BrM Tunnel Module

- BrM 5.2.3 will have a Tunnel Inspection Module
- This is in response to FHWA's new National Tunnel Inventory
- Why?

- There is now a Tunnel coding guide, the Specification for the National Tunnel Inventory (SNTI)
- All states with tunnels need to follow it.
- States need a place to store their tunnel data
- States need a way to submit their data to the FHWA.
- BrM got elected

History

- According to my memory
- Any resemblance to reality is purely coincidental

Back in Ought Six…

- FHWA was considering tunnel inspections for some time
- 2006 (or thereabouts) release of OneDOT
- Tunnel Inspection Software
- User defined elements
- Tunnel divided into user defined sections called panels
- Use FHWA style ratings, 1-9

- 2006, Big Dig (Boston) failure of roof panel caused fatality.

- FHWA's Tunnel role changed from advisory to regulatory

- By 2008 there was an FHWA advance notice of proposed rule making for tunnel Inspection

- Not sure when work on inspection manual begun
- ODOT involved in reviews
- I didn’t keep my reviews. Hoping it would go away?

- First version of the manual stayed with NBI rating style, 1-9.
- Initial language lacking—not much about tunnels in tunnel rating language
- Reviews reflected this
- Several iterations came out and were reviewed

Foreshadowing Alert

During this process, at an inspectors' conference in Oregon, one of our managers asked an FHWA Representative (publically) "Will we be able to store tunnel data in Pontis?"

The FHWA representative answered absolutely, positively, unequivocally NO!

- Finally, the tunnel coding manual was looking pretty good, almost ready for release.
- Someone had an epiphany.
- The tunnel manual should be set up just like the new AASHTO element manual.
- Junk everything, start all over.

New, Improved Tunnel Manual

- The new manual format was not terribly different from the current SNTI (Specifications for the National Tunnel Inventory)

- Unlike bridges, most elements not structural

- Originally, Elements Gone Wild. There was an element for the gas cap on the backup emergency generator.

- Structural element language taken straight from AASHTO Bridge Elements
- Again no tunnel specific language.
- Reviewers displeased, changes made
- 2012, manual 75% complete
- 2015 Manual released

Enter BrM

- Tacit assumption just put this stuff in BrM, despite earlier contrary opinion.

- Ran with this assumption for a long time.

- Finally the idea occurred that maybe, just maybe they should get in touch with the taskforce to determine feasibility

Hilarity Ensued

- FHWA SNTI items for Tunnels not a good match with NBI items for Bridges
- Can’t use same screens
- Can’t use same tables
- Can’t use BrM as it stands, need to add new module

Major Concerns for Taskforce:

Br in BrM stands for Bridge.

Do enough Users want tunnels to justify spending BrM money to put a tunnel module in?

And

Can you say “elicitation”?

10 states agreed to contribute

- Oregon
- New York
- Wyoming
- Alabama
- Kentucky
- Tennessee
- New Mexico
- Virginia
- Colorado
- Texas

Some of these states volunteered to participate in a Tunnel TRT to help Bentley.

Bentley original proposal

- Collect what's in the SNTI (no defects)
- Add a couple of other fields, such as inspector
- Only Routine Inspection recorded
- Generate FHWA XML submittal

TRT response: Nope we need more

- Ability to use Structure Units
- Add Defects as in Bridge module
- Inspection Screen to track dates, frequencies
- Work Screen for Maintenance needs
- Multimedia Screen

Bentley developed costs for these and presented them to the taskforce

With funds in elicitation + other funds scraped together Task Force can fund:

- Ability to use Structure Units
- Add Defects as in Bridge module
- Inspection Screen to track dates, frequencies

The others

- Work Screen for Maintenance needs
- Multimedia Screen

Are just too expensive this time. Maybe later.

TRT Reaction

Some states deem Work and Multimedia essential. So essential that

- Alabama
- California
- Idaho
- Oregon

Banded together to contribute enough service units to get these features into the product

So There!

Tunnel Module Delivered in 2 Phases

Phase 1

- All NTIS fields, Structure Units, Defects, Inspection Screen, will be able to create submittal for FHWA

