

in JEN ee um: Latin. Natural disposition of talents. Root word for "engineer"

Ingenium

FALL 2019

A PUBLICATION OF EMH&T ENGINEERS, SURVEYORS, PLANNERS, SCIENTISTS

The logo for EMH&T, consisting of the letters E, M, H, and T in a white serif font, separated by vertical bars, all contained within a blue rectangular border.

Heavy Highway Design

LPA Expertise

Land Survey

Blacklick Creek Sanitary Interceptor Sewer

Innovation brings success.



Innovation. While it might seem like a current business “buzzword,” it’s really much more than that. Innovation, the introduction of something new – a new method or idea or approach, is actually the backbone of many 21st century industries. In the engineering industry, innovation is recognizing a new approach to an old problem and having the courage to incorporate it into all that we do.

Our lead article on EMH&T’s highway engineering capabilities examines how EMH&T’s approach to these very large civil engineering projects incorporates innovative thinking from the very start of the project, setting a foundation for an efficient, quality design approach. On a similar note, the article on EMH&T’s structures group looks at the various innovative approaches used to design the structural components of so many of the firm’s projects, from beautiful bridges to unseen underground structures that go unheralded though their presence is absolutely vital.

One of the more exciting developments is the founding of EMH&T’s Design Innovation Initiative. This initiative employs cutting edge modeling software to not only produce realistic-level renderings and animations, but provide a level of engineering design that is completely fresh to the industry. The article on this service called “Visualization” is an interesting look at how the marriage of art and science creates innovative ways for EMH&T to continually achieve the firm’s mission of improving quality of life through well planned and designed development and public works projects.

We also take a look at some of the innovative coordination EMH&T used to successfully complete the Blacklick Creek Sanitary Interceptor Sewer project and prepare for the next phases of the major infrastructure upgrades occurring in the northeast quadrant of Columbus and into neighboring New Albany. EMH&T’s innovative approach to forward-thinking infrastructure planning and design, coupled with our commitment to working with disparate stakeholders, keeps us at the forefront of this major economic engine for Central Ohio.

As we get ready to enjoy the beauty of autumn and prepare for the winter months ahead, I invite you to sit back, grab a pumpkin spice latte, and read this issue of *Ingenium*.

A handwritten signature in black ink that reads "Sandy". The signature is fluid and cursive, with a long, sweeping underline that extends to the right.

Sandy Doyle-Ahern
President

Ingenium

EMH&T

Engineers, Surveyors, Planners, Scientists
5500 New Albany Road
Columbus, Ohio 43054

**Columbus
Charlotte**
(888) 775-EMHT
emht.com

Sandra C. Doyle-Ahern, MEn
President

Douglas E. Romer, PE
Executive Vice President

Jeffrey A. Strung, PLA, ASLA
Vice President

Editor and Graphic Design

Lee Ruh
Director of Communications

Assistant Editors and Writers

Paul Davis
Gretchen Klamar
Quinn Sammons

Ingenium is a semi-annual publication of EMH&T. It is designed to provide information on issues that are relevant to public officials and public servants of all levels, spanning the full array of public works industries. To add your name to the mailing list for **Ingenium**, please send an e-mail to lruh@emht.com with your name, address, e-mail and phone number.

Past issues of *Ingenium* are available at emht.com.



Transportation and Traffic Engineering
Water Resources Engineering
Water Distribution Systems
Wastewater Collection Systems
Geospatial Solutions
Planning and Landscape Architecture
Visualization Services
Construction Services
Infrastructure Evaluation and Management
Land Surveying
Environmental Sciences
Infrastructure Renewal
Railroad Services

Contents

Features



HEAVY HIGHWAY ENGINEERING
FEEDS THE ECONOMIC ENGINE

DIVERSITY OF LAND SURVEY
EMH&T provides surveying
throughout the Midwest
and Southeast



GAINING GROUND...
BY TUNNELING THROUGH IT
Chapter 2



VISUALIZATION DRIVES DESIGN
INNOVATION
Evolving Use of Technology Takes
Design Process to New Levels



LPA EXPERIENCE RUNS DEEP AT EMH&T
Expertise helps clients navigate
uncertain waters



Regular Columns

18	Shorts
19	Giving Back
20	People in the News
21	Contact Us
Back Cover	Come See Us



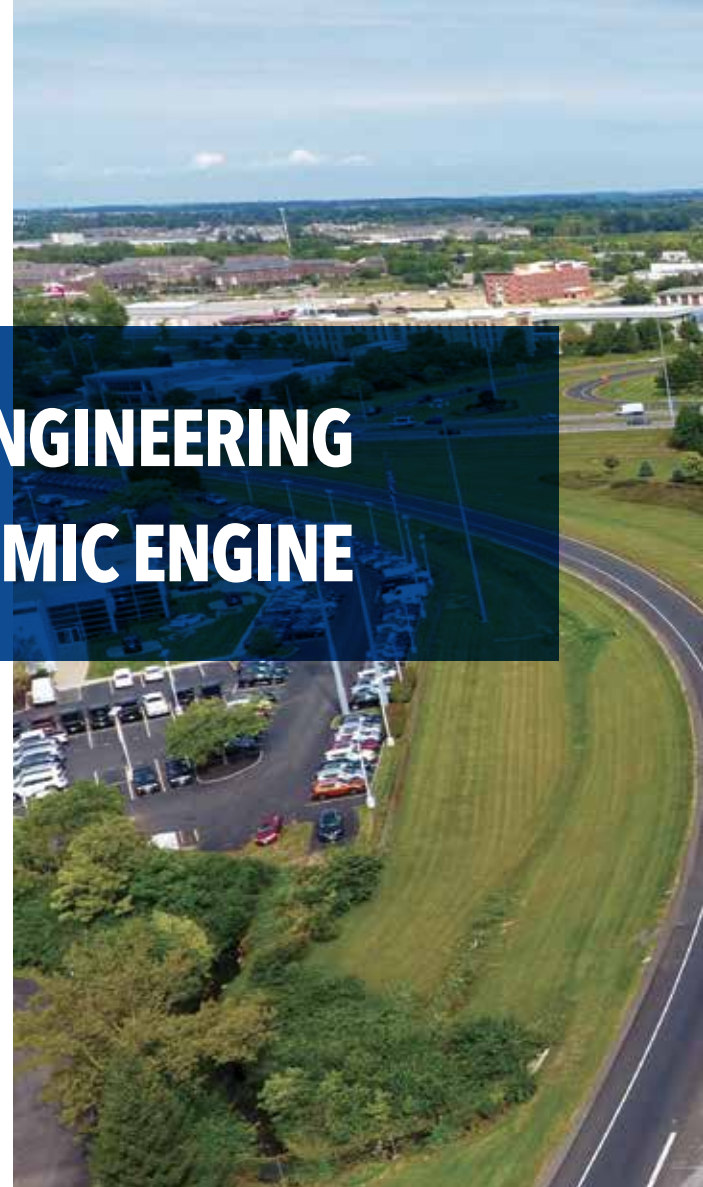
HEAVY HIGHWAY ENGINEERING FEEDS THE ECONOMIC ENGINE

Roads connect. They lead from one place to another and have been doing so for all of human history. And like the humans that use them, roads have grown and changed to accommodate the progress they are tasked with supporting.

