VTRANS RAIL BRIDGE MANAGEMENT PROGRAM

prepared for the

HOUSE TRANSPORTATION COMMITTEE

on

WEDNESDAY JANUARY 15TH, 2014

BY

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RAIL BRIDGE MANAGEMENT PROGRAM

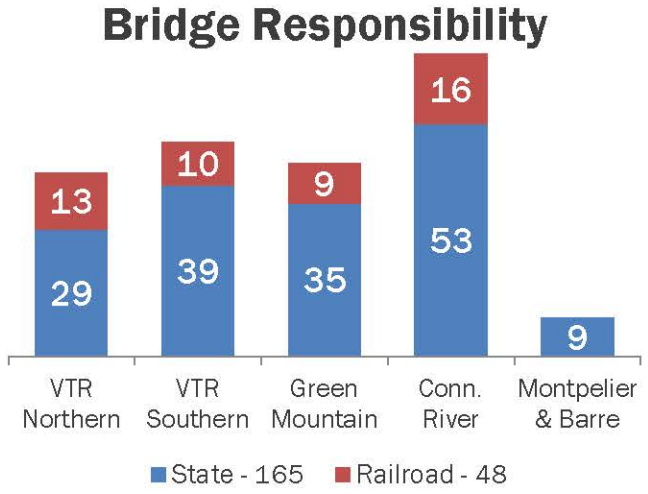
The FRA established Federal safety requirements for railroad bridges in 2010 under 49 CFR Part 237. VTrans established a Rail Bridge Management Program in September 2012 in accordance with these regulations. The program is responsible for collecting and maintaining an inventory of rail bridges, their condition, and making recommendations on repairs, strengthening or replacement of components or entire structures. These regulations also mandate that annual safetly inspections are performed for each bridge, and that all bridges have an initial determination of load capacity completed by September 2017.

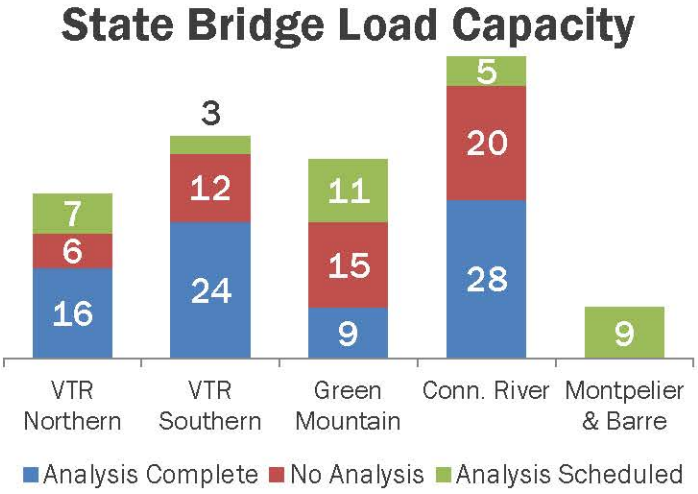
There are 213 rail bridges on State-owned property. The State is responsible for 165 of those bridges, with the railroad operator responsible for the remaining 48 bridges through existing lease agreements.

STATEWIDE BRIDGE INVENTORY

Summary:

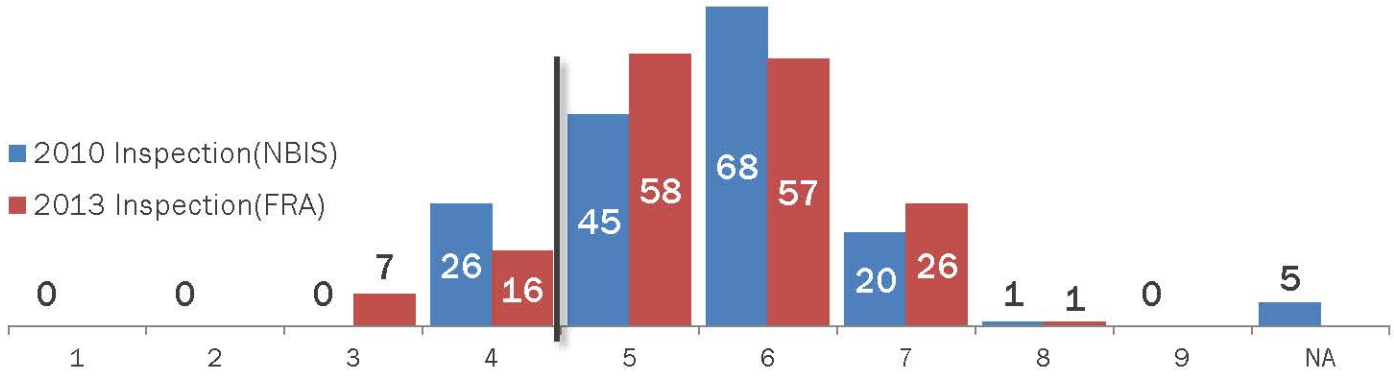
# Spans	1	2	3	4	5	6	7	8	9	10	11	**Total**
# Bridges	170	25	9	3	1	2	1	1	0	0	1	**213**





Based on 165 state-responsible bridges

STATEWIDE INSPECTION CONDITION RATING



Key:

