NATIONAL BRIDGE ELEMENT IMPLEMENTATION

Western Bridge Preservation Partnership Meeting

May 9th, 2012

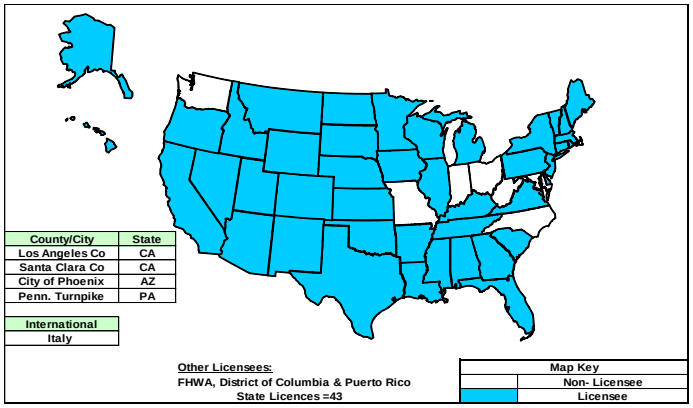
Jeremy Shaffer, Ph.D.

What is Pontis?

- Powerful Bridge Management Analytical Software Tool
  - Organize the bridge inventory
  - Allow for entry and storage of inspection data
  - Develop a preservation policy
  - Simulating future bridge conditions
  - Developing a bridge program

Pontis Basics

- Development started in the early 1990's under FHWA guidance
- Result of many millions invested by states and FHWA
- Part of AASHTOWARE – BRIDGEWare software
- Licensed by over 40+ states
- Supports AASHTO element level inspection and management



Versions

- Version 5.1.2
  - Microsoft .NET
  - Standalone (.NET) or Enterprise Web Based Application
  - NBEs/BMEs
  - Only Inspection software
  - Management depends on 5.2
  - Released March 2012
- Version 5.2
  - Microsoft .NET
  - Standalone (.NET) or Enterprise Web Based Application
  - NBEs/BMEs
  - Advanced Bridge Management Software

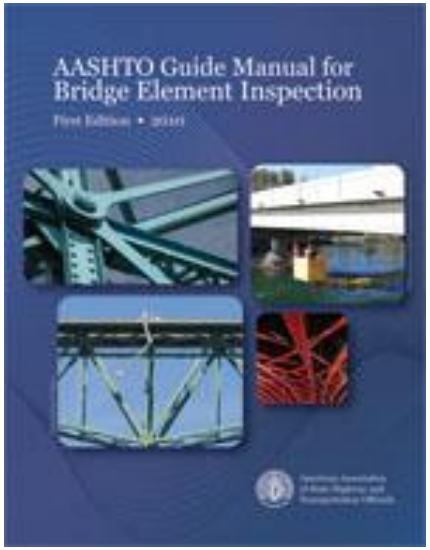
Why Change?

- Computer Technology Answer:
  - Have to stay up with technology to support user base
  - New Operating Systems (64 Bit)
  - New Database
  - New Programming Languages
  - New Protocols/Standards
  - Internet

  - Better performance, enhanced capabilities, and more features.

Why Change?

- Element Answer:
  - In early 2011 AASHTO officially adopted the AASHTO Guide Manual for Bridge Element Inspection
  - New elements (CoRe -> NBE)



- Provides a foundation for improving bridge management
- Incorporate 15+ years of extensive user comments
- Simplify for usability and capability
- Better align with state DOT business practices

NBEs/BMEs

- National Bridge Elements (NBEs):
  - Form the core, fundamental parts of the bridge
  - Minimum that will be required to be reported to FHWA
  - Cover items such as Girders, Deck, Abutment
  - Can not be changed by an agency
- Bridge Management Elements (BMEs):
  - Used to help model other parts of the bridge
  - Cover items such as: joints, wearing surfaces
  - Agency may add, edit, delete BMEs
- Protective Systems and Defect Flags

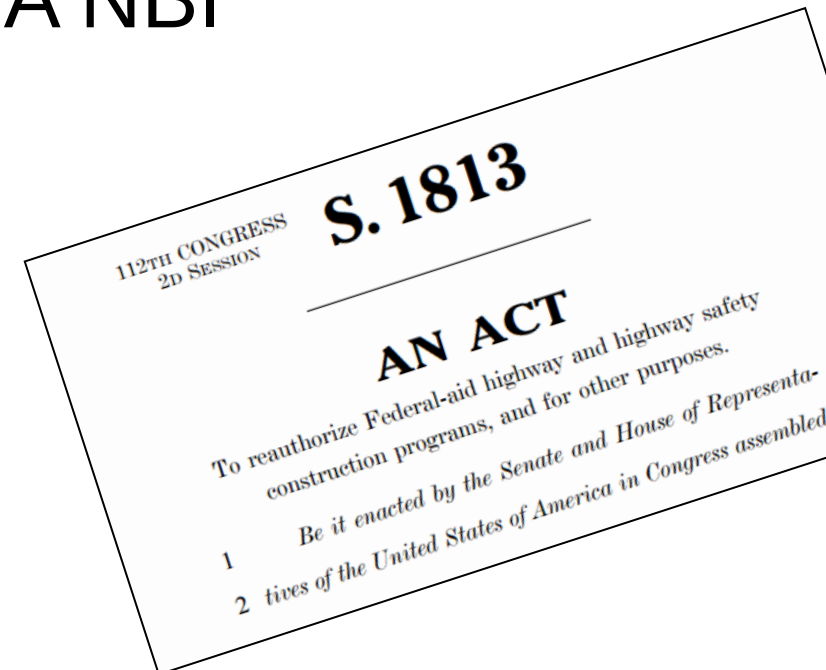
NBEs/BMEs

- Parent/Child relationship established
- All elements now have 4 condition states
- Defect flags applied at the element level instead
- Defect flag language included with the parent element description
- Elements can be set to deteriorate or not

- Great flexibility and supports what is needed for the bridge management modeling

NBEs/BMEs

- Included in draft Highway Bills
  - Mandatory NHS Bridges
  - Study for NHS Bridges
- Foundation for new FHWA NBI
- Change is coming