Whether built from cobbles and bricks or concrete and asphalt, roads and highways have been and remain a vital infrastructure component of the built environment. The US highways of today are a more recent rendition of this long-standing piece of civil engineering. Over the past 70 or so years of existence, roadways have been tasked with supporting not only new and improved transportation technologies, but significant traffic volume increases as well.

Highway Engineering at EMH&T

Highway engineering represents a significant portion of the professional services EMH&T provides. According to Abby Cueva, PE, Director of Transportation Planning & Design at EMH&T, the firm's focus on "heavy highway" type projects probably accounts for about half of the Division's project focus. "It's quite a bit more than our clients and even our competitors realize," she said.



"Compared to distantly-based, multi-national super-firms, we're small but mighty," Cueva said. "Key word there is 'mighty.' The sizes and types of highway engineering projects we design are impressive, and that's due greatly to both the depth of Ohio Department of Transportation (ODOT) knowledge within our group as well as a lot of individual career experience within the team."

Much of the Division's focus on highway design is about bringing highways up to speed (literally) to accommodate 21st century traffic volumes. This happens in several different ways, depending on the project needs as determined by ODOT.

"Some projects are about adding capacity, some are about untangling messy, outdated interchanges, and some are just about improving the highway's drivability, but they all begin with a



EMH&T provided a design solution for the I-270 Northwest Side Widening project in Columbus, Ohio, which included closing the median with barrier on this 8-mile stretch of highway and adding an additional lane in each direction.

study and the opportunity to identify the problem and solve it efficiently,” said Abby.

EMH&T’s broad range of in-house expertise, ranging from civil and structural engineering to land survey to environmental sciences and cultural resources specialists, provides a well-rounded team capable of addressing almost every aspect of the studies needed for these significant highway projects.

Project Experience Tells the Tale

While the completed studies help determine the best approach for solving the transportation conundrums that exist, it’s the actual engineering design that makes the problems go away.

The EMH&T-designed I-270 Northwest Side Widening project that wrapped up late last year is a great example. This stretch of highway on the

northwest side of Columbus, Ohio, experienced severe congestion during peak travel times. The traffic analysis study determined that a majority of the corridor was operating at an unacceptable level of service. EMH&T provided a design solution for ODOT which included closing the median with barrier on this eight mile stretch of highway and adding an additional lane in each direction. The project also included the widening of three mainline bridges, full depth pavement repairs, noise wall design, continuous highway lighting, and upgraded signage and Intelligent Transportation System (ITS) facilities along the corridor, which runs through three different incorporated areas.

According to ODOT District 6 Project Manager Cindy Wengerter, the project provided two key benefits to the traveling public: enhanced roadway capacity and reduced traffic congestion.

"The continued growth in this sector of Columbus necessitated a solution for this section of I-270. With an average of 120,000 vehicles per day currently using this stretch and an estimated additional 30,000 vehicles per day increase over the next 20 years, a solution was very much needed," she said.

The project was important to support the continued growth on the City's northwest side, which includes Columbus, Dublin, and Hilliard. Each of these municipalities, along with Franklin County, had a significant interest in the project's success and each played a role in the project's design review.

"Abby and her team were very responsive to requests for additional information or requests to make minor changes based on the review comments they received, which helped



Abby Cueva, PE

make for a smooth process over the course of the six-year design and construction project," Cindy added.

According to Abby, successful project outcomes, such as the I-270 project, don't happen without a practical design intent in mind right from the start.

"We do pride ourselves on the logical, smart decision-making and good engineering judgment that we incorporate into our designs, in conjunction with ODOT's permission and blessing," Abby said. "On this particular project, neither the ODOT reviewers nor the contractor needed changes due to our efficient design."

"I'm pleased with the project's outcome and am particularly proud that our design work improved people's commute in this area of the City. We were able to efficiently facilitate and implement ODOT'S desires and goals for this section of highway and deliver a successful outcome," continued Abby.

Another major Columbus area project that EMH&T is just beginning to design is Phases two and three of the Far East Freeway project.

"This is another example of our smart engineering approach to design," said Abby, "we won this design project based on using a costs savings approach from the start."

And it's not just in the greater Columbus area where EMH&T's approach brings successful projects. In ODOT District 8 in the Cincinnati area, the EMH&T-designed I-75/Mill Creek Expressway project improved a 3.5 mile stretch of this major interstate by eliminating one interchange, improving two other interchanges, and widening mainline I-75 from six lanes to a maximum of 10 lanes. The ODOT District 8 Consultant Review Committee recently scored EMH&T a 9 out of 10 for the project, commenting that the firm's designs were, "practical, economical, and constructible."

Private Sector Benefits, Too

Nor is it only public entities that benefit from the capabilities and experience at EMH&T. In the ever-expanding and traffic-heavy area of Easton in northeast Columbus, EMH&T worked for the destination center's private developers, providing a study to determine the most efficient and cost-effective way to move traffic into, around, and back



The project included the widening of three mainline bridges, full depth pavement repairs, noise wall design, continuous highway lighting, and upgraded signage and Intelligent Transportation System (ITS) facilities along the corridor.



^The I-70 interchange in eastern Ohio included a complete structure replacement for the SR 331 bridge over I-70, superstructure replacement for the twin I-70 bridges over US 40, improved ramp and roadway geometrics, access modifications. >Other heavy highway projects include work in Cuyahoga County (right) and Montgomery County (below).

out of this major development that serves as one of Central Ohio's major economic drivers.

And in the growing far northeast suburb of New Albany, EMH&T provided the New Albany Company with initial planning ideas to expand and improve the SR 161 corridor that provides the main access to the New Albany International Business Park as it continues its expansion into neighboring Licking County.

