[acronym]

An abbreviated look at digital design for government.

ISSUE 10. SPRING 2009

inside:

What's Happening on *[acronym] online*

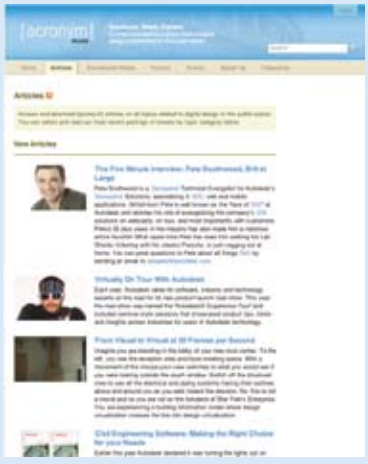
There's lots going on at *[acronym] online*. As well as a library of articles and educational media, we are building a true community of public sector users voicing opinions, sharing best practices and exploring design possibilities. Here's just some of what's going on at *[acronym] online*.

Who's Online

Everything you need to know about the members of our growing online community. Go ahead, introduce yourself!

Viewpoints

How will the new administration's stimulus package affect public works projects? Read this and other opinions on topical issues relating to digital design and the public sector.



Articles About Digital Design for Government

Browse a library of articles by topic, including civil engineering, public works, sustainable design, collaboration, good old AutoCAD tips and tricks, and much more.

Join the Forum

Commune, share, and explore with your public sector peers on a variety of topics in our discussion board.

Letter from the Editor

The old adage, "doing more with less," is unfortunately a common part of conversation these days.

Yet demands on the public sector to continue to deliver quality services, while operating on tighter budgets, still remain.

That was the premise of this issue of *[acronym] magazine*. And, I have to admit, the *[acronym]* team was a little weary about delving into such a discouraging topic. What we found from talking to you and to the experts, however, is that the public sector digital design community is hardy and resourceful.

We were inspired by how the community is leveraging innovation, teamwork and new operational practices to "do more with less." For some of you, cutbacks are creating opportunity for growth, as projects that would have been outsourced in the past, are being brought in-house and new skills are taking root at the agency level.

So while the theme of this issue of *[acronym] magazine* could seem a tad negative, I hope you will agree that the articles, reader feedback and expert recommendations we have compiled really do demonstrate the resourcefulness and creativity of government agencies across the country.

In particular, read "Innovative Public Sector Projects Prove that More Can Be Done With Less" (page 8), for examples of notable public sector projects that have achieved more with less through a combination of design, engineering and process management innovation.

We've also showcased your viewpoints. Read "Doing More with Less – Our Readers Weigh In" on page 6 for insights from the user community.

Of course, we wouldn't let our experts go without weighing in on the topic. Read "Using Technology to Deliver Better Constituent Services on a Tighter Budget" to hear what role digital design technologies can play now, and in the future, to help agencies balance the conflicting demands of achieving more with fewer resources.

Happy reading,

Caron Beesley

Caron Beesley, Editor
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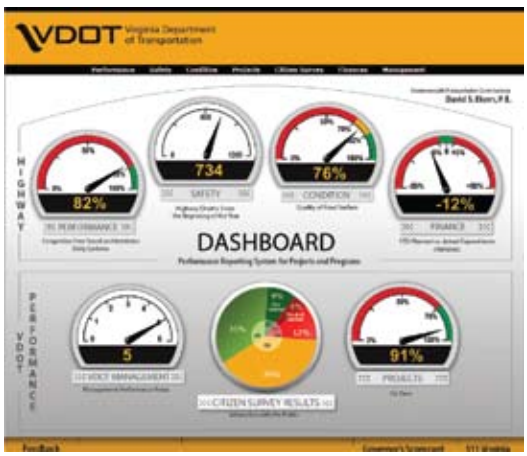
CONTENTS

On the Government Scene

Insights on government from government. *[acronym] magazine* has the scoop on public sector initiatives and resources that impact digital design and the business of government.

Figure 1: This VDOT dashboard screenshot lays out a series of gauges showing KPIs for highway performance, safety, condition, projects, financing and operations.

Figure 2: This screenshot drills down into "Project Delivery" statistics for VDOT services, including schedules, budget and environmental compliance of projects across the state and its localities. Additional tabs track pre-construction stages, project watch lists, and compliance with contract and plan specifications.



Virginia DOT Online Performance Dashboard Improves Accountability and Increases Transparency

The Commonwealth of Virginia received several pats on the back last year in the form of awards, honors and recognition for the extensive redesign of its Web portal (www.virginia.gov). Governor Tim Kaine and CIO Lem Stewart's vision of achieving better government through IT has led to a fostering of innovation, accountability and a direct and open line of communication between state government and its constituents.

Launched in the summer of 2008, the newly redesigned Virginia state government Web site included a much enhanced collaborative user experience. It features a one-stop-shop Web portal intended to keep citizens informed about state transportation issues, projects, finances and much more.

The Virginia Department of Transportation (VDOT) Dashboard (dashboard.virginiadot.org) is quite literally that – dials and gauges using a red, yellow and green color rating that let citizens view how their tax money is being used and holds VDOT accountable for its services in a very public way.

In its current version, VDOT Dashboard V.3 informs citizens using the following key performance indicators that bring together vast amounts of information and data in one easy-to-use interface:

- **Highway Performance** – In its current form, the dashboard contains real-time and daily updates on interstate traffic congestion, road and bridge conditions and projects, highway safety, and important metrics about how the state is doing in its use of citizen tax dollars.
- **VDOT Performance** – These gauges quickly show the public how VDOT is doing against its broader management goals. It also includes searchable data at the district, county, city and residencies level with information on VDOT project status, financing, environmental compliance and more.

Alexandria, VA, BIMStorm Zoning Map in Google™ Earth

BIMStorm Envelops Washington, D.C.

BIMStorm™, otherwise known as the "Woodstock of BIM," literally took the metropolitan Washington, D.C., area by storm during the second half of 2008. The BIMStorm Alexandria, VA, conference in September 2008 brought together a broad group of designers, clients and others involved in the building process to take on the city's future.

A primary development issue in Alexandria is the Base Realignment and Closure (BRAC) of military facilities, and city officials looked to the BIMStorm event to provide strategies for attracting new federal government agencies to take over these sites through the Federal Friendly Zones™ (FFZ) program.

The Background of BIMStorm

BIMstorm is a real-time, Web-based, 3D design system that allows for global communication around our built environment. It relies on a platform of Web-enabled software that integrates with other software through open standards – communicating with each other to design everything from a site plan to a budget. BIMstorm links buildings to locations on the earth to more accurately simulate and make decisions that will drive down the impact of buildings on the environment.

The BIMStorm concept is the brainchild of Kimon Onuma, president of architecture firm Onuma, Inc., who in December of 2007 had the idea for a free event that would bring together a cross-section of the industry.

How Does a BIMStorm Work?

People working on a BIMStorm can be anywhere in the world that has internet access. A participant can submit data such as the size of a building, floors, and other information to achieve a very rough cost of the building. Teams watch the projects that are submitted, place them in the actual city that they want the building designed in, and then start making decisions.

The Storm is Unrelenting

The Alexandria BIMStorm picked up where it left off in December 2008 at the AEC-ST Fall conference in Washington, D.C. Visit www.onuma.com/services/BimStorm.php for the results of the project and more information about BIMStorm.

Resources for Environmentally Preferable Purchasing

In late 2008, the National Association of State Chief Information Officers (NASCIO) released the State CIO's Top 10 Policy and Technology Priorities for 2009.

The list clearly reflects the priorities of state governments to embrace new Green IT initiatives that invest and support the growth of renewable energy and sustainable design initiatives.

For states venturing into "Green IT," there are many resources already available that budding state and local green buyers can take advantage of.

The Environmental Protection Agency (EPA) has a number of resources online that can help state and local agencies find and evaluate green products and services, understand green buying requirements, calculate the costs and benefits of their purchasing choices, and manage green purchasing.

While these tools and resources are developed for federal buyers, much of the information and training on the EPA Web site (http://www.epa.gov/opptintr/epp) can also be used by state and local officials to understand green purchasing processes and benefits. EPA also provides direct links to state green initiatives and resources.

State and local governments can also check out the resources available through the General Services Administration's "Go Green: GSA Environmental Initiatives" Web portal on www.gsa.gov.

