

EDC-5 STATE IMPLEMENTATION PLAN

*The State Implementation Plan will not be collected at this time - this document is to help in developing the Implementation Plan. The items **highlighted below** will be requested as part of the EDC-5 baseline report – due January 25, 2019*

EDC Innovation: **Advanced Geotechnical Methods in Exploration (The A-GaME)**

Program Need: (Why is the innovation is being selected?)

Implementation Goal: Indicate the current state of the practice of the tool or innovation in your State as of January 2019 and the implementation stage of where you want to be in two years (Goal). *Check one box in the Baseline Jan 2019 column and one box in the Goal Dec 2020 column.*

Innovation Implementation Stages <i>(see State of Practice Form for the innovation specific implementation stage definitions)</i>	Jan 2019 (Baseline)	Dec 2020 (Goal)
Not Implementing: The A-GaME has not been used, and the State is not interested in pursuing advanced geotechnical exploration methods and practices for improved site characterization.	<input type="checkbox"/>	<input type="checkbox"/>
Development Stage: The State is in the process of learning more about implementing advanced geotechnical exploration methods and practices. A champion has been identified, staff have received training and participating in EDC A-GaME related workshops and webinars.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Demonstration Stage: The State is testing/piloting the A-GaME, integrating project-specific geotechnical-related risk evaluations, and improvements to design, construction and performance reliability within site characterization processes, using 1+ of five featured tech.	<input type="checkbox"/>	<input type="checkbox"/>
Assessment Stage: The State frequently optimizes site characterization using multiple advanced methods and using practices to reduce geotechnical related project risks and improve design, construction and performance reliabilities. At this level, states have not yet integrated featured technologies or established routine language and guidance into their geotechnical manual.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Institutionalized: The State has integrated one or more of the technologies and practices of the A-GaME as a standard practice, and language and guidance for use is incorporated within the state’s geotechnical and policy manuals where appropriate.	<input type="checkbox"/>	<input type="checkbox"/>
<p>Description of Current Status of this innovation in your State: <i>(include state DOT and local agencies to the best of your knowledge)</i></p> <p>The A-GaME innovation aims to showcase a suite of geotechnical tools that have been fully developed and vetted yet are underutilized in the transportation industry. The geotechnical “toolbox” promoted as part of this innovation includes exploration technologies that will complement our standard auger drilling and SPT sampling along with emphasizing Geotechnical Data Management Systems for archiving data.</p> <p>The NMDOT has utilized Cone Penetration Tests (CPT), Seismic Geophysical techniques, and less frequently Electrical Resistivity techniques and optical televiwers on select projects statewide. To my knowledge, Flat-Plate Dilatomter (DMT), Acoustic Televiwers, and other Measurements While Drilling (MWD) techniques have not been used by the NMDOT.</p> <p>As of this year, the Geotechnical Section developed a GIS referenced database that show geotechnical boring locations, using Latitude and Longitude. The GIS database includes geotechnical boring locations performed in 2013 onward, where data is available. We are also in the process of transitioning from the use of excel spreadsheets to commercial software (HoleBase SI) to generate our Boring Log Summaries and report field and laboratory test results. The upgrade from excel to commercially available software for recording and reporting is a first for the NMDOT. This upgrade is expected to improve reporting accuracy and increase efficiency. We are still working to implement Phase I; Phase II will consist of transitioning the Materials Bureau Lab from excel into the use of Key Lab. Key Lab and HoleBase SI are both Keynetix applications that will work jointly to archive and report laboratory and field results. The long-term plan is to have our data tie into the geotechnical data schema known as DIGGS.</p>		

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Description of State Innovation Goal (Benefit Goal): *In other words, after 2 years “What would success look like for your state?” (i.e. X innovation will save X time, money, or lives.) These benefits are what elected officials and the traveling public can relate to and help to support the level of resources invested in the deployment of innovations under EDC.*

Innovation Implementation Team Members:

- State DOT Team co-chair: Michelle R. Mann
- FHWA Team co-chair: Thiet Nguyen
- Proposed Implementation team members will consist of Mark Strzelczyk, Brandi Butts, Melissa Bates, a member from Bridge, Drainage and Construction Bureaus
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Obstacles: (What is perceived as hindering the State in meeting the implementation goal?)

- Training, workshops, etc. to help with specifying appropriate test methods and interpreting data to reduce geotechnical risks and increase design confidence.
- **Contract funding and management of funds for professional services.**
- Equipment purchases for measurement while drilling, televewers, and other equipment. This includes possible funding needs associated with upgrading existing exploration equipment.
- Evaluate current geotechnical section deliverables (foundation and geotechnical reports) to determine if new report formats are required. The report formats or separate deliverables may be needed to assist with communicating risk during construction. As discussed during the face-to-face meeting in December 2018, a participant mentioned including an “Evaluation Section” in all geotechnical related deliverables. We will need additional direction from FHWA’s resource center or A-GaME implementation team to ensure our deliverables continue to meet the industry standard.