112TH CONGRESS
2D SESSION

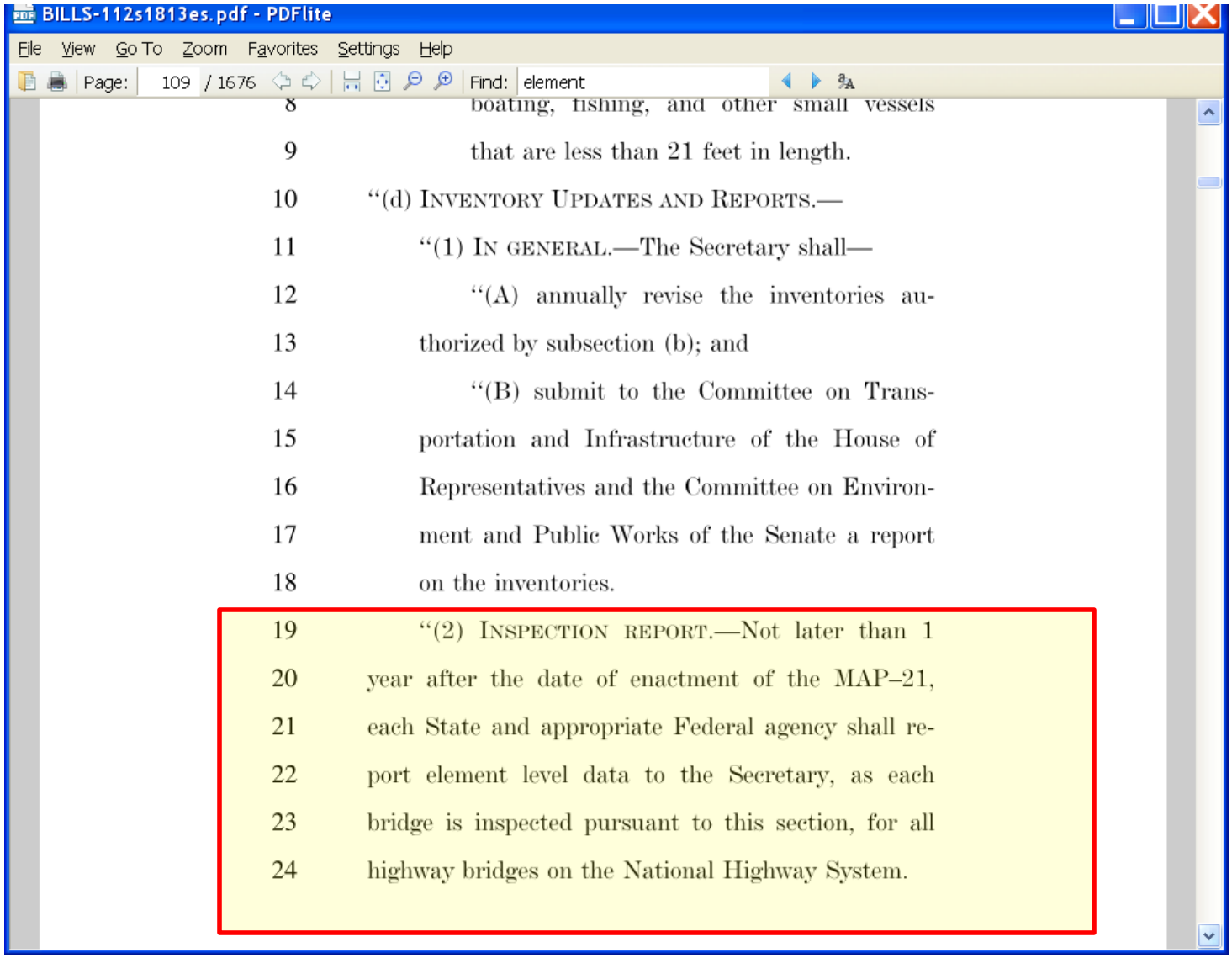
S. 1813

AN ACT

To reauthorize Federal-aid highway and highway safety construction programs, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled

Federal Requirements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File View Go To Zoom Favorites Settings Help

Page: 109 / 1676 Find: element

boating, fishing, and other small vessels that are less than 21 feet in length.

"(d) INVENTORY UPDATES AND REPORTS.—

"(1) IN GENERAL.—The Secretary shall—

"(A) annually revise the inventories authorized by subsection (b); and

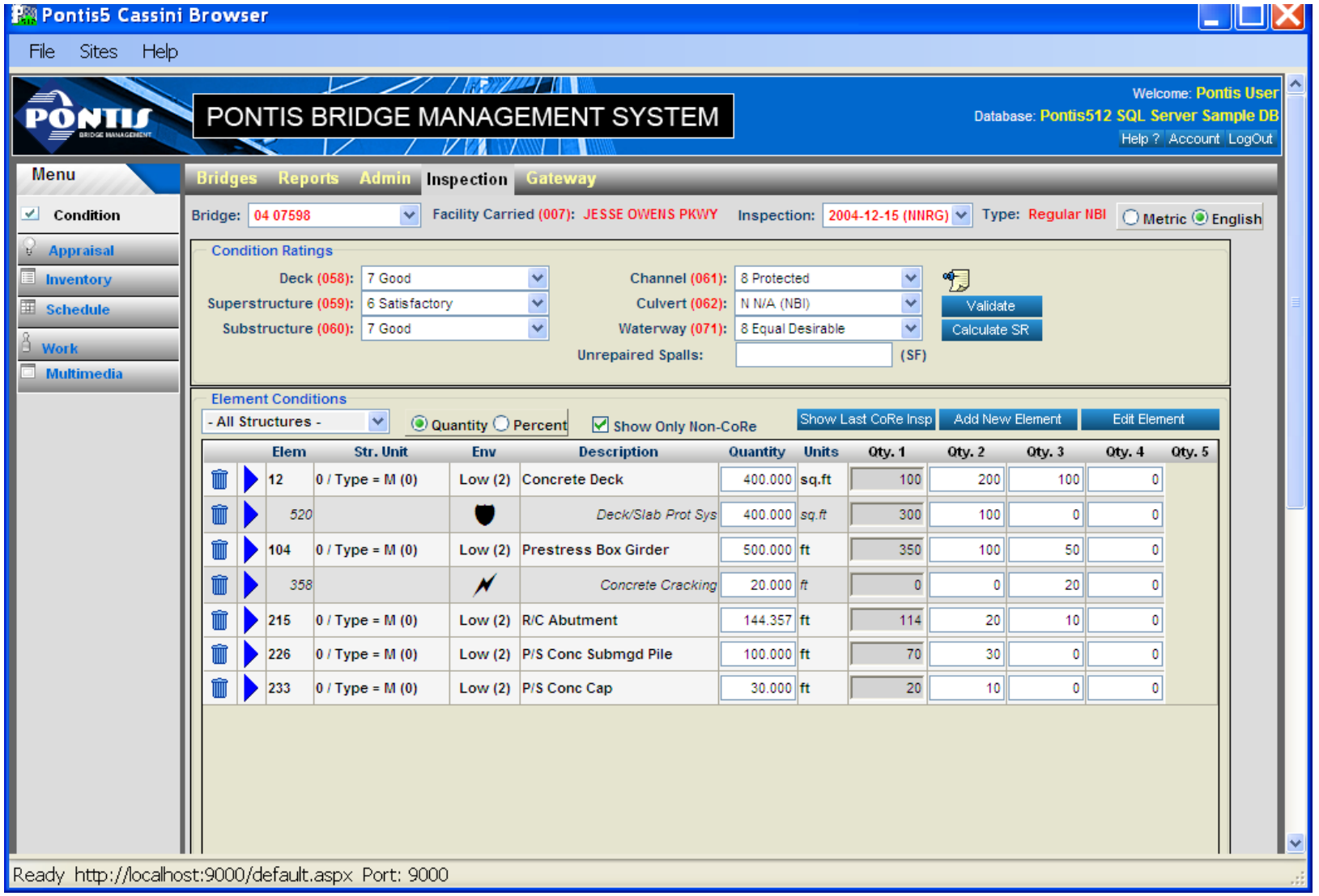
"(B) submit to the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Environment and Public Works of the Senate a report on the inventories.

"(2) INSPECTION REPORT.—Not later than 1 year after the date of enactment of the MAP–21, each State and appropriate Federal agency shall report element level data to the Secretary, as each bridge is inspected pursuant to this section, for all highway bridges on the National Highway System.

The Basics of Pontis 5.1.2

- Pontis 5.1.2
  - Built off of the existing 5.X architecture (5.11/5.1.03)
  - Add support for new AASHTO National Bridge Elements
  - Assorted minor enhancements
  - “Features release”
- Goal: Allow for NBE/BME inspections to be done with Pontis and lay the foundation for 5.2 (management).

