

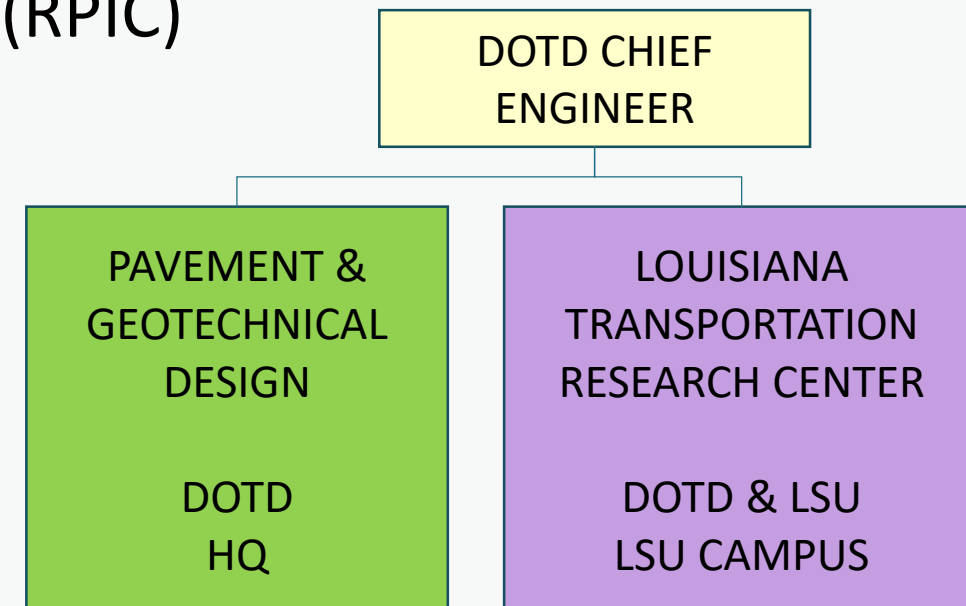
Digital Integration of AASHTO Updates for Enhanced Engineering Decisions and Project Deliveries

Gavin P. Gautreau, P.E.
Sr. Geotechnical Research Manager
LTRC Project 24-2GT



LTRC Introduction

- LTRC Created by Louisiana Legislature in 1986.
- Sponsored Jointly by the Louisiana Department of Transportation and Development (DOTD) and Louisiana State University (LSU)
 - Conducts short- and long-term research
 - Provides technical assistance, training, continuing education, technology transfer to DOTD and the transportation community.
- Research Problem Identification Committees (RPIC)
 - Problem Solicitation
 - Committee Review & Rating
 - Importance & Implementation Potential
- Project Review Committee (PRC)
 - Industry, Academia, and Government



Data Management



Digitize

Dataforensics

HOME GET STARTED PRODUCTS CONSULTING SUPPORT FAQS CONTACT

Tired of messy field notes?

Dataforensics		BORING NUMBER 01-34	
Date	Time	Location	Depth
01/01/2020	10:00	01-34	0.00
01/01/2020	10:05	01-34	0.05
01/01/2020	10:10	01-34	0.10
01/01/2020	10:15	01-34	0.15
01/01/2020	10:20	01-34	0.20
01/01/2020	10:25	01-34	0.25
01/01/2020	10:30	01-34	0.30
01/01/2020	10:35	01-34	0.35
01/01/2020	10:40	01-34	0.40
01/01/2020	10:45	01-34	0.45
01/01/2020	10:50	01-34	0.50
01/01/2020	10:55	01-34	0.55
01/01/2020	11:00	01-34	0.60
01/01/2020	11:05	01-34	0.65
01/01/2020	11:10	01-34	0.70
01/01/2020	11:15	01-34	0.75
01/01/2020	11:20	01-34	0.80
01/01/2020	11:25	01-34	0.85
01/01/2020	11:30	01-34	0.90
01/01/2020	11:35	01-34	0.95
01/01/2020	11:40	01-34	1.00
01/01/2020	11:45	01-34	1.05
01/01/2020	11:50	01-34	1.10
01/01/2020	11:55	01-34	1.15
01/01/2020	12:00	01-34	1.20