The full NASCIO report can be viewed here: nascio.org/publications/. ■

Doing More With Less – Our Readers Weigh In

By Caron Beesley, Editor, *[acronym] magazine*

When we first sat down to plan this issue of *[acronym] magazine*, we knew the theme of "doing more with less" was relevant to many of our public sector readers, particularly in state government, where revenues are dwindling and budgets are being tightened.

But rather than make assumptions about how budget cuts are impacting the public sector digital design community, we wanted to let our readers have their say and share their professional and personal experiences of "doing more with less."

In late 2008, we posted an open survey on *[acronym] online* and invited users and readers alike to share their thoughts about how public sector budget cut-backs and economic pressures are impacting both their day-to-day operations and long term outlook.

The results of the survey, now posted at www.acronym-online.org/surveys, are interesting and certainly demonstrate that budget cuts are a reality that governments are facing and adapting to.

Here's a quick look at some of the findings:

Seventy-one percent of survey respondents are expecting or experiencing budget cuts.

When we spoke to a few respondents offline, there was widespread consensus that while budget cuts to date have been between two and ten percent, there are still more to come. The impact is broad and deep – here are some comments from our readers:

On the topic of whether government agencies expect salary freezes, one AutoCAD® Civil 3D user commented "I'm not sure, but it's a possibility ... but I'm willing to cut back to a 32-hour work week if it saves my job."

When asked how budget cuts were impacting day-to-day operations, this AutoCAD user from Florida commented "... cuts are increasing the workload on existing employees ... employees we've lost will never be replaced ... it's stressful, especially when we are already operating at more than 100 percent."

Another AutoCAD user added that the prospect of future budget cuts "... changes the priorities on jobs ... what's important now may not be as important tomorrow."

While the outlook may be grim, many planning departments and public works offices are creatively doing more with less.

Despite cuts in training budgets, one Florida-based utilities employee explained that he was "... taking advantage of free webcasts and seminars from Autodesk and others."

The same employee is also seeing new opportunity as his department reduces outsourced consulting projects and look to expand its internal headcount "... we've had a drop in revenue and expect even less next year. Our management has discussed expanding our staff – it's cheaper for us to design in-house than outsource to a consulting company."

Technology is also helping agencies achieve their goals in the face of budgetary cuts. Forty-eight percent of respondents agreed. This AutoCAD user commented on the benefits of Autodesk Subscription "In the face of cuts, probably the only salvation is that my Autodesk software is automatically upgraded for more productivity. We have two AutoCAD seats with subscription and get constant software upgrades that we could not otherwise afford. Plus, if I work from home, I can access one of those two seats from my home computer as part of the subscription program." ■

Check out the survey results online at www.acronymonline.org/surveys

"How To..." Online Lessons Help You Do More in Less Time!

"Doing more with less" often means doing more in less time! So if you are on the lookout for tools and advice to help you get more out of your digital design software, check out our new collection of "How to…" lessons and advice on *[acronym] online*. (www.acronymonline.org/forums)

Whether you use AutoCAD, Civil 3D, Revit or other software, check out this resource and get ready to be more productive in an hour or less. Recent posts include:

AutoCAD Civil 3D 2009... Dust off that Box!

Do you have a copy of AutoCAD® Civil 3D 2009 just sitting on the shelf at the office collecting dust? Or maybe you have a copy installed but have been too afraid to open it because its interface is drastically different than your current design software. This "How-To" guide covers many Civil 3D capabilities that can be used immediately with very little or no training investment, including:

- Navigating through the Civil 3D Interface (5 min)
- Creating, Displaying and Editing Surfaces (10 min)
- Surface Volume Calculations (5 min)
- Alignment Creating and Editing (5 min)
- Existing Ground Profile Generation (5 min)

Civil 3D Parcels, Parcels and more Parcels!

A selection of the best "how-to" tips and guides on the Web for working with Civil 3D parcels. Includes podcasts, articles, and expert tips.

It's All in the Family: Working with Revit Families

Get tips, training and beginner or expert advice for working with Revit families.

Post your Tips Online

Share your knowledge and post your own "how to…" tips and lessons online. It's easy, go to www.acronymonline.org/articles and log-in.

Mapping Out a Plan

Geospatial data helps agencies respond, collaborate

By Colleen O'Hara, Reporter, *[acronym] magazine*

Map-making has come a long way since Lewis and Clark set off on their cross-country trek to the Pacific Northwest more than 200 years ago.

By offering views from above and below, today's detailed geospatial data lets first responders and public safety officials respond to emergencies quickly and collaborate across agency boundaries.

Hurricane Katrina, other recent natural disasters and terrorist threats have underscored the usefulness of geographic information systems (GIS) when it comes to responding to emergencies – and the importance of being proactive instead of reactive.

"These days, more and more federal and state agencies are using GIS, not only to leverage accurate maps of emergency areas," said John Cassidy, Vice President, GIS and Government Markets at Tele Atlas, "but also to identify the exact location of incidents, hazards and strategic assets."

Tele Atlas provides digital maps and dynamic content to government and private organizations worldwide.

"By combining geocoding, mapping and routing functionality, GIS can provide a single, enterprise-wide resource that is seamless across all agencies and programs," Cassidy said.

For example, the statewide Virtual Alabama project (virtual.alabama.gov) allows geospatial data to be stored in a single location so that Alabama state, county and municipal governments – including first responders and law enforcement – can access it. The database of information is superimposed on satellite imagery and aerial photography of all 67 counties. If there is a hurricane, for example, agencies can monitor evacuation routes and evaluate the damage left by the storm. The Virtual Alabama project, which is aiding emergency responders and law enforcement officials in the state to evaluate and share information, is based on Google™ Earth data provided by Tele Atlas.

Another example is what the California Orange County Fire Chiefs Association has done. Its Public Safety GIS Interoperability Project provides a detailed street-level basemap of the entire county so that agencies can share information countywide and dispatchers can find and deploy the closest fire crew to an emergency, even if they are in another county. Before this was in place, crews lost valuable time responding to emergencies due to inconsistent maps and the lack of real-time vehicle tracking between neighboring agencies.

At the foundation of the Orange County program is accurate map data from Tele Atlas. When the data is combined with digital aerial photography and other technology, the basemap displays site details such as surrounding brush, roof type and width of passages.

GIS is a critical component of any public sector emergency pre-planning and response strategy because it helps agencies "find, visualize and route," Cassidy said.

Using GIS, agencies can determine where assets and constituents are (find), create and propagate richly detailed yet easy-to-read cartography for intuitive interpretation of a

Making GIS accountable

Measuring the success of any GIS application in government can be done in several ways, according to John Cassidy, Vice President, GIS and Government Markets, Tele Atlas.

For emergency response teams, success is largely dependent on the ability of all agencies to communicate seamlessly; including police, fire, ambulance and relief agencies. Success metrics in these instances can be based on the state's ability to identify and serve the needs of emergency callers quickly and efficiently.

Another measure is the successful deployment of solutions on a single mapping standard, allowing a government entity to leverage a comprehensive, high-quality solution that provides data for a wide variety of critical mapping and emergency applications.

And finally, success can be measured by the degree to which a GIS offers proven cost-effective solutions that increase efficiency.

situation (visualize), and dispatch the right people to the right place at the right time with the right equipment for the job (route).

One challenge in emergency situations can occur "when data assets such as facilities information, land-base data, aerial photography, utility information and addressing are maintained in disparate locations by multiple agencies and in separate file formats," Cassidy said.

This can dramatically slow down response times, increase the cost and introduce errors into the data, Cassidy added.

"Having all this disparate information stored in different places means that in a time of need, it all has to be merged into a single database to be used more effectively," he said. "This means that changes made by one group may not get added to the database of another group, or that errors from one group will continue to get served to users who know it's wrong."

Fortunately, agencies today have a more comprehensive, accurate enterprise approach to make geocoding, mapping and routing information available than they did five years ago, Cassidy said. There is more of a technological infrastructure in place today that supports sharing, including over the Internet and via mobile devices. And there will be faster ways to keep map data accurate, such as Tele Atlas' plans to leverage data from personal navigation devices.

The advances in GIS have been positive. When Hurricane Katrina hit the Gulf Coast, federal, state and local agencies provided geospatial data to help locate 911 callers, map potential shelter locations and help predict the amount of debris to be hauled away. But it was all done with little coordination.

