Pavement Program

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Deputy Public Works Director

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City of Lynchburg

- Founded in 1786, Incorporated 1805
- City covers 50 square miles
- Population ~ 80,000
City Street System

- 426 Miles of Roadways within City Limits
- Street Composition
  - Mostly Asphalt
  - Historic Brick/Cobble Present in Downtown Areas
- All paving work is contracted
  - Two Paving/Treatment Contracts/Year (Spring/Fall)
  - Largely Mill & Fill Operations
- VDOT Highway Maintenance Funded
- PCI of 60 or below for resurfacing
Paving Decisions

Up until 2015
- Windshield Surveys
- Multiple Staff Members
- Variability of Results
- Lots of Work to Quantify

Since 2015
- Automated Data Collection
- Using an array of advanced sensors.
- Significant mapping and analysis capabilities.
ARAN System

- Automatic Road Analyzer (ARAN)
- VDOT Compatible System
- Measures for pavement deterioration.
  - Cracking
  - Potholes
  - Raveling
  - Ride Quality
  - Patches
  - Oxidation
  - Full imagery of pavement and right of way
ARAN System

- Collection is far quicker
- More consistent
- Easier analysis
- Gives the failure mode of the pavement
- Analyzed over time, gives a custom pavement aging/deterioration curve for City streets.
Pavement Conditions
Pavement Conditions
Pavement Conditions

Pavement Condition Breakdown
(mileage basis)

- Excellent: 4.77
- Good: 108.06
- Fair: 38.29
- Poor: 41.68
- V. Poor
- N/A
Pavement Aging

The graph illustrates the pavement condition over time.

- **Excellent** condition lasts for a short period, followed by a 40% drop in quality.
- 75% of the pavement's life is spent in a **Good** condition.
- A **Fair** condition follows, lasting for 12% of the pavement's life before it degrades to **Poor**.
- The pavement eventually reaches a **Very Poor** condition before it fails.

The graph uses a color scale to represent the pavement condition, with **Excellent** being the highest quality and **Failed** being the lowest.
How Are We Doing?

Looking for an effective way to speak to non-technical people about where we’re at with regards to our pavement system.

Reflective of:

- Budget
- Construction Costs
- Road Mileage
- Treatment Type
- Scenario Driven
Return Interval

- Mileage of Roadway System/Miles Paved Annually for Budget
- "If we pave your road today, when could we theoretically be back?"

<table>
<thead>
<tr>
<th>(Mill &amp; Fill Only)</th>
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<tbody>
<tr>
<td>Annual Budget</td>
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<tr>
<td>Paving Budget</td>
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<tr>
<td>Pavement Preservation Budget</td>
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<tr>
<td>Asphalt Cost/ton (SM9.5+16%)</td>
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<td>Asphalt sq yd/budget</td>
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<tr>
<td>Road miles Paved (24' Wide)</td>
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<tr>
<td>Chip Seal Cost/Sq yd</td>
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<tr>
<td>Road Miles Treated</td>
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<tr>
<td>Total Road miles</td>
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<td>Return Interval (Yrs)</td>
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Return Interval

- Idea can be refined:
  - Changing Budgets
  - Changing Asphalt Prices
  - Road Miles
  - Pavement Treatment Options
  - Current Back-log Based on Condition

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<tr>
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<tr>
<td><strong>Annual Budget</strong></td>
<td><strong>$ 2,500,000.00</strong></td>
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<tr>
<td><strong>Asphalt Cost/ton (SM9.5+16%)</strong></td>
<td><strong>$ 95.91</strong></td>
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<tr>
<td><strong>Asphalt sq yd/budget</strong></td>
<td><strong>315,956.72</strong></td>
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<td><strong>Road miles Paved (24' Wide)</strong></td>
<td><strong>22.44</strong></td>
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<td><strong>Chip Seal Cost/Sq yd</strong></td>
<td><strong>$ 4.40</strong></td>
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<td><strong>Road Miles Treated</strong></td>
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<tr>
<td><strong>Total Road miles</strong></td>
<td><strong>426.00</strong></td>
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<td><strong>Return Interval (Yrs)</strong></td>
<td><strong>18.98</strong></td>
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| **Annual Budget**                  | **$ 2,500,000.00**                    |
| **Paving Budget**                  | **$ 2,000,000.00**                    |
| **Pavement Preservation Budget**   | **$ 500,000.00**                      |
| **Asphalt Cost/ton (SM9.5+16%)**   | **$ 95.91**                          |
| **Asphalt sq yd/budget**           | **252,765.38**                        |
| **Road miles Paved (24' Wide)**   | **17.95**                            |
| **Chip Seal Cost/Sq yd**           | **$ 4.40**                           |
| **Chip Seal Sq yd/Budget**         | **113,636.36**                        |
| **Road Miles Treated**             | **8.07**                             |
| **Total Road miles**               | **426.00**                           |
| **Return Interval (Yrs)**          | **16.37**                            |
Thank You!

Questions?