



500 Martindale Street, Suite 500
Pittsburgh, Pennsylvania 15212
tel: 412 201-5500
fax: 412 231-0301

July 16, 2012

Ms. Connie Hill
Department of Administration, Purchasing Division
2019 Washington Street East
P.O. Box 50130
Charleston, West Virginia 25305-0130

Subject: CDM Smith's Qualifications Statement and Bid Quotation for RFQ - TAX12007

Dear Ms. Hill:

CDM Smith Inc. (CDM Smith) is pleased to submit this qualifications statement and price quotation to the West Virginia Property Tax Division (WVPTD), to assist counties with their tax mapping programs. As a local municipal services firm, we have been providing outstanding value to our clients for over 60 years, and have been helping cities and towns implement GIS solutions for over 25 years.

We feel that CDM Smith is uniquely qualified for this project. We have been providing parcel mapping services to our municipal client base for over 25 years and have recently assisted the West Virginia Water Development Authority (WDA) and the Infrastructure and Jobs Development Council (IJDC) to develop GIS and project funding, management and tracking tools to support statewide water, wastewater and stormwater infrastructure funding projects.

Our qualifications statement is provided herein as directed in WVPTD's Request for Quotations (RFQ) package. The following provides information to be included as part of this submittal:

Company submitting the proposal:

CDM Smith Inc.
Geary Plaza, Suite 210
700 Washington Street, East
Charleston, WV 25301
Phone: 304-345-2339
Fax: 304-345-2343

Name, title, telephone, and email address of the contact individual:

Matthew R. Sickles, P.E.
Client Service Manager
CDM Smith
503 Martindale Street
Suite 500
Pittsburgh, PA 15212
Phone: 412.321.3000
Fax: 412.321.3300
Email: sicklesmr@cdmsmith.com

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CDM Smith is excited about the opportunity to assist WVDTD with their tax mapping programs, and we invite you to review our qualifications submittal and bid quotation. If you have questions, need additional information, or wish to schedule an interview, please contact me in our Pittsburgh office at 412-201-5500. We look forward to discussing this project further with you.

Very truly yours,

A handwritten signature in cursive script that reads "Matthew R. Sickles".

Mr. Matthew R. Sickles, P.E.
Vice President
CDM Smith Inc.

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Section 1

Introduction

The State of West Virginia Property Tax Division is looking for a firm to assist them with the development of GIS parcel datasets for several counties. It is the hope that through this project, the state will be able to create a state-wide parcel dataset that supports local, regional, and state-wide needs. It is envisioned then when complete, a coordinated, accurate and complete GIS parcel dataset will be implemented for Mingo County and potentially expanded to other counties. Such a firm must have direct West Virginia GIS experience, have extensive expertise in implementing enterprise-wide parcel GIS environments, and have a big-picture approach that will allow developed data to be integrated in a state-wide database and potentially served out to the citizens via key applications. CDM Smith is that firm.

Our proposal is organized as directed in the City's RFP and provides a clear and concise response to proposal requirements.

About the Team

For this project, CDM Smith is teaming with Thrasher Engineering. CDM Smith will provide project management, parcel mapping, and GIS data development, while Thrasher will support as-needed deed research efforts. Brief descriptions of each firm are as follows:

CDM Smith

Headquartered in Cambridge, MA and with a local office in Charleston, CDM Smith is a privately held, employee-owned corporation specializing in consulting, engineering, and information management with the capacity to deliver comprehensive services to public clients worldwide. Founded in 1947, CDM steadily expanded and today employs more than 4,500 professionals working in over 100 offices.

In 1986, to meet the evolving needs of our clients, CDM Smith formed our GIS group. Since that time, our group has grown from a staff of five to over 110 GIS, technology, and application development professionals. Our GIS group specializes in assisting clients, like the State of West Virginia, with the implementation of enterprise GIS solutions. We bring decades of experience, high quality staff, and a commitment to excellence that has enabled us to implement award-winning GIS environments in communities of all sizes.



For over 25 years, CDM has been implementing innovative GIS solutions for our diverse client-base.

Over the years, we have completed over 100 parcel mapping projects encompassing well over one million parcels. These range from small towns with under 5,000 parcels, to large counties with over 150,000 parcels. We have perfected the art of parcel GIS development and structure our systems to support tax mapping, planning, and web-based access requirements.

Thrasher Engineering

Thrasher Engineering, Inc. (TEI), with a combined staff of 170 people in West Virginia, brings project engineers and project managers with direct client experience and knowledge of **over 100 water and wastewater systems located throughout 48 of West Virginia's 55 counties** and knowledge of systems in an additional 5 counties through economic development site preparation projects. Over the last 25 years, TEI has designed and supervised over \$600 million in water, sewer, site development, survey and construction management projects in West Virginia.



Based in Clarksburg, West Virginia, Thrasher Engineering brings to IJDC and WDA a combined statewide staff of over 170 people.

TEI is based in Clarksburg, West Virginia, with branch offices in Charleston, WV (Thrasher Environmental) and Oakland, Maryland and affiliates in Princeton, WV (Pentree, Inc.) and Martinsburg, WV (The Berkeley Associates). With 25 engineers, half who are registered professional engineers, four registered professional surveyors, TEI will also provide engineering technicians, project designers, CADD operators, and administrative / office support to the project as needed.

Organization of Proposal

CDM has organized our proposal as requested in the State's RFP, as follows:

- Section 1 – Introduction
- Section 2 –Project Technical Approach
- Section 3 – Related Experience and References
- Section 4 – Staffing and Resumes
- Section 5 – Cost Proposal and Project Timeline

Section 2

Project Technical Approach

CDM Smith has reviewed the scope of services outlined in the RFP and understands that the first county to be completed will be Mingo County. We have reviewed Mingo County tax mapping, tested rectification of tax maps, and outlined an initial process for data conversion. We make no exception to the scope of services outlined in the RFP and provide the following brief project scope.

Task 1 – Collect and Review Parcel Data Sources - CDM Smith will meet with WVPTD to collect the necessary data sources for this project. This includes existing GIS information (orthophotos and applicable vector layers), copies of existing tax maps, IAS data, and other applicable plans as deemed necessary.

Task 2 – Geodatabase Design – CDM Smith will work with WVPTD to develop a standardized Esri-based geodatabase design for this effort. This geodatabase design will be based on state-standards and will include:

- Placeholders for applicable layers (parcel lines, parcel polygons, ROW, annotation, etc)
- Attributes (Parcel ID, etc.) for each layer
- Coded domain values (i.e. pick lists to support standardized data entry.
- Topology rules to support quality review and feature generation.
- Dynamic linking fields to support integration with systems, such as IAS.

Implementation of a solid geodatabase design at the beginning of a project will make the execution of the project much more efficient. This is due to the fact that “rules” inherently included in the design will support creation of accurate and complete data. We often work with our clients to develop custom geodatabase design or apply Esri-based designs, such as Esri’s Parcel Fabric to support project execution.

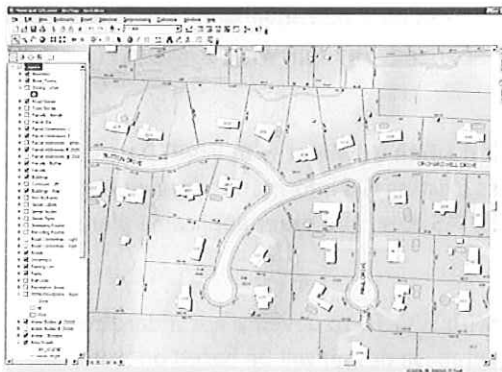
Task 3 - Parcel Pilot Project – CDM Smith will complete a parcel pilot project to test the quality of the information provided and to determine the best methods for developing a county-wide GIS dataset and tax maps. It is known that the first county to be converted will be Mingo County and CDM Smith will work with WVPTD to select a pilot area. The pilot project will be completed within 30 days of tax start.



CDM Smith will develop county-wide parcel data for Mingo County.

Task 4 – Develop Parcel GIS - CDM will convert the existing tax maps into digital format and will develop a town-wide parcel GIS. We use a proven method which will result in the most accurate parcel mapping possible without completing survey or deed research. This process includes:

- Georeferencing tax maps to accurate land base mapping to support parcel line automation. This process will be completed as specified in the RFP.



During Task 4, an accurate parcel GIS data will be developed.

- Manually transcribing parcel lines, one-by-one, from the existing tax maps onto the provided digital orthophotography. Parcel lines will be placed as accurately as possible using land base features, such as fences and water bodies, and property line dimensions as a guide. Property lines will be placed block-by-block, parcel-by-parcel, until all parcels are automated. This method, which we have used to automate over 1 million parcels, will produce high-quality parcel mapping. During the automation process, we will note obvious problems and will work with the town to resolve them.

We typically do not blindly digitize parcel lines based on georeferenced maps as inaccuracies in the maps can carry over to the GIS product. We closely look at the

orthophotography (fences, driveways, buildings, etc.) and look to identify features that can help us accurately place property lines. We also use property line dimensions and acreages to support this effort.

- Automation of tax map text, easements, map borders and other line-work and text into the ESRI Geodatabase and AutoCAD file.
- Cleaning of all automated data to eliminate and “overshoot” and “undershoot” errors and loading of all information into the ESRI Geodatabase.
- Creation of polygon topology for all parcels, easement, water bodies, rights-of-way, and other applicable features.
- Coding of each parcel with its applicable parcel ID number (i.e. Map-Lot). This will facilitate the link to IAS.
- Completing a QC process to ensure 100% verification of parcel ID numbers, identification of parcel lines that run through or near buildings, and quality checking of a property line dimensions. It will also include reviewing parcel line work and development of an error list that outlines parcels that “do not fit” or “changed shape”. We will meet with the WVPTD to review our QC reports and will work with the WVPTD to fix any errors that we cannot fix ourselves.
- Developing check plots of the tax maps using the ArcGIS Map Book/Data Driven Pages capability and delivering them to the WVPTD for review. WVPTD, or the county, will review the

maps, provide comment, and return the maps to CDM Smith. CDM Smith will then finalize the data and will deliver final files and maps to the WVPTD and County.

- Finalizing parcel data and development of final ESRI geodatabase files.
- Delivery of a final ESRI Parcel Geodatabase and maps to the WVPTD and installation of this data onto county computer systems.

This process will result in a county-wide parcel GIS. During the following tasks, this information will be integrated with town database systems and prepared for use by employees.

Task 5 – Integrate the Parcel GIS with IAS

CDM Smith will integrate the parcel GIS with provided IAS data. CDM Smith has been integrating GIS with systems like IAS for over 15 years and has helped dozens of clients link their GIS environments to Vision and other systems. This process will include the following:

- Obtaining a copy base IAS information.
- Completing an initial link between IAS and the GIS.
- Reconciling mismatch problems where IAS records do not link to the GIS or a GIS parcel does not link to IAS. CDM Smith will fix mismatch problems to the best extent possible. CDM Smith will report any remaining problems to WVPTD and will work to resolve problem areas.



Parcel GIS information will be tightly integrated with IAS.

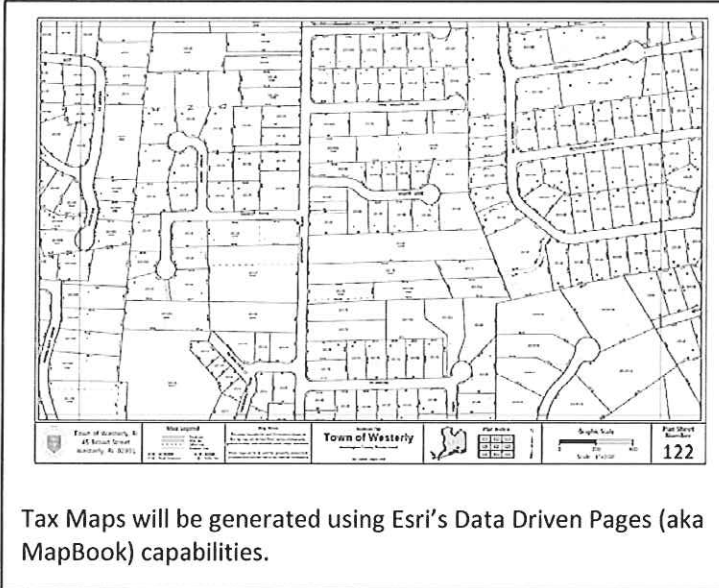
In the majority of cases, one IAS record will link to a single parcel in the GIS. However, where condos and multiple-interest parcels are present, several IAS records may be associated with a single parcel (i.e. five condo units associated with one parcel of land) or two parcels may be associated with a single IAS record (i.e. a single parcel split by a highway or water body). These issues will be resolved as part of this process.

Once this process is complete, a linking table will be generated that associates each IAS record with a parcel in the GIS. The field that will be used to link these databases together will be called the "GIS_ID". The GIS_ID will essentially be the map-lot number of the parcel in the GIS that associates with the Vision record.

This process will result in a truly integrated GIS environment that will allow users to access and query assessing and tax information through the GIS environment. We anticipate close to a 100% link between systems.

Task 6 – Tax Map Production

CDM Smith will develop tax maps for each converted county. The template for the tax maps will be developed using Esri's Data Driven Pages capability (formerly known as "MapBook"). Through this effort, the tax map borders and marginalia will be set, tax map grids (following the existing layout) will be established, and tax maps will be generated. CDM Smith will provide a printed copy of tax maps, as well as a PDV version.



Tax Maps will be generated using Esri's Data Driven Pages (aka MapBook) capabilities.