Good highway engineering is vital to the continued growth of commerce across the nation. It's a vital economic driver. Highways not only contribute to economic development and growth, they also help create and support the social structures that make up our modern society. Engineering firms, like EMH&T, that design highways and highway improvements are integral to this growth and play a major role in ensuring the strength of this vital component of our nation's transportation infrastructure. ■

To learn more about EMH&T's highway design and engineering experience and capabilities, contact Abby Cueva, PE, at 614.775.4604 or email her at acueva@emht.com.





DIVERSITY OF LAND SURVEY

EMH&T provides surveying throughout the Midwest and Southeast

Nearly a century ago, Gordon Evans—the “E” in EMH&T—started a small land-surveying firm in Gahanna, Ohio, to support the growing local development market. Over the years, EMH&T has diversified its services, land survey types, and offices. The firm provides surveying throughout the Midwest and Southeast.

“When I started at EMH&T close to 20 years ago,” said Ed Miller, PS, Director of the EMH&T Land Survey Division, “we were busy, but our surveys and crews were focused mostly on one type of client.”

Today, EMH&T serves a diversity of markets and clients with seven licensed surveyors and 15 survey crews throughout 11 states from the firm’s Ohio and North Carolina offices. EMH&T survey types include ALTA, topographic, boundary, environmental, FEMA flood elevation, and as-built. Preparation of easement descriptions and exhibits for construction of new infrastructure are also performed.

As EMH&T’s surveying types expanded and the technology of surveying improved, so did the firm’s equipment. “Our staff has the capability to perform virtually any type of horizontal or vertical land survey using state-of-the-art technology,” said Ed.

Windows Mobile data collectors, servo robotic instruments, 3D laser scanning technology, and GPS receivers are just some of the EMH&T survey tools used to measure and map the land and provide the most accurate and timely data available about boundaries and features. Using this technology, each EMH&T land survey crew is led by a tenured crew chief and coordinated through a professional surveyor who works in tandem with a field operations coordinator. They offer the flexibility to work with three or two field crews depending on the scheduling and budgetary constraints of a project.

**“We have diversified
from mostly
construction staking
to a recent successfully
completed client
request of 30 ALTA
surveys in 30 days!”**

Greg Hartley
General Manager, EMH&T Charlotte

From the Columbus, Ohio, office, years of survey services have been performed for EMH&T’s Ohio contract engineering communities of Reynoldsburg, Whitehall, Grove City, Canal Winchester, and Washington Court House, with exclusive land survey contracts in the cities of Westerville, Dublin and, most recently, Plain City. EMH&T also provides survey and construction staking for other municipalities, public agencies, rail, commercial, retail, residential, industrial, and academic clients.

In 2006, the EMH&T Charlotte office opened its doors and began provided surveying and civil engineering for a diverse project base including retirement communities, single family subdivisions, and retail developments. In 2010, EMH&T started performing work for Charlotte-based Hendrick Automotive Group in several states surrounding North Carolina. Other recent work includes a new student housing project at Queens University in Charlotte, a Novant Health expansion and parking garage in mid-town Charlotte, several large solar field projects, and an adaptive re-use project called Linden Cotton Mill. The ongoing Riverwalk major mixed-use development project—a redevelopment of a brownfield site that was formerly home to the Celanese Celriver Plant that

produced synthetic yarn during much of the last century—also relies on EMH&T Charlotte for its surveying skills.

Greg Hartley, General Manager of EMH&T’s Charlotte Office, and Tim Brown, Field Services Coordinator, have seen the field and office sides of survey expand and change due to economic growth within North Carolina during this time.

“Our survey types have evolved,” said Greg. “We have diversified from mostly construction staking to a recent successfully completed client request of 30 ALTA surveys in 30 days!”

EMH&T keeps abreast of the latest training in line with client requests for survey services such as prequalification through Ohio and North Carolina Departments of Transportation, and E-RAILSAFE training. They gain the most value from monthly in-house training to keep surveys on track.

According to Greg, even with both offices involved with the same project, “We have a seamless transfer of information since we are on the same page with the latest company standards and equipment training.”

EMH&T also believes in mentorship within the Division to supply the next generation of surveyors with the skills they need to succeed.

Ed understands the value of practical experience. “Each new surveyor hired is partnered with a tenured staff member and trained in all aspects of survey. This hands-on field experience and exposure to surveying and technology will help the next generation keep pace with client demands,” he said. ■

For land surveying needs, contact Ed Miller, PS, at 614.775.4104 or his email of emiller@emht.com. Greg Hartley is available at 704.353.9953 or his email of ghartley@emht.com.

< EMH&T Rodman Kyle Pollack prepares a survey at Aria at the Park for client Advanced Development Concepts in Charlotte, NC.

GAINING GROUND... BY TUNNELING THROUGH IT

Development is, in many ways, like a good book...it draws you in and then it makes you want more, if it's done right, that is!

Take for instance the continuing saga of the growth and development of Columbus' (Ohio) far northeast side and the City of New Albany. The past two decades have seen significant growth in this portion of greater Columbus. The transition from rural areas and farmland to master planned communities and bustling office developments has continued. New office buildings and light manufacturing facilities along with major data centers and customer service hubs continue to appear throughout New Albany. In the Columbus corporate areas, new multi- and single family housing developments are also contributing to growth. A significant piece of infrastructure that is part of the story of this area's development is the Blacklick Creek Sanitary Interceptor Sewer (BCSIS), which was completed earlier this year. This major EMH&T-designed project is the first chapter in this area's infrastructure development story. And now that it's complete it's time to move on to the next chapter in this tale of growth.

BCSIS Project Is In Service

The BCSIS project was completed on budget and ahead of schedule. EMH&T led the team for this major new underground tunnel structure. The overall investment exceeded \$98 million for this sewer tunnel that ranges from 40



Above is the factory photo of the Tunnel Boring Machine (TBM). The BCSIS project was completed on budget and ahead of schedule. EMH&T led the team for this major new underground tunnel structure. The overall investment exceeded \$98 million for this sewer tunnel that ranges from 40 feet below ground at the launch site to 140 feet at its terminus.

feet below ground at the launch site to 140 feet at the opposite end and conveys flow from the Jefferson Water and Sewer District (e.g. Jefferson Township) as well as from the New Albany sewer system into the City of Columbus sewer system.

This 4.5 mile stretch of sanitary interceptor sewer extends from south of Blacklick Ridge Boulevard to Morse Road and services approximately 16,000 acres within the Blacklick Creek watershed in this eastern portion of the City of Columbus' facility planning area.

"Columbus understands the importance of ensuring that the public utility infrastructure serving the greater metropolitan area is as efficient and interconnected as possible," said Nick Domenick, PE, Project Manager for the City. "Our mission is to enhance the quality of life for all residents of Central Ohio through responsible stewardship of our public utilities," he added, "and an added benefit is to create an environment favorable to continued development throughout the metro area."



