

# C.A.E.S.A.R. Online

Scour Risk and Stream  
Stability Assessment Software

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# CAESAR Online

- Background
- System Overview
- Usage Scenario
- Future Developments
- Summary
- Questions



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# ➤ Background



- Develop, field-test and document an expert system to aid in the inspection of bridge scour
- Provide site-specific information that might otherwise be unavailable
- Build upon existing scour research

# ➤ Background

## ■ Existing PC-application

- Discrete bridge view
- Performed analysis
- Provided recommendations
- Inconsistent data
- Built for Win 95

The screenshot displays the CAESAR software interface. The top window, titled 'Inspection Data', shows a menu bar with 'General Site', 'Bridge', 'Bridge Site', 'Cross Section', 'Downstream', and 'Bed Profile Data'. Below the menu, there are tabs for 'Right Abutment', 'Left Abutment', 'Bank Stability', 'Upstream', 'Pier Data', and 'Site Review'. The main area contains three questions with dropdown menus: 'How severe is the bank erosion at this abutment?' (none/ minor), 'How severe is the erosion at the right spill slope?' (none/ minor), and 'How much does this abutment encroach into the channel?' (<10% of channel width).

The bottom window, titled 'CAESAR - Yakima\_v2.bdg', shows a file explorer on the left with a tree view containing 'Yakima-Moxee Bridge', 'Static Information', 'Plot Options', 'Plot', 'Notes', 'Insp. - April 7, 1993', 'Site Review', 'Right Abutment', 'Left Abutment', and 'Bank Stability'. The main area displays a table with columns for 'Right Abutment', 'Yakima-Moxee Bridge', and 'April 7, 1993'. The table contains the same three questions as the top window, with answers: 'minor', 'minor', '<10% of chan. width', '<10% of fldpn width', and '>10''.

**CAESAR: an Expert System for Cataloging and Expert Evaluation of Scour Risk and River Stability\***

Developed by:  
Department of Civil Engineering  
University of Washington

Funded by:  
National Cooperative Highway Research Program, Project 24-6  
Washington State Department of Transportation

\*Note: This program does NOT apply to culverts, pipes, or "tidal zone" structures.



# ➤ Background

## ■ Need for new system

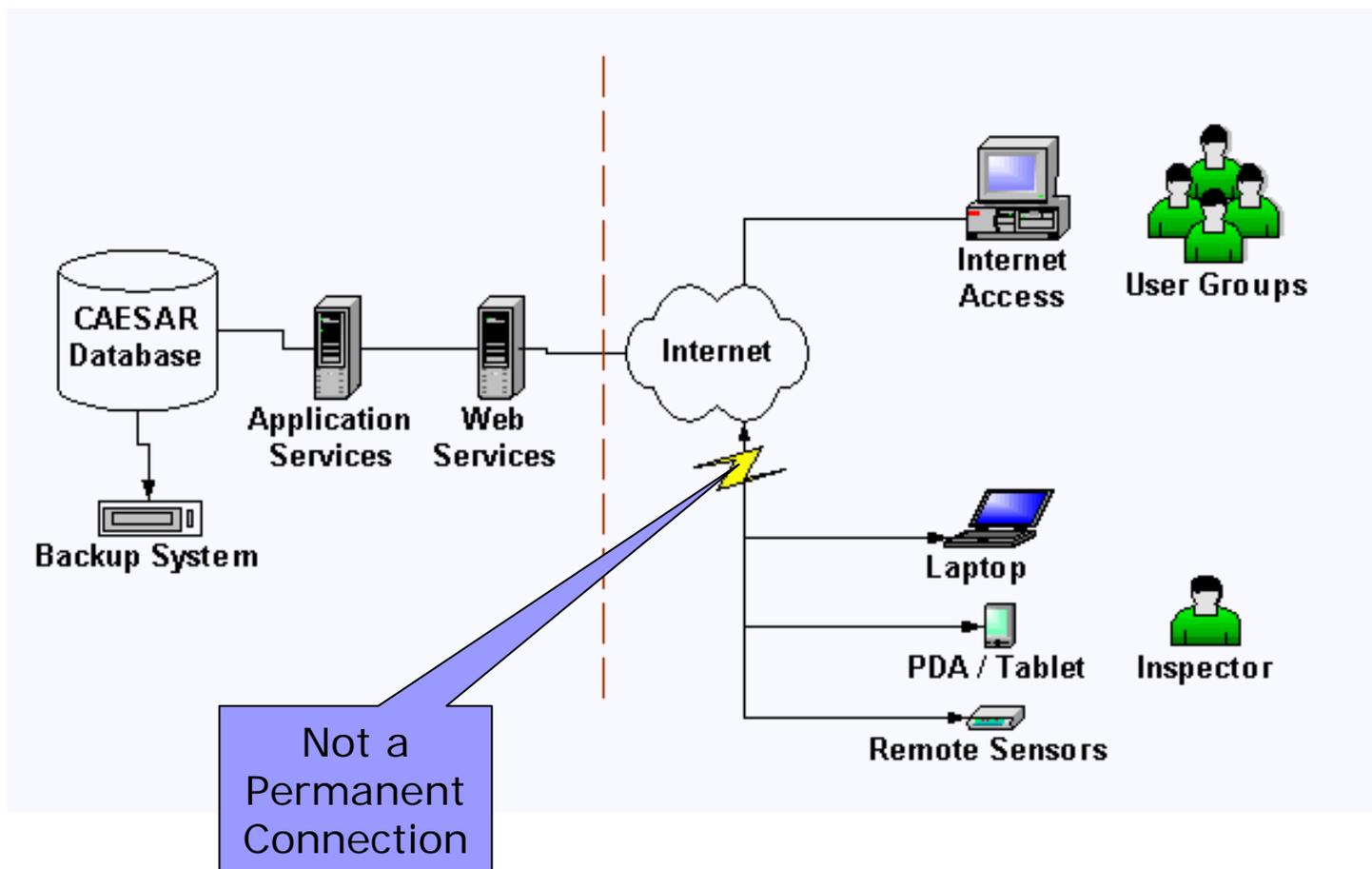
- Upgrade system for new platforms
- Improve user interface
- Provide multiple user capability
- Perform network analysis
- Make data storage, backup and distribution is straightforward