Geotechnical Database Efforts

- Phase 1, LTRC - PDFs (information) to ArcMAP

- ArcGIS map with linked borings (custom code)
- Content Manager with web interface



LTRC Project # / Report #

03-1GT / 446

- Phase 2, Dataforensics – Digital Data

- gINT – Bentley software customization
- pLOG
- Rapid CPT
- Field Data Loggers



pLog Tablet

10-2GT / 498

- Phase 3, Pile Load Test Database & District Shallow Soil Borings

- HoleBASE, Keynetix
- KeyLAB, Keynetix



15-1GT / 634

- Phase 4, LTRC - OpenGround Cloud

- LTRC Data Upload/Conversion
- KeyLAB, Keynetix (internal drill crew)
- Dataforensic (Bentley Rep)



OpenGround® Cloud
CONNECT Edition

24-2GT In-Progress

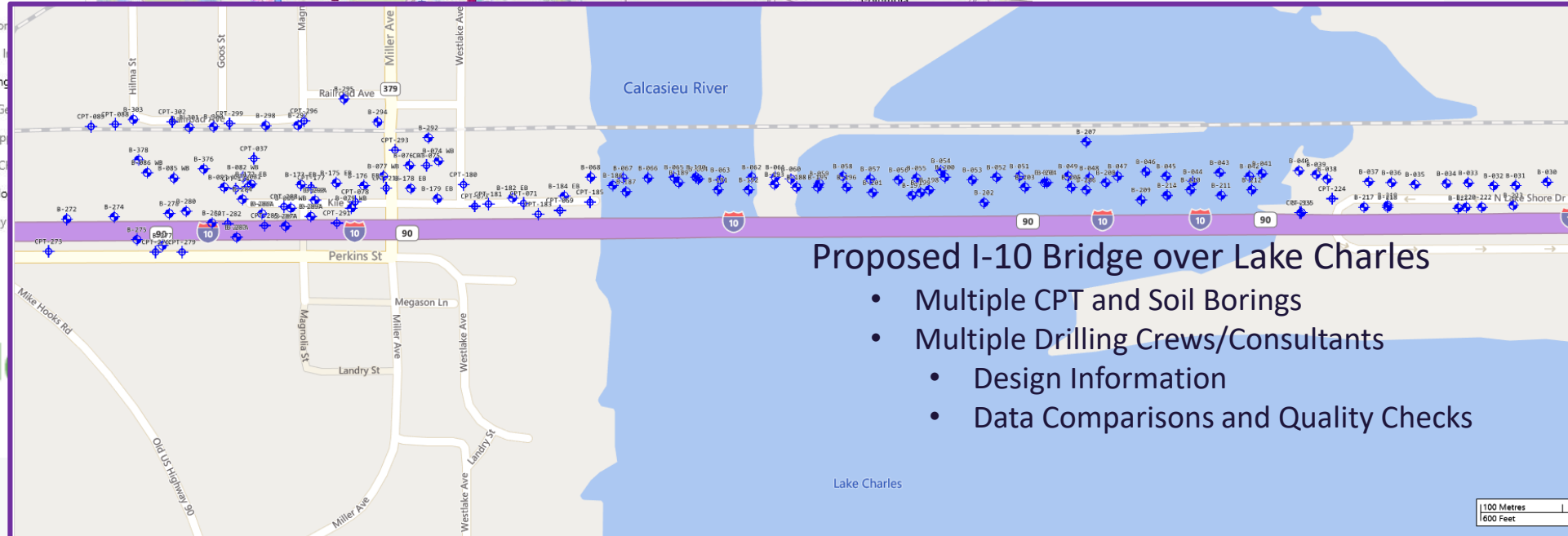
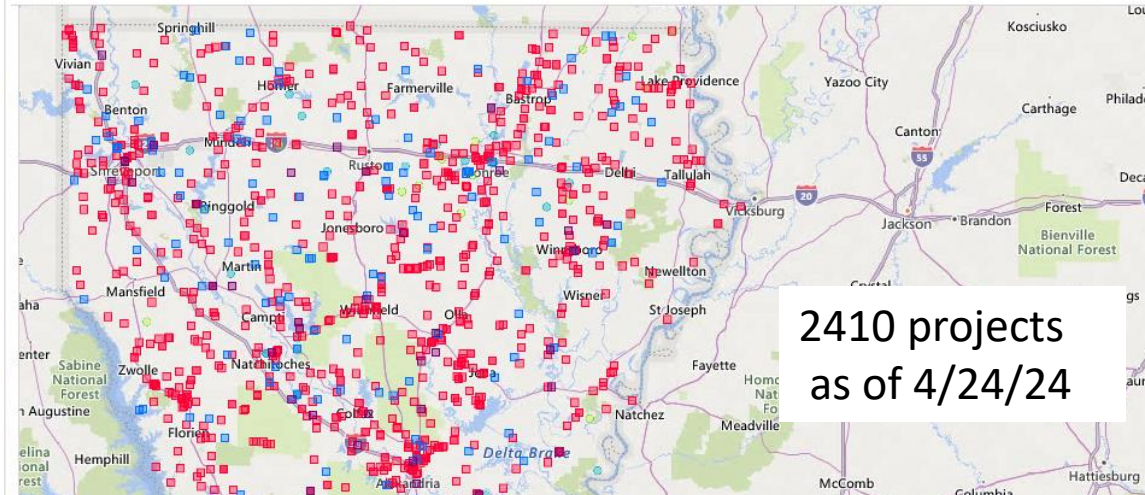
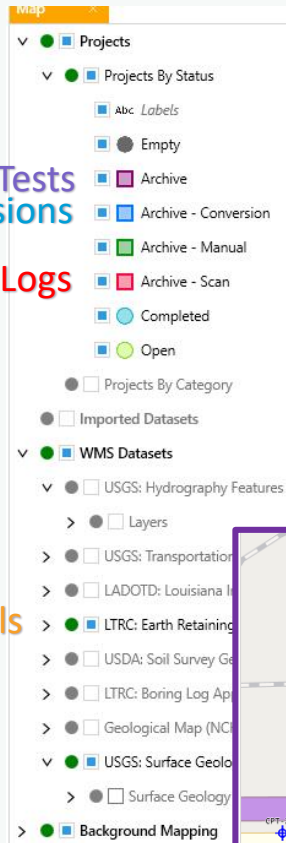


