I-84 Danbury Project Needs and Deficiencies Study

Structures

Appendix

I-84 Danbury Project

State Project Number 34-349

November 2018

CONNECTICUT DEPARTMENT OF TRANSPORTATION

CDM Smith

Table of Contents

Table of Tables

Table of Figures

1.0 Introduction

The purpose of this report is to describe the current conditions of the structures in the I-84 corridor between Exits 3 and 8 in the towns of Danbury, Newtown, Bethel and Brookfield, Connecticut, and any additional structures that could be impacted by this project. Inspection reports from January 2015 to November 2016 were utilized as the basis for current conditions. Additionally, the historical inspections and rehabilitations were evaluated to determine the future bridge conditions in the year 2037, and the future need for maintenance and rehabilitations. The corridor contains forty-eight bridges and nine culverts. The total length of the project limits along I-84 is approximately 4.5 miles.

The structures in the project corridor are classified by the following functional groups:

- Bridges carrying I-84 (I-84)
- Bridges carrying Route 7 (Route 7)
- Bridges carrying local roads over I-84 (Over I-84) *
- Culverts carrying I-84 or State Routes (Culvert)

* The Route 7 over I-84 structures are included in the "Route 7" group.

Forty-six (81%) of the bridges and culverts are located in the Town of Danbury, four (7%) in Bethel, four (7%) in Newtown, and three (5%) in Brookfield. The I-84 interstate within the project limits and the structures carrying roads over it were built in the early 1960's, which accounts for about 81% of the bridges. The remaining 19% account for the portions of Route 7 that are south and north of the I-84 Interchange, which were built between 1975 and 1986. Seven of the bridges also cross the Housatonic Railroad, which has been in operation since the early 1850's.

2.0 Structure Condition Review

The Federal Highway Administration (FHWA) Coding Guide provides the following numerical codes and verbal descriptions to assess the condition of bridge decks, superstructures, substructures and culverts. The overall bridge structural rating is an appraisal rating that compares the existing bridge to a new one which is built to current standards. See list of general codes and descriptions in Table 1 below. Additionally, the Sufficiency Rating (SR) is an evaluation of the bridge's adequacy to remain in service. A 100% sufficiency rating indicates that a bridge is completely sufficient, whereas a 0% percent rating indicates a bridge is completely insufficient and should be replaced. A bridge's sufficiency rating is based on structural adequacy and safety, serviceability, functionality, and essentiality for public use.

Table 1: FHWA Coding Guide - Condition

Code	Description
N	NOT APPLICABLE
9	EXCELLENT CONDITION
8	VERY GOOD CONDITION – no problems noted.
7	GOOD CONDITION – some minor problems.
6	SATISFACTORY CONDITION – structural elements show some minor deterioration.
5	FAIR CONDITION – all primary structural elements are sound but may have minor section loss, cracking, spalling or scour.
4	POOR CONDITION – advanced section loss, deterioration, spalling or scour.
3	SERIOUS CONDITION – loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
2	CRITICAL CONDITION – advanced deterioration of primary elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.
1	"IMMENENT" FAILURE CONDITION – major deterioration or section loss present in critical structural components, or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic, but corrective action may put bridge back in light service.
0	FAILED CONDITION – out of service; beyond corrective action.

The items in the appraisal section are used to evaluate a bridge in relation to the level of service it provides to its highway system. The existing structure is then compared to a new structure which is built to current standards. The codes and descriptions are shown in Table 2.

Table 2: FHWA Coding Guide - Appraisal Ratings

Code	Description
N	Not applicable.
9	Superior to present desirable criteria.
8	Equal to present desirable criteria.
7	Better than present minimum criteria.
6	Equal to present minimum criteria.
5	Somewhat better than minimum adequacy to tolerate being left in place as is.

Code	Description
4	Meets minimum tolerable limits to be left in place as is.
3	Basically intolerable requiring high priority of corrective action.
2	Basically intolerable requiring high priority of replacement
1	This value of rating code is not used.
0	Bridge closed.

The structure appraisal rating is based on the evaluation of the overall structure condition, which is the lower of the superstructure, substructure and culvert condition ratings. Item 68, Deck Geomtery, is a rating based on the curb to curb bridge width and the minimum vertical clearance over the bridge. Item 69, Vertical and Horizontal Underclearance, is based on the adequacy of the bridge's vertical and horizontal under clearances.

Table 3 summarizes the condition ratings and geometric data for all of the bridges in the I-84 corridor. The bridge ratings are evaluated in accordance with the FHWA Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges and the Connecticut Department of Transportation (CTDOT) Bridge Inspection Manual.

Table 3: Bridge Geometry and Current Ratings

Bridge No.	Bridge Description and Geometry					Current Condition					Appraisal Ratings			Bridge Function	Segment No.
	Carries	Crossing	No. Spans	Length (ft)	Deck Area (sq. ft)	Deck	Superstructure	Substructure	Culvert	SR	Item 67: Structure Evaluation	Item 68: Deck Geometry	Item 69: Underclearances		
00457	I-84	US Route 6	1	92	8,620	6	6	7	N	90.9	6	9	4	I-84	2
00458	I-84	US Route 6	1	87	5,977	7	6	7	N	89.9	6	5	4	I-84	2
00459	US Route 6	I-84	4	294	14,171	6	6	5	N	65.0	5	4	3	Over I-84	7
00541	US Route 7 NB	HRRC, STILL RV, MALL ACC.	4	322	18,225	6	5	7	N	82.0	5	6	3	Route 7	8
00542	US Route 7 SB	HRRC, STILL RV, MALL ACC.	4	328	18,663	6	5	6	N	81.0	5	6	3	Route 7	8
00543	US Route 7	I-84	1	99	4,425	6	7	7	N	94.3	7	7	5	Route 7	8
00544	I-84 Ramp	I-84 EB	1	114	3,613	6	6	7	N	94.8	6	9	5	I-84	8
00545	US Route 7	I-84 EB	1	124	5,548	6	6	7	N	94.1	6	5	5	Route 7	8

Bridge No.	Bridge Description and Geometry					Current Condition					Appraisal Ratings			Bridge Function	Segment No.
	Carries	Crossing	No. Spans	Length (ft)	Deck Area (sq. ft)	Deck	Superstructure	Substructure	Culvert	SR	Item 67: Structure Evaluation	Item 68: Deck Geometry	Item 69: Underclearances		
00546	I-84	Beaver Brook	N/A	23	8,499	N	N	N	6	72.8	6	N	N	Culvert	6
00547	I-84 WB	US Route 7 NB	1	96	4,291	7	6	6	N	88.6	6	7	3	I-84	6
00548	I-84 TR 803	I-84 WB, Route 7 NB and Beaver Brook	14	885	28,024	6	5	6	N	82.1	5	9	3	I-84	9
00549	I-84 TR 804	Beaver Brook	N/A	53	11,978	N	N	N	6	97.2	6	N	N	Culvert	9
00550	US Route 7 NB	SR 805	3	148	8,392	6	6	6	N	84.0	6	6	3	Route 7	9
00551	US Route 7 SB	SR 805	3	161	9,129	6	6	6	N	85.3	6	9	3	Route 7	9
00553	SR 805	Beaver Brook	N/A	27	3,175	N	N	N	6	61.5	6	4	N	Culvert	N
00897	I-84 EB	Route 25	3	140	6,557	7	6	6	N	92.5	6	9	6	I-84	N
00898	I-84 WB	Route 25	3	140	7,938	7	6	5	N	91.5	6	6	6	I-84	N
00956	I-84	Route 37	1	114	14,558	5	6	6	N	84.4	6	9	4	I-84	4
00961	I-84	Route 39	1	82	11,464	6	6	6	N	84.3	6	9	3	I-84	4
01180	Kenosia Avenue	I-84 and Housatonic RR	4	288	12,298	6	5	6	N	68.6	5	4	3	Over I-84	1
01181	I-84 WB	Housatonic RR	3	229	13,580	5	6	6	N	88.9	6	6	3	I-84	1
01182	I-84 EB	Housatonic RR	3	226	13,402	5	5	6	N	79.2	5	6	5	I-84	1
01183	Westville Ave	I-84	4	233	9,955	6	6	6	N	74.5	6	4	3	Over I-84	3

Bridge No.	Bridge Description and Geometry					Current Condition					Appraisal Ratings			Bridge Function	Segment No.
	Carries	Crossing	No. Spans	Length (ft)	Deck Area (sq. ft)	Deck	Superstructure	Substructure	Culvert	SR	Item 67: Structure Evaluation	Item 68: Deck Geometry	Item 69: Underclearances		
01184	I-84	Franklin St	1	116	14,809	6	6	6	N	83.0	6	9	5	I-84	3
01185	I-84	Kohanza St	1	70	9,713	6	6	7	N	83.0	6	9	4	I-84	4
01186	I-84	Starr Ave	1	63	9,860	6	7	6	N	83.0	6	9	4	I-84	4
01187	I-84	Kohanza Brook	N/A	38	37,380	N	N	N	6	68.0	7	N	N	Culvert	4
01188	Madison Ave	I-84	2	251	10,718	6	7	7	N	90.1	7	5	4	Over I-84	4
01189	I-84	Padanaram Brook	N/A	32	8,160	N	N	N	5	59.0	5	N	N	Culvert	4
01190	I-84	Tamarack Ave	1	69	8,683	7	6	6	N	81.0	6	9	3	I-84	4
01191	I-84	Great Plain Rd	1	60	7,662	5	6	6	N	80.0	6	9	3	I-84	5
01192	I-84	Rockwell Road	1	49	6,311	7	7	7	N	83.0	7	9	4	I-84	5
01193	I-84 EB	Beaver Brook	N/A	38	7,164	N	N	N	7	93.9	7	N	N	Culvert	6
01194	I-84 WB	Beaver Brook	N/A	32	5,160	N	N	N	6	93.9	6	N	N	Culvert	6
01195	I-84 EB	Federal/SR 805 Eagle Rd/Housatonic RR	5	292	16,669	5	5	7	N	78.0	5	5	4	I-84	6
01196	I-84 WB	Federal/SR 805 Eagle Rd/Housatonic RR	5	296	16,783	5	5	7	N	79.1	5	6	4	I-84	6
01197	I-84 WB	Still River	2	124	7,775	7	7	6	N	90.6	6	5	N	I-84	7
01198	I-84 EB	Still River	2	132	8,434	7	6	6	N	73.4	6	2	N	I-84	7
01199	Route 911	I-84	4	264	13,516	6	5	6	N	69.2	5	5	5	Over I-84	7

Bridge No.	Bridge Description and Geometry					Current Condition					Appraisal Ratings			Bridge Function	Segment No.
	Carries	Crossing	No. Spans	Length (ft)	Deck Area (sq. ft)	Deck	Superstructure	Substructure	Culvert	SR	Item 67: Structure Evaluation	Item 68: Deck Geometry	Item 69: Underclearances		
01200	Garella Rd	I-84	4	190	8,129	6	6	6	N	89.1	6	5	3	Over I-84	7
01201	Vail Rd	I-84	2	175	7,473	6	7	6	N	93.8	6	4	5	Over I-84	7
01202	Old Hawleyville Rd	I-84	4	204	8,996	6	5	6	N	94.7	5	5	5	Over I-84	N
01203	Secor Rd	I-84	4	213	8,441	6	6	6	N	95.9	6	6	5	Over I-84	N
01204	Old Hawleyville Rd	I-84	4	208	8,257	6	5	6	N	84.9	5	6	5	Over I-84	N
01205	I-84	Pond Brook	N/A	32	6,400	N	N	N	6	70.0	6	N	N	Culvert	N
03915	US Route 7 SB	Still River	1	147	6,870	7	7	7	N	95.6	7	8	N	Route 7	9
03916	US Route 7 NB	Still River	1	150	6,870	7	7	7	N	95.4	7	8	N	Route 7	9
03919	US Route 7 SB	US Route 202	1	161	7,374	7	7	7	N	92.9	7	8	3	Route 7	N
03920	US Route 7 NB	US Route 202	1	162	7,419	7	7	7	N	92.9	7	8	3	Route 7	N
05261	Old Ridgebury Rd	I-84 and Exit Ramps	2	276	22,825	7	7	7	N	74.5	6	5	6	Over I-84	N
05437	I-84	Brook	N/A	13	2,600	N	N	N	6	N	6	N	N	Culvert	N
05462	US Route 7 Ramp 47	Sugar Hollow Rd	2	416	11,564	7	7	7	N	96.1	7	7	5	Route 7	N
05463	US Route 7 SB	Park Avenue	1	143	9,695	7	7	7	N	96.6	7	5	7	Route 7	8

Bridge No.	Bridge Description and Geometry					Current Condition					Appraisal Ratings			Bridge Function	Segment No.
	Carries	Crossing	No. Spans	Length (ft)	Deck Area (sq. ft)	Deck	Superstructure	Substructure	Culvert	SR	Item 67: Structure Evaluation	Item 68: Deck Geometry	Item 69: Underclearances		
05772	US Route 7 NB	Park Avenue	1	145	8,671	7	6	6	N	100.0	6	6	7	Route 7	8
05773	US Route 7 NB	Wooster Heights Rd	1	139	6,132	7	7	6	N	99.0	7	5	7	Route 7	N
05909	US Route 7 Ramp 48	Sugar Hollow Rd	2	426	11,843	6	7	6	N	99.3	6	7	6	Route 7	N
06569	US Route 7 SB	Wooster Heights Rd	1	143	6,149	7	8	7	N	93.8	7	6	7	Route 7	N

2.1 Overall Condition Assessment of Bridges

Table 4 provides a condition assessment of the structures within the corridor by using a fair or lower condition rating of one of the major components (deck, superstructure, substructure or culvert) as a function of its bridge deck area.

A higher percentage of the bridges identified to be in fair or worse condition are carrying local roads over I-84. None of the bridges or culverts within the corridor have sufficiency ratings less than 50%.

Table 4: "Fair" Deck Condition

Bridge Type	Deck Area (sq.ft)	Fair Bridges Deck Area (sq.ft)	% Fair Area
I-84	224,723	74,878	33.3%
Over I-84	124,779	57,238	45.9%
Route 7	146,969	36,888	25.1%
Culvert	90,516	8,160	9.0%
Total Deck Area	586,987	177,164	30.2%

Table 5 summarizes the condition ratings with percentages based on the number of bridges. For each of the major components, the majority of the bridges are in "satisfactory condition", i.e. condition rating = 6. Based on the CTDOT Inspection Manual, this condition indicates that there is a potential for major maintenance. However, in the future, additional deterioration is expected and rehabilitation will be required. Below is discussion on the general conditions of the major bridge components along with some notable specific structure details.

Within the corridor, many of the bridges require deck patching. Six of the bridge decks are considered fair. Bridge No. 01191, which carries I-84 over Great Plain Road, has large spalls with efflorescence and exposed reinforcement in the north exterior bay. Bridge No. 00956, which carries I-84 over North Street, has full depth deck patches in Bays 1 through 6, however, these patches have spalls with exposed rebar, transverse cracks, hollow areas and dull sounding areas. Within the entire corridor, the total deck area is approximately 590,000 square feet, with 35,400 square feet (6%) of the total project deck area is deteriorated.

Table 5: Condition Rating by Number and Percentage

Rating		Deck		Superstructure		Substructure	
		No.	%	No.	%	No.	%
5	Fair	6	13%	10	21%	2	4%
6	Satisfactory	24	50%	22	46%	27	56%
7	Good	18	38%	15	31%	19	40%
8	Very Good	0	0%	1	2%	0	0%
Totals		48	100%	48	100%	48	100%

The majority of the bridges within the corridor have superstructures in satisfactory condition. They exhibit light to medium rusting on most of the superstructure, and minor section loss, which may require cleaning and painting. Approximately 21% are in fair condition, exhibiting severe rust and up to 5% of total flange area section loss and up to 25% section loss in the web. For bridges in fair condition, potential exists for minor rehabilitation.

Many of the bridges' substructure have spalling with exposed reinforcement. The abutments of Bridge No. 00956 exhibit spalls with exposed rebar up to 7' high by 1' long by 1' deep, and hollow areas up to 2' by 6'. Bridge No. 00898, which carries I-84 Westbound over Route 25, has a fair substructure; both abutments and all piers have large spalls with exposed rebar, rust stains, vertical and horizontal cracks with rust staining. It is anticipated that if the existing structures are to remain, major substructure repairs would be required.

Table 6 contains the breakdown of the structural condition of the culverts within the corridor. Eight of the culverts are multi-cell reinforced concrete box culverts, and one is a corrugated metal pipe culvert. The plans were examined to determine if any of the concrete culverts had reduced reinforcement in the end sections due to reduced fill in these areas. Based on this evaluation, none of the culverts have reduced reinforcement at the end sections; however, Bridge No. 00546 has thicker slab and more reinforcement in the portion that carries I-84 westbound due to the increased fill depth. Of the nine culverts in the corridor, only one was considered fair. Of the remaining eight culverts, seven were rated as satisfactory and one was rated as good. Bridge No. 01189, a culvert carrying I-84 over the Padanaram Brook, has small spalls, pop-outs and cracks with efflorescence, and random joint misalignment with active leakage on the ceilings and walls of the cells. All other culverts were satisfactory or better.

Table 6: Culvert Condition Rating by Number and Percentage

Culvert Condition			
Rating		**No.**	**%**
5	Fair	1	11%
6	Satisfactory	7	78%
7	Good	1	11%
Totals		9	100%

Figures 1, 2, 3 and 4 provide graphical representations of the bridge condition within the corridor based on deck, superstructure, substructure and culvert condition, respectively. Figure 5 provides a graphical representation of the corridor based on the overall structure condition appraisal rating.

Appendix A contains detailed summaries of the current condition of all structures within the project limits. The summary describes the bridge type and any rehabilitation projects associated with it. The summaries also identify the condition rating for the major components, and a description of the deficiencies.

Legend

Deck Condition

- Fair
- Satisfactory
- Good
- Road
- Railroad
- Town Line
- Building Footprint
- Waterbody

05261 01180 01181 01182 00544 00545 00543 00541 00542 00457 00458 05463 05772 05462 05909 06569 05773

Old Ridgebury Rd, Mill Plain Rd, Westwood Village, Driftway Rd, Elmbrook Dr, Watson Dr, Woodland Hill Rd, Amity Ln, College Park Dr, Crestdale Dr, Crestdale Rd, University Blvd, Bayberry Ln, Churchill Rd, Scuppo Rd, Mill Ridge Dr, Mill Ridge Rd, Midfield Rd, School Ridge Rd, Fairlawn Ave, Myrtle Ave, Lawnerest Rd, Haddad Dr, Abbott Ave, Well Ave, S Well Ave, Lake Ave, Concord Rd, Lee Ave, Victor St, Peace St, Merrimac St, Ridge Rd, Oak Ridge Ave, Perkins St, Claremont Ave, Concord St, Belmont Ln, Belmont Cir, Park Ave, Bardens Rd, Segar St, West Pt Greenlawn Dr, Access Rd, Larson Dr, Lakeview Dr, Cherryfield Dr, Vespucci Dr, Lake Kenosia, Ken Oaks Dr, Windaway Rd, Avalon Lake Rd, Kimberly Trl, Lake Pl N, Boulevard Dr, Blueberry Ln, Huckleberry Ln, Lake Pl S, Briar Ridge Rd, Aster Dr, Lilac Ln, Ashley Ct, Advocate Pl, Flirtation Dr, Benson Dr, Noteworthy Dr, Rolfs Dr, Greta Dr, Cel Bret Dr, Apple Ridge Rd, Access Dr, Kenosia Ave, Ye Olde Rd, Backus Ave, Wibling Rd, Sugar Hollow Rd, Wooster Hgts Rd, Old Boston Post Rd, Lee Farms Corp Pk Access Rd, Wallingford Rd, Old Sugar Hollow Rd, Miry Brook Rd, Shadow Lake Rd, Beaver Brook Rd, Chipmunk Ln, Aarons Ct, Ridgebury Rd, Crosby Ct, Old Trolley Rd

DANBURY
RIDGEFIELD

I-84 Danbury Project

Figure 1a
Bridge Deck Condition

N

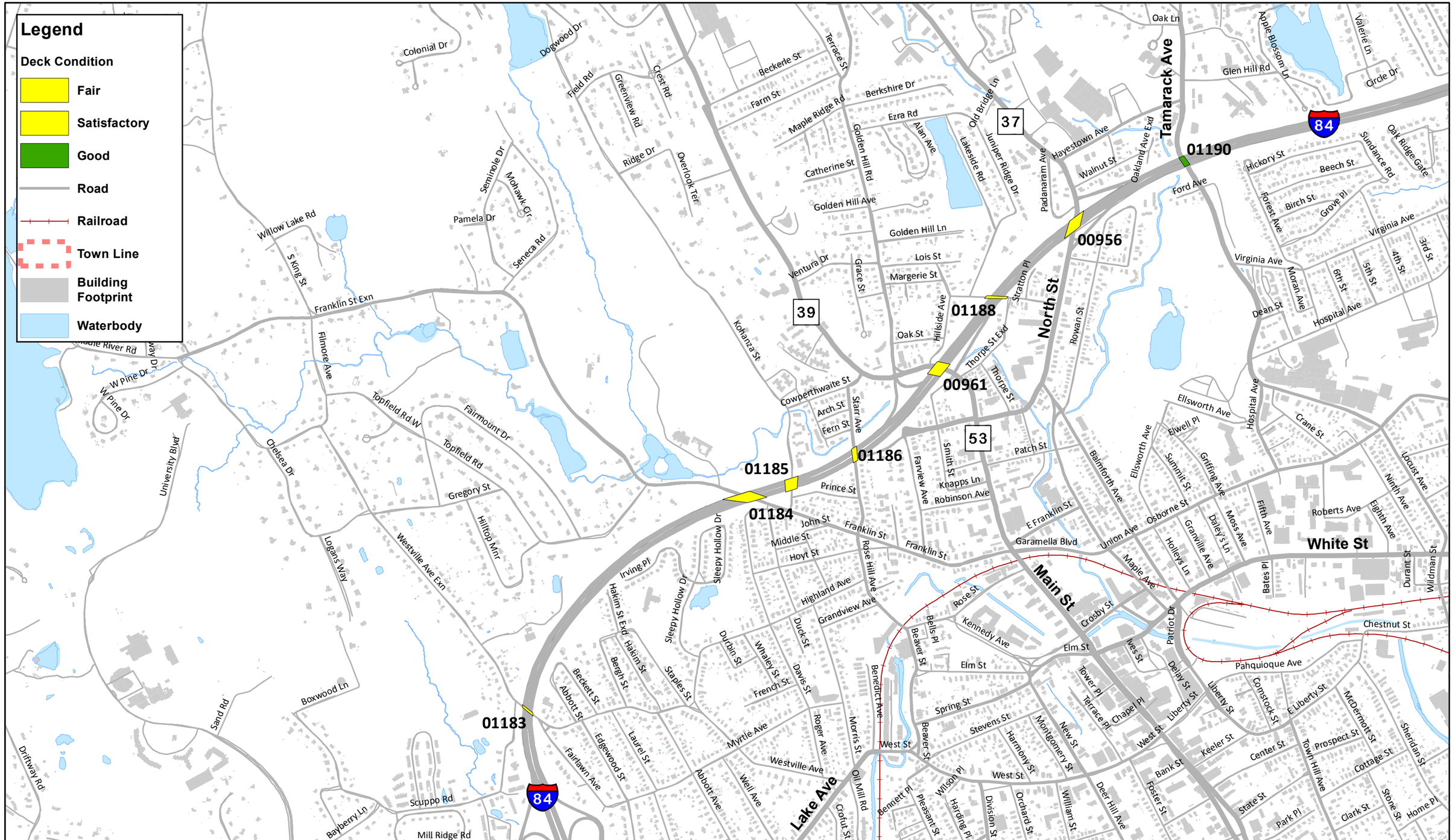
0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

WSP

Connecticut Department of Transportation



I-84 Danbury Project

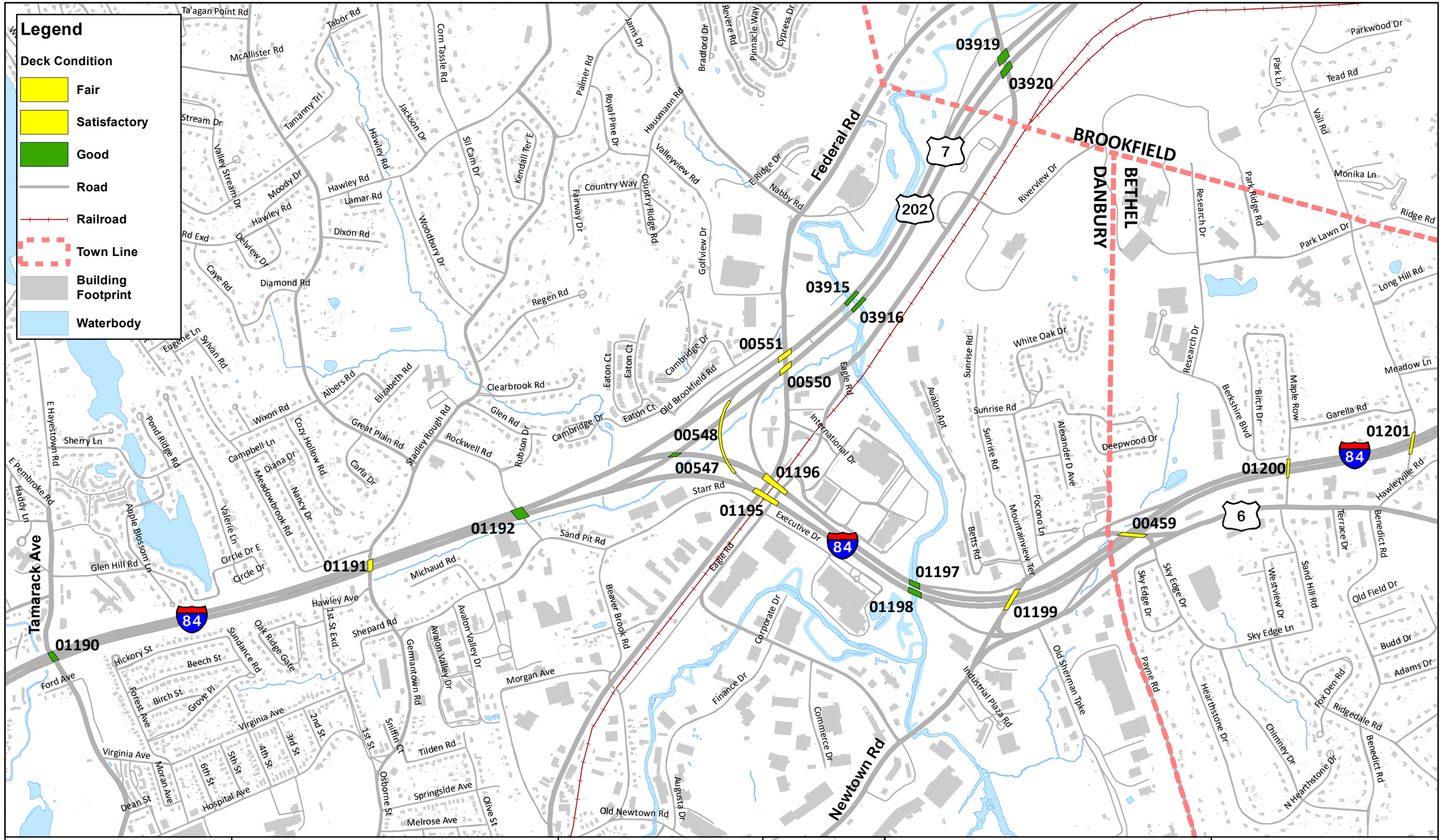
Figure 1b
Bridge Deck Condition

N

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017


Legend
Deck Condition
Fair
Satisfactory
Good
Road
Railroad
Town Line
Building Footprint
Waterbody
03919
03920
03915
03916
00551
00550
00548
00547
01196
01195
01192
01191
01190
01197
01198
01199
00459
01201
01200
BROOKFIELD
DANBURY
BETHEL
Federal Rd
Newtown Rd
Tamarack Ave
Ta'agan Point Rd
McAllister Rd
Tebor Rd
Corn Tassle Rd
Jams Dr
Palmer Rd
Bradford Dr
Revere Rd
Pinnacle Way
Cypress Dr
Tamanny Trl
Stream Dr
Valley Stream Dr
Moody Dr
Hawley Rd
Jackson Dr
Sil Cam Dr
Kendall Ter E
Royal Pine Dr
Hausmann Rd
Valleyview Rd
E Ridge Dr
Nabby Rd
Country Way
Country Ridge Rd
Fairway Dr
Golfview Dr
Woodbury Dr
Lamar Rd
Dixon Rd
Delview Dr
Caye Rd
Diamond Rd
Regen Rd
Eugene Ln
Sylvan Rd
Albers Rd
Elizabeth Rd
Clearbrook Rd
Eaton Ct
Cambridge Dr
Old Brookfield Rd
Eagle Rd
International Dr
Avalon Apt
Sunrise Rd
White Oak Dr
Research Dr
Riverview Dr
Park Ridge Rd
Park Ln
Parkwood Dr
Tead Rd
Vail Rd
Monika Ln
Ridge Rd
Park Lawn Dr
Long Hill Rd
Meadow Ln
Garella Rd
Maple Row
Birch Dr
Berkshire Blvd
Deepwood Dr
Alexander D Ave
Pocono Ln
Mountainview Ter
Betts Rd
Sky Edge Dr
Sky Edge Ln
Sand Hill Rd
Westview Dr
Terrace Dr
Benedict Rd
Old Field Dr
Budd Dr
Adams Dr
Fox Den Rd
Ridgedale Rd
Hearthstone Dr
N Hearthstone Dr
Chimney Dr
Payne Rd
Old Sherman Tpke
Industrial Plaza Rd
Corporate Dr
Commerce Dr
Finance Dr
Augusta Dr
Old Newtown Rd
Executive Dr
Starr Rd
Sand Pit Rd
Michaud Rd
Beaver Brook Rd
Hawley Ave
1st St Exd
Shepard Rd
Germantown Rd
Avalon Valley Dr
Morgan Ave
Sniffin Ct
Tilden Rd
Springside Ave
Melrose Ave
Osborne St
Olive St
1st St
2nd St
3rd St
4th St
5th St
6th St
Virginia Ave
Hospital Ave
Dean St
Moran Ave
Ford Ave
Hickory St
Beech St
Birch St
Forest Ave
Grove Pl
Sundance Rd
Oak Ridge Gate
Glen Hill Rd
Apple Blossom Ln
Circle Dr E
Circle Dr
Valerie Ln
Meadowbrook Rd
Nancy Dr
Carla Dr
Diana Dr
Cozy Hollow Rd
Campbell Ln
Wixon Rd
Great Plain Rd
Stadley Rough Rd
Rockwell Rd
Rubson Dr
Glen Rd
Cambridge Dr
Eaton Ct
Sherry Ln
E Hayestown Rd
Pond Ridge Rd
E Pembroke Rd
Haddy Ln
Rd Exd
Hawley Rd
Hawley Rd
Hawley Ave
Terrace Dr
Benedict Rd
Old Field Dr
Budd Dr
Adams Dr
Ridgedale Rd
Benedict Rd
Hawleyville Rd
Sky Edge Ln
Sky Edge Dr
Payne Rd
Hearthstone Dr
Chimney Dr
N Hearthstone Dr
Old Sherman Tpke
Industrial Plaza Rd
Corporate Dr
Commerce Dr
Finance Dr
Augusta Dr
Old Newtown Rd
Executive Dr
Starr Rd
Sand Pit Rd
Michaud Rd
Beaver Brook Rd
Hawley Ave
1st St Exd
Shepard Rd
Germantown Rd
Avalon Valley Dr
Morgan Ave
Sniffin Ct
Tilden Rd
Springside Ave
Melrose Ave
Osborne St
Olive St
1st St
2nd St
3rd St
4th St
5th St
6th St
Virginia Ave
Hospital Ave
Dean St
Moran Ave
Ford Ave
Hickory St
Beech St
Birch St
Forest Ave
Grove Pl
Sundance Rd
Oak Ridge Gate
Glen Hill Rd
Apple Blossom Ln
Circle Dr E
Circle Dr
Valerie Ln
Meadowbrook Rd
Nancy Dr
Carla Dr
Diana Dr
Cozy Hollow Rd
Campbell Ln
Wixon Rd
Great Plain Rd
Stadley Rough Rd
Rockwell Rd
Rubson Dr
Glen Rd
Cambridge Dr
Eaton Ct
Sherry Ln
E Hayestown Rd
Pond Ridge Rd
E Pembroke Rd
Haddy Ln
Rd Exd
Hawley Rd
Hawley Rd
Hawley Ave
7
202
84
84
6
I-84 Danbury Project
Figure 1c
Bridge Deck Condition
N
0
0.1
0.2
Miles
Data Sources:
•Western Connecticut Council of Governments
•Connecticut Department of Energy and Environmental Protection
Date: December 2017
wsp
CONNECTICUT DEPARTMENT OF TRANSPORTATION

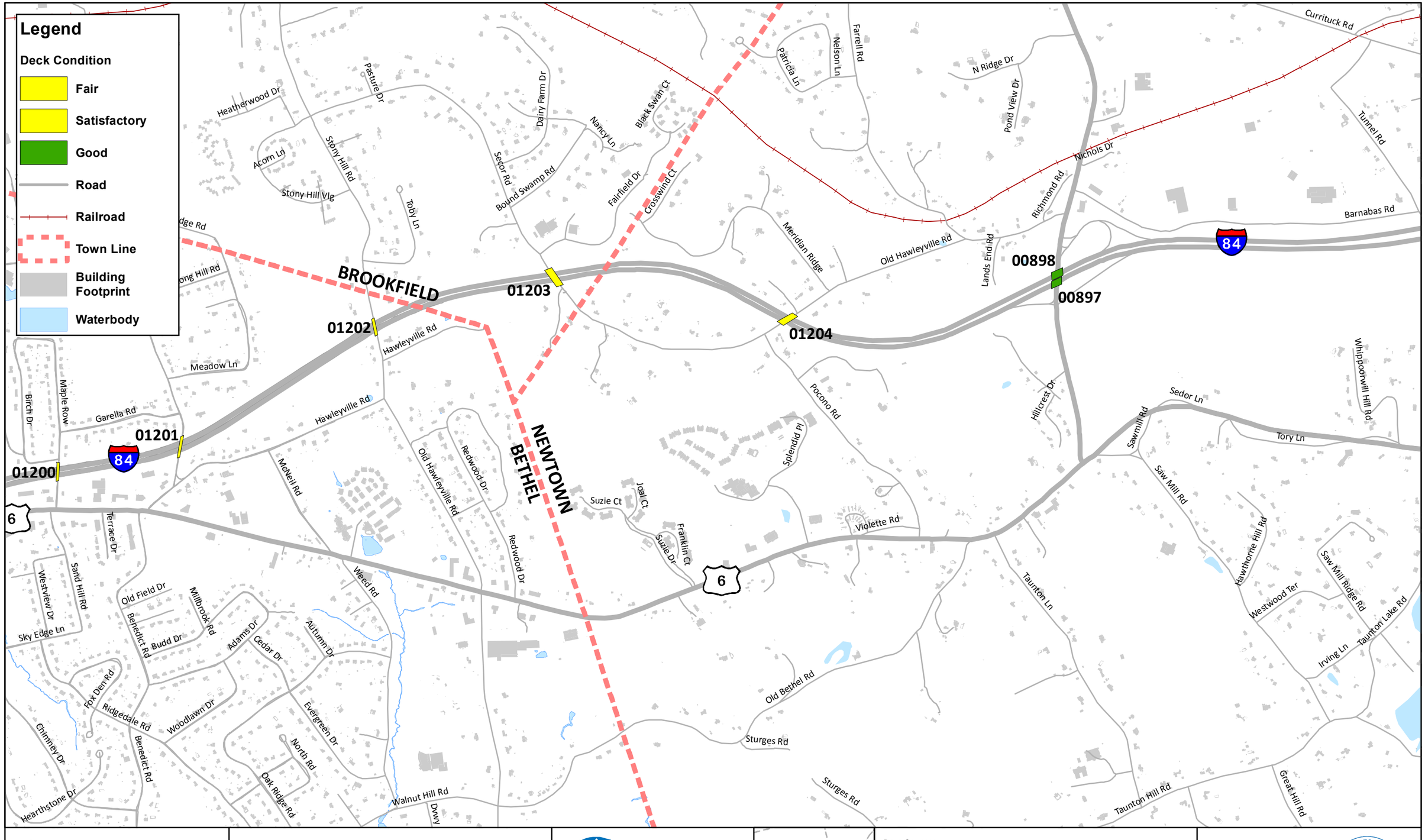


Figure 1d
Bridge Deck Condition

I-84 Danbury Project

N

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

Legend

Superstructure Condition

- Fair
- Satisfactory
- Good
- Very Good
- Road
- Railroad
- Town Line
- Building Footprint
- Waterbody

