New For 2012 PCS

- New Forms
- LARS Mileposting System
- Added
  - County Section
  - New Pavement Type (Composite)
  - Paved Shoulder Condition
  - % of Paved Shoulder Needing Repair
PCS Agenda

- Welcome
- Review Manual
- Break
- Review Distresses
- Break
- Slide Identification
- Rating Exercises
- Field Rating
- Lunch
- Field Rating
- Distribution of County Workbooks
2012 PCS

- To rate you must attend this training class
- City limits are no longer to be used as section breaks
- Old survey ratings are included on the survey sheets for your reference
- New PCS forms include County Section, Paved Shoulder Condition and Paved Shoulder Repair Percentage
Survey Goals

• Establish uniform level-of-service
• Prioritize system needs
• Summarize overall pavement conditions
• Provide consistent rating system
• Supply means to monitor section condition
• Provide historical record of pavement performance
Conducting the Survey
(Page 2)

- Write neatly and legibly
- Look over printouts
- Use current maps
- Survey all new roads
- Be safety conscious - Use vehicle lights & wear vests

- Measure rutting
- Travel 15 to 20 mph
- Ride towards sun
- Do not start survey in middle of section
- Do not rate when roads are wet/damp
Survey Forms
Survey Forms

2 Types of forms:

– Printout of existing sections with blank distress fields along with 2010 distresses (Page 6)

– Blank “road addition sheet” for adding new sections, secondary construction, and major section changes. (Pages 17)
| County Section | Route | Section | Begin Milepost | Begin Description | End Milepost | End Description | Pavement Type | Pavement Width | Number of Loops | Shoulder | Edge | Guardrail | Post-Signed | Special Notes | Remarks | Repair Work | Restroom | Summer | Winter | Rainfall | Actual | Allegations | Alligator Checking | Comments |
|---------------|-------|---------|----------------|-------------------|-------------|----------------|---------------|---------------|---------------|-----------|-------|-----------|------------|-------------|-------------|----------|-------------|---------|--------|--------|---------|--------|-------------|------------------|----------|
| 005101        | 1     | 5360    | 1.355          | B3IDGE            | 1.355       |                  | P             |               |              | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 1.265   | 2.350          | DR 1091           | 2.350       |                  | P             | 24            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 2.900   | 3.010          | DR 1004           | 3.010       |                  | P             | 22            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 3.850   | 4.920          | DR 1002           | 4.920       |                  | P             | 22            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 003101        | 1     | 4.550   | 5.650          | SR 1753           | 5.650       |                  | P             | 35            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 5.610   | 6.760          | CASHED            | 6.760       |                  | P             | 22            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 6.050   | 7.020          | DR 1001           | 7.020       |                  | P             | 22            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 5.700   | 5.700          | SR 1001           | 5.700       |                  | P             | 22            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 5.250   | 5.250          | SR 1001           | 5.250       |                  | P             | 22            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 7.180   | 7.180          | DR 1001           | 7.180       |                  | P             | 22            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 7.610   | 7.610          | SR 1001           | 7.610       |                  | P             | 22            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 8.080   | 8.080          | SR 1001           | 8.080       |                  | P             | 22            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 8.500   | 8.500          | SR 1001           | 8.500       |                  | P             | 22            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 10.530  | 11.730         | NO 87             | 11.730      |                  | P             | 20            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 10.900  | 10.900         | DR 1004           | 10.900      |                  | P             | 20            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 12.250  | 12.250         | CHATHAM            | 12.250      |                  | P             | 20            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 12.700  | 12.700         | DR 1004           | 12.700      |                  | P             | 20            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 13.100  | 13.100         | SR 1453           | 13.100      |                  | P             | 20            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 13.500  | 13.500         | SR 1001           | 13.500      |                  | P             | 20            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 13.900  | 13.900         | DR 1001           | 13.900      |                  | P             | 20            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |
| 002101        | 1     | 14.300  | 14.300         | SR 1001           | 14.300      |                  | P             | 20            | 2             | N       | U       | 4         |            |              |           |             |            |        |        |        |        |        |            |                  |          |

Surveyor: _______________  Division: ____________  Attestation (Y): ____________  Date: ____________

Page 1 of 55

NCDOT Pavement Management - 2012 Pavement Condition Survey
## NCDOT Pavement Condition Survey File

