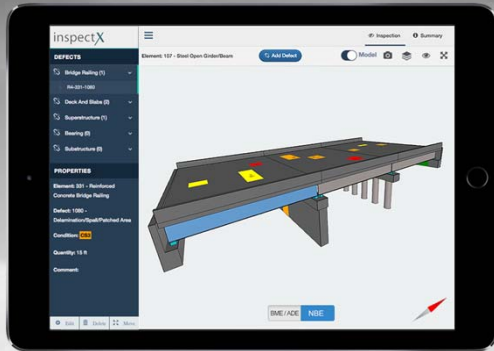


inspect X



3D Mobile Inspection of Bridges



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Managing Director
Bridge Intelligence

— Outline

- Background
- Element Level Inspection
- Current Practice for Bridge Inspection
- Problems
- Our Solution
- Software Walkthrough
- Conclusion

Background

1993: The FHWA Created A Task Force Charged With Developing The Commonly Recognized Elements (CoRe Elements)

1995: CoRe Was Adopted By AASHTO T-18

2010: New Element model was introduced (4 condition states, removal of smart flags and NBE, BME, ADE)

Starting 2015: In addition to NBI, each State and Federal agency should also provide element level bridge inspection data for bridges on the NHS to the FHWA. (MAP 21)

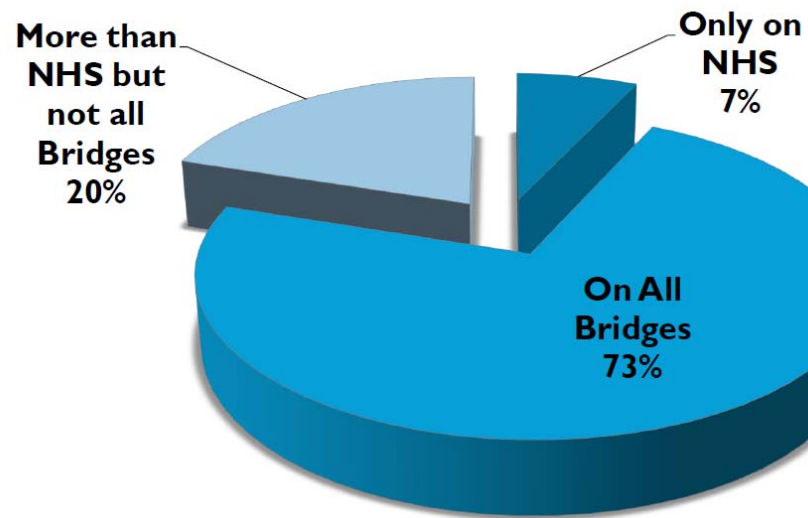


—— Advantages of Element Level Data

- More granular information about bridge comparing to NBI
- Improved bridge management decision-making through enhanced deterioration forecasting and bridge condition evaluation
- Enables the development and use of meaningful performance measures

State of Element Data Collection

Element Data Collection



* Based AASHTO 2016 Survey (43 states answered)

Current Practices for Inspection

Paper forms

A. ELEMENT RATING REPORT

DATE INSPECTED: 8/18/01 STRUCTURE NUMBER: 23043

LOCATION: RAMP TO I-65 NORTH

No.	Element Description	Unit	Total Qty	Quantities in Condition State				
				1	2	3	4	5
S.01	FOUNDATION	EA	1	1	0	0	0	0
Comments: 1 FOUNDATION BOLT								
S.02	ANCHOR BOLT	EA	0	0	0	0	0	0
Comments: 2 ANCHOR BOLT NUTS ON THE COLUMN EXHIBITED MODERATE CORROSION. LOCK WASHERS WERE OBSERVED ON ALL OF THE ANCHOR BOLTS.								
S.03	BASE PLATE	EA	1	0	1	0	0	0
Comments: THE BASE PLATE EXHIBITED LIGHT CORROSION ON APPROXIMATELY 30% OF THE SURFACE AREA.								
S.04	COLUMN SUPPORT	EA	1	0	0	0	0	0
Comments:								
S.05	COLUMN TO ANCHORAGE CONNECTION	EA	4	4	0	0	0	0
Comments:								
S.06	ANCHORAGE MEMBER	EA	4	0	4	0	0	0
Comments: ALL ANCHOR MEMBERS EXHIBITED LOSS OF GALVANIZED COATING WITH LIGHT CORROSION IN RANDOM AREAS COVERING APPROXIMATELY 40% OF THE SURFACE AREA.								
S.07	CHORD/ARM SPLICE CONNECTION	EA	4	4	0	0	0	0
Comments:								
S.08	SPAN TRUSS MEMBERS	LF	41	41	0	0	0	0
Comments:								
S.09	SIGN FRAME	EA	6	6	0	0	0	0
Comments:								
S.10	SIGN PANEL	SP	275	275	0	0	0	0
Comments:								
S.11	CATWALK	LF	36	36	0	0	0	0
Comments:								
S.12	LUMINAIRE	EA	3	0	0	0	0	3
Comments: THE PHOTO SENSOR WAS INACCESSIBLE. THE LUMINAIRES COULD NOT BE TESTED.								

CONDITION STATE DEFINITIONS:

1. Good Condition - The elements are in new or like-new condition with no significant deficiencies.
2. Satisfactory Condition - Minor damage, deterioration, or misalignment to the elements may be observed.
3. Fair Condition - Moderate damage/deterioration that does not significantly affect the element strength or integrity.
4. Poor Condition - Major or multiple defects that significantly impact the serviceability or integrity of the structure.
5. Critical/Unknown Condition - Any condition where the element has failed, or failure is imminent, or unknown.

COLLINS ENGINEERS, INC. Page 2 of 6 STRUCTURE NUMBER: 23043

Tablet based forms

Pad 9:59 AM 43%
Back B1000001

CHS&A

CONDITION

58 Deck	2
59 Superstructure	2
60 Substructure	6
61 Channel	3
62 Culvert	3
LOAD RATING AND POSTING	
31 Design Load	0
64 Operating Rating	99.9
63 Method Used	1
65 Operating Rating	1
70 Bridge Posting	5
66 Inventory Rating	91
67 Method Used	1
68 Inventory Rating	1
41 Open, Posted Or Closed	A

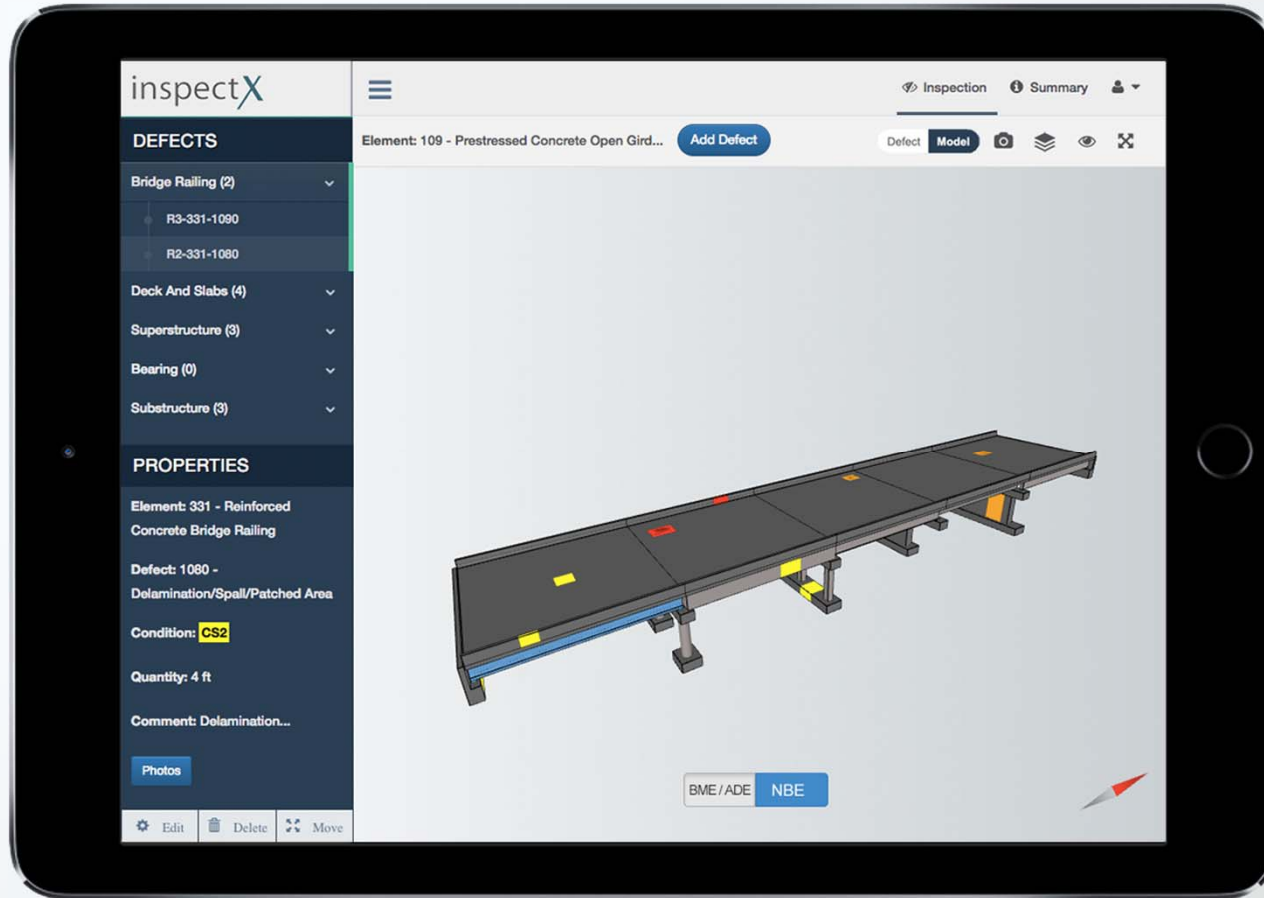