05261 01180 01181 01182 00544 00545 00543 00457 00458 00542 00541 05463 05772 05462 05909 06569 05773

Old Ridgebury Rd, Mill Plain Rd, Westwood Village, Driftway Rd, Elmbrook Dr, Watson Dr, Woodland Hill Rd, Amity Ln, College Park Dr, Crestdale Dr, Crestdale Rd, University Blvd, Bayberry Ln, Churchill Rd, Scuppo Rd, Mill Ridge Rd, Midfield Rd, Mill Ridge Dr, Mill Ridge Rd, School Ridge Rd, Fairlawn Ave, Myrtle Ave, Lawncrest Rd, Haddad Dr, Abbott Ave, Well Ave, S Well Ave, Lake Ave, Segar St, Ridge Rd, Concord Rd, Lee Ave, Victor St, Peace St, Merrimac St, Oak Ridge Ave, Perkins St, Claremont Ave, Concord St, Belmont Ln, Belmont Cir, Park Ave, Bardens Rd, Lee Farms Corp Pk Access Rd, Old Boston Post Rd, Wooster Hgts Rd, Sugar Hollow Rd, Wallingford Rd, Old Sugar Hollow Rd, Wibling Rd, Backus Ave, Kenosia Ave, Access Dr, Apple Ridge Rd, Ye Olde Rd, Noteworthy Dr, Rolfs Dr, Greta Dr, Cel Bret Dr, Miry Brook Rd, West Pt Greenlawn Dr, Larson Dr, Access Rd, Lakeview Dr, Cherryfield Dr, Vespucci Dr, Lake Kenosia, Windaway Rd, Ken Oaks Dr, Avalon Lake Rd, Kimberly Trl, Lake Pl N, Boulevard Dr, Blueberry Ln, Huckleberry Ln, Lake Pl S, Briar Ridge Rd, Lilac Ln, Aster Dr, Ashley Ct, Advocate Pl, Flirtation Dr, Benson Dr, Shadow Lake Rd, Beaver Brook Rd, Aarons Ct, Ridgebury Rd, Crosby Ct, Chipmunk Ln, Old Trolley Rd

6 84 202 84 7

DANBURY
RIDGEFIELD

Figure 2a
Superstructure Condition

I-84 Danbury Project

N

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

WSP

CONNECTICUT DEPARTMENT OF TRANSPORTATION

Legend

Superstructure Condition

- Fair
- Satisfactory
- Good
- Very Good
- Road
- Railroad
- Town Line
- Building Footprint
- Waterbody

I-84 Danbury Project

Figure 2b
Superstructure Condition

N

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

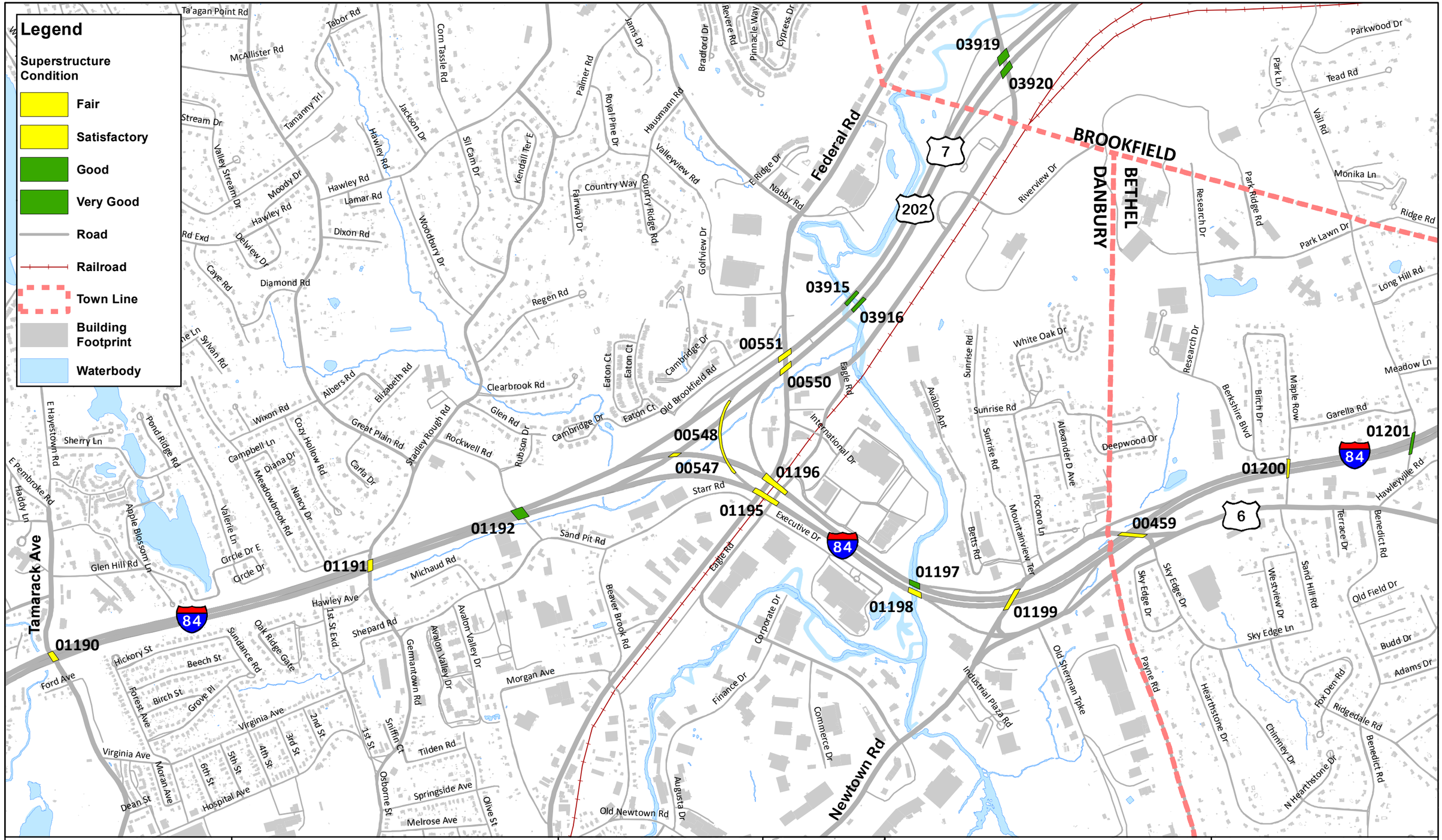


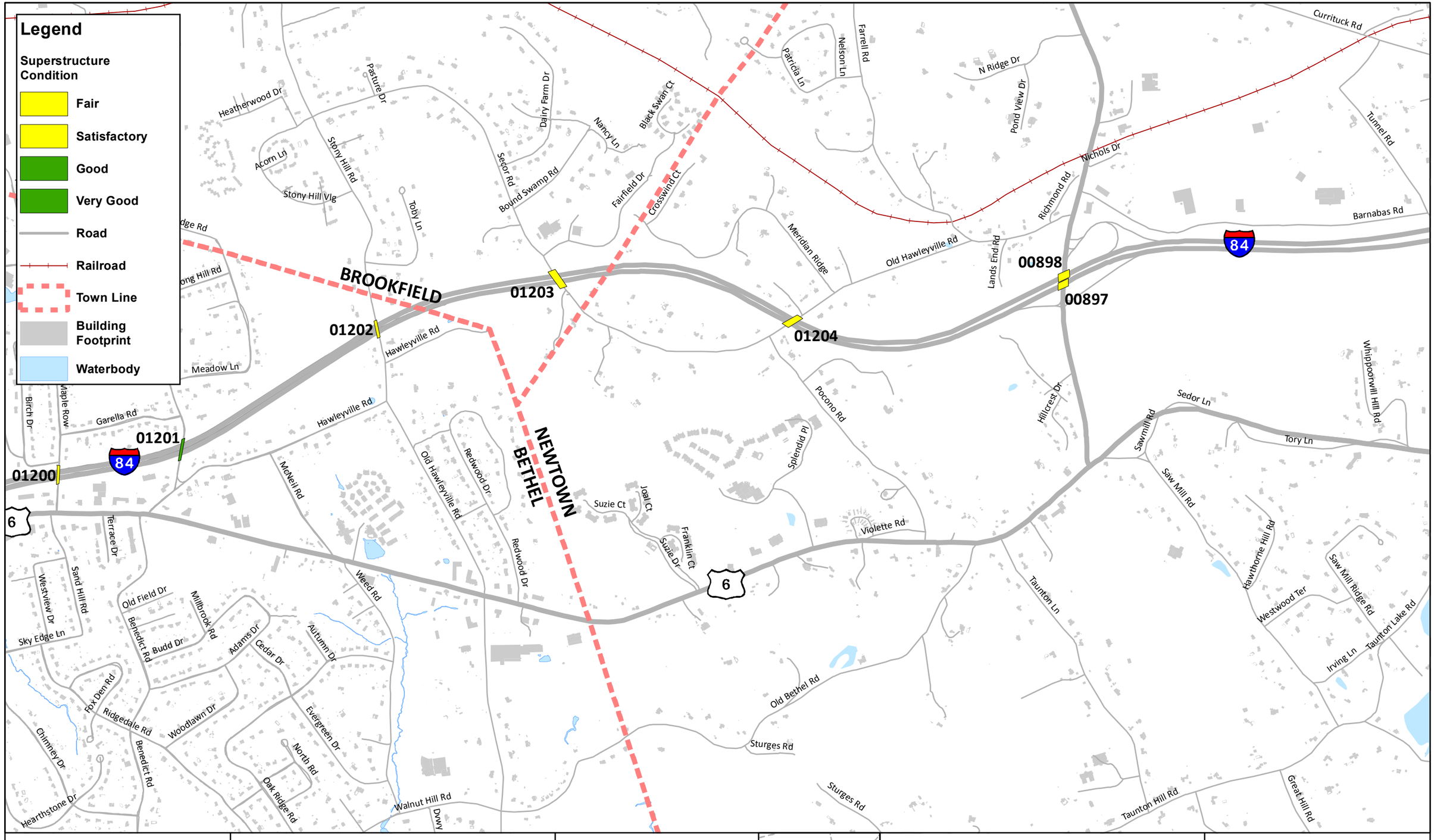
Figure 2c
Superstructure Condition

I-84 Danbury Project

0 0.1 0.2 Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017



I-84 Danbury Project

Figure 2d
Superstructure Condition

N

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

wsp

CONNECTICUT DEPARTMENT OF TRANSPORTATION

Legend

Substructure Condition

- Fair
- Satisfactory
- Good
- Road
- Railroad
- Town Line
- Building Footprint
- Waterbody

05261 01180 01181 01182 00544 00545 00457 00458 00543 00541 00542 05463 05772 05462 05909 06569 05773

DANBURY
RIDGEFIELD

Old Ridgebury Rd, West Pt Greenlawn Dr, Mill Plain Rd, Westwood Village, Driftway Rd, Elmbrook Dr, Watson Dr, Woodland Hill Rd, Amity Ln, College Park Dr, Crestdale Dr, Crestdale Rd, University Blvd, Bayberry Ln, Churchill Rd, Scuppo Rd, Mill Ridge Dr, Mill Ridge Rd, Midfield Rd, School Ridge Rd, Fairlawn Ave, Myrtle Ave, Lawncrest Rd, Haddad Dr, Abbott Ave, Well Ave, S Well Ave, Lake Ave, Victor St, Lee Ave, Concord Rd, Ridge Rd, Peace St, Merrimac St, Oak Ridge Ave, Perkins St, Claremont Ave, Concord St, Belmont Ln, Belmont Cir, Park Ave, Bardens Rd, Segar St, Lee Farms Corp Pk Access Rd, Old Boston Post Rd, Wooster Hgts Rd, Sugar Hollow Rd, Wallingford Rd, Old Sugar Hollow Rd, Wibling Rd, Miry Brook Rd, Backus Ave, Kenosia Ave, Access Dr, Apple Ridge Rd, Ye Olde Rd, Noteworthy Dr, Rolfs Dr, Greta Dr, Cel Bret Dr, Briar Ridge Rd, Ashley Ct, Aster Dr, Lilac Ln, Kimberly Trl, Lake Pl N, Boulevard Dr, Blueberry Ln, Huckleberry Ln, Lake Pl S, Lake Kenosia, Windaway Rd, Ken Oaks Dr, Avalon Lake Rd, Larson Dr, Access Rd, Lakeview Dr, Cherryfield Dr, Vespucci Dr, Old Ridgebury Rd, Advocate Pl, Flirtation Dr, Benson Dr, Shadow Lake Rd, Beaver Brook Rd, Aarons Ct, Ridgebury Rd, Crosby Ct, Chipmunk Ln, Old Trolley Rd

I-84 Danbury Project

Figure 3a
Substructure Condition

N

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

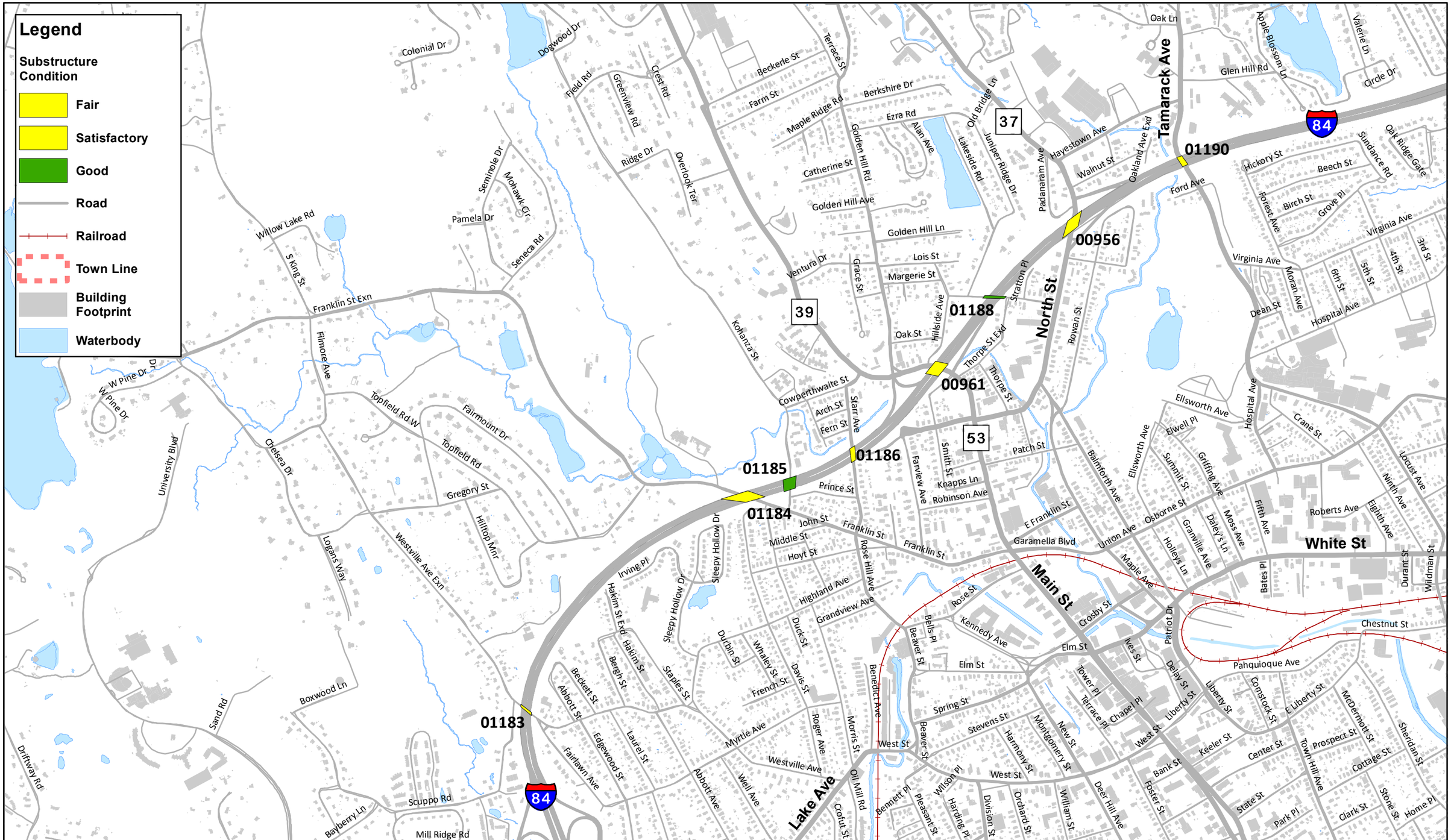
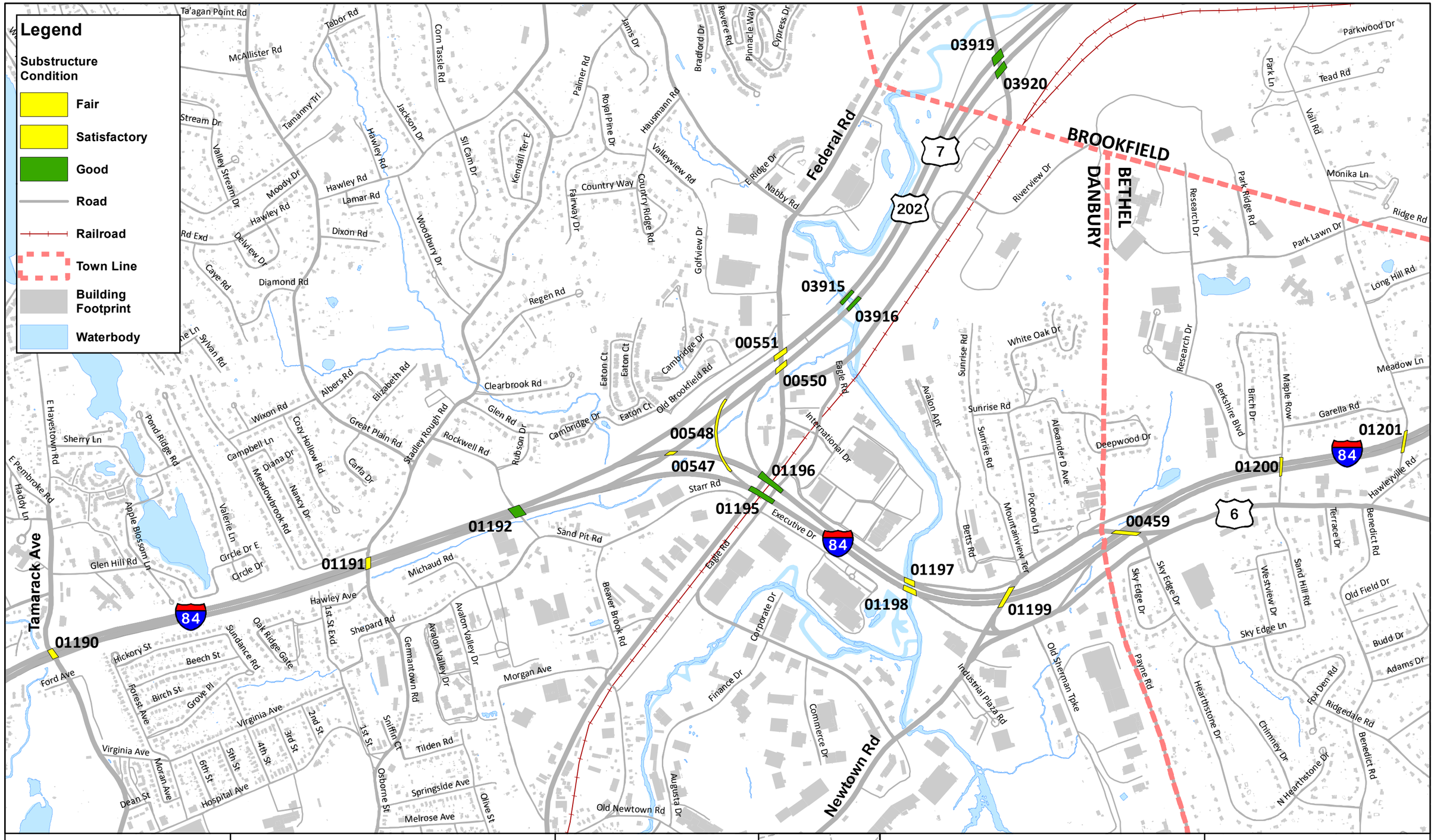


Figure 3b
Substructure Condition

I-84 Danbury Project



I-84 Danbury Project

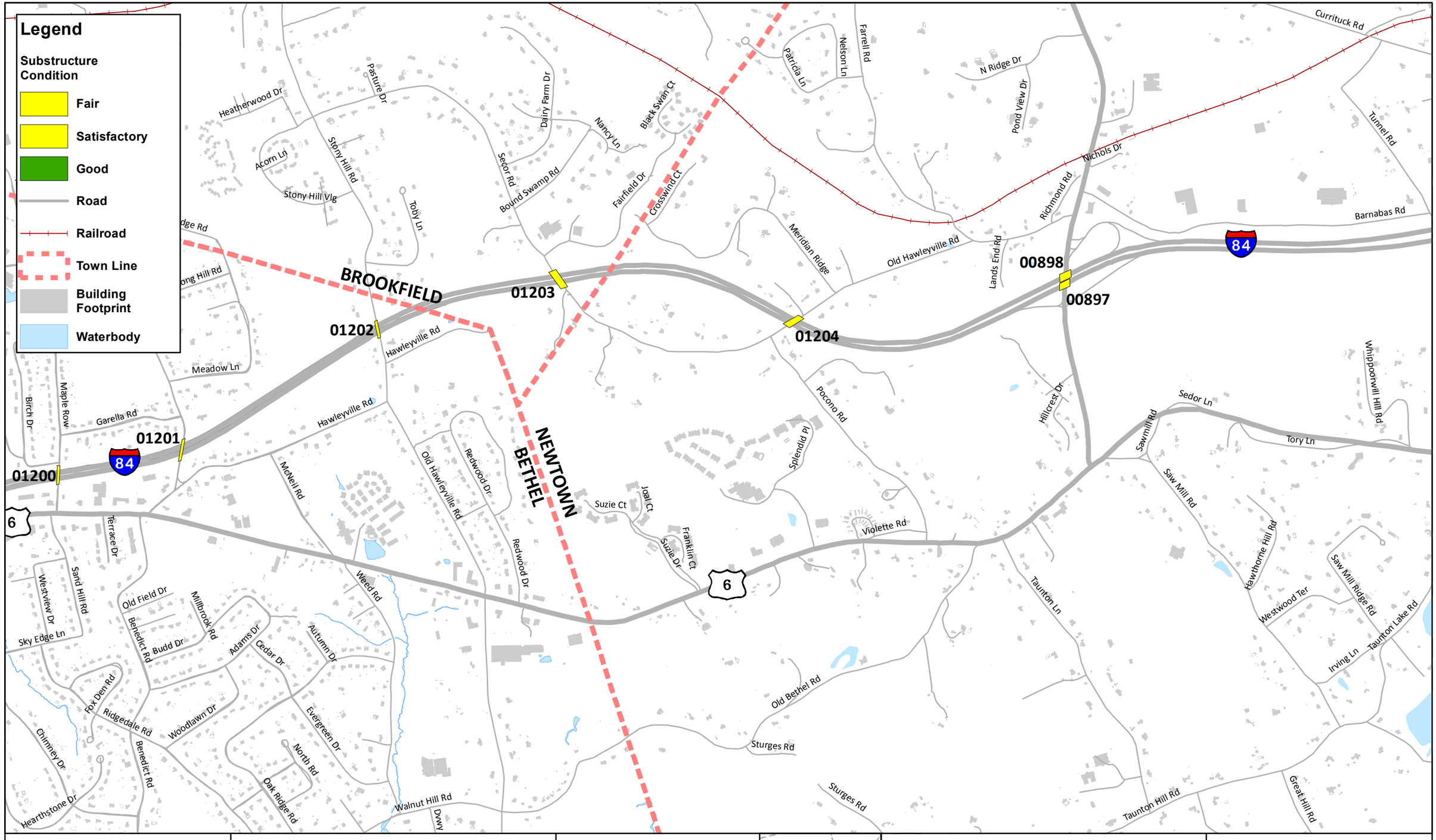
Figure 3c
Substructure Condition

N

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017



I-84 Danbury Project

Figure 3d
Substructure Condition

N

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

wsp

CONNECTICUT DEPARTMENT OF TRANSPORTATION

Legend

Culvert Condition

- Fair
- Satisfactory
- Good
- Road
- Railroad
- Town Line
- Building Footprint
- Waterbody

05437

DANBURY
RIDGEFIELD

Mill Plain Rd
Westwood Village
Old Ridgebury Rd
West Pt
Greenlawn Dr
Access Rd
Larson Dr
Lakeview Dr
Cherryfield Dr
Driftway Rd
Elmbrook Dr
Watson Dr
Woodland Hill Rd
Amity Ln
Kenosia Ave
Christopher Columbus Ave
Vespucci Dr
College Park Dr
Crestdale Dr
Crestdale Rd
University Blvd
Bayberry Ln
Churchill Rd
Scuppo Rd
Mill Ridge Rd
Midfield Rd
Mill Ridge Dr
School Ridge Rd
Fairlawn Ave
Myrtle Ave
Well Ave
Abbott Ave
Lawnerest Rd
Haddad Dr
S Well Ave
Shannon Ridge Rd
Lake Ave
Segar St
Concord Rd
Lee Ave
Victor St
Ridge Rd
Peace St
Merrimac St
Oak Ridge Ave
Perkins St
Claremont Ave
Concord St
Belmont Ln
Belmont Cir
Park Ave
Bardens Rd
Sugar Hollow Rd
Lake Kenosia
Ken Oaks Dr
Windaway Rd
Avalon Lake Rd
Kimberly Trl
Lake Pl N
Boulevard Dr
Blueberry Ln
Huckleberry Ln
Lake Pl S
Briar Ridge Rd
Lilac Ln
Aster Dr
Ashley Ct
Old Ridgebury Rd
Advocate Pl
Flirtation Dr
Benson Dr
Noteworthy Dr
Rolfs Dr
Greta Dr
Cel Bret Dr
Apple Ridge Rd
Ye Olde Rd
Kenosia Ave
Access Dr
Backus Ave
Wibling Rd
Lee Farms Corp Pk Access Rd
Old Boston Post Rd
Wooster Hgts Rd
Wallingford Rd
Old Sugar Hollow Rd
Miry Brook Rd
Shadow Lake Rd
Beaver Brook Rd
Chipmunk Ln
Crosby Ct
Aarons Ct
Ridgebury Rd
Old Trolley Rd

84
6
202
7

I-84 Danbury Project

Figure 4a
Culvert Condition

N

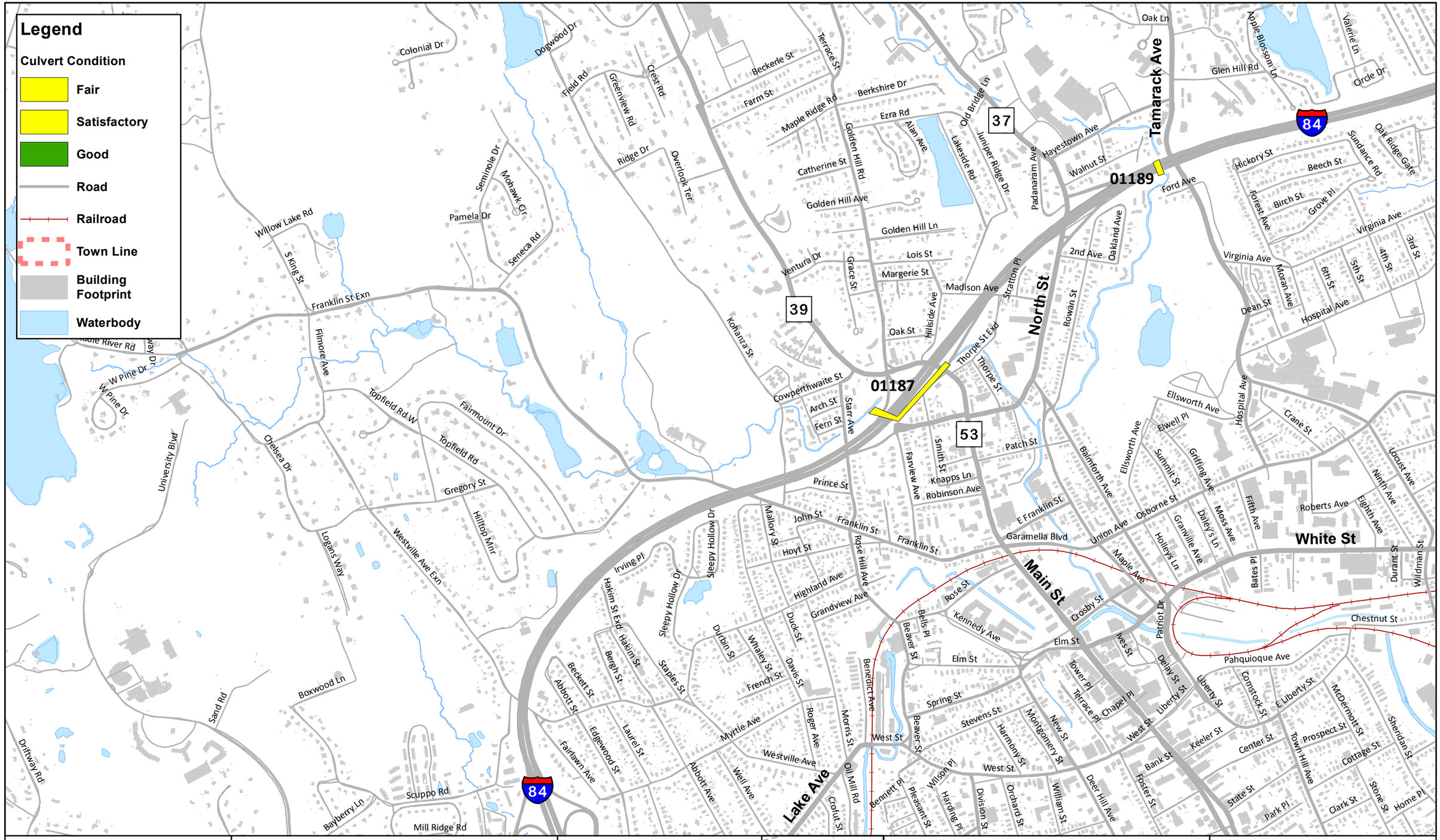
0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

WSP

CONNECTICUT DEPARTMENT OF TRANSPORTATION



I-84 Danbury Project

Figure 4b
Culvert Condition

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

Legend

Culvert Condition

- Fair
- Satisfactory
- Good
- Road
- Railroad
- Town Line
- Building Footprint
- Waterbody

00553
00549
01194
01193
00546
01189

BROOKFIELD
DANBURY
BETHEL
Federal Rd
Newtown Rd
Tamarack Ave

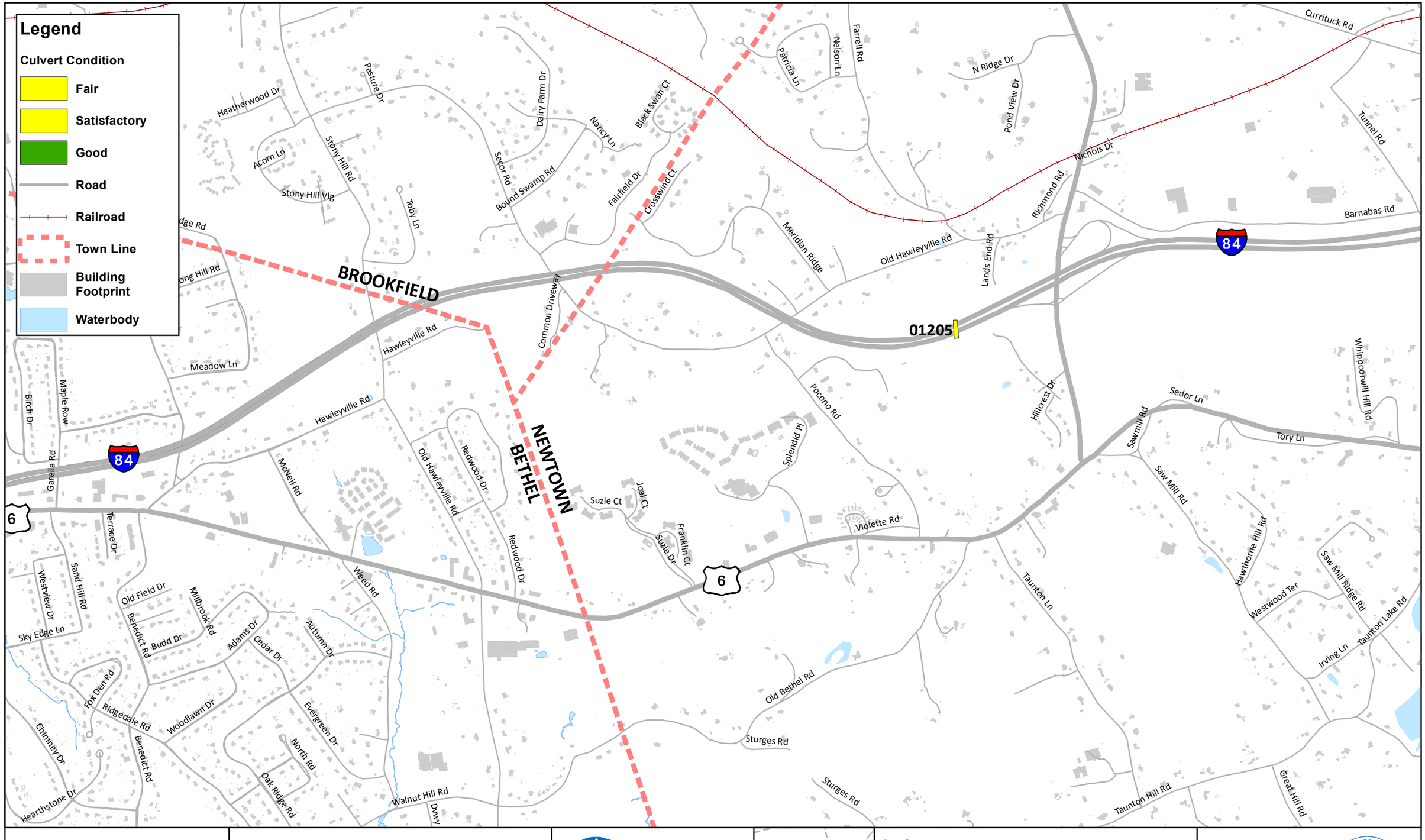
Figure 4c
Culvert Condition

I-84 Danbury Project

0 0.1 0.2 Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017



I-84 Danbury Project

Figure 4d
Culvert Condition

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

Legend

NBI Appraisal Rating

- Fair
- Satisfactory
- Good
- Road
- Railroad
- Town Line
- Building Footprint
- Waterbody

05261 05437 01180 01181 01182 00544 00545 00457 00458 00543 00541 00542 05772 05463 05462 05909 06569 05773

