Geotechnical Services

Subsurface Investigation
Site Characterization

Foundation Design:
- Shallow Footings
- Drilled Shafts
- Piles
- Micropiles

Ground Improvement
- Landslide Evaluation
- Slope Stabilization
- Retaining Walls
- Mine Remediation

Pavement Design
- Pavement Management
- Asset Management

Plan Preparation
- Technical Specifications
- Geotechnical Cost Estimating

Construction Consulting
- Construction Inspection
- Instrumentation and Monitoring
Technology Solutions Center

How Can We Help?

Program Delivery
- Program Portals
- Program Management Systems
- Implementation
- Document Management
- Cost and Schedule Management
- Quality and Audit Systems
- Public Involvement and Outreach Management
- Technology Strategic Planning
- Staff Augmentation

Geospatial Solutions
- Geospatial solutions
- Enterprise strategic planning
- Spatial Data Acquisition (LiDAR)
- Mobile solutions
- Geodatabase design and development
- BIM integration
- Augmented reality
- Multi-dimension modeling
- Spatial analysis and modeling
- Big data and cloud solutions

Business Solutions
- Rapid application development
- Database design, development
- Reporting and dashboard solutions
- Big data and cloud solutions
- Systems integration
- Legacy systems evaluation and documentation
- Software vendor analyses
- Implementation oversight

Enterprise Asset Management
- Strategic planning and needs analysis
- Program management
- Asset inventory/condition assessments
- Work management solutions
- Asset tracking strategies
- Maintenance strategies
- Training, mentoring and support
- ROI/ROA analysis
- EAM software implementation
Innovating Solutions

- Leverage Technology and Innovation through HNTB’s Inter-Office Collaboration
- Collaboration allow for New Services
  - Asset Management
  - Pavement Management
  - Mobile Data Collection
  - Conditions Assessment
  - Advanced Data Acquisition
Project Locations

- Gateway Mine Remediation
- New Jersey Turnpike Pavement Management System
- Florida Weigh Station Asset Management
- Bridge Inspection Mobile Collection Devices
Gateway Mine Remediation

- Underground limestone mines
- Preliminary design included mine structure evaluation and recommendations
Gateway - General Mine Geometry

- Pillar
- Pillar
- Room
- Pillar

- 25'
- 60'
- 35'

- Argentine Limestone
- Pillar
- Mine Room
- Lane Shale
- Roof Beam
- Ceiling / Roof
- Floor

HNTB
Gateway - Site and Subsurface Investigation
Gateway - Optical Corehole Survey

Vertical Joint from 65.0' - 67.0'
Gateway - 3D Survey
Gateway - Downhole Laser Survey
Gateway - Downhole Laser Survey
Gateway - Stability/Risk Map
Gateway - Conclusions

- Mine evaluation study and remediation design completed during preliminary design
- Geotechnical engineers did not have background to evaluate the geospatial data.
- Technology group helped Geotechnical section identify locations of necessary remediation.
- Roadway alignment “fixed” in the area of the mines
- Mine remediation complete 2013
New Jersey Turnpike Authority
Pavement Management System

Pavement Management System Components

- An interactive Pavement Viewer Module
- A mobile application for annual inspection rating collection
- A Virtual Drive created from photo images
- Pavement repair data base from as-built records
- Decision Support System
NJTA - Pavement Condition Assessment

- Advanced Infrastructure Design (AID) Subcontractor

- Data obtained through sensors and visual observation while driving

- Collected rutting, cracking, and IRI data on all lanes 2013. Lane 2 only collected 2014-2017.

- Panoramic images collected 2016 and 2017.
Mobile Inspection Application
Decision Support System

- Surface Conditions Analyzed with respect to various rating systems
- ME Design software develop pavement performance predictions
  - Traffic (Number of Trucks, truck type and distribution, growth, number of lanes, traffic speed)
  - Last Mill and Overlay
  - Existing Pavement Condition
  - Existing Pavement Thickness and Material Types
Virtual Drive

- Panoramic view of Roadway and Appurtenances
- New Images Updated Annually
- Efficient and Safe Visual Inspection
# Pavement Repair History

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<th>B</th>
<th>C</th>
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[Diagram of pavement repair history]
Pavement Conditions Viewer
Decision Support System
Decision Support System Examples
Welcome to the eGIS Portal, where data, web maps and applications can be discovered, viewed and analyzed for decision making.

Recently updated data and maps appear in the carousel above.

Please reference this quick start help guide for a brief orientation to using this website.

Contact GISadmin@turnpike.state.nj.us for any problems, errors, questions or comments.
NJTA Pavement Management System

Conclusions

- Show projections of pavement behavior within Enhanced Reporting Version 2.0
- Set Dollar Values to Repair Options
- Update results with 2017 NJTA Condition Ratings
- Update results with 2018 AID data with new objective instrument surface condition readings
- Generate reports and M&O priorities based on selected LOS
MCSAW – Project Locations
MCSAW - Condition Assessment Training

- HNTB Trained Subconsultant in iPAD use
- Assets rated on a 5-point scale:
  - Excellent
  - Good
  - Fair
  - Poor
  - Critical/Failed
MCSAW Asset Collection

- Training the Client
- Multiple office, people, geographical locations involved
- Hurricane Irma
- Size of ramps
MCSAW – Asset Collection

Pavement_Deficiency_Point

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MCSAW - Rating Schema Developed
Other Technology Applications

- Penn Station, New York
  - Advanced Data Acquisition Approach
  - Land
  - Sea
  - Air
Innovating Solutions

- Collaboration allowed new and innovative services
  - Asset Management
  - Pavement Management
  - Mobile Data Collection
  - Conditions Assessment
  - Advanced Data Acquisition
QUESTIONS