"Five years ago it was a reactive situation," Cassidy said. "The disaster occurs, the phones light up and requests come to donate data to help with the response. Now agencies have their collective act together." ■

[acronym] offline: Bringing Together Public Sector Digital Designers

By, Vinny Poliseno, Assistant Editor, *[acronym] magazine*

The *[acronym]* community began in 2006 with the first issue of *[acronym] magazine*, which is now in its tenth issue. Since then, we have grown our community to include *[acronym] online* – a Web community that connects public sector digital design professionals.

Taking the *[acronym] online* community concept to the next level, we launched *[acronym] offline* in the winter of 2008. These live events are being held throughout the country and bring together digital designers looking to share their experiences and best practices face-to-face, in real time.

[acronym] offline events are open to public sector CAD managers, engineers, designers, architects, planners and others who specialize in 2D and 3D digital design.

The first event was held in Austin, TX, on December 9, 2008. Attendees networked over appetizers while sharing best practices for design success. Here is some of the feedback from the event.

"I found it to be a great investment in my time…""…the *[acronym]* publication is first class, and is a valuable tool."

The goal of these events is to facilitate collaboration across federal, state and local government agencies. Industry experts are also on hand to provide advice and support on all manner of digital design topics.

If you'd like to have one of these networking events within your area, email me at editor@acronymonline.org or call 888.468.8472 and ask for Vinny Poliseno.

Make sure you check out the *[acronym] online* events page at www.acronymonline.org/events to find more about an event coming to an area near you.

Vinny Poliseno (center), Assistant Editor of [acronym] magazine, is joined by government digital design professionals at the first [acronym] offline event in Austin, TX.

Improving Public Funds Use Through BIM Accuracy

Altering the Role of the BIM Manager

By Beau Turner, Director Business Development, Building Solutions Group, Avatech Solutions

The severity of the current economic downturn has seen the public sector striving to increase the value of its services. While private construction projects languish due to the credit crunch, new government building projects are emerging to create jobs and keep the economy moving. In the midst of this opportunity, government decision makers are under even more pressure than usual to ensure optimal use of tax dollars.

Project managers can look to building information modeling (BIM) for help. Over the last few years, BIM-based projects have enabled collaboration, improved construction accuracy and reduced rework in the field. The model itself offers significant benefits to a building team of designers, engineers, project managers and construction managers. However, it takes just one human input error to render a model incorrect and inconsistent, and multiple contributors compound inconsistencies. BIM is a valuable process, but its models need validation checks to ensure consistent standards, accurate content, and the use of modeling techniques that support integration with other disciplines.

BIM Complexity Leads to New Role

Building information models have become more complex as more people from different disciplines contribute to the model, or create their own smaller models for particular aspects of a project. To manage this complexity, a new role has emerged. Today, large projects require a BIM manager to ensure the integrity of the information in the model. This person typically spends long hours painstakingly testing the BIM for integrity against a variety of aspects and situations. For example, are all disciplines using appropriate naming standards?

And architects at Avatech, a company of experts in design automation and technology services, whose customers work with large government projects, saw that the time spent in this process of finding and correcting inconsistencies in the BIM could be significantly reduced by automating it.

Organizations have been investing a significant amount of time reviewing, fixing and auditing their building models to ensure they adhere to industry and project standards. Automating this manual process should improve efficiency, ensure model integrity and enable designers to spend more time on design.

Efficiently Improving BIM Quality

Avatech's software development group responded with a product called BIMreview, released in December 2008. The software helps CAD managers, BIM coordinators, project managers and facility managers save time and money while increasing confidence in BIM completeness and accuracy.

The application works directly inside the Revit platform to check, correct and manage the information in a building model. By reviewing geometry and data against a given set of criteria, the software ensures that the project model adheres to company standards, industry best practices and criteria set for a specific project.

A BIMreview results page for an energy analysis validation report showing rooms containing void spaces that, if left unchanged, would lead to inaccurate results during analysis.

Automating the BIM Review Process

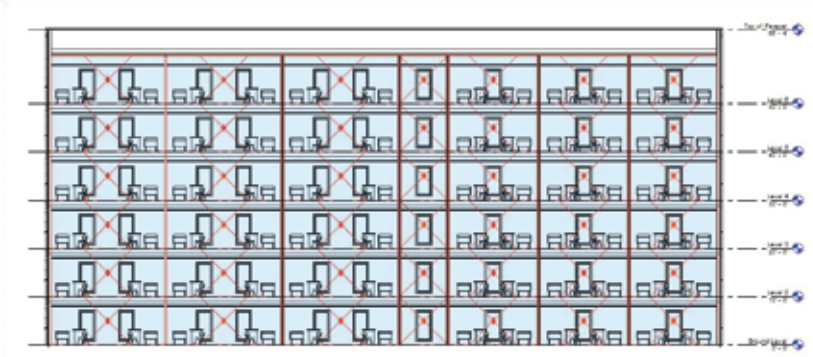
Here are some of the benefits of automating the BIM review process:

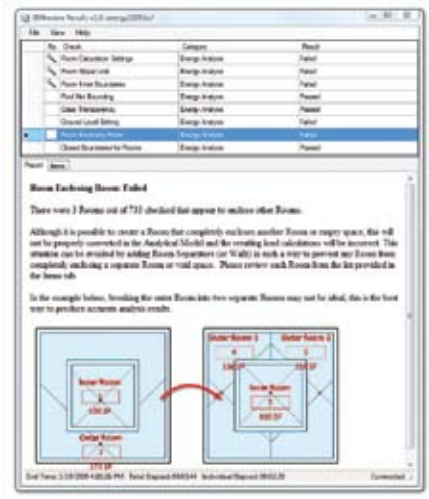
- Designers can validate the accuracy and consistency of building information models against project, national or user-defined standards.
- Errors can be corrected automatically.
- New checks and rules can be created and edited.
- Designers can eliminate the time spent manually reviewing and auditing project models for accuracy and consistency.
- The design model is ready for use as an analytical model for energy analysis.

Altering the Role of BIM Manager

By automating the checking and correcting of BIM inaccuracies, the BIM manager role is transformed from that of a digital drawing sheet reviewer to an information and team manager. Instead of spending time checking and correcting, BIM managers can now spend their day communicating with project partners to develop and enforce standards. They can also spend more time identifying areas for training and developing programs to improve consistency across internal departments and with external project partner organizations.

During these tough economic times, when government projects are forming a larger portion of the job market, doing things smarter will help stretch public funds. Automatic BIM validation and correction is one means by which the design industry can help ensure tax dollars are used wisely and that projects meet budget, design and social objectives. ■





Above: A BIMreview Report Page Showing a Multi-Story Hospital Section Showing Rooms That Require Changes
Right: A BIMreview Results Page for Energy Analysis Validation Report Showing Room Enclosing Issues.

Beau Turner is a recognized industry speaker on building information modeling, building industry trends and visualization solutions. Well over 500 companies have benefited from Beau's speeches, training sessions and strategic technology direction. You can reach him at 800-493-3233 or beau.turner@avatech.com.

Innovative Public Sector Projects Prove that More Can be Done With Less

Many government agencies continue to drive innovation and achieve cost savings while adjusting to budget cuts and increased pressure for accountability from taxpayers. Here is *[acronym] magazine's* pick of some of the more notable public sector projects that have achieved more with less through design, engineering, and process management innovation.

By Caron Beesley, Editor, *[acronym] magazine*

Design-Build Road Construction Saves Time and Money

Who: Utah Department of Transportation (UDOT)
What: Expansion of I-15 North, Salt Lake City, Utah
Result: Innovative design-build process brings road construction project to completion under budget and ahead of schedule

In 2005, the Utah State Legislature approved funding to reconstruct Salt Lake City's primary north-south route, which was in urgent need of expansion and repair following a huge increase in ski and commuter traffic since it was built in the 1960s.

The $214 million expansion project began in early 2006 and includes the widening of 9.5 miles of road from two to four lanes in each direction. Twenty-four bridges will also be built or reconstructed. The project is using best practices and lessons learned from the 1997 I-15 South reconstruction completed just before the 2002 Winter Olympic Games. At the time, that project was "the largest project ever undertaken by the State of Utah, and the largest single design-build highway contract in the United States," according to the Federal Highway Administration.

Using the same design-build process used for I-15 South, as opposed to a design-bid-build process, UDOT is able to control the job while reducing the costs and maximizing the efficiency of crews .

Traditional transportation projects are fully designed before moving to the construction phase. However, the design-build method allows both processes to occur almost simultaneously, expediting project delivery considerably.

With the design-build model used by UDOT, a design team works to finalize specific project design elements – so that design and construction can occur concurrently – saving taxpayer money and accelerating project completion.

