

Bridge Software News

The Official Newsletter of the Alternate Route Project

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WSDOT Releases BEToolbox™

A new twist for legacy software

The WSDOT Bridge and Structures Office has released a new bridge engineering software tool called the BEToolbox. The Bridge Engineer's Toolbox is a collection of engineering utilities useful for a variety of tasks including Section Properties calculations, Vertical Curve calculations, and Biaxial Column Analysis.

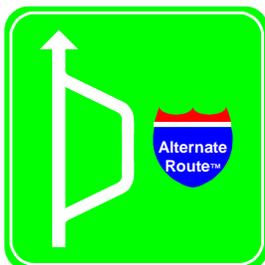
The goal of the BEToolbox project was to efficiently bring together legacy software applications into an easy to use and convenient tool without re-writing the software. Like most DOT's, WSDOT has created a multitude of engineering software over the years. These programs were primarily written in FORTRAN and have their origins on a mainframe computer.

Until recently, WSDOT had all of its legacy applications running on a VAX/VMS system. As they moved to a Windows NT system, the VAX's fell out of favor with their engineers. Because of this, the software became seemingly more difficult to access and the batch-style processing made it undesirable to use. As a result, many engineers were under utilizing some of their most useful software tools.

With today's advanced windowing environments, and the expectation of *Bridge-centric* software, there is a strong desire to re-write these legacy applications to incorporate all the latest gadgets. However, the reality

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Alternate Route Project
Open Source Software for Bridge Engineers



www.wsdot.wa.gov/eesc/bridge/alternateroute

ARP Mailing List Opens

Peer-to-Peer support for users and developers alike

As interest in the Alternate Route Project grows, so does the need to communicate. WSDOT is hosting a mailing list to facilitate peer-to-peer communication within the bridge engineering community. The purpose of this list is to provide a technical support forum for Alternate Route Software, like PGSuper™ and QConBridge™. Both end users and software developers are invited to join the list and participate in the discussions.

A mailing list works like this... Write an e-mail with your question, address it to the list, and send it. Your message goes to a list server where it is copied and forwarded to everyone on the list. Anyone on the list can then reply to your question. Technical support from expert users and developers is only a few clicks away.

Join the List

To subscribe, visit http://lists.wsdot.wa.gov/guest/...RemoteListSummary/ARP_L, enter your e-mail address and press the Submit button. The list server will verify your subscription by sending you e-mail with further instructions.

To post messages to the list, address your e-mail to ARP-L@lists.wsdot.wa.gov ❖

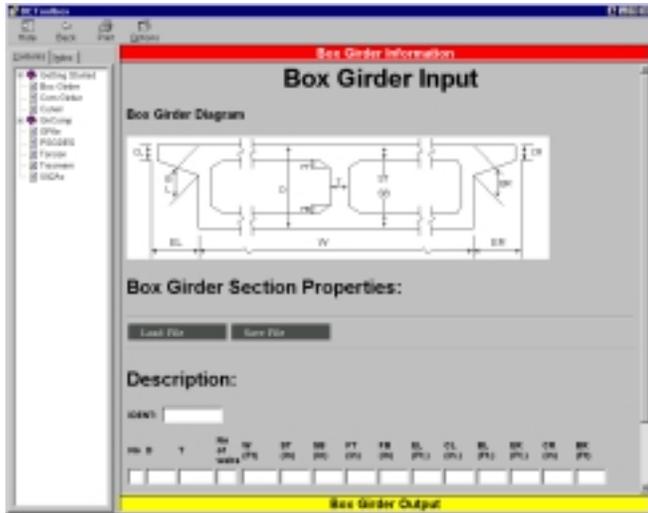
QConBridge™ Upgrade Project

Open Source Development in Action

In January WSDOT began an effort to upgrade its open source software product, QConBridge. Since its original release in 1996, QConBridge has remained virtually untouched. In the past four years, several factors have emerged that are driving the need to update this popular software package:

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of scarce resources demands innovative solutions. The BEToolbox is an excellent compromise between these competing factors.



BEToolbox user interface

How did they do it?

One of the primary goals of the BEToolbox was to avoid re-writing the legacy FORTRAN code. To accomplish this, the developers took advantage of several different technologies. On the outside, they employed Microsoft's HTML Help technology to provide a unified interface for the program. The language of the Internet, HTML (Hyper Text Markup Language), was used to create the look and feel of the user interface. But simple HTML wasn't enough. Both JavaScript and VBScript were used to dynamically update the interface in response to user choices and to manage the flow of data between the HTML pages and the legacy software. In its original form, the legacy software was like a square peg for a round hole. To work around this minor difficulty, the old FORTRAN programs were converted to standard Dynamic Link Libraries (DLLs) and adapter objects were created using Microsoft's COM technology and Visual Basic. The adapters seamlessly adapt the old technology with to the new, resulting in an economical solution.

Availability

A free download of the BEToolbox and all of its source code can be found at www.wsdot.wa.gov/eesc/bridge.



- The LRFD Specifications have been revised.
- WSDOT's LRFD implementation has progressed to the point where HL-93 live load analysis of substructure elements is needed.
- Users from around the global have requested enhancements that will greatly improve the usefulness of the software.

Open Source Development

In the true spirit of open source software, the bridge engineering community will be able to participate in every step of the development process. The Software Development Plan, Vision and Scope Document, and Requirements and Specifications are available from the QConBridge web site (www.wsdot.wa.gov/eesc/.../bridge/software/QCB_V2.htm) for public review and comment. As the project moves into the design and implementation phases, voluntary co-developers can be added to the project.

Requirements Brainstorming

Last March, WSDOT hosted an open invitation brainstorming session to elicit requirements for the QConBridge upgrade. Engineers and software developers from Washington, Oregon and California made the trek to Lacey, WA to share their thoughts and ideas on how to make QConBridge a better engineering tool. This brainstorming session generated many excellent requirements for the next version of the software.

Features

QConBridge Version 2 will feature improved bridge modeling, staged analysis, plane frame bent analysis, user defined notional live load models, a faster analysis engine, and an Automation interface for scripting. The list goes on.

Schedule

The requirements for this project are still evolving. It is anticipated that the first evaluation release will be in December 2000. WSDOT will continue with its highly successful "Release Early-Release Often" philosophy.