We will meet with WVPTD and the County to review the look-and-feel of the maps and will work closely with the agencies to finalize the map look based on comments. After review of the Mingo County data, it was noticed that many maps have notes, leaders, and text insets. Prior to start of the project, we will review content of existing maps and determine what comment will be carried over to the new mapping.

The result of this task will be Esri-generated tax maps for each county. CDM Smith will provide a printed copy of the tax maps, a version in PDF

format, plus all Data Driven Pages templates, Esri Map Documents, and support files necessary to recreate tax maps on demand.

Task 7 – Deed Research and COGO – If required, CDM Smith will provide deed research services for selected parcels. The amount of deed research to be completed will be determined upon completion of conversion of county parcel data. If areas are deemed to be substantially inaccurate, CDM Smith will discuss with the WCPTD options for reconciliation, including deed research. In our cost section, we have provided a per-parcel cost for deed research.

Task 8 – Data Installation and Support Services

CDM Smith will provide services to ensure that all data developed is properly installed and configured on client systems. This process includes:

- Installation of all data, support files, Esri Map Documents, and data driven pages on client systems and will configure it for use within the Esri ArcGIS environment.
- Provision of any developed editing, quality review, and data maintenance templates. We typically use Esri products, such as the ArcGIS Data Reviewer, to support quality review of products and custom Esri toolbars to support data entry.
- Support for integrating GIS ID numbers within IAS to facilitate near real-time integration between systems.
- Delivery of a data conversion method summary document and final technical memorandum summarizing the conversion process.

Section 3

Related Experience and References

CDM Smith has been providing parcel GIS development services to our diverse client base for over 20 years and has perfected the art of implementing sophisticated parcel-based GIS environments that tightly integrate with systems like IAS. We have extensive GIS experience in the State of West Virginia and our team-member, Thrasher Engineering, has been providing services to Mingo County since 1998.

CDM Smith – Leaders in Parcel GIS Development

CDM Smith proposes to complete Mingo County for a firm fixed fee of \$107,444. This includes costs to develop digital tax map parcel data as well as to produce a set of finished tax maps. In addition, if deed research and COGO services are required, CDM Smith proposes to provide these services for \$22.00 per parcel. If needed, the scope of these services will be agreed to by CDM Smith and WVPTD.

As provided in the RFP, below is the cost table with detailed pricing for Mingo County, as well as anticipated pricing for other provided counties. Pricing for other counties is based on the assumption that tax maps and provided data are similar to what is being provided Mingo County.

CDM Smith's national GIS Group consists of over 110 GIS and applications development experts. Collectively, this team has worked on hundreds of projects spanning the globe. We specialize in projects like WVPTV's and bring national experience in parcel GIS development within the local government arena. A summary of our key experience as it relates to WVPTV's project is as follows:

- **National Experts in ESRI Technology** – CDM Smith is one of ESRI's oldest and most trusted business partners and has been at the forefront of implementing Esri technologies for over 20 years. As an Esri "Gold Partner", we have extensive expertise in Esri technologies, as well as employ Esri-certified ArcMap, Enterprise Geodatabase, and Application Development Associates and Professionals.
- **Parcel GIS Development Experts** – For over 20 years, CDM Smith has been implementing parcel GIS solutions for our local government client base. In total, we have helped well over 100 communities implement parcel GIS solutions, totaling well over a million parcels. Most recently, we just completed mapping of 32 Massachusetts communities (consisting of approximately 350,000 parcels) in 12



CDM Smith has been implementing sophisticated parcel GIS environment for over 20 years.

months in an effort to conform mapping to strict state standards.

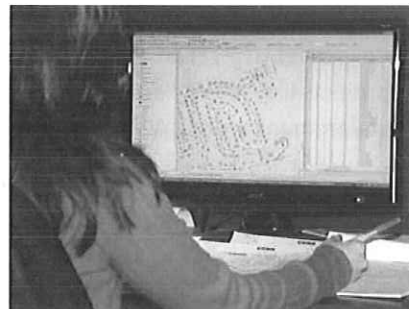
- **Award-Winning GIS Implementations** – Many of CDM Smiths GIS environments, including several parcel GIS systems, have won local and national awards for their technical innovation. Most recently, our GIS application for the WV Water Development Authority won two awards including a state-wide award for best WebGIS implementation and an international Esri “Special Achievement in GIS Award”, which singled out our work in WV from over 100,000 other systems.

Knowledge of West Virginia – CDM Smith, and our team member Thrasher Engineering, have been providing services to West Virginia communities for decades. With several local offices within the state, we have the ability to be there when you need us.

Enterprise GIS Implementation Services

CDM Smith provides the full lifecycle of GIS services to our diverse client base. Because of this, we implement our parcel GIS environment with the “hooks” to be used to support enterprise-level applications like WebGIS environment, property analysis, and land use planning. Our GIS services are backed by our municipal operations, engineering, planning, and management expertise. CDM Smith’s goal is to provide the highest quality consulting services possible to help both our clients and our own organization make the most efficient use of GIS technology. Key GIS services that our national GIS group provides include:

- **GIS Program Management** – Overall GIS Consulting Assistance.
- **GIS Implementation Planning** – GIS Needs Assessment and Strategic Planning
- **Field Data Collection** – GPS Data Acquisition and Inspection.
- **GIS Data Development** – Geodatabase Design, Layer Development, Data Acquisition.
- **GIS Applications Development** – Custom Web, Mobile, and Field Applications
- **GIS Training and Support** – Custom Training and Support Programs.



At CDM Smith, we walk our clients through the entire GIS implementation process.

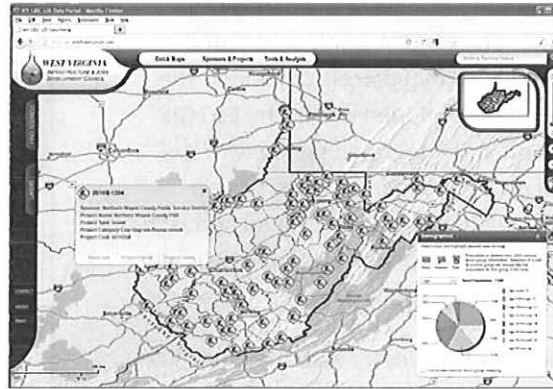
We are experts at all key GIS technologies including ArcGIS, ArcGIS Server, and ArcSDE and have helped agencies nation-wide implement enterprise GIS solutions. Our all-encompassing experience of municipal GIS will support the implementation of parcel data for the WVPTD. CDM Smith has a strong track record of successful completion of multi-user municipal GIS projects that incorporate all of our service sectors.

Unparalleled Experience in Implementing GIS Solutions

CDM Smith specializes in implementing parcel GIS solutions and develops our parcel GIS environment so that they not only result in visually-pleasing tax maps but also tightly integrate with corresponding tax assessing systems, like IAS. In most cases we achieve a 99%+ match rate between property tax systems and GIS and work closely with our clients to resolve conflicts. A summary of recent related GIS experience is as follows:

WV Water Development Authority – GIS Implementation

For the WV Water Development Authority (WDA), CDM Smith, with the assistance of Thrasher Engineering developed a state-wide GIS of water and wastewater agencies and systems. This project involved extensive field data collection, development of complex GIS databases, implementation of an Esri-based GIS environment at WDA, and development of an award-winning GIS application that allows WDA employees and the general public to access key state-wide infrastructure project information.

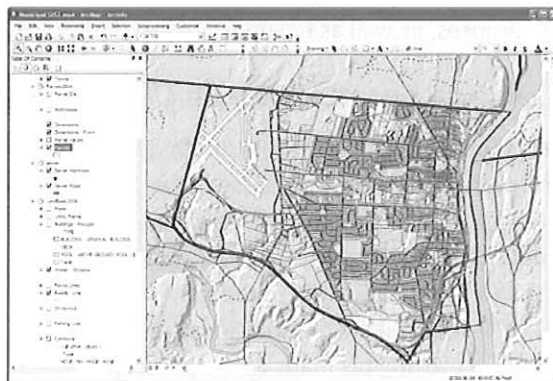


CDM Smith implemented a state-wide GIS environment for the WV Water Development Authority.

CDM Smith and Thrasher Engineering teamed on this project with CDM Smith performing project management, GIS, and applications development services and Thrasher Engineering performing field data collection services. This has been a very successful project that is being showcased by Esri.

State of Massachusetts – Parcel GIS Development

The State of Massachusetts' Office of GIS (aka MassGIS), is embarking on a program to develop a state-wide parcel GIS dataset. To support this effort, state-wide GIS standards were set and funding was allocated to support the conversion of parcel data to meet these standards.



CDM Smith recently completed a project in which 32 communities were mapped in Massachusetts.

CDM Smith was selected by the State of Massachusetts to develop Parcel GIS environment for 32 communities, totaling over 350,000 parcels. This process, which was completed in under a year, involved developing parcel data, rectifying parcels to meet accurate municipal boundaries, and

linking GIS data to municipal tax assessing systems and rectifying errors to achieve a 99.5%+ match rate between systems.

As communities were completed, extensive automated QC processes were run to ensure project quality and data was sent to the state for review and acceptance. This project was large and complex. CDM Smith had four teams assigned to the project and were able to meet the state's very aggressive schedule.

Bridgeport, Connecticut – Parcel GIS Development

For Bridgeport, CDM Smith implemented an enterprise-wide GIS environment that involved development of accurate aerial land base mapping and parcel IS development. As part of the parcel GIS development task, CDM Smith automated approximately 36,000 parcels city wide. The parcel GIS was developed within the Esri GIS environment and integrated tightly with the City's real estate assessing system (Vision Appraisal). Data is maintained on an annual basis and is available to city staff and the public via Esri-based WebGIS applications.



CDM Smith worked closely with the City's Tax Department to complete all aspects of this project and sat with the department to resolve anomalies between tax data and the GIS. This resulted in a 99%+ link between the GIS and tax system.

Colonial Heights, VA – Parcel GIS Implementation

For Colonial Heights, CDM Smith developed a city-wide parcel GIS environment. This process involved automation of existing tax maps onto accurate digital orthophotography and integration of parcel GIS data with the city's Patriot Properties municipal assessing software package. All data was developed within the Esri GIS environment and the parcel development method involved manually transcribing historical tax map information into the GIS environment. The integration with the city's assessing system achieved an approximate 99% match rate. The data is currently used by the city for engineering, planning, and assessing purposes, as well as to support billing for the city's stormwater utility.

Lowell, Massachusetts – Parcel GIS Development

For Lowell, population 110,000, CDM Smith developed a city-wide parcel GIS that encompassed over 27,000 parcels. For this projects, CDM Smith assisted the city with the development of accurate aerial land base mapping that would provide the foundation for the parcel GIS. CDM Smith then automated all parcels using the hundreds of existing tax maps as the primary source. Deed and plan information was researched on an as-needed basis to map areas where inconsistencies occurred. When completed, CDM Smith delivered a



city-wide parcel GIS environment based on Esri technology. In addition, Esri Map Books (aka Data Driven Pages) were developed to support map production and the staff and the public access GIS data through map documents, as well as a CDM Smith developed ArcGIS Server WebGIS environment.

Mingo County, WV – Engineering Services

Our team member, Thrasher Engineering, Inc. (TEI) has worked for the Mingo County Public Service District since 1998. Through this work, we have become very familiar with Mingo County's systems, parcel data, and environment. Specifically, TEI planned, designed, and oversaw construction of Naugatuck regional water system. The Naugatuck water system consisted of a 2.0 MGD surface water treatment plant in Naugatuck, 55 miles of water lines serving the communities of Maher, Lenore, Laurel Lake, Belo, along Corridor G to the Wood Products Industrial Park, Delbarton, and Ragland and numerous pump stations and water storage tanks. TEI has also done water projects to serve Nolan from the Naugatuck water treatment plant, a water system to serve the town of Delorme, and a water line extension to Scout Camp Road near Ragland. TEI has also done sanitary sewer work for the PSD which included a wastewater treatment plant and collection system in East Kermit, a collection system in Delorme, a new treatment plant in Shadee Woods, and a wastewater treatment plant upgrade and collection system improvements in Chattaroy. TEI has assisted the PSD in obtaining easements on all of these projects and has done a lot of research in the County Courthouse and is very familiar with the current tax maps. As seen from the project listing above, our experience covers the entire county and not just a portion of the county.

Westerly, Rhode Island – Parcel GIS Development

For Westerly, CDM implemented a custom parcel GIS environment that consists of over 10,000 parcels. Using digital orthophography, existing tax maps, and deeds and plans, CDM Smith constructed a parcel GIS environment that is the focal point of their GIS implementation. The parcel GIS development process involved carefully developing parcel data and integrating it with their municipal assessing system. Paper tax maps were printed, data was delivered, and the system is now accessed to the public via an Esri-based WebGIS application. Prior to CDM Smith's work, Westerly has no GIS capabilities. Now, GIS is used by municipal departments on a daily basis and their web application receives over 1,000 visits a month.



Nashua, New Hampshire – Parcel GIS Implementation

For the City of Nashua, CDM Smith implemented a parcel GIS environment that is considered one of the most exemplary systems in the northeast. Through this project CDM Smith helped the city acquire aerial base mapping, develop parcel GIS information, implement utility layers, and install an Esri-based GIS environment.