DANBURY
RIDGEFIELD

Old Ridgebury Rd, West Pt Greenlawn Dr, Mill Plain Rd, Westwood Village, Driftway Rd, Elmbrook Dr, Watson Dr, Woodland Hill Rd, Amity Ln, College Park Dr, Crestdale Dr, Crestdale Rd, University Blvd, Bayberry Ln, Churchill Rd, Scuppo Rd, Mill Ridge Dr, Mill Ridge Rd, Midfield Rd, School Ridge Rd, Fairlawn Ave, Myrtle Ave, Lawnerest Rd, Haddad Dr, Abbott Ave, Well Ave, S Well Ave, Shannon Ridge Rd, Lake Ave, Segar St, Ridge Rd, Concord Rd, Lee Ave, Victor St, Peace St, Merrimac St, Oak Ridge Ave, Perkins St, Claremont Ave, Concord St, Belmont Ln, Belmont Cir, Park Ave, Bardens Rd, Lee Farms Corp Pk Access Rd, Old Boston Post Rd, Wooster Hgts Rd, Sugar Hollow Rd, Wallingford Rd, Old Sugar Hollow Rd, Wibling Rd, Backus Ave, Kenosia Ave, Access Dr, Apple Ridge Rd, Ye Olde Rd, Noteworthy Dr, Rolfs Dr, Greta Dr, Cel Bret Dr, Miry Brook Rd, Christopher Columbus Ave, Vespucci Dr, Cherryfield Dr, Lakeview Dr, Larson Dr, Access Rd, Lake Kenosia, Windaway Rd, Ken Oaks Dr, Avalon Lake Rd, Kimberly Trl, Lake Pl N, Boulevard Dr, Blueberry Ln, Huckleberry Ln, Lake Pl S, Briar Ridge Rd, Aster Dr, Lilac Ln, Ashley Ct, Advocate Pl, Benson Dr, Flirtation Dr, Old Trolley Rd, Aarons Ct, Ridgebury Rd, Crosby Ct, Chipmunk Ln, Beaver Brook Rd, Shadow Lake Rd

I-84 Danbury Project

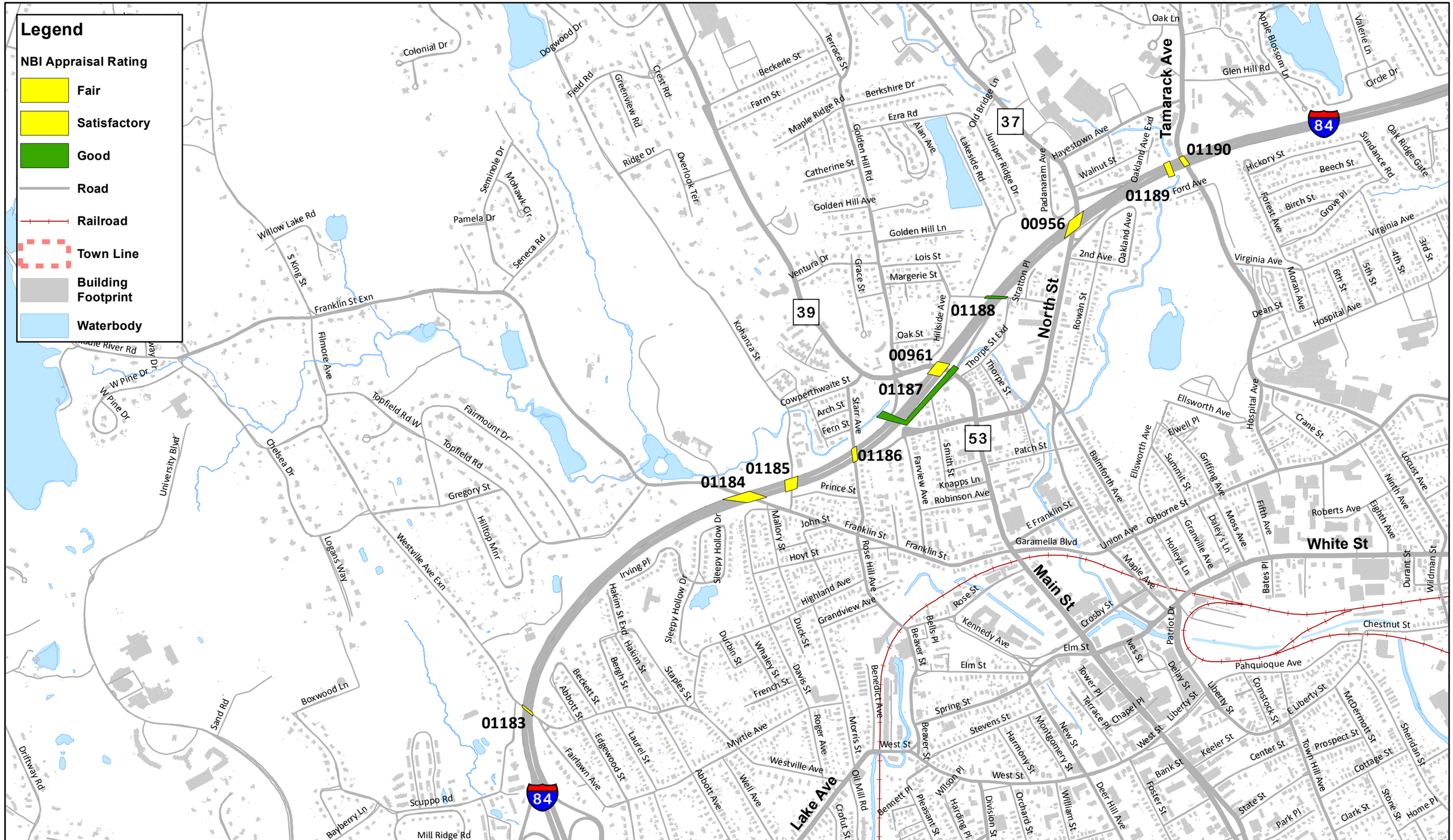
Figure 5a
Overall Structure Condition Rating

N

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017



I-84 Danbury Project

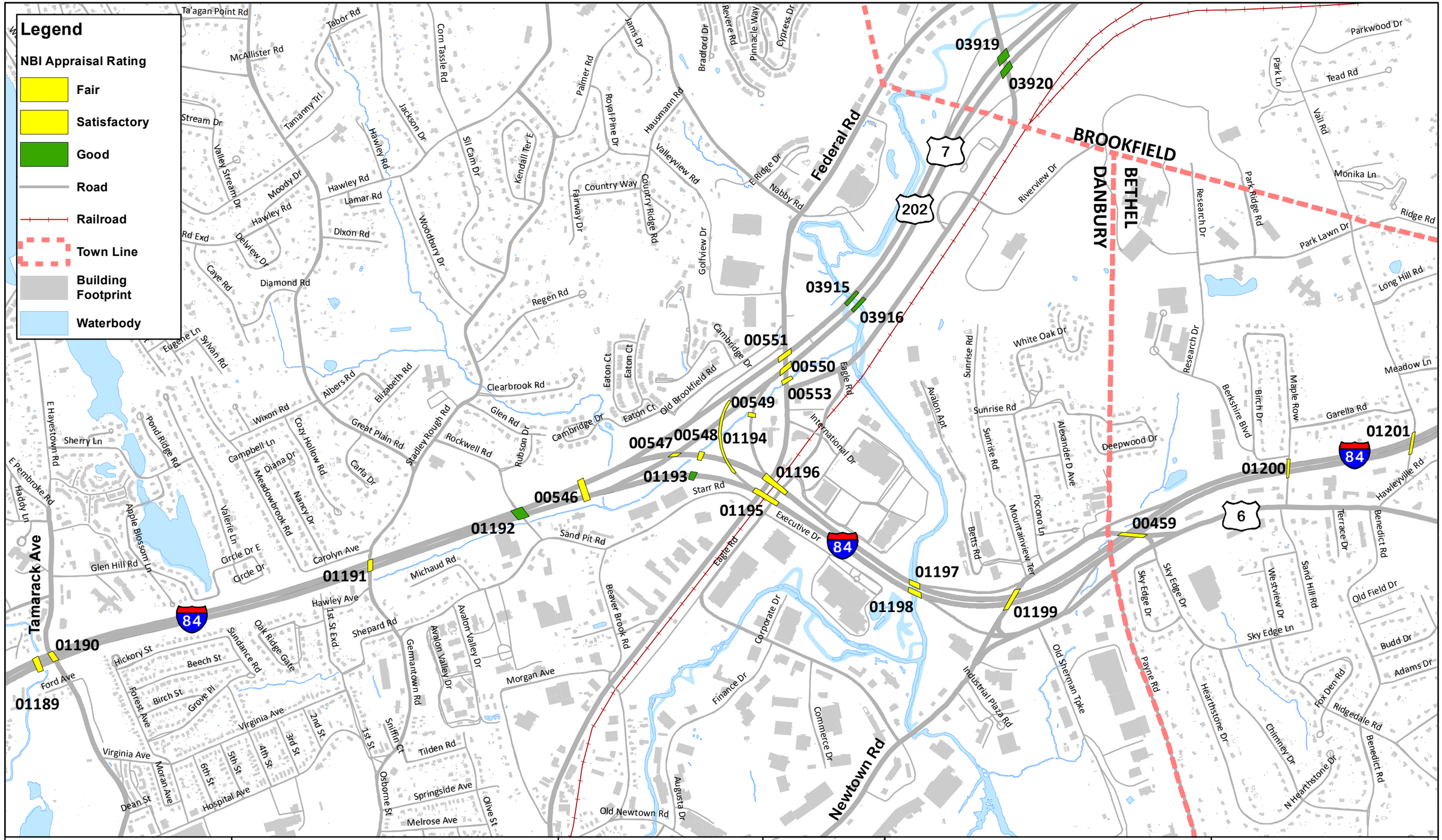
Figure 5b
Overall Structure Condition Rating

N

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017



I-84 Danbury Project

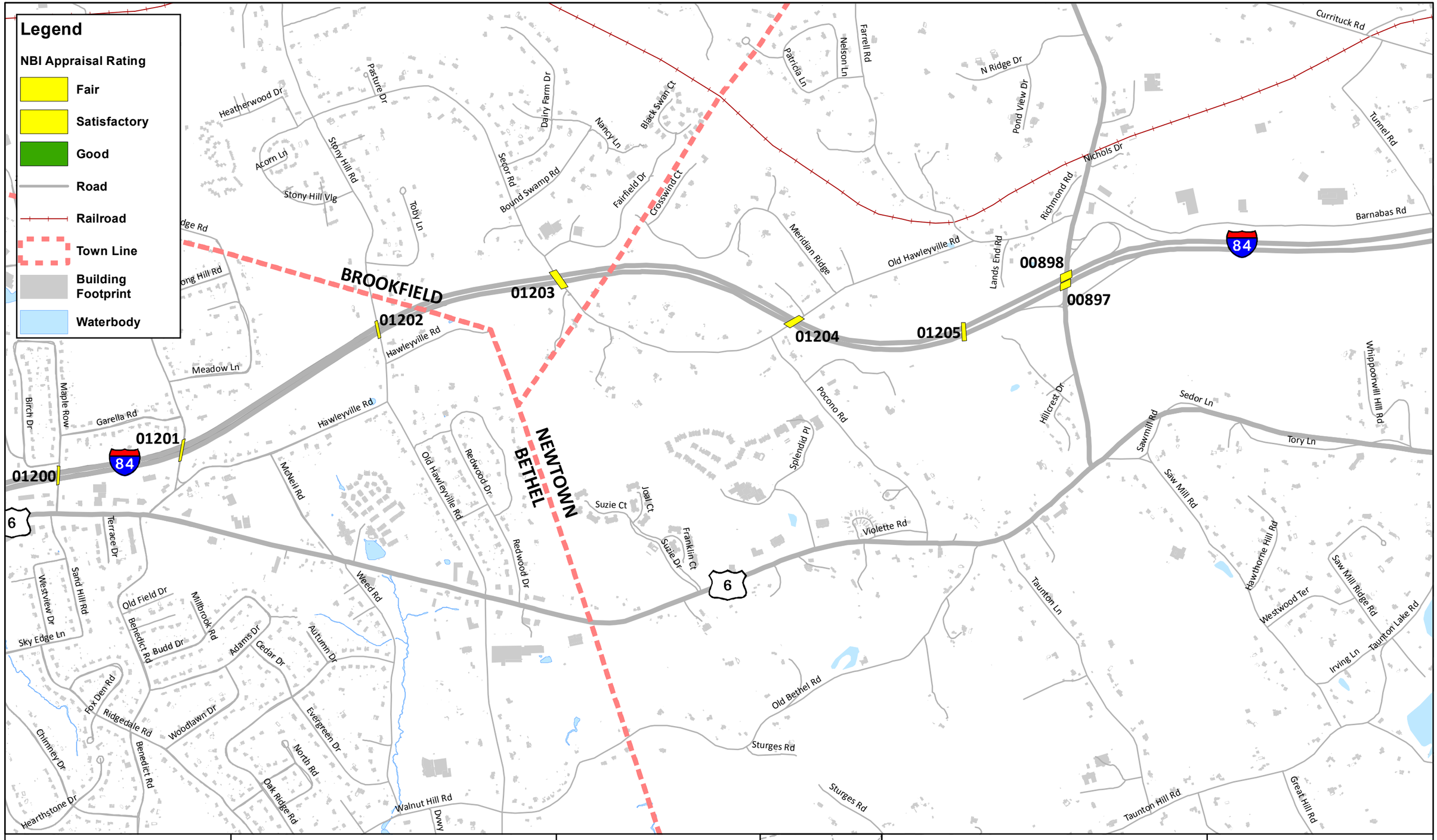
Figure 5c
Overall Structure Condition Rating

N

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017



I-84 Danbury Project

Figure 5d
Overall Structure Condition Rating

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

2.2 Load Ratings

The CTDOT Bridge Load Rating Manual, in conjunction with the American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Manual for Bridge Evaluation, provides guidelines for bridge load ratings. Load ratings are on file for each structure to determine each bridge's capacity to safely carry live loads in its current condition. Calculations are to be updated when load-carrying strength has been reduced because of deterioration, additional dead load or structural modifications. Table 7 below contains the load ratings for all the structures in the I-84 corridor.

Table 7: Load Ratings

Bridge No.	Report Year	Rating Program	Rating Method	Design Truck	Rating Factor
00457	2001	BAR7	LFD	HS20	1.73
00458	1995	*	-	HS20	1.33
00459	2001	BAR7	LFD	HS20	1.45
00541	1999	BAR7	LFD	HS20	1.56
00542	1999	BAR7	LFD	HS20	1.6
00543	1999	BAR7	LFD	HS20	1.38
00544	2000	BAR7	LFD	HS20	1.46
00545	1999	BAR7	LFD	HS20	1.7
00546	2015	N/A	LRFR	HL-93	999
00547	1996	BAR7	LFD	HS20	1.29
00548	2001	BAR7	LFD	HS20	1.55
00549	2015	N/A	LRFR	HL-93	999
00550	1999	BAR7	LFD	HS20	1.29
00551	1999	BAR7	LFD	HS20	1.18
00553	2001	*	-	HS20	0.97
00897	2002	**	-	HS20	1.20
00898	2002	**	-	HS20	1.66
00956	1995	*	-	HS20	1.97
00961	2003	BAR7	LFD	HS20	1.74
01180	2006	BAR7	LFD	HS20	1.42
01181	2003	BAR7	LFD	HS20	1.54
01182	2003	BAR7	LFD	HS20	1.54
01183	2001	BAR7	LFD	HS20	0.86
01184	1995	*	-	HS20	1.56
01185	2015	AASHTOWare	LRFR	HL-93	1.61
01186	1995	BAR7	LFD	HS20	1.56
01187	2015	N/A	LRFR	HL-93	999
01188	2001	BAR7	LFD	HS20	1.22
01189	2015	N/A	LRFR	HL-93	999

Bridge No.	Report Year	Rating Program	Rating Method	Design Truck	Rating Factor
01190	2015	AASHTOWare	LRFR	HL-93	1.69
01191	1999	BAR7	LFD	HS20	1.58
01192	1994	BAR7	LFD	HS20	2.11
01193	2015	N/A	LRFR	HL-93	999
01194	2016	N/A	LRFR	HL-93	999
01195	1994	Program E245	LFD	HS20	1.31
01196	1997	BAR7	LFD	HS20	1.26
01197	1998	BAR7	LFD	HS20	1.58
01198	2003	BAR7	LFD	HS20	1.52
01199	1998	BAR7	LFD	HS20	1.41
01200	1999	BAR7	LFD	HS20	1.2
01201	1999	BAR7	LFD	HS20	1.16
01202	1999	BAR7	LFD	HS20	1.17
01203	1999	BAR7	LFD	HS20	1.39
01204	2002	BAR7	LFD	HS20	1.26
01205	2015	N/A	LRFR	HL-93	999
03915	1999	BAR7	LFD	HS20	1.75
03916	1998	BAR7	LFD	HS20	1.92
03919	1998	BAR7	LFD	HS20	2.11
03920	2001	BAR7	LFD	HS20	2.18
05261	1997	*	-	HS20	0.78
05437	2000	*	-	HS20	0.94
05462	1997	CB-DESIGN	LFD	HS20	1.43
05463	1999	*	-	HS20	1.75
05772	1995	BAR7	LFD	HS20	1.46
05773	1996	BAR7	LFD	HS20	1.45
05909	2001	BAR7	LFD	HS20	2.24
06569	2011	BAR7	LFD	HS20	1.72

* Indicates a load rating report was unavailable. Rating factor was determined from the Inventory Rating (Item 66) from Inspection Reports.
**Indicates a load rating report was available, but a more recent inventory rating was noted in the Inspection Reports.

In the last two years, the majority of the culverts were load rated using LRFR methods with HL-93 vehicular load. These have a rating factor of 999, which is due to the large amount of ballast on top of the culvert, and therefore, an insignificant amount of live load is transferred. Five bridges and two culverts do not have load ratings on file. The rating factors for these structures within the table are determined based on the inventory rating provided in the inspection reports.

The majority of the bridges were load rated using BAR7 with HS-20 vehicular loading between the years 1995 and 2011. Bridge Nos. 01185 and 01190 were the only two bridge structures that were rated using LRFR methods with HL-93 vehicular load due to their recent rehabilitation under Project No. 0034-0313.

Of the bridges within the corridor, only four have a load rating less than one, two of which are culverts and two are steel girder bridges. Bridge Nos. 00553 and 05437, both of which are culverts, have inventory rating factors of 0.97 based on field evaluation and 0.94 based on documented engineering judgement, respectively. Bridge Nos. 05261 and 01183 had substandard load ratings based on load factor design.

The dates of the load ratings were looked at in conjunction with the rehabilitation projects to determine if the ratings were associated with the structure's most recent significant rehabilitation project. A rehabilitation project was considered significant if there were deck replacements, superstructure repairs, structure widening, or any modifications that would cause a change in dead load such as replacement of parapet or bridge railings. For structures without rehabilitation projects, it was assumed to be acceptable if they were load rated after their original construction year. Based on this analysis, all the culverts, bridges over I-84 and bridges carrying Route 7 had updated load ratings.

Three structures carrying I-84 have not been load rated since their most recent rehabilitation. Bridge No. 00548 was load rated in 2001 which would have accounted for the deck replacement in the late 1980's; however, the bridge underwent deck resurfacing, steel repairs and concrete haunch removal in 2016 under Project No. 0034-0339. Bridge Nos. 00897 and 00898 were load rated in 1973; however, in the early 1990's, they had deck replacement and deck repairs, respectively.

New load ratings are recommended for those structures without load rating reports on file, and those that have not been load rated since their most recent significant rehabilitation. A poor (4) condition rating due to steel section loss would be a sufficient reason for a load rating re-evaluation.

2.3 Safety

2.3.1 Bridge Width

Based on the figures in Chapter 5 of the CTDOT Highway Design Manual (HDM), the required bridge lane and shoulder widths must match the approach roadway width. Each bridge was examined with Google Earth and the as-built plans to determine if the current lane and shoulder widths were adequate. Any overpasses west of Exit 3 and east of Tamarack Avenue were considered intermediate areas, which are defined as residential or moderate commercial or industrial areas having moderate amounts of roadside development. Any overpasses between Exits 3 and Tamarack Avenue were considered built-up areas, which consist of urbanized areas with a high density of roadside development. Table 8 below displays the required lane and shoulder widths for the various functional classifications.

Table 8: Required Lane and Shoulder Widths

Functional Classification	Lane Width	Left Shoulder Width	Right Shoulder Width
Urban Freeway			
……DDHV > 250	12’	12’	12’
……DDHV < 250	12’	8’	10’
Multi-Lane Principal Arterial			
……Intermediate	12’	2’ – 4’	2’ – 4’
Built-up	11’	2’ – 4’	2’ – 4’
Minor Arterial			
Intermediate	11’ – 12’	2’ – 4’	4’ – 8’
Built-up	10’ – 12’	2’ – 4’	4’ – 8’
Urban Collector			
Intermediate	11’ – 12’	4’ – 8’	4’ – 8’
Built-up	10’ – 12’	2’ – 8’	2’ – 8’
Local	10’ – 11’	2’ – 4’	2’ – 4’

DDHV = Directional Design Hourly Volume

Overall, the corridor has adequate lane widths. However, the majority of the left and right shoulders are substandard. Forty-eight (84%) of the bridges within the corridor have at least one substandard element. Twenty-two (39%) of the bridges have substandard left and right lane shoulder widths. Table 9 displays the number of bridges that have standard versus substandard lanes and shoulders.

Table 9: Standard and Substandard Lane and Shoulder Widths (Bridge)

Element	Standard		Substandard		Total	
	No.	%	No.	%	No.	%
Lane	57	100%	0	0%	57	100%
Left Shoulder	5	11%	40	89%	45	100%
Right Shoulder	28	49%	30	53%	57	100%

Forty of the bridges within the project have substandard left shoulders. Table 10 below is a summary of the bridges with inadequate left shoulder widths.

Table 10: Bridges with Inadequate Left Shoulder Widths

Segment	Bridge No.	Carries	Crosses	Left Shoulder – Existing (ft)	Left Shoulder – Standard (ft)
2	00457	I-84	US Route 6	8	12
2	00458	I-84	US Route 6	4	12
8	00541	US Route 7 NB	HRRC, STILL RV, MALL ACC.	7	8
8	00543	US Route 7	I-84	5	8
8	00544	I-84 Ramp	I-84 EB	4	8
8	00545	US Route 7	I-84 EB	5	8
6	00546	I-84	Beaver Brook	4	12
6	00547	I-84 WB	US Route 7 NB	8	12
9	00548	I-84 TR 803	I-84 WB, Route 7 NB and Beaver Brook	6	8
9	00549	I-84 TR 804	Beaver Brook	6	8
9	00550	US Route 7 NB	SR 805	6	8
9	00551	US Route 7 SB	SR 805	6	8
N	00897	I-84 EB	Route 25	8	12
N	00898	I-84 WB	Route 25	6	12
4	00956	I-84	Route 37	10	12
4	00961	I-84	Route 39	8	12
1	01181	I-84 WB	Housatonic RR	8	12
1	01182	I-84 EB	Housatonic RR	10	12
3	01184	I-84	Franklin St	10	12
4	01185	I-84	Kohanza St	10	12
4	01186	I-84	Starr Ave	9	12
4	01190	I-84	Tamarack Ave	10	12
6	01193	I-84 EB	Beaver Brook	6	12
6	01194	I-84 WB	Beaver Brook	6	12
6	01195	I-84 EB	Federal/SR 805 Eagle Rd/Housatonic RR	6	12
6	01196	I-84 WB	Federal/SR 805 Eagle Rd/Housatonic RR	5	12
7	01197	I-84 WB	Still River	5	12
7	01198	I-84 EB	Still River	5	12
N	01205	I-84	Pond Brook	4	12
9	03915	US Route 7 SB	Still River	4	8
9	03916	US Route 7 NB	Still River	6	8
N	03919	US Route 7 SB	US Route 202	5	8
N	03920	US Route 7 NB	US Route 202	5	8
N	05437	I-84	Brook	10	12
N	05462	US Route 7 Ramp 47	Sugar Hollow Rd	4	8

Segment	Bridge No.	Carries	Crosses	Left Shoulder – Existing (ft)	Left Shoulder – Standard (ft)
8	05463	US Route 7 SB	Park Avenue	4	8
8	05772	US Route 7 NB	Park Avenue	6	8
N	05773	US Route 7 NB	Wooster Heights Rd	7	8
N	05909	US Route 7 Ramp 48	Sugar Hollow Rd	5	8
N	06569	US Route 7 SB	Wooster Heights Rd	7	8

Thirty of the bridges within the project have substandard right shoulders. Table 11 displays the bridges with inadequate right shoulders.

Table 11: Bridges with Inadequate Right Shoulder Widths

Segment	Bridge No.	Carries	Crosses	Right Shoulder – Existing (ft)	Right Shoulder – Standard (ft)
2	00457	I-84	US Route 6	8	12
7	00459	US Route 6	I-84	2	4
6	00546	I-84	Beaver Brook	10	12
6	00547	I-84 WB	US Route 7 NB	10	12
N	00553	SR 805	Beaver Brook	2	4
N	00897	I-84 EB	Route 25	10	12
N	00898	I-84 WB	Route 25	6	12
4	00956	I-84	Route 37	10	12
4	00961	I-84	Route 39	10	12
1	01180	Kenosia Avenue	I-84 and Housatonic RR	3	4
1	01181	I-84 WB	Housatonic RR	10	12
1	01182	I-84 EB	Housatonic RR	10	12
3	01184	I-84	Franklin St	10	12
4	01185	I-84	Kohanza St	10	12
4	01186	I-84	Starr Ave	8	12
4	01187	I-84	Kohanza Brook	10	12
4	01189	I-84	Padanaram Brook	10	12
5	01191	I-84	Great Plain Rd	10	12
6	01193	I-84 EB	Beaver Brook	10	12
6	01194	I-84 WB	Beaver Brook	10	12
6	01195	I-84 EB	Federal/SR 805 Eagle Rd/Housatonic RR	10	12
6	01196	I-84 WB	Federal/SR 805 Eagle Rd/Housatonic RR	10	12
7	01197	I-84 WB	Still River	7	12
7	01198	I-84 EB	Still River	3	12
7	01199	Route 911	I-84	2	4
N	01205	I-84	Pond Brook	9	12

Segment	Bridge No.	Carries	Crosses	Right Shoulder – Existing (ft)	Right Shoulder – Standard (ft)
N	05261	Old Ridgebury Rd	I-84 and Exit Ramps	2	4
N	05437	I-84	Brook	10	12
N	05462	US Route 7 Ramp 47	Sugar Hollow Rd	6	10
N	05909	US Route 7 Ramp 48	Sugar Hollow Rd	8	10

2.3.2 Underclearance Geometry

National Bridge Inventory (NBI) Appraisal Item No. 69, Vertical and Horizontal Underclearances, is based on the vertical and horizontal underclearances at the structure location. The vertical and horizontal underclearances are measured from the through roadway to the superstructure and substructure units, respectively. The underclearances are evaluated using Tables 3A and 3B within the FHWA Coding Guide (see Table 12 and Table 13 below) and the minimum of the two ratings is chosen for the appraisal rating. Both vertical and horizontal clearance requirements are based on the functional classification of the underpassing route.

Table 12: Minimum Vertical Underclearance (FHWA Coding Guide)

Underclearnace Rating Code	Minimum Vertical Underclearance (ft)			
	Interstate or Other Freeway	Other Principal and Minor Arterial	Major and Minor Collectors and Locals	Railroad
9	>16.99	>16.47	>16.47	>23.00
8	16.99	16.47	16.47	23.00
7	16.73	15.49	15.49	22.47
6	16.47	14.47	14.47	21.98
5	15.75	14.24	14.24	21.00
4	14.99	13.98	13.98	19.98
3	Underclearance less than value in rating code of 4 and requiring corrective action.			
2	Underclearance less than value in rating code of 4 and requiring replacement.			
0	Bridge Closed			

Table 13: Minimum Lateral Underclearance (FHWA Coding Guide)

Underclearance Rating Code	Minimum Lateral Underclearance (ft)						
	Functional Class						Railroad
	1-Way Traffic				2-Way Traffic		
	Principal Arterial-Interstate, Freeways or Expressways				Other Principal and Minor Arterial	Major and Minor Collectors and Locals	
	Main Line		Ramp				
	Left	Right	Left	Right			
9	>29.86	>29.86	>3.94	>9.84	>29.86	>12.14	>20.01
8	29.86	29.86	3.94	9.84	29.86	12.14	20.01

Underclearance Rating Code	Minimum Lateral Underclearance (ft)						
	Functional Class						Railroad
	1-Way Traffic				2-Way Traffic		
	Principal Arterial-Interstate, Freeways or Expressways				Other Principal and Minor Arterial	Major and Minor Collectors and Locals	
	Main Line		Ramp				
	Left	Right	Left	Right			
7	18.04	21.00	2.95	8.86	21.00	11.15	17.06
6	5.91	12.14	1.97	7.87	12.14	9.84	14.11
5	4.92	11.15	1.97	5.91	9.84	7.87	11.15
4	3.94	9.84	1.97	3.94	5.91	3.94	7.87
3	Underclearance less than value in rating code of 4 and requiring corrective action.						
2	Underclearance less than value in rating code of 4 and requiring replacement.						
0	Bridge Closed						

2.3.2.1 Vertical Clearance

The CTDOT HDM Chapter 5 outlines the minimum vertical clearance requirements based on the functional classification of the under passing roadway. The HDM identifies requirements for existing bridges and for new bridges. As part of this project, it is to be determined if the structures along the corridor will be rehabilitated by widening to accommodate the future corridor, or if there will be full replacements. For the purposes of this study, a structure that is widened would be evaluated under the existing condition minimum vertical clearance requirement. The bridges over water and culverts were not included in this evaluation.**Error! Reference source not found.** Table 14 contains a breakdown of the substandard structures by underpass functional classification.

Table 14: Vertical Clearance

Underpass Classification	No. Bridges	HDM Standard - New Bridge (ft)	HDM Standard - Existing Bridge (ft)	Standard		Substandard - New Construction		Substandard - Rehabilitation	
				No. Bridges	%	No. Bridges	%	No. Bridges	%
Urban Freeway	15	16.25	16	5	33%	5	33%	5	33%
Urban Freeway/ Railroad	1	16.25/20.5	16/20.5	0	0%	0	0%	1	100%
Principal Arterial	4	14.25	16.25	3	75%	0	0%	1	25%
Principal Arterial/ Urban Collector/RR	2	14.25/14.5/20.5	16.25/14.25/ 20.5	0	0%	0	0%	2	100%
Urban Collector	2	14.5	14.25	0	0%	0	0%	2	100%
Minor Arterial	12	16.25	14.25	5	42%	5	42%	2	17%
Local	4	14.5	14.25	3	75%	0	0%	1	25%
Railroad	4	20.5	20.5	3	75%	0	0%	1	25%
Total	44			19	43%	10	23%	15	34%

Overall, ten (approximately 23%) of the structures have substandard minimum vertical clearance for the full replacement condition per HDM standards. If the structures warrant rehabilitation only, fifteen bridges (approximately 34%) have substandard vertical clearance per the HDM. Currently, only six of these bridges are posted. See Table 15 below for posted bridges.

Table 15: Posted Bridges

Bridge No.	Crossing Functional Class	Required Clearance per HDM	Posted Clearance
00550	Principal Arterial	14'-3"	13'-9"
00961	Minor Arterial	14'-3"	13'-8"
01185	Local	14'-3"	13'-11"
01186	Urban Collector	14'-3"	13'-10"
01190	Urban Collector	14'-3"	13'-11"
01191	Minor Arterial	14'-3"	13'-8"

Seven of the bridges within the corridor are carried over the Housatonic Railroad. Five of these bridges are also over other roadway classifications. By looking at the clearance diagrams for each span from the inspection reports, it was determined which spans had substandard vertical clearances. Three of the seven bridges over the Housatonic Railroad were substandard for spans over the railroad, and one of the bridges was substandard for the span over another roadway classification. Bridges that are substandard for the spans over the railroad would need to be raised for both full replacements and rehabilitation projects. Of the bridges that are solely over the railroad, only Bridge No. 01181, carrying I-84 over the Housatonic Railroad, does not meet the 20'-6" vertical clearance requirement.

Five of the structures that are over Urban Freeways (I-84 and Route 7) have minimum vertical clearances that are substandard for new construction, but not for rehabilitation. In these cases, the roadway profile would only need to be raised in the event their structural condition warranted full replacement.

2.3.2.2 Horizontal Underclearance

NBI Item Nos. 55 and 56 measure the horizontal underclearance on the right and left, respectively. This dimension is measured from the edge of roadway (excluding shoulders) or the centerline of the railroad tracks to the nearest obstruction (substructure unit, concrete bridge rail or toe of slope steeper than 1 to 3) on both the left and right side of the underpassing route. The clearance measurements recorded will be the minimum after measuring the clearance in both directions of travel. A minimum lateral underclearance rating less than a 4 indicates that the underclearance requires corrective action. HDM Section 13-3.04 states that structures should be placed outside of the clearzone; however; many piers and abutments are within the design clear zone and cannot be relocated. In these cases, guiderail or concrete barrier protection is warranted. The available lateral underclearance is important for the site distance requirements, which will need to be evaluated on a case by case basis during alternatives analysis.

Table 16 displays the thirteen bridges with lateral underclearances that are driving the NBI No. 69 rating to be 3, requiring corrective action. Eight of these bridges have at least one side with a clearance less than two feet. For example, Bridge Nos. 00541 and 00542, which carry I-84 over the Housatonic Railroad, Still River and Mall Access Road, have piers directly adjacent to both sides of the Mall Access Road. In the event that the underpasses need to be widened as a result of the project, substructure elements may need to be relocated, which would be a major structural adjustment.

Table 16: Lateral Underclearance (<2')

Bridge No.	Carries	Crossing	Item 69: Vertical and Horizontal Underclearances	Item 55: Min. Lateral Underclearance on Right (ft)	Item 56: Min. Lateral Underclearance on Left (ft)	Functional Class of Underpass Route
00459	US Route 6	I-84	3	6	7.5	Principal Arterial
00541	US Route 7 NB	HRRC, STILL RV, MALL ACC.	3	0	0	Local
00542	US Route 7 SB	HRRC, STILL RV, MALL ACC.	3	0	0	Local
00548	I-84 TR 803	I-84 WB, Route 7 NB and Beaver Brook	3	8.916	5.33	Principal Arterial
00550	US Route 7 NB	SR 805	3	1.66	0	Principal Arterial
00551	US Route 7 SB	SR 805	3	1.5	0	Principal Arterial
01180	Kenosia Avenue	I-84 and Housatonic RR	3	9.4	7.5	Principal Arterial
01183	Westville Ave	I-84	3	7.833	11.667	Principal Arterial
01190	I-84	Tamarack Ave	3	0	0	Urban Collector
01191	I-84	Great Plain Rd	3	4.5	0	Minor Arterial
01200	Garella Rd	I-84	3	9.5	8.5	Principal Arterial
03919	US Route 7 SB	US Route 202	3	2.5	0	Minor Arterial
03920	US Route 7 NB	US Route 202	3	2	0	Minor Arterial

2.3.3 Roadway Width

Chapter 5 of the CTDOT HDM outlines the requirements for lane, left shoulder and right shoulder widths. Similar to the methodology used to determine bridge width, each bridge's crossing roadway was examined with Google Earth to determine if the widths were adequate. For any roadways carrying two-way traffic, only right shoulders were evaluated. Reference Table 8 for the required lane and shoulder widths for the various functional classifications. The lane and shoulder widths of the crossing roadways will drive the insufficient horizontal clearance to obstructions.

Forty-two of the bridges were evaluated for the underpass roadway width criteria. The remaining fifteen were bridges over waterways and railroads, or culverts. Overall, the lane widths were adequate. Only seven (17%) of the crossing roadways have substandard lane widths. The majority of the right shoulder widths are inadequate. Of the bridges that are crossing roadways, thirty-five (83%) have at least one substandard element. Table 17 below displays the number of crossing roadways that have standard versus substandard lanes and shoulders.

Table 17: Standard and Substandard Lane and Shoulder Widths (Crossing Roadway)

Element	Standard		Substandard		Total	
	No.	%	No.	%	No.	%
Lane	35	83%	7	17%	42	100%
Left Shoulder	2	12%	15	88%	17	100%
Right Shoulder	18	43%	24	57%	42	100%

Seven of the underpasses have inadequate lane widths. Table 18 below is a summary of the bridges with inadequate lane widths.

