



Beyond Design:

Earth Tech Uses Technology to Enhance Communication on IH-35

Growth in population and commerce has tested the capacity of many major thoroughfares in our country and Interstate Highway 35 (IH-35) through Austin is no exception.

The Texas Department of Transportation (TXDOT) realized in the 1980s that improvements to this corridor were imminent if the downtown and central city areas were to continue to prosper. Since IH-35 impacts historical areas, cemeteries, hospitals and the University of Texas, the public has been closely involved in the project development process to expand IH-35.

“With enormous public interest in right-of-way impacts and concern for the environment, we’ve opted to employ our technology resources in new ways in an effort to communicate more effectively with all involved parties,” says Lorena Echeverria, PE, lead project engineer for Earth Tech, Austin office. “The results have been surprising and refreshing.”

Earth Tech is the lead transportation planning firm on this reconstruction project, selected by TXDOT to oversee Phase II of the Major Investment Study (MIS) and develop all preliminary design schematics. Earth Tech uses GEOPAK Civil Engineering Suite for all roadway design. Design information is shared with the client and shared between different firms handling design, surveying and geotechnical engineering.

Communicating with the public

Earth Tech has taken extra steps to utilize the technology at hand to convey IH-35 project information to a very interested public. The public has been able to follow the engineering process on the Internet and in public meetings. This has, in turn, fueled their interest in the project. Earth Tech has been in the position of explaining, in detail, technical aspects that it would never have discussed before — with good results.

“Traditionally a rule of thumb has generally been to show people only what they need based on their understanding of the process,” says Echeverria. “With our website and GEOPAK as a communications tool in face-to-face meetings, we’ve inadvertently raised the bar on the public’s understanding of the transportation development process.

“We’ve been asked some surprising questions by the public and we have really enjoyed being able to respond technically and intelligently and have them understand.”

GEOPAK has played an important role in exploring and analyzing different scenarios and in relating information to the public. Earth Tech engineers have been able to quickly generate cross sections for public meetings and neighborhood association groups. They showed existing and then proposed conditions, and used rendering, shading and 3D views of cross sections. During a single meeting, they can run through scenarios in real time—for example, move road alignments — and explore whether suggestions were feasible, both technically or budget-wise, and get on-the-spot public feedback.

Several neighborhoods have come up with sound ideas that Earth Tech has been able to implement in the design. Earth Tech feels that the public’s improved understanding in the process has increased their confidence in its work.

SUMMARY

Organization

Earth Tech

Vertical Market

Civil

Location

Austin, Texas, USA

Project Objectives

- Reconstruction of IH-35, a 40-mile section of interstate that leads through downtown Austin. The project involved complex right-of-way issues and environmental impacts.
- Convey complex project information to an interested public in an intelligent and understandable way.
- Communication of project information with the client, the Texas Department of Transportation.

Fast Facts

- Earth Tech used GEOPAK to quickly generate cross sections for public meetings. The software generated views of existing structures and proposed views of planned projects. The public could see the project unfold in real time.
- GEOPAK allowed Earth Tech to easily make revisions throughout the project, including during the middle of a project.
- GEOPAK enabled more accuracy in the planning stages of a project, including costs estimations. It is easily customizable, enabling consultants to set out criteria to meet their client’s requirements.

Bentley Products Used

- GEOPAK

"We're all better off and a lot of credit goes to GEOPAK," says Echeverria. "I can't think of any other software that would allow us to adequately communicate with the public as effectively and within the same timeframes."

Meeting TXDOT's needs

Surprisingly, the burden of the heightened level of client involvement has not had a negative impact on project delivery. GEOPAK offers a lot of flexibility when making changes and exploring different design scenarios. In fact, says Echeverria, redesign is "endless."

"We found that in working with our client, TXDOT— now that it's so easy, quick and cost-effective to make revisions — we are continually making revisions throughout the project," says Echeverria. "This is where GEOPAK really gives us the edge."

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Part of what eases the project pace is the ability to customize GEOPAK using its unique Criteria capability. TXDOT provides some Criteria routines to its consultants online, as well as project and design standards. Earth Tech often massages the Criteria files and sometimes develops its own Criteria to meet the needs of specific projects and standards mandated by individual TXDOT district offices.

"GEOPAK is much easier to customize than other software and it's very easy to make a change in the middle of the design process," says Stephen Woodruff, EIT at Earth Tech, working on the IH-35 project. "The Criteria programming language is easy to use and understand, and easy to apply."

Easing the flow between project phases

Conceptual design on this project actually began 2-3 years ago. The second design schematics phase began in 2000. The use of GEOPAK has shortened the engineering process, especially with regard to making the transition from conceptual to design schematic, whether reusing the same information and improving on it or making modifications to design.

"We've actually experienced a shift in balance between the different project phases and we definitely do more in the preliminary design schematic phases than previously," says Woodruff. "With GEOPAK software, it is easier to be more accurate at an earlier stage."

"GEOPAK also provides the ability to quickly estimate the costs of different design alternatives, allowing us to associate real cost benefits with each design."

Streamlining the work with subs

The IH-35 project is large and requires considerable sharing of design information between six different engineering firms. TXDOT has required that all consultants use GEOPAK software and this has served to streamline

the project and facilitate data sharing. "Recently, one of our subs, Carter & Burgess, was exploring the feasibility of different alternatives for the central portion of downtown area," says Echeverria. "Given the short timeframe—only a week—we decided to help them out."

"We divided the expressway into Northbound and Southbound portions, shared GPK files and went to work. This saved us a lot of time—and still enabled us to have necessary conferences to study the alternatives and explore options."

Even with this level of activity, Earth Tech and the other consultants remain on schedule, working toward a targeted mid-April public meeting where everyone is invited to provide input to the entire project, not just the central portion. The final public hearing is slated for December 2002, at which time final geometric schematics will be complete.

Futures

Construction on IH-35 is projected over the next 15 years. Phase II still needs to be approved, along with state and federal funding. Earth Tech is confident that things will continue to go smoothly.

"Utilizing GEOPAK has allowed us to stay within budgeted hours and estimated engineering fees and reap the profit we hoped for from this project," says Echeverria. "We couldn't be more pleased with our results."

IH-35 is a 1,600-mile major interstate link between Canada and Mexico.

The IH-35 project addresses a 40-mile section running through Austin, between Georgetown and Buda, Texas. It is one of the most congested stretches, with traffic numbering over 250,000 vehicles a day and an accident rate 1.75 times that of similar urban freeways in the state. This has resulted in excessive commute times, fuel consumption and pollution.

TXDOT commissioned Earth Tech to develop a long-range plan for reconstruction, comprising a major investment study, schematic design, traffic studies and CORSIM analysis, environmental impact statement and communication with the public. Planning encompasses elevated and at-grade HOV lanes and a comprehensive Intelligent Transportation System plan. Estimated construction cost for the project is \$1 billion.

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