### County Section
<table>
<thead>
<tr>
<th>Route</th>
<th>Milepost</th>
<th>Begin Description</th>
<th>End Description</th>
<th>Section Length</th>
<th>Pavement Type</th>
<th>Shoulder Type</th>
<th>Shoulder Width</th>
<th>Median Shoulder Width</th>
<th>Number of Lanes</th>
<th>Curb and Gutter</th>
<th>Subdivision</th>
<th>Alligator Cracking</th>
</tr>
</thead>
<tbody>
<tr>
<td>40001001</td>
<td>0.84</td>
<td>SR 1101</td>
<td>1.10</td>
<td>0.26</td>
<td>P</td>
<td>24</td>
<td>2</td>
<td>Z</td>
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<td>2010 1.5</td>
<td>R</td>
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<td>40001001</td>
<td>0.00</td>
<td>SR 1472</td>
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<td>2</td>
<td>Z</td>
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<td>R</td>
<td>200</td>
</tr>
</tbody>
</table>

**Surveyor:** R. Frazier  
**Division:** 7  
**County:** Hanover  
**Date:** 9/18/2012

---

**NCDOT Pavement Management - 2012 Pavement Condition Survey**
Survey Forms
(Pages 3 - 5)

- COUNTY SECTION
  - County subdivided into work sections
  - Optional field

NCDOT Pavement Management - 2012 Pavement Condition Survey
Survey Forms
( Pages 3 - 5 )

ROUTE
– US, NC, or Secondary
– Direction immediately adjacent (N,S,E,W)
BEGIN MILEPOST
  – Beginning point of section

<table>
<thead>
<tr>
<th>County Section</th>
<th>Route</th>
<th>Direction</th>
<th>Begin Milepost</th>
<th>Begin Description</th>
<th>End Milepost</th>
<th>End Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>40001001</td>
<td>0.000</td>
<td>NC 62</td>
<td>1.360</td>
<td>BRIDGE</td>
<td>3.810</td>
<td>SR 1754</td>
</tr>
<tr>
<td>40001001</td>
<td>1.360</td>
<td>BRIDGE</td>
<td>2.350</td>
<td>SR 1581</td>
<td>4.200</td>
<td>SR 1754</td>
</tr>
<tr>
<td>40001001</td>
<td>2.350</td>
<td>SR 1581</td>
<td>4.200</td>
<td>SR 1754</td>
<td>6.060</td>
<td>SR 1754</td>
</tr>
</tbody>
</table>
Survey Forms
( Pages 3 - 5 )

BEGIN DESCRIPTION

– Brief description of beginning point of section
– 10 character limit
Survey Forms
( Pages 3 - 5 )

END MILEPOST
– Ending point of section

<table>
<thead>
<tr>
<th>County Section</th>
<th>Route</th>
<th>Direction</th>
<th>Begin Milepost</th>
<th>Begin Description</th>
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<td>BRIDGE</td>
<td>2.350</td>
<td>SR 1581</td>
<td>3.810</td>
<td>SR 1754</td>
</tr>
</tbody>
</table>
Survey Forms
( Pages 3 - 5 )

END DESCRIPTION
– Brief description of end point of section
– 10 character limit

NCDOT Pavement Management - 2012 Pavement Condition Survey
Survey Forms
(Pages 3 - 5)

SECTION LENGTH
– Maximum 2 mile length

<table>
<thead>
<tr>
<th>End Description</th>
<th>Section Length</th>
<th>Pavement Type</th>
<th>Pavement Width</th>
<th>Number of Lanes</th>
<th>Curb and Gutter</th>
<th>Shoulder Type</th>
<th>Shoulder Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>DGE</td>
<td>1.360</td>
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<td>24</td>
<td>2</td>
<td>N</td>
<td>U</td>
<td>4</td>
</tr>
<tr>
<td>1581</td>
<td>0.990</td>
<td>P</td>
<td>24</td>
<td>2</td>
<td>N</td>
<td>U</td>
<td>4</td>
</tr>
</tbody>
</table>
# Survey Forms
(Pages 3 - 5)