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# ➤ System Overview Architecture



# ➤ System Overview

## Web Browser Capable

The screenshot shows the CAESAR Online web application running in Microsoft Internet Explorer. The browser window title is "CAESAR Online - Microsoft Internet Explorer". The address bar shows the URL "http://hotmix.ce.washington.edu/caesar/". The page features a blue header with the "C.a.E.S.a.R." logo and the tagline "Catalog and Expert Evaluation of Scour Risk and River Stability". A navigation menu on the left includes links for Home, About CAESAR, Downloads, Quick Sign In, Support, Resources, and Quick Links. The main content area is titled "WELCOME TO CAESAR ONLINE (beta)" and contains a photograph of a bridge pier in a river. To the right of the photo is a text block describing the system's capabilities. Below this are three informational boxes: "EXISTING USERS" with a link to the old version, "NEWS & INFORMATION" with a list of recent updates, and two "Download" buttons for the "Inspection Tool" and "Conversion Utility". The footer contains a disclaimer and copyright information for 2000-2002.

CAESAR Online - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://hotmix.ce.washington.edu/caesar/>

Links Google Windows ESPN.com Fantasy Sports ASP.NET WinForms.NET UW MSDN Visual Studio Weather MyBus

**C.a.E.S.a.R.**  
Catalog and Expert Evaluation of Scour Risk and River Stability

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• [FHWA-Bridges](#)  
• [USDOT](#)  
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**WELCOME TO CAESAR ONLINE (beta)**

 C.a.E.S.a.R. Online is a system for cataloging and evaluating scour risk and river stability at bridge sites. The program assists bridge inspectors with several elements of the bridge inspection process, including: cross section plotting; storage of bridge design data; storage and retrieval of previous inspection data; note editing and storage; digital photograph storage, viewing, and annotation; and independent scour risk evaluation.

**Inspection Tool**  
This is the desktop application that allows one to create and analyze bridge inspections.  
[Download](#)

**Conversion Utility**  
This desktop utility allows one to convert all existing CAESAR files into the new format and upload to CAESAR Online.  
[Download](#)

**EXISTING USERS**  
All work done on CAESAR v2 is compatible with the new system. If you would like to use the old version or learn more please visit:  
<http://www.ce.washington.edu/~scour>.

