SCDOT FDR Program

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Overview

- Why FDR is a good fit in South Carolina
- History of FDR Program
- Status of Current FDR Program
- On-Going Research and the Future of FDR in SC
2017 STATE OF THE PAVEMENT

Pavement System
- 90,609/ lane miles
- Primaries and Secondaries Carry 70% of Traffic
Secondary System Pavement Condition

Federal Aid Eligible Portion
- 53% Poor
- 27% Fair
- 20% Good

Non Federal Aid Eligible Portion
- 57% Poor
- 27% Fair
- 16% Good

- 21,407 lane miles
- 41,326 lane miles

December 31, 2017 Data
Non-Federal Aid Secondary System: % Pavement in Good, Fair & Poor Condition
Primary System Pavement Condition Federal Aid Eligible

- 24,035 lane miles
- Comprised of US and SC routes
- Includes routes on the National Highway System (NHS)
- 46% of all travel in SC occurs on the primary system

Diagram showing pavement condition:
- 27% Good
- 21% Fair
- 52% Poor

December 31, 2017 Data
NHS Primary System: % Pavement in Good, Fair & Poor Condition

Approximately 9000 Lane Miles
SCDOT FDR Program Began 1994
SC Route 97 (2016)

8 Inches CMRB, 225 psy Intermediate, 175 psy surface
Growth and Current FDR Program
Growth of the Program Over 20 Years

- Modest Beginnings

- Within in the first 10 years FDR became recognized across the state but was still less than 100 lane miles per year.

- By the year 2011 the use of FDR was accelerating beyond 100 lane miles per year.

- Due to Funding and Program needs this fluctuated between 100 and 200 lane miles per year until 2015 when the program grew by more than 3x to 600 lane miles per year.
Full Depth Reclamation Totals

Square Yards

- 2013
- 2014
- 2015
- 2016
- 2017
- 2018
- 2019

Yardage:
- 1,000,000
- 2,000,000
- 3,000,000
- 4,000,000
- 5,000,000
- 6,000,000
Recent Program Summary

- Our cost is approximately $5 per square yard plus the cost of cement.

- Overall the program has been very successful.

- Some issues with quality as new competition has entered the market and application of FDR has significantly increased.
2018 specification focuses on pulverization, cement mixing and moisture.
- Requires contractor QC plan and test strip during construction.

Contractor performs mix design
- Samples prepared at 3%, 6% and 9%
- **Design Strength is 450 - 600 psi**
  - Not always achieved

Treatments
- 8, 10 and 12 inches of mixing. Mostly 10’s and 12’s
- Generally cure with single treatment (chip seal)
- Mill treatment off and overlay with 175 to 400 psy of HMA
- Occasionally place triple treatment as final riding course
Investigation and Pavement Design

- Investigation of existing conditions
  - Confirmation of reclamation as the proper treatment.
  - Thickness of existing pavement structure.

- Pavement design recommendations are provided by OMR.

- Completed investigation on 145 roads since Jan 2018

- 106 candidate roads are currently planned for investigation
Cement Content
- Less than 4.5% = 71
- 4.5% - 5.6% = 162
- 6% - 7.7% = 297
- 8% - 9% = 424

Mixing Depth
- 6” or less = 27
- 8” = 357
- 9” = 7
- 10” = 231
- 12” = 331
- 14” = 1
17 existing Roads have been investigated so far.
Past Performance – Shrinkage Cracking
Future of FDR in SC

- Synthetic Reclamation
- MEPDG Calibration of Semi-Rigid Model
- New Mixture Design Procedures
- Use on High Volume Roadways
  - Included on several recent Interstate Widening and Reconstruction jobs
Questions