**PAVEMENT**
- **Type** – P, B, S, O
- **Width**
- **Number of Lanes**

<table>
<thead>
<tr>
<th>End Description</th>
<th>Section Length</th>
<th>Pavement Type</th>
<th>Pavement Width</th>
<th>Number of Lanes</th>
<th>Curb and Gutter</th>
<th>Shoulder Type</th>
<th>Shoulder Width</th>
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<tbody>
<tr>
<td>DGE</td>
<td>1.360</td>
<td>P</td>
<td>24</td>
<td>2</td>
<td>N</td>
<td>U</td>
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<tr>
<td>1581</td>
<td>0.990</td>
<td>P</td>
<td>24</td>
<td>2</td>
<td>N</td>
<td>U</td>
<td>4</td>
</tr>
</tbody>
</table>

NCDOT Pavement Management - 2012 Pavement Condition Survey
## Survey Forms

( Pages 3 - 5 )

### CURB AND GUTTER

- 0.5 mile length on Rural
- 0.3 mile length on Urban
- Both sides of road

<table>
<thead>
<tr>
<th>End Description</th>
<th>Section Length</th>
<th>Pavement Type</th>
<th>Pavement Width</th>
<th>Number of Lanes</th>
<th>Curb and Gutter</th>
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<td>2</td>
<td>N</td>
<td>U</td>
<td>4</td>
</tr>
<tr>
<td>1581</td>
<td>0.990</td>
<td>P</td>
<td>24</td>
<td>2</td>
<td>N</td>
<td>U</td>
<td>4</td>
</tr>
</tbody>
</table>
# Survey Forms
(Pages 3 - 5)

## Shoulder

<table>
<thead>
<tr>
<th>Type</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>DGE</td>
<td>1.360</td>
</tr>
<tr>
<td>1581</td>
<td>0.990</td>
</tr>
</tbody>
</table>

NCDOT Pavement Management - 2012 Pavement Condition Survey
### PAVED SHOULDER CONDITION

<table>
<thead>
<tr>
<th>Shoulder Width</th>
<th>Paved Shoulder Condition (N, L, M, S)</th>
<th>Paved Shoulder Repair Percentage</th>
<th>Year Resurfaced</th>
<th>Resurface Thickness</th>
<th>Subdivision / Rural</th>
<th>ADT</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4</td>
<td>1993</td>
<td>1</td>
<td>R</td>
<td>3200</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>1993</td>
<td>1</td>
<td>R</td>
<td>3200</td>
<td></td>
</tr>
</tbody>
</table>
### PAVED SHOULDER REPAIR PERCENTAGE

<table>
<thead>
<tr>
<th>Shoulder Width</th>
<th>Paved Shoulder Condition (N, M, S)</th>
<th>Paved Shoulder Repair Percentage</th>
<th>Year Resurfaced</th>
<th>Resurface Thickness</th>
<th>Subdivision / Rural</th>
<th>ADT</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>1993</td>
<td>1</td>
<td>R</td>
<td>R</td>
<td>3200</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1993</td>
<td>1</td>
<td>R</td>
<td>R</td>
<td>3200</td>
<td></td>
</tr>
</tbody>
</table>
Survey Forms
( Pages 3 - 5 )

YEAR RESURFACED
– Year of latest resurfacing

RESURFACE THICKNESS
– Thickness of latest resurfacing

![Table Example]

<table>
<thead>
<tr>
<th>Shoulder Width</th>
<th>Paved Shoulder Condition (N, L, M, S)</th>
<th>Paved Shoulder Repair Percentage</th>
<th>Year Resurfaced</th>
<th>Resurfacing Thickness</th>
<th>Subdivision / Rural</th>
<th>ADT</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>1993</td>
<td>1</td>
<td>R</td>
<td>3200</td>
</tr>
</tbody>
</table>
Survey Forms
(Pages 3 - 5)

(S)UBDIVISION / (R)URAL

– For SR routes only

– Please make a special effort to complete this field during the 2012 survey
Survey Forms
(Pages 3 - 5)

ADT (Average Daily Traffic)
- Auto-filled by PMU
- Correct if the number is suspect
Survey Forms
( Pages 3 - 5 )

ALLIGATOR CRACKING
– 2010 ratings are provided for reference
Survey Forms
( Pages 3 - 5 )

OTHER DISTRESS

- Transverse Cracking
- Rutting
- Raveling
- Oxidation
- Bleeding
- Ride Quality
- Patching
Survey Forms
( Pages 3 - 5 )

