

# Getting to LRFD

## *Realizing the Benefits of Multi-State Collaborative Software Development*



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[www.wsdot.wa.gov/eesc/bridge](http://www.wsdot.wa.gov/eesc/bridge)

# Introduction

- For the past year WSDOT and TxDOT have been collaborating on the development of PGSuper
  - PGSuper = Precast Girder Superstructure design and analysis software
- Keys to successful multi-state collaborative software development
- Demonstration of PGSuper Version 2
  - The product of our collaboration

# The Problem

- Mandatory LRFD implementation by October 2007
- TxDOT needed a turn key solution to seamlessly integrate into their existing processes
  - 442 prestressed concrete beam bridges in FY 2006
  - 75% were custom designed, others by standard designs
- TxDOT wanted a modern LRFD software
  - Replace text based PSTRS14

# The Problem

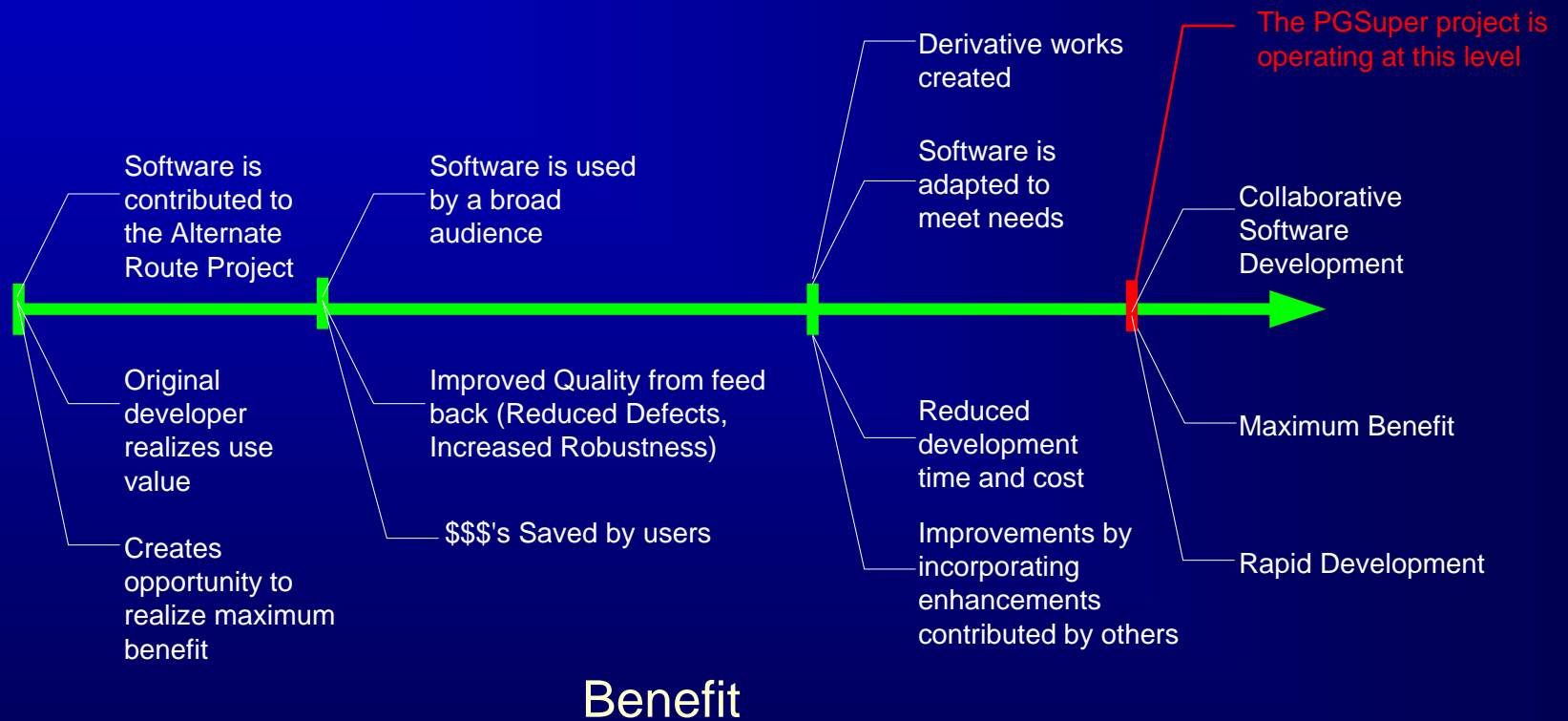
- 100 in-house engineers need LRFD precast-prestressed girder design capabilities
- Engineers at 172 separate consulting firms performing bridge designs for TxDOT annually
- Available software offerings didn't meet requirements
  - PGSuper was the best match to TxDOT needs
  - TxDOT understood how PGSuper could be modified to exactly meet their needs