Geotechnical Database - Phase IV (21-2GT)

Pile Load Tests
gINT Conversions

.PDF Logs

Retaining Walls



Bentley
OpenGround Cl
CONNECT Edition



Open Ground Cloud (OGC) Excel Extension

The image displays two overlapping screenshots. The background screenshot is the OpenGround Cloud web application interface. It features a blue header with the 'OpenGround® Cloud' logo and a 'LADOTD' dropdown menu. Below the header, there's a section for 'Installed Apps' with a list of applications: Professional (v10.0.1.1217), Excel Extension (v10.0.1.269), Data Entry (v10.0.1.1217), Template Studio (v10.0.1.434), Power BI Connector (v1.0.0.100), and Power BI Connector (Store) (v1.0.0.100). Each app has a 'LAUNCH' button. To the right of this list is a 'Latest News' section with several articles, including 'OpenGround Power BI Connector is...', 'Coffee Corner: Geotechnical Inform Data Manager Update', and 'Don't let shift changes become a bl... drilling data'. The foreground screenshot is a portion of the Microsoft Excel ribbon. The 'OpenGround Cloud' tab is highlighted with a red circle. A red line connects the 'Excel Extension' app in the web interface to the 'OpenGround Cloud' tab in the Excel ribbon. Below the Excel ribbon, a 'Reports' panel is visible, listing various reports such as 'CPT - All Data Graph', 'CPT - qt vs Bq (1986)', 'CPT - Qt vs Bq Normalized (1990)', 'CPT - Qt vs Fr Normalized (1990)', 'CPT- qt vs Rf (1986)', 'DCP Output Report', 'Geotechnical Data Plot', 'LADOT CoreLog Export', 'Tabular Subgrade Report', and 'Test Pile Database Report'.

