



Number of clients: 11

Structures monitored: 28,912

Total number of users: 1,030





Contracted Year: 2008

Starting Bridge Population: 76

Current Bridge Population: 5132

Users: 142







Idaho Transportation Department

Contracted Year: 2008

Starting Bridge Population: 230

Current Bridge Population: 336

Users: 34







BridgeWatch at ITD





Lotwick Reese, P.E. July, 2014





Idaho Stream Gauging Locations







SNOTEL Sites in Idaho











Idaho Bridges

4,313 Bridges in Idaho

_

84% bridges are over water



What Types of Bridges are Monitored?

NBI Item 113 = 2 Scour Critical bridges based on observation. (49)

NBI Item 113 = 3 Scour Critical bridges based on calculation. (208)

NBI Item 113 = 6Bridges pending scour evaluation by consultant. (4)

NBI Item 113 = U Unknown Foundation Bridges determined to be high risk. (45)



Interesting Things about ITD BridgeWatch

We are one of the only states to use SNOTEL data.
Idaho is not well covered by Doppler Radar stations.
We develop all drainage basins, thresholds, recurrence intervals, and Plan's of Action in house.
We recently added a small drainage basin for a culvert in a burn area to monitor heavy rains for maintenance purposes.

Information for BridgeWatch

1. Develop drainage basin for bridge.

2. Locate SNOTEL and USGS sites within drainage basin.

3. Determine recurrence frequencies for SNOTEL, USGS, and Precipitation.

4. Determine recurrence frequency that will generate an alert.

1329733

BridgeWatch Alert Procedure

- I) Alert is evaluated for validity by cross checking data sources. USGS: most reliable, Doppler Radar: ok, SNOTEL: suspect.
- If valid, send local maintenance staff out to monitor bridge for settlement during high flow.
- ③ 3) Cancel alert and produce Supplemental BridgeWatch Report.
- ④ 4) Move up Underwater Inspection or wait for next one to determine the high flows effect on scour.
 ⑥ 5) Re-evaluate recurrence threshold.

Supplemental BridgeWatch Report

Record of conditions that caused alert.
Uploaded to BridgeWatch for historical reference
Used to communicate between Bridge/Maintenance

IDAHO TRANSPORTATION DEPARTMENT SUPPLEMENTAL BRIDGE WATCH REPORT DISTRICT NO. 6

BRIDGE KEY: 17870 STRUCTURE NO: 09320E 263.84 FEATURES INTERSECTED: PAHSIMEROI RIVER / US 93 LOCATION: AT ELLS, 17 N. CHALLIS

SUBSTRUCTURE: No onsite inspection.

CHANNEL: No onsite inspection

NOTES TO BAME: This alert was generated by USGS gauge 13302005 which reported a flow of 726 cft on May 27th at 7:00 AM (chart attached) exceeding the 50 year flow on this gauge of 720 cfs. On May 25th at 7:00 AM the gauge reported a flow of 622 exceeding the 25 year flow on this gauge of 620 cfs.

This bridge is scour critical by evaluation (NBI ITEM 113=3) and has no previously reported scour. An onsite visit at this time could do nothing more than confirm high flows. The USG5 site is within 50 f. of bridge so it is likely receiving high flows. There is a 60 month underwater inspection scheduled for 9-16-2014 and a routine inspection scheduled 10-23-2014.

I asked the local maintenance engineer (Ken Hahn) and have his staff take a look for obvious signs of settlement. They sent the pictures linked below. There does not appear to be any or the gauge at the Pahsimeroi Raver. Although historical gauge information (distanced below) shows that this is regular annual flow for the Salmon and the Pahsimeroi gauge is at a 10 year high.

The water appears to be receding as of 5/29/14. I will continue to monitor flows over the next week. I will add bridge to the watch list, when the scheduled underwater inspection occurs observed scour will be compared to previous reports.

MISCELLANEOUS ITEMS: None.

WORK ACCOMPLISHED: None.

MTCE RECOMMENDATIONS: None.