Graphical User Interface



New Feature – NBE/BME Elements

- Newly adopted bridge element standard that replaces CoRe elements for element level bridge inspections
- Fully supported in Pontis starting with version 5.1.2
- CoRe elements still visible in Pontis but all new inspections will be NBE/BME

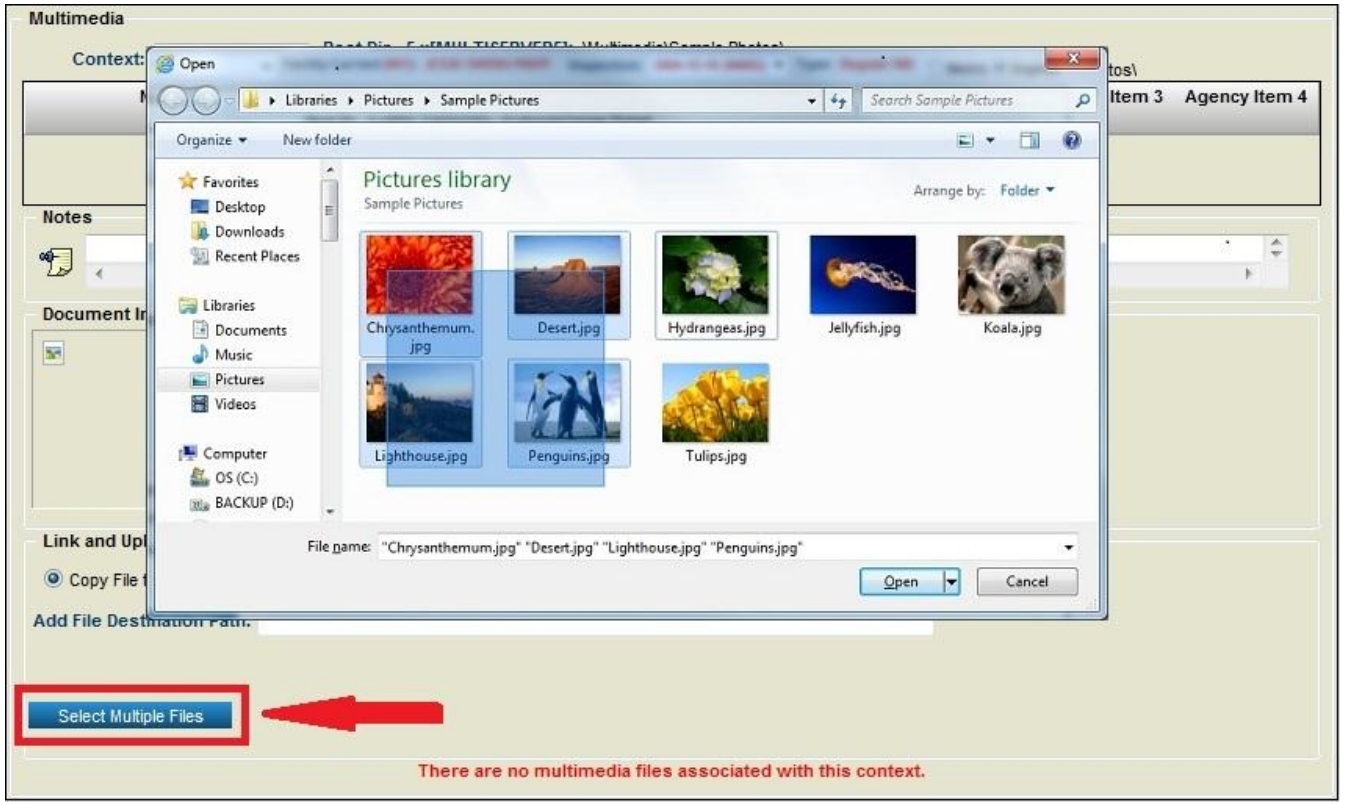
New Feature – Protective Systems

- Parent/child relationships
- Easily identifiable through icons

	Elem	Str. Unit	Env	Description	Quantity	Units	Qty. 1	Qty. 2	Qty. 3	Qty. 4
	107	0 / Type = M (0)	Ben. (1)	Steel Open Girder / Beam	1640.420	ft	1640	0	0	0
	116	0 / Type = M (0)	Ben. (1)	R/C Stringer	1.000	ft	1	1	0	0
	358			*Concrete Cracking*	1.000	*ft*	1	0	0	0
	515			*Steel Protective Coating*	1.000	*sq.ft*	1	1	0	0
	202	0 / Type = M (0)	Low (2)	Steel Column	24.000	each	0	0	24	0
	241	0 / Type = M (0)	Low (2)	R/C Culvert	1.000	ft	1	0	0	0

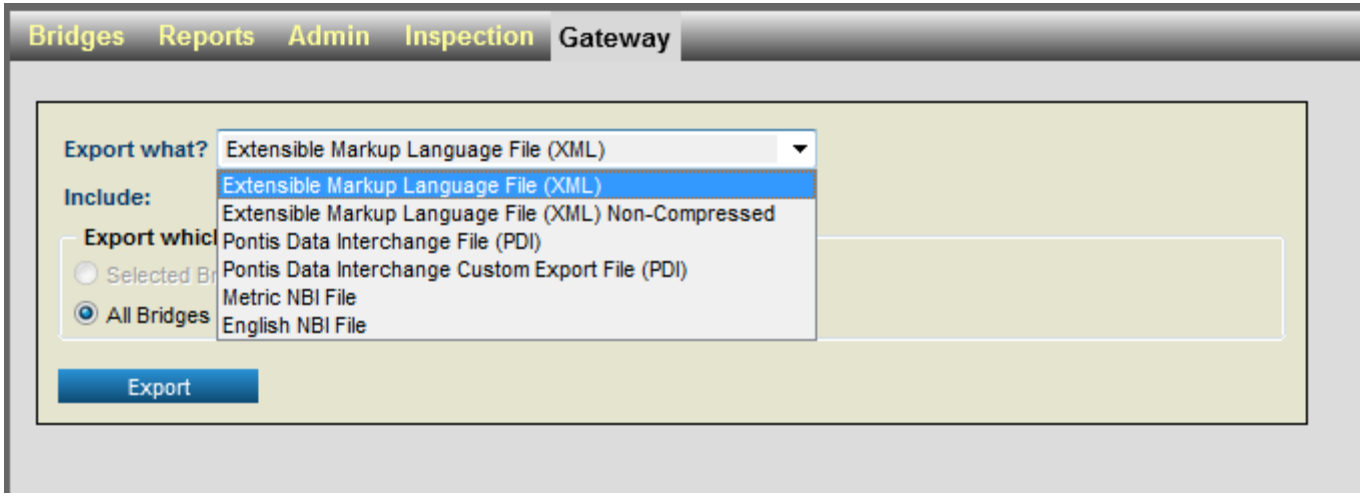
New Feature – Multi File Uploads

- Ability to upload multiple Files at once



New Feature – XML Export/Import

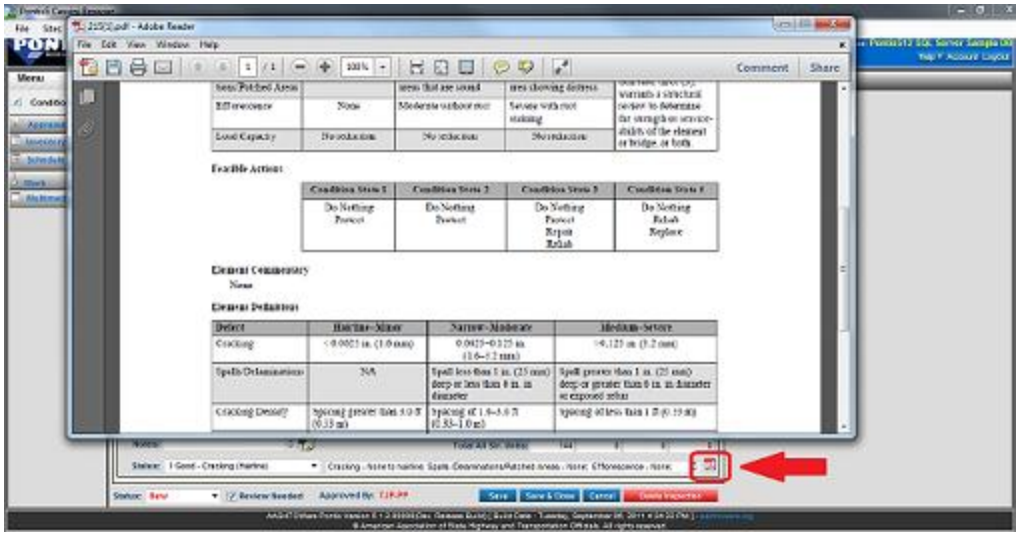
- XML is an industry standard format for saving and transferring data