Table 18: Underpasses with Inadequate Lane Widths

Segment	Bridge No.	Carries	Crosses	Lane – Existing (ft)	Lane – Standard (ft)
2	00457	I-84	US Route 6	10	11
2	00458	I-84	US Route 6	10	11
9	00550	US Route 7 NB	SR 805	10	12
9	00551	US Route 7 SB	SR 805	10	12
6	01195	I-84 EB	Federal/SR 805 Eagle Rd/Housatonic RR	10, 10	12, 11
6	01196	I-84 WB	Federal/SR 805 Eagle Rd/Housatonic RR	10, 10	12, 11
N	05909	US Route 7 Ramp 48	Route 7 SB, Sugar Hollow Rd	11, 12	12, 10

For Bridge Nos. 01195 and 01196, both Federal Road and Eagle Road have substandard lane widths based on their Principal Arterial and Urban Collector functional classifications. Based on Google Earth measurements, the rightmost lane of Route 7 SB under Bridge No. 05909 is substandard.

Fifteen of the underpasses within the corridor have inadequate left shoulder widths. See Table 19 below for a summary of these structures.

Table 19: Underpasses with Inadequate Left Shoulder Widths

Segment	Bridge No.	Carries	Crosses	Left Shoulder – Existing (ft)	Left Shoulder – Standard (ft)
7	00459	US Route 6	I-84	4	12
8	00543	US Route 7	I-84	4	12
8	00544	I-84 Ramp	I-84 EB	6	12
8	00545	US Route 7	I-84 EB	6	12

Segment	Bridge No.	Carries	Crosses	Left Shoulder – Existing (ft)	Left Shoulder – Standard (ft)
6	00547	I-84 WB	US Route 7 NB	5	8
9	00548	I-84 TR 803	I-84 WB, Route 7 NB and Beaver Brook	4, 6	12, 8
1	01180	Kenosia Avenue	I-84 and Housatonic RR	10	12
7	01199	Route 911	I-84	4	12
7	01200	Garella Rd	I-84	4	12
7	01201	Vail Rd	I-84	4	12
N	01202	Old Hawleyville Rd	I-84	5	12
N	01203	Secor Rd	I-84	4	12
N	01204	Old Hawleyville Rd	I-84	3	12
N	05261	Old Ridgebury Rd	I-84 and Exit Ramps	6	12
N	05909	US Route 7 Ramp 48	Route 7 SB, Sugar Hollow Rd	6, 0	8, 2

Both Route 7 Southbound and Sugar Hollow Road passing under Bridge No. 05909 have inadequate left shoulder widths. The left shoulders on I-84 Westbound and Route 7 Northbound passing under Bridge No. 00548 are also inadequate.

Twenty-four bridges have underpasses with inadequate right shoulder widths. Table 20 below summarizes the underpasses with inadequate right shoulder widths.

Table 20: Underpasses with Inadequate Right Shoulder Widths

Segment	Bridge No.	Carries	Crosses	Right Shoulder – Existing (ft)	Right Shoulder – Standard (ft)
2	00457	I-84	US Route 6	3	4
2	00458	I-84	US Route 6	3	4
8	00541	US Route 7 NB	HRRC, STILL RV, MALL ACC.	0	2
8	00542	US Route 7 SB	HRRC, STILL RV, MALL ACC.	0	2
6	00547	I-84 WB	US Route 7 NB	9	10
9	00548	I-84 TR 803	I-84 WB, Route 7 NB and Beaver Brook	8, 12	12, 10
9	00550	US Route 7 NB	SR 805	1	4
9	00551	US Route 7 SB	SR 805	1	4
4	00956	I-84	Route 37	0	4
4	00961	I-84	Route 39	3	4
3	01183	Westville Ave	I-84	9	12
4	01188	Madison Ave	I-84	7	12
5	01192	I-84	Rockwell Road	0	2
6	01195	I-84 EB	Federal/SR 805 Eagle Rd/Housatonic RR	0, 0	4, 4

Segment	Bridge No.	Carries	Crosses	Right Shoulder – Existing (ft)	Right Shoulder – Standard (ft)
6	01196	I-84 WB	Federal/SR 805 Eagle Rd/Housatonic RR	0, 0	4, 4
N	01204	Old Hawleyville Rd	I-84	10	12
N	03919	US Route 7 SB	US Route 202	1	4
N	03920	US Route 7 NB	US Route 202	1	4
N	05462	US Route 7 Ramp 47	Sugar Hollow Rd	1	2
8	05463	US Route 7 SB	Park Avenue	1	4
8	05772	US Route 7 NB	Park Avenue	1	4
N	05773	US Route 7 NB	Wooster Heights Rd	1	4
N	05909	US Route 7 Ramp 48	Route 7 SB, Sugar Hollow Rd	10, 0	10, 2
N	06569	US Route 7 SB	Wooster Heights Rd	1	4

The right shoulder of I-84 Westbound under Bridge No. 00548 is inadequate. For Bridge No. 05909, only the right shoulder of Sugar Hollow Road is inadequate. Both Federal Road and Eagle Road have inadequate right shoulder widths under Bridge Nos. 01195 and 01196.

2.3.4 Traffic Safety Features

Table 21 presents the appraisal ratings of the traffic safety features on the structures within the corridor. The table indicates that eight of the fifty-seven bridges and culverts within the corridor have all four traffic safety features that are substandard.

The six structures built after 1980 (Bridge Nos. 05462, 05463, 05772, 05773, 05909 and 06569) all have standard features. In the late 1980's to early 1990's, rehabilitation Project No. 0034-0189 reconstructed the parapets, metal beam rail, and curbing of ten bridges (Bridge Nos. 00457, 00458, 00956, 00961, 01184, 01185, 01186, 01190, 01191, and 01192), bringing the features up to current standards. Additionally, in the mid 1980's, Project No. 0034-0204 upgraded the bridge rail and approach systems for Bridge Nos. 01195 and 01196. As part of this project, the replacement of all substandard guardrail systems will be evaluated.

Code 1 indicates that the traffic safety feature meets currently accepted standards, and Code 0 indicates that the feature does not meet current standards or that the feature is required but not provided. Code N indicates that the feature does not exist or apply.

Table 21: Traffic Safety Feature Ratings

Bridge No.	Carries	Crossing	Approach Guide Rail Rating	Bridge Railings	Transitions	Approach Guardrails	Approach Guardrail Ends	Bridge Function
00457	I-84	US Route 6	7	1	1	1	1	I-84
00458	I-84	US Route 6	7	1	1	1	1	I-84
00459	US Route 6	I-84	5	0	0	0	0	Over I-84
00541	US Route 7 NB	HRRC, STILL RV, MALL ACC.	7	1	1	1	1	Route 7
00542	US Route 7 SB	HRRC, STILL RV, MALL ACC.	7	0	1	0	1	Route 7
00543	US Route 7	I-84	7	0	0	0	1	Over I-84
00544	I-84 Ramp	I-84 EB	7	0	0	0	1	I-84
00545	US Route 7	I-84 EB	7	0	1	1	1	Over I-84
00546	I-84	Beaver Brook	6	N	N	N	N	Culvert
00547	I-84 WB	US Route 7 NB	7	0	0	1	1	I-84
00548	I-84 TR 803	I-84 WB, Route 7 NB, and Beaver Brook	6	1	1	1	1	Over I-84
00549	I-84 TR 804	Beaver Brook	6	N	N	N	N	Culvert
00550	US Route 7 NB	SR 805	7	0	0	0	1	Route 7
00551	US Route 7 SB	SR 805	7	0	0	0	1	Route 7
00553	SR 805	Beaver Brook	5	0	0	0	0	Culvert
00897	I-84 EB	Route 25	7	0	0	0	1	I-84
00898	I-84 WB	Route 25	6	0	0	0	0	I-84
00956	I-84	Route 37	7	1	1	1	1	I-84
00961	I-84	Route 39	6	1	1	1	1	I-84
01180	Kenosia Avenue	I-84 and Housatonic RR	7	1	0	0	1	Over I-84
01181	I-84 WB	Housatonic RR	7	0	0	0	1	I-84
01182	I-84 EB	Housatonic RR	6	0	0	0	1	I-84
01183	Westville Ave	I-84	7	1	0	0	1	Over I-84
01184	I-84	Franklin St	7	1	1	1	1	I-84

Bridge No.	Carries	Crossing	Approach Guide Rail Rating	Bridge Railings	Transitions	Approach Guardrails	Approach Guardrail Ends	Bridge Function
01185	I-84	Kohanza St	6	1	1	1	1	I-84
01186	I-84	Starr Ave	7	1	1	1	1	I-84
01187	I-84	Kohanza Brook	6	0	0	1	0	Culvert
01188	Madison Ave	I-84	7	0	0	0	0	Over I-84
01189	I-84	Padanaram Brook	7	N	N	N	N	Culvert
01190	I-84	Tamarack Ave	7	1	1	1	1	I-84
01191	I-84	Great Plain Rd	6	1	1	1	1	I-84
01192	I-84	Rockwell Road	7	0	1	1	1	I-84
01193	I-84 EB	Beaver Brook	7	N	N	N	N	Culvert
01194	I-84 WB	Beaver Brook	7	N	N	N	N	Culvert
01195	I-84 EB	Federal/ SR 805 Eagle Rd/ Housatonic RR	7	1	1	1	1	I-84
01196	I-84 WB	Federal/ SR 805 Eagle Rd/ Housatonic RR	7	1	1	1	1	I-84
01197	I-84 WB	Still River	6	0	0	0	1	I-84
01198	I-84 EB	Still River	6	0	1	1	1	I-84
01199	Route 911	I-84	6	1	0	0	1	Over I-84
01200	Garella Rd	I-84	6	1	0	0	0	Over I-84
01201	Vail Rd	I-84	4	0	0	0	0	Over I-84
01202	Old Hawleyville Rd	I-84	5	0	0	0	0	Over I-84
01203	Secor Rd	I-84	4	0	0	0	0	Over I-84
01204	Old Hawleyville Rd	I-84	7	0	0	0	0	Over I-84
01205	I-84	Pond Brook	6	N	N	N	N	Culvert
03915	US Route 7 SB	Still River	6	0	0	0	1	Route 7
03916	US Route 7 NB	Still River	7	0	0	0	1	Route 7
03919	US Route 7 SB	US Route 202	6	0	0	0	1	Route 7
03920	US Route 7 NB	US Route 202	7	0	0	0	1	Route 7

Bridge No.	Carries	Crossing	Approach Guide Rail Rating	Bridge Railings	Transitions	Approach Guardrails	Approach Guardrail Ends	Bridge Function
05261	Old Ridgebury Rd	I-84 and Exit Ramps	6	1	0	0	1	Over I-84
05437	I-84	Brook	7	N	N	N	N	Culvert
05462	US Route 7 Ramp 47	Sugar Hollow Rd	6	1	1	1	1	Route 7
05463	US Route 7 SB	Park Avenue	6	1	1	1	1	Route 7
05772	US Route 7 NB	Park Avenue	7	1	1	1	1	Route 7
05773	US Route 7 NB	Wooster Heights Rd	8	1	1	1	1	Route 7
05909	US Route 7 Ramp 48	Sugar Hollow Rd	7	1	1	1	1	Route 7
06569	US Route 7 SB	Wooster Heights Rd	8	1	1	1	1	Route 7

The following narrative provides a definition of the traffic safety features identified **Error! Reference source not found.**, and the state of the feature pertaining to the bridges within the corridor.

Bridge Railings: Factors affecting the proper functionality of bridge railings are height, material, strength and geometry. Railings must be capable of smoothly redirecting an impacting vehicle. Bridge Rail systems should be designed per AASHTO LRFD Specifications for Highway Bridges, and should be crash tested per FHWA policy. Elements are considered acceptable when they meet specific geometric criteria and resist static loads without exceeding the allowable stress in their elements as defined by AASHTO requirements. Other railings are considered acceptable if they have been previously crash tested even if they do not meet the static loading analysis and geometric requirements. Overall, approximately 46% of the bridges within the corridor have substandard bridge railings.

Transitions: The transition from approach guardrail to bridge railing requires that the approach guardrail be firmly attached to the bridge railing. It also requires that the approach guardrail is stiffened as it approaches the bridge railing. It is required that the ends of curbs be tapered out or shielded at the transition locations. Overall, 47% of the bridges within the corridor have substandard transitions. All of the bridges carrying local roads over I-84 have guardrail transitions that are substandard.

Approach Guardrail: The approach guardrail system must have adequate length and structural qualities to shield motorists from the hazards at the bridge site, and be capable of safely redirecting an impacting vehicle. The system must also act as a smooth transition to the bridge railing that does not cause snagging or pocketing of an impacting vehicle. Approach rail systems are to be designed per the AASHTO Roadside Design Guide or subsequent FHWA and AASHTO guidelines. Overall, 46% of the bridges within the corridor have substandard approach guardrail. All of the bridges carrying local roads over I-84 have approach guardrail that is substandard. During the field inspection, it was identified that the majority of these bridges have wood posts with wire rail.

Approach Guardrail Ends: The ends of approach rail should be flared, buried, made breakaway or shielded. They are to be designed per the AASHTO Roadside Design Guide. Overall, 18% of the bridges within the corridor have substandard approach guardrail ends. Of the twelve bridges carrying local roads over I-84 that have substandard approach guardrail and transitions, seven of them also have substandard approach guardrail ends.

2.4 Structure

2.4.1 Seismic Retrofit

In the 1990's, the CTDOT started a seismic retrofitting program. The preliminary seismic screening was created as a first step to identify the need for further evaluation and potential upgrading of the seismic resistance of existing highway bridges. This evaluation would be completed during the regular bridge inspection. Based on the inspection data, a Seismic Sufficiency Rating (SERS) would be calculated. Like the sufficiency rating, a SERS of 100 represents a bridge with no need for further evaluation of seismic retrofitting, and a SERS of 0 represents a bridge that is extremely inadequate in resisting seismic forces. The goal of this system was to create a prioritized list of structurally vulnerable NBI bridges for the next phase of the seismic retrofitting program. The SERS was evaluated based on three separate factors: Importance, Seismicity, and Vulnerability. These three factors are defined below.

Importance:	Considers:	Average Daily Traffic
		Length of Detour Route
		Proximity to Hospitals
		If Structure is on an Interstate Highway
		If Structure Crosses a Major River
Seismicity:	Considers:	Acceleration Coefficient of Structure
Vulnerability:	Considers:	Type of Bearing
		Support Length (Longitudinal/Transverse)
		Restraint (Longitudinal/Transverse)
		Column/Pier Height

Only 13 of the structures included within the project limits have been evaluated through this preliminary seismic screening process. These structures were evaluated based on the criteria listed above. All are within the same seismic zone and therefore were treated equally. Four of the bridges received SERS less than or equal to 50, which indicate that they are good candidates for seismic retrofitting. Bridge Nos. 00547, 01181 and 01182 low ratings likely were attributable to the importance of these structures, as they carry the mainline I-84 and have the three highest ADT's of all the bridges in the corridor. Bridge No. 01183 carries Westville Avenue over I-84 so it has a lower ADT; however, it's vulnerability factor increases due to its short longitudinal support length (approximately one foot from centerline of bearing to front face of pedestal at the abutments).

This program was not completed due to the change in seismic zone classification, which resulted in a reduced impact of seismic in terms of governing load cases. Table 22 below summarizes the results from this evaluation.

Table 22: Available Seismic Sufficiency Ratings

Bridge No.	Carries	Crossing	Seismic Sufficiency Rating (SERS)
00459	US Route 6	I-84	92
00547	I-84 WB	US Route 7 NB	43
00550	US Route 7 NB	SR 805	59
00551	US Route 7 SB	SR 805	59
01180	Kenosia Avenue	I-84 and Housatonic RR	75
01181	I-84 WB	Housatonic RR	47
01182	I-84 EB	Housatonic RR	47
01183	Westville Ave	I-84	50
01188	Madison Ave	I-84	75
01199	Route 911	I-84	96
03915	US Route 7 SB	Still River	84
03916	US Route 7 NB	Still River	84
05909	US Route 7 Ramp 48	Sugar Hollow Rd	75

The rehabilitation plans for the structures in the corridor were examined and previously completed seismic retrofit rehabilitations were identified. Of the bridge structures within the project, twelve of the bridges (approximately 21%) have undergone a seismic retrofit rehabilitation. See Table 23 below for completed seismic retrofit rehabilitations.

Table 23: Seismic Retrofits

Bridge No.	Carries	Crossing	Project No. Installed	Project Year	Notes
00459	US Route 6	I-84	0034-0155	1976	New elastomeric bearing pads, new steel pedestal and braces, new keeper plates
00541	US Route 7 NB	HRRC, STILL RV, MALL ACC.	0034-0202	1984	Concrete bearing pad extension at interior girders, concrete keeper blocks at fascias
00542	US Route 7 SB	HRRC, STILL RV, MALL ACC.	0034-0254	1992	New concrete keeper blocks
01192	I-84	Rockwell Road	0034-0262	1994	Concrete keeper blocks installed
01199	Route 911	I-84	0034-0155	1976	New elastomeric bearing pads, new steel pedestal and braces, new keeper plates

Bridge No.	Carries	Crossing	Project No. Installed	Project Year	Notes
01200	Garella Rd	I-84	0034-0266	1994	Keeper blocks at piers and abutments
01201	Vail Rd	I-84	0034-0266	1994	Keeper blocks at piers and abutments
01202	Old Hawleyville Rd	I-84	0034-0266	1994	Keeper blocks at piers and abutments
01203	Secor Rd	I-84	0034-0266	1994	Keeper blocks at piers and abutments
03915	US Route 7 SB	Still River	0034-0124	1973	Relocation of Route 7 - keeper blocks installed
03916	US Route 7 NB	Still River	0034-0124	1973	Relocation of Route 7 - keeper blocks installed
06569	US Route 7 SB	Wooster Heights Rd	0034-0260	2008	New construction - concrete keeper blocks

The most common seismic retrofit was the addition of concrete keeper blocks or steel keeper angles at the expansion bearings.

AASHTO Section 4.7.4.4 outlines empirical minimum support length requirements for analysis of earthquake loads. The required minimum support length is a function of the span length, the height of supports and the support skew angle. Each support of all the bridges within the corridor was analyzed to determine if their support length was adequate. Based on this analysis, all supports had adequate seats.

2.4.2 Fracture Critical and Fatigue Prone

The AASHTO Guide Specification for Fracture Critical Bridge Members includes the following definition: "Fracture Critical Members (FCMs) or member components are tension members or tension components of members whose failure would be expected to result in the collapse of the bridge." Examples are two-girder bridges, pin and hangers, pier cap girders, through trusses, tied arches and suspension bridges.

As part of the reporting requirements for the National Bridge Inspection Standards (NBIS), CTDOT has a fracture critical members and fatigue prone details inspection data sheet (BRI12). This form is filled out for each different fracture critical member and/or fatigue prone detail that is present in the structure.

The FHWA Bridge Inspection Reference Manual defines the different fatigue categories as noted in Table 24 below.

Table 24: Fatigue Categories (FHWA Bridge Inspection Reference Manual)

Category	Description
A	Base metal or plain material with rolled or cleaned surfaces, away from welded, riveted or bolted connections. This condition has the best fatigue resistance.
B	Welded structural details and high strength bolted joints.
B’	Sub-category including details in Category B, but found to be more sensitive to fatigue.
C and C’	Base metal at welds connecting transverse stiffeners, very short attachments, shear connectors, transverse groove welds with reinforcement not removed.
D	Welded short attachments, welded connections with sharp transition curves, and riveted joints.

Category	Description
E	Ends of partial length cover plates on flanges, welded attachments with groove or fillet weld in direction of main members (greater than 100 mm or 12 times the plate thickness), with curved transition radius, with loads transverse to welds, intermittent fillet welds, shear stress on the throat of fillet weld, deck plate at the connection to floorbeam weld.
E’	For welded details within Category E, Category E’ applies if the flange plate thickness exceeds 20 mm (0.8 inch) or if the attachment plate thickness is 25 mm (1 inch) or more.

Categories E and E' are the most susceptible to fatigue crack growth, and should be examined at every inspection. Table 25 below summarizes the number of bridges with fracture critical and fatigue prone details.

Table 25: Bridges with Fracture Critical and Fatigue Prone Details by Number/Percentage

Bridge Function	No. Bridges	Fracture Critical		Fatigue Prone	
		No.	%	No.	%
I-84	21	0	0%	17	81%
Over I-84	11	0	0%	9	82%
Route 7	16	2	13%	11	69%
Culvert	9	0	0%	0	0%
Total	57	2	13%	37	65%

Only two structures have fracture critical members. Bridge Nos. 05462 and 05909, which carry Route 7 ramps over Sugar Hollow Road, are comprised of horizontally curved multicell steel box girders that are continuous over their piers. The flange transition welds in the tension regions are only Category B fatigue details. However, the horizontal curvature of the girders introduces additional fatigue concerns due to the internal bracing and stiffening required, which may also produce welded details sensitive to repetitive loads.

Table 26 below lists the number of fracture critical and fatigue prone details noted in inspection reports within the project based on fatigue category.

Table 26: Fatigue Details by Fatigue Category

Fatigue Category	No. Details
B	10
C	1
D	1
E	17
E'	22

The majority of the structures had Fatigue Category E and E’ details, most of which occur in the older bridges carrying I-84. The structures having Fatigue Detail E’ elements consisted of partial length welded cover plates. Some additional fatigue prone details that were present in the structures along the corridor were plug welds, groove welds for flange transitions and web splices, fillet welded gusset plates and rivets at diaphragm connections.

2.4.3 Flooding, Waterway, and Scour

Using the Federal Emergency Management Agency (FEMA) flood mapping, bridges within flood areas were identified. It is important to determine which bridges are within a flood zone to perform hydraulic analysis, and determine potential environmental impacts due to construction. The mapping within our corridor identifies flood areas with the definitions in Table 27 below.

Table 27: FEMA Zone Definitions

Zone	Definition
Zone A	Special flood hazard area subject to inundation by the 1% annual chance of flood with no base flood elevations determined.
Zone AE	Special flood hazard area subject to inundation by the 1% annual chance of flood with base flood elevations determined.
Zone X	Areas of 0.2% annual chance of flood; areas of 1% annual chance of flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance of flood.

Within the corridor, there are fifteen bridges and culverts that are located within a FEMA flood zone, four of which do not pass over water. Bridge No. 01189, which carries I-84 over the Padanaram Brook, has a waterway that is in both the AE and X flood zones. Structures such as this were recorded as such. Table 28 summarizes the number of bridges in each flood zone.

Table 28: FEMA Flood Zone by Number and Percentage

Zone	No. Bridges	%
A	5	33%
AE	4	27%
X	4	27%
AE/X	2	13%
Total	15	100%

There are sixteen bridges that pass over waterways within the corridor. The three major inspection ratings identified were waterway adequacy, scour critical structures, and channel/channel protection. Per the inspection guide, waterway adequacy appraises the waterway opening with respect to the flow through the bridge. It is graded on a scale from 0 to 9, 0 meaning the bridge is closed due to frequent overtopping, and 9 meaning that both the bridge and the approaches are above the flood water elevations. The scour critical bridge item identifies the status of the bridge regarding the foundation's vulnerability to scour. When a rating factor of four or below is identified for this item, the substructure appraisal item may need to be revised to reflect the damage of the bridge due to scour. A scour critical bridge is one with abutment or pier foundations which are rated as unstable due to observed scour at the bridge or a scour potential determined by a scour evaluation study. The channel and channel protection are also evaluated in inspections based on the conditions associated with the flow of water through the bridge and the condition of the riprap and slope protection. Table 29 below identifies the appraisal items pertaining to waterway structures.

Table 29: Waterway Appraisal Ratings

Bridge No.	Carries	Crossing	Waterway Adequacy	Scour Critical	Channel/Channel Protection
00541	US Route 7 NB	HRRC, STILL RV, MALL ACC.	9	8	7
00542	US Route 7 SB	HRRC, STILL RV, MALL ACC.	9	8	7
00546	I-84	Beaver Brook	9	8	6
00548	I-84 TR 803	I-84 WB, Route 7 NB and Beaver Brook	9	8	7
00549	I-84 TR 804	Beaver Brook	9	8	5
00553	SR 805	Beaver Brook	9	8	5
01187	I-84	Kohanza Brook	9	8	6
01189	I-84	Padanaram Brook	8	8	5
01193	I-84 EB	Beaver Brook	9	8	6
01194	I-84 WB	Beaver Brook	9	8	6
01197	I-84 WB	Still River	8	5	6
01198	I-84 EB	Still River	8	8	7
01205	I-84	Pond Brook	8	8	6
03915	US Route 7 SB	Still River	7	8	7
03916	US Route 7 NB	Still River	7	8	7
05437	I-84	Brook	9	8	6

The waterway adequacy of the structures had a minimum rating of seven, which indicates for that roadway classification, that there is a slight (frequency of every 11 to 100 years per the FHWA Inspection Coding Guide) chance of overtopping bridge deck and roadway approaches.

None of the structures are deemed to be scour critical. Bridge No. 01197, a two-span steel girder bridge, received a five, which indicates that the bridge foundations are stable for the calculated scour conditions, but the scour is within the limits of the footing or piles. For this structure, a foundation structural analysis will be required to determine the adequacy of the existing foundation. The remainder of the waterway structures received a rating of 8, which indicates that the foundations are determined to be stable for assessed or calculated scour conditions and that calculated scour is above top of the footing.

Three of the culverts exhibited channel and channel protection ratings of 5, which indicates that there is erosion at the embankments with major damage and trees and brush restricting the channel. The worst case was at Bridge No. 01189, a three-cell concrete culvert, which had the waterway flowing mostly through the middle cell. There was excessive debris built up at the inlet of the first cell, causing water to flow around it into the middle cell. During a site visit in January 2017, it was noted that there was also a small tree that had fallen in the middle of the stream, causing the water to divert around it.

2.4.4 Structure Geometry

The existing bridge geometry could have a large factor in the design and construction of new bridges. Additional design considerations are required for high skew structures. Per the CTDOT Bridge Rating

Manual, refined analysis and load rating of diaphragms and cross frames for curved structures and structures with a support skewed greater than thirty degrees is required. Additionally, the CTDOT Bridge Design Manual provides guidance on providing a thickened deck slab and additional deck reinforcement at acute corners for skew angles greater than twenty degrees.

For the purposes of this report, a structure with a skew angle greater than thirty degrees is considered to be a high skew structure. Twenty-three bridges within the project limits have skew angles greater than thirty degrees. Table 30 below shows the twenty-three bridge structures that have high skew angles.

Table 30: High Skew Structures (> 30 deg.)

Bridge No.	Carries	Crossing	Skew	Bridge Function	Segment
00459	US Route 6	I-84	50.00	Over I-84	7
00541	US Route 7 NB	HRRC, STILL RV, MALL ACC.	34.42	Route 7	8
00542	US Route 7 SB	HRRC, STILL RV, MALL ACC.	34.42	Route 7	8
00543	US Route 7	I-84	63.05	Route 7	8
00544	I-84 Ramp	I-84 EB	59.07	I-84	8
00545	US Route 7	I-84 EB	55.42	Route 7	8
00547	I-84 WB	US Route 7 NB	59.38	I-84	6
00548	I-84 TR 803	I-84 WB, Route 7 NB and Beaver Brook	43.84	I-84	9
00550	US Route 7 NB	SR 805	37.91	Route 7	9
00551	US Route 7 SB	SR 805	34.30	Route 7	9
00956	I-84	Route 37	47.36	I-84	4
01181	I-84 WB	Housatonic RR	48.80	I-84	1
01182	I-84 EB	Housatonic RR	48.80	I-84	1
01183	Westville Ave	I-84	33.34	Over I-84	3
01184	I-84	Franklin St	53.97	I-84	3
01188	Madison Ave	I-84	38.98	Over I-84	4
01199	Route 911	I-84	40.70	Over I-84	7
01201	Vail Rd	I-84	31.35	Over I-84	7
01204	Old Hawleyville Rd	I-84	31.50	Over I-84	N
03919	US Route 7 SB	US Route 202	33.40	Route 7	N
03920	US Route 7 NB	US Route 202	33.97	Route 7	N
05773	US Route 7 NB	Wooster Heights Rd	30.99	Route 7	N
06569	US Route 7 SB	Wooster Heights Rd	30.99	Route 7	N

3.0 History of Bridge Condition and Rehabilitation Projects

There are fifty-seven bridges and culverts within the I-84 corridor. A condition summary is prepared for all of the bridges based on the most recent inspection reports (See Appendix A). Twelve bridges, eight of which are culverts, have not been rehabilitated since their original construction. Twenty-one of the steel girder bridges have been painted since 1990. Based on the information provided, it does not appear that any of the bridges within the corridor are part of any upcoming List Bridge Program. There do not appear to be any upcoming or ongoing rehabilitation projects within the corridor.

Forty-seven of the bridges were built in the early 1960's with the construction of I-84. Table 31 below outlines these main projects, the project limits, and the structures associated with each project.

Table 31: Historic I-84 Major Construction Projects in the Study Area

Project No.	Plan Year	Project Limits		Structures			
		Start (West)	End (East)	I-84	Over I-84	Route 7	Culverts
0034-0093	1958	Saw Mill Road	HRRC	01181, 01182	01180, 05261	-	05437
0034-0103	1958	HRRC	HRRC, Still River, Mall Access	00457, 00458, 00544	-	00543, 00545	-
0034-0105	1958	HRRC	Lake Avenue	-	-	00541, 00542	-
0034-0084	1958	Westville Avenue	Still River Crossing	00547, 00548, 00961, 01184, 01185, 01186, 01192, 01195, 01196	01183, 01188	00550, 00551	00546, 00549, 00553, 01187, 01193, 01194
0034-0102	1958	North Street	Great Plain Road	00956, 01190, 01191	-	-	01189
0034-0094	1958	Still River Crossing	Route 25	00897, 00898, 01197, 01198	00459, 01199, 01200, 01201, 01202, 01203, 01204	-	01205

The other ten bridges were built as part of the construction of Route 7 as discussed in Section 3.2.

This section describes the historical rehabilitations based on the bridge function. The current condition of a couple of bridges are described for each bridge function that represent the average condition of the structures of that function.

Appendix B contains the historical data from inspections over the last twenty-five years to show how the structures have deteriorated over time, and how their known rehabilitations correlate with the deterioration.

3.1 I-84 Bridges

There are twenty-one bridge structures that carry I-84 in the corridor. The average minimum condition rating between the major components of each structure is approximately 6. Based on this information, it can be determined that the overall maintenance and up-keep of the bridges carrying I-84 in this corridor has been satisfactory. All bridges in this category underwent at least one rehabilitation project with improvements to the deck, substructure and bearings. See Table 32 below for a summary of projects on this group of structures within the corridor.

Table 32: I-84 New Construction and Rehabilitation Projects

Plan Year	Project No.	Description	Structures
1958	0034-0084	Original Plans	00547, 00548, 00961, 01184, 01185, 01186, 01192, 01195, 01196
	0034-0093	Original Plans	01181, 01182
	0034-0094	Original Plans	00897, 00898, 01197, 01198
	0034-0102	Original Plans	00956, 01190, 01191
	0034-0103	Original Plans	00457, 00458, 00544
1980	0034-0162	Widening - median girders	01181, 01182
1982	0034-0172	Deck repairs, remove/replace bituminous overlay, install weepholes, clean/reseal expansion joints, curb repair	00956, 00961, 01184, 01185, 01186, 01190, 01191
	0034-0160	Deck repairs, remove/replace bituminous overlay, install weepholes, clean/reseal expansion joints	00457, 00458, 01192
1983	0034-0153	Safety improvements (protective fence)	01185, 01186, 01191, 01192
1984	0034-0204	Deck replacement, repairs to end cover plates, bearing repair, steel painting, pier cap support	01195, 01196
1985	0034-0206	Deck replacement, new shear studs, new parapet/metal beam rail, wingwall reconstruction, substructure repair, expansion bearings keeper device, performed expansion joints, bolted splices with end cover plate welds	00548
1986	0034-0189	Br. 00457 to be widened by 4 girders on the west side, clean/paint existing steel, remove/replace bituminous overlay, reconstruct parapets/curbing	00457, 00458, 00956, 00961, 01184, 01185, 01186, 01190, 01191, 01192
1987	0174-0122	Replace parapet/sidewalk, metal beam rail and fence, wingwall modification, install weepholes, substructure repairs, deck replacement and cut cross frames to remove concrete, replace expansion bearings, bearing pad replacement	00897
1991	0034-0235	Deck repairs, repair joints, substructure repair, expansion bearing keeper device	00544, 01181, 01182, 01198
	0034-0250	Bridge widening on south side	01186
	0034-0252	Deck repairs, replace deck joints, substructure repairs, expansion bearing keeper device	00547, 00898, 01197
1994	0034-0262	Deck replacement except in mid 36' area, shear studs, bearing replacement, new parapet/metal beam rail	01192
	0034-0266	Bridge widening and abutment drilling and grouting modifications, deck patching and resurfacing, new expansion bearings, keeper blocks	01198
2001	0174-0293	Bridge painting	01186, 01192
2008	0174-0339	Remove/repair existing joints, replace with asphaltic plug expansion joint systems	00457, 00458, 00547, 00548, 00956, 00961, 01181, 01184, 01186, 01191, 01192, 01195, 01196, 01198

Plan Year	Project No.	Description	Structures
2011	0174-0357	Asphaltic plug expansion joint system (installed joint with bridging plate when pavement on both sides of joint are concrete (approach slab), no bridging plate when one side is bituminous)	00544, 01182, 01197
2016	0174-0370	Substructure repairs	01195, 01196
	0034-0334	Substructure repairs, cleaning and painting, bearing replacement, deck resurfacing	00548
2017	0034-0313	I-84 EB widening of superstructure and substructure, deck patching	01185, 01190

3.1.1 Historic I-84 Rehabilitation

All structures within the corridor have had deck repairs or full deck replacements in the past thirty years. Bridge Nos. 01195 and 01196, which carry I-84 over Federal Road, Eagle Road, and the Housatonic Railroad, had full deck replacements in the late 1980's under Project No. 0034-0204. This project also consisted of repairs to the end cover plates, bearing repair, and steel painting. Currently, both the deck and superstructure are in fair condition for these structures. The underside of the deck has hairline cracks with efflorescence, hairline map cracking with efflorescence, hollow areas and spalls (up to full bay width by 1' by 7" D in Bridge No. 01196) with exposed rebar and light rust. The girders have areas of peeling paint, heavy to moderate rust mostly at the girder ends and the fascia girders have moderate to heavy rust with pitting on the bottom flanges and webs.

The deck was also replaced on Bridge No. 00897 under Project No. 0174-0122 in the early 1990's. The deck has remained in good condition over the past twenty-five years. The substructure was also repaired under this project, which is now in satisfactory condition. In the mid 1990's, Project No. 0034-0235 performed deck, joint and substructure repairs to I-84 Bridge Nos. 01181, 01182, 00544, and 01198, which explains the significant improvement in their condition ratings during that time period. There were also substructure repairs under this project. Project No. 0034-0189 replaced the deck in the median bays and reconstructed parapets and median barriers for the following ten structures: 00457, 00458, 00956, 00961, 01184, 01185, 01186, 01190, 01191, and 01192. All other structures have had deck patching sometime in the 1980's.

All bridges under Project No. 0034-0189 had full steel painting as well. Bridge No. 00457 was widened by four girders on the west side to accommodate a new on ramp under this project. The superstructures are all in either satisfactory or good condition. In the mid 2000's, Bridge Nos. 01186 and 01192 were fully painted including diaphragms and bearings under Project No. 0174-0293. Based on this historical data in Appendix B, this painting job was effective, as the superstructure rating has been consistently good for the past twenty-five years.

The structures carrying I-84 mostly have substructures in satisfactory condition, as the majority of bridges have had some type of substructure repair in the past thirty years. The majority have moderate spalls with exposed rebar, random hollow areas and vertical cracking. The worst case is Bridge No. 00898, which carries I-84 westbound over Route 25, which has a substructure in fair condition. The West abutment has several full height hairline cracks, hollow areas up to 2.25 square feet with rust stains and a spall that is 3' long by 1' wide by 4" deep with exposed rusted rebar adjacent to the construction joint. The east elevation of Pier 1 has a few spalls that are up to 6' long by 4' high by 4" deep. Rehabilitation to this bridge has not occurred since Project No. 0034-0252 in the mid 1990's.