Visit www.udot.utah.gov for more information about UDOT's guidelines for the design-build process in transportation projects.

Bridging the Potomac with a Pioneering Cost-Saving Plan

Who: Woodrow Wilson Bridge Project
What: $24.7 Billion Bridge Reconstruction Project
Result: Winner of America's Transportation Award for "Large Project – Innovative Management"

In 1988, Maryland, Virginia, and the District of Columbia kicked off a $24.7 billion revitalization plan to rebuild one of the worst traffic bottlenecks in the Washington, D.C., metropolitan region – the Woodrow Wilson Memorial Bridge.

The project entails the replacement of the original six-lane bridge with a modern 12-lane structure that will separate local and through traffic, features room for future mass transit, and ties communities together with hiker/biker trails.

The 15 year project, scheduled for completion in 2013, involves much more than replacing a bridge; the award-winning venture has also pioneered new policies and procedures for construction management and financial planning.

An innovative engineering feat, the new bridge features eight huge bascule leaves, each with a deck encompassing at least 11,800 square feet. The most striking innovations include employing movable falsework for the bascule piers, using carbon dioxide to neutralize concrete wash water and then reusing the water to promote the settlement of dust, and adapting an epoxy gel method to seal post-tensioning ducts.

Photo from: commons.wikimedia.org. Photographer: Aude

With new gossamer twin spans supported by curving V piers, the new bridge began carrying traffic in 2006.

A detailed financial plan has kept cost escalation to 1.3 percent since 2001, and an integrated construction management plan has helped keep the project on schedule.

Twenty years after the inception of the project, the state governments of Virginia and Maryland were honored with a range of awards for the project, including the national "Large Project – Innovative Management" award at America's Transportation Awards – the Oscars of the transportation industry.

Read more about the project at www.wilsonbridge.com/index.htm

Applying Corporate Business Practices to Achieve Government Savings

Who: Fort Wayne, Indiana, Public Works Department
What: Application of Six Sigma business methodologies to streamline many of the tedious government hurdles necessary to do business on a day-to-day basis
Result: $10 million in savings or cost avoidance on infrastructure projects

When Public Works Utilities Director Greg Meszaros was charged by the newly-elected mayor of Fort Wayne, Indiana, to look into ways to streamline departmental efficiencies, Meszaros implemented an innovative solution that borrows techniques from industry and applies them to his city's government. The result – a quality improvement program that saved taxpayers $10 million over seven years.

Using the principles of Six Sigma, the 500-employee department addressed more than 30 processes that were unnecessary, redundant or inefficient. The result, other than millions in cost savings, was that the department received approval for a series of initiatives that would help improve the city's infrastructure system.

Since its introduction in 2000, Six Sigma projects have resulted in more than $10 million of savings or cost avoidance for the City. Some of the improvements include:

- Reduction in the time to fill a pothole from 4 days to 4 hours
- Reduction in late garbage pick-ups by 50%
- Reduction of the cost per foot of water main repairs by 20%
- Lowering the crime rate to record levels; Fort Wayne currently has the lowest crime rate it has had in more than 20 years.

Learn more at www.cityoffortwayne.org/6sigma.htm ■

Five Steps for Planning a Successful Migration to Civil 3D

By Brad Heil, Director, AEC Product Group, Eagle Point

With the growing shift from 2D to 3D design, and the evolution of technologies such as building information modeling (BIM), the public sector is increasingly making the move from legacy engineering drafting software to dynamic 3D modeling tools, such as AutoCAD® Civil 3D®.

It's not such an easy stepping stone. In fact, any investment in next-generation technology actually requires a step back from the procurement phase. Migrating to newer, more complex, but ultimately more productive software requires a great deal of pre-planning, buy-in, policy development and workflow adjustments.

Regardless of the size and complexity of your migration, here are five key points to consider for a successful transition to AutoCAD Civil 3D.

1 Organizational Buy-In

When transitioning from one software platform to another, having buy-in across all levels of the organization can ensure a successful implementation.

As it comes time to roll out the migration plan, management must provide consistent communication to ensure that all stakeholders understand the rationale for the transition, and what the day-to-day operational impact will be.

Central to gaining organizational buy-in is the communication of a solid business case for the migration. Business reasons may include time-savings, productivity gains or policy changes. Department managers, CAD managers and end users will all have different motivations for transitioning software platforms, and these reasons will differ from agency to agency.

2 IT Considerations

When contemplating the move to Civil 3D, an agency should determine how much data is currently shared across internal IT networks or with external locations. This is a necessary step, since making a successful transition to Civil 3D requires an organization to determine if its current network infrastructure and hardware will support its decisions on how data will be shared and transferred.

The following steps can help agencies assess data sharing needs on engineering projects:

1) Determine who in the organization, whether they be individuals or departments, is responsible for the project from start to finish.
2) Determine if these individuals access data on a local-area network (LAN).
3) If you are a multi-office organization, do responsible parties share data across multiple offices throughout the design process?

3 Standards/Styles Development

When organizations migrate to Civil 3D from legacy design software like Geopak®, Land Desktop® or Eagle Point™, they quickly identify that a fundamental difference in Civil 3D, compared to legacy design engineering software, is in the use of Styles.

In Civil 3D, Styles control how objects look as well as the type of information that is displayed in the drawing. Because the use of Styles is such a mindset shift from the more traditional layers concept, they are one of the most important things to get right when migrating to Civil 3D.

While not everyone in your organization needs to be an expert on creating Styles, they do need to be an expert in using Styles. Setting up customized drawing templates at the beginning can make the rollout to users progress much smoother. If drawings don't look like they used to, users will have a hard time buying into the transition. In addition, not setting up Styles correctly from the beginning can diminish the gains you can expect to see in your migration.

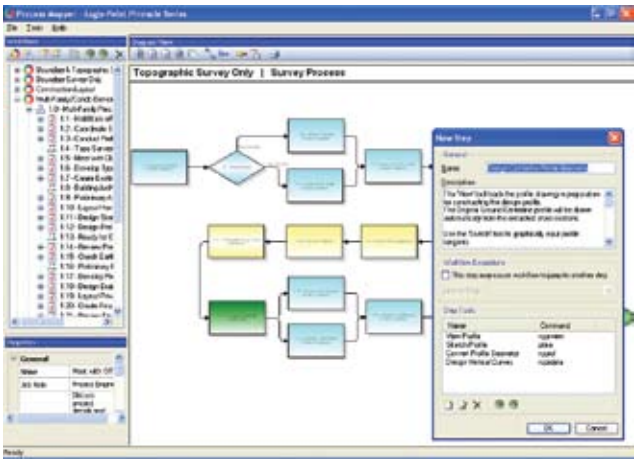
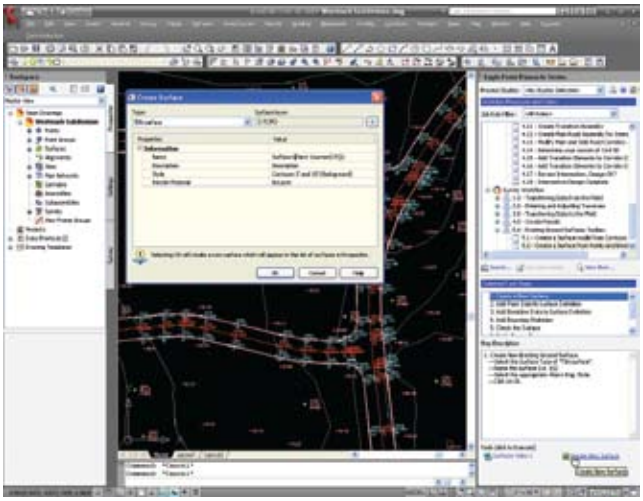


Figure 1 (Left): Use Pinnacle's Process Mapper to document new workflows and make links to Civil 3D commands. Figure 2 (Below): Distribute workflows with instructional text and command links to end users via Eagle Point's Task Navigator for Civil 3D.



4 Workflow Modifications

In contrast to the way your agency might use design tools today, Civil 3D can have a significant and positive impact on agency workflows.

When making the switch to Civil 3D, it is critical that you plan your desired workflow in advance. To do this, start with one type of project and determine what tasks need to be performed to produce the desired output. Then establish a small group of people who understand the workflow and can translate that to Civil 3D functionality. As users become more involved in the rollout, they will take more ownership in the process and be more likely to use the new workflow. There are tools on the market such as Eagle Point's Pinnacle Series® that can speed up the development and rollout of new workflows (Figure 1).