COMMENTS
– Any notes that might be helpful to the CME
Mileposting Notes
(Pages 7 - 8)

• Divided Highway Mileposting is reversed in the non-primary direction
• Matches the GIS mileposting system
• For example, US64 in Wake County:
  – **EB**: Begin MP = 0.000 at Chatham County Line
    End MP = 43.520 at Franklin County Line
  – **WB**: Begin MP = 0.000 at Franklin County Line
    End MP = 43.779 at Chatham County Line.
US 64 - Wake County

MP 43.779

MP 0.000

Westbound

Chatham

MEDIAN

Franklin

Eastbound

MP 0.000

MP 43.520
Use the single route geometrics report in the LRS Access and Reporting System (LARS) to ensure consistent mileposting. Go to:

https://dot-jbp02.dot.nc.net:8443/Lars/
System Numbering

Route number

Special condition
1 = Alternate
2 = ByPass
7 = Spur
8 = Truck
9 = Business

Directional Code
0 = Primary
4 = Southbound
6 = Westbound

Type of Route
1 = Interstate
2 = US
3 = NC
4 = Secondary

NCDOT Pavement Management - 2012 Pavement Condition Survey
System Numbering
Page 10

- For divided primary routes, NB or EB legs will have a value of 0 in the directional code slot (as they are the primary directions). The SB and WB directions will be coded with values of 4 and 6, respectively.
• NCDOT GIS has changed the coding for divided secondary routes. Divided secondary routes will have a value of 0 in the directional slot in one direction and will always have a value of 4 to indicate the opposing direction. This is due to SRs not having a default primary direction.
Multi-Lane Sections
Multi-Lane Sections
( Pages 11-13 )

Most common route configurations:

- Two Lane
- Multi-Lane
  - Undivided
  - Divided
- One Way
Multi-Lane Sections
Two Lane Roads

• Most common rating sections
  – Secondary roads
  – Low volume primary roads

• Each lane represents 50% of the section rating
Multi-Lane Sections
Two Lane Roads

Rate both lanes as one section.
Multi-Lane Sections
Multi-Lane Undivided

- For multi-lane undivided roads (3 or more lanes), rate outside lane in each direction
- Each outside lane equals 50% of section rating on multi-lane undivided roads
Multi-Lane Sections
3 Lanes with Middle Turn Lane

Rate through lanes as one section. Do not rate turn lane.
Multi-Lane Sections
4 Lane Undivided

Rate both outside lanes as one section.
Multi-Lane Sections
Multi-Lane Undivided with Middle Turn Lane

Rate both outside lanes as one section.
Multi-Lane Sections
Multi-Lane Divided

• For divided roads, each direction of travel is rated as a separate section
  – Rate only the outside lane in each direction
• ADT is the two-way ADT for the highway
  – PMU will update ADT
• To be considered divided, a section must be at least 0.5 miles in length
Multi-Lane Sections
Multi-Lane Divided

• **DO NOT DIVIDE** in case of
  – Turn lane channelization
  – Narrow concrete islands
  – Short divisions for interchanges
• Interchange ramps are not rated
Multi-Lane Sections
4 Lane Divided

Rate the outside lane in each direction.
Multi-Lane Sections
One Way Streets and Urban Areas

- Rate most distressed lane on one-way streets
- Ignore special lanes < 0.3 mile
- **DO NOT** break sections if the number of lanes changes but pavement width stays the same
Multi-Lane Sections
One Way Streets and Urban Areas

Rate most distressed lane.

100%
Urban Areas
Page 14

- Curb & gutter present - both sides - 0.3 mi
- Rate most distressed lane
- Ignore special lanes less than 0.3 mi.
- Do not form new section if number of lanes changes but not pavement width
- **DO NOT** break sections at city limits
Pavement Section Adjustment

( Pages 14 - 15 )

Pavement section limits adjusted for:

– Change in number of lanes

– Change in shoulder type
  • 2 foot or wider paved shoulder
  • Continuous on both sides

– Presence of Curb & Gutter
  • 0.3 mile - Urban
  • 0.5 mile - Rural
  • Continuous on both sides
Pavement Section Adjustment

(Pages 14 - 15)

Pavement section limits adjusted for:

– Recent resurfacing
– Change in pavement type
  • (P)lant Mix
  • (B)ituminous Surface Treatment
  • (S)lurry Seal
– Change in pavement width
– Dramatic change in pavement conditions
Pavement Section Adjustment
( Pages 14 - 15 )

Pavement section limits adjusted for:

- Resurfacing or full-width patch
  - < 0.5mi considered a patch
  - > 0.5mi requires breaking of section
- City Limits are no longer being used for pavement section breaks.
Updating Section Information
(Pages 16 - 17)

To correct descriptive data (length, type, etc.):
- Mark through with a single line
- Place correct data above it

<table>
<thead>
<tr>
<th>Begin Milepost</th>
<th>Begin Description</th>
<th>End Milepost</th>
<th>End Description</th>
<th>Section Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000</td>
<td>NC 62</td>
<td>1.360</td>
<td>BRIDGE</td>
<td>1.360</td>
</tr>
<tr>
<td>1.360</td>
<td>BRIDGE</td>
<td>2.350</td>
<td>SR 1581</td>
<td>0.990</td>
</tr>
<tr>
<td>2.350</td>
<td>SR 1581</td>
<td>3.96</td>
<td>SR 1754</td>
<td>1.55</td>
</tr>
<tr>
<td>3.96</td>
<td>SR 1754</td>
<td>4.930</td>
<td>SR 1002</td>
<td>1.03</td>
</tr>
</tbody>
</table>
To delete a section:

- Mark through section
- Write DELETE above it
Updating Section Information
(Pages 16 - 17)

• When breaking existing sections into two or more parts:
  – Make appropriate changes on printout.
  – Record new section information on blank “road addition sheet”...
Road Addition Sheet
(Pages 18 – 19)

1. Forms are identical to the field survey forms without previous distress ratings
2. There is no need to use separate sheets for Primary and Secondary systems
3. Fill out form correctly and completely
4. Include Division, County, Date and Rater
### NCDOT Pavement Condition Survey File

<table>
<thead>
<tr>
<th>County Section</th>
<th>Route</th>
<th>Division</th>
<th>Begin Milepost</th>
<th>End Description</th>
<th>Section Length</th>
<th>Percent Grade</th>
<th>Shoulder Type</th>
<th>Shoulder Width</th>
<th>Skid Resistance</th>
<th>Moisture</th>
<th>Subgrade</th>
<th>Rut Depth</th>
<th>Alligator Cracking (01, 02, 03...10)</th>
<th>N</th>
<th>L</th>
<th>M</th>
<th>S</th>
<th>Pavement Rating (K, L, M, S)</th>
<th>Rating (K, L, M, S)</th>
<th>Merging</th>
<th>Shoulder Width</th>
<th>Edge of Pavement</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>10000101</td>
<td>234</td>
<td>B1</td>
<td>1.00</td>
<td>SR 110.01</td>
<td>1.00</td>
<td>0</td>
<td>2R</td>
<td>W 3</td>
<td>7/10</td>
<td>400</td>
<td>3000</td>
<td>1200</td>
<td>2000</td>
<td>N</td>
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<tr>
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<td>B1</td>
<td>5.00</td>
<td>SR 1172</td>
<td>0.00</td>
<td>0</td>
<td>30</td>
<td>2</td>
<td>0</td>
<td>200</td>
<td>400</td>
<td>600</td>
<td>3000</td>
<td>N</td>
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</tbody>
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Survey: R. Frazier  
Division: 7  
County: Alamance  
Date: 9/18/2012
Pavement Distresses
Distresses

- Alligator Cracking
- Transverse Cracking
- Rutting
- Raveling - BST
- Oxidation - Plant Mix
- Bleeding
- Ride Quality
- Patching
Distresses
Sealed Cracks

For sections where alligator and transverse cracks have been well sealed and the sealant is in good condition, the severity of the crack is light.