He continued, "This investment allows for future improvements like the Blacklick Creek Trunk Sewer, by the City of New Albany, to expand the reach of the centralized sewer system to support economic development and provide regional, sustainable solutions for wastewater collection and treatment."

"Think of the BCSIS as the trunk of infrastructure that supports the branches of smaller pieces of infrastructure that in turn support the leaves of the various types and levels of development that continue to sprout throughout this area. The next chapters in the development story will be the branches, or smaller pieces of support infrastructure that need to be put into place," said Mike.

And this brings us to chapter two of this story: the Blacklick Creek Trunk Sewer (BCTS), the first phase of which is now completing construction, also on budget and ahead of schedule. It was placed into service in early October 2019 with effluent flow by the end of that month.

Chapter Two: The BCTS And More

Working with the City of New Albany, EMH&T provided design for this first branch out of the BCSIS trunk. The BCTS extends northeast from the BCSIS terminus at Morse and Reynoldsburg-New Albany Road to Smith's Mill Road (North of SR-161). It is an additional 24,000 feet of sanitary sewer installed utilizing both traditional, open-cut sewer construction and some trenchless construction due to site specific constraints such as groundwater, surface disruption, adjacent utilities, and other constraints. This portion of the project also involved the connection of the two systems (Columbus owned and New Albany owned sewers) at a junction manhole that EMH&T coordinated

According to Mike Keller, PE, EMH&T's Director of Public Works, one of the main goals of the interceptor sewer is to ensure sufficient utility infrastructure is in place to sustain current development in the area and also support future development, which is now spilling over into adjacent Licking County.

"The goal of the Columbus BCSIS project was to provide the backbone of a centralized wastewater collection system serving portions of Franklin, Licking, and Delaware Counties," said Mike.

By the Numbers

BCSIS

4.5 miles long (23,000 linear feet)

120 inches in diameter tunnel

4 shafts

40 to 140 feet below the surface

\$98.4 million total construction cost

BCTS

24,000 linear feet

\$20 million total construction cost

Water Line

30 and **36** inch mains

11,700 linear feet of 36 inch and 7,100 feet of 30 inch

\$11.5 million construction cost

New booster station with

16.2 MG pumping capacity

between Columbus and New Albany to ensure the overlapping work areas did not negatively impact either project.

"This expansion project allows the area's growth and development pattern to continue in the most economical way with a shared investment between municipalities," said Mike.

But as is so often the case in the story of development, there is a plot twist. As new sections of the New Albany International Business Park were opened and marketed, a change in tenant profile was occurring. In 2017, Facebook announced it would be building a 900,000 square foot facility within the new section of the business park.

"This change in the development pattern and the land use required New Albany to respond quickly to accommodate the increased infrastructure demands being placed on the project," said Mike.

Fortunately, EMH&T and New Albany were ready to handle these changes thanks to significant planning and pre-design for the public infrastructure needed to support expansion within this area. In fact, the plans for the major infrastructure needed to support such development were already in place and just needed modification to support the increased demand.

At the other end of the pipe, these sewers would only support economic development if the City could adequately provide the water infrastructure needed to support the users. This is the holistic challenge of working at the speed of business—you need to understand the overall utility needs and ensure that both designs are aligned to support the unique demand patterns anticipated with the mixed-use customers, including manufacturing and tech facilities. In addition to the sanitary infrastructure connecting these sites to the BCTS, the water infrastructure also needed to be addressed.

EMH&T Public Works Project Manager, Shane Spencer, PE, took the reins for this \$11.5 million component of the project.

"In order to provide sufficient water supply for the new large data center



Launch frame being installed. This 4.5 mile stretch of sanitary interceptor sewer extends from south of Blacklick Ridge Boulevard to Morse Road and services approximately 16,000 acres within the Blacklick Creek watershed.

and other tech-heavy facilities moving to this new section of the business park, we needed to significantly increase the water supply capacity as part of the overall infrastructure upgrade work," he said.

Specifically, EMH&T designed a 36-inch water line that extends to these sites from the existing lines along Morse Road. Other pieces of the water improvements include a new booster station to provide the new large volume feed to the New Albany pressure district.

According to Jennifer Chrysler, community development director for the City of New Albany, the City works hard to maintain a high level of readiness for situations like this.

"New Albany's commitment to providing the infrastructure necessary to support a wide range of user needs within the business park has enabled us to streamline our planning processes and develop the methods needed to quickly accommodate a businesses' need for speed as they prepare to better compete in the global market," said Jennifer. "That level of preparation enables us to provide a high level of service and amenities for businesses that choose to make New Albany their home."

Coordination And Solid Project Management Keys To Success

Projects like the BCSIS (City of Columbus) and the BCTS (City of New Albany), which represent the foundational infrastructure needed to support future development, don't come in on budget and ahead of schedule without a significant amount of coordination and quarter-backing.

"Successfully navigating the coordination and management of a project that is required to match the 'speed of business' goes above and beyond the engineering, it incorporates the fourth dimension of a project...time," said Shane.

The time dimension required a significant level of EMH&T involvement from contract negotiations to budget management to design and construction through multiple stakeholder coordination. Additionally, it is working in real time both during the design and during construction to address nuanced schedule, sequencing, phasing, and other disruptors which may affect the "on-time, on-budget" expectations of the City and the businesses.

"As the project lead, EMH&T was fully engaged in each of these aspects of

the project,” added Mike, “we played the roles of master scheduler, master coordinator, and expert tactician all at the same time!”

At one point in time as these projects crossed paths, there were six different contractors working on them simultaneously (reporting to three different Owners—City of Columbus, City of New Albany, and Franklin County Engineer’s Office). Even after substantial completion of the BCSIS project the BCTS still had three different contractors working at the same time.

“We had to carefully establish milestones for each company’s tasks so the first firm could move out of the way of the second firm without compromising what either firm was doing. We facilitated a lot of discussions focused on the who, what, and when for each of these contractors,” said Mike.

The same holds true for the coordination among the many stakeholders involved, including not only Columbus and New Albany, but also Franklin County, Plain

Township, Jefferson Township, and the various private developers.

“Balancing and coordinating the varying interests of this many stakeholders is a monumental task in itself, and fortunately EMH&T’s experience in these situations allowed us to do that in a way that kept all parties happy without jeopardizing the project timeline or budget,” said Mike.

Mike’s Public Works Division worked closely with the EMH&T Development Division, which was providing the site/civil engineering for many of the large-scale user’s projects in this new section of the park, from project start through to substantial completion.

