Integrating Pavement Data Entry From Contract to Post Installation Inspection

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The Situation...
The Solution...
GIS is the answer...

It Enables:

• Data Integration
• Visualization
• Simple Collection
Project Background

Mobile Pavement M-20 Data Collection
Leverage technology to replace pen & paper collection of M-20 form

**Desired Outcomes**

- Mobile, GIS based field data collection
- Improved accuracy
- Automated workflow
  - Pre-generation from PMSS planned work
  - Batched transfer of collected data to PMS
Purpose

- Document pavement work accomplishments / material layer history

Primary Stakeholders

- Pave Mgmt. (District & CO)
- Construction (ACE & CM)
- Materials (District & CO)
- Executive Team (District & CO)
Mobile Pavement M-20 Data Collection
“AS-IS” Process for M-20 Data Collection

1. PMSS contract developed, advertised, and awarded
2. Contract executed (potentially work ordered in field)
3. Inspector validates and completes M-20 (pen & paper)
4. M-20 submitted to District Pave Mgmt (through CM / ACE)
5. District Pave Mgmt reviews and **manually** keys into PMS
6. PMS System Location Validation (invalid location rejected)
7. District Pave Mgmt adjusts rejected records (as needed)
8. CO Maintenance addresses exceptionally problematic location referencing issues (as needed)
Mobile Pavement M-20 Data Collection

“Mobile” Process for M-20 Data Collection

1. PMSS records pre-populated to GIS
2. Field User Update & Approval of Work Accomplished
   • Mobile: Collector App
   • Desktop: Web App
3. Central Office Migration of GIS Data to PMS
“Mobile” M20 Process
Mobile Process Detail

Mobile Pavement M-20 Data Collection
Mobile Pavement M-20 Data Collection
PMSS Pre-Population (Central Office)

Field User Requirements: NONE (accurate PMSS data entry)

Contract Information
- Location:
  - District, County
  - RNS Route, Start & End
  - Lanes, Lane Direction
- Project:
  - UPC, Schedule, Project #
  - Dashboard Year
  - Maintenance / New Const.
  - # Lanes Paved
  - Pave Type & Treatment Cat

Mainline Material Information
- Layer Number
  - Follows PMS Requirements
  - Left blank if multiple similar materials are found (requires manual update)
- Material Information
  - Uses PMS Material Names
  - Only full length / width paving items (not misc. quantities)
- Thickness
  - Will convert Application Rate if Thickness is not provided
Mobile Pavement M-20 Data Collection

Field Data Update / Approval (District)

Field User Requirements: Limited data update requirements (assuming actual paving reflects PMSS planned)

Min. Approval Data Entry:
• Approved = “Yes”
• Date Paved
• Prepared By
• Reviewed By

Additional Actions
Field user should verify:
• GIS accurately describes actual paved locations
• Materials properly entered and represent all mainline materials
• Address “flagged” conditions
Field User Requirements: **NONE**

All “Accepted” records will be imported by Central Office
*(Approved M20s, with no validation issues)*
Mobile Pavement M-20 Data Collection

Important Considerations

Consistent Use
• Direct entry to PMS is possible > duplicate entry is a risk

Mobile Collection
• Helpful, but NOT required, the Web App provides full function

LRS Requirements
• Start and End matched to nearest routes (based on business data)
• Split across “Master Routes” (same as PMS)
Mobile Pavement M-20 Data Collection

Additional Considerations

Material Pre-Population
• Only as good as PMSS data – many surface treatment records lack both Thickness and Application Rate (requiring manual data entry)

Business Validation
• Scripts are run on cycle (1 to 5 minute frequency, not immediate)

Location Definition
• Updating Mile Point will not impact location
• GIS Start / End Points must be moved to adjust location
Tool Introduction

Mobile Pavement M-20 Data Collection
M-20 Web App (Desktop Data Review, Update, Entry and Export)
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Available Data – Layer List

Summary Data & Status – Start Point

Data Entry – Related Table Form

Data Entry / Review – Related Tables
M-20 Collector App (Field Project-Level Data Review, Update, and Entry)
Mobile Pavement M-20 Data Collection

Vision Achieved?

2018 Paving begins in April