- PDI is still available option for exporting/importing data

New Features – User Requested Features

- Integrated Guide Manuals



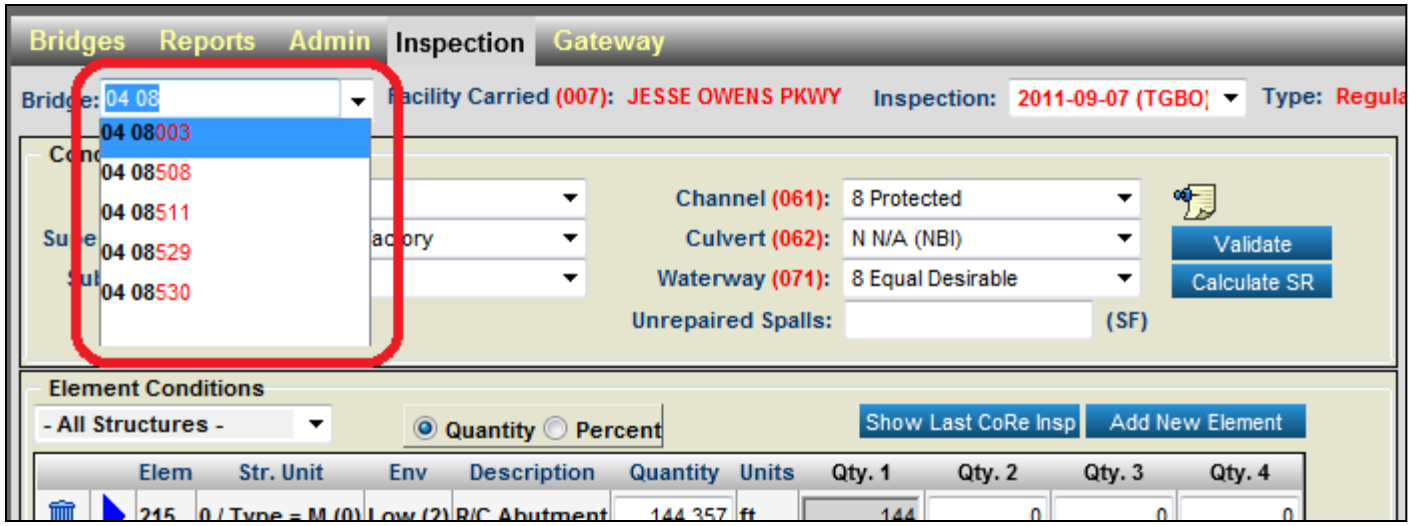
- Easy access to past CoRe elements

	Elem	Str. Unit	Env	Description	Quantity	Units	Qty. 1	Qty. 2	Qty. 3	Qty. 4	Qty. 5
	241	0 / Type = M (0)	Low (2)	(CoRe)Concrete Culvert	647.999	(LF)	641	7	0	0	0
	333	0 / Type = M (0)	Low (2)	(CoRe)Other Bridge Railing	157.999	(LF)	158	0	0	0	0
	334	0 / Type = M (0)	Low (2)	(CoRe)Misc. Rail -.33 m sw	342.001	(LF)	342	0	0	0	0
	515	0 / Type = M (0)	Low (2)	(CoRe)Custom R/C Wing Wall	354.326	(LF)	354	0	0	0	0

New Feature – On Demand Lists

- Performance improvement for agencies with large databases, from 70 sec load time to 7 sec load time

- Filter bridges as you type



Pontis 5.1.2 Foundation for 5.2

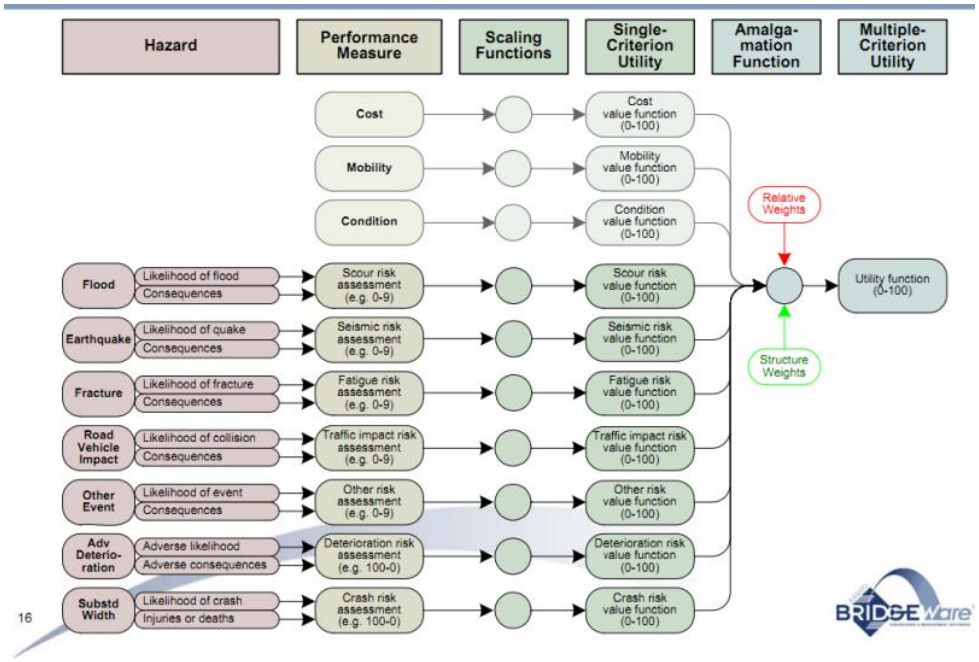
- Lays element level foundation
- Starts technology updates
- New database tables and relationships started
- Starts agencies on a multi-year migration process

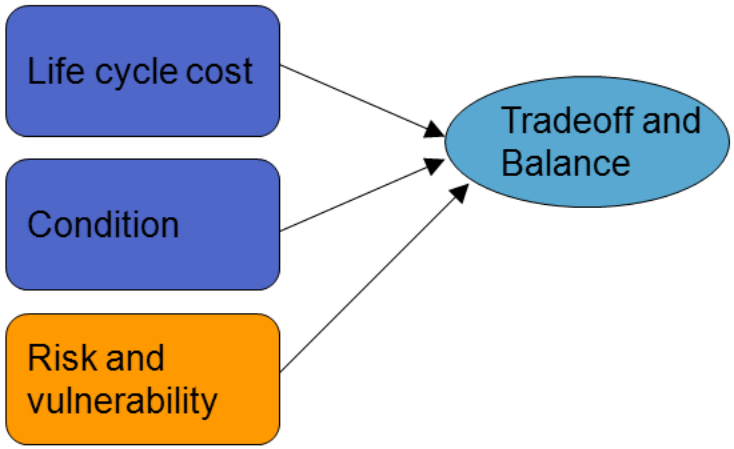
What is in Pontis 5.2?