“Kudos starts with New Albany’s City Administration for working with the private developers and public stakeholders to find a way for the local government to work at the ‘speed of business.’ As development continues within the business park it has been critical that the City has already vetted the required infrastructure to support

the wide range of users. It is really a symbiotic, organic process which they have mastered,” added Mike.

The results of all this effort speak for themselves. This area within the business park has transformed to become an important location for some of the nation’s biggest companies. The foresight of the cities of New Albany and Columbus combined with the engineering and project management expertise of EMH&T have resulted in an infrastructure trunk that is fully ready to support more development.

There’s little doubt that growth within the New Albany International Business Park will continue for the foreseeable future. EMH&T is ready to continue serving the City as they continue to contribute to Central Ohio’s growing reputation as one of the country’s best places to do business. ■

For more information on EMH&T’s public works and tunneling design capabilities, contact Michael Keller, PE, at 614.775.4207 or email him at mkeller@emht.com.

The Tunnel Boring Machine was designed and constructed in Germany, deconstructed, and shipped to Ohio for reassembly at the project site.





VISUALIZATION DRIVES DESIGN INNOVATION

Evolving Use of Technology Takes Design Process to New Levels



Visualization has served mankind for millennia. Even before the rise of the written word, pictures and images were used to communicate events and stories important to both teller and listener.

Visualization is simply a way to communicate something using imagery—to represent an object, situation, or information as an image. Similarly, innovation has propelled mankind forward for all of human history. Without innovation we would not enjoy the daily experiences of living in our technology-rich twenty-first century world.

At EMH&T, the nexus of visualization and innovation is creating an evolution in the firm’s design process that rivals the introduction of Computer-Aided Design and Drafting (CADD) and allows the firm’s design professionals to up the game not only for the client, but also for the project team. American inventor Thomas Edison was known for his tenacity in his inventing process. A famous quote attributed to this prolific inventor is: “There’s a way to do it better—find it.” At EMH&T the connection between visualization and innovation is that “better way to do it.”

Marriage Of Art And Science

The use of visualization as a way to foster design innovation is akin to the marriage of art and science—think of it as computer program meets artist’s brush and the next thing you know a project visualization is born! According to Adam Burger, PE, EMH&T’s Design Innovation Project Manager, sometimes the relationship is a match made in heaven and sometimes it’s more of an arranged marriage.

“Which one it is depends on how we are using it in a particular context,” said Adam. “Sometimes it helps us get from preliminary to final design faster, sometimes it contributes to better decision making for the project, but in almost every situation it helps us become more efficient.”

The use of visualization as part of the design process is iterative, according to Adam. “The more we use it in a design context, the more speed and flexibility we develop.” he said. “It’s truly an ongoing exercise in form following function as the design grows and changes and the model and images develop.”



Computerized renderings helped stakeholders visualize the outcome of Rotary Park in Marion, Ohio.

Visualization As Placemaker - And So Much More!

EMH&T's Director of Planning and Landscape Architecture, Jim Dziatkowicz, PLA, ASLA, sees visualization as more than just a design aid. For him, it is a placemaking tool. "It's an opportunity for us to visually create ahead of time what will ultimately hope to be," he said.

"There is a real synergy between the firm's design capabilities and our visualization capabilities in the context of our approach to designing places of character for all of our clients' projects," said Jim.

He added, "Our way of working and designing has evolved into a more efficient process that allows for "real-time and in-the-moment" decision making, face-to-face with our clients, with the result being a photo-realistic image of what can actually exist at the end of a project."

According to Adam, InfraWorks and other software used to develop visualization images has improved significantly over the past three years. "Prior to 2016, we would not have used these kinds of programs during design, but in 2019 they are often part of the design

process starting with our very first meeting," he said.

"We have developed an almost symbiotic relationship among the design programs, such as CADD and InfraWorks, we use now—one program feeds off the other and vice-versa." said Adam. "CADD

provides the foundation for the designs as well as being the program for bid and construction drawings, but for quick design modifications and decisions, InfraWorks is now our go-to program."

The CADD drawings provide the data and the calculations,

Visualizing new roadway alignments and modifications enables a smooth development design process.





This approach view of a new roundabout in Strongsville, Ohio, allowed engineers to visualize the line of site at the facility approach.

both of which provide significant value in the design and imaging process. But in the context of InfraWorks they are more than just data and calculations, they are ultimately the images depicting them.

According to Adam, there are several EMH&T projects that serve as good examples of the correlation between data and images. These include the Cannon Drive relocation project on the Ohio State

medical campus, the new entry roadway and gateway on the Tuscarawas Campus of Kent State University, the design of the SR 129 at I-75 Interchange in Butler County, Ohio, and the State Street Urban Streetscape Improvements in Westerville, Ohio.

“With all of these projects we were able to use visualization as a key component of the design process and as a placemaking tool to provide a superior “finished” set

of images even before construction began,” said Adam.

Setting The Stage For Future Success

The use of visualization in the context of design is really just one tool in EMH&T’s ever expanding innovation toolbox.

“Each time we jump into something new in the context of a project design, we create and develop better ways of doing things down the road,” said Adam.

Jim agrees, “Every new project is an opportunity for us, as designers, to improve existing methods and approaches and develop process innovations that translate into design innovations. It’s really an exciting discovery process each time we start a new project.”

“Part of the process is to develop the frameworks and structures in InfraWorks that

we already have in CADD, and each time we complete a project that is something we assess. In addition, our intellectual capital develops and gets deeper with each project,” said Adam. “There’s a lot of value in applying what we’ve learned to what we’re doing next and that value benefits both EMH&T and our clients.”

Thanks to the ingenuity and artistic abilities of designers like Adam, Jim, and others, EMH&T’s use of visualization in project design helps move the needle from innovation to transmutation—which is to say we transform nothing into something in a surprising and magical way! ■

If you would like to learn more about Visualization and Design Innovation at EMH&T, contact Jim Dziatkowicz, PLA, ASLA, at 614.775.4703 or by email at jdziatkowicz@emht.com. or Adam Burger, PE, at 614.775.4608 or by email at aburger@emht.com.

This rendering of a rare 5-point roundabout was critical in communicating with key stakeholders.



LPA EXPERIENCE RUNS DEEP AT EMH&T

Expertise helps clients navigate uncertain waters

Say you've got a significant infrastructure issue that needs addressed. It will be a big project and likely expensive, so outside financial assistance will be needed. Fortunately, there is ODOT's Local Public Agency (LPA) program, which can provide the funding assistance a local agency needs for such projects.