As part of Project No. 0034-0204, Bridge Nos. 01195 and 01196 had substructure repairs in the mid 1980's. Additionally, Bridge No. 01195 Pier 1 was filled in between the outside of the northern column to the north edge of the pier cap to provide additional support.

3.1.2 Recent I-84 Rehabilitation

All bridges carrying I-84 in the corridor have had their joint systems replaced recently. In the mid 2010's, Bridge No. 01197 got asphaltic plug expansion joints. In the early 2010's, Project No. 0174-0339 replaced the existing deck joints with asphaltic plug expansion joint systems for the following fourteen bridges: Bridge Nos. 00457, 00458, 00547, 00548, 00956, 00961, 01181, 01184, 01186, 01191, 01192, 01195, 01196, and 01198. While the replacement of the joints was recent, asphaltic plug joints will require on-going maintenance, as their useful life is less than ten years.

In the past year, Project No. 0034-0334 addressed the deficiencies of Bridge No. 00548, which had a superstructure in poor condition and a substructure in serious condition. The web section losses were up to 3/8" deep resulting in up to 60% section loss in web bearing area. There were several areas having section loss more than 25% in the web bearing area. The steel girders have been cleaned and painted and repair plates were installed under this project, but there are still section losses remaining, and they are still in fair condition. The pier caps and columns had large hollow areas and spalls throughout. Exposed rebar was not embedded in concrete at some locations. At the time of the 2011 inspection, there were large hollow areas up to 18' high and spalls up to 11' high. Most of the deteriorated areas on the pier columns were repaired under this project, which leaves the substructure in satisfactory condition. The deck had been previously replaced under Project No. 0034-0206 in the late 1980's.

Construction was completed in June of 2016 for the substructure repairs for Bridge Nos. 01195 and 01196 under Project No. 0174-0370. Since this project has been completed, the substructures of these bridges are in good condition.

Bridge Nos. 01185 and 01190 were most recently rehabilitated under Project No. 0034-0313, which consisted of the widening of the Exit 5 off-ramps (eastbound and westbound) and the Exit 6 on-ramp and off-ramp. Bridge No. 01185 was widened by two girders to accommodate the deceleration lane and shoulder for the Exit 5 eastbound off-ramp. Bridge No. 01190 was widened by two girders to accommodate the acceleration lane and shoulder for the Exit 6 eastbound on-ramp. This widening required the partial removal and widening of the deck and substructure. Both bridges also had deck patching and touch up painting under this project. All components of the structures are in at least satisfactory condition.

3.2 Route 7 Bridges

There are sixteen structures that carry Route 7 in the corridor. The south side of Route 7 connects into I-84 around Exit 3, and the north side of Route 7 connects into I-84 around Exit 7. See Table 33 below for a summary of projects on this group of structures within the corridor.

Table 33: Route 7 New Construction and Rehabilitation Projects

Plan Year	Project No.	Description	Structures
1958	0034-0084	Original Plans	00550, 00551
	0034-0103	Original Plans	00543, 00545
	0034-0105	Original Plans	00541, 00542
1973	0034-0124	Relocation of Route 7 - Original plans	03915, 03916, 03919, 03920
1984	0034-0190	Relocation of Route 7 - Original plans	05462, 05463, 05772, 05773, 05909
	0034-0202	Deck replacement, new shear connectors, chain link fence added to span 2 only, substructure repairs, concrete bearing pad extension, concrete keeper blocks at fascias, performed expansion joints	00541
	0174-0098	Deck replacement, new shear connectors, new parapet/metal beam rail, substructure repairs, expansion bearing keeper device, bolted splice with end cover plate welds, trough at joints	00550, 00551
1986	0174-0112	Bridge painting	00542
1991	0034-0235	Deck repairs, repair joints, substructure repair, expansion bearing keeper device	00545
	0034-0252	Deck repairs, replace deck joints, substructure repairs, expansion bearing keeper device	00543
1992	0034-0254	Remove top 1.5" of existing slab, add 2.5" min Class F and 1.5" latex modified concrete layers to top of deck, replace Metal beam rail, new chain link fence, substructure repairs, keeper blocks, new elastomeric bearings	00542
2008	0034-0260	Original Plans	06569
2011	0174-0357	Asphaltic plug expansion joint system (installed joint with bridging plate when pavement on both sides of joint are concrete (approach slab), no bridging plate when one side is bituminous)	00550, 00551, 03915, 03916, 03919, 03920
2014	0174-0364	Installation of asphaltic plug expansion joints	05462, 05909
2016	0174-0370	Substructure repairs	00541, 00542

3.2.1 Exit 3 Interchange

The I-84 interchange near Exit 3 includes the following structures that carry the current Route 7: Bridge Nos. 00541, 00542, 00543 and 00545. These structures were built in the early 1960's under Project Nos. 0034-0103 and 0034-0105, and have all undergone multiple rehabilitations.

All four of these bridges had either deck repairs or full deck replacement. In the mid 1980's to mid 1990's, Bridge Nos. 00541 and 00545 had full deck replacements with new shear connectors under Project Nos. 0034-0202 and 0034-0235, respectively. In the mid 1990's, Bridge No. 00542 had a partial deck replacement. The top 1.5" of the existing slab was removed, and 2.5" of Class F concrete and 1.5" latex modified concrete layers were added to the top of deck. Bridge No. 00543 had deck repairs under Project No. 0034-0252. In the last ten years, the bridge decks of these structures have gone from good to satisfactory condition.

All bridges have had substructure repairs in the last twenty-five years. Bridge Nos. 00541 and 00542, which carry Route 7 over the Housatonic Railroad, Still River and Danbury Fair Mall access, had substructure repairs under Project No. 0174-0370, which completed construction in summer of 2016. These bridges currently have substructures in good condition. Bridge Nos. 00543 and 00545 had substructure repairs in the early 1990's under Project Nos. 0034-0252 and 0034-0235, respectively. Both bridges have substructures in satisfactory condition.

Bridge No. 00542 was fully painted in the late 1980's under Project No. 0174-0112; however, in the last few years, the superstructure condition has gone from satisfactory to fair. Currently, the superstructure is in fair condition. At the piers, the girder webs have areas of section loss resulting in up to 6% loss of web cross-sectional area. In Span 2 at the third intermediate stiffener, Girder 1 bottom flange has 8% loss of flange cross-sectional area. In Spans 2 and 3, there are repair plates welded to webs. There are also section losses in the bearing stiffeners.

The superstructure of Bridge No. 00541 is in fair condition. The girders have areas of heavy rust and peeling paint. At the pier, the web ends have areas of laminated rust and section loss. There are some areas that were previously painted but are re-rusting. These section losses result in up to 3.6% of the web cross-sectional area. The substructure was repaired in the last few years under Project No. 0174-0370.

3.2.2 Route 7 Southern Connection

In the mid 1980's, the south side of Route 7 was built under Project No. 0034-0190, connecting to the I-84 interchange near the Danbury Fair Mall. This included Bridge Nos. 05462, 05643, 05772, 05773, 05909, and 06569.

In the last three years, Project No. 0174-0364 replaced the existing joints of Bridge Nos. 05462 and 05909 with elastomeric concrete headers with silicone joint seal. The condition of Bridge No. 05909 has remained in good condition over the last twenty-five years. In the last ten years, the condition of the substructure of Bridge No. 05909 has gone from good to satisfactory. Both abutments have hairline cracks up to full height, hollow areas, random patches and spalls up to 2' wide by 1' high by 2" deep with exposed rebar.

Bridge Nos. 05463, 05772 and 05773 have not required rehabilitation since they were built in the late 1980's. Based on the historical data presented in Appendix B, Bridge No. 05463 has remained in good condition over the last twenty years. The overall underside of deck deterioration is 3% due to transverse cracks with isolated efflorescence in all bays. The steel girders have areas of peeling paint with exposed primer. The web and bottom flange of Girder 8 have graffiti and several small dents and gouges. The

abutments have some hollow areas, cracking and evidence of leakage with efflorescence. The bottom flange transition welds and gusset plate connection to web welds have no notable deficiencies.

The superstructure and substructure of Bridge No. 05772 have gone from good to satisfactory in the last three years. In the last two years, the substructure of Bridge No. 05773 has gone from good to satisfactory condition. The welded plate girders have areas of peeling paint with moderate rust. There are impact gouges on the bottom flanges of Girders 4 and 5.

In the early 2010's, Project No. 0034-0260 included the reconstruction of Route 7 between Wooster Heights Road and Starrs Plain Road. Bridge No. 06569 was constructed under this project, which carries Route 7 Southbound over Wooster Heights Road. Previously, Route 7 Southbound did not pass over Wooster Heights Road. Since it was constructed, there has not been any decrease in condition ratings. The underside deck deterioration is about 4% due transverse cracks and areas of map cracking. There are a few areas with scraped paint on the bottom of the girders. Both abutment stems have minor vertical hairline cracks. The deck joints and bearings have no noted deterioration.

3.2.3 Exit 7 Interchange

The I-84 interchange near Exit 7 includes the following structures that carry the current Route 7: Bridge Nos. 00550 and 00551. The bridges were built under Project No. 0034-0084 in the early 1960's. Both bridges were rehabilitated under Project Nos. 0174-0098 in the mid 1980's and 0174-0357 in the early 2010's. Project No. 0174-0098 involved full deck replacements with new shear connectors, new parapets and metal beam rail systems and substructure repairs. New asphaltic plug expansion joint systems were installed under Project No. 0174-0357. Looking at the historical data in Appendix B in conjunction with a January 2017 field visit, substructure repairs were performed by the routine maintenance in 2005; numerous stepped out patches were observed at the piers. Currently, both bridges have superstructures in fair condition. The steel rolled beams have light rust and peeling paint, and isolated girder web ends have section loss (<5% loss of cross-sectional area). Several of the collision damage areas noted in the previous inspection have been ground smooth and painted

3.2.4 Route 7 Northern Connection

In the mid 1970's, the north connection of Route 7 was built under Project No. 0034-0124. The project limits extended from just after I-84 Exit 7 to the Federal Road Crossing to Route 7 Exit 12 near the northern Federal Road crossing. This project included the construction of Bridge Nos. 03915, 03916, 03919 and 03920.

Bridge Nos. 03915 and 03916 carry Route 7 over the Still River in Danbury. Over the last twenty-five years, these structures have remained in good condition. For the two bridges, the underside deck deterioration is less than 2%. The bearings exhibit heavy laminated rust and have evidence of movement. The girders are made of weathering steel, and have some areas of heavy rust. There are random missing erection bolts at gusset plate connections but the plates are welded. The substructures of both bridges have heavy graffiti and mud stains.

Bridge Nos. 03919 and 03920 carry Route 7 over Route 202 in Brookfield. All components of Bridge No. 03919 have remained in good condition over the last twenty-five years. The underside of the deck has scattered transverse hairline cracks with and without efflorescence and a spall with exposed rebar and adjacent hollow area over the roadway. The lateral bracing connection are missing several erection bolts but the connections are welded. Some of the girders exhibit fading paint and light rust. Bridge No. 03920 has also remained in good condition over the last twenty-five years. The deck has several transverse cracks, some with efflorescence, and the south end has an area of delamination and potential spall. The

curved plate girders have areas of spotty rust and areas of flaking laminar rust along the edges of the bottom flanges. Some have small dents and moderate to heavy rust on the bottom flanges. For both structures, the bottom flange transition welds, gusset plate connection welds and lateral bracing connection welds have no notable deficiencies. The substructures of both bridges exhibit random cracking, few spalls and hollow areas.

All four bridges had existing joints removed and replaced with asphaltic plug expansion joint systems in the last five years under project No. 0174-0357. Since the project, minor joint deterioration has occurred. The joint at the south abutment of Bridge No. 03920 has 15' of adhesion cracks along the South approach and an additional 24' of adhesion cracks. The north abutment joint has areas of exposed aggregate.

3.3 Local Road/State Road Bridges over I-84

The eleven structures carrying local roads or state routes over I-84 were built in the early 1960's when I-84 was constructed. See Table 34 below for a summary of projects on this group of structures within the corridor.

Table 34: Structures over I-84 New Construction and Rehabilitation Projects

Plan Year	Project No.	Description	Structures
1958	0034-0084	Original Plans	01183, 01188
	0034-0093	Original Plans	01180, 05261
	0034-0094	Original Plans	00459, 01199, 01200, 01201, 01202, 01203, 01204
1967	0034-0126	Metal beam rail treatment	01183, 01188, 01200, 01202, 01203, 01204
1976	0034-0155	New elastomeric bearing pads, new steel pedestal and braces, new keeper angles	00459, 01199
1980	0034-0162	Full bridge replacement	05261
1983	0034-0153	Safety improvements (protective fence)	00459, 01183, 01188, 01199, 01200, 01201, 01202
1984	0034-0198	Deck replacement, new shear connectors, new sidewlaks/ Metal beam rail, substructure repairs. Br. 01204 clean and paint steel, deck repairs, joints	01183, 01188, 01204
	0034-0199	Deck replacement, new shear connectors, new sidewalks/ Metal beam rail, substructure repairs, expansion bearing keeper device, trough installed at joints, bolted splice with end cover plate welds.	01180
1987	0009-0077	Replace parapet/sidewalk, Metal beam rail and fence, wingwall modifications, install weepholes, substructure repairs, deck replacement and cut cross frames to remove concrete, bridge scuppers	00459
1993	0174-0208	Bridge painting	01200, 01201, 01202, 01203

Plan Year	Project No.	Description	Structures
1994	0034-0263	Bridge widening, deck replacement, new shear connectors, substructure repair/modifications, keeper blocks at abutments, pier 2 and 3, new elastomeric bearing pads	01199
	0034-0266	Deck patching and resurfacing, new expansion bearings, keeper blocks	01200, 01201, 01202, 01203
1995	0174-0244	Bridge painting	01183
2001	0174-0293	Bridge painting	01199
2014	0174-0364	Installation of asphaltic plug expansion joints	00459

All structures have had safety improvements made in the last thirty years including new protective fencing and metal beam rail treatment. Currently, about 55% of these bridges have substandard bridge railing systems; all transitions and approach guiderails are up to current standards.

All structures over I-84 have had either extensive deck repair or full deck replacement. Bridge Nos. 01200, 01201, 01202, and 01203, which extend from Garella Road to Secor Road, had deck patching and resurfacing under Project No. 0034-0266 in the mid 1990's. Bridge No. 01204, which carries Old Hawleyville Road over I-84 in Newtown, had deck repairs in the mid 1980's under Project No. 0034-0198.

Bridge Nos. 00459, 01180, 01183, and 01188 had full deck replacements in the mid to late 1980's with new shear connectors. These four bridges are currently in satisfactory condition due to spalls and cracking. Bridge No. 01180 is in the worst condition, with an overall underside deck deterioration of 15%, with a maximum deterioration of 22% in Span 2. Bridge No. 01199 had a full deck replacement in the mid 1990's under Project No. 0034-0263. Looking at the historical data from Appendix B, the deck condition rating improved from poor in 1996 to very good in 1997 due to this replacement. In the past 10 years, it has dropped to satisfactory condition due to additional hollow areas and transverse hairline cracks with efflorescence, and some small spalls with exposed reinforcement.

In 2013, asphaltic plug joints were installed at Bridge No. 00459 under Project No. 0174-0364. Of the eleven structures over I-84, five of the structures have not had joint replacements. The south abutment joint of Bridge No. 01199 exhibits adhesion and cohesion cracks up to 5' long, areas of active leakage and a large pothole with exposed backing plate in the right lane. The north abutment joint has adhesion cracks up to 1' long, a 3' sealed cohesion crack in the left shoulder, evidence of past leakage and depressed sealant due to accumulation of sand.

Many of the structures exhibit peeling paint and moderate to heavy rust. The steel of Bridge Nos. 01200, 01201, 01202 and 01203 was fully cleaned and painted under Project No. 0174-0208 in the mid 2000's. In the last two years, the superstructure condition of Bridge No. 01202 has become fair. The girder webs have section loss typically less than 2% in shear loss and less than 25% in bearing loss. In Span 1 Girder 5 web has painted over section losses resulting in 6% shear loss and 34% bearing loss. Bridge Nos. 01183, 01199 and 01204 have also been painted in the last twenty-five years.

The fixed bearings of the bridges over I-84 all exhibit moderate rusting. Bridge Nos. 00459 and 01199 have had elastomeric bearing pad replacements under Project No. 0034-0155 in the late 1970's. Bridge No. 01199 had the bearing pads replaced a second time in the mid 1990's under Project No. 0034-0263.

In the mid 1990's, Project No. 0034-0266 replaced the expansion bearings for Bridge Nos. 01200, 01201, 01202 and 01203. Bridge No. 01180 had bearing improvement work done under Project No. 0034-0199 in the late 1980's.

Five bridges have had substructure repairs in the last thirty years. Based on the historic data from Appendix B, their substructure condition has remained good or satisfactory in the last twenty-five years. Bridge No. 00459 had substructure repairs under Project No. 0009-0077 in the late 1980's; however, in the last two years, the condition has gone from satisfactory to fair. On the eastbound side of the south pier, there is a large spall with exposed rebar. Both abutments also have large spalls and vertical cracks. Bridge No. 01199 had substructure repairs under Project No. 0034-0263 in the mid 1990's, and the substructure condition rating jumped from fair to good. Some additional deterioration has occurred in the last six years bringing the condition to satisfactory; the north abutment has hollow areas up to full width and full height, full height vertical cracking, and large spalls with exposed reinforcement. The piers and south abutment also exhibit hollow areas and cracking.

In the early 1980's, Old Ridgebury Road was relocated under Project No. 0034-0162, so Bridge No. 05261 was fully replaced. In the last twenty-five years, all components of the bridge have remained in good condition.

3.4 Culverts

There are nine culverts within the I-84 corridor. See Table 35 below for a summary of projects on this group of structures within the corridor.

Table 35: Culverts New Construction and Rehabilitation Projects

Plan Year	Project No.	Description	Structures
1958	0034-0084	Original Plans	00546, 00549, 00553, 01187, 01193, 01194
	0034-0093	Original Plans	05437
	0034-0094	Original Plans	01205
	0034-0102	Original Plans	01189
1980	0034-0162	Culvert extension	05437

The overall condition ratings of the culverts have not changed drastically in the last twenty-five years. Most have remained in satisfactory condition for the entire period. Only Bridge No. 05437 has been rehabilitated as part of Project No. 0034-0162, which consisted of extending the culvert to the north and channel improvements to the inlet in the early 1980's. This did not have an impact on the culvert's overall condition rating.

While the culverts did not undergo rehabilitation projects, eight have had Bridge Maintenance Memorandums (BMM's) assigned in the last ten years. See Table 36 for summary of BMM's that have been issued for the culverts, and if the concerns have been resolved. None of these maintenance tasks included structural improvements. All of them address channel improvements due to debris build up. Of these BMM's only 14-354 was completed, which filled a void under the pipe culvert to prevent further undermining. The most recent inspection report noted that the culvert floor was no longer undermined.

Table 36: BMM Numbers and Descriptions for Culverts

Bridge No.	BMM No.	Description	Issue Resolved
00546	12-056	Remove large fallen tree across the channel at the inlet end.	N
00549	06-266	Remove debris caught on the nose of the center wall at inlet	N
	10-404	Remove debris caught on the nose of the center wall at inlet	N
	12-552	Remove debris caught on the nose of the center wall that extends in front of both cells	N
	14-510	Remove debris build up at the inlet nose, fill scour voids with riprap, remove tree that is leaning over the stream	N
00553	15-579	Clear debris at the inlet of culvert cells that is block flow through the cells.	N
001187	None	N/A	N/A
001189	15-593	Clear debris built up at nose of the center wall between cell 1 and 2 at inlet	N
01193	09-447	Remove debris to prevent the impediment of flow	N
	13-387	Remove the logs and debris from the inlet area, cut back the brush	N
01194	13-388	Remove the logs and debris from the inlet area, cut back the brush	N
01205	11-119	Remove debris at inlet that is caught up on center wall.	N
05437	14-354	There is a large void below the plate arch pipe at the inlet that is 10 ft wide x 6 inch max to 1" high x up to 4' penetration. Place crushed stone within the larger section of void below the pipe and place intermediate riprap across the inlet base to prevent further undermining of the arch plate floor at inlet.	Y

3.5 Cost of Rehabilitation Projects

For the assessment of the bridges within the project limits, past rehabilitation projects were discussed with respect to the bridges' condition. Table 37 identifies the recent rehabilitation projects in the corridor that have been implemented in the last five years. The total cost of rehabilitation including structural improvements was approximately $28.7 million. It is important to note that the construction costs are the total project cost, not the cost for the individual bridge within our project. Some of the work included in this total project cost does not relate to this study.

Table 37: Rehabilitation Project Descriptions and Total Cost

Project No.	Bridge No(s).	Construction Start	Construction Completed	Construction Cost	Work Description
0034-0313	01185, 01190	4/6/15	8/25/17	$ 15,424,000	Reconstruction at Exits 5 & 6 and CT 37
0034-0334	00548	8/28/14	5/2/16	$ 4,810,000	Substructure repairs, abrasive blast cleaning and painting of steel beams, replacement of bearings, and deck resurfacing along with minor safety improvements
0174-0357	00544, 00550, 00551, 01182, 01197, 03915, 03916, 03919, 03920	8/21/11	4/25/12	$ 1,016,000	Asphaltic Plug Joints
0174-0364	00459, 05462, 05909	10/15/13	11/18/14	$ 2,434,000	Concrete header and joint replacement
0174-0370	00541, 00542, 01195, 01196	6/26/14	6/29/16	$ 4,995,000	Substructure repairs

4.0 Future Bridge Condition – Planning Year 2037

The bridges in the study area are aging. Almost all of the structures are either currently beyond their target design service life or will be reaching that milestone within the future planning year of 2037. The bridges are also withstanding a higher frequency of trucks, which are heavier than those designed for in the 1960's and 1970's era. Additionally, more aggressive de-icing materials are being used today in higher quantities. However, bridge components often outlive their intended service life even in more extreme environments and the structures in the study area are still in relatively good condition especially for their age.

The *actual* service life for a component ends when it is no longer economically feasible to maintain/rehabilitate the component and full replacement is the only viable option. One of the important objectives of this study is to investigate the future condition of the structures and estimate when, if at all, the components will reach the end of their actual service life within the future planning period. This information is critical when evaluating alternatives and strategies, such as rehabilitating or widening a structure versus a complete replacement.

This section provides the estimated future component condition ratings for every structure and any likely maintenance, rehabilitation, or replacement required by 2037. Each bridge's deck, superstructure, and substructure ratings are projected based on historical rating data and other important factors that can affect the rate at which the component deteriorates. The culvert ratings are also predicted in the same manner. The following provides the general framework for the criteria and procedure used to determine the future ratings and summary of the results of the future conditions analysis. Full results for each structure and the methodology for producing the future prediction graphs are in Appendix B.

The condition ratings for the structures are available dating back to 1992. These condition ratings are plotted for each year creating a series of points showing the component's state at any point in this historical period. In order to create a larger data set for more realistic and uniform results, the rating data was combined for all the bridges per their functional group established in this report (I-84, Over I-84, etc.), and a best-fit curve was applied for each component rating in relation to time. The functional groups also naturally group structures of similar age together. The one exception is the Route 7 structures which have variation in year built and slightly different Annual Average Daily Truck Traffic (AADTT). However, the adjustment factors account for the variation and help individualize each base curve. To ensure that the base curves are showing the true or natural deterioration without having spikes in ratings due to rehabilitations, the pre-rehabilitation data for structures was removed. These "base curves" are lines which are used to represent the data in lieu of higher order polynomial curves. The linear equations are used for simplicity and consistency in the data interpretation, and they are founded in research from multiple Department of Transportation's (DOT's) that show straight-line approximations are good predictors when plotting condition ratings versus age of structure, especially for ratings above 4 (which is the vast majority of the components for the study structures). See Figure 6 for an example of deck rating deterioration model from NYSDOT report on bridge model deterioration rates.

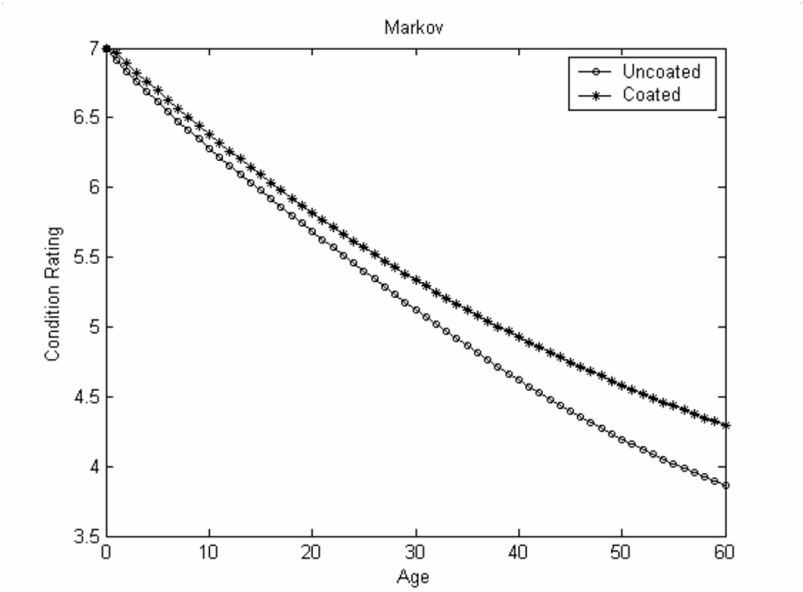


Figure 6: NYSDOT Deck Deterioration Model

These base curves are applied to each specific structure's component, along with intercept and slope factors, which are used to adjust the curves based on key information specific to each bridge that influences the deterioration rates. The criteria used to modify the curves vary by individual bridge group and include adjustments based on AADTT, the feature under the bridge, rehabilitation restart curve shifts, the consistency of the rating factors, and if the superstructure contains continuous or simple spans. To account for condition rating jumps of two or more ratings, the curves are reset at the year of the rehabilitation (known or assumed) and modified in the same way with the adjustment factors, and if necessary, the intercept adjustment. The selection of these adjustment factors are based on other DOT asset management procedures/criteria for bridge deterioration models. The magnitude and application of these factors to the base curves are based on engineering judgement and the historical inspection data for each bridge.

The adjusted curve is used to project the structure's future component rating for 2037 by using adjustment factors. This is done for each component of each structure, and the estimated future condition rating results are summarized in the tables below. See Appendix B for a full summary of the methodology of the future condition rating predictions, including a detailed explanation of the base curve generation and each adjustment factor used, as well as the group base curves and individual bridge component curves.

Using the information generated from the estimated future condition ratings and engineering judgement, a qualitative approach is used to determine the "Likely Required Action" for each structure within the planning period. Likely required actions were determined assuming the ongoing maintenance program remains in place throughout the duration of this study. As shown in the tables below, this ranges from routine maintenance only to full replacement of the structure. The general rules for the selection of each Likely Required Action are listed here:

- All Future Condition Ratings (FCR) > 6 – Minor/major maintenance only
- All FCR between 5 and 6 – Maintenance and minor rehabilitation

- Deck FCR < 5, other two FCR > 5 – Deck replacement (maintenance or minor rehabilitation on other components assumed)
- Deck and superstructure FCR < 5, substructure FCR > 5 – Superstructure replacement (maintenance or minor rehabilitation for substructure assumed)
- Superstructure FCR < 5, other two FCR > 5 – Major superstructure rehabilitation (maintenance or minor rehabilitation for other components assumed)
- Substructure FCR < 5, other two FCR > 5 – Major substructure rehabilitation (routine maintenance or minor rehabilitation for the other components assumed)
- Superstructure and substructure < 5, deck > 5 – Major superstructure rehabilitation and Major substructure rehabilitation (routine maintenance or minor repairs for the deck assumed)
- All FCR < 5 – Full structure replacement

These are the general rules used to develop the Likely Required Actions; however, engineering judgement is applied in certain cases for more rational and financially feasible results. For example, if the superstructure and substructure FCR's are 4.2 and 4.1 respectively and the deck FCR is 5.1, it is more viable to indicate the structure will likely be replaced rather than rehabilitated. In this case, the deck is close to the threshold as well, and would need significant improvements as well to remain in satisfactory condition for much longer.

Finally, a category for the Likely Required Action of bearing replacement is also included in the table. For this common rehabilitation strategy, the bearing type, current bearing condition rating, and notes from the latest inspection reports are used to determine if bearing replacement is likely to be required within the planning period. This qualitative assessment is unique from the other Likely Required Actions, but provides a useful addition to the scope of the potential future rehabilitation evaluation.

Table 38: Summary of Future Predicted Condition Ratings and Likely Required Action for I-84 Group

Bridge No.	Current Condition Ratings			2037 Predicted Condition Ratings			Likely Required Action by 2037								Comments from Current Condition Report
	Deck	Superstructure	Substructure	Deck	Superstructure	Substructure	Minor/Major Maintenance Only	Maintenance and Minor Rehabilitation	Deck Replacement	Deck and Beam Replacement	Major Superstructure Rehabilitation	Major Substructure Rehabilitation	Full Bridge Replacement	Bearing Replacement	
00457	6	6	7	4.7	4.7	5.5				X				X	Underside of deck has cracks, spalls, and hollow areas likely required deck replacement. Girders have moderate to heavy rust and pitting. Self-lubricating bronze sliding plate bearings are currently in fair condition. Light to moderate rust and laminar rust; 1/8" rust between plates.
00458	7	6	7	5.4	4.9	5.7					X				Routine maintenance, repairs, and patching of cracks and spalls likely required. Girders have areas of peeling paint, moderate to heavy laminar rust, and pitting.
00544	6	6	7	4.8	5.0	5.1				X				X	Minor cracks, spalls, and hollow areas on deck and parapet. Bituminous overlay has areas of cracking and potholes. Deck underside has map cracking and efflorescence. Painted surfaces have approximately 15% deterioration, spot painting likely required. Self-lubricating bronze sliding plate bearings are currently in fair condition and there is 24% loss of bearing area.
00547	7	6	6	5.4	4.7	5.1					X				Routine maintenance; repair and patch minor cracks and spalls. Girders exhibit light to moderate rust, gouges, scrapes, and pitting.
00548	6	5	6	5.0	3.7	4.5							X		Deck maintenance and weep drainage repairs. Girders have section loss in bottom flange and web; partially repaired and newly painted. The abutments have cracks, hollow areas, and spalls with exposed rebar. Pedestals have isolated spalls.
00897	7	6	6	5.5	4.8	5.1					X				Routine maintenance; repair and patch minor cracks and spalls. Girders exhibit gouges, scrapes, and slight negative camber due to past collision damage. There are large areas of chipped paint with light to moderate rust.

Bridge No.	Current Condition Ratings			2037 Predicted Condition Ratings			Likely Required Action by 2037								Comments from Current Condition Report
	Deck	Superstructure	Substructure	Deck	Superstructure	Substructure	Minor/Major Maintenance Only	Maintenance and Minor Rehabilitation	Deck Replacement	Deck and Beam Replacement	Major Superstructure Rehabilitation	Major Substructure Rehabilitation	Full Bridge Replacement	Bearing Replacement	
00898	7	6	5	5.5	4.8	4.1						X			Routine maintenance; repair and patch minor cracks and spalls. Superstructure maintenance and repairs, spot painting likely required. Pier caps have numerous stains, hollow areas, spalls, cracks, and areas of exposed rebar. Several cracks and hollow areas in the abutments.
00956	5	6	6	3.0	4.5	4.2							X		Deck underside has numerous cracks, spalls, and hollow areas. Jersey barrier has spalls and hollow areas. Girders have peeling paint, heavy rust, and gouges due to collision damage. Abutments have stains, cracks, pop-outs, hollow areas, and spalls with exposed rebar. Rocker bearing currently with moderate to heavy rust.
00961	6	6	6	4.5	4.6	4.6							X		Underside of deck has patches that are cracking again and numerous hollow areas and deteriorating full-depth repairs on the underside, deck replacement likely required. Jersey barrier has hollow areas, spalls, and active leakage. Less than 50% of painted surfaces have deterioration. Girders have impact scrapes and gouges due to collision damage. Hairline cracks, hollow areas, and spalls with exposed rebar on abutments. There is active leakage through the deck joint onto backwall.
01181	5	6	6	3.5	4.7	4.7							X		Overlay has areas of light ravelling, cracks, open paving seams, depressed areas, and potholes. Deck underside has map cracking, spalls, hollow areas, and exposed rebar. 50% of painted surfaces are rusting, full girder painting likely required. Cracks and spalls with exposed rebar on abutments, pier caps, and pier columns.
01182	5	5	6	3.4	3.4	4.8							X		Overlay has areas of light to moderate ravelling, cracks, and open paving seams. Deck underside has map cracking, spalls, hollow areas, and exposed rusted rebar. Girders have areas of peeling paint with light to moderate

Bridge No.	Current Condition Ratings			2037 Predicted Condition Ratings			Likely Required Action by 2037								Comments from Current Condition Report
	Deck	Superstructure	Substructure	Deck	Superstructure	Substructure	Minor/Major Maintenance Only	Maintenance and Minor Rehabilitation	Deck Replacement	Deck and Beam Replacement	Major Superstructure Rehabilitation	Major Substructure Rehabilitation	Full Bridge Replacement	Bearing Replacement	
															rust. Girders have section loss up to 16.4% loss in web shear and 16.4% loss in web bearing. Less than 50% of painted surfaces are rusting. Cracks and spalls with exposed rebar on abutments, pier caps, and pier columns.
01184	6	6	6	3.9	4.7	4.3							X		Overlay has areas of map cracking, open paving seams, bituminous spalls and bituminous spalls. Deck underside has patches, hollow areas, and cracks. Expansion joints are in fair condition. There is active leakage which is causing peeling paint and heavy rust on the girders. Abutments have cracks, hollow areas, spalls with exposed rebar, and stains from active leakage. Rocker bearings are currently in fair condition with light to heavy rust.
01185	6	6	7	4.6	4.8	5.2			X						Underside of deck has map cracking, hollow areas, spalls, and exposed rebar. Jersey barrier and parapets have spalls and cracks. Routine superstructure maintenance such as spot painting, repairs, and repairing welds likely required.
01186	6	7	6	4.6	5.6	4.9			X						Deck replacement likely required as useful deck life is coming to an end. Routine maintenance, repairs, patching of cracks and spalls, and spot painting likely required. Repair and patch substructure cracks and spalls in abutments.
01190	7	6	6	5.5	5.0	5.0					X				Girders have areas of peeling paint, laminated rust, and gouges due to collision damage. Past leakage onto abutments as well as concrete patches, cracks, pop-outs, hollow areas, and spalls with exposed rebar.
01191	5	6	6	3.6	4.8	5.0				X					Underside of deck has poor quality patches, map cracking, hollow areas, spalls, and areas of exposed rebar. Less than 50% of the paint has deteriorated. Girders have moderate rust, pitting, and gouges due to collision damage. Abutments have cracks, areas of scale,

Bridge No.	Current Condition Ratings			2037 Predicted Condition Ratings			Likely Required Action by 2037								Comments from Current Condition Report
	Deck	Superstructure	Substructure	Deck	Superstructure	Substructure	Minor/Major Maintenance Only	Maintenance and Minor Rehabilitation	Deck Replacement	Deck and Beam Replacement	Major Superstructure Rehabilitation	Major Substructure Rehabilitation	Full Bridge Replacement	Bearing Replacement	
															hollow areas, spalls with exposed rebar, and evidence of past leakage from deck joints.
01192	7	7	7	5.1	5.5	5.5		X							Routine maintenance, repairs, patching of cracks and spalls, and spot painting likely required.
01195	5	5	7	3.8	4.0	5.6				X				X	Underside of deck has map cracking, spalls, hollow areas, and areas of exposed rusted rebar. The drainage and construction joints are in fair condition. Girders have peeling paint, heavy rust, and section loss. There are poor quality welds and areas of deteriorating paint. Self-lubricating bronze sliding plate bearings are currently in fair condition with light to heavy rust and 1/4" rust between plates, likely replaced along with superstructure.
01196	5	5	7	3.9	3.7	5.6				X					Underside of deck has map cracking, spalls, hollow areas, and areas of exposed rebar. The drainage is in fair condition. Girders have peeling paint, heavy rust, and section loss. There are poor quality welds and areas of deteriorating paint.
01197	7	7	6	5.2	5.4	5.1	X								Routine maintenance, repairs, patching of cracks and spalls, and spot painting likely required.
01198	7	6	6	5.3	4.8	5.3					X				Routine maintenance, repairs, patching of cracks and spalls, and spot painting likely required. Girders have moderate rust, pitting, and areas of re-rusting.