Performance Metrics: (What are the **measurable targets** to assess your progress?)

Implementation Plan Activities		
Activity No.	Description of Activity	Target Completion Date
1	Continue efforts to fully implement HoleBase SI and KeyLab software (this supports the geotechnical data management system component of the A-GaME innovation).	12/2019
2	Revise NMDOT geotechnical design guide to include the decision tree for exploration methods, discussed during the Implementation team meeting in Lakewood Colorado, December 2018.	12/2020

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	When the decision tree is developed and deployed we can incorporate this into our Geotechnical Design Guide immediately.	
3	When and where available, we would like to attend training, workshops, and showcases to understand how to specify A-GaME toolbox technologies, interpret the results, use data to generate design recommendations, and communicate risk to contractors.	1/2021

Action Items to follow up with after the EDC Summit:

State of Practice Form – Implementation Stages Defined

Implementation Stage Definitions		Guidance Questions
<p>*State is all-inclusive (e.g., state agency, local municipalities, contractors, consultants)</p>		<p>Prompt questions to help assess your current state of practice.</p> <p><i>NOTE: Not all questions have to be affirmatively answered to meet any given stage; judgment is required; call the A-GaME Deployment Team w/ questions.</i></p>
	<p>Not Implementing: The A-GaME has not been used or is not regular practice in the state, and the State is not interested in pursuing advanced geotechnical exploration methods and practices for improved site characterization.</p>	<ul style="list-style-type: none"> • After learning its benefits, has the State determined that the A-GaME technologies and practices are not beneficial to their project delivery? • Does the State lack the internal resources or access to consultant expertise to begin an evaluation of the A-GaME technologies and practices? • Is the state not interested in hosting or sending staff to an A-GaME peer-exchange or training course?
	<p>Development Stage: The State is in the process of learning more about implementing advanced geotechnical exploration methods and practices. A champion or champions has(have) been identified, staff have received (or State is committed to) training and participating in EDC A-GaME related workshops and webinars.</p>	<ul style="list-style-type: none"> • Does the State have a champion or team identified? • Has the State hosted training or sent staff to training or event(s) on advanced site characterization methods and practices? • Has the State participated in workshops, webinars, field demonstrations or peer exchanges? • Has the State sponsored or requested a showcase presentation on A-GaME technologies and practices? • Has the State sponsored or requested field demonstrations of one or more of the five featured exploration methods? • Has the State completed at least one project with low to moderate geotechnical related risks, using one or more of the five featured exploration technologies (either in-house or by a consultant)? Please include the exploration methods used.
	<p>Demonstration Stage: The State is testing/piloting the A-GaME, integrating project-specific geotechnical-related risk evaluations, and improvements to design, construction and performance reliability within site characterization processes, using one or more of the five featured exploration technologies.</p>	<ul style="list-style-type: none"> • Has the State requested technical assistance or peer review for a project? • Has the State completed at least one project integrating one or more of the five featured exploration technologies (either in-house or by a consultant) while explicitly evaluating and assessing the following: <ul style="list-style-type: none"> ○ moderate to very high geotechnical related risks? ○ natural site variation of conditions and its impact on design sensitivity and reliability? • Has the State integrated more than one of the five featured exploration technologies into the project design? • Has the State compared their A-GaME with results from previous practice? • Please include the exploration methods used.

Advanced Geotechnical Methods in Exploration – The A-GaME

https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/geotech_methods.cfm

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Implementation Stage Definitions	Guidance Questions
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<p>Assessment Stage: The State frequently optimizes site characterization using multiple advanced methods and using practices to reduce geotechnical related project risks and improve design, construction and performance reliabilities. At this level, states may not have yet integrated featured technologies or established routine language and guidance into their geotechnical manual or other policy documents.</p>	<ul style="list-style-type: none"> • Has the State frequently reduced significant geotechnical related project risks and improved design, construction and performance reliabilities by optimizing geotechnical site characterization using multiple advanced methods and practices? • Is the State working toward incorporating the featured geotechnical exploration methods and practices into required practice within their design manuals, contract language, and other documents? • Has the State observed marked or measured improvements with the standard deviation of bid prices, reductions in cost escalations, reduction in construction delays, improvements in design efficiencies, and improvements in design performance from optimized site characterization? • Please include the exploration methods used.
<p>Institutionalized: The State has integrated one or more of the technologies and practices of the A-GaME as a standard practice, and language and guidance for use is incorporated within the state’s geotechnical and policy manuals where appropriate.</p>	<ul style="list-style-type: none"> • Does the State routinely use the technologies and practices of the A-GaME to reduce geotechnical related project risks to schedule and budget, and to improve reliability in design, construction and performance to optimize geotechnical site characterization using proven, effective exploration methods and practices? • Has language been successfully integrated into the State’s policies, procedures, and guidance (e.g., design manuals) to optimize geotechnical site characterization to effectively reduce project risks and maximize ROI from geotechnical exploration? • Has more than one of the five featured exploration technologies been incorporated into routine practices and standard processes? • Please include the exploration methods institutionalized