5 Enterprise Rollout

The rollout of Civil 3D to the entire organization must be done in a way that allows the end user to start taking advantage of all the upfront work that has been done to prepare for the move. Using a tool like Eagle Point's Pinnacle Series can help smooth the transition by electronically diagramming workflow processes and providing users access to the right tools to use at the right point in the process. In addition, tools such as Eagle Point's Task Navigator for Civil 3D can be used as a training tool and a quick go-to guide for rarely used processes (Figure 2).

Finally, it is also important to solicit feedback from users on how the transition is going and communicate the progress throughout the organization.

Conclusion

As you can see, making the move to Civil 3D requires more thought and planning than previous design software upgrades. However, by incorporating the five key points outlined above in your transition planning, your agency won't just survive the transition, but actually thrive by properly utilizing the powerful technology found in Civil 3D. ■

For 25 years, Eagle Point has been providing the land development industry with the right balance of technical and business solutions to help organizations thrive. Eagle Point's strength lies in its ability to provide solutions to sectors that work to improve land quality and design the nation's infrastructure. www.eaglepoint.com

Brad Heil serves as Director of the AEC Product Group at Eagle Point. In his 15 years of service with the company, he has consulted with hundreds of civil engineering and surveying organizations, helping them achieve greater success in their technology implementations. Brad is also an accomplished speaker, delivering his expertise in land development processes and technology to hundreds of attendees at numerous national and international conferences over the years.

Power Analytics: An Electrifying New Approach to Operations Management

Unless you are involved in building or facilities management, few designers encounter, or are required to support, post-build issues such as power cuts, or suffer the associated productivity and economic losses that power cuts can cause. *[acronym] magazine's* Assistant Editor, Vinny Poliseno, talked to Mark Ascolese of EDSA about making power systems "perfect on paper" before a single building foundation is laid.

By Vinny Poliseno, Assistant Editor, *[acronym] magazine*

People familiar with AutoCAD® Revit® for building information modeling (BIM) applications know it's the premiere platform for architectural engineering and construction. But as magnificent as the resulting structures are, they are very much like the skeletal system in the human body – a physical framework throughout which other vital systems like HVAC, plumbing, and electrical power – must be threaded.

Like building a ship in a bottle, incorporating all of these separate systems into a single structure involves extensive planning, beginning from the outset of the design phase, and frequently relying on specialized design, analysis and simulation software tools.

This is particularly important in modern "power-centric" facilities with extraordinary mission-critical requirements, e.g. data centers, customer service offices, law enforcement operations, transportation and air traffic control facilities, and military installations, where the loss of electrical power also results in the loss of vital services or capabilities.

"Not many facility operators realize that 40 percent of all their functional downtime is caused by electrical power problems, and that 80 percent of those problems originate within their facility, not externally," said Mark A. Ascolese, Chairman & CEO of EDSA, a power systems software developer in San Diego, CA. "Electrical power problems cause $150 billion in downtime and damages every year and, in the public sector, they can have catastrophic consequences."

To help organizations maintain high levels of electrical power reliability – while at the same time lower their energy consumption – EDSA developed Paladin, its proprietary power analytics software platform.

As Ascolese explains, Paladin supports two very important tasks, described below.

Design and Test Power Systems

EDSA's CAD modeling program – Paladin DesignBase – enables enables power systems engineers to meticulously design – and rigorously test – proposed power systems models in the design phase. This early testing ensures it will withstand the rigors of the live environment, while also performing as energy-efficiently as possible.

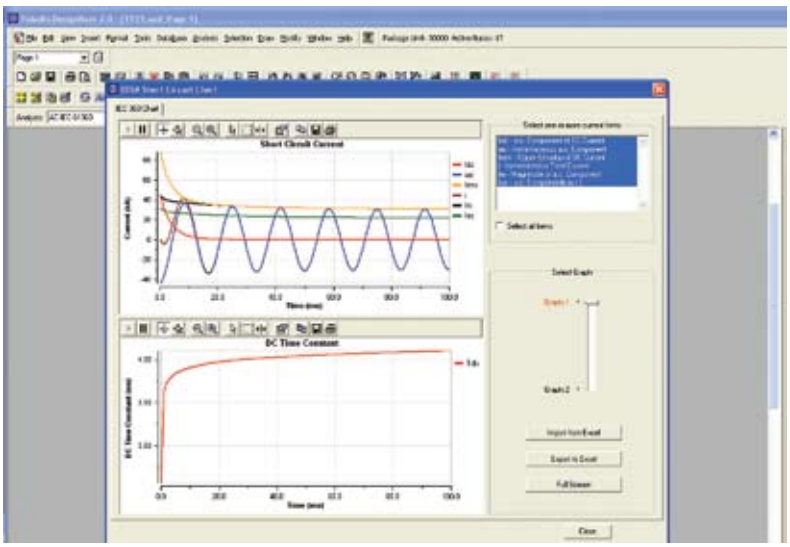


Figure 1. Use DesignBase to check electrical system for short circuits through the system.

Figure 2. Paladin Live provides a dashboard view of your server health.

Actual vs. As-Designed

The online counterpart to DesignBase – Paladin Live – continually compares the specifications in the DesignBase model to the corresponding readings in the live environment; if any readings deviate from their as-designed specifications, the system assesses and isolates the anomaly – typically, before it can become a larger problem.

"Though it sounds technical, the concept of power analytics is really no different than a football coach designing new plays, running them in practice and then using them with confidence in a live game situation," Ascolese explained. "In our case, we make sure the power system is perfect on paper before construction of the physical facility. After construction, when the facility goes live, there should be absolutely no surprises, if the CAD model was adhered to correctly."

How powerful of a capability is this model-based approach? Well, compare it to using AutoCAD® to design an automobile braking assembly: with model-based capabilities, not only would AutoCAD's solid modeling and finite-element analysis capabilities ensure optimally designed components at the end of the design phase, but, once installed in an automobile, it would provide real-time reports on wear-and-tear, future service needs and emerging safety threats.

Ascolese continued, "When you stop to consider how reliant some of our customers are on their electrical power infrastructure to continue operations – the FAA is responsible for the safety of 760 million passengers per year, and one data center customer alone processes $4 trillion in transactions per year – it is easy to see how an investment in this technology pays for itself very quickly."

But beyond just averting infrequent crises, the Paladin power analytics software platform delivers day-to-day benefits as well, especially in the area of energy savings and investment protection. Electrical infrastructure – and the electricity-consuming equipment throughout it, like computers, communications equipment, etc. – deteriorates over time due to wear-and-tear, dust and other environmental conditions.

Tracking the impact of that degradation can provide important clues about what equipment should be replaced and at what point. Like a tune-up for a car, power analytics system ensures that all systems are operating optimally, ensuring that energy is being used as efficiently as possible, and in turn, lowering energy costs.

Taking the car analogy a step further, Ascolese explained, "It's like asking someone, 'What's more important: having an airbag in your car, or getting high MPG?' when we all know the truth is both. It's nice to save a few thousand dollars a year in fuel costs but, when you're in a head-on collision, that airbag is a lifesaver."

Paladin's power analytics system is proven in some of the world's most demanding customer environments, protecting more than $100 billion in customer assets. Ascolese noted that – for new facilities that are still on the drawing board, or old structures in need of modernization – power analytics can provide three essential benefits.

- Increasing Reliability – 80% of electrical power problems are internal in nature, caused by gradual overloading, power quality problems or voltage irregularities, such power spikes and surges that damage delicate computer equipment.
- Understanding Capacity – This enables facility operators to make insightful decisions about equipment, environmental systems and other loads on their electrical system to maximize their investment in existing infrastructure.
- Reducing Energy Costs – President Bush's "Energy Independence Act" of 2002 requires federal building tenants to reduce their energy usage to 50 percent of 2002 levels before 2012. But most government offices lack even the means to measure and analyze their energy usage, let alone reduce it. By revealing hidden clues buried deep in their power infrastructure, power analytics system helps facility operators see – and test – where opportunities for energy savings lie. ■

Using Technology to Deliver Better Constituent Services on a Tighter Budget

Got questions? We've got answers. Each issue our team of experts weighs in on a variety of topical issues relevant to public sector digital design. In this issue our team of experts includes leading technical and public sector experts from Avatech Solutions, CADD Centers of Florida, U.S. CAD, and CADD Microsystems.