View Attached Files

Problems

- Inspectors have to carry inspection manuals and previous inspection reports
- Photos are saved and uploaded separately
- Extra time is required to manually enter data into BMS
- Significant time required for QA/QC
- Inspection process is inefficient
- Defect location data is not recorded

Only for paper
form Data
Collection

One-Stop Shop Solution: InspectX



—— Notable Features

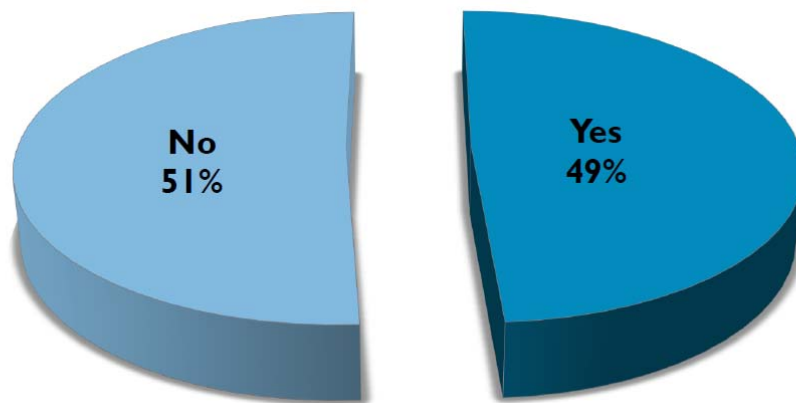
- Mobile bridge inspection
- State-of-the-art 3D visualization
- Defects with location and photo references
- Simple yet effective review feature
- Sync with existing Bridge Management Systems
- Offline/Online feature for inspection without internet connection

— Improvements to bridge inspection

- Carry forward previous bridge inspection report
- Digital reference of AASHTO Element Level Inspection Manual
- Defect information including photos are in one place
- Data can be synced with existing bridge management systems
- Reduce QA/QC review time
- Record defect location