1	2	3	4	5	6	7	8	9	NA
Failure Imminent	Critical	Serious	Poor	Fair	Satisfactory	Good	Very Good	Excellent	Not Accessible

VT RAIL BRIDGE INSPECTION FORM

Type

Form Version 1.1

Town		Br. Num		Mile Post		Feature Crossed	
Line Name		Branch		Superstructure		Substructure	
No. Spans		Struc. Len		Span 1 Len		No. Tracks	
Yr Built		Rennov.		Horiz. Track Alignment		Vert. Track Alignment	
Gauge		Deck Type		Inspector		Date Inspected	
Date Filled Out							

Bridge General

General	Cond.	Action	General	Cond.	Action
Action Under Load			Scour		
Approach Track			Erosion		
Track on Bridge			Channel		
Approach Ties			Catwalks		
Deck Ties			Handrails		

Miscellaneous Notes

Other - Please Describe	Cond.	Action
1.		
2.		

Abutment Conditions

	#1		#2	
General	Cond.	Action	Cond.	Action
Stem\Columns				
Wingwalls				
Backwalls				
Pedestals				
Bridge Seat				
Bearings				
Parapet & Capstones				
Pointing				
Footing				
Settlement				
Piles				
Pier Protection				
Cap Beams				
Top of stem/cap				
Dia. Bracing				

Girders or Trusses ☐ NA

Member/Element	Cond.	Action
Top Flange/Chord		
Bottom Flange/Chord		
Web or Diagonals		
Stiffeners or Verticals		
Pins		
Rivets or Bolts		
Welds		
Con. Pl., Gusset, Angles		
Top Lateral Bracing		
Bottom Lateral Bracing		
Cross Frames		
Bracing Struts		
Diagonal Bracing - Top		
Diagonal Bracing - Bot		
Portals		

Floor Beams ☐ NA

Elements	Cond.	Action
Top Flanges		
Bottom Flanges		
Webs		
Stiffeners		
Rivets/Bolts		
Welds		
Con. Plates, Guss., Angl		
Diaphragms		

Stringers ☐ NA

Element	Cond.	Action
Top Flanges		
Bottom Flanges		
Webs		
Stiffeners		
Rivets\Bolts		
Welds		
Con pl/Guss/Ang		
Diaphragms		

Culverts ☐ NA

Element	Cond.	Action
Barrel		
Head wall		
Cutoff wall		
Portals		
Footings		

FOR IMMEDIATE ATTENTION

Deck Condition	
Superstructure Cond.	
Substructure Cond.	
Overall Bridge Cond.	

Submit by Email

Rating Code Definitions

The purpose of the rating system is to ensure consistency in classifying structures with an appropriate code and to provide a corrective reaction for the identified condition. The rating system attempts to provide an overall understanding of a structure's condition and is based on an inspector applying appropriate condition rating codes. The following summarizes this relationship:

Condition Rating	Condition Description	Implied Reaction	Key
N	Not Applicable	---	---
9	Excellent	No Action	AA
8	Very Good	No Action	AA
7	Good	No Action	AA
6	Satisfactory	Improve Maintenance	BB
5	Fair	Periodic Maintenance	CC
4	Poor	Long Term Rehabilitation	DD
3	Serious	Intermediate Term Rehabilitation	EE
2	Critical	Short Term Rehabilitation	FF
1	Failure Imminent	Emergency Declaration	GG
0	Structural Failure	Replace Structure	HH

Key – Explanation of Double Letter Codes:

AA Continue to inspect structure on a one year cycle.

BB No rehabilitative measures are required for the next time the structure is to be inspected.

CC Structure's component(s) can be treated effectively or improved with accelerated maintenance procedures and/or replacement of structural component(s) to extend service life.