- Builds off capabilities of existing Pontis versions
- Completely replaces and rewrites many previous modules
- Some significant areas:
  - Full incorporation of risks
  - Multi-objective analysis
  - Enhanced deterioration models
  - Life cycle cost analysis
  - Bridge level analysis
  - Project and Program Planning
  - Enhanced reporting
  - New data exchange

Multi-objective bridge modeling and prioritization framework

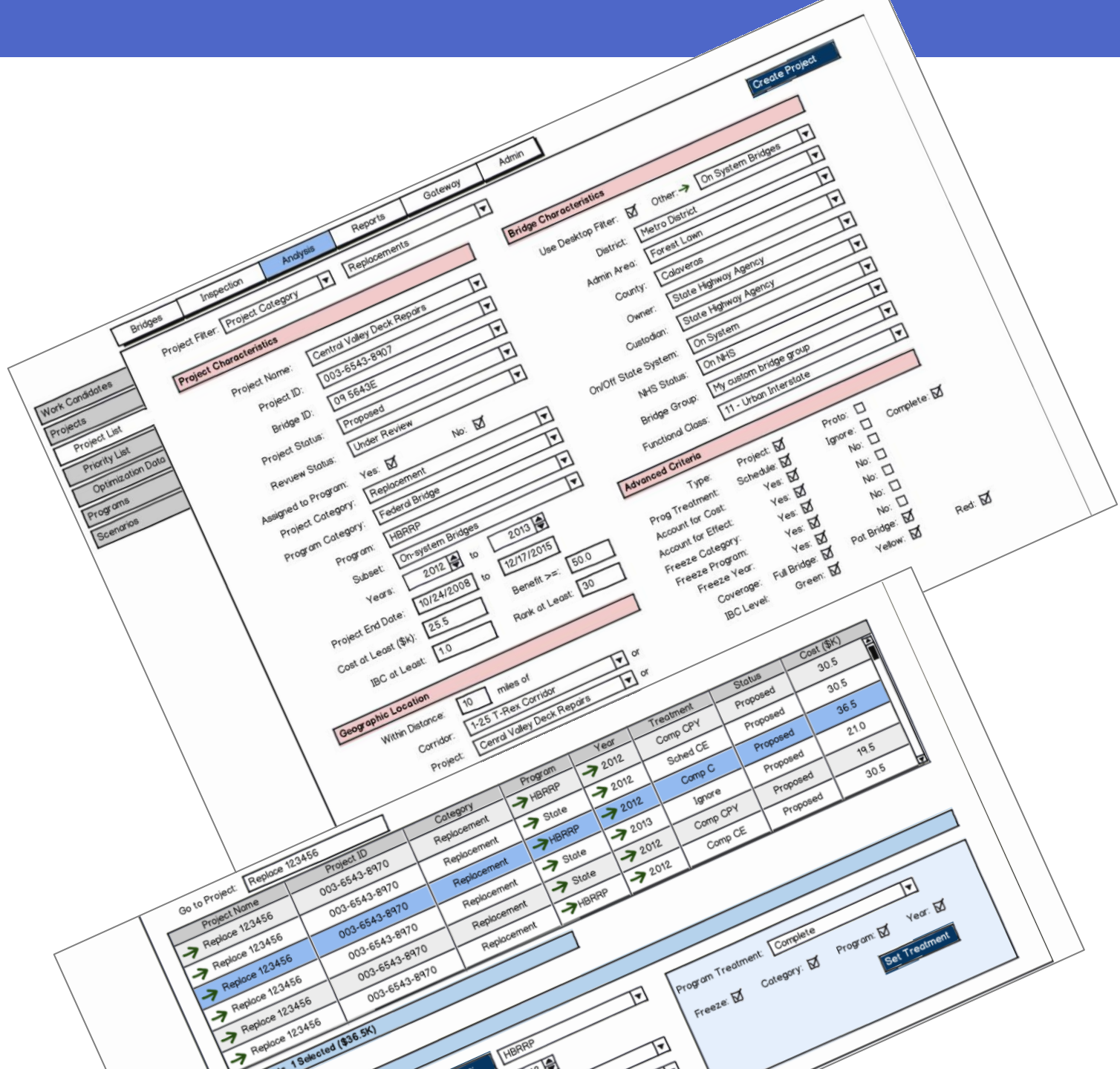
- Ability to evaluate and prioritize multiple objectives (current and future conditions, risks, and safety) simultaneously across all bridges.
- Better fit to agency workflow and business practices





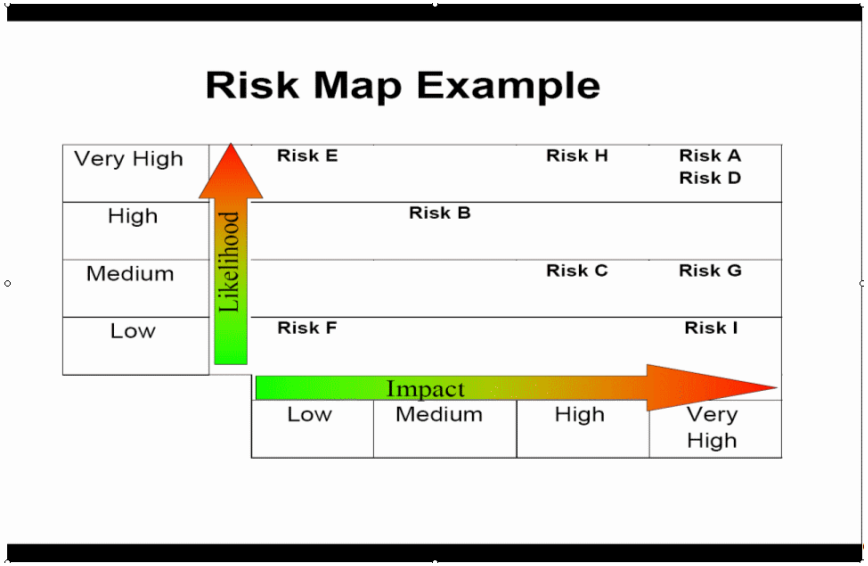
Replacement of the project planning module

- Advanced analysis capabilities to for life cycle cost analysis, multi-objective comparisons and expected performance measures for the projects being created
- Performance measures for expected condition improvement, risk reduction, safety improvement and related economic evaluation

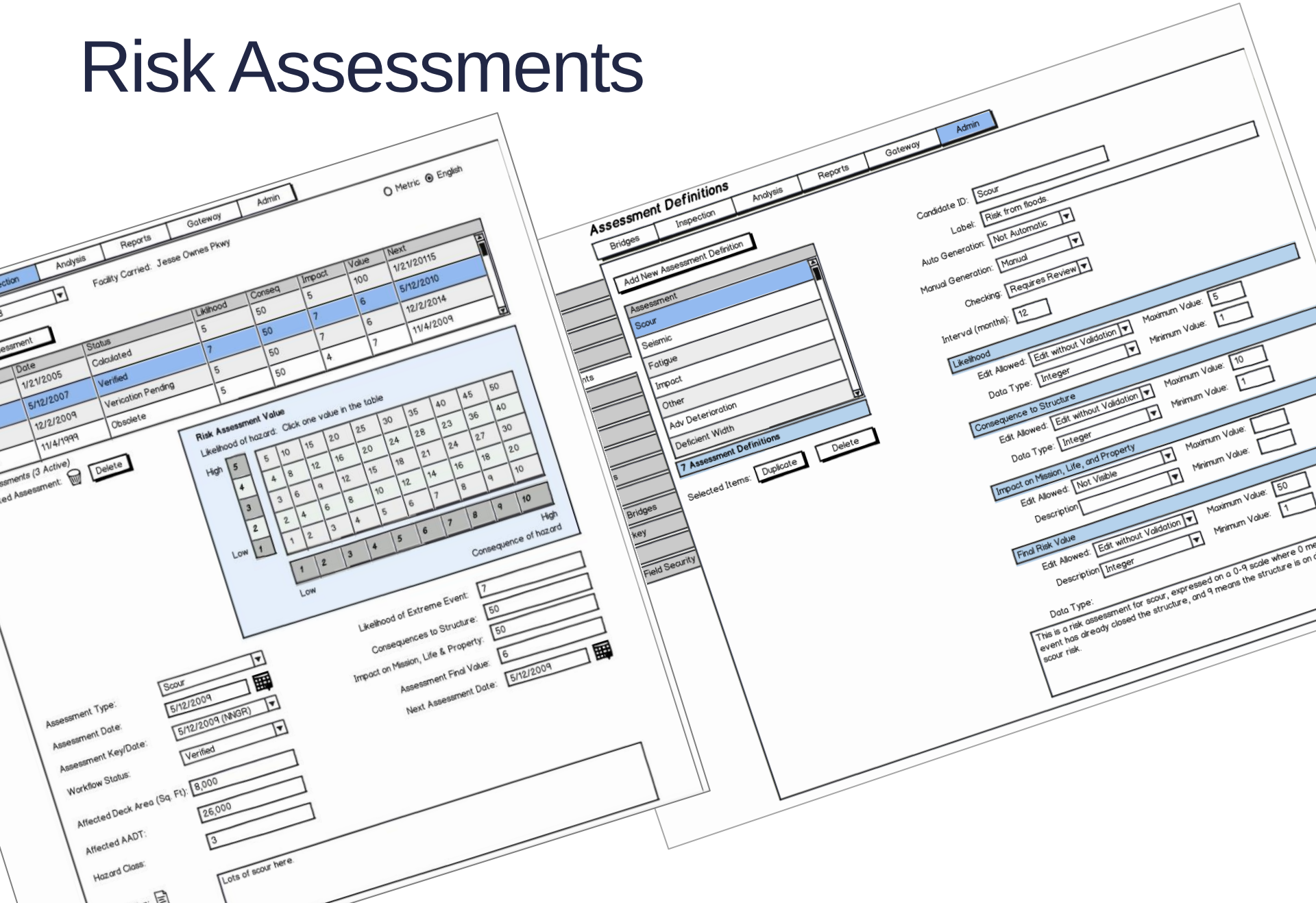

Bridges
Inspection
Analysis
Reports
Gateway
Admin
Work Candidates
Projects
Project List
Priority List
Optimization Data
Programs
Scenarios
Project Filter: Project Category
Replacements
Create Project
Project Characteristics
Project Name: Central Valley Deck Repairs
Project ID: 003-6543-8907
Bridge ID: 09 5643E
Project Status: Proposed
Review Status: Under Review
Assigned to Program: Yes: No:
Project Category: Replacement
Program Category: Federal Bridge
Program: HBRRP
Subset: On-system Bridges
Years: 2012 to 2013
Project End Date: 10/24/2008 to 12/17/2015
Cost at Least ($k): 25.5
BC at Least: 1.0
Benefit >=: 50.0
Rank at Least: 30
Bridge Characteristics
Use Desktop Filter: Other: On System Bridges
District: Metro District
Admin Area: Forest Lawn
County: Calaveras
Owner: State Highway Agency
Custodian: State Highway Agency
On/Off State System: On System
NHS Status: On NHS
Bridge Group: My custom bridge group
Functional Class: 11 - Urban Interstate
Advanced Criteria
Type: Project: Proto: Complete:
Prog Treatment: Schedule: Ignore:
Account for Cost: Yes: No:
Account for Effect: Yes: No:
Freeze Category: Yes: No:
Freeze Program: Yes: Pat Bridge:
Freeze Year: Full Bridge: Yellow:
Coverage: Green: Red:
IBC Level:
Geographic Location
Within Distance: 10 miles of
Corridor: I-25 T-Rex Corridor or
Project: Central Valley Deck Repairs or
Go to Project: Replace 123456
Project Name
Project ID
Category
Program
Year
Treatment
Status
Cost ($K)
Replace 123456 003-6543-8970 Replacement HBRRP 2012 Comp CPY Proposed 30.5
Replace 123456 003-6543-8970 Replacement State 2012 Sched CE Proposed 30.5
Replace 123456 003-6543-8970 Replacement HBRRP 2012 Comp C Proposed 36.5
Replace 123456 003-6543-8970 Replacement State 2013 Ignore Proposed 21.0
Replace 123456 003-6543-8970 Replacement State 2012 Comp CPY Proposed 19.5
Replace 123456 003-6543-8970 Replacement HBRRP 2012 Comp CE Proposed 30.5
1 Selected ($36.5K)
HBRRP
Program Treatment: Complete
Freeze: Category: Program: Year:
Set Treatment

Incorporation of risks definitions

- Ability to define bridge risks at the bridge level
- Support for user-defined risks to be considered
- Ability to define multiple risks for any bridge
- Consideration given based on the risk potential and consequences



Risk Assessments



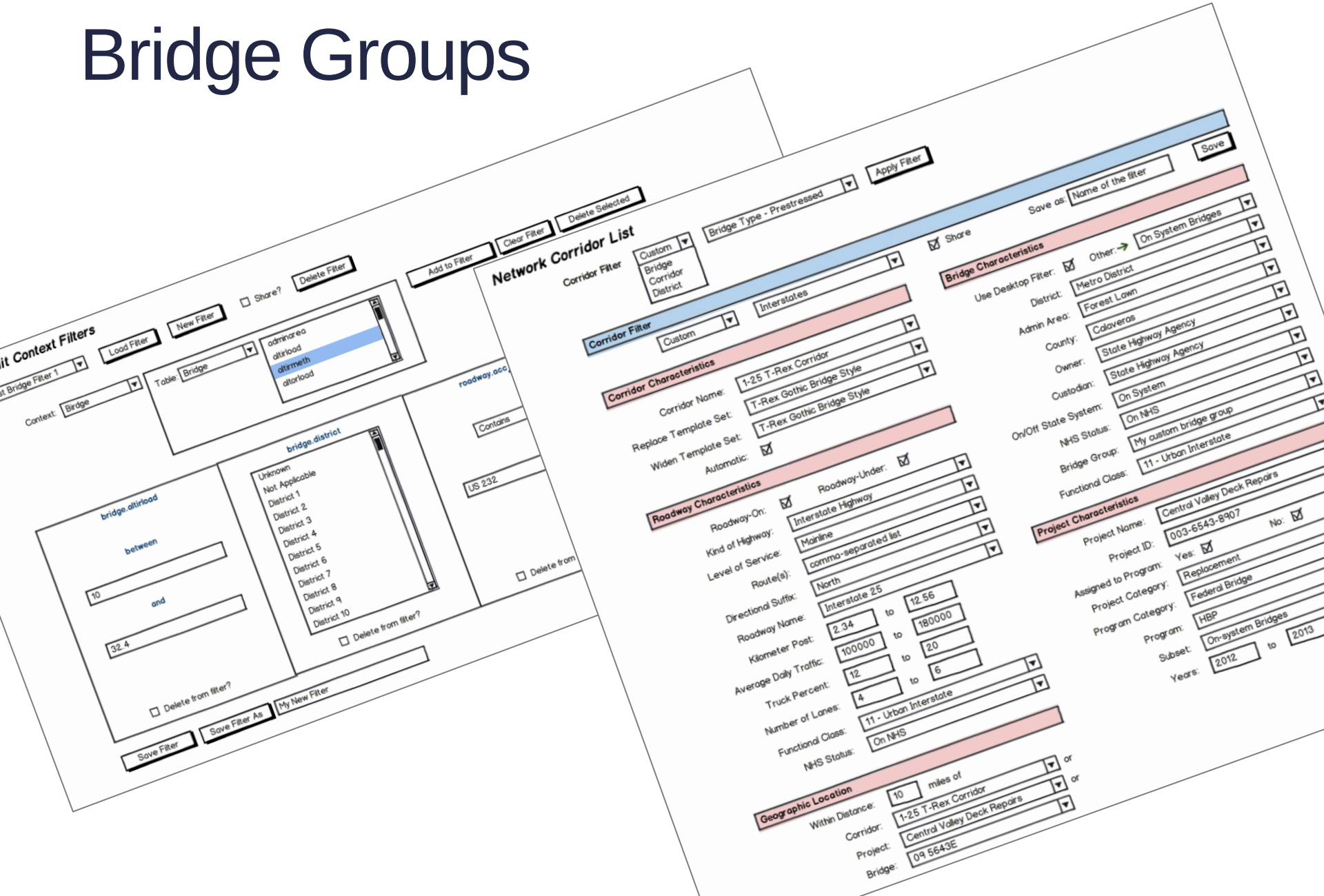
Improved cost estimating for bridge replacements