Phase 2

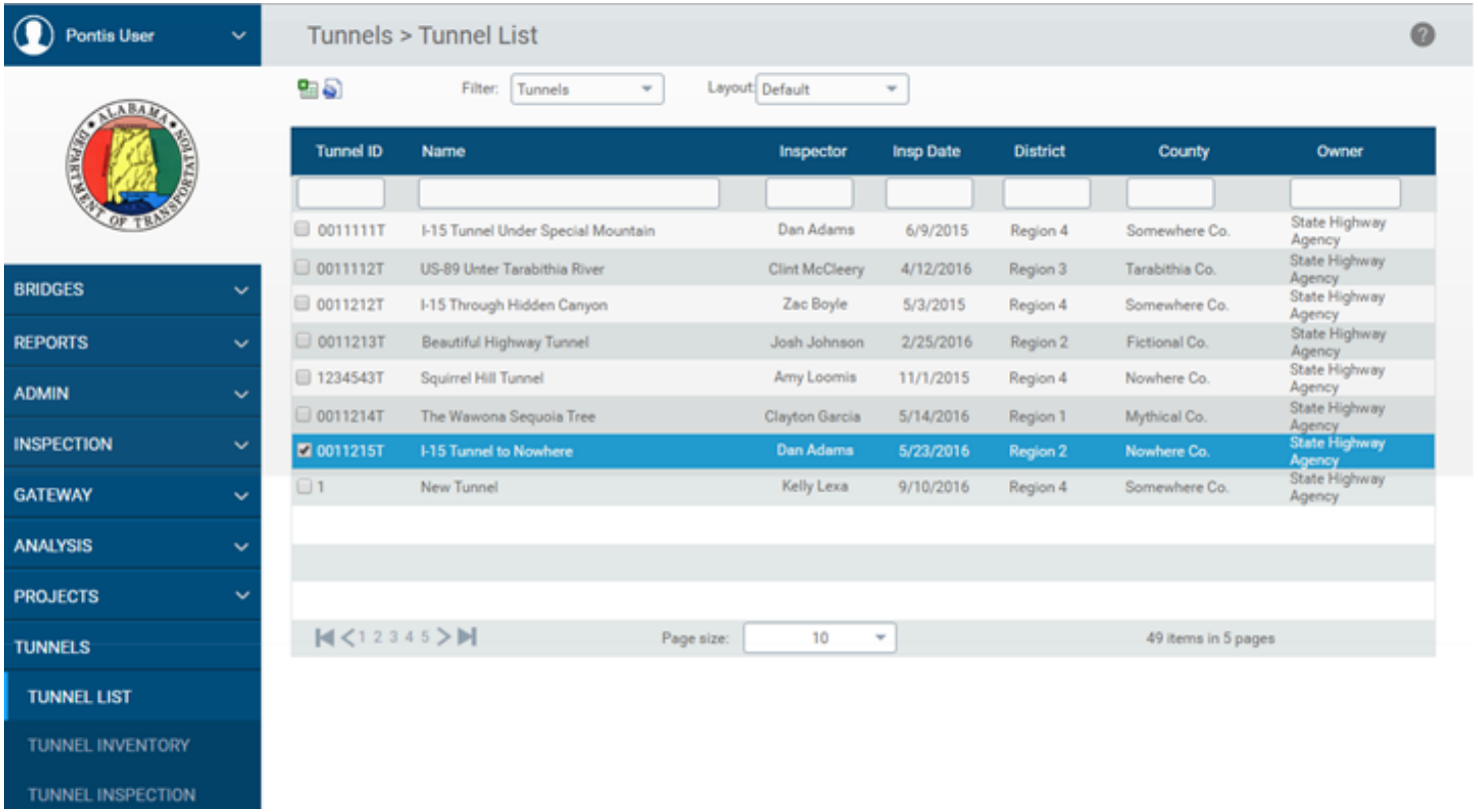
- Work Screen and Multimedia

- Phase 1 delivered with or within a month of BrM 5.2.3 release
- Phase 2 delivered 1 or 2 months after Phase 1, or longer….
- Depends on when TF and Bentley get requirements for phase 2 from the concerned states

Phase 1 Tunnel Module

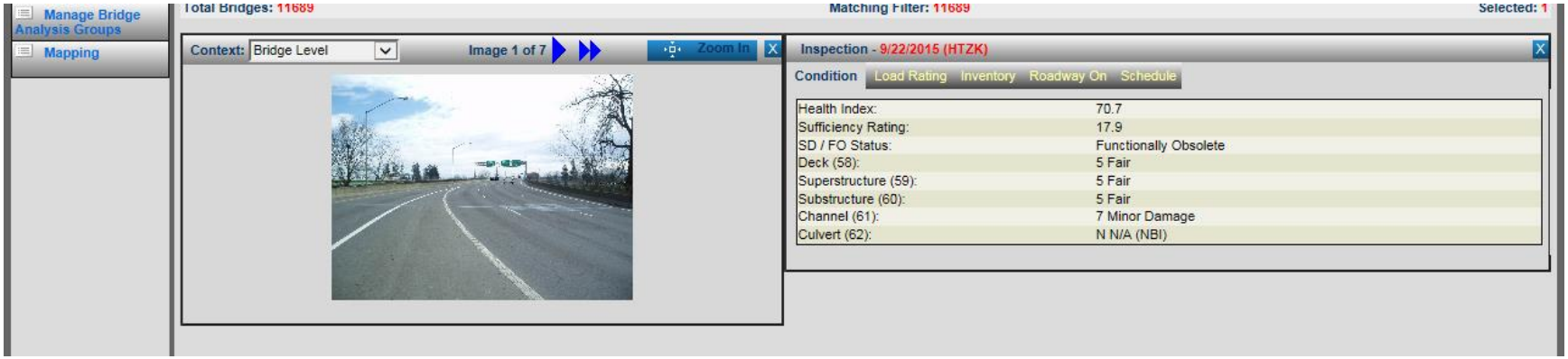
- Let’s take a peak.
- Screenshots courtesy of the Functional Design Specification
- i.e. I haven’t seen the real deal either.

Tunnel List


Pontis User
Tunnels > Tunnel List
BRIDGES
REPORTS
ADMIN
INSPECTION
GATEWAY
ANALYSIS
PROJECTS
TUNNELS
TUNNEL LIST
TUNNEL INVENTORY
TUNNEL INSPECTION
Filter: Tunnels
Layout: Default
Tunnel ID | Name | Inspector | Insp Date | District | County | Owner
0011111T | I-15 Tunnel Under Special Mountain | Dan Adams | 6/9/2015 | Region 4 | Somewhere Co. | State Highway Agency
0011112T | US-89 Unter Tarabithia River | Clint McCleery | 4/12/2016 | Region 3 | Tarabithia Co. | State Highway Agency
0011212T | I-15 Through Hidden Canyon | Zac Boyle | 5/3/2015 | Region 4 | Somewhere Co. | State Highway Agency
0011213T | Beautiful Highway Tunnel | Josh Johnson | 2/25/2016 | Region 2 | Fictional Co. | State Highway Agency
1234543T | Squirrel Hill Tunnel | Amy Loomis | 11/1/2015 | Region 4 | Nowhere Co. | State Highway Agency
0011214T | The Wawona Sequoia Tree | Clayton Garcia | 5/14/2016 | Region 1 | Mythical Co. | State Highway Agency
0011215T | I-15 Tunnel to Nowhere | Dan Adams | 5/23/2016 | Region 2 | Nowhere Co. | State Highway Agency
1 | New Tunnel | Kelly Lexa | 9/10/2016 | Region 4 | Somewhere Co. | State Highway Agency
1 2 3 4 5
Page size: 10
49 items in 5 pages

- Not really different from Bridge List
- Will be able to select, create, duplicate and delete tunnels
- Can build new layouts, filters with the same page you use for Bridge