For the parcel mapping task, CDM Smith automated over 27,000 parcels using a combination of existing tax maps, plans, and deeds as the sources. All data was developed within the Esri-software environment and was migrated into the City's ArcSDE-based enterprise GIS database. As parcels were developed, data was integrated with the city's real estate assessing system with a 99%+ match rate. Parcel maps were then generated and counter GIS applications were developed to allow access to GIS data on their public access

terminals. In addition, a highly successful ArcGIS Server-based WebGIS environment was implemented to provide the public with access to GIS data. This site receives tens-of-thousands of hits per year. CDM Smith trained the city and they city is now able to maintain their parcels.

Project URLs

Many of the results of our parcel and GIS projects are available via public web applications. Below are URLs for several projects.

- State of WV WDA GIS Website -> <http://gis.wvinfrastructure.com>
- Town of Trumbull, CT -> <http://ags2.cdm.com/trumbullct/>
- City of Nashua, NH -> <http://citygisweb.nashuanh.gov/fl/nashuanh/main.html>
- Fall River, MA -> <http://ags.cdm.com/FallRiverMA>
- Bridgeport, CT ArcIMS (being converted to ArcGIS Server Flex) -> <http://gis.cdm.com/bridgeportct>

References

The following are references for key projects:

- Chris Jarrett
Executive Director
WV Water Development Authority
(304) 414-6500
CJarrett@wvnda.org
- Neil MacGaffee
Project Coordinator
State of Massachusetts – MassGIS
(617)619-5641
Neil.Macgaffey@state.ma.us
- Aijaz Syed
GIS Coordinator
City of Bridgeport, CT
203.576.7063
Aijaz.Syed@bridgeportct.gov
- Ellie Derrig
Engineering Department
Town of Westerly, RI
401-348-2572
Derrig@westerly.org
- Angelo Marino
Chief Assessor
City of Nashua, NH
603-589-3042
marinoa@nashuanh.gov

Section 4 Staffing and Resumes

For WVPTD's project, we have assembled a team that specializes in parcel GIS development. This team has successfully worked on dozens of similar projects and will work closely with WVPTD to ensure successful completion of this project.

Project Team Organization

Our project team consists of staff who specialize in completion of parcel GIS projects and are located within our local and regional offices. Our staffing plan is provided in Figure 4-1 below.

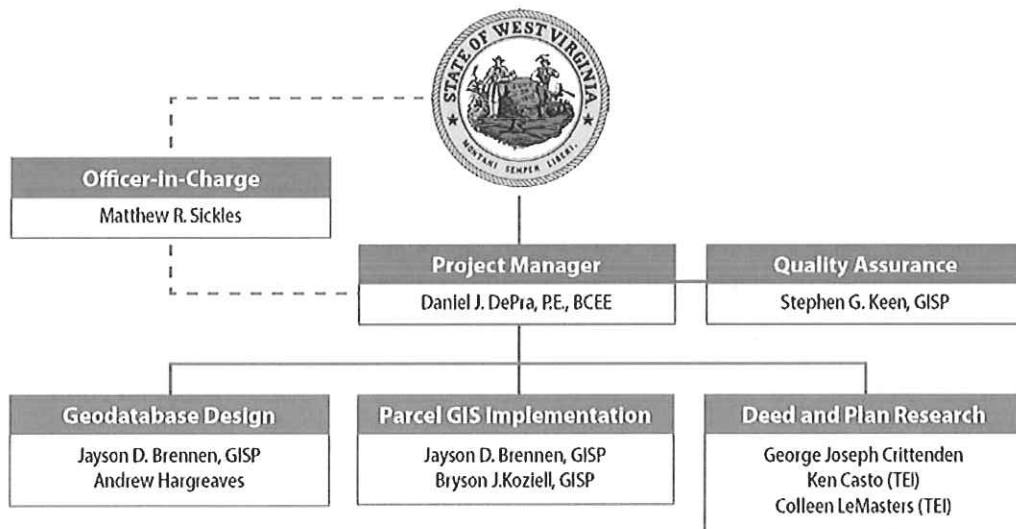


Figure 4-1 CDM Smith Proposed Organizational Chart

Project Management Staffing

As indicated in our project organization chart, the project will be directed by CDM Smith's Officer-in-Charge, Matthew R. Sickles, P.E. Project Director, Daniel DePra, P.E. BCEE, will be responsible for overall program management and directing CDM Smith's team of GIS specialists. As requested below provides experience summaries for our proposed project managers. Full resumes are provided at the end of this section. Brief biographies follow and detailed resumes are provided in Appendix A.

Matthew R. Sickles, Officer-in-Charge

Mr. Sickles is an environmental/civil engineer with 20 years of engineering and project management experience in a variety of projects, including petroleum hydrocarbon, solid/hazardous waste, storm water, general civil, water and wastewater projects, for transportation, municipal and industrial clients. Mr. Sickles has management and engineering experience with environmental investigations and studies, civil and remedial designs, preparing specifications and design drawings, bid services, construction administration services, resident engineering services, operation and maintenance, and permitting. He has provided management and engineering services for several multi-discipline projects.

As Officer-in-Charge, Mr. Sickles will support directing all CDM Smith-assigned projects and communicate with WVPTD.

Daniel J. DePra, P.E., BCEE, Project Manager

Mr. DePra is a senior project manager and environmental engineer with more than 15 years of diverse technical experience in managing large projects and designing and implementing environmental compliance programs, environmental audits and permitting, and remediation projects. He has also conducted federal, state and local regulatory reporting and negotiation.

In addition, Mr. DePra is an energetic and excellent communicator, who has a talent for organizing and executing the details of complex and multi-discipline projects. He is particularly skilled at the Project Controls aspects of management, including scheduling, scope development, financial evaluation and tracking, contracts, and subcontractor management.

As Project Manager, Mr. DePra will handle the day-to-day activities of assigned parcel conversion projects.

Stephen G. Keen, GISP, Quality Assurance

Mr. Keen has over 21 years of experience in spatial information technology implementations including GIS, CAD, and document management systems. He is a senior information technology specialist with CDM Smith who has managed a variety of projects for clients. His experience and comprehensive knowledge of spatial information technologies and software provides clients with a valuable resource.

Mr. Keen has 21 Years of GIS Implementation Experience and has managed dozens of Municipal GIS Implementation projects . He will serve as Quality Assurance for WVPTD.

Recent projects include :

Revere Mass.

Whitman Mass.

Melrose, Mass.

Jayson D. Brennen, GISP, Geodatabase Design/Parcel GIS Implementation

Mr. Brennen has over 23 years of municipal GIS implementation experience and has helped over 50 communities implement parcel GIS programs. He has extensive knowledge of MassGIS Parcel Standards and has worked closely with all major CAMA vendors to ensure proper integration with parcel GIS environments. In fact, Vision hired CDM Smith to help them better integrate with GIS programs and Patriot has a “CDM Smith GIS Extract” report that is built-in to the software to ensure proper system integration.

For WVPTD, Mr. Brennen will be responsible for the Geodatabase Design and the Parcel GIS Implementation.

Projects in which Mr. Brennen has managed parcel GIS implementation include:

City of Beverly, Mass.

City of Nashua, N.H.

Town of Winchester, Mass.

City of Fall River, Mass.

Andrew Hargreaves, Geodatabase Design

Mr. Hargreaves has worked on a broad range of geographic information system (GIS) projects. These cover conversion of utilities data into digital formats, developing QA/QC tools to ensure data compatibility for modeling within the utility sector, and the development of web and mobile GIS solutions for utilities clients. Mr. Hargreaves has extensive systems architecture experience and has implemented enterprise-scale systems utilizing SQL Server and ArcServer. He is a PRINCE2 certified project manager and has covered the design, development and implementation of GIS infrastructure for both local government and private enterprise. He is also a well-experienced trainer of GIS techniques to both casual and highly trained users of ArcGIS Desktop & Server.

For WVPTD, Mr. Hargreaves will be responsible for the Geodatabase Designs.

Relevant Projects include:

GIS Specialist, Falls Church, VA. Mr. Hargreaves assists a number of local clients in the DC Metro Area.

GIS Specialist, New York City Environmental Protection, New York City

GIS Manager, Enterprise-wide GIS System, City of East Point, Georgia

Bryson J. Koziell, GISP, Project Manager (Certified).

Mr. Koziell has 12 years of municipal GIS implementation experience and specializes in developing and implementing parcel and utility GIS data sets. During his time at CDM Smith, Mr. Koziell has managed the implementation of over two dozen municipal GIS programs, all of which involved development of parcel GIS data sets that integrate with CAMA systems. He specializes in larger city GIS programs having helped cities like Manchester N.H., Bridgeport Conn., and Lowell Mass., implement parcel GIS programs. Mr. Koziell has extensive experience with integrating parcel GIS environments with Vision, Patriot, and other CAMA packages and have helped develop custom integrations with these systems. For our 2011-2012 project with MassGIS, Mr. Koziell managed our delivery team and also converted 11 communities to the MassGIS Standard.

For WVPTD, Mr. Koziell will be responsible for the parcel GIS implementation

Projects in which Mr. Koziell has managed parcel GIS implementation include:

City of Lowell, Mass.

City of Marlborough, Mass.

City of Haverhill, Mass.

City of Methuen, Mass.

George Joseph Crittenden, Deed and Plan Research

Mr. Koziell has 12 years of municipal GIS implementation experience and specializes in developing and implementing parcel and utility GIS data sets. During his time at CDM Smith, Mr. Koziell has managed the implementation of over two dozen municipal GIS programs, all of which involved development of parcel GIS data sets that integrate with CAMA systems. He specializes in larger city GIS programs having helped cities like Manchester N.H., Bridgeport Conn., and Lowell Mass., implement parcel GIS programs. Mr. Koziell has extensive experience with integrating parcel GIS environments with Vision, Patriot, and other CAMA packages and have helped develop custom integrations with these systems. For our 2011-2012 project with MassGIS, Mr. Koziell managed our delivery team and also converted 11 communities to the MassGIS Standard.

For WVPTD, Mr. Koziell will be responsible for deed and plan research

Detailed resumes for the CDM Smith Team are provided in Appendix A.

Section 5

Cost Proposal and Project Schedule

CDM Smith proposes to complete Mingo County for a firm fixed fee of \$107,444. This includes costs to develop digital tax map parcel data as well as to produce a set of finished tax maps. In addition, if deed research and COGO services are required, CDM Smith proposes to provide these services for \$22.00 per parcel. If needed, the scope of these services will be agreed to by CDM Smith and WVPTD.

As provided in the RFP, below is the cost table with detailed pricing for Mingo County, as well as anticipated pricing for other provided counties. Pricing for other counties is based on the assumption that tax maps and provided data are similar to what is being provided Mingo County.

County	Digital Tax Map Parcel Polygon Data	Cost	Finished Tax Map Publication	Cost
BRAXTON	16,439	\$65,756	277	\$3,000
CALHOUN	8,766	\$35,064	149	\$3,000
GRANT	12,172	\$48,688	260	\$3,000
HARDY	14,655	\$58,620	298	\$3,000
JACKSON	19,474	\$77,896	322	\$3,000
LEWIS	15,223	\$60,892	231	\$3,000
LINCOLN	17,029	\$68,116	264	\$3,000
LOGAN	29,212	\$116,848	399	\$3,500
MCDOWELL	31,020	\$124,080	535	\$4,000
MINGO	25,986	\$103,944	369	\$3,500
MONONGALIA	49,865	\$199,460	638	\$4,000
MONROE	13,483	\$53,932	255	\$3,000
ROANE	14,521	\$58,084	241	\$3,000
TYLER	8,994	\$35,976	149	\$3,000
WEBSTER	10,765	\$43,060	251	\$3,000
Total	287,604	\$1,150,416	4,630	\$48,000

Project Schedule

• Data Collection and Geodatabase Design	Within Two Week of Project Start
• GIS Pilot Project	Within 30 days of task start
• GIS Data Conversion	Within 3 months of task start
• GIS/IAS Data Linking	Within 3 months of task start
• Map Production and Data Delivery	Within 4 weeks of completion of GIS data conversion

Matthew R. Sickles, P.E.

Officer-In-Charge

Mr. Sickles is an environmental/civil engineer with 20 years of engineering and project management experience in a variety of projects, including petroleum hydrocarbon, solid/hazardous waste, storm water, general civil, water and wastewater projects, for transportation, municipal and industrial clients. Mr. Sickles has management and engineering experience with environmental investigations and studies, civil and remedial designs, preparing specifications and design drawings, bid services, construction administration services, resident engineering services, operation and maintenance, and permitting. He has provided management and engineering services for several multi-discipline projects.

Officer-in-Charge, Airport GIS Needs Assessment, Pilot Development, and Full Implementation Program, Columbus Regional Airport Authority, Ohio. Mr. Sickles oversaw Phases 3-5 of this project, which include incorporating utility data (conversion by others); the adopting and incorporating the Spatial Data Standard for Facilities, Infrastructure, and Environment (SDSFIE); interior sign conversion, and other layers into the GIS. CDM is also developing a general-purpose "incident" mapping application that will allow safety and other ad hoc incidents to be mapped and viewed in the terminal and on the airport grounds, and incorporating another airport into the GIS due to a merger.

Project Manager, Watershed Improvement Project, Pittsburgh, Pennsylvania. Mr. Sickles served as the project manager on the Nine Mile Run Watershed Improvement Project for the Pittsburgh Water and Sewer Authority (PWSA). The project scope included rehabilitation design for the combined sewer interceptor, and system inventory, system characterization, and hydraulic/hydrologic characterization of the combined and separated sewer systems within the 4,118-acre Nine Mile Run watershed. Project tasks include field verification (location and condition) of over 1200 sewer structures, sewer televising and cleaning, dye testing within the separated sewer areas, flow monitoring, hydrologic and hydraulic modeling using SWMM, and incorporating all data into a Geographic Information System (GIS). As project manager, Mr. Sickles coordinated all project efforts with PWSA and was responsible for meeting PWSA's expectations and delivering quality products to PWSA.

