

Keystone Bridge Management System

Main Menus

The image displays two screenshots of the Keystone Bridge Management System interface. The top screenshot shows the 'Main Menu' with six tabs: 'Inspection', 'Images', 'Reports', 'Add Bridge', 'Estimating', and 'Edit'. The 'Reports' tab is active, showing a grid of report options: 'Inspection Reports', 'Print Insp. Images', 'Capital Needs Report', 'Bridge Listing', 'Statistical Report', 'Culvert Listing', 'Culvert Cost Report', 'Depreciation Report', 'Picture List', 'Maintenance Report', and 'Additional Reports'. An orange callout box labeled '6 Menu Tabs' points to the 'Estimating' tab. The bottom screenshot shows the 'Auxiliary Reports Menu' titled 'Supplemental Reports', which lists 'Bridge Condition Index', 'Depreciation Forecast', and 'Performance Report'. Each report has three action icons: 'Preview', 'Print', and 'to File'. An orange callout box labeled '3 Printing Choices' points to these icons and lists: 'Preview', 'Print', and 'to File'. Another orange callout box labeled 'Additional Reports on Overflow Menu' points to the 'Additional Reports' button in the main menu.

6 Menu Tabs

Additional Reports on Overflow Menu

3 Printing Choices

- Preview
- Print
- to File

KBMS Demonstration

Inspection Input Form

The screenshot displays the 'Inspection Input Form' interface. On the left, a metadata section includes fields for 'Locater', 'Owner ID' (101502), 'Insp Date' (28/05/2010), 'Name' (Brush Rd/Malden Rd), and 'Route' (Brush Rd). Below this is a thumbnail image of a bridge. The main area features a table for 'Component Detail' with columns for '%', 'Defect / Damage', and 'Severity'. The 'Deck Soffit' component is highlighted, showing 'Defects' at 2.0% and 'Damage' at 0.1%. A dropdown menu is open for 'Defect / Damage', listing options like 'Leaching/Seepage', 'Honeycomb', 'Delamination', 'Cracking', 'Impact', 'Spalling', 'Disintegration', and 'Fire Spalls'. A 'Comment' field contains the text: 'At north end on upstream half there is an area of honeycomb about 2m^2 surface area.' At the bottom, there are navigation buttons: 'Next Component', 'Previous Component', and 'Form Controls' with directional arrows.

Thumbnail Image of Bridge

Inspection Date X-Referenced to Inspection Party & Weather

Context Sensitive Drop-down Menus

Built-in Quick Form Access

Unlimited Length Comment Field

Easy Movement between Bridge Components & between Bridges



KBMS Demonstration

Loading Images Form

Pop-up
Confirmations

Auto-Loads Next
Sequential Image

Supports JPG &
BMP Images

The screenshot shows the 'Add Structure Image Form' window. At the top, there are input fields for 'Name' (Brush Rd/Malden Rd), 'Route' (Brush Rd), and 'Bridge ID' (101502). A 'Structure Locator' dropdown is also present. On the right, a 'Control Panel' contains navigation buttons (back, forward, stop) and a 'STOP' button. The main area is divided into 'Drive and Directories' (c:\KBMS\Esex Images\), 'Folder' (101502), 'Image Prefix' (IMG_), 'Image Suffix' (9925), and 'Extension' (*.jpg, *.bmp). A preview window shows a bridge over water. Below this is a table with columns for 'Image Full Path' and 'Image Caption'. A pop-up dialog box asks 'Is this the picture you wish to add?' with 'Yes' and 'No' buttons. Callouts from the surrounding text point to the pop-up, the 'Image Suffix' field, the 'Control Panel', the table, and the 'Add Picture' button.

Image Full Path	Image Caption
C:\KBMS\Esex Images\101502\IMG_9932.jpg	Construction joint in north span slab
C:\KBMS\Esex Images\101502\IMG_9924.jpg	South approach
C:\KBMS\Esex Images\101502\IMG_9925.jpg	East elevation
C:\KBMS\Esex Images\101502\IMG_9926.jpg	West railing

See History of Images
already Input

Common Intuitive
Form Controls



Image Viewing Form

Option to Print Exhibited Image

The screenshot shows a web interface titled "Bridge Pictures". On the left, there is a form with the following fields: "Name" (Brush Rd/Malden Rd), "Route" (Brush Rd), "Bridge ID" (101502), and "Bridge Location" (a dropdown menu). Below the form is a "Form Control" section containing a print icon, a set of navigation buttons (back, forward, home, stop), and an "Image 1 of 18" odometer. On the right, a large image of a bridge over a river is displayed. Below the image is a magnifying glass icon and the text "East elevation".

Easily Move Between Images for a Bridge & Between Bridges

Image Odometer

Magnify Exhibited Image



Adding Bridge Components Form

Add Bridge Components Form

Structure ID 101502

Deck Furniture

- Railings
- Barrier
- Curb
- Sidewalk
- Median
- Deck Drain
- Expansion Joint
- Deck Drain Tube

Abutment

- Abutment Bearing
- Ballast Wall
- Wing Walls
- Abutment Stem
- Abutment Foundation

Embankment

- Embankment
- Embankment Cover
- Approach Barriers
- Approach Curbs
- Approach Slabs
- Slope Protection

Truss

- Top Chord
- Diagonals Hangars
- Bottom Chord
- Upper Bracing
- Portal
- Floor Beam
- Stringers

Deck

- Wear Surface
- Waterproofing
- Deck Surface
- Deck Soffit

Pier

- Pier Bearings
- Pier Cap
- Pier Column/Shaft
- Pier Foundation
- Crash Wall

Features

- Signs
- Channel
- Channel Arm

Panel Bridge

- Panels

Spanning Element

- Girders
- Spandrel
- Slab

Secondary Elements

- Diaphragms
- X-Frames
- Lateral Bracing
- Coating

Keystone Bridge Management Corp.

You have successfully added 4 Bridge Components!

OK

Add Components

- *Bridge Components Catalogued*
- *Visual Confirmation of Selected Components*
- *Confirmation that Components have been Added*



Editing Bridge Components Form

Fast Navigation to Related Forms

Component Edit Form

Bridge/Culvert Component Inventory

Name 14755-14th Concession Road
Route 14th Concession Rd
Owner ID 100502

Structure Locator
[Dropdown]

Control Panel
[Navigation Buttons]

Open Inspection **Go to History Form**

Category	Component	Delete Record	Length	Width	Diameter	Height	Count
Curbs	Conc Curb	[X]	6.40				2
Wear Surface	Gravel Surface	[X]					1
Deck Soffit	Soffit	[X]	1.83	8.00			1
Wing Walls	RC Wing Walls	[X]	2.75			2.15	4
Abutment Stem	RC Abutment Wall	[X]		8.00		1.52	2
Embankment	Embankment	[X]					2
Structural Slab	RC Solid Slab	[X]	2.45	8.00		0.20	1
Channel	RC Solid Slab	[X]					1
Signs	RC Arched Slab	[X]					
	Prestressed Voided Slab	[X]					
	Prestressed Solid Slab	[X]					1

Context Sensitive Drop-Down Menu Choices

Simple Populating & Editing of Geometric Data



Capital Work & Summary Input Form

Thumbnail Image of Bridge

List of Components with > 5% Damage

Unlimited Length Comment Box

WORK INPUT

Work Description and Cost Input Form

ID: 101502
Route: Brush Rd
Name: Brush Rd/Malden Rd
Plan Area: 296
Bridge Finder: [Dropdown]

Replace Deck (Includes all Major Items)
O'Lay
WP Pave
Barrier Wall
X-Joints
Coating Coating Type [Dropdown] Coating Cost: 0
Bearings Bearing Cost: 0 Use \$4K Each
Other Work: Deck Drains
Rec'd Work: O'Lay, Deck Drains Structure Costs: 178
Detour Cost: [Dropdown] 50
CA + Contingencies @ 20%: 16
Computed Estimate: 27
Rounded Estimate: 200 Cap Year: 2015

Component	% Damaged	Need	Time Need	Time
Deck Surface	5	Repair	5	

Open Inspection Form
Structure History Form

Recommended Investigations

- Load Posting
- Deck Condition Survey
- Enhanced Inspection
- Structure Evaluation
- Underwater Investigation
- Ice Inspection

Form Navigation: [Home] [Back] [Forward] [End] [Close]

Remark: Deck surface requires scarifying, concrete removals and a new 60 mm thick normal concrete overlay. Plug with concrete, present 16 deck drains and replace with six new deck scrapers. Add guiderail for approaches.

Check-off List of Typical Capital Needs

Ad-hoc Capital Needs Added Here

Auto-Calculation of Capital Needs

Check Boxes for Special Investigations

Tombstone Data Editing Form

Thumbnail Image of Bridge

The screenshot shows a web-based form titled "Bridge Historical Data Form". At the top, there is a "Structure Locator" dropdown menu and two buttons: "Next Structure" and "Previous Structure". The form is divided into several sections:

- Basic Information:** Fields for Bridge ID (101502), Bridge Name (Brush Rd/Malden Rd), Owner Name (Town of Essex), Route Name (Brush Rd), Location (0.90 km S of Malden Road), Span Arrangement (4 @ 8.1 m), Description (Solid Slab), Direction (N-S), and Skew (37).
- Operational Data:** Fields for Year Built (1962), Open Lanes (2), and AADT (159).
- Environment and Features:** Fields for Structure Environment (Rural), Aesthetic Value (Pleasing), Heritage Value (Moderate), Main Feature Under (Railway), and Secondary Feature Under.
- Continuity:** Radio buttons for "Simply Supported", "Semi-Continuous", and "Fully Continuous" (which is selected).
- Dimensions:** Fields for Bridge Spans (4), Bridge Length (31.80), Deck Width (9.30), and Girder Lines (0).
- Actions:** A vertical list of buttons on the right side: "Open Picture Edit Form", "Open Picture View Form", "Add Bridge Components", "Edit Structure Components", "Open Inspection Form", and "Open Work Input".

A thumbnail image of a concrete bridge over a river is located on the right side of the form. An orange arrow points from the text "Thumbnail Image of Bridge" to this image. Another orange arrow points from the text "Extensive Drop-Down Menus" to the "Main Feature Under" dropdown menu. A third orange arrow points from the text "Related Forms only a Click Away" to the "Open Picture Edit Form" button.

Extensive Drop-Down Menus

Related Forms only a Click Away



Inspection Team Entry Form

Inspection Date

Inspection Team & Weather

Date

Principal Inspector

Assistant Inspector


Assistant Inspector

Principal Weather

Secondary Weather

Low Temp

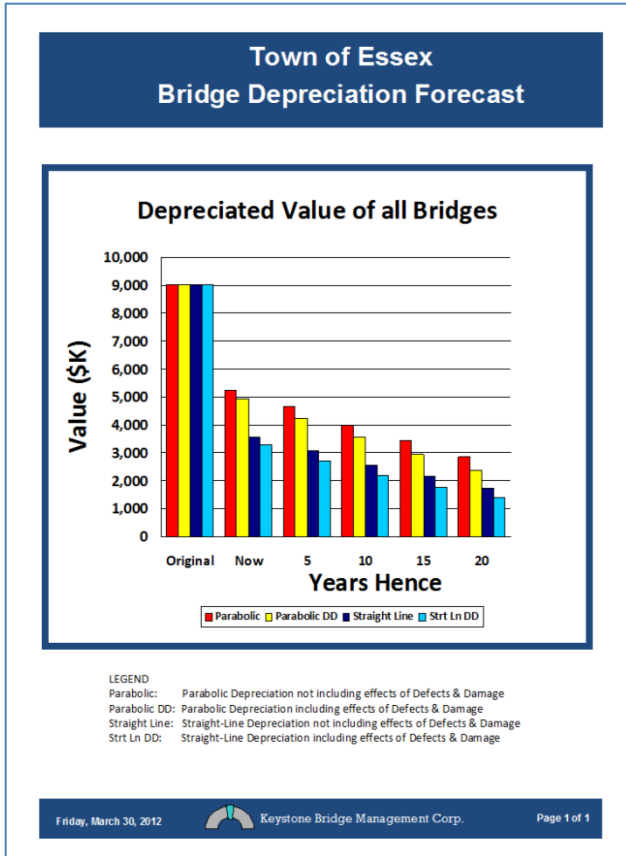
High Temp



- *Easy Date Picking Feature*
- *Drop-Down Menus for Selecting Inspection Staff*
- *Two Drop-Down Menus for Describing Weather*
- *High & Low Temperature on Inspection Date Recorded*
- *All Bridges Inspected on Same Day are Tagged with Consistent Information by Cross-Referencing the Dates*
- *No Laborious Repetitive Input*



Reporting

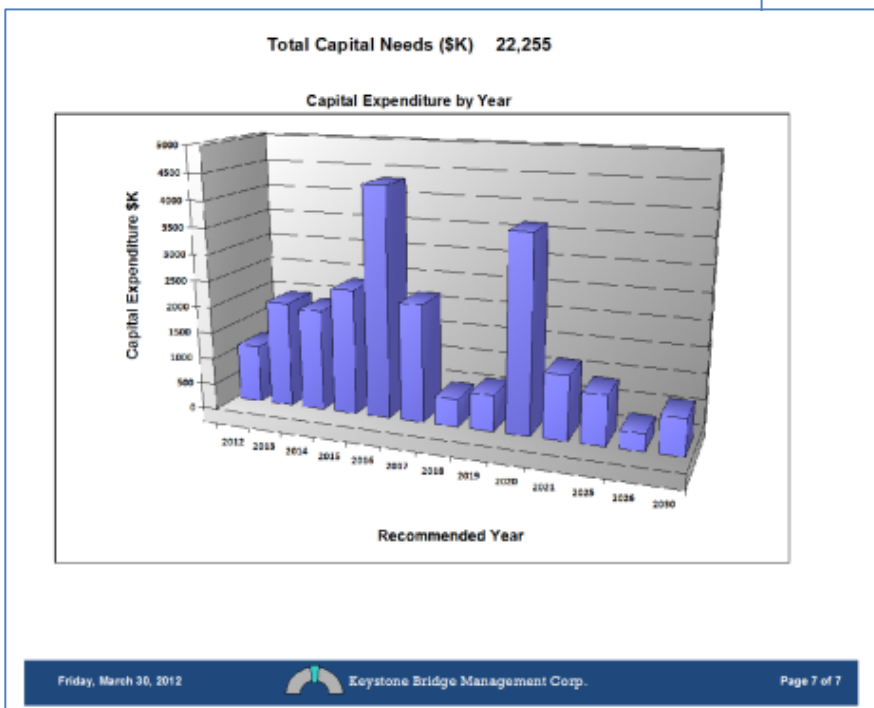


- Unlimited Reporting Capability
- Easily Customized
- All Reports may be Previewed
- 15 Built-in Standard Reports

Town of Essex Bridge Condition Index Report

Bridge ID	Name	BCI
100101	10th Con Rd/Country Rd No. 23	62.9
100301	12th Con Rd/Country RD No. 11	84.7
100302	12th Con Rd/Country Rd No. 11	75.0
100401	13th Con Rd/Country Road No. 11	74.8
100402	13th Con Rd/Walker StRd	75.0
100403	13th Con Rd/Old Malden Rd	73.4
100404	13th Con Rd/Country Rd No. 15	74.5
100405	13th Con Rd/Hyland Rd	73.7
100406	13th Con Rd/N. Malden Rd	71.5
100407	13th Con Rd/N. Malden Rd	73.7
100501	14th Con Road/Country Road 11	73.8
100502	14755-14th Concession Road	74.6
100503	14th Con Rd/Hyland Rd	75.0
100701	8th Con Rd/Ferris Rd	63.6
100801	9691-9th Concession Road	73.9
100802	9th Con Rd/Country Road No. 23	71.5
101201	Baten Rd/S. Malden Rd	74.6
101202	Baten Rd/Malden Rd	68.0
101401	Briton Rd/Country Rd No. 18	67.9
101402	Briton Rd/S. Malden Rd	57.5
101501	Brush Rd/Malden Rd	69.6
101502	Brush Rd/Malden Rd	72.3
	Brush Rd/Malden Rd	75.0
	Brush Rd/Malden Road	73.4
	Campbell Ave/Gesto Rd	71.5
	Coulter RD/8th Con Rd	74.5
	Coulter Rd/9th Con RD	69.9
	Coulter Rd/9th Con Rd	68.0
	Camard River Bridge	72.7
	Gesto Rd/Country Rd No. 12	56.3
	2211 Gesto Road	72.6
	14th Con Rd/Hyland Rd	74.1
	N. Malden Rd/Trembley Rd	85.0

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Inspection Reports

Thumbnail Image

Bridge Inspection Report

Hoople Creek Bridge

Solid Slab Site ID 02-423
County Road #2 Length 38.9
United Counties of SD&G Width 15.1
1.6 km West of County Road #12 Spans 3
Built 1957
Span Arrangement 11.7, 15.5, 11.7



Insp Date Thursday, August 11, 2011
Inspector Harold Kleywegt, P.Eng.
Assistant Nick Richardson
Weather Mostly Mixed Sun & Cloud with some Showers
Low/High 17 23

AADT 0 Lat 45.01126423
Lanes 2 Long -74.93903923
Skew 0
Orient E-W

Only Essential Tombstone Data

Component Inspection Information

Protected BSRC Deck (1) Defects 0.0%
Deck Top Damage 0.0%
Length 38.90 Maintenance None Partial Inspection
Width 15.10 Capital Rec. None
Diam. Deck covered with asphalt.
Height

Asphalt Wear Surf (1) Defects 0.0%
Wearing Surface Damage 0.0%
Length 37.90 Maintenance None
Width 13.50 Capital Rec. Repair in 5 years
Diam. Several wide transverse and longitudinal cracks, numerous areas of moderate to severe ravelling. Deterioration of asphalt at joints. Several small pot holes. PN Asphalt in poorer condition on WBL.
Height

Asphalt Wear Surf (2) Defects 0.0%
Apr Wearing Surface Damage 0.0%
Length 30.00 Maintenance None
Width 13.50 Capital Rec. None
Diam. Longitudinal and transverse wide cracks. Moderate ravelling, a asphalt disintegration at joints. PN
Height

Up to 6 Components per Page



Image Reports

Name Aultsville Creek.
Bridge 02-315

Inspection Images

Monday, August 22, 2011
Page 1 of 2

Image 1074



East approach

Image 1075



Upstream north

Image 1076



Downstream south

Image 1077



West approach

Image 1078



Soffit typ

Image 1079



East wall typ

Standard 6
Images per
Page

Available Option to Print 2
Images per Page

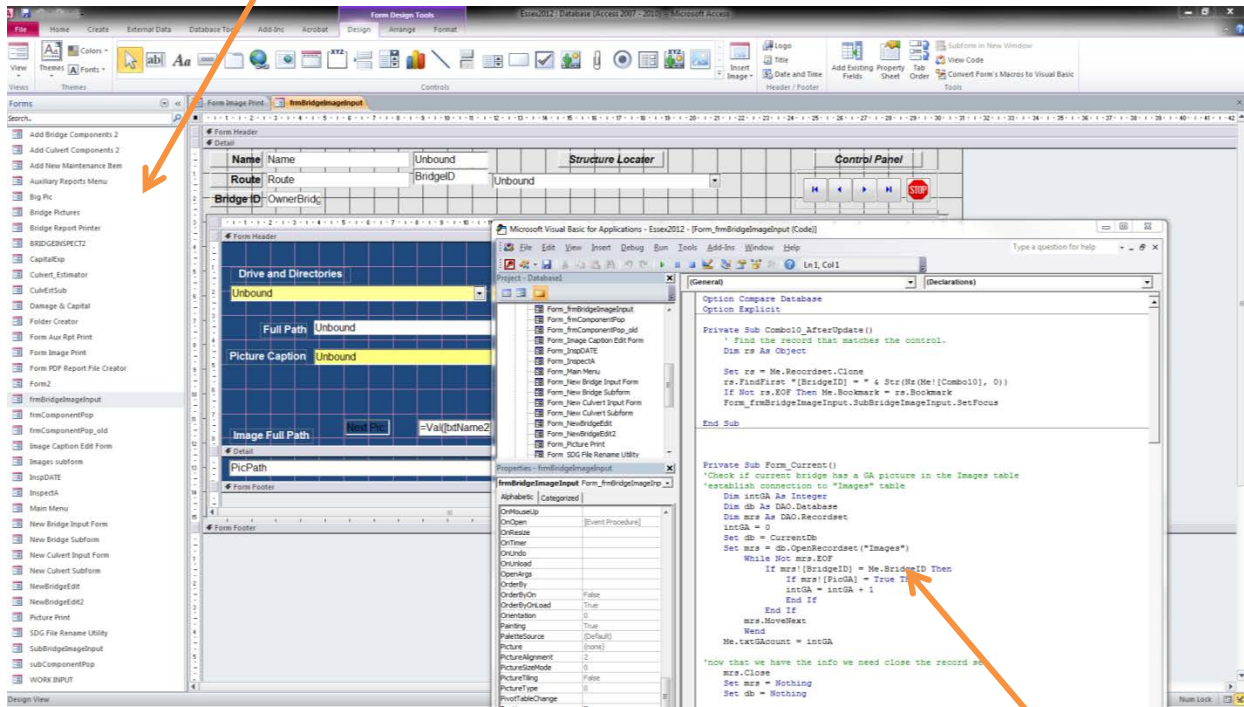
KBMS Demonstration

Inner Workings

Tables
Queries
Forms
Reports
Modules

Developed in MS Access 2010
& MS Visual Basic

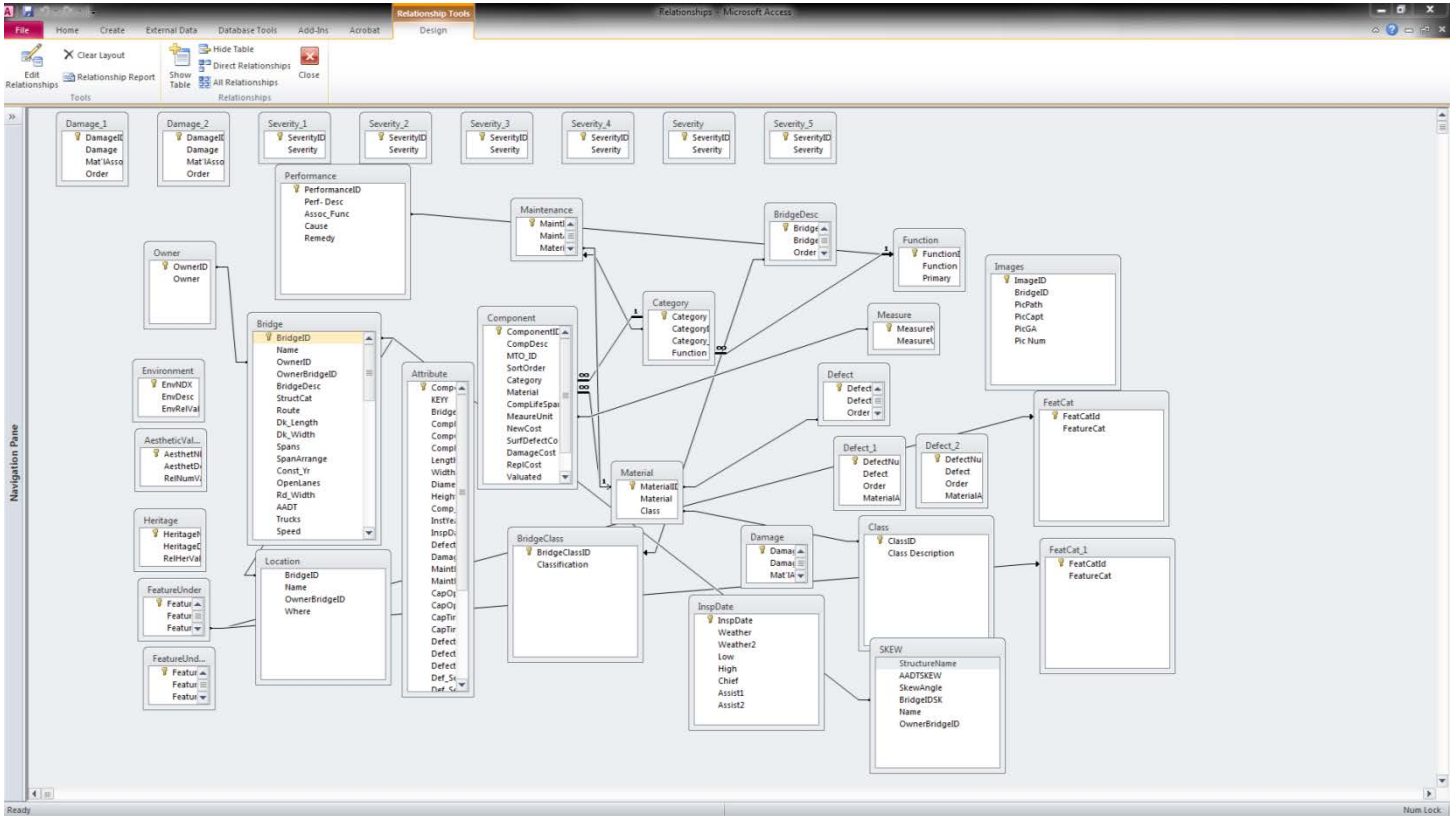
- SQL Compliant
- ESRI ARC-view Geo-database Compliant



Several Thousand
Lines of Visual Basic
Code



Table Relationships



Sophisticated Relational Database Architecture

- Efficient Data Handling
- Enables Complex Filtered Queries
- Upgradeable to more Sophisticated Database Platforms
- Easy Customization



Features Not Demonstrated

- **Ability to Print all Inspection Reports to a Single PDF File**
- **Choice of Single-Sided or Double-Sided Printing**
- **All Supplementary Reports can be Printed Individually or as a Single Batch to a PDF File**
- **All Forms & Reports can be Customized to suit Client Preferences ie:**
 - I. Font*
 - II. Colour*
 - III. Background*
 - IV. Text Size*
- **Endless Ad-Hoc Reporting Capability**
- **Can be Modified to Perform PSAB 3150 calculations**
- **Table Structure Easily Accommodates Descriptor Changes, ie “Pristine vs. Excellent”**