If the sealant has deteriorated, the severity of the crack is moderate/severe.
Distresses
Alligator Cracking (Pages 21 - 28)

Alligator Cracking:
- Load associated structural failure
- Includes cracking along pavement edge

- On a two lane road, each lane represents 50% of section rating
- Cracking in one wheelpath or both wheelpaths results in an equivalent rating
Distresses
Alligator Cracking (Pages 21 - 28)

- Rate most distressed lane (usually the outside lane)
- Don’t rate construction joints unless they show noticeable distress
- Rate potholes (5-10 per mile) as 10% moderate
Distresses
Alligator Cracking

• Fill in the percentage of cracking under each appropriate heading (N,L,M,S)
• The percentage shall be filled in to the nearest 10 % by using 01, 02, 03 … 10 to indicate 10, 20, 30 … 100 %
• For each section, the sum of the numbers must equal 10
Light: Disconnected longitudinal hairline cracks about 1/8 inch wide running parallel to each other. May initially be a single crack in the wheelpath or edge of pavement but could also have an alligator pattern.
**Moderate:** Longitudinal cracks in wheelpath or edge of pavement form an alligator pattern; cracks may be lightly spalled and are about 1/4 inch wide.
Severe: Pieces may appear loose with severely spalled edges. Cracks are about 3/8 to 1/2 inch wide or greater. Potholes may be present.
Light: Hairline cracks are random with no pattern, just beginning to show, and are about 1/8 inch wide.
**Moderate**: Cracks are more extensive and may form an alligator pattern. Cracks are about 1/4 inch wide and may be spalled.
Severe: Cracks have formed alligator pattern and are severely spalled. Cracks are usually 3/8 to 1/2 inch wide or greater. Pieces may be loose and potholes may be present.
These distresses are rated over the entire section rather than as a percentage of the section.

The rater should recognize that various amounts of Light, Moderate and Severe distress may be present.
Rating Methodology:

- Determine distress - type and severity
- Determine total % of distress in section
- Determine % of each severity (L, M, S)
- Use the guidelines in the following slides to assign a distress rating
Transverse Cracking, Rutting & Raveling  
( Page 29 )

**LIGHT**

50% or more of the section shows Light distress

OR

A combination of distress conditions is present on 33% or more of the section with some Moderate distress
Transverse Cracking, Rutting & Raveling

Page 29

MEDIUM

50% or more of the section shows Moderate distress

OR

A combination of distress conditions is present on 33% or more of the section with some Severe distress
Transverse Cracking, Rutting & Raveling

33% or more of the section shows Severe distress

SEVERE
Distresses
Transverse Cracking (Pages 30 – 36)

Transverse Cracking:
– Divides pavement into rectangular pieces
– Not load associated
– Generally caused by temperature & shrinkage
– Reflective cracks caused by underlying slab movement

• Important to seal cracks to prevent water seeping into base
**Light:** Cracks are less than 1/4 inch wide with little or no spalling and usually 10 to 20 feet apart. A block pattern may not be visible yet. Joints are not significantly bumped up.
**Moderate:** Cracks are 1/4 inch to less than 1/2 inch wide, may be spalled, and are usually 5 to 20 feet apart. A block pattern may be visible with blocks 10 square feet or more. Joints may be bumped up 1/2 to 1 inch.
Severe: Cracks are 1/2 inch wide or greater, may be severely spalled, and are commonly 1 to 2 feet apart. A block pattern may be visible with blocks 2 to 10 square feet in size. Joints may be bumped up greater than 1 inch.
Light: Cracks are usually 1/8 to 1/4 inch wide and have little or no spalling. Joints are bumped up less than 1/2 inch.
Moderate: Cracks are 3/8 to 1/2 inch wide and may be moderately spalled. Joints may be bumped up 1/2 to 1 inch.
Severe: Cracks are greater than 1/2 inch wide and usually severely spalled. Joints may be bumped up greater than 1 inch.
Distresses
Rutting (Pages 37 - 40)

• A depression in the wheel path or at the edge of pavement

• Causes of rutting:
  – Pavement deformation caused by traffic loads
  – Unstable mix design
  – Movement of mix in hot weather
  – Subgrade failure
**Light**: Rutting 1/4 inch to less than 1/2 inch deep.
Moderate: Rutting 1/2 inch to less than 1 inch deep.
Severe: Rutting 1 inch or greater.
Raveling:

- A wearing away of aggregate particles
- Sand seals are not considered raveling
- Usually found in the wheel paths and can be seen as longitudinal streaks

• **RAVELING WILL ONLY BE INDICATED ON BST & SLURRY SURFACES**
Light: Aggregate has started to wear away, but aggregate loss within the pavement lanes is not great. Small amounts of stripping may be detected.
Moderate: Some stripping is evident. Random stripping with small areas of aggregate (less than one square foot) are broken away. Can also appear as strips of aggregate broken away.
Severe: Stripping is very evident and aggregate accumulation may be a problem. Sections greater than one square foot exhibit stripping and the aggregate layer is broken away.
Oxidation/Weathering:

- Hardening & aging of asphalt binder
- Binder worn away to expose aggregate
- Pitting is very evident
- Usually covers entire surface

• OXIDATION IS ONLY INDICATED ON PLANT MIX
None: Condition is not present.
Severe: Condition is present.