With the weight of current economic pressures on business organizations and government agencies alike, we asked our network of experts to weigh in on the following question:

Question:

As the ebb and flow of the U.S. economy takes us from times of prosperity back to times of cutbacks, state, local and federal government agencies must do more with less. At the same time, government faces pressure to deliver better services. What role can digital design technologies play now and in the future to help agencies balance these conflicting demands?

Answers:

David Lingebach, Director of Government Services at CADD Centers of Florida, sees benefits in combining current technology tools with new collaborative work-flows that cut costs and increase productivity for state, local and federal government agencies.

"Like many local governments across the country, cities and counties in Florida have been hit particularly hard by the recent economic downturn. Combine this with the state-wide property tax cuts that all but crippled the budgets of smaller municipal governments, it is more important than ever to find ways in which technology can help us "do more with less."

With CAD technology playing a much greater role across a wide variety of government services, we are seeing a certain urgency within state and local government to re-evaluate older work flows and processes in ways that maximize the investment in, and use of, digital design technology. If anything, the current economic climate provides a definite imperative for new ideas and innovation which help cut costs, reduce waste and maximize productivity.

One of the greatest challenges many local governments are facing is an ever-increasing backlog of GIS work. GIS departments are responsible not only for editing and updating data like utility maps, road maps and parcel maps, they are also responsible for responding to multiple departments requesting accurate GIS information for city functions like property assessments, capital improvement projects and utility distribution.

By utilizing more advanced CAD technology like AutoCAD® Map 3D, GIS departments gain greater interoperability with CAD and GIS data, reducing the need to recreate data multiple times. AutoCAD Map 3D also allows for multi-user editing, making it easy for design teams and GIS professionals to update multiple map layers at the same time and increase team productivity. In addition, many GIS departments have begun publishing GIS data to the Internet or internal intranets

using Autodesk's MapGuide® Enterprise and MapGuide Studio software. By providing this data in an online format, it is easier to share data with other city departments and reduce the backlog of requests.

Community development is a large part of what local government does, and often at very large expense. Building renovation, new construction and capital improvement projects are just a few of the areas in which public works and building and planning departments can cut costs with better use of digital design technology.

Mandating the use of building information modeling (BIM) for in-house design work and plans submitted by general contractors and Design/Build firms is an excellent (and inexpensive) way to reduce the wasted time and money RFIs and construction errors produce. BIM models can also help facility managers operate and maintain government buildings more efficiently. Requiring LEED standards for new building projects can help reduce increasingly higher energy costs.

Federal government agencies like the General Services Administration and the Department of Veterans Affairs are leading the way in setting LEED standards for government building in an effort to reduce federal building energy consumption by more than 30 percent. Many well-established design firms have already long been using purpose built solutions for BIM like Revit® Architecture, and government agencies should follow suit to gain the full benefit of what BIM and LEED standards can do to reduce waste and cut costs."

Daniel Hebert, Vice President of U.S. CAD, extols the cost savings and productivity benefits that building information modeling technology can provide, not just for architectural and engineering design, but across many public sector AEC disciplines.

"The revolution around building information modeling (BIM) is the best way for state, local and federal government agencies to do more with less while delivering better services. These two seemingly conflicting demands are exactly why commercial companies are so quickly making the move to BIM and Revit® in particular, Autodesk's purpose-built BIM software.

One of the challenges of traditional CAD is the constant repetition of data. In a typical set of construction documents, you have the same information showing in plan, section, elevation and schedules. With traditional CAD tools, the information in each of these views must be drawn separately each time and, as design changes are made to the documents, these edits must also be made separately in each view. This not only takes time, but also results in poorly coordinated documents that are highly prone to error.

BIM largely solves this issue by allowing you to focus on creating a single digital model of the design and then quickly and easily generate as many plan, section, elevation and schedule views as needed to fully document the project. As information is modified in any view, Revit's parametric change engine updates all of the associated views with no additional user intervention. This not only increases productivity tremendously, but results in much more tightly coordinated documents.

Revit's information-rich model can also be repurposed for everything from sustainable design analysis leading to increases in energy efficiency, to better cost estimation and project scheduling, helping everyone on the project understand the potential budgetary impacts of proposed design changes.

The savings increase exponentially as BIM is introduced into the various disciplines that make up a single project such as civil engineering, architecture, structural design and MEP. Not only does each discipline get their own corresponding productivity increase, but the ability to bring the digital design data together prior to physical construction is invaluable in finding and fixing conflicts and coordination issues before they lead to cost overruns in the field.

On the horizon, these digital building information models will be used for facilities and building lifecycle management, benefitting government agencies for decades to come.

BIM is a technology that will allow government agencies to do more with less and, if implemented correctly, the savings will be felt for generations to come."

Got Questions for Our Experts?
If you have a question that you want answered, send an email to editor@acronymmagazine.com and we'll consult the experts on your behalf. Or post a comment to the forum on *[acronym] online* (www.acronymonline.org/forums).

Jeff Gravatte, CEO and owner of CADD Microsystems, gets to the heart of how digital design can help public sector agencies streamline and automate workflow processes across a variety of disciplines, but stresses the strategic and financial commitment required to make it a productive, cost saving exercise.

"Digital design technologies afford public sector agencies an opportunity to automate process in many areas, including permitting, code compliance, construction, facilities management, and document storage and retrieval, to name but a few. This, in turn, logically allows them to "do more with less."

The reality is, however, that investing in automation is just that – investing. And, while automation is not free, it pays exponential dividends in the long run.

To make any automation project succeed, it's essential that government officials have the vision to make and instigate the decision to change accepted workflows and processes.

Automation needs differ greatly from agency to agency. As a rule, workflows that involve drawings are often the most obvious processes where design technology can help bring cost and productivity savings. Start by mapping out a simple workflow and test ideas for how you can automate that workflow.

Sometimes, a third party professional is needed to identify potential areas for process automation. The technical specialists bring an aggregation of ideas and options to suit each particular agency scenario."

Did you know that the AMC-developed GPS2CAD device saves agencies time and resources? One agency that has deployed this device is the Boyland Environmental Consultants of Ft. Myers, FL. They used the device to locate wetlands and protected species habitats. The device also helps to more precisely locate and determine legal borders. Key to its success is the interoperability with AutoCAD® software, allowing users to both import data from handheld GPS units into AutoCAD and export it back. www.eco-structure.com

Kevin Breslin, Director of Professional Services, Infrastructure Solutions, Avatech Solutions, recommends the benefits of working within a 3D design object environment to reduce the time and associated costs of design and construction compared to a 2D environment.

"While there is no question that the advent of CAD has greatly advanced the capabilities of engineering and design, it still involves the same basic 2D processes that have been used since design was done on paper. These antiquated processes make design change updates very arduous and inefficient.

For example, in 2D CAD, if a curve segment radius that represents an alignment centerline changes, all of the associated geometry (labels, road design, profiles, cross sections, etc.) need to be redrawn or reprocessed and relabeled. Tables need to be updated, as do reports. The "re" part of the edit process, whether on paper or in 2D CAD, is the time consuming and costly part of the design.