OpenGround® Cloud

LADOTD

Installed Apps

- Professional v10.0.1.1217 [Release Notes](#) [LAUNCH](#)
- Excel Extension v10.0.1.269 [Release Notes](#) [LAUNCH](#)
- Data Entry v10.0.1.1217 [Release Notes](#) [LAUNCH](#)
- Template Studio v10.0.1.434 [Release Notes](#) [LAUNCH](#)
- Power BI Connector v1.0.0.100 [Release Notes](#) [LAUNCH](#)
- Power BI Connector (Store) v1.0.0.100 [Release Notes](#) [LAUNCH](#) Power BI Desktop required.

Available Apps

Latest News

OpenGround Power BI Connector is...
Tuesday, August 9, 2022
[READ MORE](#)

Coffee Corner: Geotechnical Inform Data Manager Update
Monday, August 1, 2022
[READ MORE](#)

Don't let shift changes become a bl... drilling data
Thursday, July 21, 2022
[READ MORE](#)

Coffee Corner: Geotechnical Inform Data Manager Update
Tuesday, July 12, 2022
[READ MORE](#)

Come Meet the Team at Geotechni...
Monday, July 4, 2022
[READ MORE](#)

Excel

File Home Insert Page Layout Formulas Data Review View **OpenGround Cloud** Tell m...

Projects Reports User Guide Online Help About Help

Sources

Reports

Name
CPT - All Data Graph
CPT - qt vs Bq (1986)
CPT - Qt vs Bq Normalized (1990)
CPT - Qt vs Fr Normalized (1990)
CPT- qt vs Rf (1986)
DCP Output Report
Geotechnical Data Plot
LADOT CoreLog Export
Tabular Subgrade Report
Test Pile Database Report