NCDOT Pavement Management - 2012 Pavement Condition Survey
Distresses
Bleeding (Pages 46 - 47)

Bleeding:

– Film of bituminous material on surface
– Caused by excess asphalt cement / low voids
– Expands during hot weather, is not reversible during cold weather

• Each wheelpath represents 25% of section
Light: Condition is present on 10% to 25% of section.
Moderate: Condition is present on 26% to 50% of section.
Severe: Condition is present on more than 50% of section.
Distresses

Ride Quality (Page 48 - 52)

Ride Quality:

- Primary criteria the public uses to judge the performance of a road.
- Evaluated using a combination of “Seat of the pants” judgement and vehicle operating speed.

• Operating Speed
  - The speed at which most drivers travel a section of road with the current alignment and normal weather conditions.
Light (average): No unevenness or bumpiness. Pavement texture is relatively fine, resulting in a minimum of tire noise. Operating speed is easily maintained.
Light (average): Pavement texture may be slightly coarser, resulting in some increased tire noise. Isolated cases of bumps and dips range up to 25% of the section. Operating speed can be maintained safely.
Moderate (slightly rough): 25% to 50% of the section is uneven and bumpy with dips and ruts. Pavement may be broken and cracked with a resulting increase in tire noise. Slight difficulty in maintaining safe operating speed.
Severe (rough): Greater than 50% of pavement is uneven and bumpy. Rider is frequently jostled. Large and frequent pavement failures and rough texture may be present, causing substantial tire noise and jolts. Operating speed cannot be maintained safely.
Distresses
Patching (Pages 53 - 56)

Patching:

– Consists of PM or BST patches, short overlays, etc.
– **Quality of patch NOT RATED; Just the amount**
– Any distresses in a patch should be included in the normal distress evaluation
• The following are not considered patching:
  – Bridge approach tie-ins
  – Intersection tie-ins
  – New signals
  – Section widening
  – Crack pouring
Distresses
Patching ( Page 53 )

• Rating is based on the percentage of roadway surface patched
  – Less than 315 (6%) feet of full width patch/overlay per mile = no patching
  – 315 to 844 (6 to 15%) feet of full width patch/overlay per mile = light patching
  – 845 to 1585 (16 to 30%) feet of full width patch/overlay per mile = moderate patching
  – More than 1585 (30%) feet of full width patch/overlay per mile = severe patching
**Light**: Condition present on 6 to 15 percent of the section.
Moderate: Condition is present on 16 to 29 percent of section.
Severe: Condition is present on more than 30 percent of section.
Points to Remember

( Page 57 )

• When rating distresses:
  \[ N = \text{None}, \quad L = \text{Light}, \quad M = \text{Moderate}, \quad S = \text{Severe} \]

• Each direction of travel on all divided highways is rated as a separate section

• Rate cracking near pavement edge as alligator

• Truly Severe (Rough) Ride is extremely rare across the state
Common Abbreviations

In Description Fields:

– CO = County
– CL = City Limit
– SR = Secondary Road
– CG = Curb & Gutter
– PVT/PVMT = Pavement
– EOP = End of Pavement
– EOM = End of Maintenance
– DE = Dead End
– CDS = Cul de Sac
• Make copies of all data for your records before submittal
• County Maintenance Engineers should turn in survey sheets as completed for data entry
• Turn in progress reports to Division Maintenance Engineer weekly
• Reassemble completed survey book and send to Jerry Blackwelder in the Pavement Management Unit – 1593 MSC
Transmittal of Survey Data

( Page 58 )

Complete survey & data entry by:

**March 1, 2012**

*Trainers:*

Jeff Chinlund

Steve Hinnant

Tom Thomas

Jerry Blackwelder
Questions?