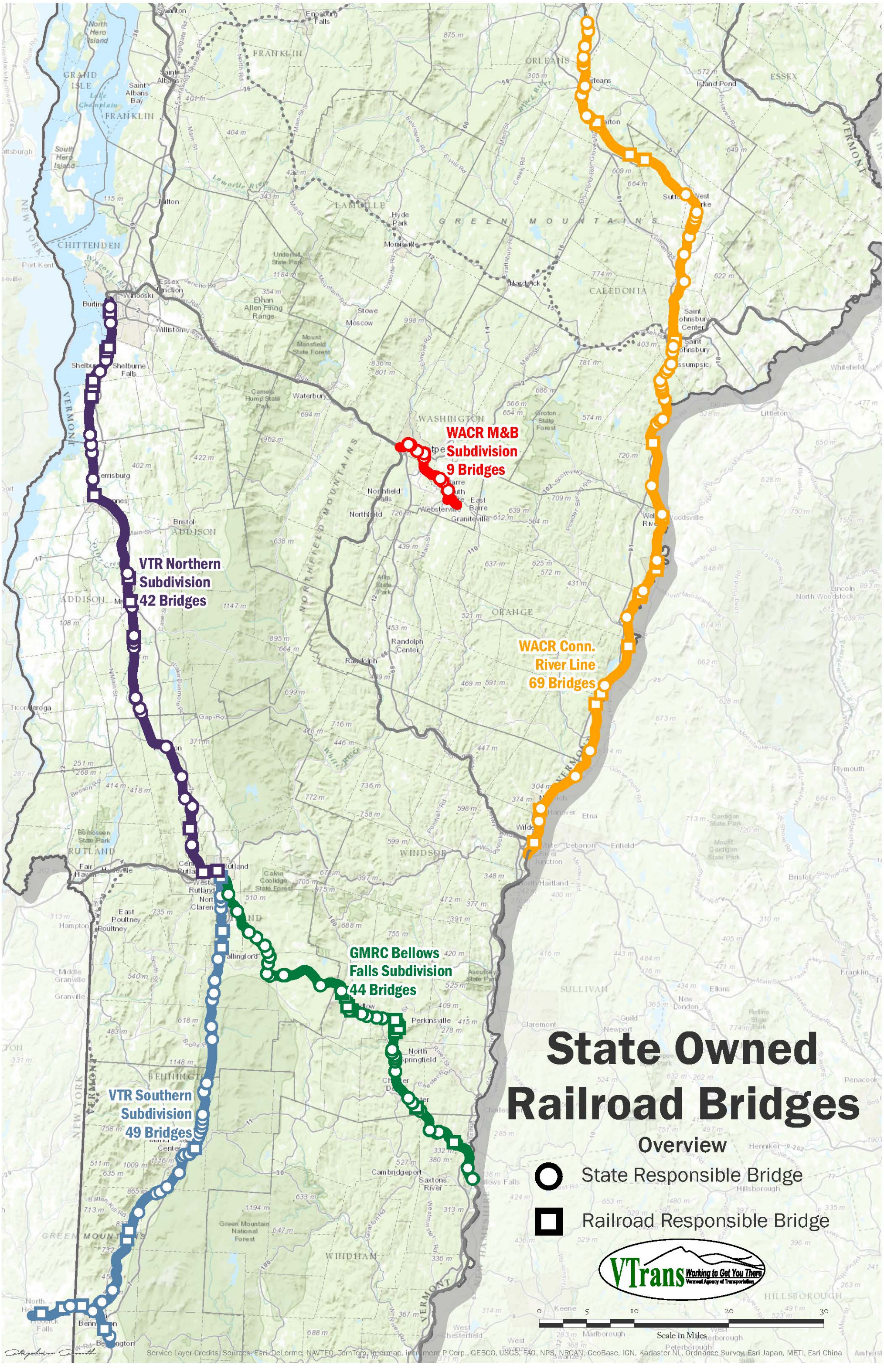
DD Structure listed in long term rehabilitation program for rehabilitation within the next five to ten year period.

EE Structure listed in intermediate term rehabilitation program for rehabilitation within the next two to five year period.

FF Structure listed in short term rehabilitation program for rehabilitation within the next two year period. Requires periodic monitoring of identified structural concern(s).

GG Immediate rehabilitation necessary.

HH Structure has failed and is to remain out of service pending reconstruction.


State Owned
Railroad Bridges
Overview
State Responsible Bridge
Railroad Responsible Bridge
VTrans
Working to Get You There
Vermont Agency of Transportation
Scale in Miles
0 5 10 20 30
WACR M&B
Subdivision
9 Bridges
VTR Northern
Subdivision
42 Bridges
WACR Conn.
River Line
69 Bridges
GMRC Bellows
Falls Subdivision
44 Bridges
VTR Southern
Subdivision
49 Bridges
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

VERMONT RAILWAY – NORTHERN

There are 42 Bridges on this line, 29 of which are the responsibility of the State.

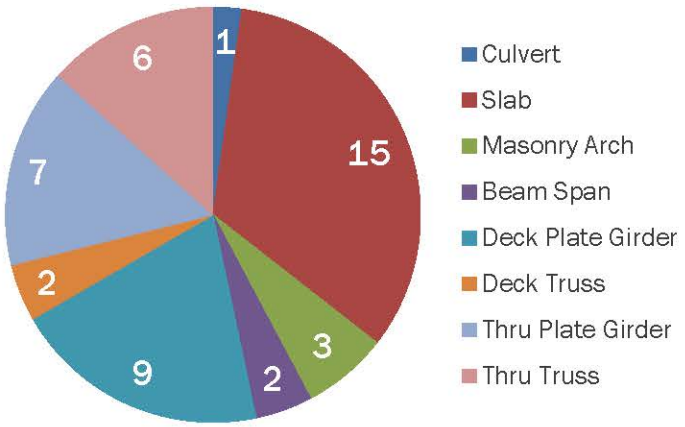
- All 29 bridges had an Annual Inspection during 2013.
- 7 Load Capacity Analyses are scheduled to be completed by 6/30/14.