**NEWS & INFORMATION**  
This is the beta release of CAESAR Online. Please look for new developments and updates in this list.

- **Web Site Published [3/17/03]**  
The CAESAR Online site is now available for viewing.
- **Inspection Tool (beta 0.9) Released [5/31/03]**  
This is the tool used to create inspections. Please visit the download section to learn more about this application.
- **Conversion Tool (beta 0.9) Released [5/31/03]**  
This is the tool used to upload existing inspections. Please visit the download section to learn more about this application.

Disclaimer | Terms of Service  
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Done Local intranet



# ➤ System Overview

## ■ Data Warehouse

- Consistent data set
- Store historical data
- Easy data backup and retrieval
- Perform network analysis
- Perform data mining



# ➤ System Overview

- Disconnected data model
  - Portable data
  - User has access to all historical data associated with each bridge
  - Can modify and add new inspections
  - Re-synch after data modifications are performed



# ➤ System Overview

## ■ Web Portal

- Working with complete data set
- No geographic constraints

## ■ Security

- User Credentials
- Group and Role Based



# ➤ System Overview

- What bridge data is stored?



# ➤ System Overview

- Static Bridge Data

- Elevations, Pier Types

- Inspection Data

- Observations

- Bed Profiles

- Media (Digital Photographs, Video)

- Analysis Info (based on observations)



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# ➤ Usage Scenario

## ■ A day in the life of an Inspector



- Log onto system
- Bridge Selection
- Download Data
- Travel to sites
- Perform inspections
- Return from sites
- Upload new inspections

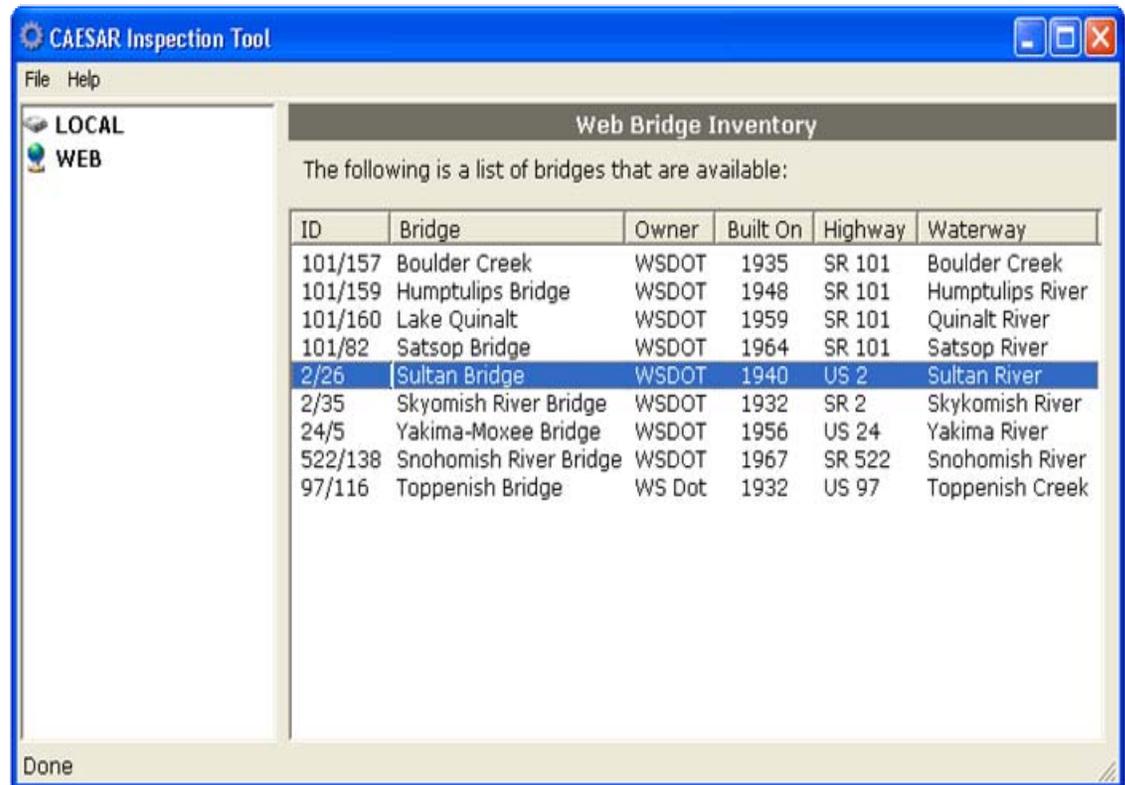
# Log into the system

- Authenticate credentials



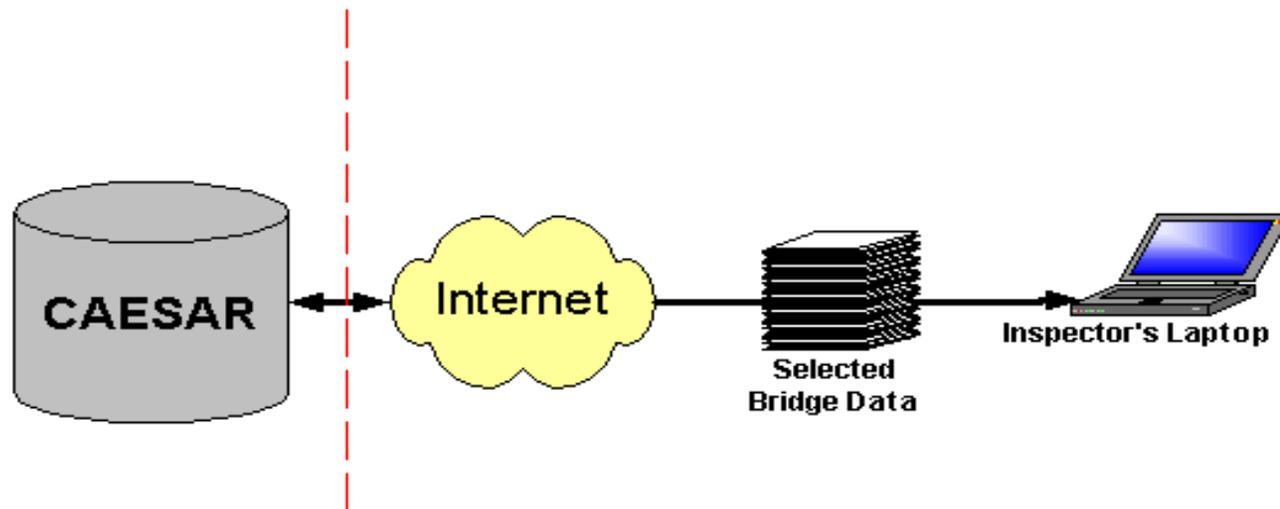
# Bridge Selection

- Drag and drop bridges to local computer



# Download Data

- Static Bridge Data
- Inspection Data
- Media Files (optional)



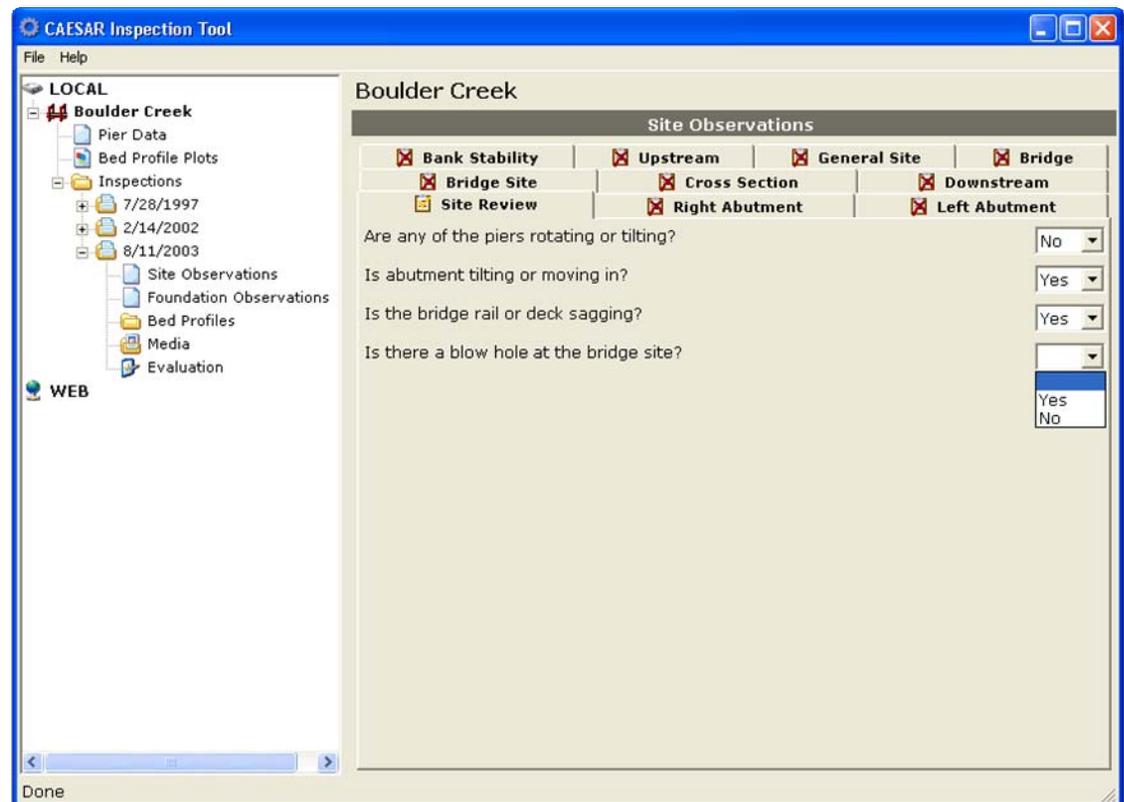
# Travel to bridge sites

- All current bridge data and previous inspections are available
- Once at bridge inspector records observations on laptop



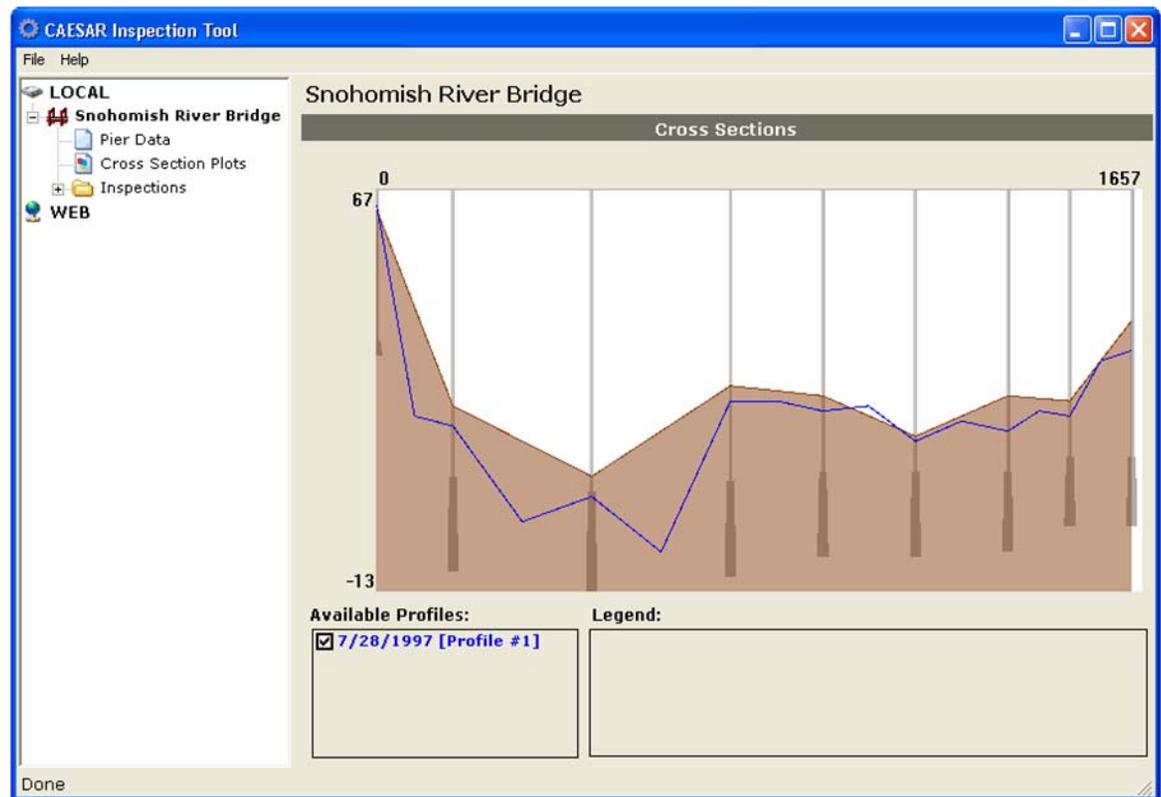
# Performing Inspection

- Input screens have been updated



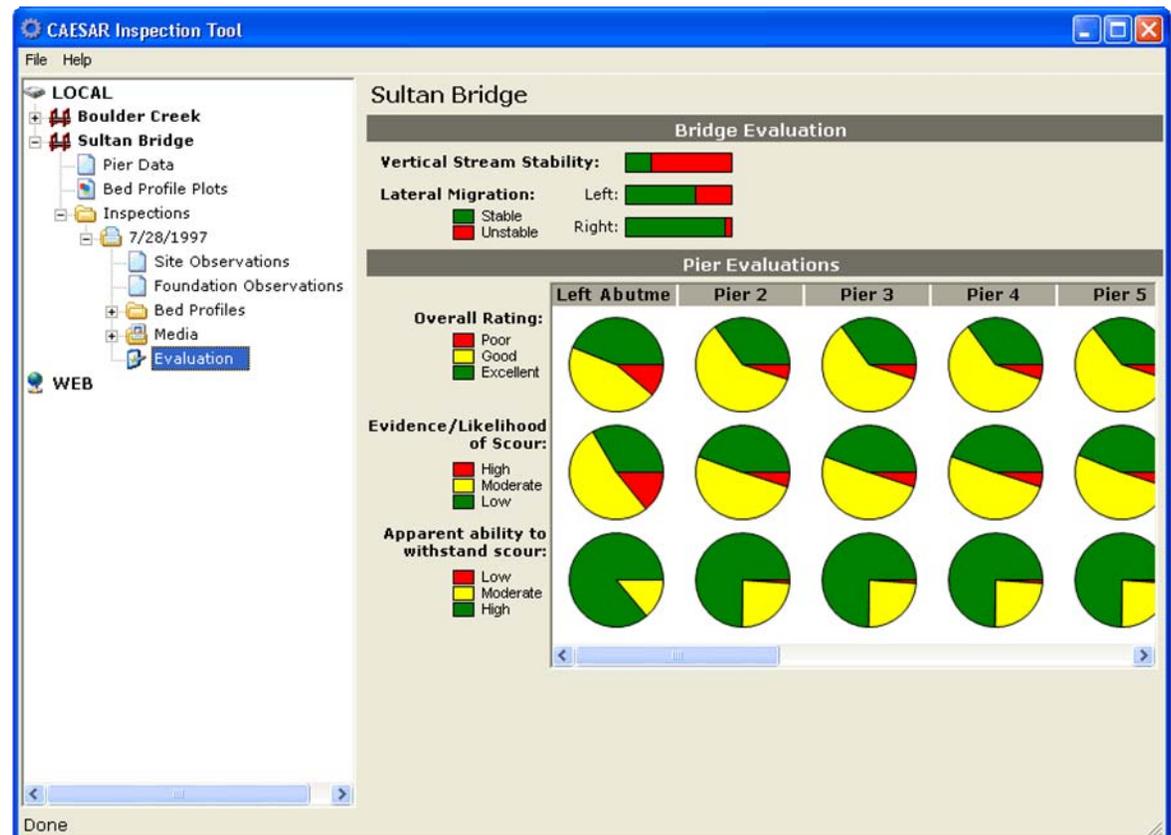
# After Inspection

- View Bed Profile plots



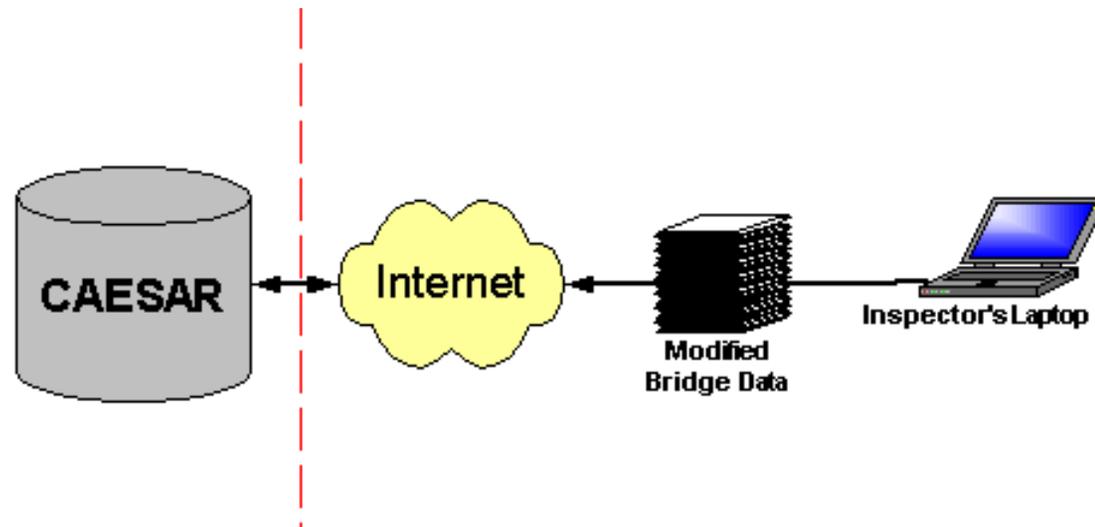
# After Inspection

- Run analysis engine and evaluate



# At the end of the day

- Re-connect to the internet
- Authenticate User
- Synchronize data





# At the end of the day

- Data that is uploaded
  - New inspections
  - New media files (photographs)
- Server Operations on upload
  - Stores all data in database tables
  - Data is immediately available to others through the web portal



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## ➤ Future Developments

- Deploy on a state, county, or city level basis
- Volunteers needed
- Refine the inspector application
- Network level analysis tools



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# ➤ Summary

- CAESAR Online provides:
  - Web enabled inspection tool
    - Scour risk assessment / evaluation
  - Expands existing functionality
  - Central data warehouse
  - Universal access



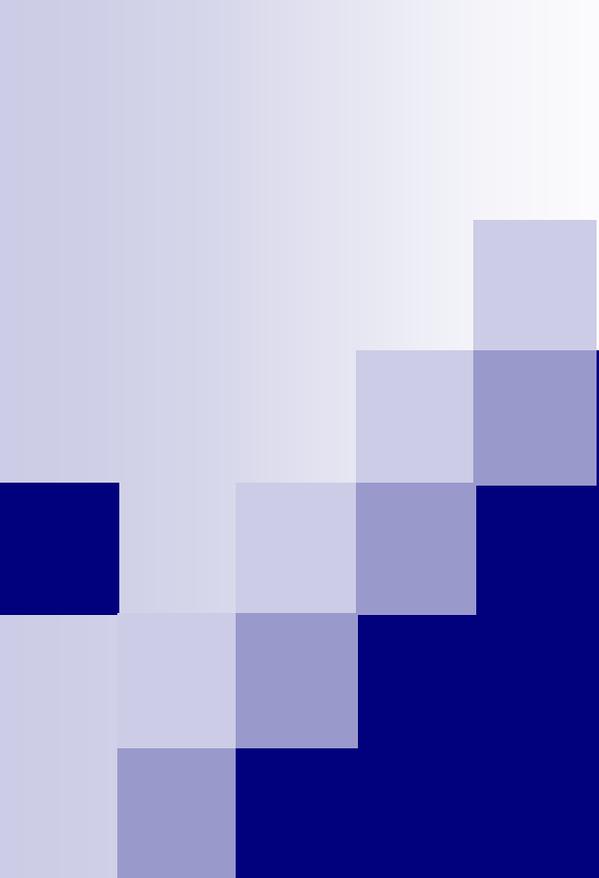
# Acknowledgements

- Federal Highway Administration
  - Office of Bridge Technology
- NCHRP panel
- WSDOT
- University of Washington



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Scour Risk and Stream  
Stability Assessment Software

➤ Current Web Site:

<http://hotmix.ce.washington.edu/CAESAR>

➤ Contact Information:

- George White      [gcw@u.washington.edu](mailto:gcw@u.washington.edu)
- George Turkiyyah      [george@ce.washington.edu](mailto:george@ce.washington.edu)