Officer-in-Charge, Multi-Modal Center Needs Study and Design, Butler, Pennsylvania. Under the direction of Mr. Sickles, CDM assisted the Butler Township-City Joint Municipal Transit Authority with an initial needs study to develop a Multi-Modal Transit Center, which will encompass a terminal, offices, storage and maintenance facility, and a commuter park-and-ride facility lot. The initial phase of the project required a conceptual study of the project, including preparing drawings to describe the site development and facility layout. The development is being planned to allow 25- to 30-year growth. The planned storage, maintenance and wash facility will accommodate seven full-size transit buses (30-35 foot) and 25 Para-transit buses (20-25 foot). The facility and equipment are being configured to have the capability to house and service 40-foot vehicles. The anticipated two-level office component will house a rider comfort area, driver area with lunchroom, training area, dispatch and office space in approximately 6,000 square feet, on grade. Administrative offices and conference space with kitchen will be located on the

Education

B.S. -
Environmental
Engineering,
The
Pennsylvania
State University,
1989

Registrations

Professional
Engineer:
Pennsylvania,
1995

Training

40-Hour Health
and Safety
Training, OSHA

Confined-Space
Entry Training,
OSHA

second level. CDM is providing architectural, electrical, environmental, permitting, structural, HVAC, and plumbing professional design services.

Officer-in-Charge/Engineer-of-Record, Echo and Charlie Deicing Facilities Pavement Rehabilitation, Pittsburgh International Airport, Pennsylvania. Mr. Sickles oversaw this rehabilitation of the E & C deicing facilities pavement rehabilitation, completed in 2002. The rehab required removing and replacing concrete slabs in poor structural condition and repairing pavement joints to reduce the ability of deicing-laden runoff from entering the subsurface. During the design, CDM evaluated the use of an asphalt overlay to be used in place of costly concrete slab removal and replacement since the rehabilitation was intended to be only a temporary fix. The overlay was not selected since developing the technology has not yet spread to enough suppliers to avoid proprietary bid situation.

Officer-in-Charge/Engineer-of-Record, Deicing Pad System Phase 3B (C&E Pads Boom Upgrade), Pittsburgh International Airport, Pennsylvania. Mr. Sickles served as the officer-in-charge and engineer-of-record for the upgrade of C & E deicing facility fixed-base-booms to incorporate forced-air capabilities. The project was conducted on a fast-tracked schedule, requiring design to be completed within six weeks. The project included replacing existing boom cabs with new cabs fitted with up-graded controls, features and a forced air centrifugal pump. Also included was the provision of a new doghouse at each boom to contain a hydraulic system capable of operating the associated boom and forced-air pump. New electrical supply was provided to each boom, requiring utility trenching across airfield pavement and the associated pavement section replacement. Mr. Sickles was responsible for the services provided by the multi-disciplinary design team for all phases of the project.

Project Manager/Engineer-of-Record, New Aircraft Deicing Facility (Sierra Widebody Pad), Pittsburgh International Airport, Pennsylvania. As project manager and engineer-of-record, Mr. Sickles led the design team through completion of the fast-tracked design in approximately four months so the airport could meet Pennsylvania Department of Environmental Protection (PaDEP) expectations for having a new operating facility within one year. The design criteria required the facility to be considered best available technology by PaDEP and required a contractor to construct the facility within six months. Design features of the new facility included a 17-acre concrete apron, associated storm water collection including trench drains, diversion structures and 1.4 million gallons of storage for contaminated storm water, an HDPE liner system beneath the entire facility, raw glycol storage tanks and electronic monitoring/control facilities. Mr. Sickles led the design team through construction phase services during which the team had to quickly review and comment on all submittals and requests-for-information so as not to slow down the contractor.

Mr. Sickles also served as the project manager for the design of an extension to the Sierra Widebody Deicing Facility. The extension was rolled out as a subsequent phase because it required a substantial quantity of fill to be placed within an existing ravine, impacting wetlands and streams. The design included approximately nine acres of concrete apron, associated storm-water collection, conveyance and diverse structures, 1.6 million gallons of storage for contaminated storm water, an HDPE liner system, relocating an NPDES outfall, determination of impacted wetland and stream resources and associated mitigation design, building demolition, and monitoring and control systems.

Professional Activities

Member, American Academy of Environmental Engineers
Member, Engineer's Society of Western Pennsylvania
Member, American Association of Airport Executives
Member, Pittsburgh Airport Area Chamber of Commerce
Member, Pittsburgh Downtown Partnership
Member, Water Environment Foundation
Member, Aviation Council of Pennsylvania
Member, Pennsylvania Water Environment Association
Member, Southwestern Pennsylvania Engineering Outreach

Publications and Presentations

Sickles, M., P. Hobeck, K. Gurchak, and S. Meunch. "When is Enough, Enough?" Presented at the 14th Annual Aircraft, Airfield Deicing and Storm Water Conference, Washington, D.C., August 2005.

Sickles, M., B. Barley, D. Genneken and M. Villem. "Simulation Technology: Designing & Validating a Centralized Deicing Facility at Cleveland Hopkins International Airport." Presented at the 13th Annual Aircraft, Airfield Deicing and Storm Water Conference and Exposition, Washington, D.C., August 2004.

Sickles, M., B. Homan, T. Somerville and P. Florian. "National Award-Winning Airport Pavement — Pittsburgh International Airport." Presented at the American Concrete Pavement Association's Fourth Annual Pennsylvania Concrete Seminar, Hershey, Pennsylvania, January 2003.

Sickles, M., B. Homan, T. Somerville and P. Florian. "National Award-Winning Airport Pavement — Pittsburgh International Airport." Presented at the Pittsburgh Area Chapter of the American Concrete Institute Quarterly Meeting, Pittsburgh, Pennsylvania, December 2002.

Sickles, M., B. Cook, Mr. Ehnott and T. Somerville. "Site Characterization focusing on Brownfield Initiative Strategy relating to Soil and Groundwater containing Jet-A Fuel." Presented at the 11th Annual Conference on Contaminated Soils, University of Massachusetts, Amherst, Massachusetts, October 1996.

Sickles, M., M. Hlavacik and H. Megahan. "Investigation and Remediation of Jet-A Fuel Contamination at the Former Greater Pittsburgh International Airport Terminal." Poster presentation presented at ASCE-CSCE (American Society of Civil Engineers - Canadian Society of Civil Engineers) Environmental Engineering Conference, Pittsburgh, Pennsylvania, July 1995.

Daniel J. DePra, P.E., BCEE

Project Manager

DePra is a senior project manager and environmental engineer with more than 15 years of diverse technical experience in managing large projects and designing and implementing environmental compliance programs, environmental audits and permitting, and remediation projects. He has also conducted federal, state and local regulatory reporting and negotiation.

In addition, Mr. DePra is an energetic and excellent communicator, who has a talent for organizing and executing the details of complex and multi-discipline projects. He is particularly skilled at the Project Controls aspects of management, including scheduling, scope development, financial evaluation and tracking, contracts, and subcontractor management Kentucky. Many of the projects were of a "fast track" nature.

Project Manager, Allegheny County Airport Authority (ACAA), On-Call Deicing Action Plan, Environmental Management, and Field Services, Pittsburgh, PA. Mr. DePra manages the multi-year, \$1.5 million on-call environmental engineering management and field services project. Since 1994, the Pennsylvania Department of Environmental Protection (PADEP) has required the collection of aircraft deicing fluids at the Pittsburgh International Airport (PIT) and the development of annual "Deicing Action Plans" to characterize the potential impacts to local streams from deicing activities and evaluate the effects of de-icing operations. For this contract, Mr. DePra's typical duties include planning, scheduling, conducting, and coordinating all phases of the project, including development and implementation of the "Deicing Action Plan/Airfield Material Plan"; coordination/schedule of field sampling; update and maintenance of the existing database; evaluation of sampling data; and completion of the annual "Deicing Action Plan Update Report" for submission to PADEP and the Authority.

Permitting Task Leader, ACAA Deicing/Stormwater Treatment Plant Project, Pittsburgh, PA. Mr. DePra serves as the permitting task leader for the construction of the deicing/stormwater collection treatment plant, separation and transmission facilities; two retention basins; effluent discharge and associated infrastructure; utilities and site improvements associated with this project. Anticipated impacts from the project include stormwater discharges, stream crossings, stream and wetland encroachments, stream channel modifications, and construction activities within these areas. Permits include *General (PAG-2) NPDES Permit for Stormwater Discharges Associated with Construction Activities; Water Obstruction and Encroachment Permit; two Dam Permits* (for the retention basin weir walls); *NPDES Part I Discharge Permit; NPDES Part II Water Quality Management (Construction) Permit for Industrial Wastewater Facilities; and Air Quality Permitting.*

Project Manager, Loop Geothermal Well Testing and Consulting, Drake Well Museum, Titusville, PA (2007). Mr. DePra managed the \$59,000 project to evaluate the feasibility of a closed loop geothermal system for a heating, ventilation, and air conditioning (HVAC) system at the Drake Well Museum in Oil Creek State Park. This work included project management, planning, oversight, sampling; drilling and installing

Education Course Studies

M.S. - Civil Engineering, University of Pittsburgh, 2004

B.S. - Mechanical Engineering, University of Pittsburgh, 1993

B.S. - Chemistry, University of Pittsburgh, 1993

Registration

Professional Engineer: Pennsylvania (1999), and Ohio

Certification/Training

EPA 40-hour Hazardous Materials Technician Training (ERTHMI 165.15), 1994

8-hour Refresher Course - EPA Hazardous Materials Response

Laser Institute of America, Laser Safety Officer Training, 1994

PADEP Land Recycling Client Workshops, 1998, 2004

University of Pittsburgh - Bloodborne Pathogens

University of Pittsburgh - Chemical Hygiene/Lab Safety

Honors/Awards

Board Certified Environmental Engineer (BCEE), American Academy of Environmental Engineers, 2002

geothermal borehole/well and disposal of petroleum-contaminated cuttings; conducting geothermal conductivity testing; and preparation of a final report.

Project Manager – Project Controls, Allegheny County Department of Public Works (ACDPW), On Call Architecture, Pittsburgh, PA (2004-present). CDM received the three-year, \$759,000 contract to provide services on an as-needed basis to the ACDPW, including architectural, mechanical, civil, structural, environmental, HVAC, plumbing, and electrical engineering. The projects include more than 35 work orders for design services associated with the construction and/or renovation of county owned facilities such as public works warehouses, swimming pools, recreation facilities, and county-owned buildings. Mr. DePra manages the financial and contractual aspects of this project, including completion and update of the project management plan, tracking of all project expenditures, generating invoices, executing subcontractor agreements, and approving subcontractor invoices. He also communicates and coordinates regularly with the client service manager and project technical manager regarding scope and schedule to ensure that project assignments are completed within budget.

Project Manager, W5 Group, Evaluation of C&D Disposal Technologies Landfill property in Steubenville, OH (2007). Mr. DePra managed this \$25,000 evaluation of a construction and demolition debris landfill for a potential buyer of the facility. This evaluation included a regulatory review at Ohio EPA, current compliance issues of the landfill, review of future revenue estimates, and development of final conclusions and recommendations.

Project Manager, Allegheny County Department of Public Works, New Maintenance Warehouse No. 5, West Mifflin, PA (2005-2006). CDM received a \$495,000 contract to provide architectural and engineering services to design a maintenance warehouse, office building, salt storage area, and associated parking for ACDPW on Allegheny County Airport property. This project was completed through the 60 percent design phase, and then cancelled by the client due to a change of project site. Mr. DePra served as project manager and environmental and permitting task leader for this project. His typical duties included planning, scheduling, conducting, and coordinating detailed phases of the project, including tracking of all project expenditures, managing subcontractors, coordinating tasks among task leaders and meeting regularly with project staff to ensure that project assignments were completed within scope, schedule, and budget.

Deputy Project Manager, Multi-Modal Transit Facility Design, Butler Township-City Joint Municipal Transit Authority, Butler, PA (2005-present). CDM received \$953,600 contract to provide architectural and engineering services to design a Multi-Modal Transit Facility for the Butler Township-City Joint Municipal Transit Authority, which included a transit terminal, offices, storage and maintenance facility, and a commuter park-and-ride facility lot. CDM provided architectural, electrical, environmental, permitting, structural, HVAC, and plumbing professional design services. Mr. DePra served as deputy project manager for project controls and environmental task leader. He also designed a sampling and remediation plan to drain and clean petroleum contaminated water and construction debris from site pits.

Stephen G. Keen, GISP

Quality Assurance

Mr. Keen has over 15 years of experience in spatial information technology implementations including GIS, CAD, and document management systems. He is a senior information technology specialist with CDM Smith who has managed a variety of projects for clients. His experience and comprehensive knowledge of spatial information technologies and software provides clients with a valuable resource.

Project Manager, Transportation GIS Work, Office of Transportation Planning (OTP), Mass Highway Department. Mr. Keen is managing an ongoing support contract for OTP that involves the support of various GIS projects including; the coding of all bridges in Massachusetts to enable a link from the linear referencing system (LRS) to the bridge database, the development of a RouteLog application that facilitate the production of highway "strip maps" that reference the highway mile-markers and the development of a Construction GIS Attribute Data Processing Tool and COMMWORKS Consulting Support.