INVENTORY

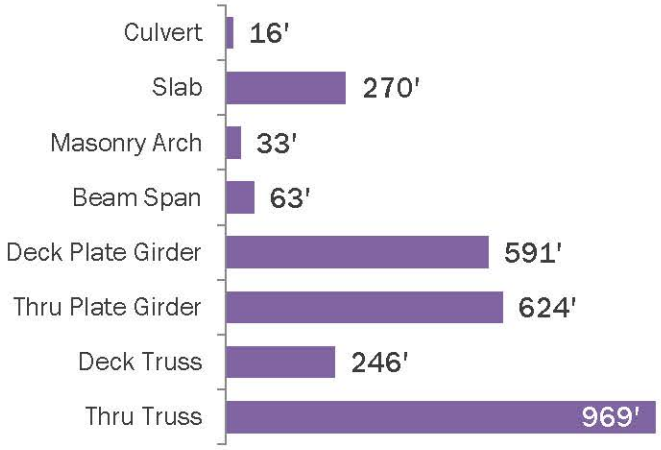
Summary:

# Spans	1	2	3	4	Total
# Bridges	18	7	3	1	29

Span Superstructure Types

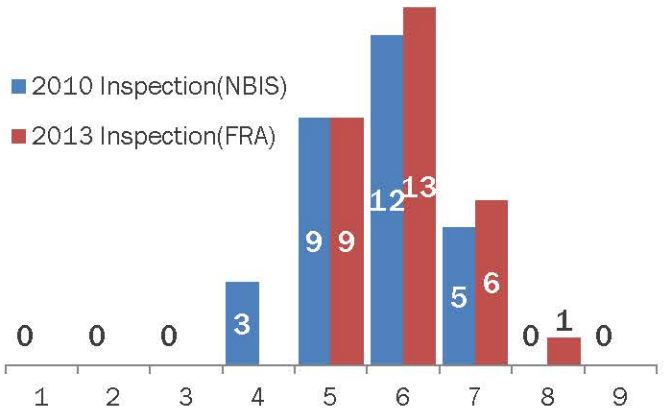


Superstructure Lengths

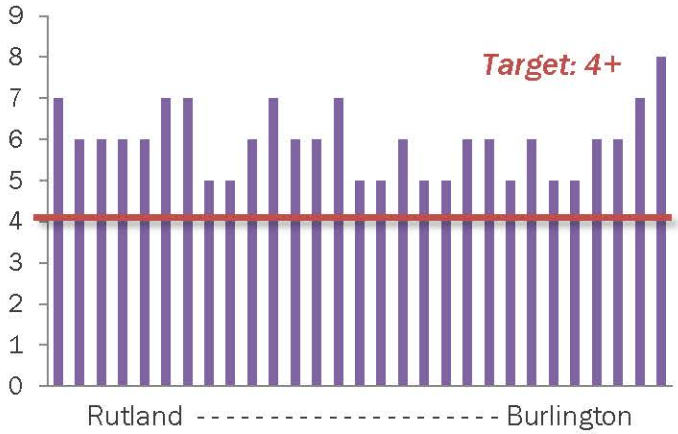


INSPECTION CONDITION RATING

Rating History



Rating by Bridge



VERMONT RAILWAY – SOUTHERN

For the purposes of this presentation, the VTR "Southern" is a combination of the B&R and Hoosick Subdivisions and the Bennington Branch.

There are 49 Bridges on this line, 39 of which are the responsibility of the State.

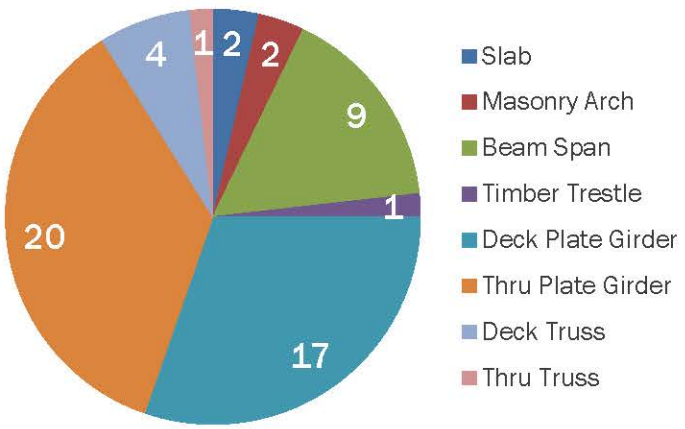
- All 39 bridges had an Annual Inspection during 2013.
- 7 Load Capacity Analyses are scheduled to be completed by 6/30/14. We have received 4 out of the 7 as of 1/14/14.

INVENTORY

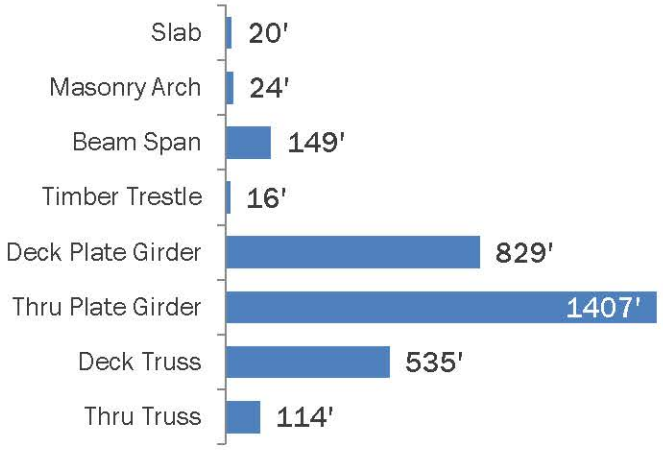
Summary:

# Spans	1	2	3	4	5	6	Total
# Bridges	31	5	1	0	0	2	39

Span Superstructure Types

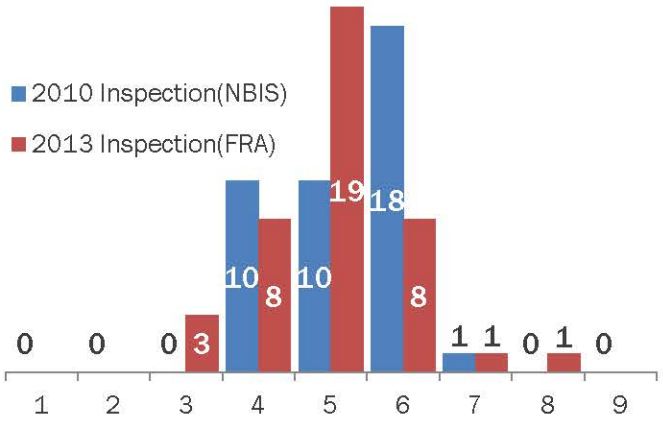


Superstructure Lengths



INSPECTION CONDITION RATING

Rating History



Rating by Bridge

GREEN MOUNTAIN

There are 44 Bridges on this line, 35 of which are the responsibility of the State.

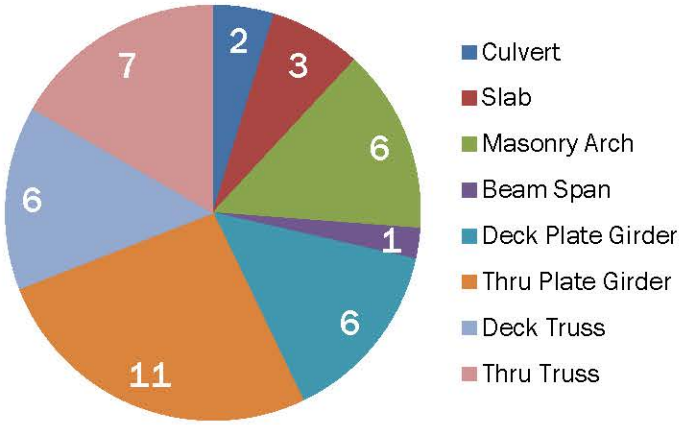
- All 35 bridges had an Annual Inspection during 2013.
- 11 Load Capacity Analyses are scheduled to be completed by 6/30/14.

INVENTORY

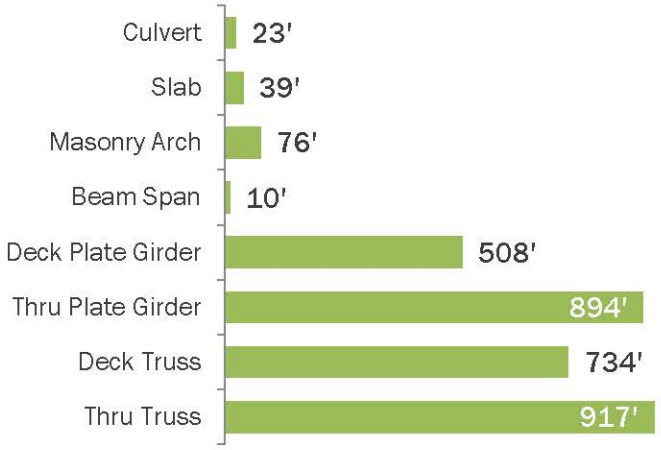
Summary:

# Spans	1	2	3	4	Total
# Bridges	30	4	0	1	35

Span Superstructure Types

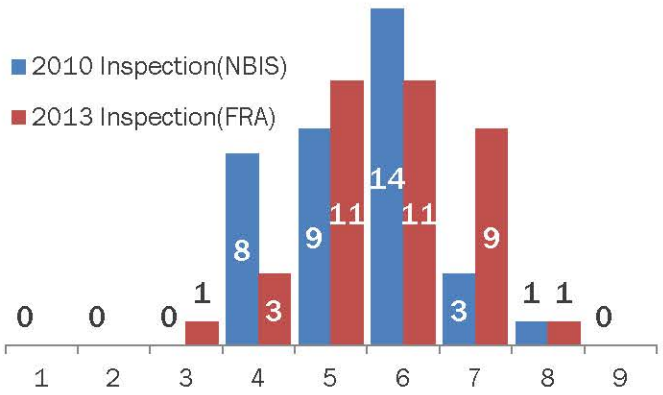


Superstructure Lengths

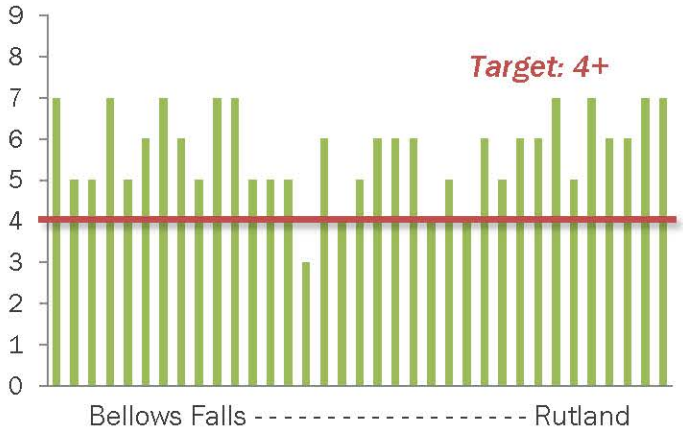


INSPECTION CONDITION RATING

Rating History



Rating by Bridge



WACR – CONNECTICUT RIVER

There are 69 Bridges on this line, 53 of which are the responsibility of the State.