- Improved replacement recommendations coming from future years deterioration simulations to consider roadway level of service needs and current design standards in determining the proposed width, length and cost of the replacement bridge.
- Ability to “opt-out” historic bridges
- Better models for culvert cost estimates

Support for “corridor” based and geographically proximate project development

- Ability to define a collection of bridges (on a route, in an interchange, etc.) that will have their needs queried, evaluated and packaged as a group to take advantage of economies of scale.
- Improved project development process and cost savings for the agency

Bridge Groups



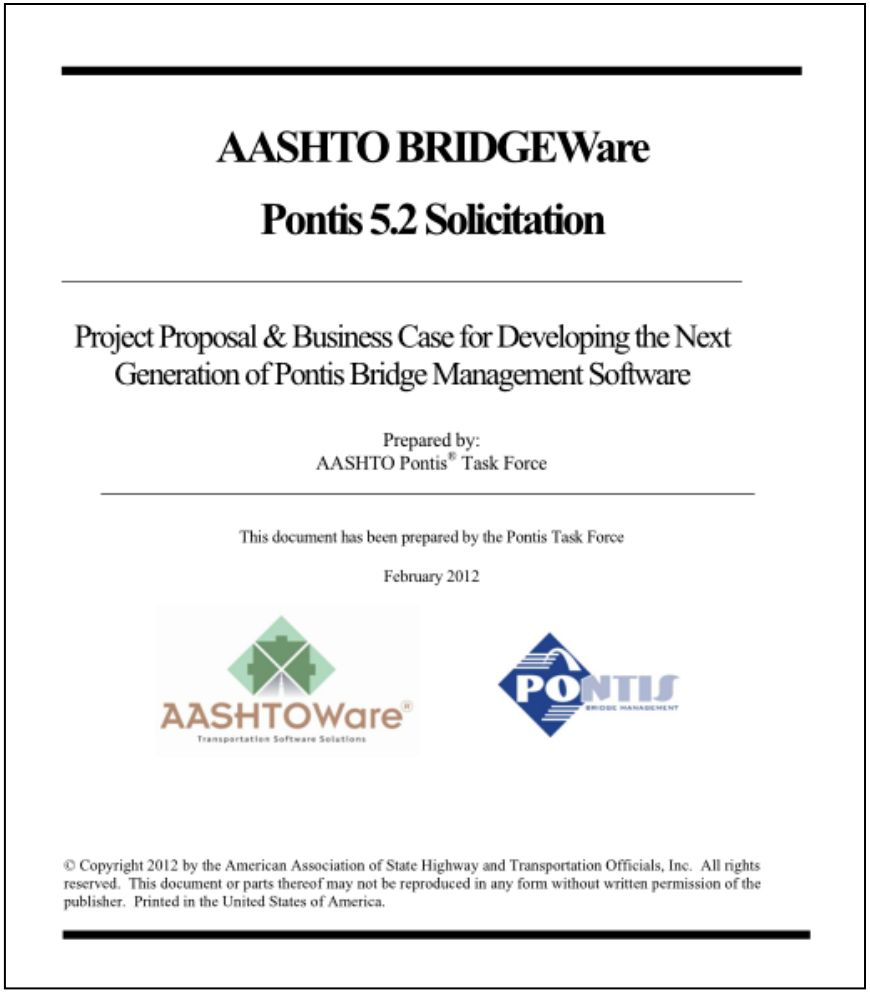
Who/How will Pontis 5.2 be Done?

- AASHTO BRIDGEWare Task Force
- AASHTO Staff
- Pontis Technical Review Team (TRT)
  - Assist in evaluating technologies and making detailed recommendations
- Pontis Users Group
- Contractor (InspectTech)

- Multiple groups/people working toward the same goal.

Solicitation

- States are asked to help support 5.2 development
- Significant advantages to participating states:
  - TRT participation
  - On-site training/assistance
  - Early knowledge and implementation
  - Staff expertise considerably increased



AASHTO BRIDGEWare

Pontis 5.2 Solicitation

Project Proposal & Business Case for Developing the Next Generation of Pontis Bridge Management Software

Prepared by:
AASHTO Pontis® Task Force

This document has been prepared by the Pontis Task Force

February 2012

When will Pontis 5.2 be available?

- Development on 5.2 has started!
- Phased releases
  - Version 5.2.1
    - Core program framework, risk assessments, integrated utility functions, network corridors
    - October 2012
  - Version 5.2.2
    - Implementation of new deterioration models and multi-objective analysis
  - Version 5.2.3
    - Integrated project and program planning
    - All administrative features

Completion and delivery of the final phase (5.2.3) is expected by January 2015.

Advantages of Pontis

- Full support and maintenance provided by AASHTO.
- Enhancements and features are fully coordinated with AASHTO guidelines
- Incorporation of FHWA regulatory requirements.
- Development administered and overseen by a task force of State DOT representatives. (Software created by DOTs for DOTs)

