2022 Municipal Streets Seminar  
Better Pavement Foundations: Iowa DOT Roadmap  

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Pavement Needs Exceed Available Funding in Iowa  
• Iowa DOT has identified that maintenance and construction costs for pavements will far outpace funding  
• Methods for extending pavement life and reducing lifecycle costs must be developed and implemented  
• Staffing (or lack thereof) needs present additional challenges to ensure quality pavement construction

Pavement Foundations Are Often Overlooked  
• Pavement foundations represent a critical part of pavement design  
• Costs to improve pavement foundations are less than pavement materials improvements  
• Additional focus must be given to improvement of pavement foundations  
• Improved pavement foundations extend pavement life and reduce lifecycle costs  
• Quality control measures are disconnected from design values (subgrade modulus)  
• The digital revolution offers opportunities to leverage new technology to extend pavement life

Iowa DOT Pilot Projects and FHWA Pooled Fund  
• Iowa DOT is participating in FHWA Pooled Fund Study TPF-5(478) to verify pavement foundation design modulus and monitor construction quality  
• As part of TPF-5(478), Ingios COMP-score technology is being used by IADOT to collect data for materials across the state and evaluate opportunities to improve the technology during implementation  
• IADOT is also undertaking pilot projects to use Ingios technology as part of the pavement foundation workflow, including real-time decision making  
  • 2022 – 5 Pooled Fund Projects and 4 IADOT Pilot Projects  
  • 2023 – 6 IADOT Pilot Projects (2 continued from 2023, 4 new projects)
Overview of COMP-Score Technology

- COMP-Score platform is an information system combining data, software, hardware, and networks to empower people to more effectively design/construct pavement foundations.
- Direct measurement of design parameters (subgrade modulus/resilient modulus) during construction using Measured Path load test (APLT) and machine outputs.
- Real-time machine measurements and computer display in roller improves construction operation efficiency by focusing efforts on areas needing correction.
- Machine measurements cover 100% of the pavement area compared to <0.1% from current methods for QC/QA documentation.
- E-compaction reports are generated within minutes of machine mapping; decision-makers can assess conditions and implement corrective action without project delay.
- Web interface allows remote inspection from the desktop.

Iowa DOT Key Findings

- Iowa DOT has used e-compaction technology on over 30 projects since 2017.
- Nearly 70% of pavement foundations are not achieving the minimum design values for modulus under existing methods.
- Awareness of deficiencies in the pavement foundation has increased dramatically on IADOT pilot projects by using e-compaction technology.
- E-compaction has been used to implement pavement foundation improvements (grout, cement stabilization, etc.), in response to rutting or deformation.
- Design modulus values have been achieved as a result of action taken through e-compaction which will extend pavement life.
- Refinement of the information system continues as part of the implementation strategy and improves the effectiveness of e-compaction within the pavement design process (e.g., designer, contractor, Inspector, project owner).

IADOT Overview of Implementation Plan – Next Steps

- Identify & evaluate specification and design changes to cost effectively deliver better performing pavement foundations.
- Develop SPs for use in future years.
- Quantify value proposition of longer performing foundations.
- Determine best contracting arrangement to continue this work.
- Continue work with Technical Working Group (includes industry).

Application to Municipalities

- Municipal maintenance and roadway engineers can use COMP-score technology to extend pavement life.
- APLT and COMP-Score technology allow municipalities to assess remaining service life of existing pavements.
- Automated reporting and remote inspection increase inspector effectiveness, improve quality control and quality assurance.
- Remote inspection allows fewer inspectors to monitor more projects from a desktop interface.
Thank you!
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