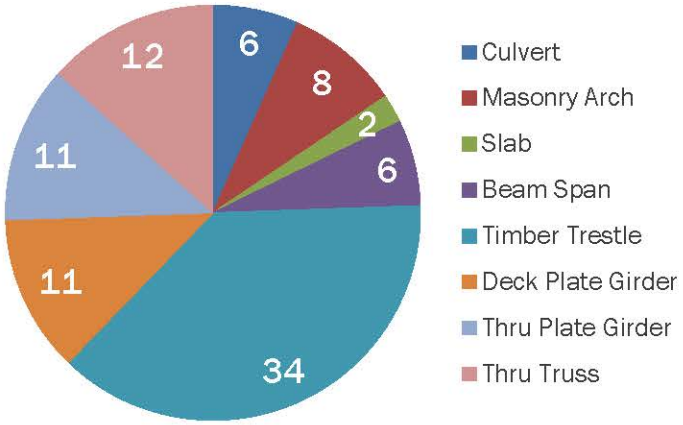
- All 53 bridges had an Annual Inspection during 2013.
- 4 bridges had an Underwater Inspection during 2013.
- 5 Load Capacity Analyses are scheduled to be completed by 6/30/14.

INVENTORY

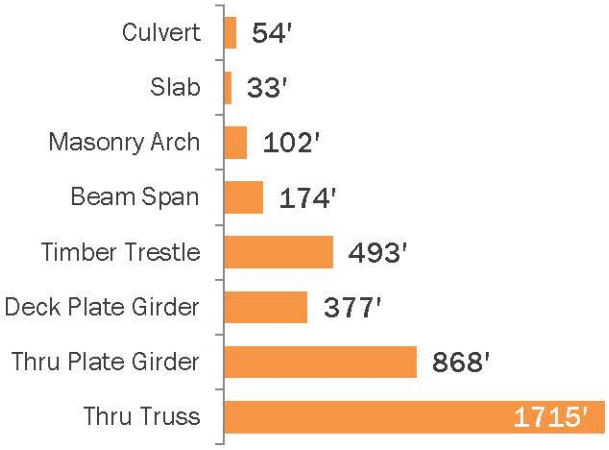
Summary:

# Spans	1	2	3	4	5	6	7	8	9	10	11	Total
# Bridges	42	5	1	1	1	1	1	1	0	0	1	53

Span Superstructure Types

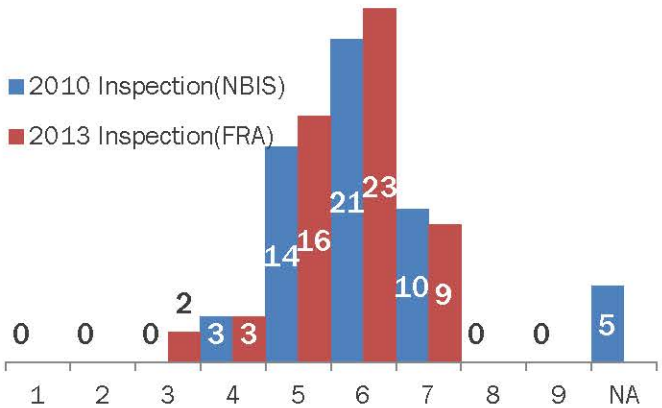


Superstructure Lengths

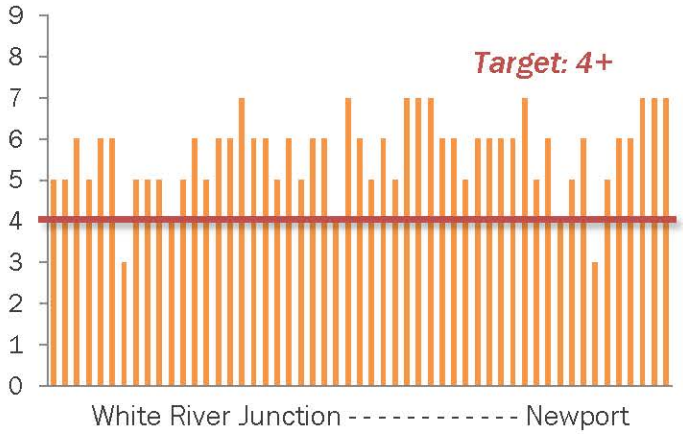


INSPECTION CONDITION RATING

Rating History



Rating by Bridge



WACR – MONTPELIER & BARRE

There are 9 Bridges on the WACR – Montpelier & Barre Line, all of which are the responsibility of the State.