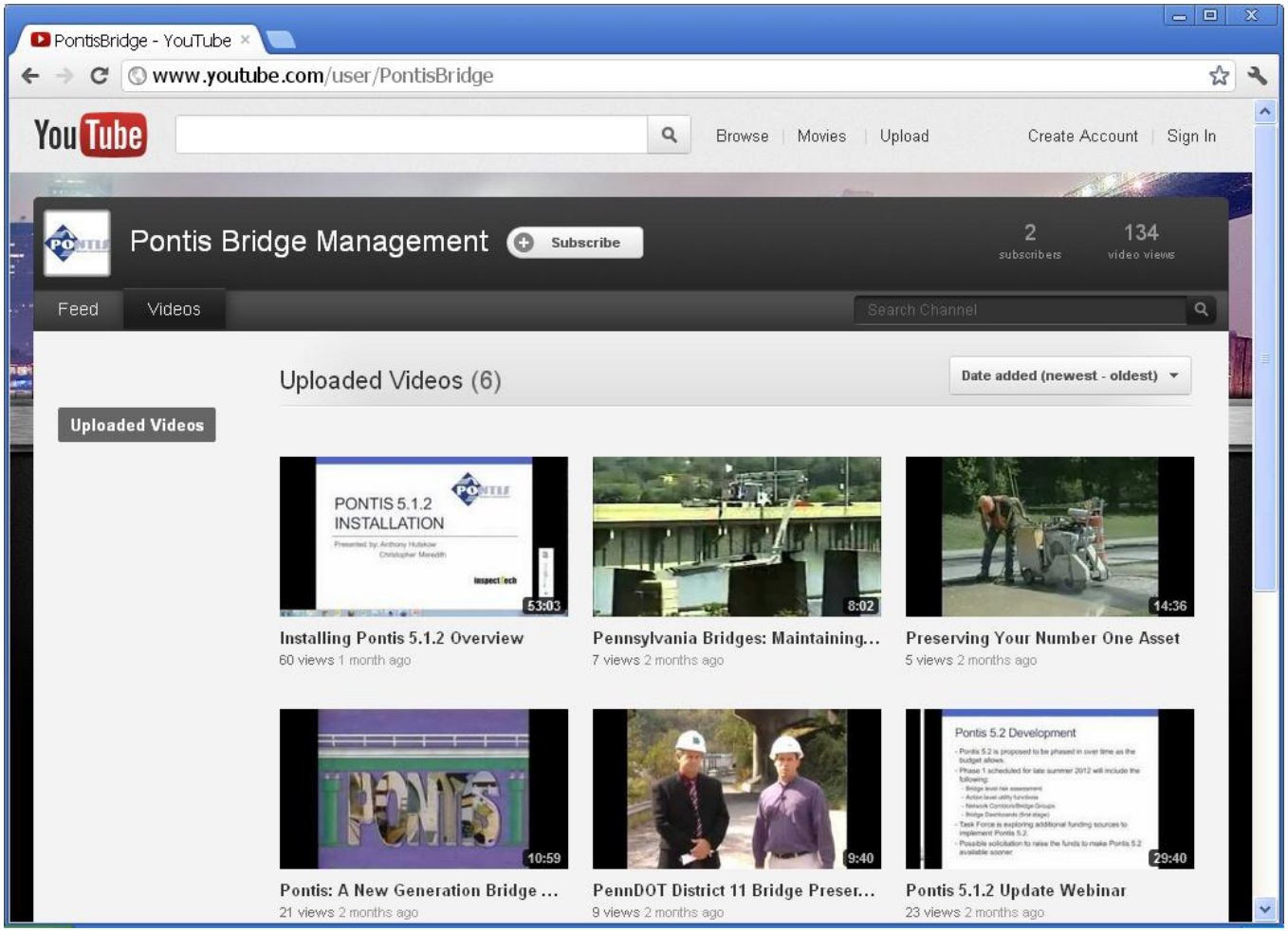
How do I stay updated?

Enhanced Communication Options:

- Webinars
- Email list
- Twitter/Facebook
- Pontis website (http://pontis.inspecttech.com/)

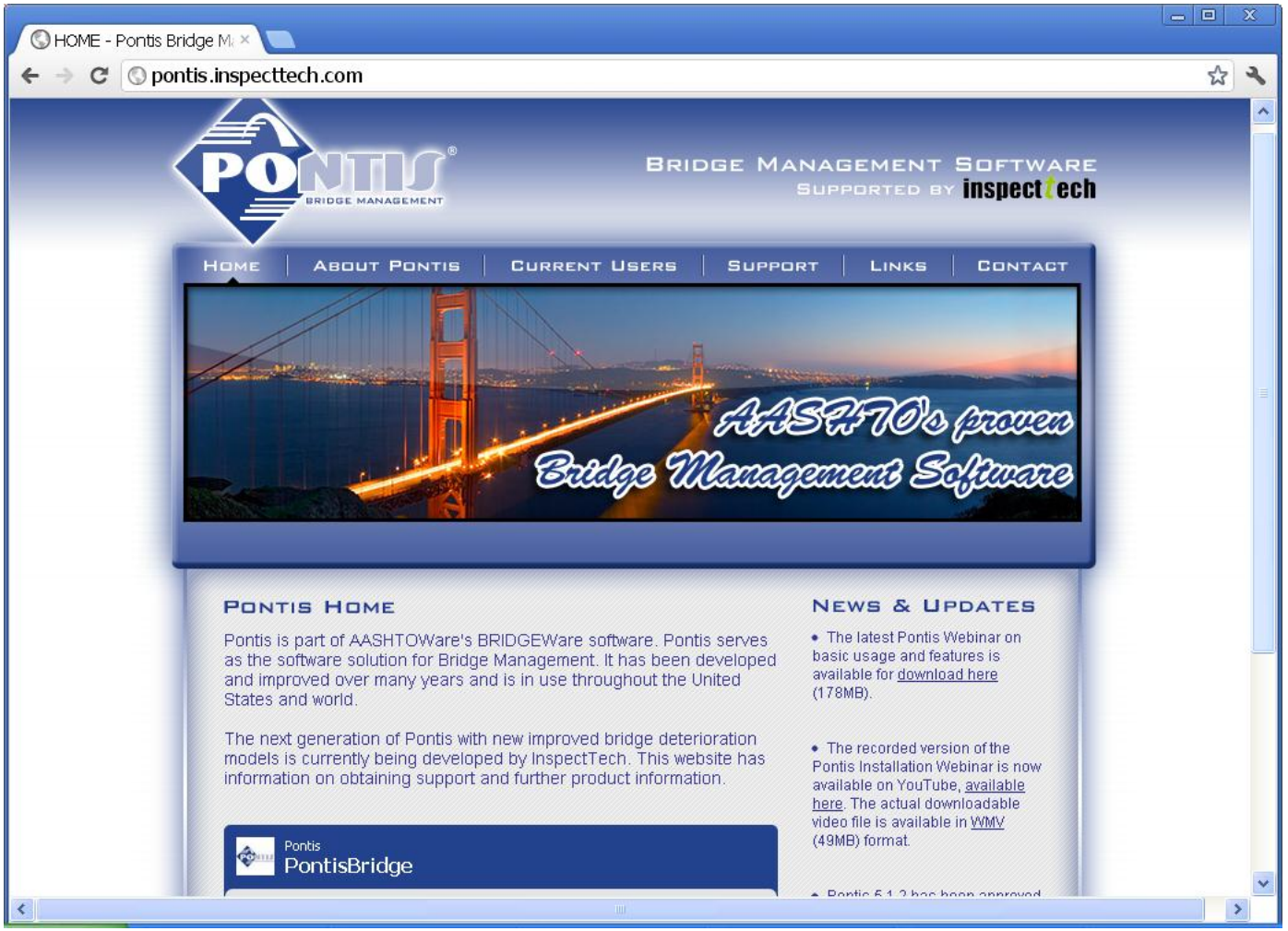
- Just Ask!

Webinar Series



http://www.youtube.com/user/PontisBridge

Webinar links on website:



http://pontis.inspecttech.com/

Next Webinar:
Advanced Inspection Module Training

- Using the Pontis built in customization features
  - Adding in your own custom reports to Pontis
  - Adding in custom developed screen/forms into Pontis
  - Tips for developing agency custom elements in Pontis
  - Changes to the administrative module in Pontis 5.1.2

Date: Wednesday May 16th

Time: 11:00 -Noon (EST)

To Register use link:

- https://www4.gotomeeting.com/register/671193535

QUESTIONS

http://pontis.inspecttech.com/