According to EMH&T Director of Transportation Planning and Design, Abby Cueva, PE, the LPA program is a mechanism for local agencies—be they cities, towns, villages, or counties—to receive ODOT funding for a variety of infrastructure improvement projects.

"The LPA projects use a shared cost approach with the ODOT funds generally covering the hard construction costs and right-of-way acquisition with the cost of engineering and other design needs covered by the local agency," said Abby.

"The LPA program funds are a combination of state and Federal allocations disbursed through annual allotments," she added.

EMH&T Experience with LPA Process

In her role overseeing EMH&T's transportation planning and design work, Abby brings a laser focus on successfully navigating project design and construction for the firm's public projects.

EMH&T brings a very thorough understanding of how to navigate the

"The firm's technical expertise was proven when few, if any, comments came back from ODOT on their plans."

Amy Havenar, PE
Piqua City Engineer

LPA process. Any local agency choosing to use this approach for project funding will benefit from this depth of understanding, and also from the EMH&T team's ability to exceed the technical engineering requirements as well as its strong project leadership to meet the challenges of multiple stakeholders and project fiscal constraints.

Specifically, the firm has provided professional services on over 23 LPA projects in just the past five years.

"As a firm and as individual professionals, we bring a significant depth of knowledge to performing on LPA projects, and much of that knowledge is specific to the ODOT processes that need to be followed to ensure project success. It also helps that many of us have long-time working relationships with the various ODOT districts," said Abby.

EMH&T's leadership of the LPA process plays a very big role in overall project success. Once an LPA project is approved, it is required to follow the ODOT delivery method related to all phases of project development from programming and environmental clearance, through ROW acquisition, to construction and final inspection. Knowing how to guide the client through these project phases successfully is developed through experience and ODOT know-how.

"We enjoy leading these communities through the process, making sure they dot all their i's and cross all their t's, but we also know the importance of acting as a liaison on their behalf so once their funding is achieved we can make sure it is used efficiently," said Abby.

Successful Project Outcomes

EMH&T's significant public sector experience, combined with an excellent track record on ODOT projects and the broad capabilities of a multi-disciplinary firm, makes EMH&T a very safe bet when it comes to delivering LPA projects.

"I see EMH&T as a 'one-stop shop' when it comes to successful LPA project outcomes. Our approach starts with the basics, such as a safety study with the Traffic Engineering Division, or navigating through the NEPA process with the Environmental Division, and it moves naturally into applying those results to the client's need, and ending up with a fundable solution," said Abby.

In Mahoning County, outside of Youngstown, Ohio, EMH&T worked with the county to provide a roundabout study and professional design services for the “5-Points Intersection” as part of an ODOT LPA project through ODOT District 4. EMH&T evaluated current and future traffic volumes at this highly-congested intersection to provide a long-term solution focused on improving safety and capacity within the corridor. In partnership with the County and ODOT, the preliminary engineering phases evaluated alternative alignments and roundabout configurations while minimizing impacts to properties, environmentally-sensitive areas, and petroleum pipelines adjacent to the project. The project has completed design with construction set to finish in November.

In the Columbus suburb of Canal Winchester, EMH&T’s experience helped the City to improve a highly-traveled corridor with design and construction of a three-legged roundabout. A safety study served as a basis for an application and subsequent award of LPA funds to design and construct the roundabout for Phase II of the project.

“EMH&T understood the driving force for the project was the LPA component, and they researched ways within ODOT LPA guidelines and process to meet our expectations for completing this project,” said Matt Peoples, Canal Winchester’s Director of Public Service.

High traffic volumes and a need to design for future development were driving factors in another roundabout project for the city of Piqua, Ohio. EMH&T designed the intersection of Looney Road and Garbry Road for a modern roundabout with enhanced pedestrian connectivity. Beginning with the preliminary engineering study, EMH&T developed alternatives and then advanced the preferred roundabout alternative, balancing intersection geometry and operations while addressing future development needs adjacent to the project location. EMH&T also executed a public communication plan educating the community on the



Gender and Lithopolis Road roundabout LPA project in Canal Winchester, Ohio.

Guilford Road culvert replacement LPA project in Medina, Ohio.



benefits of the proposed improvements while delivering the final design in compliance with the ODOT LPA process.

According to Amy Havenar, PE, Piqua City Engineer, the technical expertise of the EMH&T staff played a key role in the project.

“The firm’s technical expertise was proven when few, if any, comments came back from ODOT on their plans. They delivered the final design in compliance with the ODOT LPA process and did an outstanding job with communication throughout the project. It was a wonderful experience to work with the team at EMH&T,” she said.

There are always more local transportation projects than there is funding to finance them, but that doesn’t change the fact they need to be done. The LPA program is a great way for local

agencies to successfully navigate the inevitable construction projects in their lives and work together with ODOT to get these needed projects completed.

“EMH&T can cover all the bases in what is a very prescribed process for delivering a project, and we do it every day for many different local agencies. Our ability to maneuver through the process, while also effectively managing schedule and budget on these projects, allows us to bring a high level of confidence to our clients,” said Abby. ■

If you’d like to learn how EMH&T can help you navigate the LPA project delivery process, call Abby Cueva, PE, Director of Transportation Planning and Design at 614.775.4604 or email her at acueva@emht.com.

Shorts



Central Ohio Housing Forum

EMH&T hosted leaders from the Columbus area development community in an ongoing conversation about a significant issue facing Central Ohio: the widening gap in available housing. Over 50 individuals attended this discussion focused on how best to address the growing need for housing in the greater Columbus area to accommodate the additional million residents predicted by 2050. Representatives from several Columbus area developers—both single family and multi-family—came together to discuss this increasingly important topic, which was followed by a second forum with these Columbus area leaders, where the group moved toward identifying solutions for this widening gap of available housing. EMH&T is proud to work with professionals who care deeply about Central Ohio and to make a professional contribution toward solving this issue.



Honoring the Heroes Among Us

EMH&T held its annual Fall Family Event at the new National Veterans Memorial and Museum in October. The firm performed the site civil engineering for the project, which quickly gained national attention for not only its unique architecture, but for being designated as a national museum by the US Congress. EMH&T seized the opportunity to also recognize employees that are active, retired, or reserve military and employee spouses who served in uniform.

EMH&T salutes our friends and clients who also served!



Giving Back

EMH&T has long valued its commitment to give back to the communities where we live and work. The firm offers employees paid time off so they can participate in a wide variety of charitable efforts. Working as individuals on personal passions to division staff working together on a group project, philanthropic endeavors are held in high esteem at EMH&T. Here's a brief look at how some of our staff have been giving back.