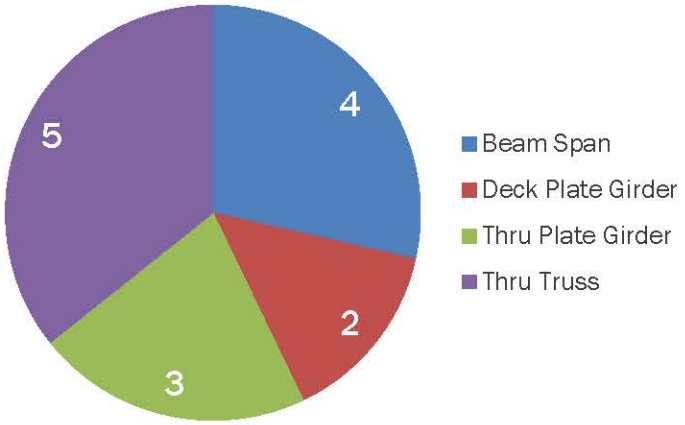
- All 9 Bridges had an Annual Inspection completed during 2013.
- All 9 Load Capacity Analyses are scheduled to be completed by 6/30/14.

INVENTORY

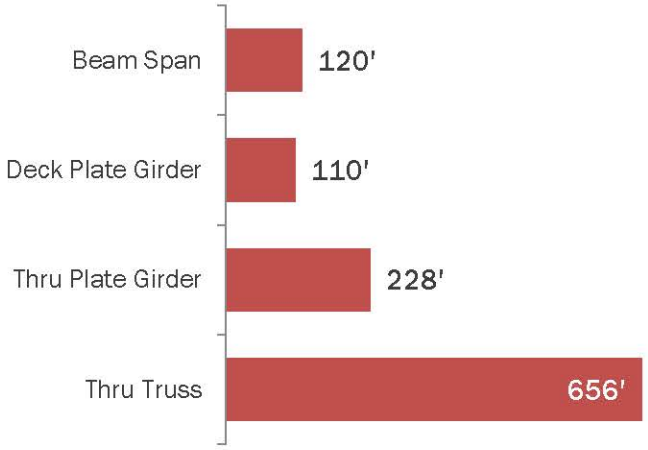
Summary:

# Spans	1	2	3	Total
# Bridges	6	1	2	9

Span Superstructure Types

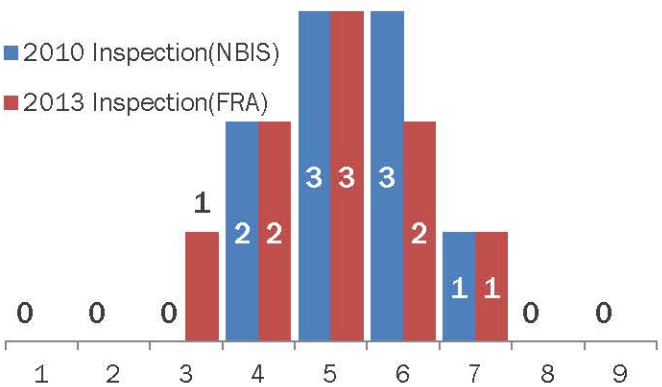


Superstructure Lengths

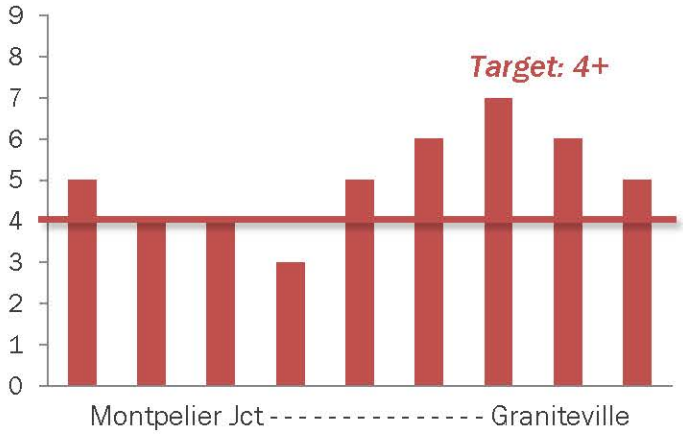


INSPECTION CONDITION RATING

Rating History



Rating by Bridge



STATEWIDE LOAD CAPACITY

Load Capacity Analyses have been performed on 77 of of our bridges.

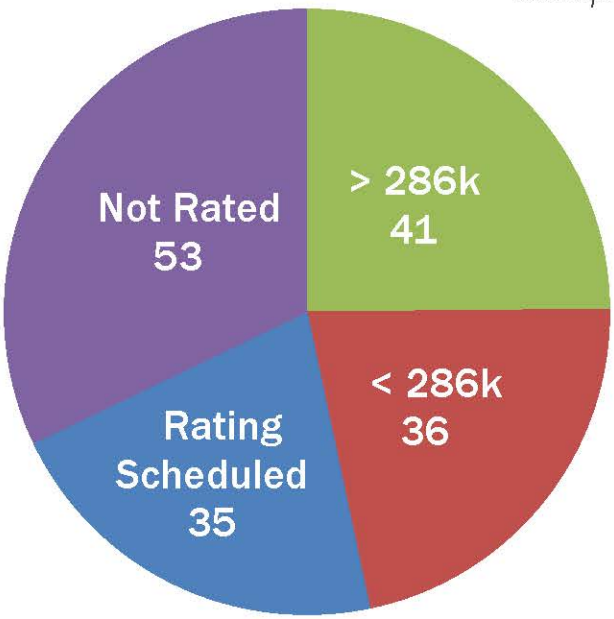
An additional 35 are scheduled to be completed by 6/30/14.