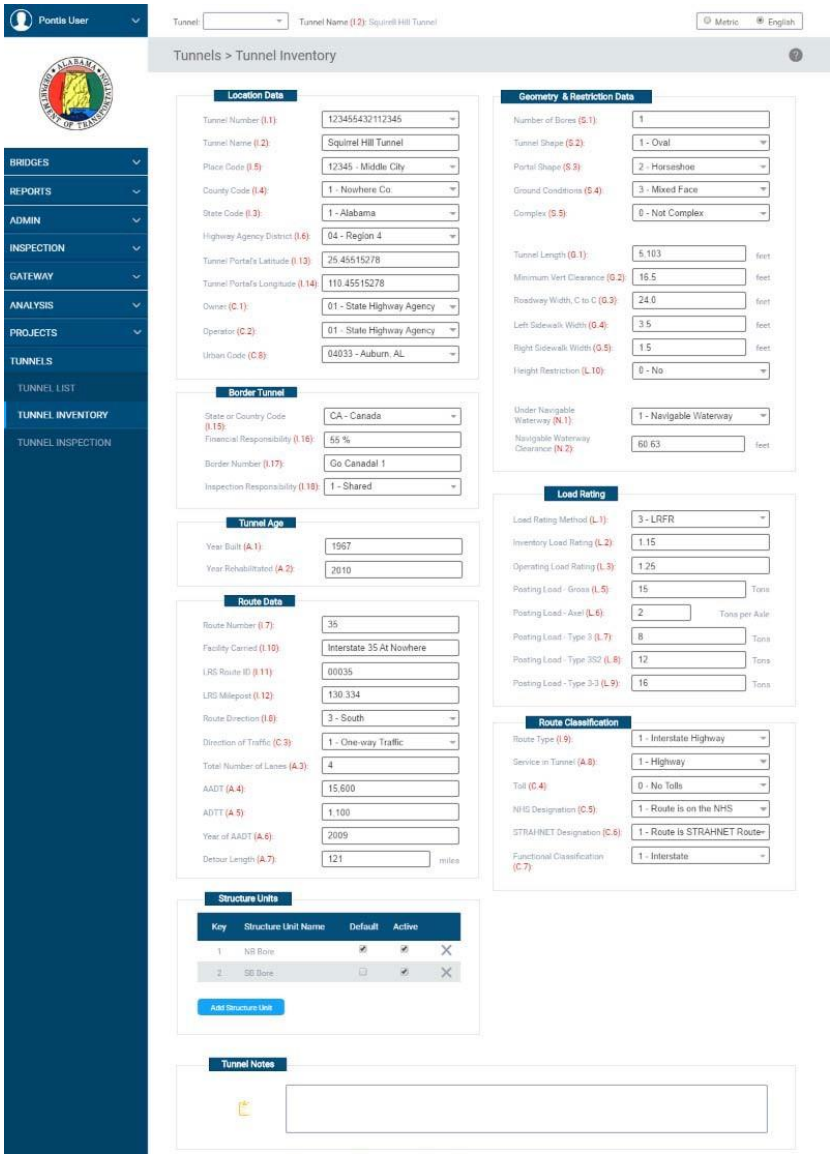
Not Included in Tunnel List



Also Not Included

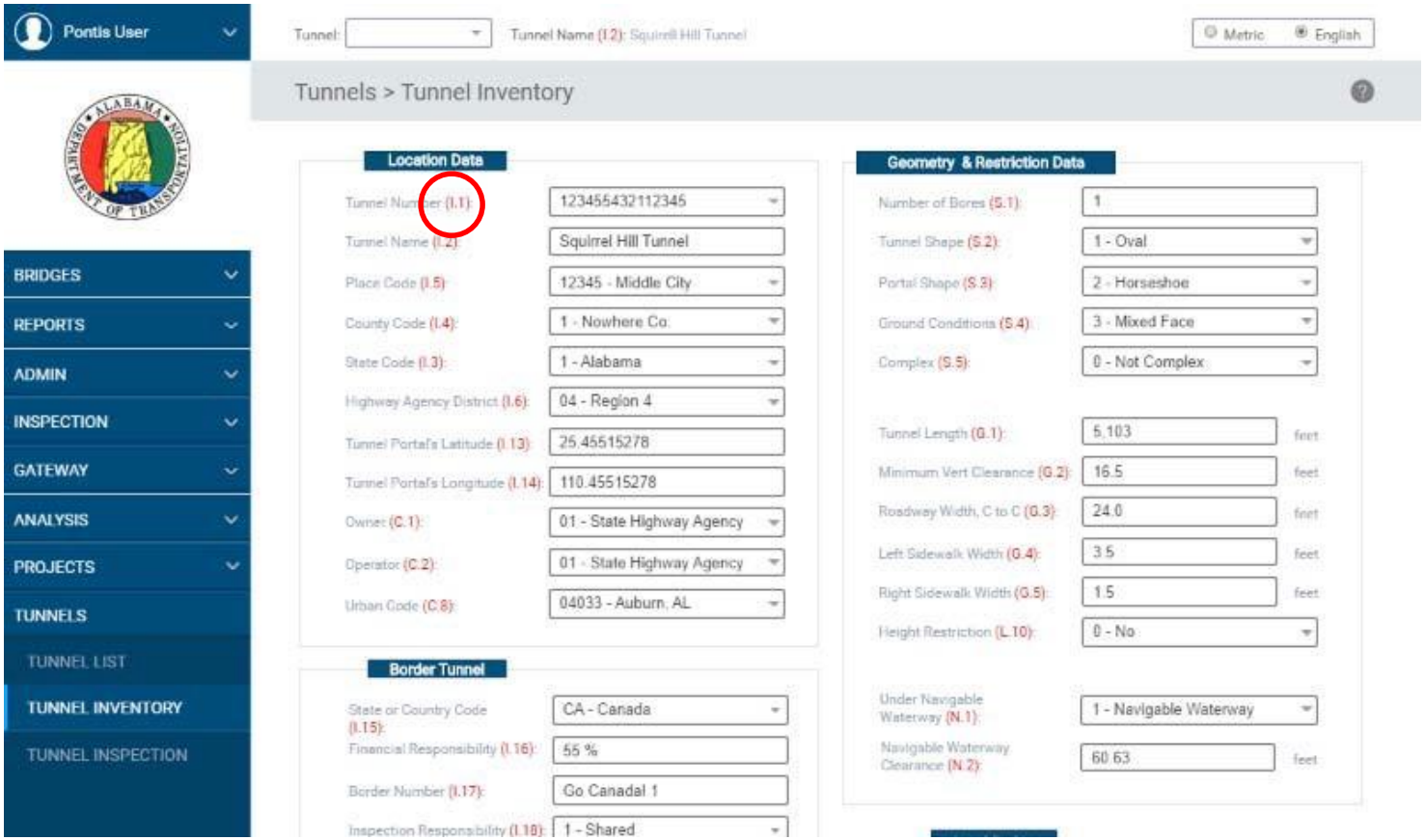
- No Sufficiency Rating (Well Duh)
- No mapping. May be added in the future
- No validation rules this time around. Not enough time.

Tunnel Inventory



- Items are arranged “logically” instead of by SNTI section.

- SNTI Section and Number displayed in parentheses like NBI item numbers in BrM


Pontis User
Tunnel:
Tunnel Name (I.2): Squirrel Hill Tunnel
Metric
English
Tunnels > Tunnel Inventory
BRIDGES
REPORTS
ADMIN
INSPECTION
GATEWAY
ANALYSIS
PROJECTS
TUNNELS
TUNNEL LIST
TUNNEL INVENTORY
TUNNEL INSPECTION
Location Data
Tunnel Number (I.1): 123455432112345
Tunnel Name (I.2): Squirrel Hill Tunnel
Place Code (I.5): 12345 - Middle City
County Code (I.4): 1 - Nowhere Co.
State Code (I.3): 1 - Alabama
Highway Agency District (I.6): 04 - Region 4
Tunnel Portal's Latitude (I.13): 25.45515278
Tunnel Portal's Longitude (I.14): 110.45515278
Owner (C.1): 01 - State Highway Agency
Operator (C.2): 01 - State Highway Agency
Urban Code (C.8): 04033 - Auburn, AL
Border Tunnel
State or Country Code (I.15): CA - Canada
Financial Responsibility (I.16): 55 %
Border Number (I.17): Go Canada! 1
Inspection Responsibility (I.18): 1 - Shared
Geometry & Restriction Data
Number of Bores (S.1): 1
Tunnel Shape (S.2): 1 - Oval
Portal Shape (S.3): 2 - Horseshoe
Ground Conditions (S.4): 3 - Mixed Face
Complex (S.5): 0 - Not Complex
Tunnel Length (G.1): 5,103 feet
Minimum Vert Clearance (G.2): 16.5 feet
Roadway Width, C to C (G.3): 24.0 feet
Left Sidewalk Width (G.4): 3.5 feet
Right Sidewalk Width (G.5): 1.5 feet
Height Restriction (L.10): 0 - No
Under Navigable Waterway (N.1): 1 - Navigable Waterway
Navigable Waterway Clearance (N.2): 60.63 feet

Almost everything on the inventory page is from the SNTI. Two exceptions. Here's one:

The other, Tunnel Notes. Basically the same thing as Structure notes for Bridges. Just a structure level note field to use as you wish.

Inspections

- FHWA model. One and only 1 inspection recorded, Routine.
- No new inspection created until next routine.
- i.e. Any information from special inspections after the last routine gets entered into the last routine.

- TRT didn’t like it

New Inspection

- This is very similar to the BrM 5.2.2/5.2.3
- Multiple inspection types available.
- Create a new inspection, all info from the previous inspection comes over
- That way, latest inspection has all data and latest data needed for the submittal.
- Agency can keep track of data for separate inspections, need not all be buried in routine.

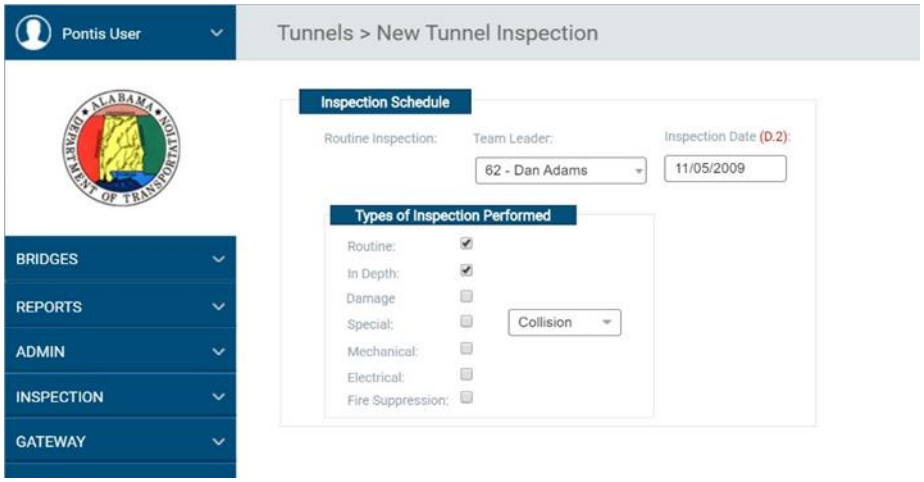
New Inspection

- Separate Mechanical, Electrical, Fire Suppression inspections not part of SNTI
- These would all be part of Routine Inspection
- TRT recognized may not be able to get all personnel on site at once, Routine may need to actually be multiple inspections.

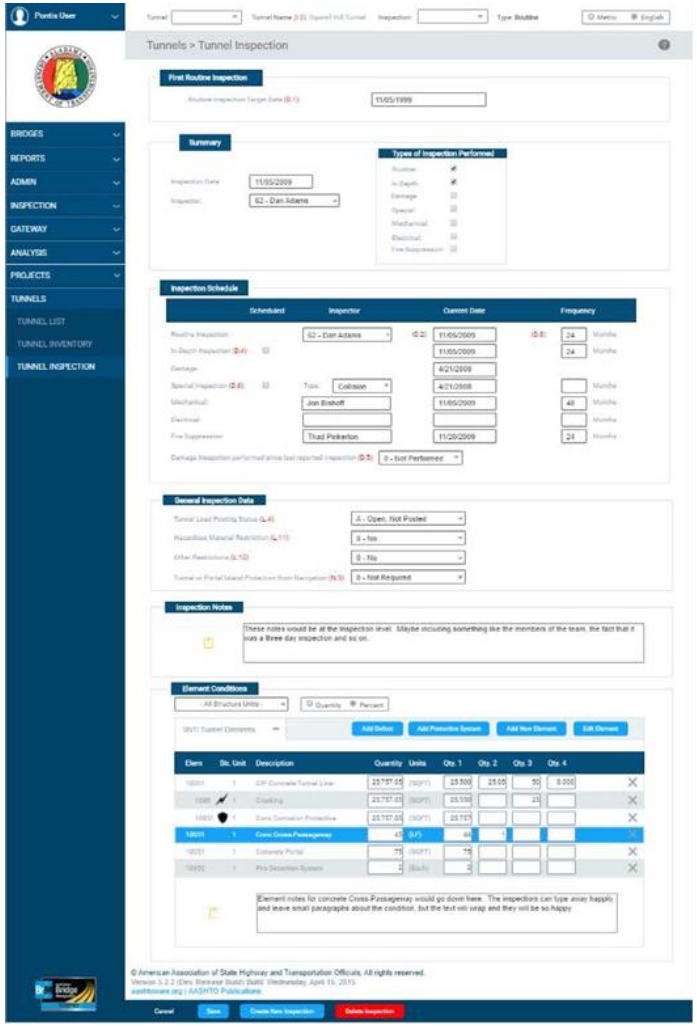
Create New Inspection

Similar To BrM

Check a box in the Types of Inspection Performed group, the date in Inspection date will be placed with the appropriate inspection when you click the create button



Tunnel Inspection



First Routine Inspection

Sorry for the quality. Stole this from the FDS

This is Routine Inspection Target Date at the top of the form

- Routine Inspection Target Date is an odd duck
- Date you **anticipate** you will inspect the tunnel using SNTI for the first time.
- May not agree with actual first inspection date
- Once entered, this date should NEVER change (unless you get special permission from FHWA)

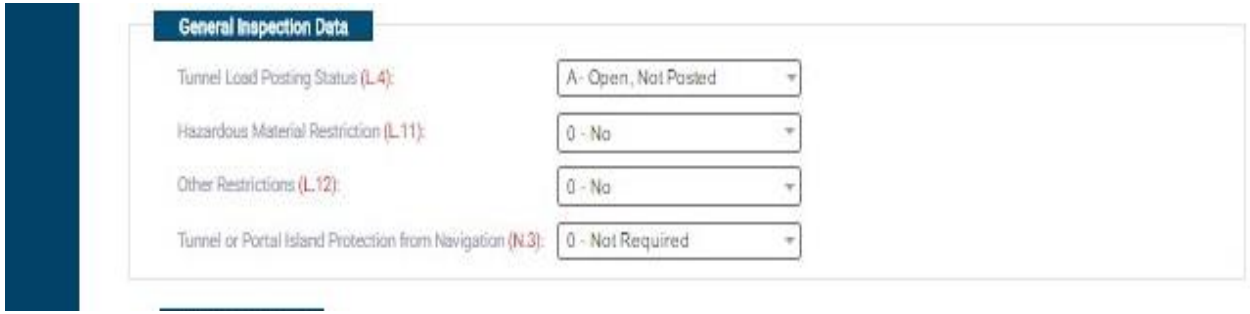
Summary Section

Pretty much a recap of the information on New Inspection Screen

Inspection Schedule

- Most of the fields in this group not NTI
- They are there to allow agencies to better track inspections, they will not be submitted to FHWA.
- Use ‘em if you want

General Inspection Data

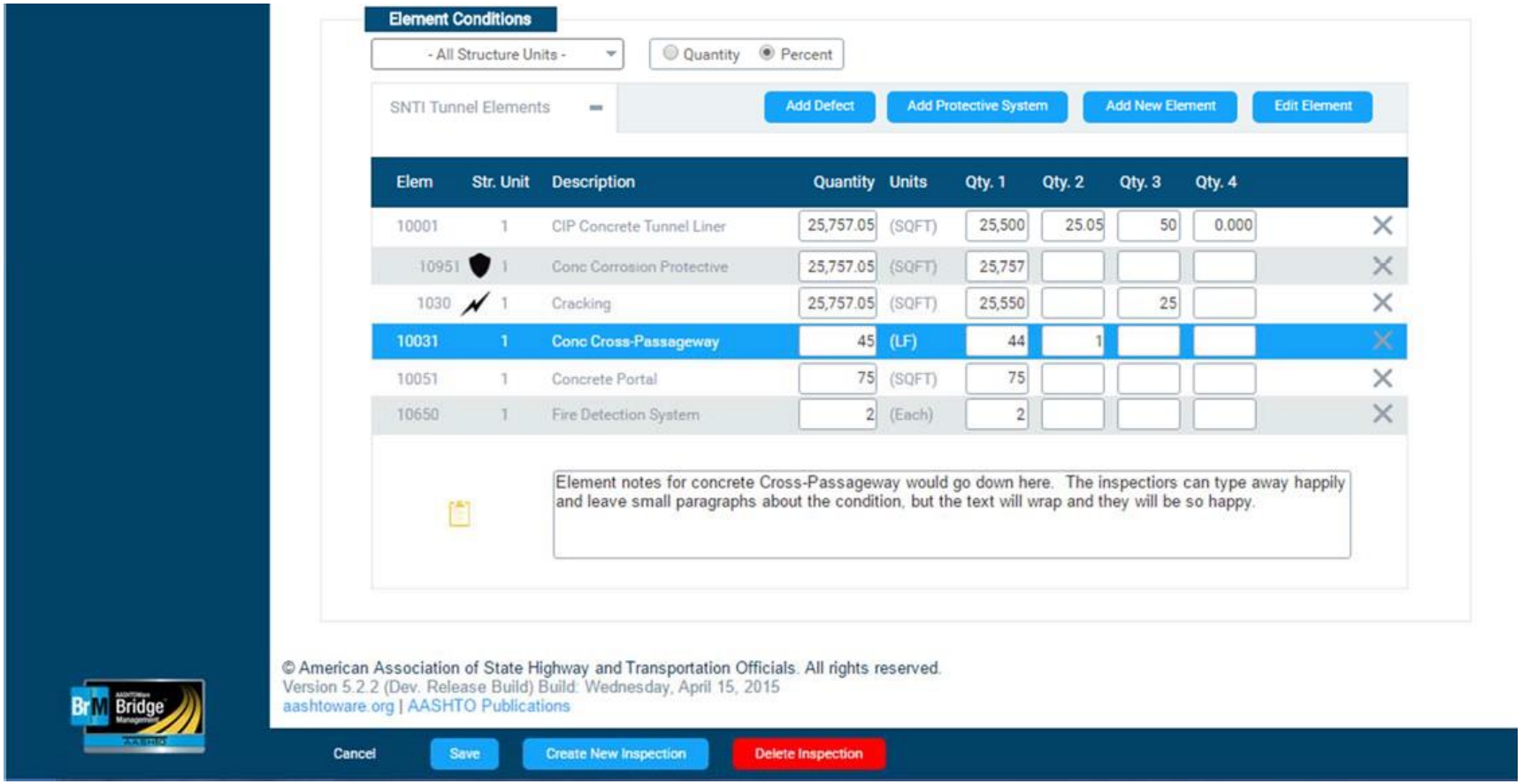


- These 4 fields all NTI
- My personal opinion is these should be inventory, not Inspection fields
- You may disagree

Inspection Notes

- General notes for the inspection
- Like Bridge inspection notes
- Use for whatever you want
- Not a NTI field

Element Condition



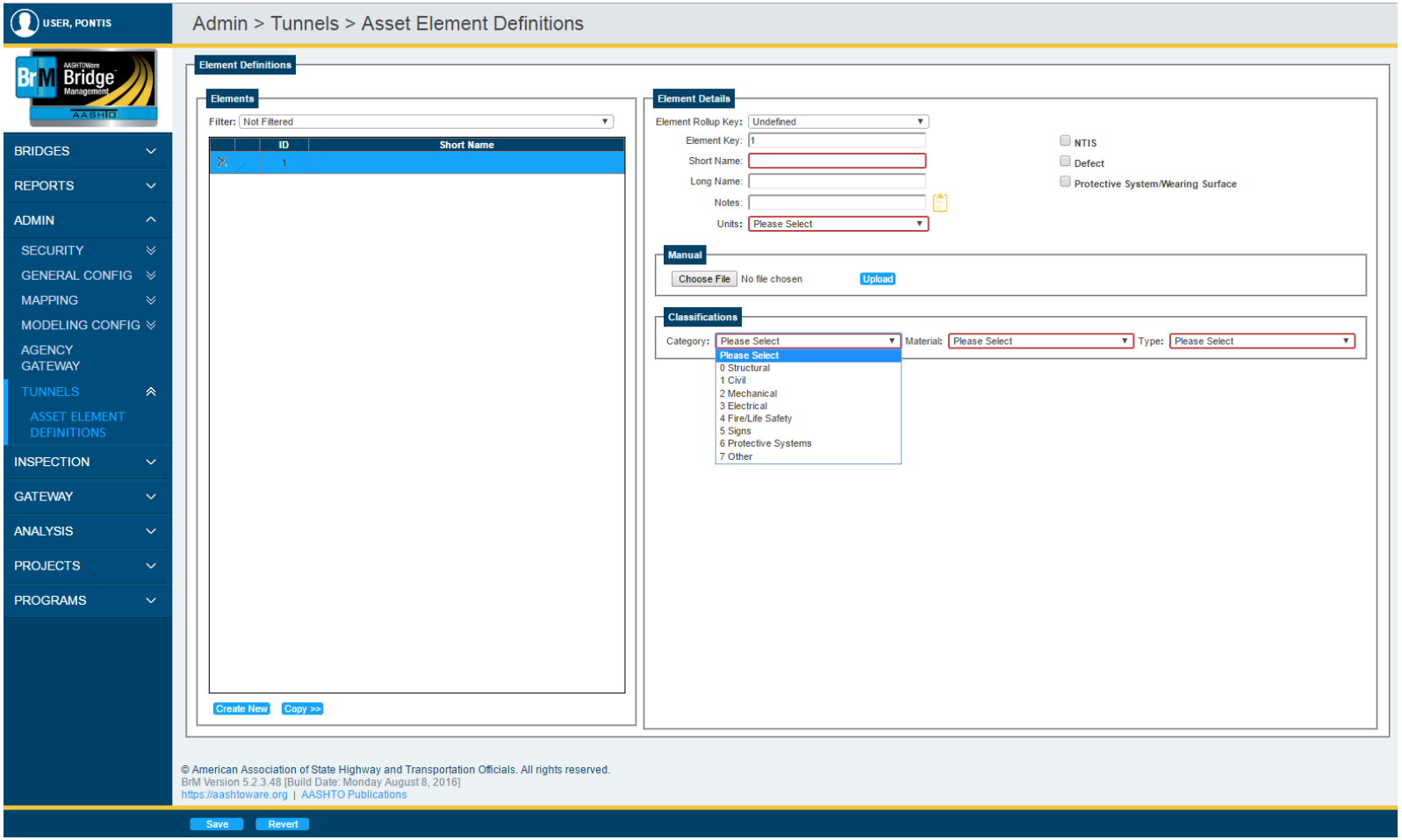
- Nothing to see here folks, move along.