Project Manager, Parcel/Utility GIS Development, Revere, Massachusetts. Mr. Keen managed the development of an enterprise GIS for the City of Revere, Massachusetts. This included the development of a parcel GIS to enable the generation of new parcel maps for the Assessing Department. Sewer, water and drain utilities are also being developed into GIS layers. This involved collecting the position of all visible utility structures using GPS technology, and building the piping network from available as-built drawings in the city (which are being scanned and referenced to the GIS). The project also includes the development of a GIS WEB site to access the GIS data that has been developed, and the development of field application to allow field inspections to be carried out using a field tablet device.

Project Manager, Utility GIS Development, Reading, Massachusetts. Mr. Keen managed the conversion of water and sewer utilities from design drawings including QA/QC tasks. Tasks have included scanning the town's design drawings, water and sewer gate cards and hydrant cards. Once data conversion has been completed, he is overseeing the development of a customized field data viewing software and the purchase of associated ruggedized hardware and software.

Project Manager, Water System GIS Development and Enterprise Maintenance Management System Software Procurement, Springfield, Massachusetts. Mr. Keen is managing two projects for the City of Springfield. The first is a project to load all of Springfield's water utilities into a GIS system, the second is the procurement of a Enterprise Maintenance Management System (EMMS). The EMS procurement involves the development of requirement, the development of a Request for Proposals (RFP) and software procurement.

Project Manager, Implementation of Field Computing, Town of Salem, Massachusetts. Mr. Keen managed the development of a GIS-based field data collection application running on a ruggedized laptop. The application facilitates the viewing of GIS information and scanned tie-cards in an operational setting, also providing the ability to navigate to a location using GPS or address look-up.

Education

Postgraduate Degree
- Digital Cartography
and Automated
Mapping, Glasgow
University, Scotland,
1990

B.S. - Geography, Hull
University, England,
1988

Certifications

Certified GIS
Professional (GISP)

Project Manager, Utility GIS Development, Whitman, Massachusetts. Mr. Keen managed a turn-key GIS system project that included the development of a needs assessment, procurement of planimetric and orthophotography data, procurement of hardware and software, and the development of utility datalayers. The utility datalayers include water, sewer and drain; conversion of data from as-built engineering drawings and master plans; and will include a field program to collect missing data using ruggedized laptops and GPS units.

Project Manager, Water Department Oak Bluffs, Massachusetts. Mr. Keen managed the development of GIS for Oak Bluffs, Massachusetts. This project included, purchasing hardware (workstation, GPS, plotter, printer and field laptop) and software (GIS and GPS) for the project and developing a water system GIS that could be updated using the sub-meter GPS unit. Once the water system data was developed/updated from source documents, a complete training course was completed to instruct the client how to improve the accuracy of the data, over time, using the sub-meter GPS.

Technical Specialist, FEMA Region I, Blackstone River Basin, Massachusetts. Mr. Keen worked on a FEMA Region I project to identify GIS data resources for the potential improvement of FEMA FIRM maps in the Blackstone River Basin (Worcester and Providence counties). He has worked extensively on field data collection projects, including the use of ruggedized field computers, custom application development, GPS data capture, and sophisticated data integration methodologies.

Technical Specialist, Boston, Massachusetts. For the Boston Water and Sewer Commission (BWSC), Mr. Keen is preparing the GIS data for the sewer/drain system for the development of a model. He has developed procedures and programmed applications to perform data conversion and QA/QC procedures. This multi-year project includes the collection of data from all Boston neighborhoods, from both source documents and field data collection.

GIS Manager, Field Data Collection, Mansfield, Massachusetts. Mr. Keen supervised a field collection of utility information that focused on drainage structures and was carried out to meet NPDES Phase II requirements. The work resulted in a fully functioning GIS system that included a 40/100 scale planimetric basemap, half-foot orthophotography, a complete water and drainage utility GIS, hardware, software, and training. Also for Mansfield, Mr. Keen oversaw the development a web-based GIS mapping system that allowed employee and public access to the GIS data.

Technical Lead, Catch Basin Inspection Project, Boston, Massachusetts. For the Boston Water and Sewer Commission (BWSC), Mr. Keen developed an ArcView application to inspect all the catch basins in the city of Boston. The goal was to gather a complete inventory of the catch basins, the condition of each structure, and the sediment contained in the structure. The project led to two subsequent contracts: one to fix condition issues in the catch basins and another for sediment removal. This application enabled the inspection to collect electronic data and avoid a time-consuming data entry process. The application also allowed for the addition, removal, and movement of catch basins in the field for later integration into the BWSC's GIS system. The application had built-in quality control routines that increased the accuracy of the data and minimized post-processing. This project resulted in approximately 40 percent savings in time over a traditional paper-data-collection methodology.

Technical Lead, House-to-House Inspection Application, Williamstown, Massachusetts. To identify illegal connections to Williamstown's sewer system, Mr. Keen developed a house-to-house inspection application. The application used ruggedized computers and a custom application that allowed for the collection of a detailed series of attributes and photographs at each location and managed the entire inspection/re-inspection process. The project also involved sophisticated reporting and data integration.

Project Development, ArcView GIS Applications, Various Projects. Mr. Keen developed several ArcView GIS applications using AVENUE for clients in water and wastewater management, municipal government and a police department. This has included a parcel database access tool, public access counter terminals, utility tracing applications, sex offender tracking, assessor comparables reports, and custom mapping applications.

Project Development, Massachusetts Water Resources Authority (MWRA) Facility Conversion, Massachusetts. Mr. Keen has developed and implemented the quality control and quality assurance program for the ongoing conversion of facilities for the MWRA.

GIS Manager, GIS Development, Boston, Massachusetts. Mr. Keen played a major role in the maintenance and development of a GIS to analyze the distribution of soil contamination during the construction of the Central Artery/Third Harbor Tunnel (CA/T) project. He maintained an extensive database of soil boring and monitoring well locations.

GIS Manager, GIS Applications, Massachusetts. Mr. Keen has worked on major municipal GIS applications, including a constraints mapping project for North Attleboro to aid the siting of a landfill expansion and transfer station. He developed a town-wide GIS of sewer pipes for Wakefield using digital orthophotographs to rectify old maps that were derived from inaccurate sources.

Project Development, Infiltration/Inflow Project, Springfield, Massachusetts. Mr. Keen completed an infiltration/inflow project for which he developed a comprehensive GIS of manholes and pipes from aerial photography and linked it to a database of attributes. This project was completed using ArcCAD software.

Project Development, GIS Model, Massachusetts. Mr. Keen developed an extensive GIS model to assess the potential environmental hazard of pollution sources on state-owned property for the Clean States Program for the Division of Capital Planning Office (DCPO). This involved ranking the sites based on their proximity to environmentally sensitive areas such as aquifers, wells and reservoirs. The GIS ranking, combined with site inspections, was used to develop an overall ranking which will be used to prioritize cleanup efforts.

Jayson D. Brennen, GISP

Geodatabase Design/Parcel GIS Implementation

Mr. Brennen has 23 years of experience in the design and implementation of geographic information systems and technology solutions for governmental agencies, utilities, airports, and private organizations. As one of CDM Smith's most senior GIS program managers, he has been part of CDM Smith's GIS/Information Management Solutions group since 1993. Over the years, he has helped close to 100 municipalities, utilities, and other agencies implement geographic-based technology solutions. These range from enterprise-wide GIS environments to technology solutions that support large utility program management to custom GIS-based environments.

GIS and Application Project Leader, Statewide Infrastructure Planning Program, State of West Virginia Water Development Authority (WDA). Mr. Brennen served as GIS and technology task leader for the WDA's statewide comprehensive planning system. Through his direction, a statewide GIS environment was implemented. This system included mapping of over 650 water and wastewater systems in the state, development of a centralized Esri-based GIS database, integration of GIS with WDA project tracking and finance systems, and implementation of key ArcGIS Server web-based GIS applications that provide real-time access to state-wide water and wastewater utility and project information. The web application developed for this project has been highlighted on Esri's ArcGIS.com website.

GIS and Applications Development Project Leader, Asset Management and GIS Program Implementation, Naval Facilities Engineering Command (NAVFAC). Mr. Brennen served as GIS lead for NAVFAC's asset management program pilot project. As part of this project, he assisted with the development of utility GIS databases (water, wastewater, electric, and steam) for three naval facilities and was a key designer of a sophisticated GIS/GPS-based field data collection application. The application used Trimble Yuma GPS hardware and was developed to support collecting asset, condition, and risk information for NAVFAC's asset management program. Data collected integrated directly with NAVFAC's Maximo and Esri-based systems.

Project Director, Statewide Parcel GIS Development Program, MassGIS, Massachusetts. For MassGIS, Mr. Brennen managed the development of a statewide parcel GIS development program. Through this project, CDM Smith developed parcel GIS databases for over 25 Massachusetts Communities. In all, close to 200,000 parcels were automated. This data was integrated with municipal assessing systems, and converted to MassGIS' strict Esri-based geodatabase environment.

Program Manager, Enterprise-Wide GIS Implementation, Bridgeport, Connecticut. Mr. Brennen managed Bridgeport's enterprise-wide GIS implementation program. This project involved extensive system planning, enterprise software implementation, data development (aerial mapping, parcels, sewer, zoning, etc.), implementation of municipal permitting and asset management systems, and development of many custom GIS applications. Software solutions implemented included ArcGIS, ArcSDE, ArcGIS Server, assessing, tax, permit, asset management, and document management systems. Mr. Brennen directed this project since its inception and was instrumental in securing a

Education

B.A. - University of
New Hampshire -
Keene State, 1988

Certifications

GIS Certified
Professional
(GISP), 2005

Honors/Awards

URISA Exemplary
Systems in
Government
Award

Esri Special
Achievement in
GIS Awards

funding plan to support the system's operation. He also worked closely with the city's GIS Policy Committee to implement policies and procedures to protect its investment and ensure system sustainability.

Program Manager, Enterprise-Wide GIS Implementation, Lowell, Massachusetts. Mr. Brennen managed the implementation of a citywide GIS project that spanned 10 city departments. This process included acquiring detailed aerial photogrammetric mapping, developing parcel (27,000), sewer (300 miles), stormwater, and numerous other layers, and integrating all data into a seamless ArcSDE geodatabase. This system was primarily developed to support large sewer system projects but expanded into a citywide effort. CDM Smith implemented a suite of WebGIS (ArcGIS Server – Flex), Field (ArcEngine and ArcGIS Server), and integrated GIS with numerous city systems including their on-line assessing system and Cues CCTV sewer inspection system.

Project Manager, Regional GIS Data Development and Enterprise Water Account Mapping Project, Hampton Roads Sanitation District (HRSD). Mr. Brennen assisted HRSD with the development of a regional wastewater GIS environment that spanned 14 cities and counties in southeast Virginia. Data was collected from localities through a custom GIS-based data delivery portal, quality reviewed, and migrated to HRSD's regional ArcSDE geodatabase environment, data was collected to support the development of a consent order-driven regional hydraulic model.

In addition, Mr. Brennen managed the development of a district-wide GIS-based account mapping system. As part of this process, approximately 500,000 HRSD customer accounts, spanning 14 cities and counties, were mapped to the parcel level using HRSD customer service information and locality address point and parcel information. When complete, data was integrated with HRSD's Esri-based GIS environment and X/Y locations of customers are being migrated into HRSD customer information systems. This process resulted in a district-wide address mapping system that is being used to support regional hydraulic modeling (determination of water consumption per pump station service area), capital planning, customer care, and reporting purposes.

GIS Program Manager, Enterprise-Wide Municipal GIS Implementation Projects, Manchester and Nashua, New Hampshire. Mr. Brennen was GIS program manager for enterprise GIS implementation projects in Manchester (population 110,000) and Nashua (population 90,000), New Hampshire. These projects were initiated through large sewer system improvement programs and evolved into enterprise-wide GIS environments.

For these projects, Mr. Brennen directed the completion of 40 and 100-scale photogrammetric mapping; development of 65,000 parcels, 1,200 miles of utilities, and dozens of other layers; and implementation of ArcSDE-based enterprise-wide GIS environments. These two environments are directly integrated with city applications including Vision and Patriot assessing systems, Hansen and GBA asset management systems, Intergraph's public safety system, HTE and ADMINS finance systems, and utility modeling environments. Users of these systems access data via many custom applications including ArcGIS Server web applications, field applications, and custom routing systems.

Project Manager, Enterprise GIS Implementation, Alexandria Sanitation Authority, (ASA), Virginia. Mr. Brennen managed the implementation of an Esri-based GIS environment for ASA. This project involved the completion of a GIS implementation strategy, development and conversion of GIS databases (wastewater, land base, etc.),

implementation of GIS hardware and software, and configuration of a centralized GIS environment. In addition, field applications, using Panasonic Toughbook computers, were developed to provide field-based access to GIS data. This enterprise GIS environment provides staff with easy access to the information necessary to support system planning, maintenance, and operation.

Project Director, Enterprise-wide GIS System Implementation, Lowell, Haverhill, Malden, and Marlborough, Massachusetts. Mr. Brennen directed the implementation of enterprise-wide GIS systems in Lowell, Haverhill, Reading, and Marlborough, Massachusetts. These GIS programs were initiated through sewer and stormwater improvement programs and evolved into enterprise-wide GIS solutions.

Mr. Brennen helped form GIS management committees, developed GIS implementation plans, facilitated the development of accurate aerial base mapping, managed the development of extensive GIS databases (parcels, water, sewer, stormwater, zoning, etc.), and implemented internet-facing public GIS applications based on Esri's ArcGIS Server software. These systems are all integrated with major city applications including municipal assessing and planning applications.

Professional Activities

Committee, North East Arc Users Conference Committee

Member, URISA

Member, GIS Corps

Publications and Presentations

Brennen, J. "Delivering GIS to All Levels of Your Organization." New Jersey Water Environment Association Conference, Atlantic City, New Jersey, May 2012.

Brennen, J. "Using GIS to Support Asset Management Programs." New York Water Environment Association Annual Conference, New York, New York, February 2012.

Brennen, J. "Trends in Web and Mobile GIS Technologies." North East Arc Users Conference, Saratoga Springs, New York, November 2011.

Brennen, J. Contributing "Mapping the Future." Water Efficiency Magazine, October 2011.

Brennen, J. "What's new in Mobile and Web GIS Technologies." New England URISA Conference, Sturbridge, Massachusetts, October 2011.

Brennen, J. "Employing Mobile GIS in Water and Wastewater Agencies." New England Water/Wastewater Users Group, Danvers, Massachusetts, July 2011.

Brennen, J. "What's Hot in Geospatial Technology." Maryland Association of Municipal Wastewater Agencies Symposium, Columbia, Maryland, April 2011.

Brennen, J. "West Virginia Water Development Authority GIS Implementation." West Virginia Rural Water Conference, September 2011.

Brennen, J. "Mobile Mapping Delivers." Underground Infrastructure Magazine, October 2008.

Brennen, J.D. "Maximizing Your Investment in GIS." New England Water Works Conference, 2007.

Brennen, J.D. "ArcGIS Server vs. ArcIMS, choose your Web Mapping Weapon." Virginia State GIS Conference, 2007.

Brennen, J.D. "Technologies that Support Field-Based GIS Access." North East Water/Wastewater GIS Users Group, 2007.

Brennen, J.D. "Using GIS in Support of GASB34 Reporting." NE Governmental Finance Officers Meeting, 2007.

Brennen, J.D. "Taking GIS on the Road." North East Arc Users Conference, 2006.

Brennen, J.D. "Implementing GIS in the Small Water Utility." New Hampshire Water Works Association, 2006.

Brennen, J.D. "Strategies for Self Funding Municipal GIS." North East Arc Users Conference, 2005.

Brennen, J.D. "Advanced GIS Applications in Municipal Assessing." Connecticut Municipal Assessors Conference, 2005.

Brennen, J.D. "Is ArcSDE for Me?" North East Arc Users Conference, 2004.

Brennen, J.D. "Mobile GIS Options for Utilities and Municipalities." Presented in conjunction with ESRI and Trimble in seven cities in the North East US. ESRI Mobile GIS Seminar Series, 2004.

Brennen, J.D. "Using GIS Technology to Support Field GIS Access and Disconnected Editing." Massachusetts Municipal Engineers Fall Meeting, 2004.

Brennen, J.D. "Base Mapping Issues... What Base Map Scale is Right for Me?" New England GIS Conference (URISA & GITA), 2004.

Brennen, J.D. "Parcel Mapping in Nashua, NH goes Paperless." ArcNews Magazine, Spring 2003.

Brennen, J.D. "GIS for Public Works and Municipal Engineering Operations." American Public Works Association Regional Seminar, 2003.

Brennen, J.D. "Field-based GIS for Water Utilities." New England Water Works Conference, 2003.

Brennen, J.D. "Policies and Procedures for the Sale and Distribution of GIS Data." New Hampshire Municipal Conference, 2003.

Brennen, J.D. "GIS in Public Works Snow Removal Operations." American Public Works Conference, 2002.

Brennen, J.D. "Developing an Integrated, Multi-Purpose Geographic Information System." Public Works Magazine, August 1994.

Andrew Hargreaves

Geodatabase Design

Mr. Hargreaves has worked on a broad range of geographic information system (GIS) projects. These cover conversion of utilities data into digital formats, developing QA/QC tools to ensure data compatibility for modeling within the utility sector, and the development of web and mobile GIS solutions for utilities clients. Mr. Hargreaves has extensive systems architecture experience and has implemented enterprise-scale systems utilizing SQL Server and ArcServer. He is a PRINCE2 certified project manager and has covered the design, development and implementation of GIS infrastructure for both local government and private enterprise. He is also a well-experienced trainer of GIS techniques to both casual and highly trained users of ArcGIS Desktop & Server.

GIS Specialist, Falls Church, Virginia. Mr. Hargreaves assists a number of local clients in the DC Metro Area. Project highlights include:

- Alexandria Sanitation Authority - implement an enterprise level GIS environment including design and establishment of GeoDatabases, application development covering both web and mobile.
- Arlington County – Automated Meter Reading installation project management through near real-time mapping of meter swap-outs tracked via a Flex based webmap.
- City of Virginia Beach – Using ESRI Data Reviewer toolset and Python code to automate QA/QC of hydrological data before large-scale modeling.
- Washington Suburban Sanitary Commission - developed a series Visual Basic tools to QA/QC spatial and hydrological data before large-scale modeling.

Acting GIS Manager, Enterprise-wide GIS System, City of EastPoint, Georgia. To establish an enterprise-wide GIS system, Mr. Hargreaves' responsibilities include data management, manipulation and loading into ArcSDE; creating web-based solutions for collection, or editing, of data by city staff in the field; and interfacing with city back-end systems, such as "Work Order Management" systems, to query and present associated information. In addition, he manages a public facing "Information Portal", built using "Sitefinity Content Management System" software which provides city residents with ongoing information about engineering works being undertaken in their area.

GIS Specialist, New York City Environmental Protection, New York City, New York. Mr. Hargreaves worked onsite at New York City Environmental Protection's premises designing and building a series of ESRI ArcObject desktop-based QA/QC tools. The tools were to help populate and edit one of the largest and most complex sewer geodatabases in the U.S., which CDM Smith has been working on since its inception in 1995. Additionally, Mr. Hargreaves developed, implemented and managed multiple ArcServer web applications using ASP.Net. Working with New York City Environmental Protection's ESRI account manager, he also jointly promoted the benefits of an "Enterprise Level" approach to GIS and successfully gained "buy-in" from other departments.

Education

M.A. - Urban and Regional Analysis, The Ohio State University, 2002

B.S. - Geography (Honors), University of Hull, UK, 2000

Certification

PRINCE2, Project Management Practitioner

Technical Skills

ArcGIS Desktop, ArcGIS Server, ArcSDE (SQL), ArcINFO, ArcMap, ArcView, and ArcIMS

GIS Specialist, River Basin Management System (RBMS) web portal, Dublin, Ireland.

The RBMS web site provides an integrated "portal" that encompasses an ISO 14001-based Environment Management System (EMS) as well as tools for implementing and monitoring action plans to meet the European Union's *Water Framework Directive* objectives. The website supports Ireland's EPA initiative to develop the technologies, infrastructure, standards and procedures for the WFD. While sponsored by Dublin City Council, the RBMS website is being extended to encompass all the Republic's river basin districts.

The website features real-time integration with a GIS web site and decision support through environmental and economic data. It allows local authorities to assign cost effective environmental measures to hydrologic features (subcatchments and water bodies) to create "programmes of measures", which will achieve local, national and EU water quality objectives.

Real-time data integration is accomplished using a .NET web service that handles bi-directional data communication between the RBMS web server, the GIS web server and the Environment Measures SQL Server database. Current development includes an import routine for Laboratory Information Systems data, and a GIS-based query and analysis interface to facilitate reporting of monitoring results. Application architecture features ASP.NET 2.0 reusable page components that reduce program maintenance effort and follow best practices for software design; developed using Visual Studio 2005, ASP.NET 2.0 and ComponentOne WebGrid.

Hydrologic Modeling, Metropolitan District of Greater Hartford, Hartford, Connecticut. Mr. Hargreaves was part of the modeling team to develop a detailed hydraulic and hydrologic model for the Metropolitan District of Greater Hartford, Connecticut, USA. It will be used to analyze different storm responses to the network system and to update their Long Term CSO Control Plan (LTCP). This model is drawing heavily on the District's GIS of the system and involves providing topological correctness between pipes and catchments as well as the use of virtual water/sewer values in the network. Catchments were delineated by aggregating MDC property polygons. Storm and sewer catchments were delineated as two different sets and loaded to the nearest manhole. ArcGIS Spatial Analyst tools and custom build VBA script were used to route each catchment. ArcGIS feature editing tools were used to modify the catchments.

These catchments will be imported to an EPA SWMM hydraulic model and calibrated against a flow metering program to perform simulations to determine flow and surcharge in the pipes and manholes to quantify capacity issues and peak flows and volumes of overflows. This information will be used to refine sizing and operation of CSO control facilities, which include wastewater treatment facility upgrades, tunnels, sewer separation, consolidation conduits and real time control measures.

Prior to CDM

GIS Coordinator, Gateshead Metropolitan Borough Council. Mr. Hargreaves was responsible for the successful initial implementation, management and continual growth of the council's corporate GIS in order to ensure seamless data sharing between departments and to facilitate public access to local government information.

He managed a team who designed, built and deployed web-based GIS solutions throughout the council, its strategic partners and to the public. He was responsible for all aspects of

GIS within the Council including project management, budgets, staffing, ensuring centralized software distribution, on-site technical help, GIS data quality and identifying training for GIS users.

Senior GIS Consultant, Nathaniel Lichfield & Partners. Mr. Hargreaves was responsible for the establishment and management of all GIS within NLP as well as establishing procedure and policy related to data integrity, maintenance and usage. During his time there, his work informed the future direction for housing provision determined by the UK Governments Regional Development Agency's planning policies. This was achieved through projects including:

Mr. Hargreaves updated employment land records for South Tyneside Council, Stockton-on-Tees Council and Enfield Council utilizing mobile GIS to record data from the field in accordance with government criteria.

Mr. Hargreaves completed housing market assessments for the UK Governments "Pathfinder" housing renewal scheme. These included performing spatial analysis of local demographics, housing market composition and public transport accessibility.

Mr. Hargreaves was responsible for analyzing housing completions, brownfield/greenfield rates, housing sales/turnover ratios, live/work containment rates and population change on a regional level to inform private sector developers on broad scale planning matters and to determine overarching company strategy for land purchase as part of strategic land investment assessments.

Mr. Hargreaves used wind speed data from the DTI overlain with conservation boundaries, such as SSSIs, to determine the most competent site for a wind turbine to power a carbon neutral development within Brighton when completing wind farm site assessments.

Mr. Hargreaves performed viewshed analysis. He integrated multiple datasets such as proposed building height information, terrain relief data, and observation point position to determine the potential visual impact of a prospective development in the historic Llantarnam region of South Wales,

Professional Activities

Former Chair, Tyne & Wear Regional GIS Users Group

Papers and Presentation

Hargreaves, A. "How to set up an Enterprise GIS in one easy step." OGRIP statewide GIS Users Conference, September 2004.

Bryson J. Koziell, GISP

Parcel GIS Implementation

Mr. Koziell has over 11 years experience in the design and implementation of geographic information systems (GIS) and associated databases, including implementation of municipal applications, water, wastewater, and storm drain conversion projects, and the use of GIS for asset management, planning, and environmental issues. He has also developed methodologies for integrating information from CAD and GIS. Mr. Koziell has experience with a wide range of GIS related software packages including ArcMap, ArcSDE, ArcIMS, Autodesk Map 3D 2007, and ArcInfo Workstation. He has also integrated GIS data with a variety of modeling and asset management software including H2O Map, Water CAD, Haestad, Azteca-City Works, Cues-Granite XP, Hansen, and Cartegraph.

GIS Specialist, Enterprise GIS Development, Springfield Water and Sewer Commission (SWSC), Massachusetts. For the past 5 years, Mr. Koziell has worked closely with SWSC staff on the development of an enterprise wide geographic information system. This project has included the installation and configuration of an enterprise GIS database and web software, mobile applications development, and training and support for SWSC staff. Mr. Koziell has also provided GIS related assistance for SWSC's implementation of the Infor Asset Management System. These tasks included; modifying the water distribution GIS database to successfully integrate with Infor software, developing the address based data consumed by the asset management system, and developing the necessary web based services needed to support the Infor interface. Most recently, Mr. Koziell has developed and assisted in the implementation of a mobile GIS viewer which provides access to SWSC field staff and has worked closely with the SWSC GIS administrator on the development of a custom GIS website that provides access to all SWSC staff.

Project Manager, Enterprise GIS Development and Asset Management Integration, Falmouth, Maine. Mr. Koziell was responsible for implementing an enterprise wide geographic information system that included database development, enterprise GIS software installation and configuration, and integration with town systems such as VUEWorks asset management and the Vision assessing system. The database design portion of this project included the configuration of the town's GIS data into a SQL based enterprise database. Database fields and pick lists were developed to follow applicable industry standard data models and allow for compatibility with the GIS based asset management system. Software installation included the configuration of ArcGIS Server Enterprise GIS software (ArcSDE), and ArcGIS Server web mapping software needed to support the VUEWorks web interface. Mr. Koziell provided training and developed the data maintenance policies necessary for the town's successful GIS and asset management implementation. He continues to provide support to the town and is currently executing a contract to support the integration of transportation GIS data into VUEWorks which will assist the Town with budget forecasting and capital planning.