Table 39: Summary of Future Predicted Condition Ratings and Likely Required Action for Route 7 Group

Bridge No.	Current Condition Ratings			2037 Predicted Condition Ratings			Likely Required Action by 2037								Comments from Current Condition Report
	Deck	Superstructure	Substructure	Deck	Superstructure	Substructure	Minor/Major Maintenance Only	Maintenance and Minor Rehabilitation	Deck Replacement	Deck and Beam Replacement	Major Superstructure Rehabilitation	Major Substructure Rehabilitation	Full Bridge Replacement	Bearing Replacement	
00541	6	5	7	4.8	4.2	5.8				X					Deck replacement likely required. The Girders have peeling, heavy rust, and section loss. Bearing and web stiffeners have rusted through holes and section loss. Less than 50% of painted surfaces are deteriorated.
00542	6	5	6	4.8	4.1	4.7							X		Latex modified concrete deck has map cracking and potholes. The deck underside has cracks, honeycombing, hollow areas, and spalls. Poor drainage with clogged scupper grates and abandoned drains. Girders have heavy rust and section loss with repair plates already welded to certain webs. The girder alignment is considered fair. Abutments, pier caps, and pier columns have patches, map cracking, and spalls. Self-lubricating bronze sliding plate bearings are currently in fair condition. Moderate rust with 1/2" rust between plates.
00543	6	7	7	4.5	5.9	5.5			X					X	Underside of deck has hairline cracks, hollow areas, and spalls; likely required deck replacement as useful deck life is coming to an end. Parapet maintenance for cracks, scrapes, and spalls. Four self-lubricating bronze sliding plate bearings show no sign of movement and there is 12.5% loss of bearing - bearing replacement likely required.
00545	6	6	7	4.7	4.7	5.5				X					Underside of deck has hairline cracks, map cracking, hollow areas, and spalls with exposed rebar; likely required deck replacement as useful deck life is coming to an end. Light rust and peeling paint on about 25% of superstructure. Girders have areas of laminated rust, pitting, and localized bows. Girders also have scrapes and gouges from collision damage.

Bridge No.	Current Condition Ratings			2037 Predicted Condition Ratings			Likely Required Action by 2037								Comments from Current Condition Report
	Deck	Superstructure	Substructure	Deck	Superstructure	Substructure	Minor/Major Maintenance Only	Maintenance and Minor Rehabilitation	Deck Replacement	Deck and Beam Replacement	Major Superstructure Rehabilitation	Major Substructure Rehabilitation	Full Bridge Replacement	Bearing Replacement	
00550	6	6	6	5.1	5.1	4.4						X			Deck and superstructure routine maintenance, repairs, and patching of cracks and spalls. Less than 50% of painted surfaces have deteriorated, spot painting likely required for girders.
00551	6	6	6	4.8	5.2	4.5			X			X			Routine maintenance, repairs, and patching of cracks and spalls. Less than 50% of painted surfaces have deteriorated, spot painting likely required for girders. Deck replacement likely required as useful deck life is coming to an end. Substructure likely required repairs and rehab.
03915	7	7	7	5.9	6.0	6.0		X						X	Routine maintenance, repairs, and patching of cracks and spalls. Weathering steel rocker bearings are currently in fair condition. Heavy and laminar rust. 1/4" thick rust on rockers and masonry plates - at least routine maintenance and/or painting likely required for bearings.
03916	7	7	7	5.9	6.0	5.9		X						X	Routine maintenance, repairs, and patching of cracks and spalls. Spot painting likely required. Weathering steel rocker bearings have heavy and laminar rust. 1/4" thick rust on rockers, masonry plates, and anchor bolts - at least routine maintenance and/or painting likely required for bearings.
03919	7	7	7	6.0	6.0	6.2		X							Routine maintenance, repairs, and patching of cracks and spalls. Spot painting likely required. Pot bearings with neoprene and Teflon are currently in fair condition, with moderate to heavy rust - at least routine maintenance and/or painting likely required for bearings.
03920	7	7	7	6.0	5.7	6.2		X							Routine maintenance, repairs, and patching of cracks and spalls. Spot painting likely required for superstructure. Pot bearings with elastomer and Teflon are currently in fair condition, with moderate to heavy rust - at least routine maintenance and/or painting likely required for bearings.

Bridge No.	Current Condition Ratings			2037 Predicted Condition Ratings			Likely Required Action by 2037								Comments from Current Condition Report
	Deck	Superstructure	Substructure	Deck	Superstructure	Substructure	Minor/Major Maintenance Only	Maintenance and Minor Rehabilitation	Deck Replacement	Deck and Beam Replacement	Major Superstructure Rehabilitation	Major Substructure Rehabilitation	Full Bridge Replacement	Bearing Replacement	
05462	7	7	7	6.1	6.2	5.9		X							Routine maintenance, repairs, and patching of cracks and spalls. Spot painting likely required for superstructure.
05463	7	7	7	5.9	5.6	5.6		X						X	Routine maintenance, repairs, and patching of cracks and spalls. Expansion joints are in fair condition. Spot painting likely required for superstructure. Rocker bearings have light to heavy rust and laminar rust - painting or replacement likely required for bearings.
05772	7	6	6	6.0	4.9	5.0					X	X		X	Routine maintenance, repairs, and patching of cracks and spalls. Expansion joints are in fair condition. Paint in fair condition, painting likely required for superstructure. Girders have heavy rust and section loss. Abutments have hollow areas, areas of scale, cracks, and spalls with exposed rebar. Rocker bearings are currently in fair condition. Light to heavy rust. 3/16" rust between rockers and masonry plates - painting or replacement likely required for bearings.
05773	7	7	6	5.8	6.1	5.0						X		X	Routine maintenance, repairs, and patching of cracks and spalls. Spot painting likely required for superstructure. Abutments have hairline cracks, hollow areas, pop-outs, and spalls with exposed rebar. Rehab and repairs of substructure likely required. Rocker bearings have light to heavy rust and laminar rust - painting or replacement likely required for bearings.
05909	6	7	6	5.2	5.6	5.2		X							Routine maintenance, repairs, and patching of cracks and spalls. Active leakage on to abutments. Spot painting likely required for superstructure.
06569	7	8	7	6.5	7.3	6.3	X								Routine maintenance and spot painting likely required for superstructure.

Table 40: Summary of Future Predicted Condition Ratings and Likely Required Action for Over I-84 Group

Bridge No.	Current Condition Ratings			2037 Predicted Condition Ratings			Likely Required Action by 2037								Comments from Current Condition Report
	Deck	Superstructure	Substructure	Deck	Superstructure	Substructure	Minor/Major Maintenance Only	Maintenance and Minor Rehabilitation	Deck Replacement	Deck and Beam Replacement	Major Superstructure Rehabilitation	Major Substructure Rehabilitation	Full Bridge Replacement	Bearing Replacement	
00459	6	6	5	5.1	4.4	4.2							X		Bituminous concrete overlay has cracks, potholes, and raveling as well as the deck underside having hairline cracks and up to 14% deterioration; likely required deck replacement as useful deck life is coming to an end. Superstructure has girders with peeling paint, heavy rust, section loss, and missing welds. Self-lubricating bronze sliding plate bearings and elastomeric bearings are currently in fair condition. Light to moderate rust and laminar. 3/4" thick rust between sole plate and keeper angles. The piers and abutments have large spalls, cracks, and hollow areas with exposed rebar.
01180	6	5	6	5.2	3.7	5.1					X			X	Deck maintenance, weep drainage repairs, patching, and potential resurfacing. Bottom flange section loss at mid-span on multiple girders. Girders have heavy laminar rust and isolated active corrosion. Severe paint condition of 75% deterioration, address in superstructure rehab. Self-lubricating bronze sliding plate bearings are currently in fair condition; heavy rust and 3/4" laminar rust on plates.
01183	6	6	6	4.7	5.1	5.3			X						Bituminous concrete overlay has hairline map cracks and raveling as well as the deck underside having hairline cracks, hollow areas, and spalls; likely required deck replacement. Routine maintenance; repair and patch minor cracks and spalls. Spot painting likely required.
01188	6	7	7	4.9	6.0	6.1			X					X	Heavy raveling and potholes on bituminous deck overlay as well as hairline map cracking, hollow areas, and spalls with exposed rebar in the underside of the deck. Utility upkeep and maintenance. Patch and repair cracks and spalls. Rocker bearings are currently in fair condition. Light to moderate rust with 1/2" rust between rockers and plates.

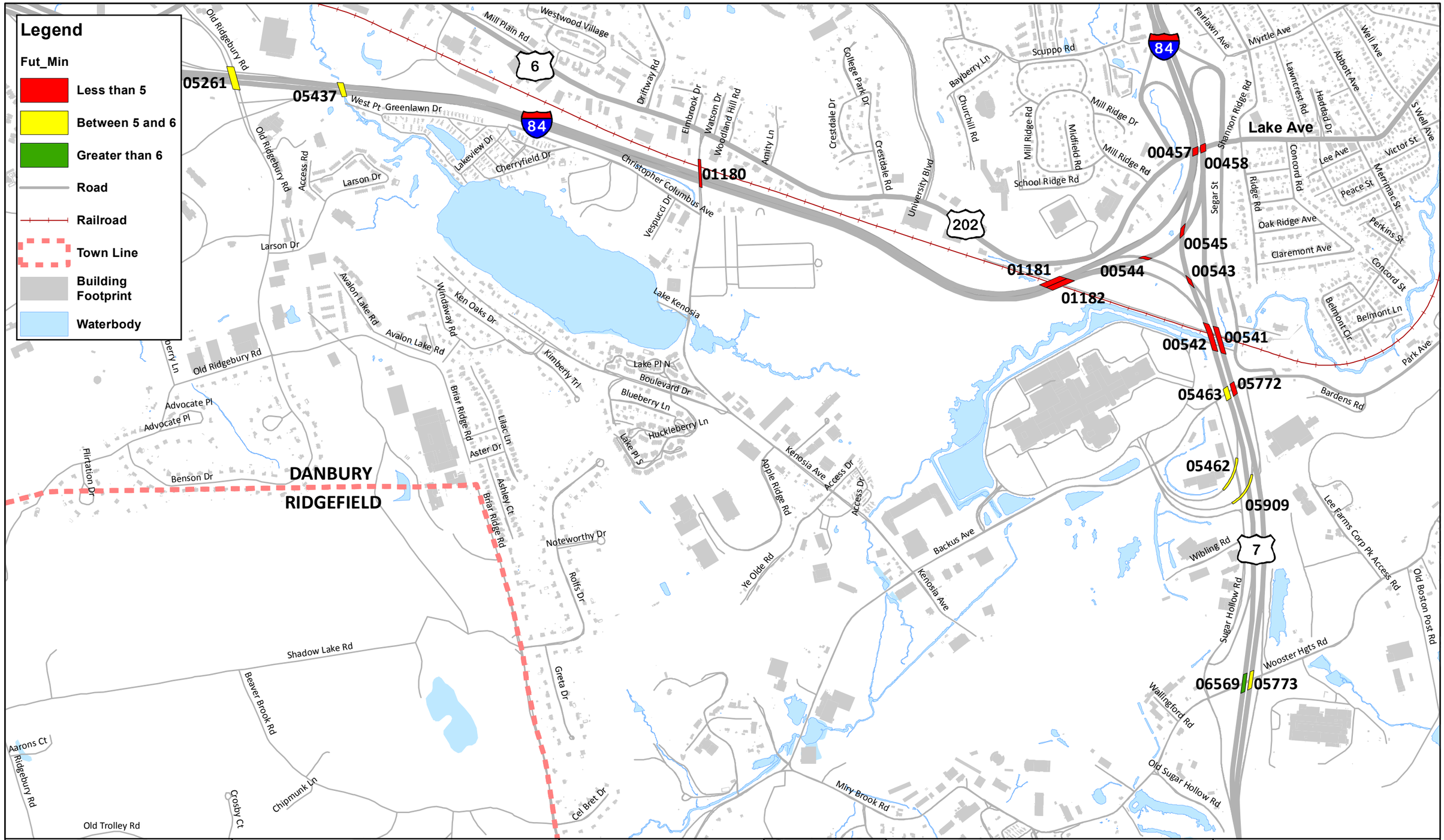
Bridge No.	Current Condition Ratings			2037 Predicted Condition Ratings			Likely Required Action by 2037								Comments from Current Condition Report
	Deck	Superstructure	Substructure	Deck	Superstructure	Substructure	Minor/Major Maintenance Only	Maintenance and Minor Rehabilitation	Deck Replacement	Deck and Beam Replacement	Major Superstructure Rehabilitation	Major Substructure Rehabilitation	Full Bridge Replacement	Bearing Replacement	
01199	6	5	6	4.5	3.9	4.7							X		Deck overlay has light to moderate rutting, raveling, and areas of map cracking. Expansion joints are in fair condition. Spalls, cracks, hollow areas, and areas of exposed rebar in underside of deck, abutments, pier caps, and pier columns. Girders have numerous areas of pitting and section loss in critical areas, up to 10% web loss.
01200	6	6	6	5.0	5.1	5.2			X						Deck joints are paved over and have cracks. There are hairline cracks, hollow areas, and spalls on the underside of the deck with a maximum underside deck deterioration of 17.6%. Routine maintenance for superstructure and substructure; repair and patch minor cracks and spalls. Spot painting likely required.
01201	6	7	6	4.9	6.0	5.3			X						Bituminous overlay has rutting in the wheel lines and cracks covering up to 50% of surface area. The underside of the deck has hairline cracks, hollow areas, and spalls with exposed rebar. Spot painting likely required. Routine maintenance; repair and patch minor cracks and spalls in piers and abutments.
01202	6	5	6	4.9	3.7	5.2				X					Bituminous concrete overlay has areas of map cracking throughout, up to 80% of surface area. The underside of the deck has hairline cracks, concrete patches, hollow areas, and spalls. Girders and diaphragms have light rust with impacted rust up to 1/2" between flanges and deck haunches. Girders have section losses up to 3/16" deep. Random welds missing or of poor quality. Long scrape with rust along a girder due to collision damage.
01203	6	6	6	4.7	5.1	5.2			X						Bituminous overlay has sealed and unsealed cracks. The deck underside has full depth patches, map cracking, hollow areas, shallow rebar, and spalls. Spot painting likely required. Routine maintenance; repair and patch cracks and spalls in piers and abutments.

Bridge No.	Current Condition Ratings			2037 Predicted Condition Ratings			Likely Required Action by 2037								Comments from Current Condition Report
	Deck	Superstructure	Substructure	Deck	Superstructure	Substructure	Minor/Major Maintenance Only	Maintenance and Minor Rehabilitation	Deck Replacement	Deck and Beam Replacement	Major Superstructure Rehabilitation	Major Substructure Rehabilitation	Full Bridge Replacement	Bearing Replacement	
01204	6	5	6	5.0	3.7	4.5							X		Bituminous concrete overlay has moderate to heavy wear, sealed and unsealed cracks, areas of raveling, and potholes. Underside of deck has hairline cracks and spalls with shallow rebar. Likely required deck overlay resurfacing and routine maintenance. Girders have section loss resulting in 15% shear loss and 84% bearing loss. Girders have peeling paint and heavy rust. 50% of painted surfaces are rusting. Cracks and spalls in pier caps, pedestals, and abutments.
05261	7	7	7	5.8	5.8	5.6		X						X	Deck will likely need at least minor rehab based on inspection report notes - the overlay has numerous potholes and map cracks; extensive deterioration. Rocker bearings have heavy rust; 3/16" rust between rocker and masonry plate - painting or replacement likely required for bearings.

Table 41: Summary of Future Predicted Condition Ratings and Likely Required Action for Culvert Group

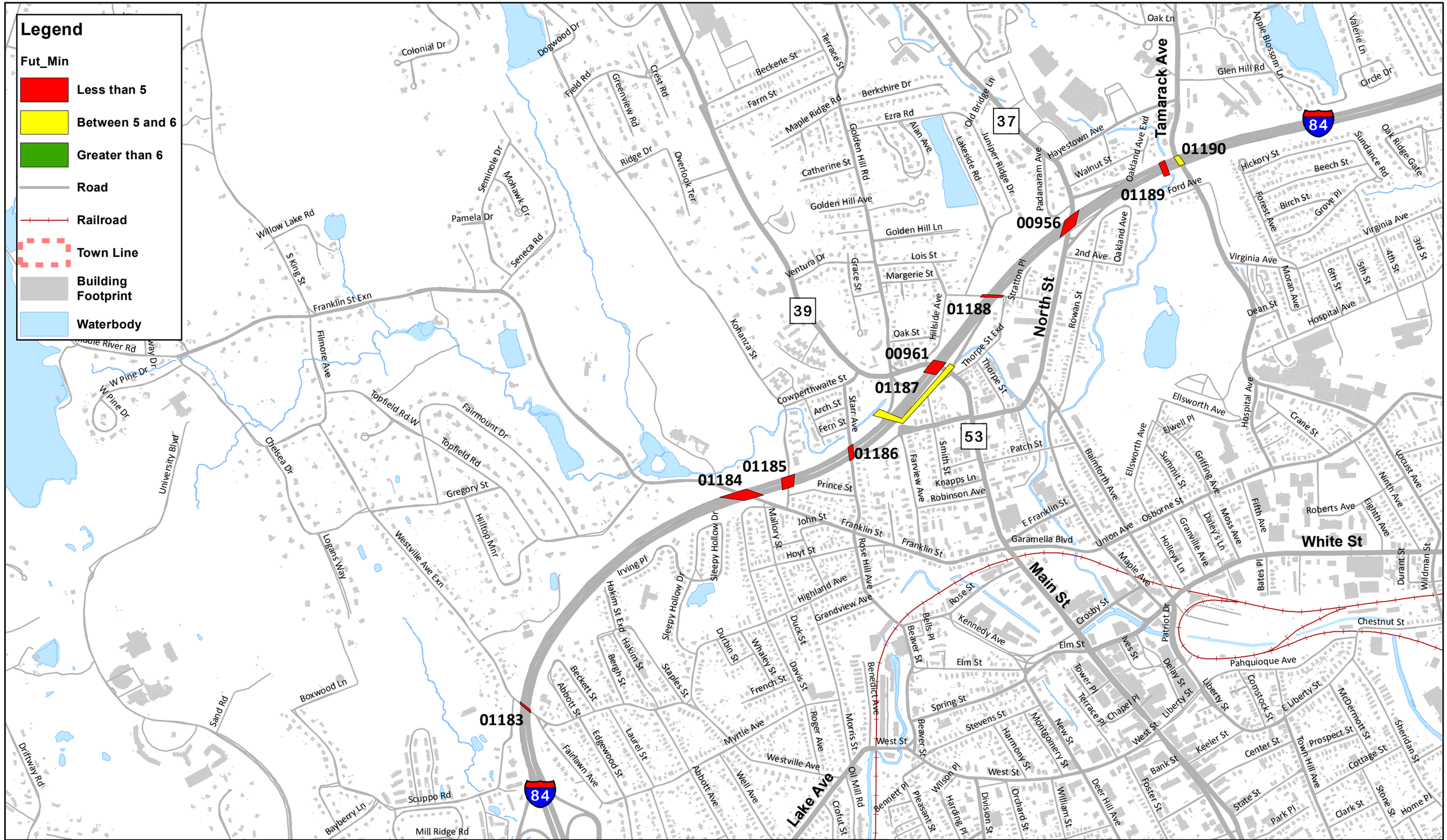
Bridge No.	Current Condition Ratings	2037 Predicted Condition Ratings	Likely Required Action by 2037			Comments from Current Condition Report
	Culvert	Culvert	Minor/Major Maintenance Only	Maintenance and Minor Rehabilitation	Major Rehab or Replace Culvert	
00546	6	5.4		X		
00549	6	5.7		X		
00553	6	5.5		X		
01187	6	5.3		X		
01189	5	4.1			X	Spalls, cracks, pop-outs, exposed wires, and leaking joints.
01193	7	6.3	X			
01194	6	5.1		X		
01205	6	5.6		X		
05437	6	5.6		X		

Figure 7 provides a graphical representation of the corridor based on the future overall structure condition, which is taken as the minimum rating of deck, superstructure, substructure and culvert future rating. Figures 8, 9,10 and 11 provide graphical representations of the future bridge condition within the corridor based on deck, superstructure, substructure and culvert condition, respectively.



I-84 Danbury Project

Figure 7a
Future Overall Structure Condition



I-84 Danbury Project

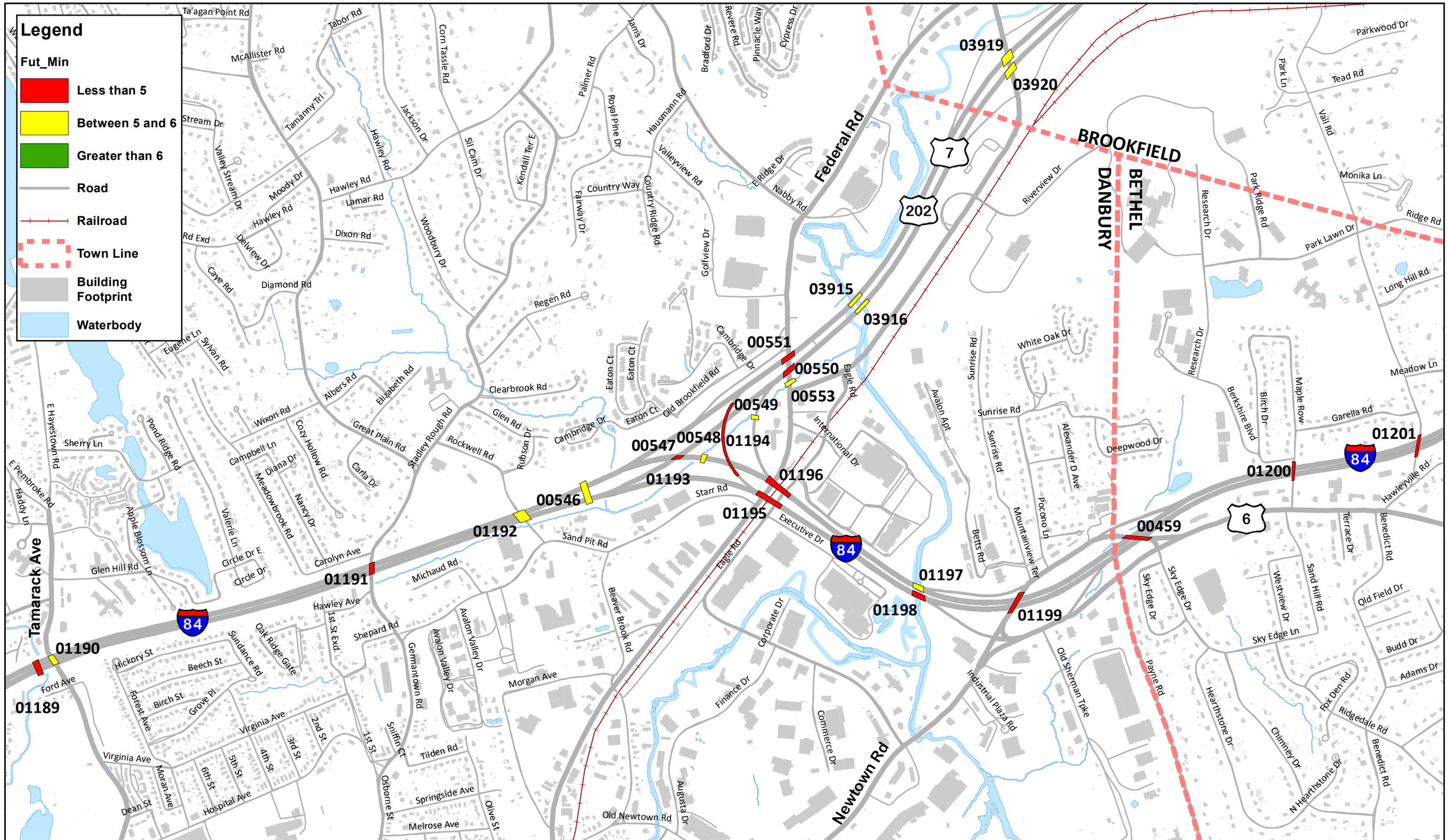
Figure 7b
Future Overall Structure Condition

N

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017



I-84 Danbury Project

Figure 7c
Future Overall Structure Condition

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

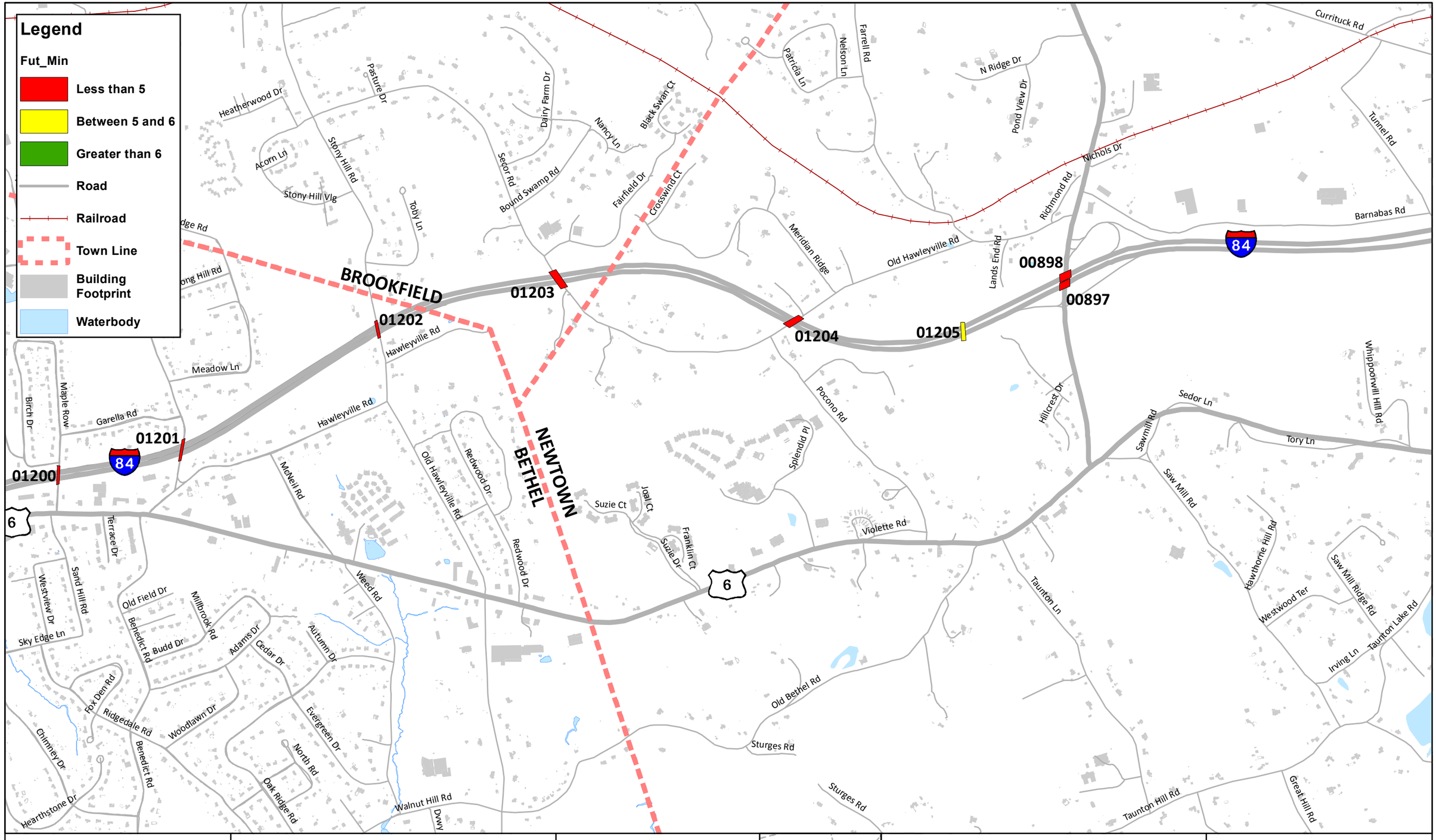


Figure 7d
Future Overall Structure Condition

I-84 Danbury Project

N

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

Legend

Predicted Deck Rating

- Less than 5
- Between 5 and 6
- Greater than 6
- Road
- Railroad
- Town Line
- Building Footprint
- Waterbody

05261 01180 01181 01182 00544 00545 00543 00457 00458 00542 00541 05463 05772 05462 05909 06569 05773

DANBURY
RIDGEFIELD

Old Ridgebury Rd, West Pt Greenlawn Dr, Mill Plain Rd, Westwood Village, Driftway Rd, Elmbrook Dr, Watson Dr, Woodland Hill Rd, Amity Ln, Crestdale Dr, College Park Dr, Crestdale Rd, University Blvd, Bayberry Ln, Churchill Rd, Scuppo Rd, Mill Ridge Dr, Mill Ridge Rd, Midfield Rd, School Ridge Rd, Fairlawn Ave, Myrtle Ave, Lawnerest Rd, Haddad Dr, Abbott Ave, Well Ave, S Well Ave, Lake Ave, Victor St, Lee Ave, Concord Rd, Ridge Rd, Peace St, Merrimac St, Oak Ridge Ave, Perkins St, Claremont Ave, Concord St, Belmont Ln, Belmont Cir, Park Ave, Bardens Rd, Segar St, Access Rd, Larson Dr, Lakeview Dr, Cherryfield Dr, Vespucci Dr, Lake Kenosia, Ken Oaks Dr, Windaway Rd, Avalon Lake Rd, Kimberly Trl, Lake Pl N, Boulevard Dr, Blueberry Ln, Huckleberry Ln, Lake Pl S, Briar Ridge Rd, Aster Dr, Lilac Ln, Ashley Ct, Advocate Pl, Flirtation Dr, Benson Dr, Noteworthy Dr, Rolfs Dr, Greta Dr, Cel Bret Dr, Apple Ridge Rd, Ye Olde Rd, Kenosia Ave, Access Dr, Backus Ave, Wibling Rd, Sugar Hollow Rd, Wooster Hgts Rd, Wallingford Rd, Old Sugar Hollow Rd, Lee Farms Corp Pk Access Rd, Old Boston Post Rd, Miry Brook Rd, Shadow Lake Rd, Beaver Brook Rd, Chipmunk Ln, Crosby Ct, Aarons Ct, Ridgebury Rd, Old Trolley Rd