- Pretty much a clone of the element part of the Condition Screen in Bridge

Admin Functions

- The Datadict for tunnels will be the same as for bridges. Same screen
- The screen for Element/Defect/Protective System linking will function identically to that used for bridges
- Will be able to import the XML submittal you generated in December for the FHWA to get your tunnels in the database
- Will do XML import, export. Will not do PDI import, export so no check in check out.

Element Definitions



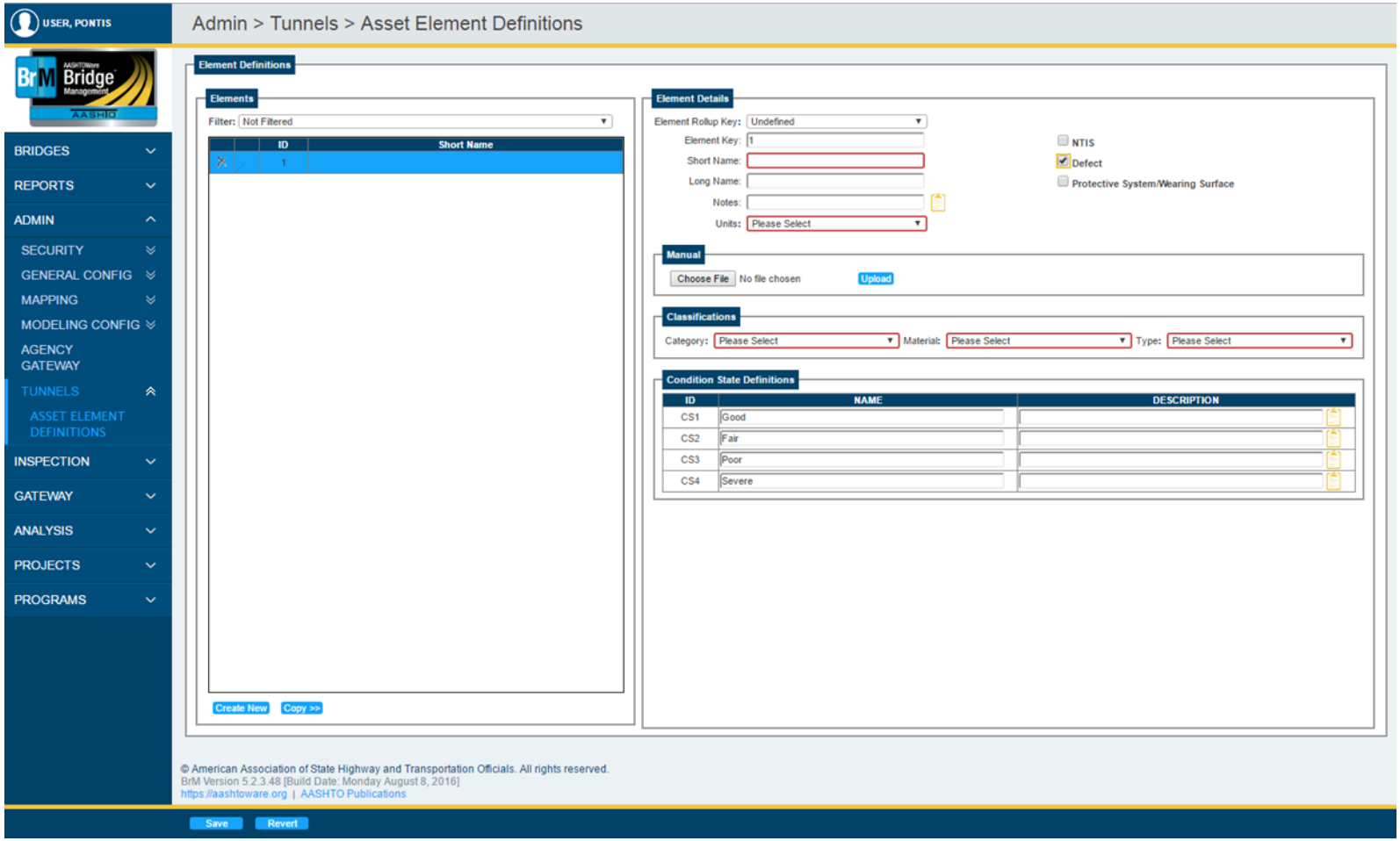
- Major difference between Tunnel and Bridge element definition screens is no modelling parameters for tunnels.

- All elements except defects are NTIS unless agency adds their own. So you can have an element that is both NTIS and is a protective system

- It is possible to roll agency elements up into NTIS elements, just like with bridges.

- Element Category looks like SNTI sections

Finally, With a Defect, you can define condition states, just like BrM



Questions?