

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

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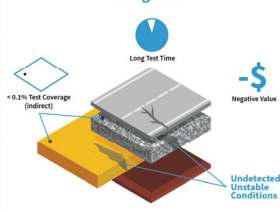
Pavement Foundations Are Often Overlooked

- 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

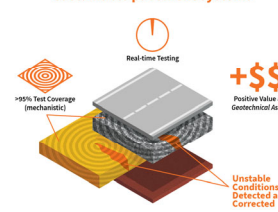
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~40 year lifespan=
state of practice for pavement design life



100+ year lifespan=
engineering requirement for sustainable pavement systems



Improved pavement foundations extend pavement life **and** decrease project costs over time.

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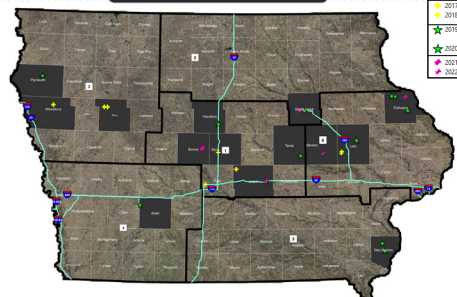
Iowa DOT Pilot Projects and FHWA Pooled Fund

- 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)

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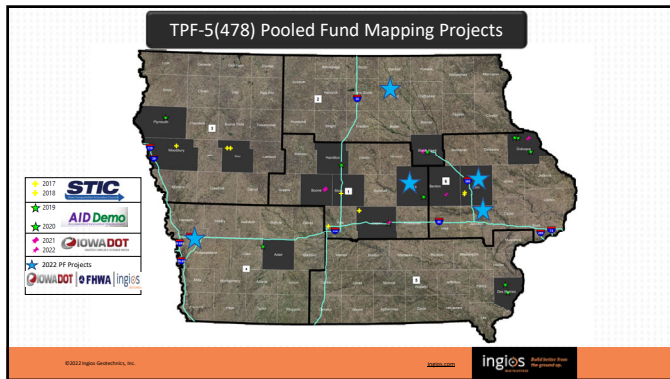
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IADOT Pilot Projects



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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 Automated Plate 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

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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** (geogrid, cement stabilization, etc) in response to COMP-score measurements
- 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 everyone involved in the pavement design process** (e.g. designer, contractor, inspector, agency, etc)

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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)

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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

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Thank you!
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