I-84 Danbury Project

Figure 8a
Future Deck Condition

N

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

WSP

CONNECTICUT DEPARTMENT OF TRANSPORTATION

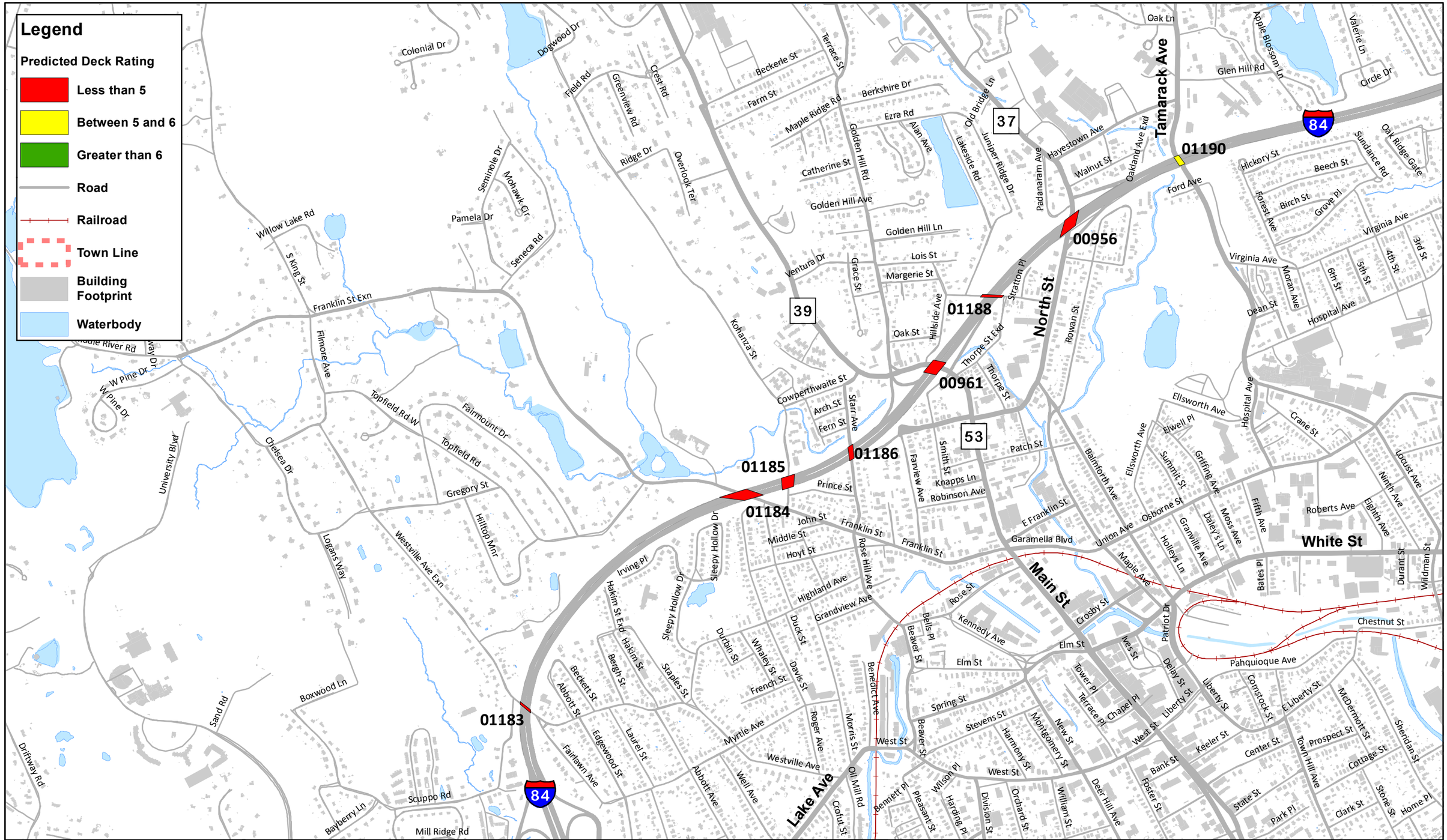


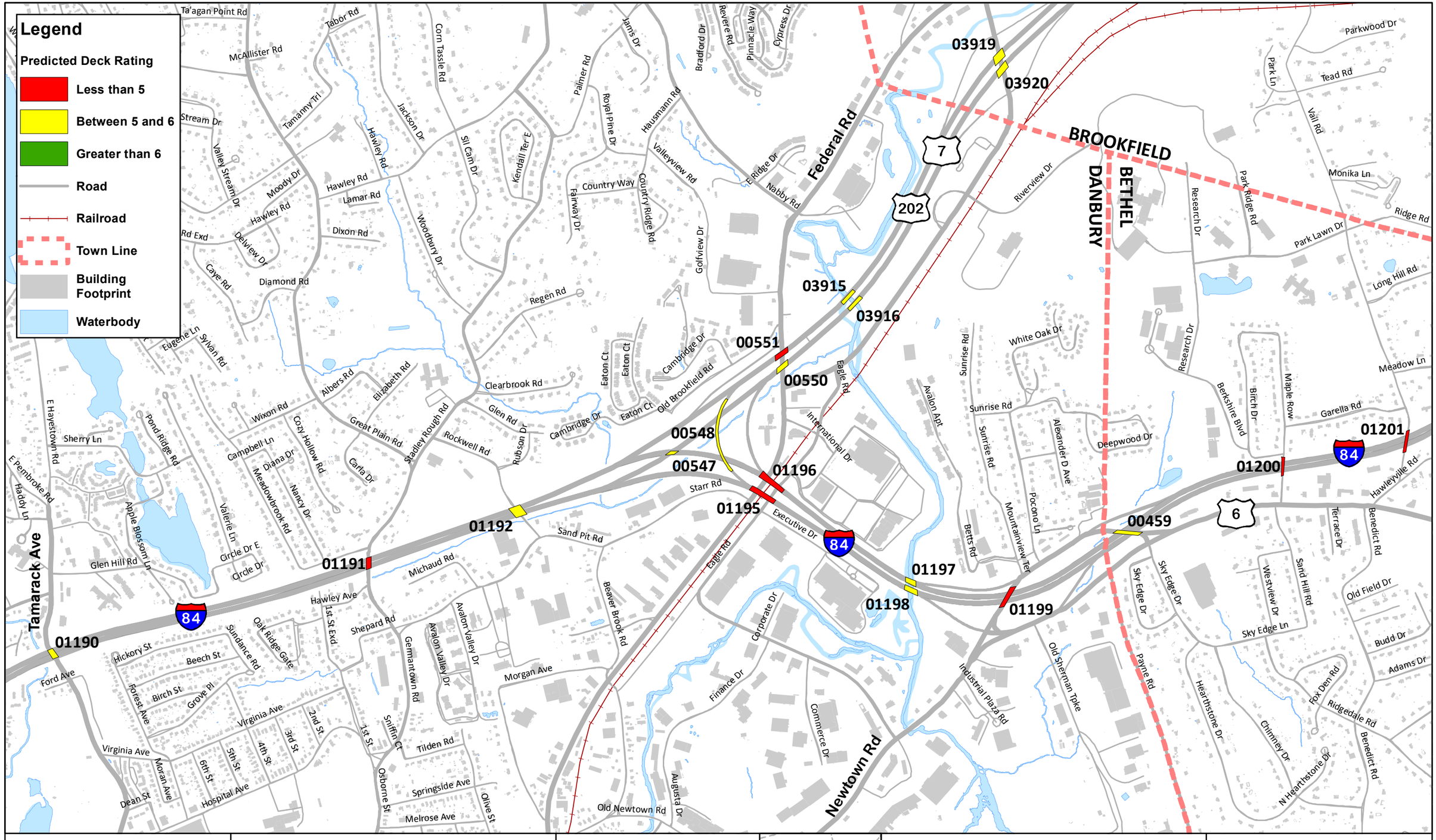
Figure 8b
Future Deck Condition

I-84 Danbury Project

0 0.1 0.2 Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

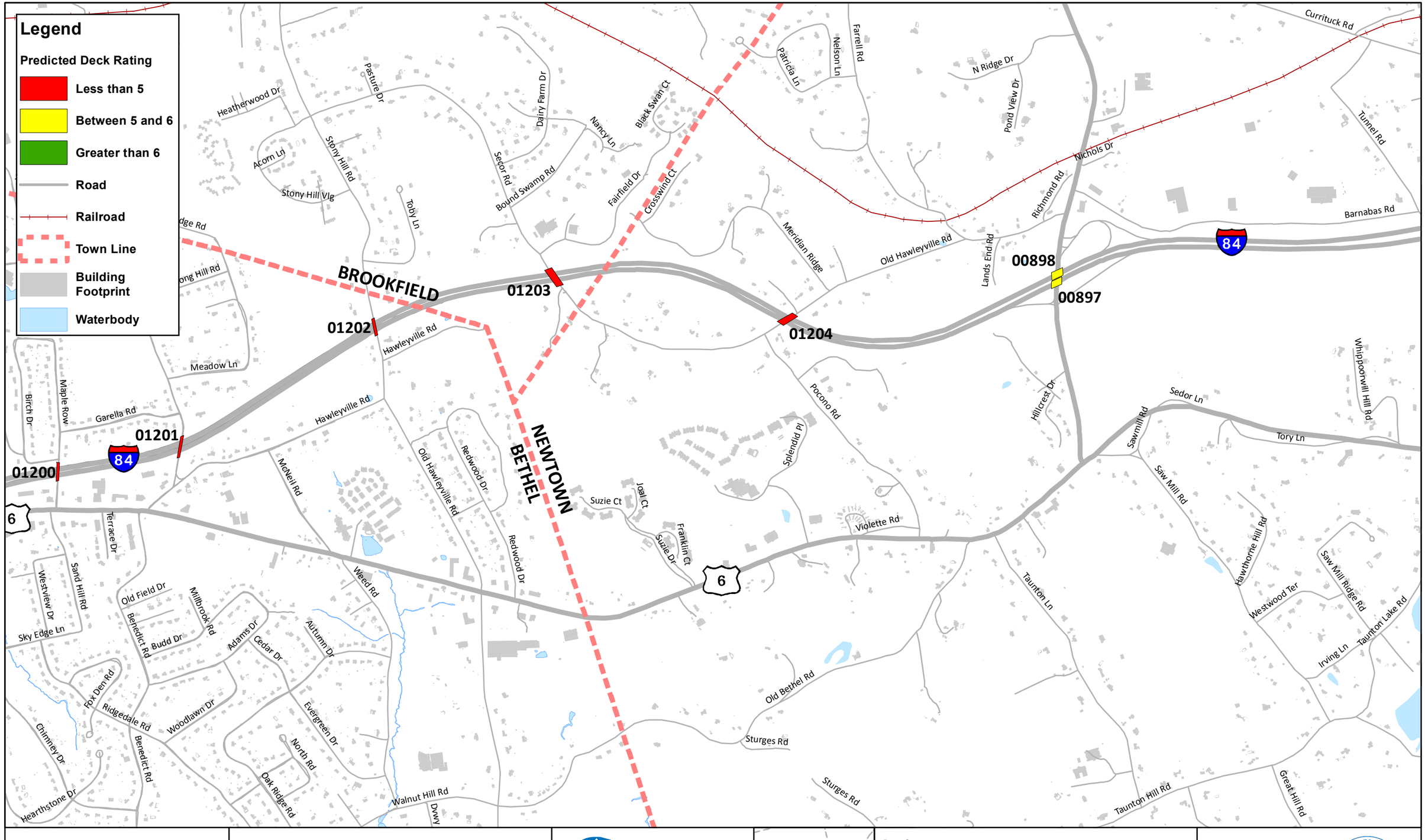


I-84 Danbury Project

Figure 8c
Future Deck Condition

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017



I-84 Danbury Project

Figure 8d
Future Deck Condition

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

Legend

Predicted Superstructure Rating

- Less than 5
- Between 5 and 6
- Greater than 6
- Road
- Railroad
- Town Line
- Building Footprint
- Waterbody

05261 01180 01181 01182 00544 00545 00543 00457 00458 00542 00541 05463 05772 05462 05909 06569 05773

DANBURY
RIDGEFIELD

Old Ridgebury Rd, Mill Plain Rd, Westwood Village, West Pt Greenlawn Dr, Driftway Rd, Elmbrook Dr, Watson Dr, Woodland Hill Rd, Amity Ln, College Park Dr, Crestdale Dr, Crestdale Rd, University Blvd, Bayberry Ln, Churchill Rd, Scuppo Rd, Mill Ridge Dr, Mill Ridge Rd, Midfield Rd, School Ridge Rd, Fairlawn Ave, Myrtle Ave, Lawnerest Rd, Haddad Dr, Abbott Ave, Well Ave, S Well Ave, Lake Ave, Concord Rd, Lee Ave, Victor St, Peace St, Merrimac St, Ridge Rd, Oak Ridge Ave, Perkins St, Claremont Ave, Concord St, Belmont Ln, Belmont Cir, Park Ave, Bardens Rd, Segar St, Lee Farms Corp Pk Access Rd, Old Boston Post Rd, Wooster Hgts Rd, Sugar Hollow Rd, Wibling Rd, Wallingford Rd, Old Sugar Hollow Rd, Miry Brook Rd, Backus Ave, Kenosia Ave, Access Dr, Apple Ridge Rd, Ye Olde Rd, Noteworthy Dr, Rolfs Dr, Greta Dr, Cel Bret Dr, Ashley Ct, Briar Ridge Rd, Aster Dr, Lilac Ln, Briar Ridge Rd, Kimberly Trl, Lake Pl N, Boulevard Dr, Blueberry Ln, Huckleberry Ln, Lake Pl S, Lake Kenosia, Windaway Rd, Ken Oaks Dr, Avalon Lake Rd, Avalon Lake Rd, Larson Dr, Access Rd, Old Ridgebury Rd, Lakeview Dr, Cherryfield Dr, Vespucci Dr, Larson Dr, Old Ridgebury Rd, Advocate Pl, Advocate Pl, Flirtation Dr, Benson Dr, Shadow Lake Rd, Beaver Brook Rd, Aarons Ct, Ridgebury Rd, Crosby Ct, Chipmunk Ln, Old Trolley Rd

6 84 202 84 7

Figure 9a
Future Superstructure Condition

I-84 Danbury Project

N

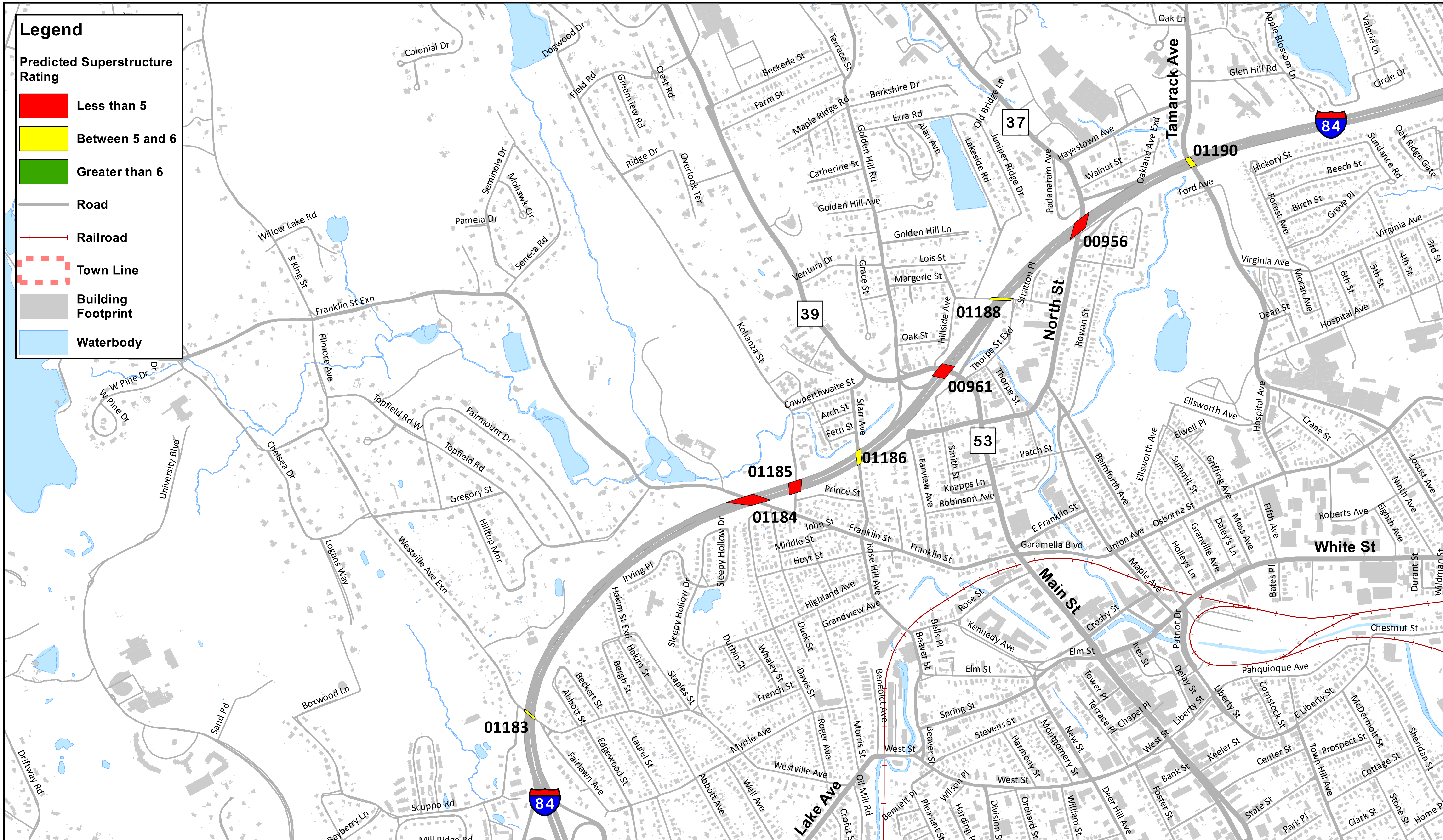
0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

WSP

CONNECTICUT DEPARTMENT OF TRANSPORTATION



I-84 Danbury Project

Figure 9b
Future Superstructure Condition

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

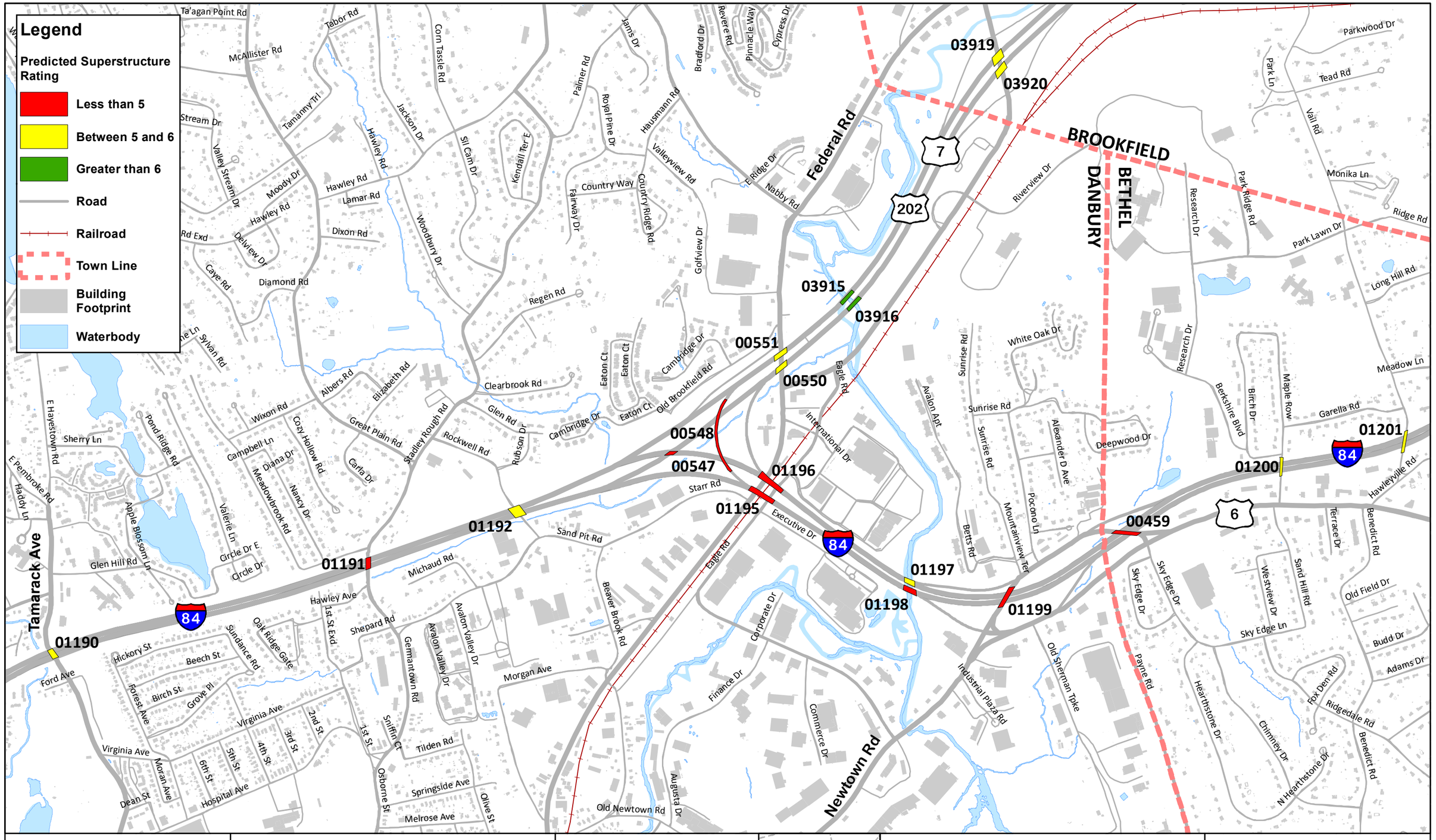


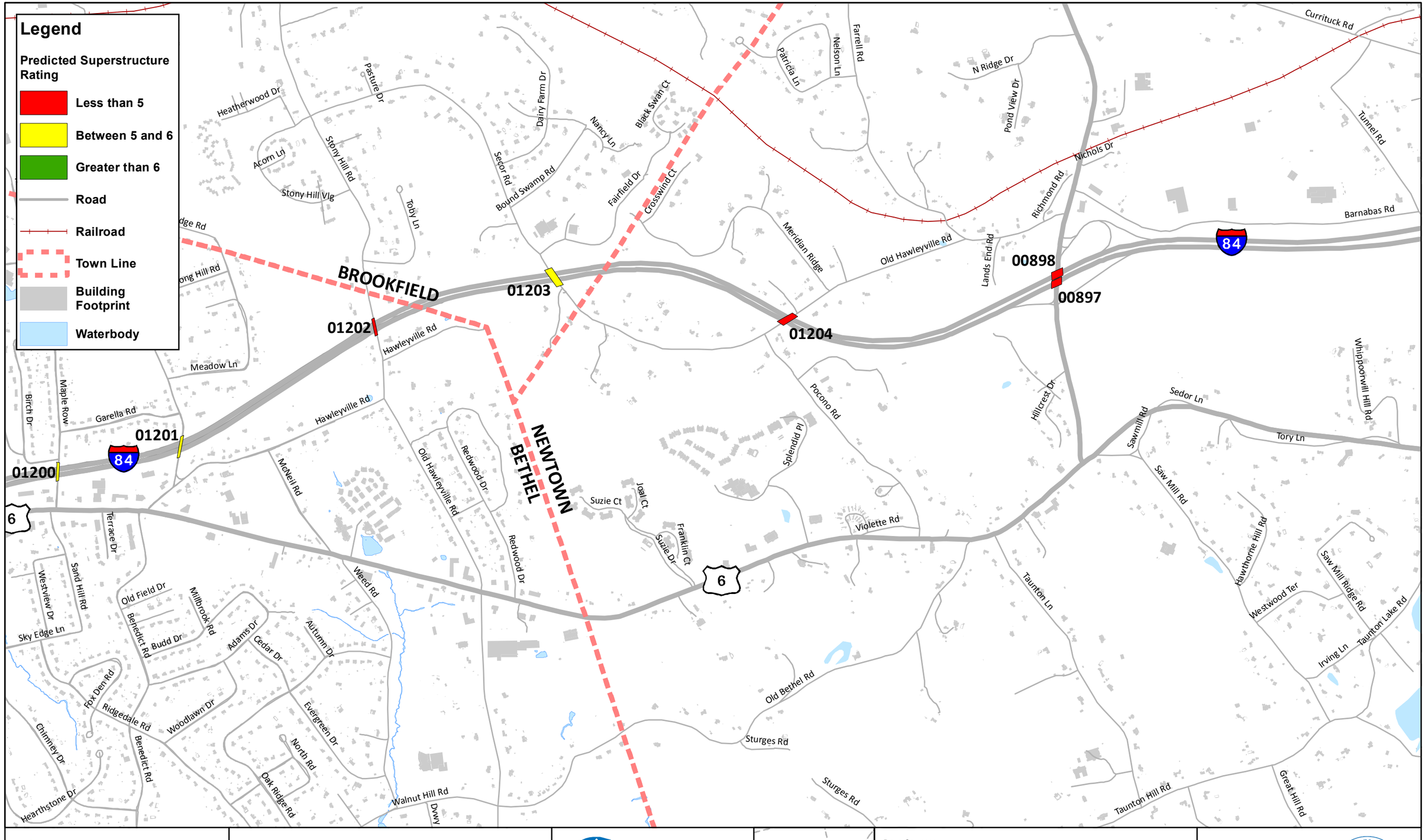
Figure 9c
Future Superstructure Condition

I-84 Danbury Project

0 0.1 0.2 Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017



I-84 Danbury Project

Figure 9d
Future Superstructure Condition

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

Legend

Predicted Substructure Rating

- Less than 5
- Between 5 and 6
- Greater than 6
- Road
- Railroad
- Town Line
- Building Footprint
- Waterbody

05261 01180 01181 01182 00544 00545 00543 00457 00458 00542 00541 05463 05772 05462 05909 06569 05773

Old Ridgebury Rd, Mill Plain Rd, Westwood Village, Driftway Rd, Elmbrook Dr, Watson Dr, Woodland Hill Rd, Amity Ln, College Park Dr, Crestdale Dr, Crestdale Rd, University Blvd, Bayberry Ln, Churchill Rd, Scuppo Rd, Mill Ridge Dr, Mill Ridge Rd, Midfield Rd, School Ridge Rd, Fairlawn Ave, Myrtle Ave, Lawnerest Rd, Haddad Dr, Abbott Ave, Well Ave, S Well Ave, Lake Ave, Victor St, Lee Ave, Concord Rd, Ridge Rd, Peace St, Merrimac St, Oak Ridge Ave, Perkins St, Claremont Ave, Concord St, Belmont Ln, Belmont Cir, Park Ave, Bardens Rd, Segar St, West Pt Greenlawn Dr, Lakeview Dr, Cherryfield Dr, Vespucci Dr, Larson Dr, Access Rd, Lake Kenosia, Ken Oaks Dr, Windaway Rd, Avalon Lake Rd, Kimberly Trl, Lake Pl N, Boulevard Dr, Blueberry Ln, Huckleberry Ln, Lake Pl S, Briar Ridge Rd, Aster Dr, Lilac Ln, Ashley Ct, Advocate Pl, Flirtation Dr, Benson Dr, Noteworthy Dr, Rolfs Dr, Greta Dr, Cel Bret Dr, Apple Ridge Rd, Ye Olde Rd, Kenosia Ave, Access Dr, Backus Ave, Miry Brook Rd, Shadow Lake Rd, Beaver Brook Rd, Chipmunk Ln, Crosby Ct, Aarons Ct, Ridgebury Rd, Old Trolley Rd, Wibling Rd, Sugar Hollow Rd, Wooster Hgts Rd, Wallingford Rd, Old Sugar Hollow Rd, Lee Farms Corp Pk Access Rd, Old Boston Post Rd

DANBURY
RIDGEFIELD

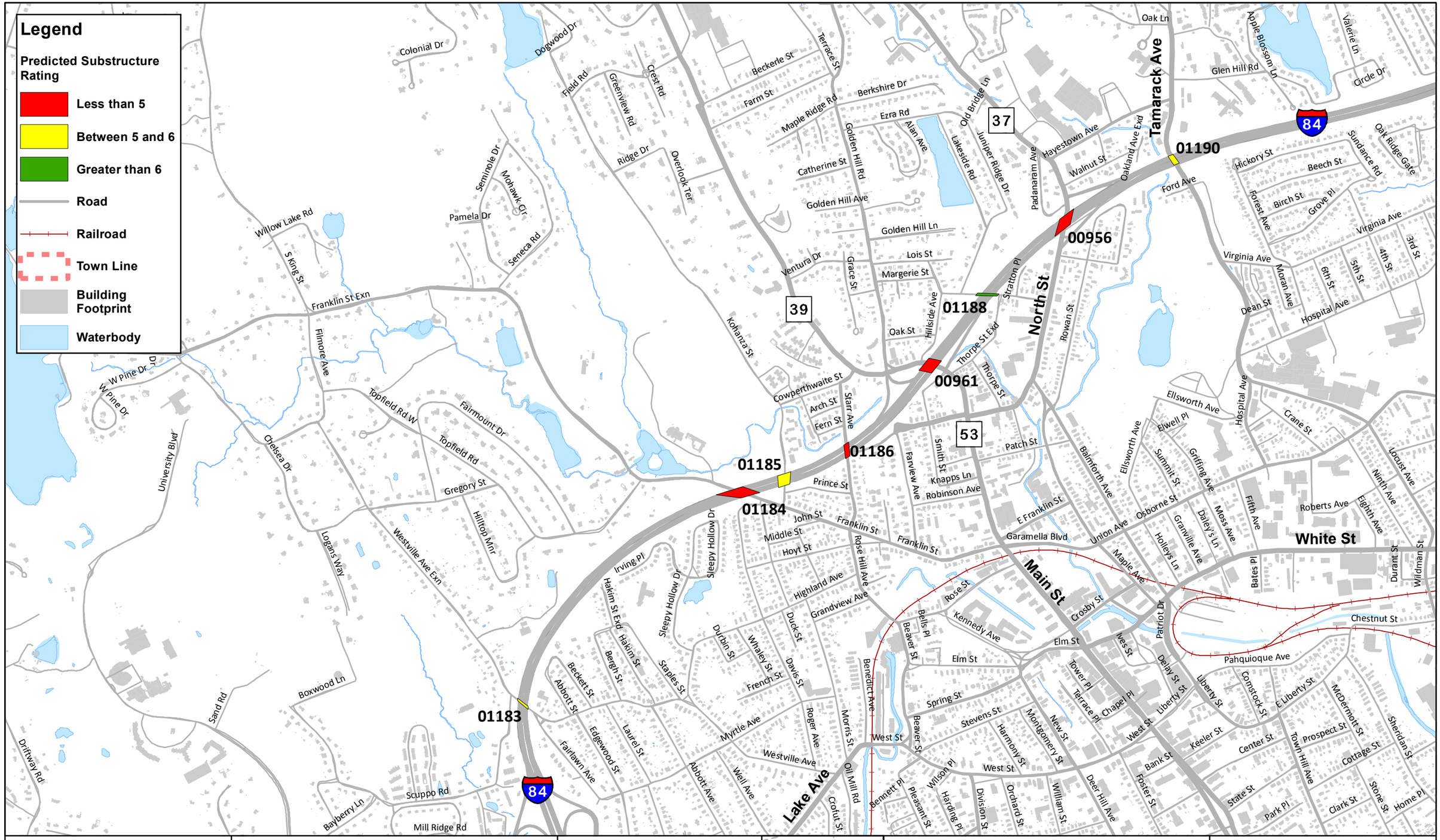
I-84 Danbury Project

Figure 10a
Future Substructure Condition

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017



I-84 Danbury Project

Figure 10b
Future Substructure Condition

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

Legend

Predicted Substructure Rating

- Less than 5
- Between 5 and 6
- Greater than 6
- Road
- Railroad
- Town Line
- Building Footprint
- Waterbody

03919
03920
03915
03916
00551
00550
00548
00547
01196
01195
01192
01191
01190
01197
01198
01199
00459
01201
01200

BROOKFIELD
DANBURY
BETHEL

Federal Rd
Newtown Rd
Tamarack Ave
Eagle Rd

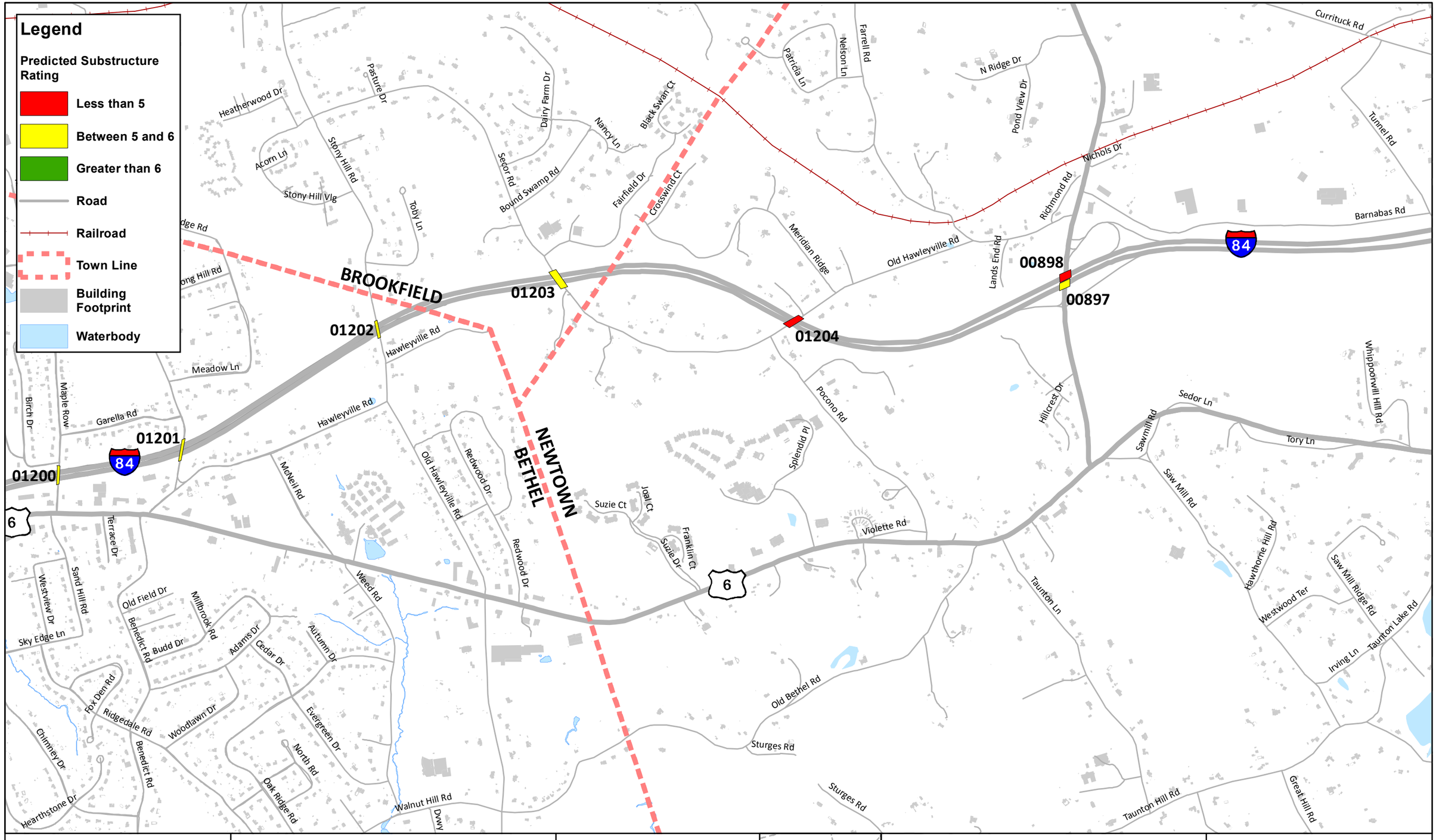
I-84 Danbury Project

Figure 10c
Future Substructure Condition

0 0.1 0.2 Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017



I-84 Danbury Project

Figure 10d
Future Substructure Condition

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

Legend

Predicted Culvert Rating

- Less than 5
- Between 5 and 6
- Greater than 6
- Road
- Railroad
- Town Line
- Building Footprint
- Waterbody

05437

DANBURY
RIDGEFIELD

Figure 11a
Future Culvert Condition

I-84 Danbury Project

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

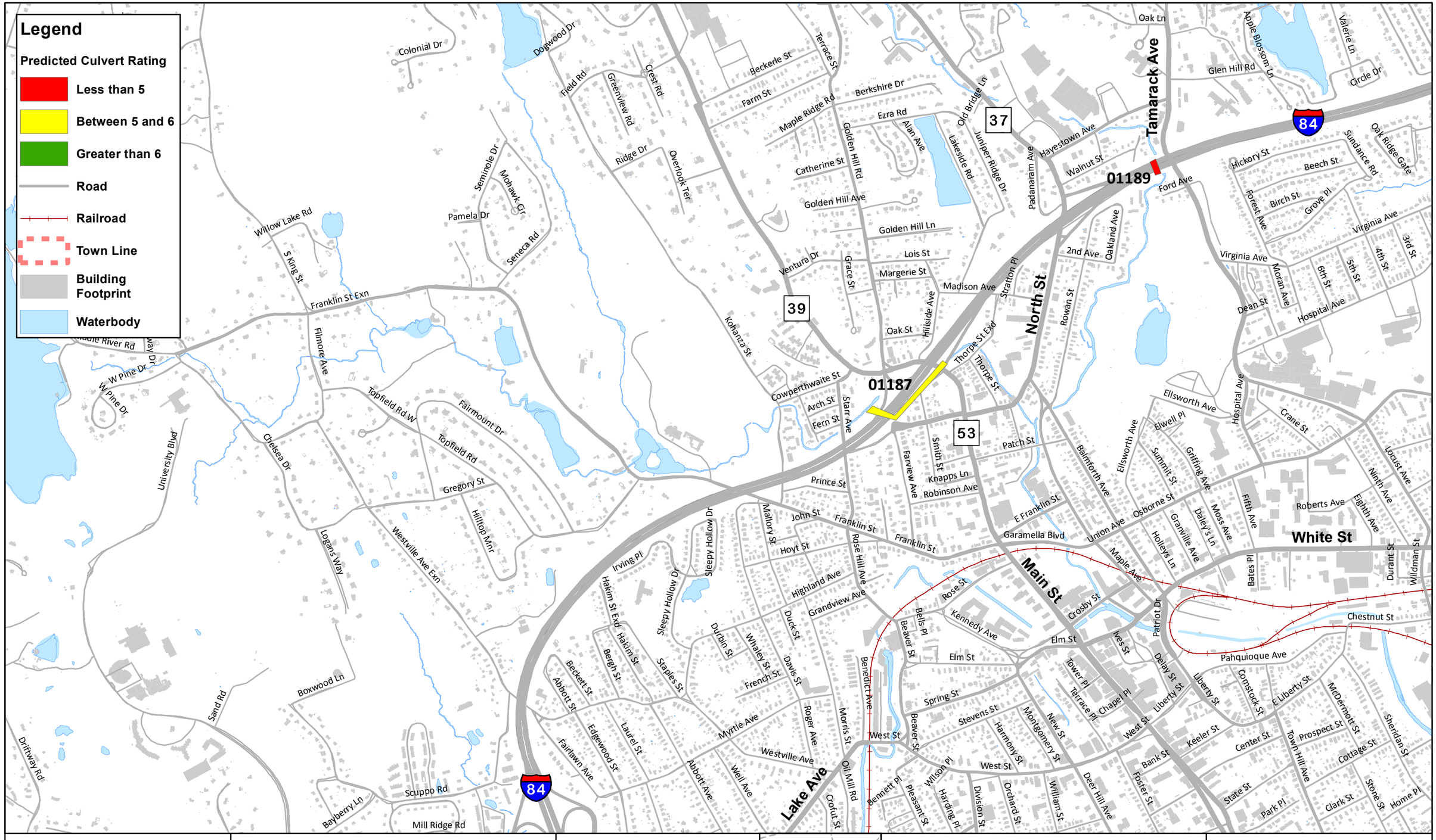


Figure 11b
Future Culvert Condition

I-84 Danbury Project

0 0.1 0.2 Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

Legend

Predicted Culvert Rating

- Less than 5
- Between 5 and 6
- Greater than 6
- Road
- Railroad
- Town Line
- Building Footprint
- Waterbody

00553
00549
01194
01193
00546
01189

BROOKFIELD
DANBURY
BETHEL

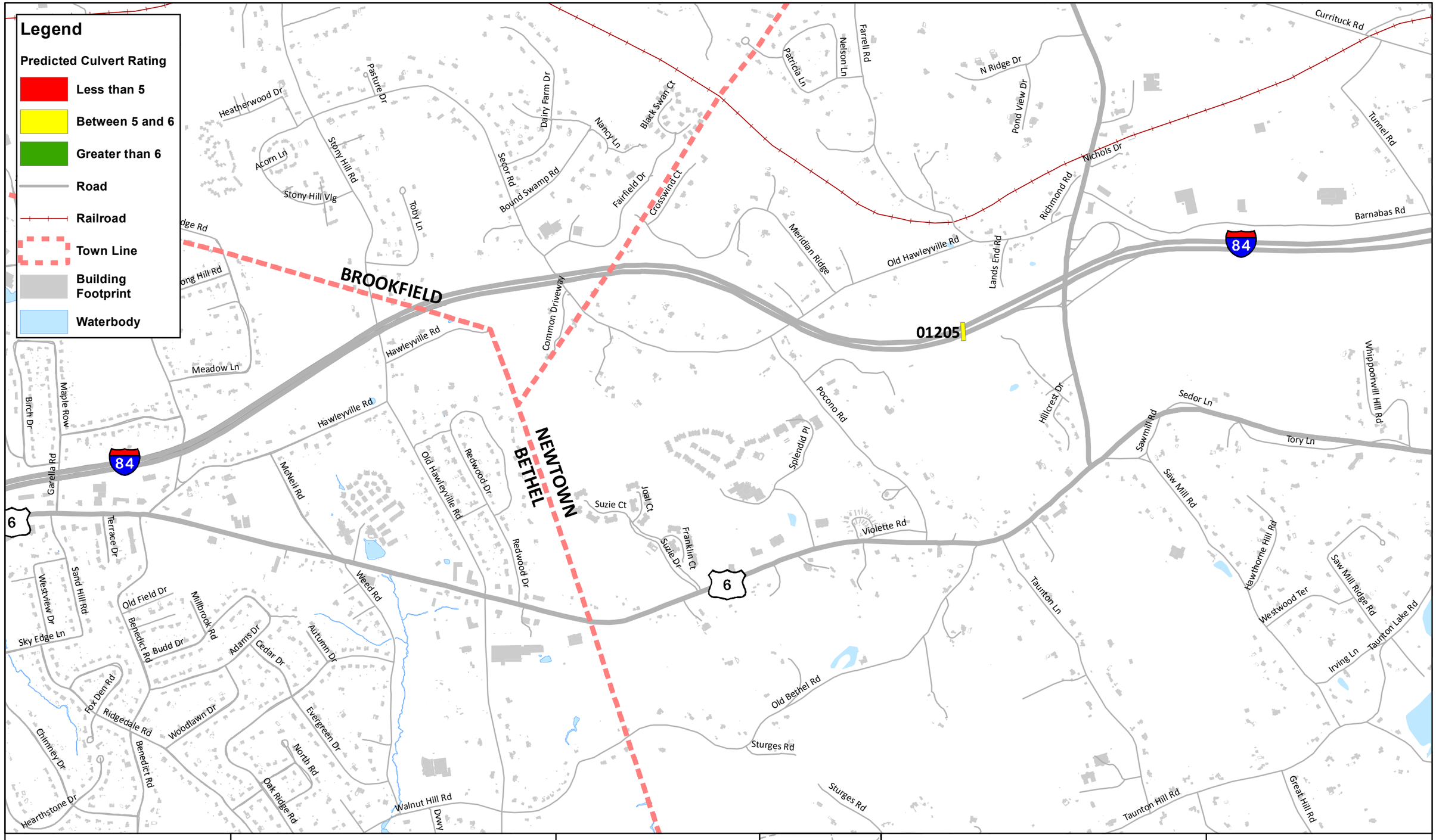
Figure 11c
Future Culvert Condition

I-84 Danbury Project

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017



I-84 Danbury Project

Figure 11d
Future Culvert Condition

N

0 0.1 0.2
Miles

Data Sources:
- Western Connecticut Council of Governments
- Connecticut Department of Energy and Environmental Protection

Date: December 2017

Appendix A – Existing Condition Summary

Bridge No. 00457

Bridge No. 00457 was built in 1962 and rehabilitated in 1982 (Project 0034-0160), in 1986 (Project 0034-0189) and in 2008 (Project 0174-0339). The single span bridge carries Interstate-84 westbound and Ramp 6 over US Route 6 in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 92'-0" and the curb to curb width is 87'-6". As provided by the Connecticut Department of Transportation the inventory rating is 62.4 tons.