# Open Source Software

- Copyrighted software licensed with special terms
- License Characteristics
  - Allows for free use and distribution
  - Requires the distribution to include source code
  - Allows the creation of derivative works w/o restriction
  - Allows use without restriction
  - Does not restrict who can use the software
  - Requires all these rights be passed along

# Benefits of Open Source Software

## Level of Open Source Activity



# Keys to a Successful Collaboration

- Commitment
  - WSDOT committed to OSS collaborative development in 1999
  - WSDOT/TxDOT, we just decided to do it, no formal agreements needed
  - Similar Goals, Shared Vision, No hidden agendas
  - Willingness to find mutually beneficial solutions and accept compromises
- Communication
  - Face to face, e-mail, phone between developers, managers, stakeholders
  - Defining requirements
  - Small pool of decision makers
- Open Source
  - Zero risk in the collaborative relationship
  - At any time, either party can walk away with everything  
The other party still has everything as well!

# Keys to a Successful Collaboration

*“I think from my perspective the collaboration has been highly effective. We’ve been able to leverage each other’s resources and abilities to solve problems collectively.”*

Gregg Freeby, TxDOT

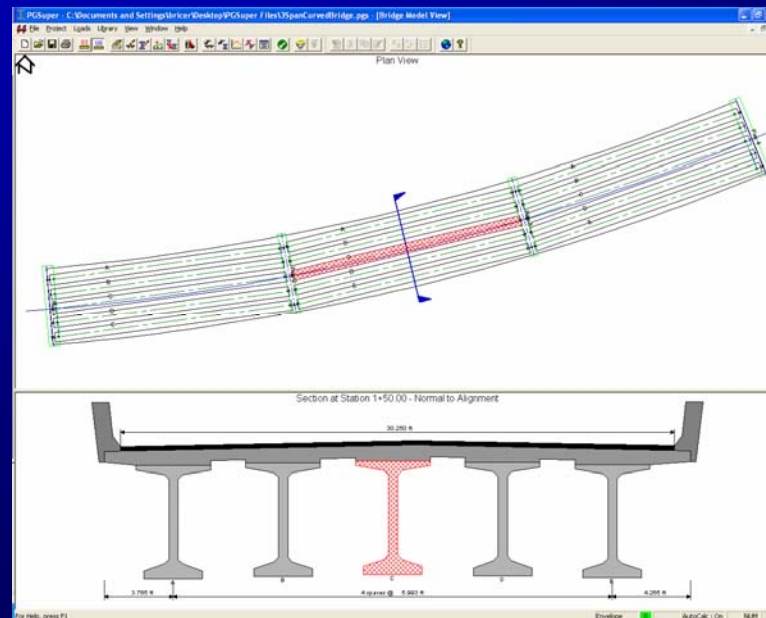


# PGSuper Version 2.0

- WSDOT Contributions
  - Multi-span continuous bridge analysis
  - Analysis Methods
    - Simple Span, Simple Spans made Continuous, Enveloped
  - Design for optimized fabrication
  - User interface enhancements
- TxDOT Contributions
  - Enhanced strand pattern definitions
  - New strand input options
  - Enhanced design algorithm
  - TxDOT specific reporting
  - Testing and validation
- Full implementation at TxDOT by October 2007

# PGSuper Demonstration

- Free PGSuper download from
  - [www.wsdot.wa.gov/eesc/bridge/software](http://www.wsdot.wa.gov/eesc/bridge/software)



# Conclusion

- PGSuper has helped TxDOT get to LRFD
- TxDOT recognized the opportunity created by OSS and stepped up to the plate
- WSDOT and TxDOT are successfully collaborating on the development of PGSuper
- Others are encouraged to join in with PGSuper or any other software
  - User feedback, development, testing, documentation, funding