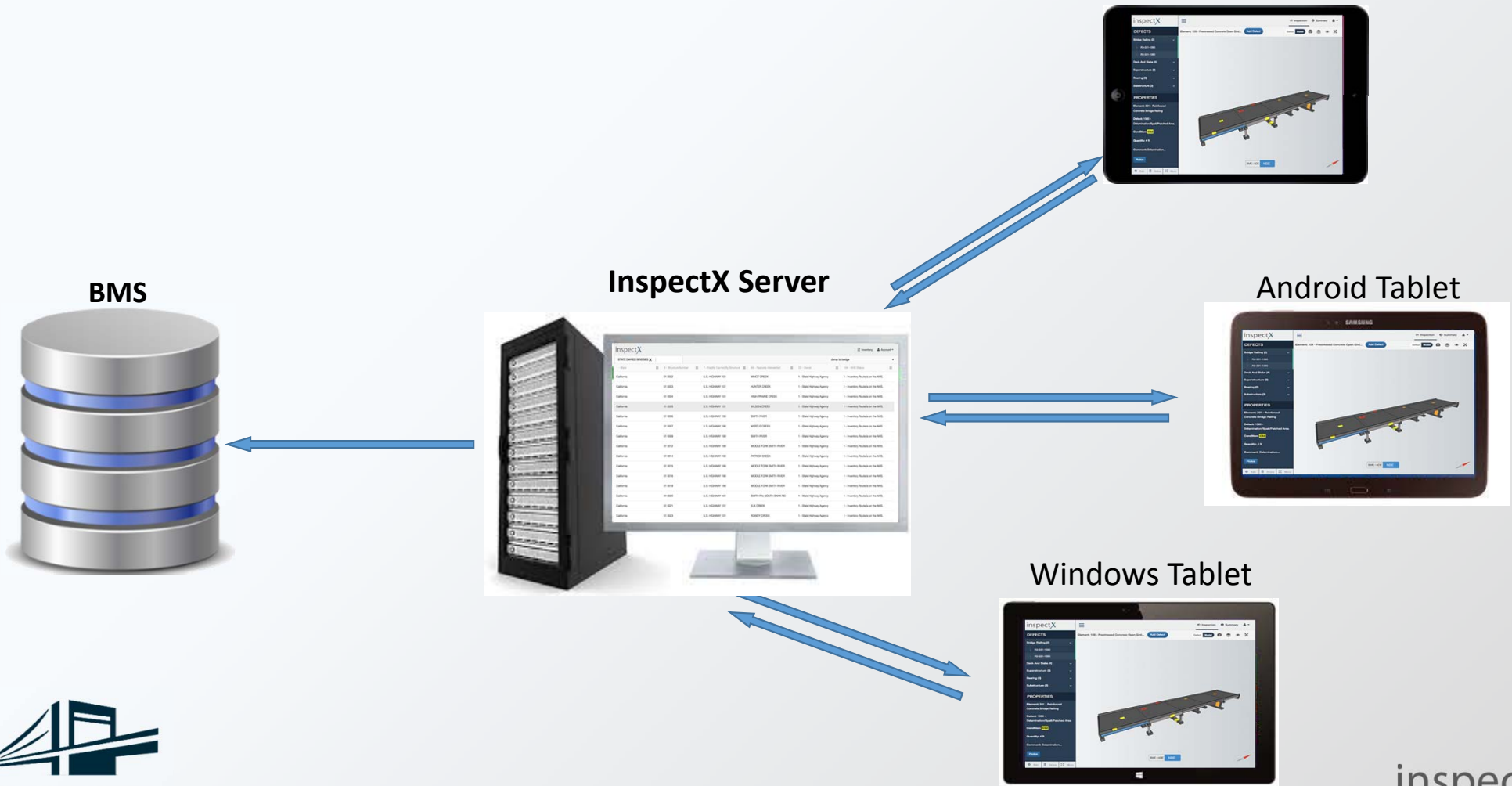
— Are states interested in 3D Mobile Inspection?

Interested in 3D Mobile Inspection?



* Based AASHTO 2016 Survey (43 states answered)

Framework



Live Demo

<https://www.youtube.com/watch?v=NJTylRU5tZU>

Conclusion

———— Benefits to Inspector

- User-friendly mobile application
- Lower learning curve in element inspection
- Reduction in inspection time
- Improvement in data accuracy
- Minimize redundant data entries

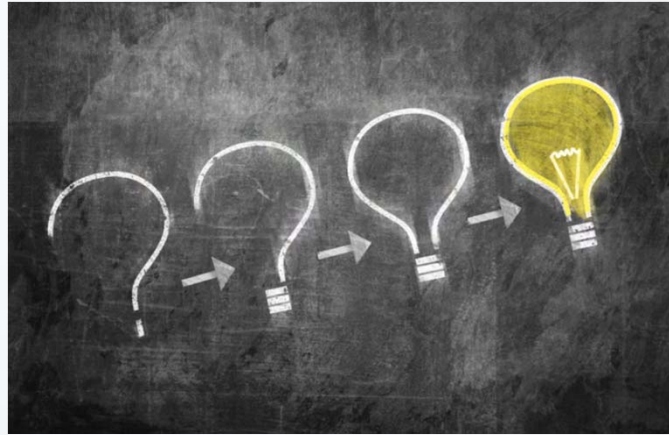
———— Benefits to State Agencies

- Maximize efficiency of inspection forces
- Reduction in inspection and training costs
- A more efficient review process
- Effective monitoring of bridge deterioration
- Everything will be digitally stored in one DB (Defects, Images, ...)
- Seamlessly synchronize with BMS
- Significant save of time for future inspection
- Accurate deterioration model based on detailed data
- Report accurate data to FHWA

Progression Of Deterioration



———— Questions?



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Request a Demo on our website.