ARTERIALS $3,695,000
QUESTIONS?