Task Manager, Enterprise GIS Implementation and Asset Management Integration, Narragansett Bay Commission (NBC), Rhode Island. Mr. Koziell was responsible for the design and implementation of an enterprise wide GIS that included database design, software implementation, custom web site development, and integration with the NBC's Hansen asset management system. The database design segment of this project involved

Education

B.S. - Geography,
Terrain Analysis,
Plymouth State
University, 1998

Certifications

Geographic
Information Systems
Professional
Certification

enhancing the NBC's existing utility GIS data and designing a GIS database that incorporated industry standard pipeline and manhole assessment fields and domains, and required fields for integration with the NBC's asset management system. Mr. Koziell deployed the database in an Oracle/ArcSDE enterprise GIS environment and provided training and documentation on database administration. He installed and configured the ArcGIS Server Enterprise web software to support the Hansen web interface and developed a customized ArcGIS Server website to support internal NCB staff. Mr. Koziell continues to support the NBC with general GIS technical support.

Task Manager, Enterprise GIS Development, Lowell, Massachusetts. Mr. Koziell oversaw the design and implementation of an extensive citywide geographic information system. This project included the conversion of over 650 miles of sewer and drainage piping, converting 25,000 parcels to GIS format, and the development of numerous other city GIS layers. He handled all aspects of the conversion process including database development, quality assurance, and technical support for city employees. He worked closely with the city assessor to ensure the quality and accuracy of the cadastral data as well as developing a link between the city's Vision Appraisal System and the GIS. Mr. Koziell continues to work with the city and has recently installed and configured an ArcSDE with SQL server geodatabase, a customized ArcGIS Server website and has provided training to city staff.

Task Manager, Enterprise GIS Development, Manchester, New Hampshire. Mr. Koziell oversaw the design and implementation of an extensive citywide geographic information system. This project included the conversion of over 650 miles of sewer and drainage piping, converting 25,000 parcels to GIS format, and the development of numerous other city GIS layers. He handled all aspects of the conversion process including database development, quality assurance, and technical support for city employees. He worked closely with the city assessor to ensure the quality and accuracy of the cadastral data as well as developing a link between the city's Vision Appraisal System and the GIS. Mr. Koziell developed an extensive road centerline network which he helped to integrate with the city's existing emergency vehicle routing software. He continues to work with the city and has recently installed and configured an ArcSDE with SQL server geodatabase, a customized ArcIMS website and provided training to city staff.

Task Manager, Utility GIS Conversion Project, Lewiston, Maine. Mr. Koziell was task manager for Lewiston's Utility GIS conversion project. This project involved the conversion of the city's existing storm water, sewer, and water records into a seamless citywide GIS format. He assisted in the development of a citywide land-base from over 200 separate AutoCAD drawings, which provided a base map to place the city's utilities. Mr. Koziell integrated all utility data into the Cartegraph Asset Management Software Suite and provided training to help the city with their asset management and capital improvement needs. He continues to work with the city, working closely with the town planner helping to create more accurate zoning and ward maps. He has installed several custom applications that allow city workers to query, edit, and plot their data

GIS Specialist, Drainage System Mapping (SWMP), Danvers, Massachusetts. Mr. Koziell was tasked with mapping all town owned stormwater structures. He provided mapping support to field crews tasked with the collection of stormwater facilities and their attributes. He then converted the raw field data into a seamless town wide stormwater

layer. To finalize the project, Mr. Koziell trained town staff to utilize the stormwater layer to comply with NPDES regulations and help with capital improvements planning. He continues to work with the town, most recently developing and installing a customized ArcIMS website to provide GIS access to all town departments.

Task Manager, Utility GIS Development Project, Methuen, Massachusetts. Mr. Koziell was responsible for the development of Methuen's Utility GIS, which included both sewer and storm water mapping. He oversaw the conversion process, which utilized Arc GIS 9 geodatabase technology and worked closely with the city engineers to ensure data accuracy and completeness. Mr. Koziell delivered a working geometric network allowing the city to perform up and downstream traces on the sewer and drainage systems as well as analysis of their GIS data. He continues to work with the city providing support for their GIS program.

GIS Specialist, Parcel Migration Project, Washtenaw County, Mississippi. This project consisted of the automation of over 90,000 parcels from AutoCAD to ESRI Enterprise Geodatabase format. His duties on this project included the geodatabase design in UML format, design of a conversion procedure, supervision of GIS technicians performing the data conversion, custom application development, and training county staff. Mr. Koziell installed the final data in a versioned Oracle ArcSDE environment which addressed the client's security concerns.

GIS Specialist, City Works Implementation, Woburn, Massachusetts. Mr. Koziell integrated existing utility GIS data with Azteca City Works Asset Management Software. This project involved conversion of existing GIS data into the City Works data model and implementation in an ArcSDE 9.x Geodatabase. He also assisted the city with GIS support, hardware procurement, and training on the administration of an ArcSDE Geodatabase.

George Joseph Crittenden

Deed and Plan Research

Mr. Crittenden has 36 years of experience in providing project management, client coordination, project design, design studies, value engineering, construction inspection, and surveying for correctional facilities, government buildings, private developments, highways, airports, residential subdivisions, and abandoned mine land reclamation projects. Mr. Crittenden has been involved in grading, drainage, new highway design, roadway improvement projects, and bridge replacement projects in multiple locations within West Virginia, Tennessee, Georgia, South Carolina, New Jersey, Pennsylvania, and Kentucky. Many of the projects were of a "fast track" nature.

Senior Designer, Green River Correctional Complex, Central City, Kentucky. As senior designer for this project, Mr. Crittenden developed grade and drain plans for the correctional complex. The grading plans included access roads, common areas, parking areas, line of sight, consideration for utility locations, special undercut/backfill for structure locations, and coordination with geotechnical engineers to ensure structure stability for the planned automated locking systems.

The construction phase included inspecting the installation of an under drain system, storm drain system, compaction testing, and the special undercut/backfill at the structure locations.

Senior Designer, Capital Complex, Frankfort, Kentucky. For this project, Mr. Crittenden served as senior designer responsible for survey layout for the construction phase of the complex's improvements to the Capital grounds. The survey layout included road layout, curb returns, and landscape features.

Senior Designer, Yeager Airport, Charleston, West Virginia. Mr. Crittenden served as senior designer for the reconstruction of the general aviation runway. The project included plans, specifications, NPDES permit, and construction inspection.

Senior Designer, Hartman Run, Morgantown, West Virginia. Mr. Crittenden was responsible for the pavement drainage and storm sewer design for a bridge replacement project located in Morgantown, West Virginia.

Senior Designer, Huntington Industrial Center Access Road, Huntington, West Virginia. Mr. Crittenden served as senior designer for this access road project. The project extended 8th Avenue into the Hunting Industrial Center. The curb and gutter project contained grade, drain, storm sewer, water line relocation, signing, and pavement markings.

Senior Designer/Project Manager, Terry Branch Portals and Refuse Remediation, WVDEP, Wyoming County, West Virginia. Mr. Crittenden served as project manager responsible for delineation of access road into site, demolition and disposal of fan and fan house, reclamation of refuse pile, design of four bat gate mine seals and six dry mine seals. Addressed on-site drainage concerns, and re-vegetated all areas disturbed by construction. The project included producing grading plans, drainage plans, erosion control plans, and specifications.

Education Course Studies

Computer Programming Course Study, Murray State University, 1976

Civil Engineering and Applied Mathematics Course Study, Kentucky State University, 1987-1989

Civil Engineering Course Study, Tennessee State University, 1989-1992

Nashville Institute of Technology, 1991

Civil Engineering Course Study, West Virginia Institute of Technology, 1992-1994

Years of Experience

Total Years: 36

CDM Smith: 2

Senior Design Technician, Scott Tipple, Barbour County, West Virginia. As senior design technician, Mr. Crittenden was responsible for layout of survey work, layout of subsurface investigation, requesting and analyzing laboratory test results, and production of grading plans with details, project specifications and bid documents to correct two areas impounding water and coal refuse. The project included producing grading plans, drainage plans, erosion control plans, and specifications.

Senior Design Technician, Red Star Refuse and Coke Ovens, Fayette County, West Virginia. As senior design technician, Mr. Crittenden was responsible for layout of survey work, layout of subsurface investigation, requesting and analyzing laboratory test results, and production of grading plans with details, project specifications and bid documents for backfilling, soil covering and re-vegetation of over 60 abandoned coke ovens and three refuse piles. The project included producing grading plans, drainage plans, erosion control plans, and specifications.

Senior Design Technician, Minden Mine Dump, Fayette County, West Virginia. As senior design technician, Mr. Crittenden was responsible for layout of the survey work, layout of subsurface investigation, requesting and analyzing laboratory test results, and production of grading plans with details, project specifications and bid documents to install wet seals to permanently lower the water level in the mine workings, to establish positive drainage to a nearby stream, to excavate and re-grade the refuse piles, and to provide soil cover and re-vegetate the refuse and all disturbed areas. The project included producing grading plans, drainage plans, erosion control plans, and specifications.

Senior Design Technician, Little Slate Creek Refuse Pike, McDowell County, West Virginia. Mr. Crittenden served as senior design technician responsible for layout of survey work, layout of subsurface investigation, requesting and analyzing laboratory test results, and production of grading plans with details, project specifications and bid documents to re-grade the refuse pile to establish stable slopes and establish drainage to a nearby stream. The project included producing grading plans, drainage plans, erosion control plans, and specifications.

Senior Design Technician, Marrowbone Water Line Extension, Mingo County, West Virginia. Mr. Crittenden served as senior design technician responsible for layout of survey work, layout of subsurface investigation, requesting and analyzing laboratory test results, and production of grading plans with details, project specifications and bid documents to extend a water line into the Marrowbone area where the groundwater was found to be contaminated by mining activities.

Senior Design Technician, Glen Fork/Sabine Area Phase II Abandoned Mine Lands Water Feasibility Study and Water Line Extension, Wyoming County, West Virginia. Mr. Crittenden served as senior design technician responsible for interviewing all residents about the quantity/quality of their water source and updating maps to show houses/businesses to support an AML&R grant request to OSM to extend or install water systems in these impacted areas.

Senior Design Technician, Tabler Station Connector, Corridor H, West Virginia Department of Transportation Division of Highways. As a senior design technician, Mr. Crittenden developed complete highway construction and right-of-way plans for the Tabler Station Connector, Corridor H (U.S. 48) in Grant County near the Greenland Gap, and the Jones and Laughlin value engineering plans. The projects included grade, drain, storm

sewer, water line relocation, sanitary sewer relocation, pave, pavement markings, and NPDES permitting.

Senior Design Technician, Bridge Replacement Project, Marlton, New Jersey.

Mr. Crittenden served as a senior design technician for this bridge replacement project for Route 206 in Montgomery Township, Somerset County, New Jersey. This project included calculations in the change of the impervious areas before and after construction.

Senior Design Technician, Bridge Replacement Projects, Pennsylvania Department of Transportation. Mr. Crittenden provided assistance on two bridge replacement projects in Pennsylvania. The project included HEC-RAS modeling.

Senior Design Technician, Beckley Z-Way Study, Beckley, West Virginia. Mr. Crittenden assisted in the development of a Phase 2 design study for the West Virginia Department of Transportation to improve the traffic flow near Beckley, West Virginia.

Senior Design Technician, WV 2, Marshall and Wetzel Counties, West Virginia.

Mr. Crittenden assisted in the development of a design study for the West Virginia Department of Transportation to re-align a section of WV 2 for safety and industrial improvements.

Senior Design Technician, Seneca Creek Bridge and Roadway Approaches Pendleton County, West Virginia. Mr. Crittenden assisted in the development of contract plans for the roadway approaches on U.S. 33.

Senior Design Technician, Silver Creek Bridge and Roadway Approaches Wayne County, West Virginia.

Mr. Crittenden assisted in the development the winning design concept for this design-build project. This project replaced a substandard structure adjacent to active railroad tracks with a 22-foot-diameter structural plate pipe and eliminated the need for a temporary structure.

Senior Design Technician, Anamoriah Bridge and Roadway Approaches Calhoun County, West Virginia.

Mr. Crittenden assisted in the development of the winning design concept for this design-build project. This project replaced a substandard structure on WV 5 and re-aligned substandard alignments to a 55-mph design speed.

Senior Design Technician, Coopers Creek Bridge and Roadway Approaches Kanawha County, West Virginia.

Mr. Crittenden assisted in the development of the winning design concept for this design-build project. This project was an emergency and fast track project to replace a dilapidated structure on U.S. 119 in the unincorporated community of Big Chimney.

Senior Design Technician, I-64 Exit 91 Bridge and Roadway Approaches Augusta County, Virginia.

Mr. Crittenden assisted in the development of the design concept for this design-build project. The main responsibilities included pavement inlet spacing, storm sewer design, and cross drain sizing.

Senior Design Technician, The Summit National Scout Reserve.

As senior design technician, Mr. Crittenden reviewed plans for service road layout and primary trail locations.

Senior Design Technician, Highway Construction and Right-of-Way Plans, West Virginia Department of Transportation Division of Highways.

Mr. Crittenden served as

senior design technician for these projects that included the Arlington Truss Bridge replacement approaches, 5- and 20- Mile Creek Bridge replacement approaches, Jaeger Pony Truss Bridge replacement approaches, Litwar Bridge replacement approaches, the Merrick Creek Connector Interchange, Huntington Industrial Center Access Road, Strawberry Road, Dutch Hollow Road, Rowlesburg Railroad Truss Bridge approaches, Mt. Gay Bridge near Logan, and Honey Creek Bridge near Chimney Corner in Fayette County. Additionally, Mr. Crittenden produced a set of Demolition Contract Plans for a section of WV 10 near Huntington, West Virginia.