The remaining 53 are required to be complete by September 2017.

Results from Annual Safely Inspections, or In-Depth Inspections, may require updated Load Capacity Analyses be performed as prescribed by a Railroad Bridge Engineer.

LOAD CAPACITY ANALYSIS

Corresponds to map on the next page



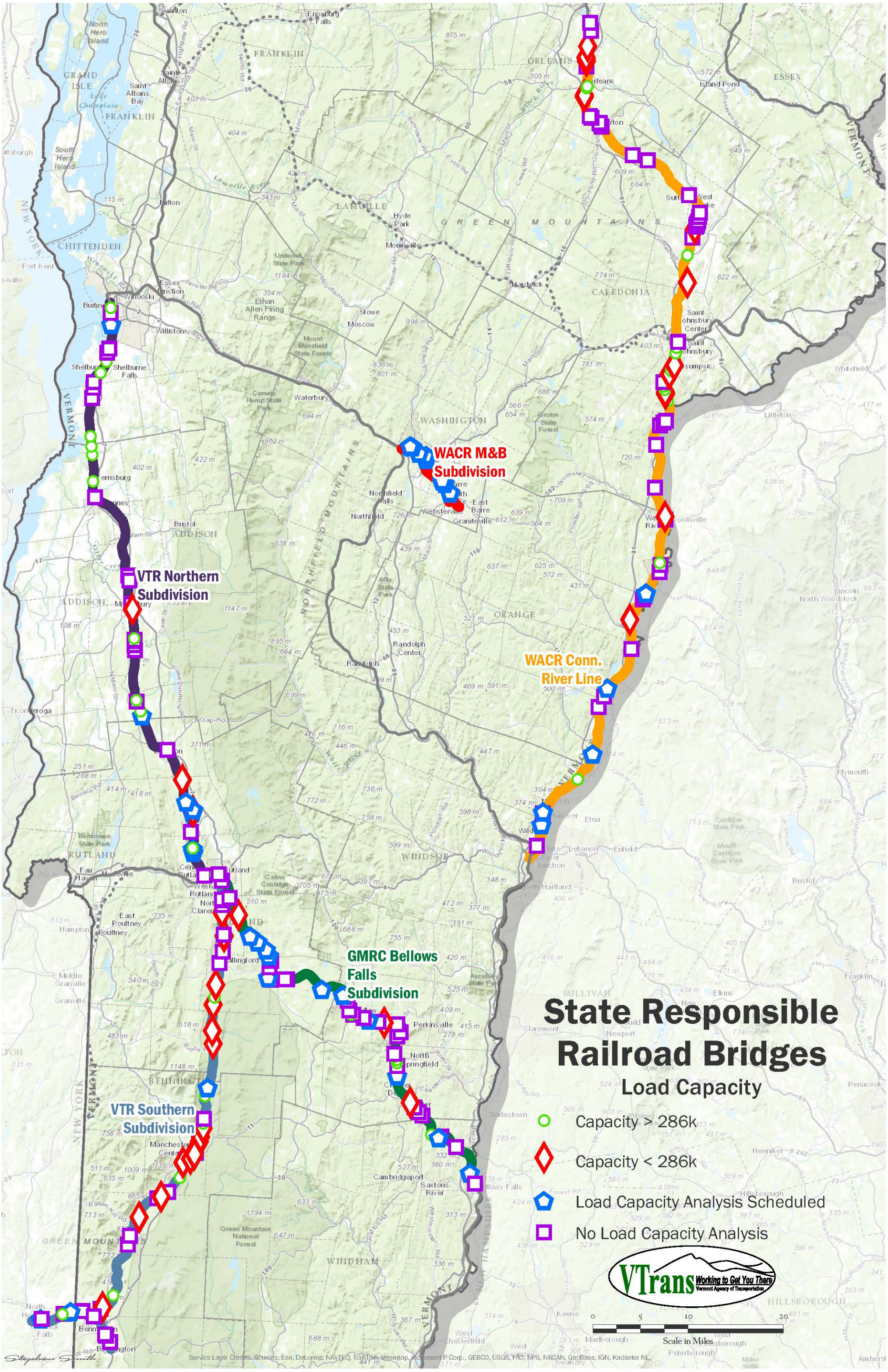
LOOKING AHEAD

Estimated yearly activities:

Task	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20 - 25
Initial Load Capacity Analysis	77	35	39	14	0	0	0	0
Updated Load Capacity Analysis		0	0	0	5	5	5	5
Annual Inspection		165	165	165	165	165	165	165
Detailed Inspection*		39	35	14	17	17	17	17
Underwater Inspection*		17	17	17	17	17	17	17
Bridge Maintenance		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Data Maintenance		Yes	Yes	Yes	Yes	Yes	Yes	Yes

**Estimated 10-year cycle*

Scheduled to be complete by end of FY 2014


State Responsible Railroad Bridges
Load Capacity
Capacity > 286k
Capacity < 286k
Load Capacity Analysis Scheduled
No Load Capacity Analysis
WACR M&B Subdivision
VTR Northern Subdivision
WACR Conn. River Line
GMRC Bellows Falls Subdivision
VTR Southern Subdivision
VTrans Working to Get You There
Vermont Agency of Transportation
0 5 10 20
Scale in Miles
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL