



NTTA
NORTH TEXAS TOLLWAY AUTHORITY

HDR CUTS COSTS AND CARBON EMISSIONS

WHEN CONNECTED BY PROJECTWISE®

PROJECT SUMMARY

Organization:

HDR, Inc.

Solution:

Project Team Collaboration

Project Location:

17 connected offices

Project Objectives:

- Real-time collaboration
- Reduce travel costs
- Reduce carbon emissions
- Speed time to market

Bentley Products used:

- ProjectWise® Integration Server
- ProjectWise® Caching Server
- ProjectWise® Web Server
- ProjectWise® Passport
- MicroStation®
- GEOPAK Civil Engineering Suite
- Bentley Descartes

FAST FACTS





- Distributed teams got connected
- Project quality was improved
- Engineering content was made secure
- Recruitment costs were reduced
- Project insight was increased
- Travel costs were reduced
- Carbon emissions were reduced

THE BOTTOM LINE

HDR got Connected by ProjectWiseSM to design a two-mile portion of the Southwest Parkway project in Fort Worth, Texas. Rather than relocate dozens of design team members to the project's office headquarters in Dallas, HDR used ProjectWise to connect a virtual design team of 174 people located in 17 different cities across five U.S. States.

By implementing ProjectWise, HDR created an enterprise-level project team collaboration environment to connect people and information across offices. The results speak for themselves: the project was delivered on time and on budget, the team recorded substantial cost savings and reductions in carbon emissions by minimizing employee relocations, and HDR received high marks from the client for delivering the highest quality designs for the project.

KEY METRICS FOR SUCCESS

 Reduced travel costs	\$1,480,834
 Reduced carbon emissions	581 metric tons
 Delivered on time	18 Months
 ProjectWise ROI	5x ROI

THE COMPANY

HDR is an employee-owned architectural, engineering and consulting firm with more than 7,700 professionals in more than 165 locations worldwide. All of them are committed to helping clients manage complex projects and make sound decisions. HDR is number 16 overall in the Engineering

News-Record Top 500 Design Firms rankings for 2008, and number 8 in transportation.

THE CHALLENGE

When the North Texas Tollway Authority set an aggressive, 18-month schedule to deliver final designs for a new six-lane tollway, HDR knew that changes to their process had to be made if they were to stand a chance of delivering on time.

HDR'S CHALLENGES

- Assemble a multi-skilled project team
- Meet aggressive project deadlines
- Improve project quality
- Reduce team member relocations
- Reduce carbon footprint

On past projects, many of HDR's team leaders would relocate to the project office headquarters to ensure good coordination among the entire project team. As is often the case for tight schedules, adding more people to the project is one option, but it isn't always the best. Traditionally, "more people" required "more travel," which is a cost and inefficiency on many levels.

- With oil prices soaring, travel-related costs can eat into profits
- Working away from home can inconvenience employees and their families
- Frequent air travel between offices substantially increases environmental pollution

For this project, HDR management challenged its team to find a better way to increase efficiencies while delivering the project on time and budget.



“ProjectWise allowed HDR to engage several of our offices and our subconsultants without having to temporarily relocate team members. For the Southwest Parkway Project, we moved the work, not the people.” – John Quintero, HDR

THE STRATEGY

HDR resolved to create a virtual-project team in order to reduce the pains associated with relocation. So the firm developed a plan to embrace technologies that would support project team collaboration across multiple offices.

Front and center for increasing efficiencies was the need to spend less money on team travel. It was also hoped that by keeping project team members in their home offices, there would be a measurable and positive impact on the environment by reducing the team’s carbon footprint.

Importantly, the virtual-project team would ensure that all project work was well coordinated, even though the lead designers were not collocated. It was a strategy that would enable each team member to access all project information directly from his or her own computer, further saving time and money in the process.

THE SOLUTION

ProjectWise was selected as the project team collaboration system for all project-related information including CAD files, engineering calculations, spreadsheets, Word documents, and all e-mail correspondence.

THE SOUTHWEST PARKWAY PROJECT

- 8.7 mile, six-lane tollway
- Estimated capital cost: US\$1.2 to 1.3 billion
- Estimated use: 52,000 vehicles daily

CONNECTING STATE HIGHWAY 183 AND I-20

- Estimated cost: US\$305 million
- Design team: 134 HDR engineers, 40 subconsultants
- Design team location: scattered across 12 HDR offices and multiple consultant locations

HDR DESIGNED:

- A five-level interchange
- 15 slip ramps and connecting new frontage roads
- Two miles of new roadway
- Reconstruction of more than one mile of Highway 183
- Reconstruction of existing cross-street underpass

To sustain its workforce and ensure project team members would master this new technology, HDR trained the entire design team on the current versions of MicroStation and ProjectWise. During the training program, HDR team members visited each subcontractor’s office to install ProjectWise on each workstation and to ensure that each user was properly Connected by ProjectWise.

“It’s a privilege to participate in the design of a landmark project like Southwest Parkway, and we are very proud of the environmental benefits our design collaboration practices have enabled.”

– Mark Borenstein, Project Manager for bridges at HDR

To guarantee maximum performance and to deal with the “big file problem,” HDR also added ProjectWise Caching Servers to each office location and WAN accelerator appliances to several offices. These ProjectWise Caching Servers and appliances kept the virtual project team working fast, and accelerated the usually slow file access times that are typical when opening, and working with, large project files stored in distant locations.

THE PROJECTWISE DEPLOYMENT

Applying lessons learned from its previous successes on large-scale collaborative projects, HDR determined the right balance of ProjectWise servers and services to develop a world-class collaboration system for the project.

The table below lists the products deployed.

ProjectWise Integration Server	For enterprise-level content management and collaboration
ProjectWise Caching Servers	For rapid, LAN-like access to information across all offices
ProjectWise Web Server	For browser-based access to project information
ProjectWise Passport	For any user to connect to any server from any location



“Helping clients manage complex projects and make sound decisions is what differentiates HDR. That is a core part of our mission, and that starts with ensuring quality throughout the design.”

– Dan Ruth, project manager for HDR

KEY BENEFIT AREAS

HDR Professional Associate John Quintero was quick to applaud the value returned to the team by using ProjectWise. Several of the benefits experienced by the team are listed below.

Connecting the Team

- Saved time and money by eliminating temporary relocations for collaboration
- Improved project information search and retrieval times
- Increased team productivity and work output from multiple offices

Improving Project Quality Service Levels

- Project quality received high marks from the client during review for completeness and accuracy
- Project was delivered by HDR on time and on budget

Protecting Engineering Content

- ProjectWise provided dependable digital security and team-member access levels
- Managers could easily see, “Who did what, and when?” via automated audit trails

Gaining Greater Project Insight

- With ProjectWise, HDR managers had a single source of truth for project information
- Everyone could easily find, validate, and access engineering and Office documents

HDR'S GREEN BUSINESS PRACTICES SAVINGS

- **Total carbon footprint reduction equaled: 581 metric tons**
- Round-trip airline flights not taken: 1,400
- Airline miles not flown: 925,900 miles
- Car rental travel eliminated: 64,680 miles
- Personal auto travel reductions: 107,644 miles

MEASURING THE ROI

Using ProjectWise, HDR was able to create a virtual project team office that reduced the costs associated with collocating design team members. After completing a thorough analysis of its monthly billings for the Southwest Parkway project between January 2006 and April 2008, HDR found that it had saved nearly 1,400 round trip airline flights and reduced the project team's air travel by almost 1 million miles. Bigger still, 7,000 hotel nights were avoided by a team that got to stay at home.

This action alone resulted in substantial travel-related cost savings. Based upon HDR's ProjectWise deployment costs for 1 ProjectWise Integration Server, 18 ProjectWise Caching Servers, 18 ProjectWise InterPlot Servers, and 1 ProjectWise Web Server, the ProjectWise Collaboration system paid for itself five-times over. That's a 5X ROI from travel-related savings alone. But that was just the start.

HDR'S COST SAVINGS

- **Total travel cost savings: \$1,480,834**
- Lodging costs: \$1,025,850
- Air travel cost savings: \$304,675
- Car rental & fuel cost savings: \$99,467
- Mileage reimbursement cost savings: \$50,824

The environmental benefits of keeping lead design team members grounded were also enormous. Beyond the dollar-cost savings of reduced travel, HDR also measured the carbon emission savings that followed. The figures are staggering; the team enjoyed significant savings relating to green business practices.

Eliminating travel for the project's design phase reduced the project's carbon footprint by a staggering 581 metric tons of CO₂. Put into context that is the equivalent of:

- 96 cars being taken off the road for an entire year
- 73 American households' average annual consumption of electricity
- 1,226 barrels of oil or 59,827 gallons of gasoline

Finally, and perhaps most importantly for the client, the team achieved a delivered the project according to the aggressive timetable of just 18 months.

"I was highly impressed with how smoothly ProjectWise worked and how useful it could be. Someone at HDR knows what they're doing and has their priorities in order."

– HDR Subconsultant

ABOUT BENTLEY

Bentley Systems, Incorporated is the global leader dedicated to providing comprehensive software solutions for sustaining infrastructure. Architects, engineers, constructors, and owner-operators are indispensable in improving our world and our quality of life; the company's mission is to improve the performance of their projects and of the assets they design, build, and operate. Bentley sustains the infrastructure professions by helping to leverage information technology, learning, best practices, and global collaboration – and by promoting careers devoted to this crucial work.

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ABOUT PROJECTWISE

ProjectWise is an engineering project team collaboration system that is used to help teams improve quality, reduce rework, and meet project deadlines. Proven on projects of all shapes and sizes to increase productivity and reduce costs, ProjectWise is unlike competing systems in that it is the only one that delivers integrated solutions for content management, content publishing, design review, and asset lifecycle management.

ProjectWise is optimized for real-time collaboration across distributed teams and can be deployed OnPremise at your office or OnLine as a hosted managed solution.

To learn more, go to:
www.bentley.com/projectwise

To see who else is Connected by ProjectWise, go to
www.bentley.com/projectwisesuccess

The Southwest Parkway Project Team