Tables, Graphs, and Forms

- To speed and ease calculations
- Digital vs. hand-drawn

Long term benefits – Database

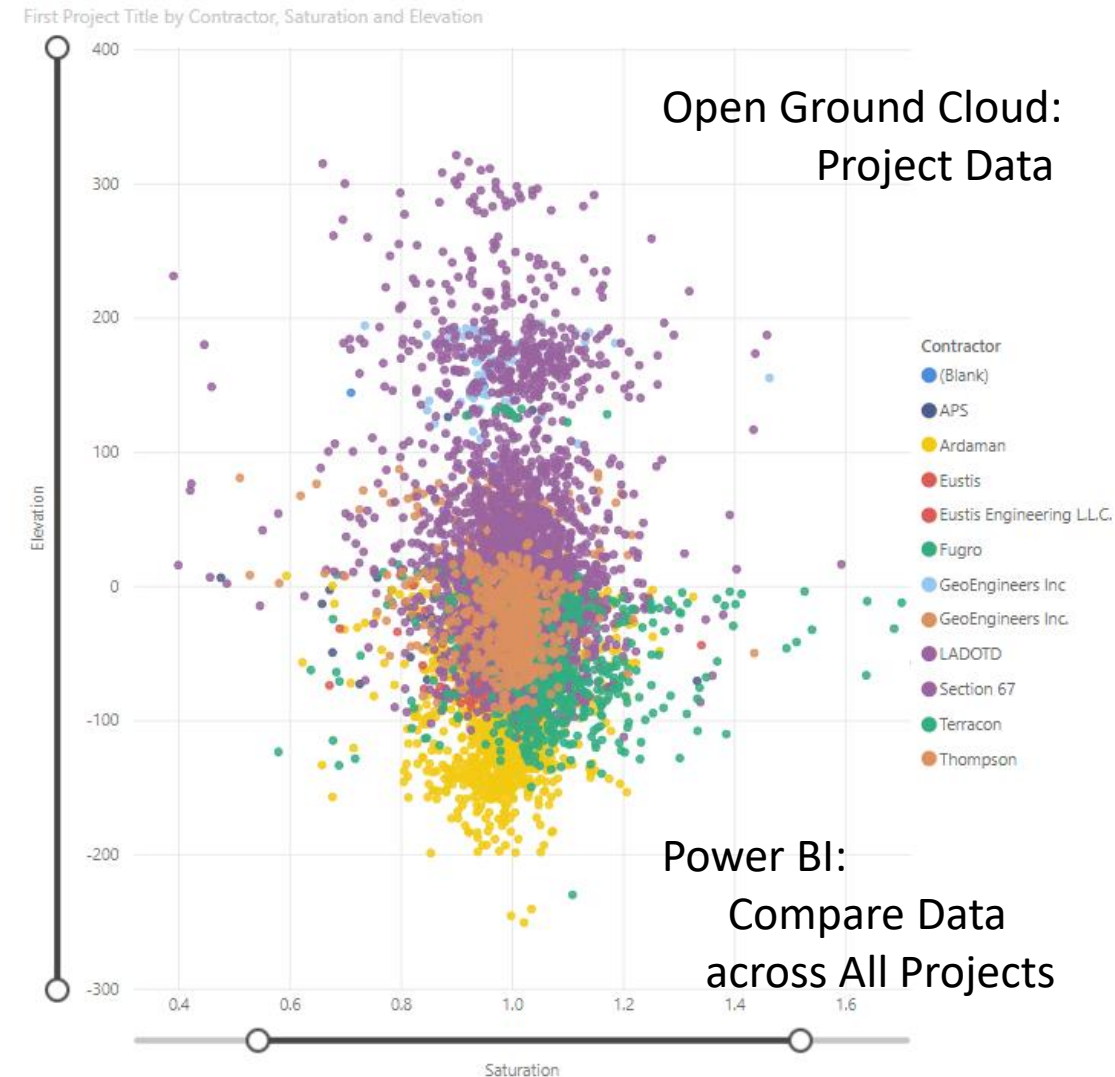
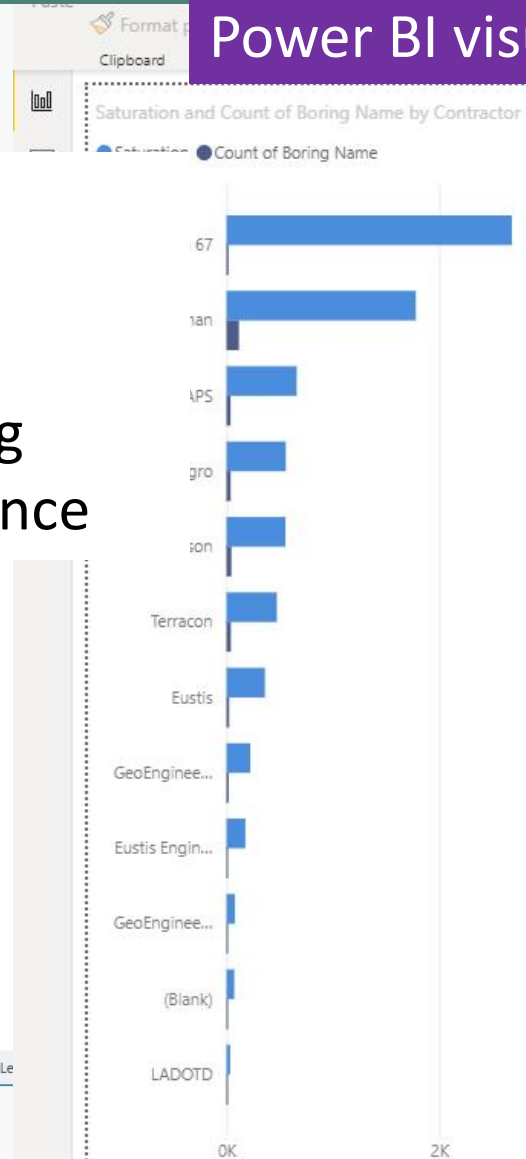
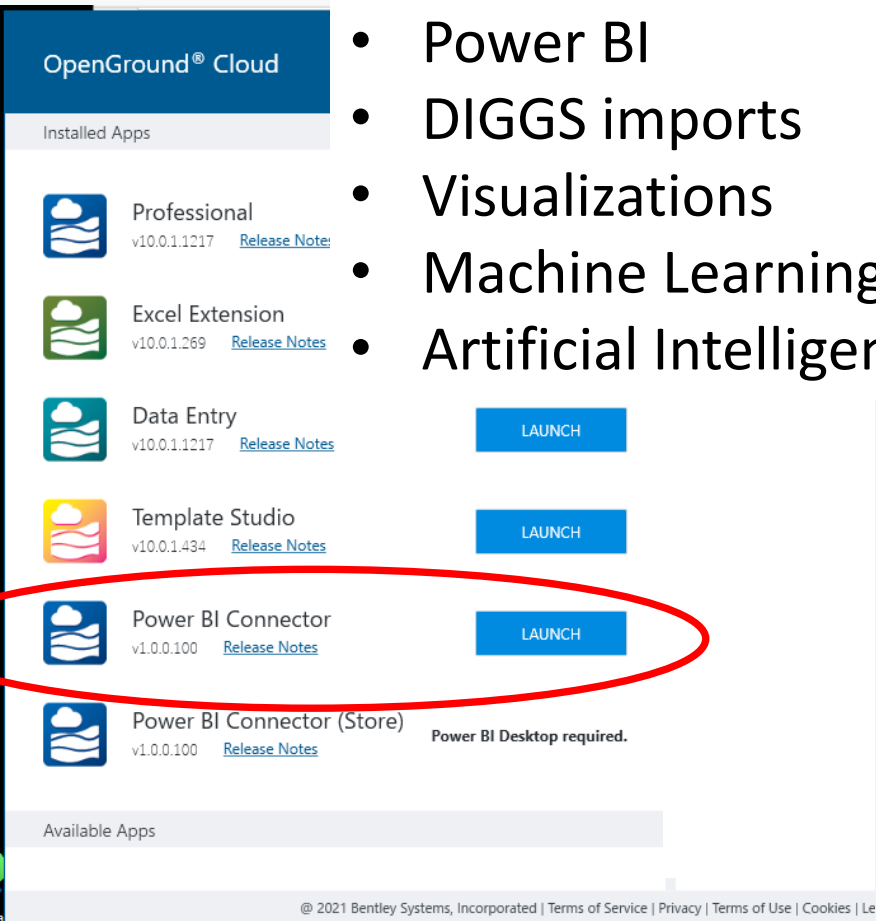
- Digital record for future
- Research Correlations

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Other visualizations and analyses

Power BI visualizations using OpenGround Data

- Power BI
- DIGGS imports
- Visualizations
- Machine Learning
- Artificial Intelligence



Open Ground Cloud:
Project Data

Power BI:
Compare Data
across All Projects

LTRC Project: 24-2GT

“GEC-5”

**WEB-based tool to Advance Geotechnical Data
Interchange and Reliability-Based Site Characterization**

LTRC: **DOTD**, Gavin Gautreau, Nick Ferguson, Technicians
LSU, Murad Abu-Farsakh, Research Associates, etc.

GeoSyntec: **Xin Peng, Staff**

Project Review Committee insight

DOTD: Section 67, Geotechnical & Section 22, Materials Laboratory
Dataforensics, Scott Deaton (Bentley-OGC Representative)



- **Web-Based Visualizations**
- **Data Management & DIGGS** Data Interchange for Geotechnical and Geoenvironmental Specialists
- **GEC-5** Geotechnical Engineering Circular (GEC) No. 5 (Updates)



- **Web-Based Visualization**

Finalize/formalize a web-based platform used by DOTD for several large projects...to standardize this visualization process for all projects.

- Interactively visualize and interpret data from soil borings, CPTs, geophysical/conventional data.
- Create composite soil stratigraphy
- Plot soil properties and derived parameters vs. elevation
- Develop design profiles.



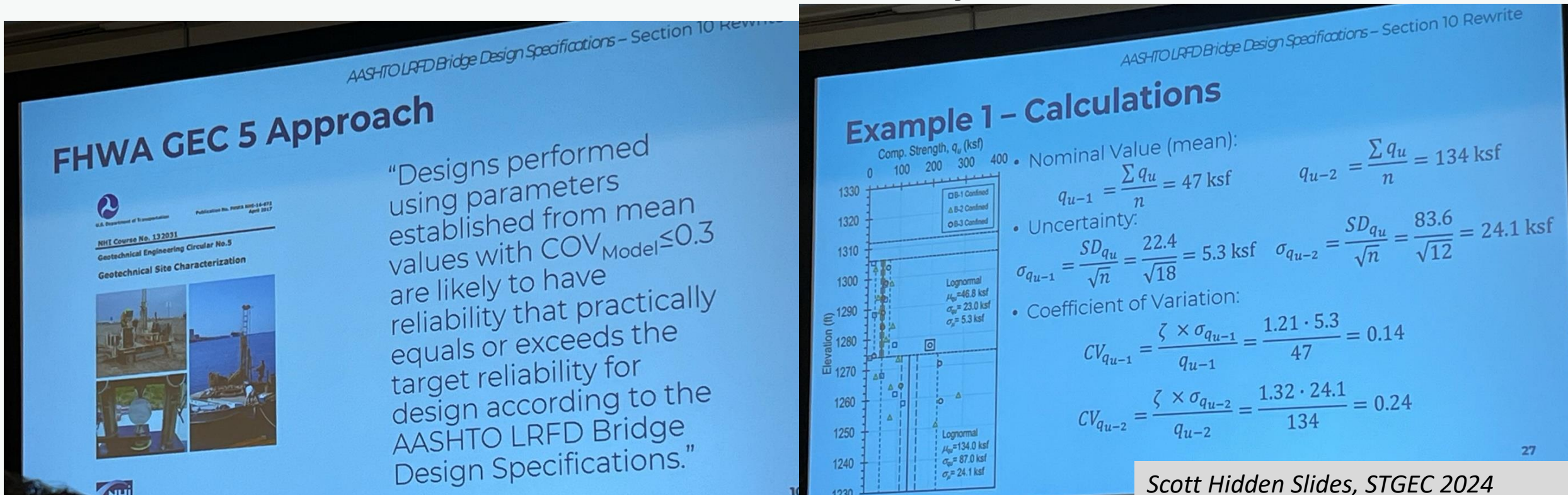
Data Management & DIGGS Data Interchange for Geotechnical and Geoenvironmental Specialists (DIGGS) - Implementation

- DOTD → Open Ground Cloud (OGC) & KeyLAB (Phase IV)
- DOTD Contract Consultants → ...maybe OGC??? (other solutions)
 - gINT Sun-setting
 - Data transfer & exchange (new and historical data)
 - Proactive solution for DOTD and its consultants
- Implement a web-based platform with visualizations for standardized exchange to efficiently increase the quality of geotechnical data deliverables as a digital asset.



AASHTO LRFD Bridge Design Specifications

- **Section 10 Rewrite**
 - **2023 STGEC – Scott Hidden, NCDOT**
 - **2024 SWGEC- Jesse Rauser, LADOTD**



Part Two

Xin Peng



Conclusions

- Advancing Geotechnical Data
 - Easy Access with GIS Interface
 - Current Functional Effectiveness and Efficiencies
 - Succession Planning
 - Long Term Database Building - Correlations
 - Leadership & Vision: Jesse Rauser