Scouts of America Day Camp

A major focus of the Scouts of America is to prepare boys and girls for life - both now and in the future - through ethical and moral choices, and by instilling in them the values of the Scouts. Employee Jeremy Eisele of the Development Division has seen this happen in the lives of his own kids and was pleased he could use his company-provided volunteer time to help other kids. Specifically, he volunteered to help kids learn to utilize critical thinking and teamwork by creating and teaching STEM-inspired activities. Jeremy worked with kids ages 6 to 11 on these activities by helping them work through the process of critical thinking and teamwork to develop some very unique games. Jeremy's volunteer time allowed the Scouts to have a STEM station at their day camp. Jeremy believes strongly that STEM is a very important learning tool for children and feels very fortunate that he was able to be a part of such a positive program.



A Kid Again

EMH&T employees volunteered their time on July 10th assisting the Central Ohio Chapter of "A Kid Again," as they provided a fun day at Kings Island for families with disabled children. Brandon Bragg, Misty Alderman, Teague Webb, Kristen Corder, and Brian Prenger handed out wristbands, entry tickets, lunch tickets, and \$10 gift certificates for each kid to spend in the park. The focus of the organization is to make life for families caring for a child with a life-threatening illness "normal" again by helping them gain moments of positive, family-shared experiences and memories.



Second Harvest Heartland Foodbank

What's better than using your company provided volunteer time to give back to the community? Why sharing the experience with your dad, of course! That was the case for Natalie Fremming who used her volunteer hours to sort food for the Second Harvest Heartland organization while also enjoying some quality father-daughter time. Second Harvest Heartland is the second largest food bank in America and collects and distributes food to smaller front line agencies such as food shelves, food pantries, meal programs, etc.



Student LifeCamp

Being a positive influence on young people is what Evan Salyers sees as a result of his volunteer time. Evan volunteered for a week-long stint as a high-school counselor with Student Life Camp, a Christian group that brings kids together from all over the country for a week of swimming, playing games, having fun, and worshipping. Evan says church camp was a big part of growing up for him, and this year was his first time serving in the high-school ministry at his current church.

People In The News

New Principals and Associate Announced



E. Miller

Ed Miller, PS, and Shawn Arden, PE, CFM, LEED AP, CPESC, have been named Principals of the firm. Ed has been with EMH&T since 2001 and currently serves as Director of Survey. He manages right-of-way descriptions and surveying for all public projects including capital improvements, state, county, and municipal roadway plans. He is responsible for establishing existing roadway centerlines, right-of-way and boundary lines, and his division conducts courthouse research and preparation of all legal descriptions.



S. Arden

Shawn is a Senior Project Manager with EMH&T's Water Resources Division. His 19-year professional career includes projects that involve flood risk identification and mitigation, dam and levee safety improvements, streambank stabilization, and ecological restoration. He enjoys working with a wide range of clients and communities to develop programs that foster a collaborative approach to reducing the impact of development on stormwater flooding and water quality.



C. Schrader

EMH&T has named a new Associate of the firm, Craig Schrader, PE, MS. Craig leads our Structures group and has experience ranging from

simple to very complex projects for many Ohio counties, municipalities, and ODOT Districts. Craig develops numerous unique designs at the substructure and superstructure level to accommodate the aesthetic requirements of clients, and his diverse background helps him to quickly refine design details and not "over complicate" project tasks—reducing design and construction costs for project teams.

Client-focused Transportation Divisions Announced



A. Cueva



M. Brehm

Recognizing the changing needs to client types and project drivers, EMH&T recently transformed its Transportation Division into two distinct but related transportation engineering-focused divisions. Led by Abby Cueva, PE, the Transportation Planning & Design Division will focus on continuing to provide services for ODOT and LPA projects, large scale transportation planning, structures design, preliminary engineering and traffic planning analysis (teamed with our Traffic Division). Mike Brehm, PE, will lead the firm's Transportation Partnerships Division will continue to focus on all aspects of municipal and local roadways. His group also leads complete streets and roundabout projects, along with projects that include complex financing via economic development agreements, public-private partnerships, and grant funding. The new divisions further enables EMH&T to provide laser-focused services to their clients.

Dziatkowicz Joins Grange Insurance Audubon Center Board



J. Dziatkowicz

The Grange Insurance Audubon Center welcomed a new members to its Stewardship Board. Jim Dziatkowicz, Director of Planning and Landscape Architecture at EMH&T has been appointed for a three-year term. The Stewardship Board is a 10-member board comprised of community leaders who invest their time and resources in supporting the Center, whose mission is to conserve and restore natural ecosystems. Their focus is on birds, other wildlife, and their habitats for the benefit of humanity and the earth's biological diversity.

New Employees



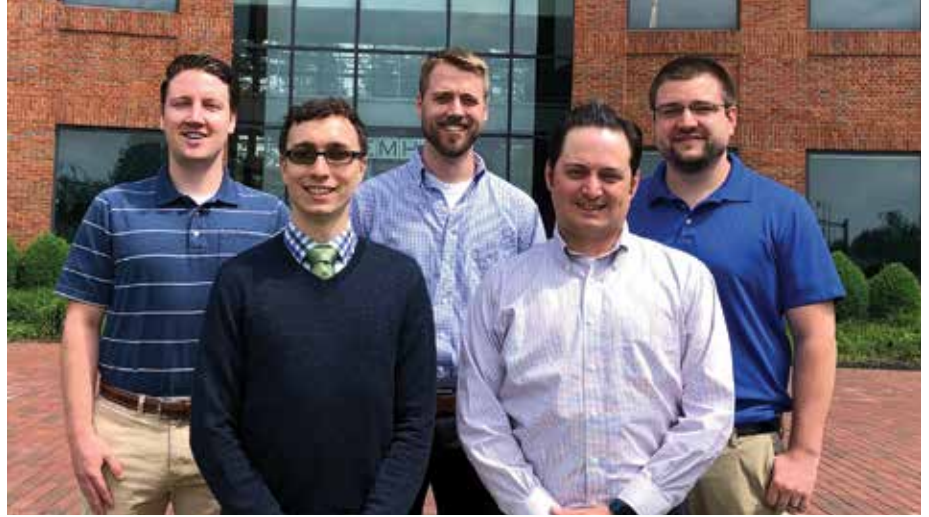
K. Pike

Kellie Pike, PE, ENV SP, has joined the Water Resources Division as a Senior Water Resources Engineer. Kellie comes to EMH&T with over 18 years of experience. She has worked on an extensive number of projects that range from City of Columbus, CSX, ODOT, NiSource, and several others at consulting engineering firms in Columbus. She is registered as a professional engineer in Ohio, Kentucky, and West Virginia, and is a member of Ohio Stormwater Association and Water Management Association of Ohio.