DATE: 5-29-14











IDAHO MANUAL FOR BRIDGE EVALUATION----SECTION 4: INSPECTION APPENDIX 4.9 SCOUR COMMITTEE ASSESSMENT FLOW CHART

Scour Committee Assessment Flow Chart (Continued) Bridges Exhibiting Scour



APPENDER 4.10 UNKNOWN FOUNDATION FLOW CHART

Unknown Foundation Bridges Risk Assessment Flow Chart





Thank you

Tennessee DOT

Contracted Year: 2003

Starting Bridge Population: 1100

Current Bridge Population: 1982

Users: 307







Tennessee DOT's Implementation

of Bridge Watch IM

A Program for Vionitering Scour Critical and Unknown Roundation Bridges

on Zirkle, P.B.



- 19,727 bridges in Tennessee
- 17,061 bridges are over water
- 820 scour critical bridges statewide
- 3/4 are located in west Tennessee
- Just under 50 percent are state owned
- 1000 unknown foundation bridges statewide
- Spread evenly throughout the state
- Approx. 85 percent are locally owned

Regions of Tennessee

HA1, hydrologic area 1

HA2, hydrologic area 2

HA3, hydrologic area 3

HA4, hydrologic area 4

TDOT Region Boundary
 Updated hydrologic area boundary (2001)

Previous hydrologic area boundary (1993)



HA4 HA2

Western Valley

Coastal Plain



HA2 HA

Sequatchie Valley

HA2

Central Basin

HA3

HA2

WRIR 03-4176





Scour critical bridges

- 100+ are set to USGS stream gages 3 criteria for alerts
- 20 are set to 10 year rainfall event
- Rest are set to NEXRAD radar 25 year
- Analyzed 400 state owned bridges

Unknown foundation bridges – set to NEXRAD

Plans of Action for all scour critical and unknown foundation bridges in place per FHWA requirement



Plans of Action

Bridge Design Plans, if available Tape measure with weight

Traffic Cones - Minimum of four (4)

A Barricade Tape Dispenser with serrated cutter

TDOT radio directory (State Personnel only)

Plumb bob Range Pole

A roll of Duct Tape

PUBLICATION DATE

30-May-10

Rev. 08-31-09	HIGH	WAY BRIDGE SCOUR		
BRIDGE ID NUMBER: (x) BRIDGE OWNER: (x) ROAD NAME: (x) CROSSING: (5) LATITUDE: (x) LONGITUDE: (x)	2008500051 REAKLEY COUNTY LD SR22 PRING CREEK BRANCH I 38.160M DEGREES V 88.54767 DEGREES	TYPE OF SUPERATEUCTURE	COUNTY: WEAKLEY ROUTE: 00050 SPECIAL CASE: 0 COUNTY SEQUENCE: 1 LOG MILE: 1.75 YEAR BUILT: 1950	
MAIN SPAN: CONCRET	E - STRINGER/MULTI-BEA	M OR GIRDER APPR. SPAN:	NOT APPLICABLE	-
ABUTMENTS: CONCRET BENTS: NOT APPL PIERS: NOT APPL	E FULL HEIGHT ABUTMEN ICABLE ICABLE	TYPE OF SUBSTRUCTURE -	ION	-
Bridge is scour critical;	bridge foundations de	scour evaluation -	iculated scour conditions. Monitor bridge in	-
What Initiated the Ca	ll-out inspection?	BridgeWatch Alert TDOT District or Loc: THP or Local Law En Other:	al Maintenance Personnel forcement Personnel	
Span movement Span movement Span movement Check dia Check for Check for emb Check for drift Check pier exp Span Check pier exp Span Check pier exp Span S	nt - horizontally as we placement / deflection plumb of piers or ben ankment erosion build-up on piers or i bosure, if possible, an ast bridge inspection	- all as vertically a long curb line, both bridg ts. bents d compare to previous insp report versus current field o	e rails and outer edge of bridge deck. ection conditions	
Closure is recomme County or City temporary me be property cito (2) Ci (3) Te (4) Ti (2) a TDOT brid	anded: with vehicle pulled ac Maintenance Person asures to warn motori sed and barricaded. letrict Maintenance Si ty or County Highway annessee Highway Pa DOT Regional Bridge DOT Regional Bridge Duid remain closed ur tge Inspection team.	ross road until bridge is se nel. Use Barricade Tape, tra ists to stay off of the bridge upervisor (if bridge is State y Maintenance Official (if b trol and/or local law enforce Engineer till the water recedes and a	cured and properly closed by District, file cones and/or traffic flares as until such time as the bridge may maintained) ridge is not State maintained) ment Officers as appropriate daylight visual inspection is made	
DUBLICATION DATE			_	
30-May-10	7	BRIDGE ID 92009590001	Page 1 of 2	2

Rev. 08-31-09	HIGHWAY BRIDGE SCOUR PLAN OF ACTION REPORT	TDOT TENN DEPT OF TRANSPORTATION
 The bridge inspe officials in establ prior to signing t The bridge can b units and they ar 	ction team will work with State District maintenance (lishing a detour route. Any bridge on the selected det he detour route. e re-opened only after a TDOT bridge inspection team e determined to be structurally stable.	or local highway maintenance tour route shall be checked n checks the substructure
CONTACT PERSONN	TELEPHO	ONE NUMBER:
COUNTY SHERIFF'S	OFFICE (731)	364-5454
HWY. CHIEF ADMINIS	STRATOR'S OFFICE (731)	364-2284
COUNTY MAYOR'S C	VFFICE (731)	364-5413
The report shall in as appropriate, pi acouring has occ COMMENTS:	nclude the date and time of the inspection, a brief sur hotographs of the bridge and stream channel measur urred, the report shall also be copied to Bridge Inspe	mmary of findings and, rements. If significant ction Headquarters.
Suggested List of Equip	pment to conduct the Inspection:	
Latest Bridge Inspectio	n Report	
Scour POA Report with	the above Checklist	

BRIDGE ID 92008590001

Page 2 of 2

A 1000 Foot Roll of yellow Polyethylene Barricade Tape printed with the following message: SAFETY HAZARD KEEP AWAY

Traffic Safety Flares - Minimum of four (4) or set of electronic warning flashers TDOT two-way radio (State Personnel only) and/or cellular telephone



- <u>Unknown foundation bridges</u> have an NBIS item 113 rating of U according to FHWA guidelines
- Majority have been in place 40 plus years
- No scour observed at these bridges and not deemed scour critical by calculation
- Have default threshold initially of 100 year flood frequency for monitoring
- Added to the system 2010



- Receive BridgeWatchTM alert by email, fax, and/or cell phone text message.
- Dispatch personnel within 24 hours to inspect bridge following items in Plan of Action.
- Notify TDOT Region Bridge Inspection of bridge status so alert can be terminated and notes entered.
- If bridge is closed then must have approval of TDOT Bridge Inspection prior to reopening.



Next Steps

- Add Emergency Services Routes (ESRs) in west TN for New Madrid seismic zone
 - Add almost 1800 bridges and overpasses
 - Utilize USGS products projecting PGA values to bridge site and compare with design values on file
 - Run simulations to identify weaker routes and/or bridge locations for repair or replacement
- Add approximately 1580 overhead signs
 - Add overhead and cantilever signs across the state
 - Utilize NWS wind products to see if design loads are exceeded or adverse directions occur at site

Iowa DOT

Contracted Year: 2005

Starting Bridge Population: 172

Current Bridge Population: 325

Users: 33







Using BridgeWatch to Monitor Road Overtopping















Iowa's Statewide LiDAR

- LiDAR Light Detection and Ranging
 - Creates a ground surface
- Cooperative Effort Between Iowa DNR, Iowa DOT & Iowa Dept. of Agriculture
 - USGS contract for statewide acquisition
 - Sanborn Map Company
 - LiDAR Accuracy
 - +/- 8" vertical
 - Cost = 8.5 Cents per Acre or \$3.1 Million
- Total Cost = \$5.8 Million (inc. high resolution photography, processing, web access, etc

INFRASTRUCTURE DATABASE

- Develop/Correlate Rating Curve at Vulnerable Highway Sites
- Capture Low Road and Low Beam Elevations
- Utilize BridgeWatch to Proactively Protect Traveling Public from Roadway Overtopping

It wasn't raining when Noah built the ark!

Dave Claman, P.E. Office of Bridges & Structures Iowa DOT david.claman@dot.iowa.gov