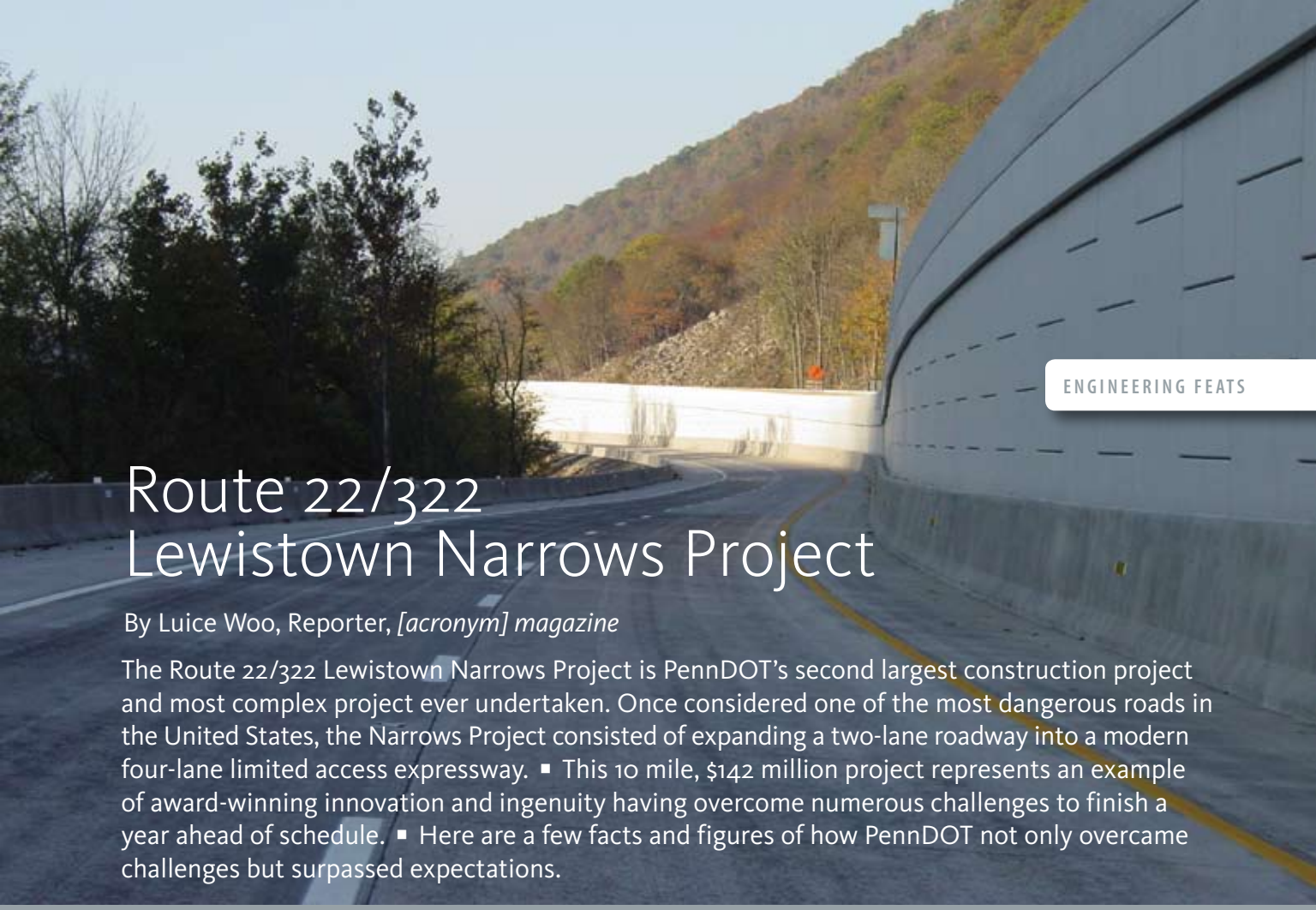
Even with specialty add-on technologies that accelerate some of these steps, at the end of the day, most design tasks in a 2D environment encounter bottlenecks because of the re-work that is inherent to the process.

In a 3D intelligent object environment, elements such as terrain surfaces, pipes and roads are aware of what they are, how they interact with other objects and, most importantly, understand how to update design changes when they take place. This 3D intelligence substantially reduces the re-work resulting from design updates by automating the resultant changes throughout the project.

This gives the designer instant and accurate updated results the first time, thus reducing design/drafting time and costly errors and omissions.

Also, with a 3D intelligent object environment, users have the ability to create deliverables beyond simple paper or e-prints and can now produce 3D object model exports. One of the great advantages of the new 3D objects model exports is that it can be used directly by surveyors for site stakeout and for GPS-guided construction grading. This reduces or even eliminates the need for translation and interpretation.

These advances allow designers to ultimately design more quickly with more accuracy, and create deliverables that allow for faster and more accurate construction." ■



Route 22/322 Lewistown Narrows Project

By Luice Woo, Reporter, *[acronym] magazine*

The Route 22/322 Lewistown Narrows Project is PennDOT's second largest construction project and most complex project ever undertaken. Once considered one of the most dangerous roads in the United States, the Narrows Project consisted of expanding a two-lane roadway into a modern four-lane limited access expressway. ▪ This 10 mile, $142 million project represents an example of award-winning innovation and ingenuity having overcome numerous challenges to finish a year ahead of schedule. ▪ Here are a few facts and figures of how PennDOT not only overcame challenges but surpassed expectations.

Longest MSE Wall in the US

Because of the narrow corridor and unstable rock conditions, a mechanically stabilized earth (MSE) wall was built – the longest in the United States and second longest in the world. The wall is 2.5 miles long with a maximum height of 30 feet, and comprises 41,000 reinforcing steel strips.

Slippery Slope

To ensure that the roads built into Shade Mountain were secure, 40,000 linear feet of core borings were completed, along with seismic and ground penetrating investigations. The stability system included 15,000 linear feet of retaining walls, reinforced with about 43.5 miles of pipe. The cost to stabilize the slope amounted to 18 percent of the overall project cost.

Friend to Nature

Several sections of the Narrows were classified as "pristine" areas and therefore could not be affected by construction. Nine river walls were built to retain the roadway and prevent encroachment onto the Pennsylvania Canal and Juniata River. PennDOT also agreed to create a canal park to alleviate any impacts the reconstruction might have caused. The park consists of a new visitor area, canal lift lock system, restored towpath spillway, and a fish and boat access area at the end of the towpath trail.

Award Winner

The Lewiston Narrows Project surpassed multiple challenges and was recognized for them with many awards, one of them being the "American Transportation: Large Project – On Time" award. The project began in 2002 and was completed, months ahead of schedule, in December of 2007.

Great Communication

About 20,000 vehicles travel along Route 22/322 Lewistown Narrows and at peak times, the road carries more than 50,000 vehicles. With few alternative routes, the Narrows could not be closed down during construction. Traffic was pared down to one lane in each direction. To minimize delays, PennDOT continually kept motorists up to date on the status of the project through its Web site, highway signs, highway advisory radio, local media, and during football media briefings. ■

Five Minute Interview: Shaan Hurley

Shaan Hurley is a passionate and public Autodesk figure. His blog, "Between the Lines," was the first recognized CAD industry blog back in 2003. Despite working for Autodesk for more than 10 years, Shaan considers himself to be a product user and customer evangelist first and an Autodesk employee second.

If I weren't talking to you right now, I'd be...

Working and catching up after five weeks of international travel and one week of Autodesk University. OK, really I would prefer to be hiking in the middle of the Mojave or Sonoran desert far away from the Blackberry phone and email.

A phrase I use too often is...

No problem.

I wish people would take more notice of...

The world and people around them. Also, I wish people would recognize the amount of passion Autodesk employees have for what they do and that many of them actually sat in a design seat before coming to Autodesk.

The most surprising thing in my career was...

That I went from designing large steel structures to working at a software company. As far as a career projects that really stick out in my memory, it would have to be working as an active member of a team doing the mechanical design for a commercial self-powered submarine, as well as the weldment design for the Golden Gate Bridge seismic retrofit project. The submarine has not sunk and is still in operation, as is the bridge.

A common misperception of me is...

That I don't have a pocket protector or speak binary or that I am only an "AutoCAD guy." Actually, some have the misperception that I only know and use Autodesk design products, when I have used and still look at other design products.

Five famous people I would love to have dinner with...

Many of the people that inspired me in engineering and design are no longer around or might not make the most exciting dinner guest. How about I answer with - anyone who has a firm grip on reality, design experience, a healthy appetite, loves adventure and has a sense of humor would make a great dinner guest to me.

I'm good at...

Taking on too many things, being passionate about what I do, digesting technology and communicating with others. I am also good at collecting Autodesk and design memorabilia and have the most extensive Autodesk and AutoCAD collection going back 26 years, including the 002 manual for AutoCAD 86. I still run AutoCAD 2.18 on my laptop.

I'm bad at...

Taking things too personally, delegation and sometimes writing in a way that can be misinterpreted.

In moments of weakness I...

Agree to do everything but don't allow time for sleep.

I am a technology geek and design professional, but in a truer life I'd have been...

Believe it or not, I always wanted to be a marine biologist or rock guitarist. I was always attracted to the ocean and marine life and even had my own salt water fish and invertebrate business to support my hobby. I was also a pretty good guitarist with industry connections, but an accident with an ice auger ended that dream. In the end I am happy with where I am and have the pleasure of working with cool and interesting people.

The most interesting digital design-related project I have worked on:

It is hard to pick just one. I have worked with some of the world's greatest designers and visited customers around the world. I have seen complex solutions created to address problems that most would have given up on.

