Part D5:

Management

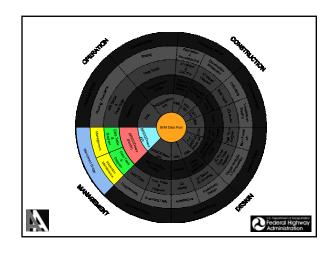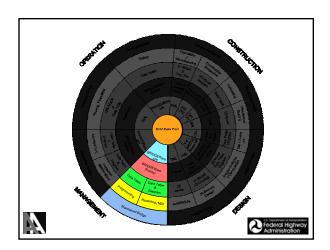
Overview (D5-Management)

- Where BridgeWare Fits In
- (Inspection) Condition Data Management
- Linking Deteriorated Inspection Condition to (Re-)Rating
- Preservation (Costs, etc)
- Programming
- Project Planning and Funding

Map of Pontis Licensing States 2009

County/City	State
Los Angeles Co	CA
Santa Clara Co	CA
City of Phoenix	AZ

International
Italy

Other Licensees:
FHWA, District of Columbia & Puerto Rico

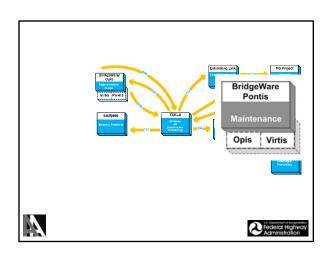| Map Key	
	Non- Licensee
	Licensee

D5-2

What is Pontis?

Pontis is a comprehensive bridge management system.
- It can assist agencies in allocating scarce resources to protect existing infrastructure investments, ensure safety and maintain mobility.
- It stores inventory and inspection information, and provides a rich set of modeling and analysis tools to support project development, budgeting and program development.
- It helps an agency to formulate network-wide preservation and improvement policies for use in evaluating the needs of each structure in a network; and makes recommendations for what projects to include in an agency's capital plan.
- It also provides the capability to analyze the impact of different project alternatives on the performance of individual structures and on a network of structures.

Pontis Modules

- Inspection Module
  - Collect and maintain inventory and inspection information about structures.
- Project Planning Module
  - Build projects from Pontis-generated or inspector recommended work items.
- Programming Module
  - Organize projects into agency-wide programs categorized by funding or maintenance needs.
- Preservation Module
  - Develop a preservation strategy with cost and deterioration models to be used in analysis.
- Results Module
  - View and present graphical information about needs, programmed work and expected performances between the various program simulations to aid in programming decisions.
- Gateway Module
  - Import and export data between Pontis and other systems (i.e., NBIS submittals).
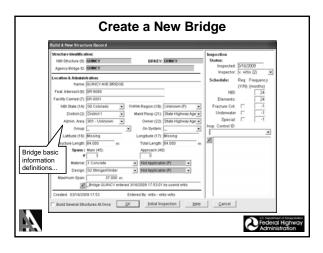- Configuration Module
  - Customize Pontis according to the needs of individual agencies.

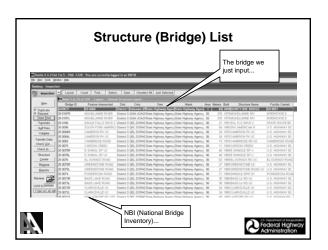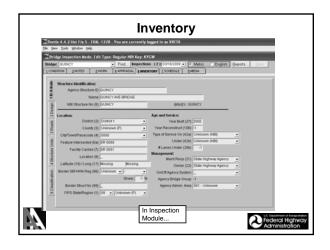
Pontis----Inspection Module

Create a New Bridge

Structure (Bridge) List

Inventory

Create an inspection

We can duplicate previous inspection to setup a new one...

Verify the inspection schedule

Define Element

Condition Card Entry

Input the element condition in current inspection procedure...

Inspection Schedule

Pontis-Virtis Linkage

Inspection Data: Girder Section Loss

Web Section Loss Input Form (web_Section_Loss.csv file):

	A	B	C	D	E	F
1	Girder Type (Interior = 1; External=0)	Girder No.	Thickness Loss (%)	Span No.	Start Distance (ft)	Length (ft)
2	1	1	20	1	13	2
3	0	1	10	1	1	0.5
4	1	2	5	1	1	0.4
5	1	3	5	1	3	7
6	1	4	10	2	5	2

Flange Section Loss Input Form (tf_Section_Loss.csv file):

	A	B	C	D	E	F	G
1	Girder Type (Interior = 1; External=0)	Girder No.	Widthness Loss (%)	Thickness Loss (%)	Span No.	Start Distance (ft)	Length (ft)
2	1	1	19	21	1	13	2
3	1	1	0	13	1	2	2
4	0	1	5	5	1	1	3

Input the section loss data from current inspection into csv (Comma Separated Value) linkage file which can be edited in Excel...

Inspection Data: Girder Section Loss

❖ Section loss data can be attached in Pontis:

Girder Section Loss Data Inputs in Virtis

1. The program is developed by C# in Visual Studio;
2. It calls BRIDGEWare APIs to update the section loss data

Transfer Section Loss Data into Virtis

Compare the Rating Results (Dead Load)

Before Section Loss:

After Section Loss:

Compare the Rating Results (Live Load)

Before Section Loss:

After Section Loss:

Pontis: Preservation Module

Preservation Module Desktop

The preservation module allows editing of the agency policies, cost, and deterioration models for a selected element and environment.