C. Laster

Chris Laster, RLA, ASLA, joined EMH&T as a Landscape Architect in the Planning and Landscape Architecture Division. Chris is a graduate of The Ohio State University. He started his career as a Lighting Designer and then transitioned to an Associate Landscape Architect/Urban Designer. In these positions Chris created urban environments and managed projects at various scales. Chris is currently the Vice President of Communications and President Elect of the Ohio Chapter of The American Society of Landscape Architects.



New PEs

Congratulations to EMH&T's newest PEs! Ryan Irwin (Traffic), Jacob Schroeder (Land Survey), Kyle Kungle (Urban Design), Christian Goodrich (Transportation Partnerships), and John Bruno (Development I) recently received their professional engineer licenses.



A. Davis

Andrew Davis joined EMH&T's Planning and Landscape Architecture Studio as a Visualization Specialist. Andrew is a graduate of The Ohio State University where he earned

his bachelor's degree in Landscape Architecture. Andrew is an expert in advanced technology such as virtual reality, 3D renderings and more, as well as holding an FAA license for piloting a drone.

Newest PLSs

Congratulations to Brandon King, PS, and Marcus Magers, PLS, who recently earned their Professional Surveyors licensure.



B. King



M. Magers

Contact Us

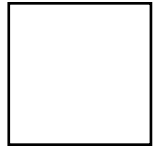
Contact EMH&T's Director of Business Development **Linda Peck** today to schedule a visit at your office. You can reach Linda directly at **(614) 774-1270** or by email at **lpeck@emht.com**.

You are also welcome to contact any of the experts identified at the end of each article in this issue of *Ingenium*.





5500 New Albany Road
Columbus, Ohio 43054



Toll Free: 888.775.3648
info@emht.com

Columbus Office:
5500 New Albany Road
Columbus, OH 43054
Phone: (614) 775-4500

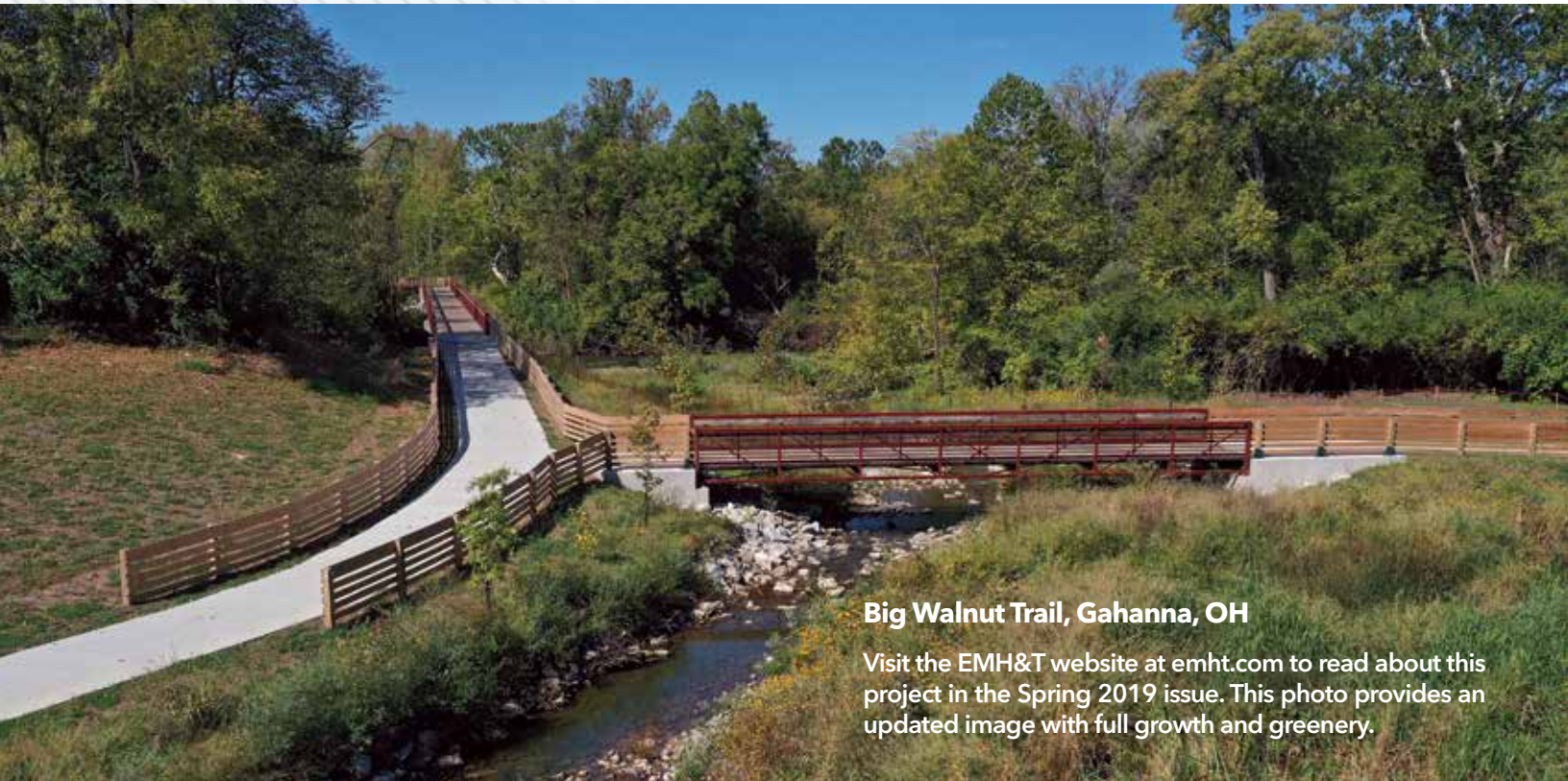
Charlotte Office:
301 McCullough Drive
Suite 109
Charlotte, NC 28262
Phone: (704) 548-0333



Visit us at **Booth 501** and pick up your string bag for carrying all the OTEC swag.



EMH&T President Sandy Doyle-Ahern will be participating in the first-ever **Pecha Kutcha** session at the **Tuesday, October 29**, lunch session. Don't miss this unique speaker platform to communicate relevant transportation issues.



Big Walnut Trail, Gahanna, OH

Visit the EMH&T website at emht.com to read about this project in the Spring 2019 issue. This photo provides an updated image with full growth and greenery.