In a nutshell, my philosophy is this:

Connect with customers, and listen to and understand what they want. And when I can no longer make a difference, look for another place to go. ■

Check out Shaan's blog at
http://autodesk.blogs.com/

Our Extended Community

[acronym] magazine thanks our extended community who generously provided insight and articles for this issue. Without the expertise of these Autodesk Government Premier Solutions Providers, Independent Solutions Vendors and their teams of technology experts, we would not be able to bring you such a diverse collection of articles and opinions.

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Avatech Solutions, Inc. is America's leading professional services company for design and engineering technologies. Avatech advances the way organizations design, develop, and manage building, infrastructure, and manufacturing projects.

Federal, state and local government agencies work with Avatech to assist citizens and streamline processes through technology consulting, implementation, training, and support services. One of the world's largest integrators of Autodesk software, Avatech designs systems that accelerate innovation while improving quality and profitability. Headquartered in Maryland, Avatech Solutions serves the design automation industry through a national network of locations.

Read Avatech's article: "Improving Public Funds Use Through BIM Accuracy," by Beau Turner on page 10.

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Headquartered in Alexandria, VA, CADD Microsystems, Inc. (CMI) is an Autodesk Premier Solution Provider in Civil Engineering, Building Architecture, Federal and State and Local Government, with more than 21 years of experience with architectural, engineering and construction design software solutions.

Staffed with Registered Architects and LEED certified consultants, CMI collaborates with customers from needs analysis through implementation, including process consulting, data migration, custom development and training. CMI works closely with federal, state and local government agencies as well as commercial design firms to provide solutions in support of BIM and other mission critical objectives.

CADD Microsystems's Jeff Gravatte from CADD Microsystems contributed to "The Experts Weigh In: Using Technology to Deliver Better Constituent Services on a Tighter Budget" on page 18.

Tele Atlas
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Tele Atlas delivers digital maps and dynamic location content that fuel powerful geographic solutions. The Tele Atlas database is a highly accurate representation of today's street network and forms the foundation for a wide range of government, business, and navigation systems delivered in your car, on your mobile phone, and over the Internet.

In the public sector, Tele Atlas has a long history of supporting state, local, and federal Government partners with mission critical applications. Tele Atlas has users in 40 Federal departments and agencies, in more than 40 U.S. states, and in numerous regional, county and local governments.

Read Tele Atlas's article: "Mapping Out a Plan" on page 8.

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Based in Costa Mesa, CA, U.S. CAD, Inc. (formerly L.A. CAD) has grown to be the largest Autodesk reseller in California and the Western U.S.

Specializing in the civil, mechanical, architectural, building-engineering and geospatial industries, the company provides technical expertise and customized training to deliver superior customer solutions. Customers value U.S. CAD's quality instruction from Autodesk Approved Instructors, and its flexible training options, including modular mobile training labs. With Autodesk Authorized Training Centers at its Costa Mesa, Los Angeles, San Diego, Las Vegas, Honolulu and Guam locations, U.S. CAD has become the Autodesk provider of choice for many of the West's leading CAD-related companies.

U.S. CAD's Daniel Hebert contributes to "The Experts Weigh In: Using Technology to Deliver Better Constituent Services on a Tighter Budget" on page 18.

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CADD Centers of Florida ...Your Total CADD Solution! Established in 1983, our mission has and will continue to be providing the best software, support, and training solutions to fit our customers' needs. We have grown faster than the industry average and are the largest CAD system integrator in the state of Florida. We are committed to continue that growth by building on a reputation of quality and exceptional performance and have a proven track record of implementing, training and supporting companies in Florida for over 25 years!

Read CADD Centers of Florida's David Lingebach contribution to "The Experts Weigh In: Using Technology to Deliver Better Constituent Services on a Tighter Budget" on page 18.

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For 25 years, Eagle Point has been providing the land development industry with the right balance of technical and business solutions to help organizations thrive. Our strength lies in the ability to provide solutions to sectors that work to improve land quality and design the nation's infrastructure.

Read Eagle Point's article: "Five Steps for Planning for a Successful Migration to Civil 3D" on page 14.

EDSA
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EDSA develops software solutions for the computer-aided design, modeling, real-time analysis, energy management, and preventative maintenance of complex electrical power systems. For more than 25 years, the Company's Paladin® software products have been used in thousands of commercial, industrial, governmental, and military applications worldwide, to protect more than $100 billion in customer assets, while reducing their energy consumption. Headquartered in San Diego, CA., the company maintains sales, distribution, and support offices around the world.

Read EDSA's article: "Power Analytics: An Electrifying new Approach to Operations Management" on page 16.

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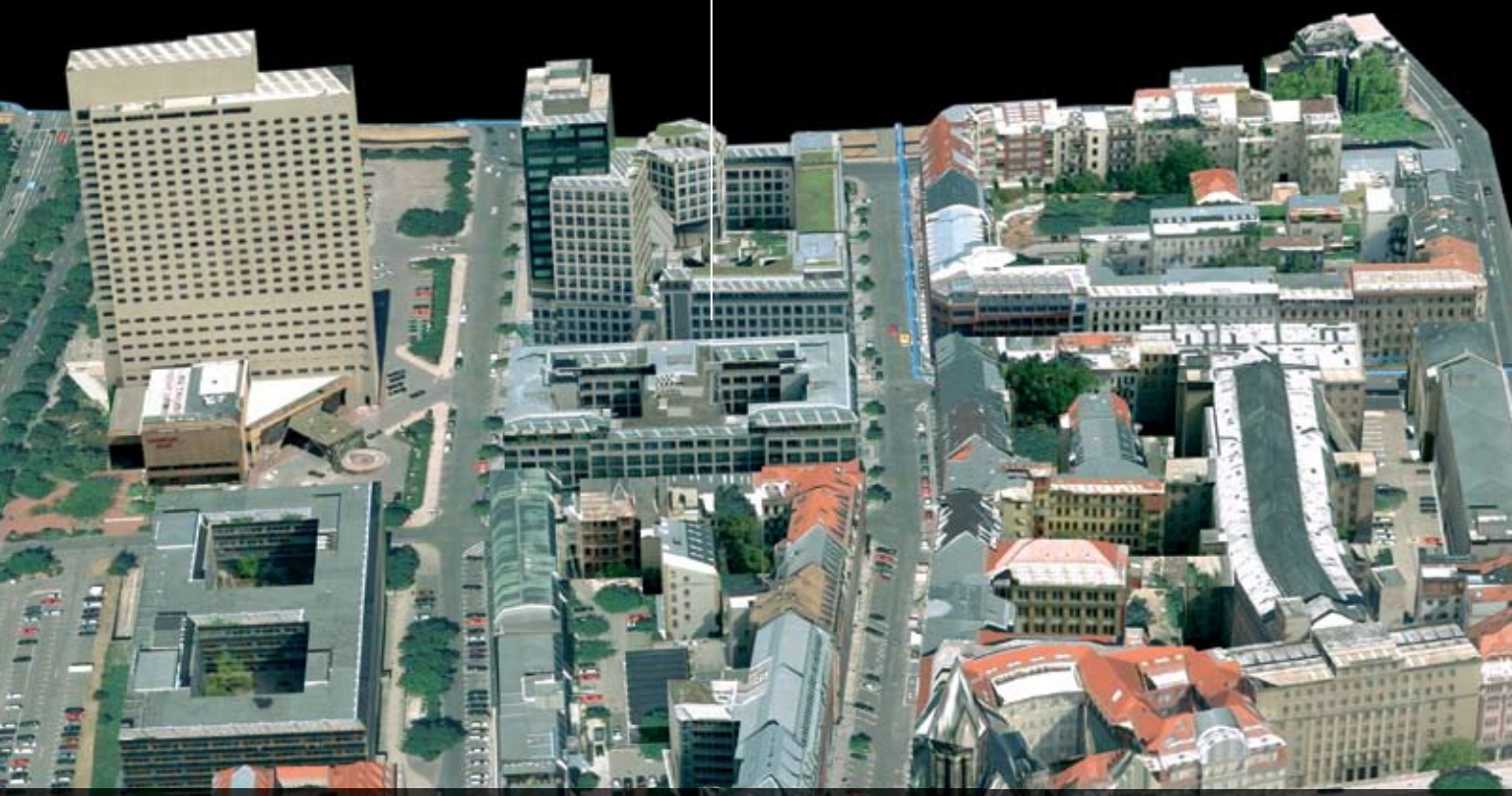
WHEN DELIVERING PUBLIC SERVICES DESIGN MATTERS



3D city model created with Autodesk® LandXplorer™ software.