From here, you can select different elements and/or environments, edit expert elicitations, update the models based on elicitation or historical results, or build the preservation optimization model.
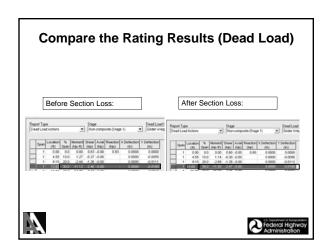

Elicit Cost

Edit agency-based costs of different preservation actions.

Expert Transition Probability Model Elicitation

Edit agency-based actions regarding how different structure elements deteriorate.

Adjust Costs

Inflation Adjustments:
•**Cost Index Used----** Numeric value of cost index last used for inflation adjustments.
•**Date Revised----** Date the MR&R model information was last revised.

Last Sensitivity Analysis Adjustments:
•**Agency Costs----** Percentage by which MR&R unit costs were last adjusted for the preservation optimization. For example, to increase all agency costs by 20 percent, enter 120. To decrease all agency costs by 20 percent, enter 80.
•**User Costs----**Percentage by which user costs were last adjusted for the preservation optimization.

Adjust the preservation costs for inflation to determine the impact to a program of increases or decreases.

Reports----Preservation model details

• A detailed report can be printed to view the preservation strategy for each condition unit, including the recommended actions (represented by **>>**) for each element/environment combination.

• The report also shows the long-term optimal cost for the condition unit, representing best cost-benefit choice.

Also, the report indicates the percentage chance of failure from the worst condition state of the condition unit and the agency and user unit failure costs.

Pontis: Programming Module

Programming Module Desktop

Define and run program scenarios. From this screen a user can edit functional improvement standards, cost and benefit assumptions, annual budgets, improvement models, and simulation rules.

Simulation Parameters----Policy Definition

Policy Sets can be edited that will specify the functional improvement standards used in the scenario.

Simulation Parameters----Costs Definition

Cost Sets can be edited that will specify the set of functional improvement unit costs and benefits used in the scenarios.

Simulation Parameters----Budgets Definition

Budget Sets can be defined to be used in the various scenario simulations.

Simulation Parameters----Improvement Parameters Definition

Improve:

Improvement Sets can be edited that will specify the improvement benefit model parameters used by the scenario.

Simulation Rules

Rules that control the behavior of program simulation can be defined and edited (i.e. If a bridge replacement is < 5 years, then no rehab to any other elements).

Results----Total Needs vs. Programmed Work Over Time

A report that can be generated that summarizes the needs and programmed work over time for the current Pontis scenario by a specified budget year.

Results----Bridge Management Network Summary

The Bridge Management Summary Report provides an overview of the state of the bridge network.

Results----Annual Allocation of Needs and Work

A report can be generated to summarize needs and programmed work for the current scenario for each program year, providing separate summaries and graphs for each program year by

– district,
– functional class,
– on/off National Highway System (NHS) status, and
– on/off State System status.

Results---- Network Performance Measure Summary

A report that summarizes performance measures for the entire network can be generated. Performance measures are broken down by district, functional class, on/off National Highway System (NHS) status, and on/off State System status.

Results---- Preservation Work Programmed by District

This report shows programmed preservation work (work modeled by Pontis as being programmed given the budget constraint), and the benefits of preservation work programmed by district and year for each scenario.

Results---- Scenario Specification Report

This report documents key elements of
the current Pontis scenario being used.

Pontis: Project Planning
Module

Project Planning Desktop

A user can search through a list of bridges or a list of projects and
edit or create new projects.

Program Setup Screen

This screen allows you to define and edit the bridge construction or maintenance programs.

Funding Source Setup

This screen allows you to view and edit the funding sources defined in the database.

New/Open Project - Overview Screen

- The New/Open Project screen allows you to create a new project or edit the information for an existing project.

- The Overview tab contains general project-level information.

Rank Projects Screen

Projects can be assigned an agency program ranking based on project benefit, cost, benefit/cost ratio, health index or sufficiency rating or an agency preference.

Reports---- Projects and Work Candidates by Bridge

A report can be generated to show all projects and work candidates for selected structures after a particular scenario has been run.

Reports---- Project Priority List on Actual Projects

A report can be generated to display a list of projects, sorted by program, program year and benefit/cost ratio.

Reports---- Project Details Sheet

A report detailing project information can be generated.

Reports---- Actual versus Budgeted Work

A report that indicates actual work accomplished versus budgeted work can be generated for each program.

Reports---- Program Funding

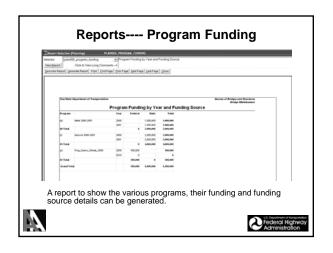A report to show the various programs, their funding and funding source details can be generated.

Reports---- Pontis Priority List on Program Simulation

A report that outlines Pontis-generated projects fin order of cost/benefit ratio for the scenario selected can be generated and then compared to other scenarios for budgetary impact and/or policy change sensitivity.

Summary (D5-Management)

- Workflow demonstrated leveraging constructed bridge (model) downstream for asset management concerns surrounding bridge condition
- One of several possible such workflows
- Encompassing individual bridge condition documentation using inspection data, bridge load (re-)rating, and network-level programming

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