Senior Design Technician, U.S. 52 from Fort Gay to Crum, Star City to Osage U.S. 19 and Oak Hill to Fayetteville U.S. 19, West Virginia Department of Transportation Division of Highways. Mr. Crittenden developed highway location studies and managed a Transportation Need Analysis Study for U.S. 19 from Bradley to the New River Gorge Bridge, a distance of approximately 20-miles.

Senior Design Technician, Richard B. Russell Lake Road Relocations, Calhoun Falls, Georgia. Mr. Crittenden was involved with the construction inspection for seven road and bridge relocations due to construction of the Richard B Russell Dam and Power House. The project consisted of construction inspection of earth excavation, earth embankments, bridge substructures, and bridge superstructure construction.

Senior Design Technician, I-264 (Watterson Expressway), Louisville, Kentucky. Mr. Crittenden assisted in the development of contract plans for the reconstruction and widening of the inner beltway in Louisville, Kentucky. The design included a new diamond interchange at Third Street/Southern Parkway and a fully directional interchange with I-264 and I-64.

FIRM OVERVIEW

THRASHER ENGINEERING, INC.

Established 1983

Officers/Partners

H. Wood Thrasher, P.E.,
Kenneth P. Moran, P.E., P.S.
Ron Stanley, CPA

President
Vice-President
Secretary/Treasurer

Partners

Wm. Randy Watson
Chadwick Biller, P.E.
Development/Highways/Airports/

Public Utilities
Site

Chad Riley, P.E.
Robert Milne, P.E.
Clay P. Riley, P.E.
Daniel E. Ferrell, P.E.
Craig Baker, Assoc, AIA
Jonathan Carpenter, P.E.

AML
Site Development
Site Development
Public Utilities
Public Utilities
Architecture
Charleston Branch Manager/
Public Utilities
Testing & Inspection

Aaron Denham

Scope of Services

Public Work – Water / Sewer / Treatment Plants /
Facility Plans / Business and Industrial Parks
Site Development – Industrial / Business
/ Commercial / Residential
General Civil Engineering – Municipal Engineering /
Subdivisions / Paving / Highway / Roadways
Environmental Engineering
Architecture
Landscape Architecture
Land Surveying, Platting, Legal Description
Preparation
Construction Management / Materials Testing /

Inspection

GIS Mapping and Software Development

Offices

30 Columbia Boulevard, Clarksburg, WV
300 Association Drive, Charleston, WV
3000 Thayer Center, Oakland, MD
4150 Belden Village Street, Canton, OH
380 Airport Circle, Beckley, WV – Lab & Field Office
Princeton, WV – Pentree, Incorporated – Affiliate



*Thrasher Engineering, Inc. Office –
Clarksburg, WV*



*Thrasher Engineering, Inc. Office –
Charleston, WV*



*Thrasher Engineering, Inc. Office –
Oakland, MD*

Thrasher Engineering, Inc. (TEI) is a civil engineering consulting firm, specializing in public works projects. The majority of TEI's work involves publicly funded water treatment and distribution systems, sewage collection and treatment systems, and industrial and business parks. Over \$800 million in water, sewer, site development, survey and construction management projects have been designed and supervised by the firm.

H. Wood Thrasher and Henry A. Thrasher formed the company in 1983 with a commitment to excellence and professionalism in engineering. H. Wood Thrasher, P.E. remains principal of the company; also serving as principal is Kenneth P. Moran, P.E.

Providing a full range of professional engineering services, Thrasher Engineering, Inc. currently maintains a staff of 250+ full-time employees. Our staff includes registered professional engineers, graduate engineers, registered professional surveyors, and support staffing of surveyors, design technicians, CADD technicians, construction managers, and secretarial / clerical personnel. This professional staff has a wealth of experience and is our greatest asset. This includes not only the principals but also the technicians, surveyors, construction managers, and office support staff. Combining education with experience, the qualified staff of TEI strives to provide service that is second to none and is committed to maintaining a strong reputation for quality work. The company's full and diverse staff has the resources to handle many projects, both large and small, simultaneously.

Thrasher Engineering's philosophy is founded on the principle of client satisfaction and repeat business. We do what it takes to assure satisfaction and to insure project success, and want to be the clients' engineer, project after project.

The working philosophy is based on commitment, quality and service. This commitment to quality and service is second to none. Thrasher Engineering's formula is simple: work hard, work smart, like what you do, and make a commitment to clients. We strive to give practical solutions to complex problems. How? By using modern methods that get the job done and that make projects successful.

Ken Casto is TEI's **GIS Manager** and will serve as the **Project Manager**. He brings eight years of GIS mapping and database software development to the project. In addition to managing data, Mr. Casto develops GIS software specifically geared to clients' needs. Ken's project management expertise and specialties include:

- Budgeting/Invoicing
- Computer hardware design
- Ordering / installing GIS and IT software
- Training / Implementing new technologies
- Providing coordinates / data for support and field personnel
- Maintaining / Setting up GPS units (Trimble / Garmin)
- Cartography / Municipality Utility mapping / analysis
- Data re-projection (including for AutoCAD)
- GIS data management
- Georeferencing raster and vector data
- Analysis on data sets including: wetland delineation, classification, elevation profiles, pipeline placement, encroachment areas, environmental impacts, best-path, routing, custom contouring, FEMA floodway/floodplain, bathymetric studies, contiguous property owners.
- System maintenance (IT, GIS)

Ken is a graduate of Marshall University, where he received his M.S. in Physical Science: Geo-biophysical Modeling in 2007, his M.S., in Technology Management: Transportation Systems in 2006, and B.S. degree in Integrated Science and Technology in 2004.

Assisting Ken in the project data management will be **Colleen LeMasters**. Colleen serves as a **GIS Technician** at TEI. She joined Thrasher Engineering in May of 2008. A graduate of Morehead State University with a Bachelor of Arts Degree in Geography, Colleen also earned her GIS Certification through the University. Her areas of expertise include:

- Raster to Vector Conversion
- Digitize tax map parcels
- Provide maps for engineering projects
- Upload data to GPS data collection units for 911 field collection
- Geocoding Addresses for e911 mapping

She has provided GIS technical support for numerous mapping projects, including but not limited to:

- Kanawha County Metro 911, Addressing and Mapping Project
- Weston Sewer GIS Project
- Putnam County E-911 Addressing Project
- State of West Virginia Comprehensive Planning Study for Water, Wastewater, and Storm water

KEN CASTO- GIS MANAGER

SUMMARY OF EXPERIENCE

Mr. Casto serves as Thrasher's GIS Manager and brings over seven years of experience as a manager and consultant of Geographic Information Systems (GIS). Included in his experience is the development of custom GIS software geared specifically to the needs of the client. He is also skilled in hardware and software troubleshooting.

EDUCATION

M.S., Physical Science: Geo-biophysical Modeling, 2007, Marshall University
M.S., Technology Management: Transportation Systems, 2006, Marshall University
B.S., Integrated Science and Technology, 2004, Marshall University
A.S., Information Technology, 2001, Marshall University

CERTIFICATIONS/LICENSES

- WV Contractors License #WV047879

REPRESENTATIVE EXPERIENCE

- Project Management
- Budgeting/Invoicing
- Computer hardware design
- Ordering / installing GIS and IT software
- Training / Implementing new technologies
- Providing coordinates / data for support and field personnel
- Maintaining / Setting up GPS units (Trimble / Garmin)
- Cartography / Municipality Utility mapping / analysis
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- System maintenance (IT, GIS)

COLLEEN N. LEMASTERS - GIS TECHNICIAN

SUMMARY OF EXPERIENCE

Colleen Lemasters joined Thrasher Engineering in May of 2008 and serves as a GIS Technician within GIS department. Colleen's primary responsibilities include data management of GIS Systems.

EDUCATION

B.A. Geography, 2007 – Morehead State University, Morehead, KY

CERTIFICATIONS

GIS Certification through Morehead State University

REPRESENTATIVE EXPERIENCE

- Raster to Vector Conversion
- Digitize tax map parcels
- Provide maps for engineering projects
- Upload data to GPS data collection units for 911 field collection
- Geocoding Addresses for e911 mapping

Projects:

- City of Weston
- Pea Ridge Public Service District
- Jefferson Utilities
- Metro 911
- Gauley River Public Service District
- WV WDA Statewide Utility Mapping



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

Solicitation

NUMBER
TAX12007

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
CONNIE HILL
304-558-2157

RFQ COPY
 TYPE NAME/ADDRESS HERE

VENDOR

SHIP TO

STATE TAX DIVISION
 PROPERTY TAX DIVISION
 GREENBROOKE BUILDING
 1124 SMITH STREET
 CHARLESTON, WV
 25301 304-558-3940

DATE PRINTED
06/13/2012

BID OPENING DATE: 07/17/2012

BID OPENING TIME

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
0001		EA		962-52		
<p>THE STATE OF WEST VIRGINIA AND ITS AGENCY THE WEST VIRGINIA STATE TAX DIVISION AND WEST VIRGINIA PROPERTY TAX DIVISION REQUEST A QUOTE FROM QUALIFIED VENDORS TO DEVELOP A GIS DATABASE FOR THE DIGITAL CONVERSION OF COUNTYWIDE TAX MAPS PER THE ATTACHED SPECIFICATIONS.</p> <p>**BID OPENING: JULY 17, 2012 AT 1:30 PM</p> <p>LOCATION: PURCHASING DIVISION, BUILDING #15 2019 WASHINGTON STREET, EAST CHARLESTON, WV 25305</p> <p>MAPPING SERVICES</p> <p>GIS DATABASE FOR THE DIGITAL CONVERSION OF COUNTYWIDE TAX MAPS PER THE ATTACHED SPECIFICATIONS.</p> <p>ATTACHMENTS: SPECIFICATIONS INSTRUCTIONS TO BIDDERS GENERAL TERMS & CONDITIONS CERTIFICATION & SIGNATURE PAGE ADDENDUM ACKNOWLEDGEMENT VENDOR PREFERENCE CERTIFICATE PURCHASING AFFIDAVIT</p>						

SIGNATURE: <i>Mark R. ...</i>	TELEPHONE: 412-201-5500	DATE: July 16, 2012
TITLE: Vice President	FEIN: 04-2473650	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO SOLICITATION, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

Solicitation

NUMBER
TAX12007

PAGE
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CONNIE HILL 304-558-2157

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BID OPENING TIME

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
***** THIS IS THE END OF RFQ TAX12007 ***** TOTAL:						

SIGNATURE <i>Walter R. Swan</i>	TELEPHONE 412-201-5500	DATE July 16, 2012
TITLE Vice President	FFIN 04-2473650	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO SOLICITATION, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

CERTIFICATION AND SIGNATURE PAGE

By signing below, I certify that I have reviewed this Solicitation in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this bid or proposal for review and consideration; that I am authorized by the bidder to execute this bid or any documents related thereto on bidder's behalf; that I am authorized to bind the bidder in a contractual relationship; and that to the best of my knowledge, the bidder has properly registered with any State agency that may require registration.

CDM Smith

(Company)

Matthew R. Sickles, Vice President

(Representative Name, Title)

412-201-5500/412-231-0301

(Contact Phone/Fax Number)

July 16, 2012

(Date)

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: TAK12007

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

- | | |
|---|--|
| <input type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
| <input type="checkbox"/> Addendum No. 2 | <input type="checkbox"/> Addendum No. 7 |
| <input type="checkbox"/> Addendum No. 3 | <input type="checkbox"/> Addendum No. 8 |
| <input type="checkbox"/> Addendum No. 4 | <input type="checkbox"/> Addendum No. 9 |
| <input type="checkbox"/> Addendum No. 5 | <input type="checkbox"/> Addendum No. 10 |

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

CDM Smith

Company

Martin R. Smith

Authorized Signature

July 16, 2012

Date

NOTE: This addendum acknowledgment should be submitted with the bid to expedite document processing.

State of West Virginia
VENDOR PREFERENCE CERTIFICATE

Certification and application* is hereby made for Preference in accordance with *West Virginia Code*, §5A-3-37. (Does not apply to construction contracts). *West Virginia Code*, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the *West Virginia Code*. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Resident Vendor Preference, if applicable.

1. Application is made for 2.5% resident vendor preference for the reason checked:
 Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; or,
 Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or,
 Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; or,
2. Application is made for 2.5% resident vendor preference for the reason checked:
 Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
3. Application is made for 2.5% resident vendor preference for the reason checked:
 Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
4. Application is made for 5% resident vendor preference for the reason checked:
 Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; or,
5. Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:
 Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; or,
6. Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:
 Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

Under penalty of law for false swearing (*West Virginia Code*, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.

Bidder: CDM Smith

Signed: 

Date: July 16, 2012

Title: Vice President

*Check any combination of preference considerations indicated above, which you are entitled to receive.

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

West Virginia Code §5A-3-10a states: No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owed is an amount greater than one thousand dollars in the aggregate.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Debtor" means any individual, corporation, partnership, association, limited liability company or any other form or business association owing a debt to the state or any of its political subdivisions. "Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities. "Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

EXCEPTION: The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

Under penalty of law for false swearing (*West Virginia Code* §61-5-3), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

WITNESS THE FOLLOWING SIGNATURE

Vendor's Name: CDM Smith

Authorized Signature: *Matt R. Smith* Date: July 16, 2012

State of Pennsylvania

County of Allegheny, to-wit:

Taken, subscribed, and sworn to before me this 16th day of July, 2012.

My Commission expires February 28, 2013.

AFFIX SEAL HERE

NOTARY PUBLIC _____