Deck: (Rated 6 – Satisfactory)

The bituminous overlay was replaced as part of Project 0034-0189 (1986). However there appears to be slight opening of the longitudinal paving seam joints and light raveling. In Bays 1 through 4 there are scattered transverse cracks with and without efflorescence. In Bay 7 near the South abutment there is a spall (45"L x 45"W x 2"D) with epoxy coated rebar. There is a second spall (13" diameter x 3.5"D) located in Bay 10 near the South abutment. The deck also exhibits scattered map cracking, uneven patches and several hollow areas. In Bay 7 over the westbound lanes there is a 16' long false work and cribbing. The curbs exhibit scrape marks and chipped edges with average curb reveals of 3-1/2" left and 3-9/16" right. The concrete median barrier, which separates Ramp 6 from I-84 has random horizontal and vertical hairline cracks. Some of these cracks open up to 1/8" wide x 5' long. With respect to the bridge median, the North approach median has settled up to 5". The concrete parapets have hairline transverse cracks across the top and full-height vertical hairline cracks. The parapet at the Northeast extension has spalls (10" H x 4" W x 1" D) at the bottom. At both abutments the asphaltic plug joints have exposed aggregate and minor depressed/heaved areas.

Superstructure: (Rated 6 – Satisfactory)

There are curved fixed bearings at the South abutment, which exhibit light to medium rust. Bearing 4 was observed to be the worst with laminar rust. At Bearings 4, 12 and 13 the anchor bolts are slightly tilted to the south. There are bronze plate sliding expansion bearings at the North abutment which have areas of light to moderate rust on the plates. There are a few bearings with laminar rust between the sole plate and bronze plate resulting in gaps up to 1/8". The bearings for girders 1 through 4 have steel keeper blocks and three of the keeper blocks are in contact with the sole plate. The bearing for girder 1 is laterally misaligned ½" to the west with the sliding plate ½" east of the sole plate. There are a few random anchor bolts that are tilted to the north. The rolled steel girders have areas of peeling paint and light to moderate rust at the top and bottom flanges. At the east face of girder 4 over the South Abutment the web has laminar rust with minor section loss (3'L x 6"H x 1/16"). There is heavy rust at the west face of girder 5 with minor section loss (2.5'L x 2"H x 1/16") at the bottom of the web. There is also heavy rust and minor section loss in the top and bottom flange. The bottom flanges of girders 7 through 9 have pitting throughout and heavy rust. Girder 13 has up to 1/16" pitting along the web for the full-length. The end diaphragm over the South Abutment was found to have a missing bottom weld at a random location.

Substructure: (Rated 7 – Good)

There is light scaling, light moss growth and evidence of deck joint leakage on the concrete abutment stems. There are a few random vertical hairline cracks at the South abutment and a 1' horizontal hairline crack at the Southwest cheekwall. There is a large hollow area (2'W x 4'H) with map cracks located at the joint between the ramp extension and the stem under girder 5. There is also a large area (2'W x 12'H) of map hairline cracks with rust stains in Bay 4. There is spalling in Panels 5 & 6. The concrete stem at the North abutment exhibits hairline vertical cracking and some spalling. The concrete pedestal for girder 7 has three pop-out spalls and the concrete pedestal for girder 8 has full-height spalling with exposed rusted rebar. The concrete abutment backwalls exhibit mud and water stains as well as random hairline vertical cracks. The as built condition of the Northeast wingwall is tipped to the south 1-1/2" in 20' which has not changed. All wingwalls exhibit horizontal and/or diagonal hairline cracks, some with efflorescence. On the beam seats at both abutments there is some light debris and sand.

Bridge No. 00458

Bridge No. 00458 was built in 1962 and rehabilitated in 1982 (Project 0034-0160), in 1986 (Project 0034-0189) and in 2008 (Project 0174-0339). The single span bridge carries Interstate-84 eastbound and Route 7 over US Route 6 in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 87'-0" and the curb to curb width is 63'-6". As provided by the Connecticut Department of Transportation the inventory rating is 48 tons.

Deck: (Rated 7 – Good)

There are minor wheel marks in the bituminous overlay and the paving seams have opened slightly to 1/16". The underside of the deck in Bays 2 through 8 has random spalls (2' x 1.5' x 4"), honeycomb areas (2.5'L x 5'W x ½"D), transverse cracks with and without efflorescence, areas of map cracking with and without efflorescence and several uneven patched area. The hole with punky concrete (10"W x 10"L x 8"D) and exposed rusted rebar in Bay 8 noted in the previous inspection has been repaired. A previously noted hollow area has also been removed. The curbs exhibit scrape marks and chipped edges with average reveals of 2-3/4" right and 2-1/4" left. The rub coat on the reinforced concrete parapets is peeling at random locations for 10% of the total length. The parapets also have transverse cracks along the top surfaces, isolated vertical hairline cracks with and without efflorescence and scrape marks. The PVC weep pipes located in Bay 5 were observed to be in good condition. At the South abutment the asphaltic plug joint has a 1'-6" long gouge in the East shoulder. As a result of the gouge, some of the joint material has been pushed out. At the North abutment the asphaltic plug joint shows no deficiencies.

Superstructure: (Rated 6 – Satisfactory)

There are curved fixed bearings at the South abutment which exhibit heavy rust between the plates. Bearing 1 was observed to be in the worst condition with heavy laminar rust on and between the plates up to 3/16". There are sliding expansion bearings at the North abutment with steel keeper plates on both sides which have light to moderate rust on the masonry plate. About half of the bearings at the North abutment have powdered rust protruding from between the plates. The bearings were not frozen and had normal movement. The 9 rolled steel girders have areas of peeling paint. Girder 1 has light to moderate rust with pockets of laminar rust on the web and bottom flange up to 20' long at the mid-span. Girders 2 and 3 have light rust on the web up to 17' long. Girder 9 has medium to heavy rust with minor pitting on the fascia up to 12' long. Girder 9 has a full-length bottom flange cover plate. The remaining girders have partial length bottom flange cover plates. The welds and cover plates were observed and found to be in good condition.

Substructure: (Rated 7 – Good)

The stems of both abutments have mud and water stains. The South abutment stem has spalls with exposed rebar (2'W x 1'H x 1"D), light scaling, evidence of leakage through the deck joint and several shallow rebar. The Girder 5 concrete pedestal has a spall with exposed corroded rebar (14"H x 6"W x 1"D). The North abutment stem has a pop-out (3" diameter x ¼"D), a spall with exposed rebar (8"diameter x ¾"D) and a 3' long diagonal crack at the East cheekwall. The Girder 9 concrete pedestal has a spall with exposed rebar (3"diameter x ¼"D) on the West face. Between Girders 2 and 3 there is a hollow area (2'W x 8"H) on the South abutment backwall. On the Northwest and Southwest sides, there is a common retaining wall shared with Br. 00457. The protective coat on the North side is peeling and the Southeast and Northeast wingwalls have moderate to heavy vine growth. On the beam seats at both abutments there is some light debris and sand.

Bridge No. 00459

Bridge No. 00459 was built in 1962 and rehabilitated in 1976 (Project 0034-0155), in 1983 (Project 0034-0153), in 1987 (Project 0009-0077) and in 2013 (Project 0174-0364). The four-span bridge carries US

Route 6 westbound over Interstate 84 in Bethel, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 294'-0" and the curb to curb width is 40'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 52 tons.

Deck: (Rated 6 – Satisfactory)

The bituminous concrete overlay is in fair condition with paving seams open up to 2" over the full-length, transverse and longitudinal map cracks open to 1" wide and potholes (1'L x 8"W x 1"D). There are areas of heavy raveling and bituminous patches. In Span 2 on the North shoulder there is a pothole (3'-6"L x 2'W x 1"D). The underside of the deck has areas of hairline map cracking with efflorescence and hairline transverse cracks with efflorescence. There are haunch spalls at the end diaphragms (full-length x full-width x 1"D), an area of honeycombing (2'L x 1'W) in Bay 6 of Span 2 and isolated hollow haunches (up to 2' long). None of the hollow haunches are located over travel lanes and none are loose. The maximum deck deterioration was observed in Span 1 at 14%. The curbs exhibit chipped edges, scrapes with rust stains, vertical hairline cracks and isolated missing joint mortar. The curbs have an average reveal of 6" at the North curb and 3" at the South curb. Along the north side of the bridge the concrete sidewalk has areas of heavy scaling (1" deep) and transverse hairline cracks. At isolated locations, the joint located between the sidewalk and the curb is separating and at the abutment deck joints the sidewalk has settled ½". Along both fascia the concrete parapets have light scaling and vertical hairline cracks with efflorescence. At Pier 2 there is a spall (1'-4"L x 6"W x 1"D) in the North parapet. The aluminum grid panel mesh fence on the top of both parapets has areas of impact damage and a hole (2'-9"H x 8"W) in Span 1 of the North fence near the West abutment. In Span 3 along the South fascia the bottom of the fence is bent 1" to the south over 4' in length. At the connection to the parapet in Span 4 at the Northeast corner there is a missing bolt. There are scuppers located in both shoulders in Span 2 near Pier 1 and Span 3 near Pier 3. The scupper grate in Span 2 at the North curb is partially clogged with the pipe full of sand. The scupper grate in Span 3 at the South curb is partially blocked but the pipe is clear. In Span 2 Bay 1 the scupper pipe is leaking onto the Pier 1 cap. There are PVC weep pipes under the deck. In Span 2 at Pier 2 along the South deck overhang there is a missing weep extension that is not draining onto the steel. Since the previous inspection, new asphaltic plug deck joints were installed at Pier 1 and at the abutments and new compression seal joints were installed for Piers 2 and 3. The deck joint at Pier 2 has a 1' long adhesion separation, 1' long area where the seal is pushed up, sand in the joint for the full-length, evidence of deck joint leakage on the substructure and active deck joint leakage on Pier 2.

Superstructure: (Rated 6 – Satisfactory)

There are three types of bearings; (1) sliding plate expansion, (2) elastomeric, and (3) fixed which were observed to be in fair condition. (1) The sliding plate expansion bearings at the abutments have light rust and keeper angles with light rust. At 85 degrees Fahrenheit a majority of the bearings are in contraction mode. Between the sole plates and the sliding plates of the sliding plate expansion bearing there is up to ½" lateral misalignment. There are no anchor bolts; there are plates welded to cover up the anchor bolt holes. With regard to the keeper blocks, some random keepers are bent but still in contact with the sole plate and there is up to ¼" impact rust between the keeper and the sole plate. (2) There are elastomeric bearings located in Span 1 at Pier 1, in Span 4 at Pier 3 and at Pier 2. The elastomeric bearing pads are uneven due to impact rust up to 3/4" thick between the sole plate and the bearing pad, they have slight bulging and moderate rust. The Girder 5 bearing sole plate at Pier 2 in Span 2 is misaligned up to 1". The bearing pads at Pier 2 overhang the pedestal by 3/16". (3) There are fixed bearings located in Span 2 at Pier 1 and in Span 3 at Pier 3 which have areas of moderate rust, isolated areas of laminated rust and up to ¼" impact rust between plates. For the Girder 1 fixed bearing at Pier 3 in Span 3 the masonry plate is overhanging the pedestal up to 1" in the front. There are two types of girders (a) welded steel plate girders and (b) rolled steel beams. In Spans 2 and 3 there are 7 welded steel plate girders, in Spans 1 and 4 the fascia girders are welded steel plate girders and the interior girders are rolled steel beams with partial length cover plates. (a) The welded steel plate girders have areas of peeling paint and heavy rust.

The bottom flanges of the girders have areas of pitting (1/16” deep) and areas that are wavy. The North elevation of Girder 4 in Span 2 at Pier 1 has pitting in the web (2’L x 6”H x 1/16”D) that was painted over. Some of the web stiffeners are bent and some random bearing stiffeners have pitting at the base (1/8” deep). (b) In the end spans the interior rolled beams have light rust at the bottom flanges at the beam ends and at the bolster angles. Near the West abutment Girder 6 in Span 1 has a 1-1/2” rolling defect in the web. At the bottom of the bearing stiffeners there is isolated section loss (1/8” deep). There is pack rust between the bolsters and bottom flanges. The welds have been observed to be in fair condition. On the South side of Girders 3 and 5 at Pier 3 in Span 3 the welds at the cross-frame bottom angle and stiffener connection is cracked up to 1-1/2”. On the north side of Girder 7 at Pier 3 in Span 4 the weld between the cross-frame bottom angle and connection plate is cracked 3-1/2”. On the South side of Girder 6 at Pier 1 in Span 2 there is a 5/8” gap between the cross-frame bottom angle and stiffener connection. The cover plate end welds in Spans 1 and 4 were found to have no notable deficiencies. The bottom flange transition welds and full-height welded web splices are not ground smooth. At random diaphragm to stiffener connections there are poor quality welds and heavy rust. In Spans 2 and 3 there are isolated areas of light scrapes on the bottom flanges. In Spans 2 and 3 the girder bottom flanges are wavy up to ¾”.

Substructure: (Rated 5 – Fair)

The West abutment stem has two spalls at the South end (1’W x 1’H x 2”D), areas of hairline map cracking with efflorescence and isolated vertical cracks. At the West abutment the Girder 2 pedestal has a 2’ high x 3’ wide area of hairline map cracking with efflorescence. The East abutment has two hollow areas in Bays 4 and 5 (2’W x 2’H), spalls with exposed rebar (10”W x 6”H x ½”D) and vertical hairline cracks with efflorescence. The backwall of the West abutment has a spall in Bay 6 (6”diameter x 1”D) and a full-height vertical hairline crack. All of the concrete wingwalls have heavy vegetation growth. The Southwest wingwall has a spall along the joint (1’H x 6”W x 1”D), an area of map cracking with efflorescence and rust and cracks open up to 1/16” wide. On the Northwest wingwall there is light vine growth and horizontal cracks that open up to 1/16” wide. The pier caps were observed to be in poor condition. There are hollow areas (6’W x 1’H) at Pier 1 east elevation, horizontal and vertical cracks with efflorescence, spalls with exposed rebar (6’L x 9”H x 3”D) at Pier 3 west elevation, areas of light scaling and active leakage at Pier 2 cap. The pedestals have hairline cracks with rust. In Span 3 at Pier 3 the pedestals for girders 2 and 3 have been patched since the previous inspection. The pier columns were observed to be in fair condition as they have vertical cracks open up to 1/8” wide, hollow areas (full-height x 1’W) at column 4 at Pier 1 and column 3 at Pier 3, and spalls (1’-6”H x 1’W x 1”D) at column 3 at Pier 1 with 1/8” section loss to exposed rebar. On the top of the pier caps there are areas of moderate accumulation of debris.

Bridge No. 00541

Bridge No. 00541 was built in 1962 and rehabilitated in 1984 (Project 0034-0202) and in 2016 (Project 0174-0370). The four span bridge carries US Route 7 NB over Mall Access Road, Still River and Housatonic Railroad in Danbury, CT. The bridge consists of a reinforced concrete deck with a welded steel plate girder superstructure. The total length of the bridge is 322’-0” and the curb to curb width is 52’-9”. As provided by the Connecticut Department of Transportation the inventory rating for AASHTO HS20 loading is 56 tons.

Deck: (Rated 6 – Satisfactory)

The bituminous overlay has paving seams that open up to ½” and areas of map cracking that open up to ¼” wide. The underside of the reinforced concrete deck has transverse cracks with efflorescence. In Span 3 Bay 1 there is a hollow area (4’L x 1’W) and in Span 2 Bay 6 there is a spall with exposed rebar (16” diameter x 1”D). In Span 2 Bay 4 at Pier 1 there is a haunch spall (1’W x 5”H x ½”D). The maximum deck underside deterioration is 4% in Span 2. The granite curbs have minor scrapes, gouges and vertical cracks with rust stains. At the Northeast corner there is a 2’ long section of approach curb that is missing.

The average curb reveal is 2-1/2” on both sides. The concrete parapets have vertical hairline cracks, minor scrapes and gouges up to 5.5’ long x ¼” deep. In Span 1 there is a spall at the East parapet (22”L x 6”H x 1”D). In Span 1 Bay 6 at the South abutment and Bay 1 at Pier 1 have broken weep pipes. In Span 4 the South end of Bay 6 there is a missing weep pipe that discharges onto the steel below. At Pier 2 the asphaltic plug joint has a cohesion crack (full-length x 1”W) and active deck joint leakage. The potholes at the South abutment deck joint, Pier 1 deck joint and Pier 2 deck joint previously noted have been patched since the last inspection. In addition, the adhesion cracks at the South and North abutments have been repaired.

Superstructure: (Rated 5 – Fair)

At both abutments and at Pier 2 the elastomeric bearing pads are in contraction at 15 to 20 degrees Fahrenheit. At isolated locations there are gaps (1/8”) between the pads and pedestals. There are fixed bearings at Piers 1 and 3 which have moderate rust, laminated rust at isolated locations and impacted rust up to ¼” between bearing plates. The welded steel plate girders were observed to be in fair condition. They have areas of heavy rust and peeling paint. At the pier the web ends have areas of laminated rust and section loss (6”L x 7”H x 1/8”D) at girder 7 in span 1 at Pier 1. There are some areas that were previously painted but are re-rusting. These section losses result in up to 3.6% of the web cross-sectional area. At the piers the bearing stiffeners have ¼” remaining x full-width. In Span 2 at Pier 1 Girder 7 web stiffeners have rusted through holes (2” diameter). There are steel repair plates welded to webs at random locations. In Span 4 near Pier 3 the bottom flange of girder 7 has 4’ long x 6” wide x 7/16” remaining 4’ from the centerline of bearing. Isolated bottom flange transition welds have undercut pockets and voids at edges (1/8” deep). In Span 2 at Pier 1 the end diaphragm connection to girder 7 has a crack (5-1/2” long) in the bottom weld.

Substructure: (Rated 7 – Good)

There are isolated vertical hairline cracks on both abutment stems. The spalls noted in the previous inspection have been patched. At the North abutment Pedestal 5 has a 6” long vertical hairline crack. Both backwalls have vertical hairline cracks with efflorescence. The North abutment backwall has a spall at the West end (6’L x 6”H x 2”D). The spalls and hollow areas noted in the previous inspection have been repaired. The pile cap of the North abutment at the East end is exposed 11’L x 4”H. The wingwalls have isolated hairline cracks. The Southwest cheekwall has two pop-outs, one with exposed rusted rebar. The cracks, spalls and hollow areas previously noted on Pier 1, Pier 2 and Pier 3 caps noted in the previous inspection have been repaired. Pier 2 and 3 caps have horizontal cracks up to 3’ long x 1/16” wide with efflorescence. At the South elevation of Pier 1 Pedestals 2 and 3 have spalls (1’W x full-height x 1”D) and an adjacent hollow area (10” x 5”). At the North elevation of Pier 1 Pedestal 4 has a hollow area (6” diameter). At the North elevation of Pier 2 isolated pedestals have hairline cracks with efflorescence and pedestal 7 has an area of scale (1/4” deep). At the North elevation of Pier 3 Pedestals 2 and 5 have spalls (2’L x 1’W x 1.5”D). Most of the hollow areas on the pier columns noted in the previous inspection have been repaired. Column 1, Pier 1 has a hollow area on the North face (4’H x 1’W). Column 1, Pier 2 has a vertical crack on the North face (3’H x 1/8”W) and Column 3, Pier 2 has a 1’ long vertical hairline crack with rust on the West face. On the abutment seats and pier caps there is minor debris.

Channel Protection: (Rated 7 – Good)

There is minor debris in the channel and small trees and brush growing along the banks. There is rip-rap placed along the South side of the pier.

Bridge No. 00542

Bridge No. 00542 was built in 1962 and rehabilitated in 1986 (Project 0174-0112), in 1992 (Project 0034-0254) and in 2016 (Project 0174-0370). The four span bridge carries US Route 7 SB over Mall Access Road, Still River and Housatonic Railroad in Danbury, CT. The bridge consists of a reinforced concrete

deck with a welded steel plate girder superstructure. The total length of the bridge is 328'-0" and the curb to curb width is 53'-0". As provided by the Connecticut Department of Transportation the inventory rating for AASHTO HS20 loading is 57 tons.

Deck: (Rated 6 – Satisfactory)

The latex modified concrete deck overlay has random longitudinal, transverse and map cracks open up to 1/8" wide. The potholes noted in the previous inspection have been repaired. There are concrete patches near the deck joints. In Span 3, in the right travel lane there are 2 potholes (6" diameter x ½"D). The underside of the reinforced concrete deck has isolated areas of honeycombing up to 1" deep, areas of hairline map cracking with efflorescence and transverse hairline cracks. In Span 3 over the railroad the haunches were removed up to full-length. In Span 2 there are several spalls with exposed rebar (2' diameter x 2"D). In Span 2 Bay 6 near Pier 1 there is an epoxy coated spall (3' x 3' x 2"). In Span 2 Bay 6 near Pier 1 there are two hollow areas (1'L x 6"W) over Mall Access Road. The maximum underside deck deterioration is in Span 3 at 16%. The concrete curbs have minor spalls, scrapes with rust stains and vertical hairline cracks. The average curb reveals are 1-1/2" East and 1" West. The concrete parapets have scrape marks, moderate scale, minor pop-outs and vertical hairline cracks. In Span 3 there is a 5'-2" high chain link fence attached to the parapets, with no notable deficiencies. In Span 1, Bay 1 and Span 2, Bays 1 and 6 there is an abandoned 6" diameter drain. In Spans 1 and 3 there are scupper grates. In Span 1 the West scupper grate is partially clogged but the pipe is clear. In Span 3 the West scupper grate is 100% blocked and is buried under debris. In Span 3 there is a junction box cover at the West parapet that is not secure and wires are exposed. There is a 2" diameter conduit with junction boxes attached to the underside of the concrete deck with areas of light rust in all spans. Since the previous inspection the asphaltic plug deck joints at the piers and at both abutments have been resealed but are re-cracking at some locations. The South abutment deck joint has a cohesion crack (full-length x ½"W) and settlement (1/2" deep) along the joint. The deck joints at Piers 1 through 3 have adhesion cracks (up to 40'L x 1/8"W). There is active leakage below deck joints.

Superstructure: (Rated 5 – Fair)

There are three types of bearings; (1) fixed, (2) elastomeric, and (3) sliding plate which were found to be in fair condition. (1) There are fixed bearings at Piers 1 and 3 which have moderate rust and up to ½" pack rust between plates. (2) There are elastomeric bearings at the South abutment which have gaps (full-length x 1/8"H) between the bearing pad and sole plate. At the Northeast corner the Bearing 7 pad overhangs the pedestal by 1". At the Southwest corner the Bearing 1 and 2 pads overhang pedestals by ¾" at the North abutment. (3) There are sliding plate bearings at Pier 2, which have heavy rust pack rust up to 3/16" thick and were in expansion mode at 25 to 30 degrees Fahrenheit. At 25 degrees Fahrenheit, Bearings 1 and 3 were in over expanded mode causing Girder 1 and 3 ends to be in contact at Pier 2. At the piers the girder webs have areas of section loss resulting in up to 6% loss of web cross-sectional area. In Span 2 at the third intermediate stiffener Girder 1 bottom flange has 12" long x 9" wide x 1-1/16" remaining thickness resulting in 8% loss of flange cross-sectional area. In Spans 2 and 3 there are repair plates welded to webs. There are section losses in the bearing stiffeners (6"H x full-width x 1/8"D). The end diaphragms are bolted and the connection bolts have moderate rust. The bottom flange transition weld on Girder 5 in Span 3 has minor surface rust. The flange transition welds on Girder 6 in Span 4 have minor gouges and isolated voids up to 1/8" deep. In Span 4 at Pier 3, Girder 4 has a 3.5" cracked weld at the diaphragm/stiffener connection. The rat holes at the bottom of the web on Girders 1, 3 and 4 in Span 3 were found to have no notable deficiencies. There are minor scrapes on the bottom flange of Girder 5 in Span 3. At Pier 2 Girder 1 and 3 are in contact with girders from adjacent span. Girders in Spans 2 and 3 have minor negative camber. In Span 2 at Pier 2, Girder 3 bottom flange is bowed upward (1"H x 1'L).

Substructure: (Rated 6 – Satisfactory)

The abutment stems have concrete patches. The South abutment has map cracking (2' x 2' area) and a spall (1'W x 4"H x 1"D). The North abutment stem has a full-height hairline crack. The pedestal spalls

noted in the previous inspection have been repaired. The abutment backwalls have full-height vertical hairline cracks. The spalls noted in the previous inspection have been patched. The South abutment backwall has a spall (2'L x 6"W x 2"D), a previously repaired hollow patch, and evidence of past leakage. At the Southwest end of the South abutment there is an area of exposed pile cap (2'H x full-width). The wingwalls have moderate vine growth and deteriorated joint material. The spalls and hollow areas on the pier caps noted in the previous inspection have been repaired. The pier caps have horizontal and vertical cracks open up to 1/8" wide with isolated efflorescence and rust. The south face of Pier 1 has a hollow area (1.5' x 2') between Pedestals 2 and 3. The north face of Pier 2 has map cracking (2' x 2'). Pier 3 has two hollow areas (1' x 2') on the underside. Random pedestals have full-height hairline cracks in line with anchor bolts. The spalls and hollow areas on the pier columns noted in the previous inspection have been repaired, however there is an isolated hollow area in Pier 2 Column 3 (30" x 7") and isolated cracks 2' long x 1/8" wide. There is an area of erosion in front of the North abutment (6'L x 2'W x 1'D) and two areas of erosion at the Northeast wingwall (3' diameter x 2'D). On the abutment seats and pier caps there is minor debris.

Channel Protection: (Rated 7 – Good)

There is minor debris in the channel and small trees and brushes are growing along the embankments. There were not any significant changes in the dropline measurements since the last inspection. Along the south face of Pier 2 there is rip-rap with no deficiencies noted.

Bridge No. 00543

Bridge No. 00543 was built in 1962 and rehabilitated in 1991 (Project 0034-0252). The single span bridge carries US Route 7 SB over Interstate-84 Ramp 802 in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 99'-0" and the curb to curb width is 41'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 49 tons.

Deck: (Rated 6 – Satisfactory)

There is new bituminous overlay with no significant deficiencies. The underside of the deck has areas of map cracking up to 20' long x 6' wide with efflorescence and transverse hairline cracks. The deck overhangs have spalls (3'L x 2'W x 1.5") with exposed rebar. Between Girders 5 and 6 there is a spall (3'L x 1.5'W x 1.5") with an exposed rebar. The West overhang near the North abutment over the right shoulder has two hollow areas (2.5'L x 6"W) and between Girders 4 and 5 over the travel way there is a hollow area (32"L x 14"W). The granite curbs have minor scrapes and missing mortar in a few locations. At the West curb there is a full-height crack. The average curb reveal is 1.5" on the West side and 2" on the East side. Concrete parapets have minor scrapes and vertical hairline cracks with efflorescence. The outside faces of the parapets have spalls (2'L x 1'W x 2"D) with exposed rebar. The extruded aluminum bridge rail has minor scrapes. There are no notable deficiencies in the PVC weep pipes. There is a junction box cover on the East parapet that is missing 2 of the 14 screws but is secure. On the Northeast wingwall a junction box cover is missing at the 2" conduit. The deck joints are paved over.

Superstructure: (Rated 7 – Good)

There are two types of bearings (1) fixed and (2) expansion. (1) At the South abutment the fixed bearings have areas of rust and anchor bolts tipped up to ¼". The Bearing 5 masonry bearing plate is undermined (4"L x 4.5"W) and the anchor bolt is exposed due to spall. This results in a 12.5% loss of bearing area. (2) At the North abutment the expansion bearings have moderate rust. The bearings are in contraction and expansion at 60 degrees Fahrenheit. Bearings 2, 3, 5 and 6 show no signs of movement. There are six welded plate girders which have areas of light rust and peeling paint. At the South abutment the web of Girder 4 is bowed ½" over 2' high. All of the bottom flange transition welds were found to have no significant deficiencies. On the East side of Girder 4 near the North abutment there is a weld strike. Near

the North abutment on Girder 3 there is an excess of weld material. At the South abutment on Girder 6 there is a bearing stiffener that is tack welded to the girder web with no significant deficiencies. On the bottom flange of Girders 1, 2 and 6 there are some minor scrapes.

Substructure: (Rated 7 – Good)

There are isolated vertical and horizontal hairline cracks on both abutment stems. At the South abutment Pedestal 5 has a spall (16”W x 6”H x 4”D) that undermines the masonry bearing plate. There are isolated vertical hairline cracks up to full-height on the backwalls. There are vertical cracks and pop-outs on the wingwalls. The Northwest wingwall has a spall (1’L x 4”H x 1.5”D) and adjacent hollow area (3’L x 2”H). Along the Northeast and Southeast wingwalls there is heavy vegetation growth. The drain hole at the Southwest wingwall is clogged with silt. On the South abutment seat there is minor accumulation of debris.

Bridge No. 00544

Bridge No. 00544 was built in 1962 and rehabilitated in 1991 (Project 0034-0235) and in 2012 (Project 0174-0357). The single span bridge carries Interstate-84 TR 802 over Interstate-84 EB in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 114’-0” and the curb to curb width is 28’-0”. As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 52 tons.

Deck: (Rated 6 – Satisfactory)

The bituminous overlay has random longitudinal and transverse cracks and an area of map cracking along the paving seam (full-length x 3’W x ¼” wide open seam). The paving seam is open up to 1” wide. Near the West abutment there is an area of breaking-up bituminous with a pothole (6” diameter x 2-1/2”) exposing the slab. The underside of the reinforced concrete deck has map cracking (15’L x 6’W) and some of the map cracking has efflorescence and/or dampness. There are full-width transverse cracks with and without efflorescence. The West end of Bays 2 and 3 have some hollow areas (2’ x 2’) over the left lane/shoulder. The North fascia overhang has spalls with exposed rebar (5’L x 1’W x 2”D) on the underside and corner. Several spalls extend into the parapet and spalls have been partially epoxy coated and rebar has recurring rust. The overall underside deck deterioration is 19.4%. The granite curbs at the base of both North and South parapets have chipped edges, minor scrapes, and reveals 1-3/4” on the North side and 2-3/16” on the South side. The concrete parapets have vertical hairline cracks up to the full-height with and without efflorescence. There are several partially epoxy coated spalls with exposed rebar on the North fascia that extend from the deck overhang and are up to 5’ long. Over the Northeast cheekwall the North parapet end has a full thickness horizontal crack. There is a single extruded aluminum bridge railing on top of the parapet with no significant deficiencies. The PVC weep pipes are extended below the deck to prevent them from draining onto the steel. The weep at the Southwest corner has been extended and redirected since the previous inspection. At both abutments the asphaltic plug joints have minor exposed aggregate in the travel lane. The joint at the East abutment has two adhesion cracks (18’L x ½”W) in the travel lane and right shoulder.

Superstructure: (Rated 6 – Satisfactory)

There are two types of bearings (1) fixed and (2) sliding expansion. (1) At the West abutment there are fixed bearings which have light rust. The Bearing at Girder 1 has areas of laminated rust and the south anchor bolt of Girder 2 bearing is tipped west. (2) There are sliding expansion bearings at the East abutment. The bearings were lubricated in the past. On the masonry plates there are areas of laminated rust. There is pack rust between the masonry plates and the pedestals resulting in up to 24% loss of bearing area (gaps up to 8”L x 6”W). At 62 degrees Fahrenheit Girder 1 bearing was in contraction and Girders 2, 3 and 4 bearings were in expansion. The bearings have a lateral misalignment of 11/16”. The bearings at Girder 1 and 3 are missing both anchor bolt nuts and the bearing at Girder 4 is missing the

south anchor bolt nut. The bearing for Girder 2 has a tipped anchor bolt and anchor bolt nut is missing on the South side. The welded plate girders have areas of peeling paint and light to moderate rust. Starting at the interface of the bottom flange, about 8" from the East abutment, the Girder 2 web is bowed (17"L x 14"H x 15/16"D). The bottom flange of Girder 3 is bent upwards 1" over 6" at both abutments. There are several areas where welds are not ground smooth, however the welded girder web splices are partially ground smooth. At the bottom flange transitions there are small gouges. Near the West abutment between the bottom flange and the web of Girder 3 there is a 15" missing weld. At the West abutment the South sides of Girders 1 and 2 have a 2" missing weld between the web and bottom flange. Near the West abutment the South side of Girder 2 has a 2" missing weld between the bottom flange and web. Near the East abutment, Girder 4 has a few scrape marks on the bottom flange. The East abutment backwall behind Girder 4 has been chipped out to alleviate prior contact with the top and bottom flanges.

Substructure: (Rated 7 – Good)

The abutments have random areas of painted over graffiti. The West abutment stem has vertical cracks up to 68" long with and without efflorescence, spalls (1 sq. ft) and random pop-outs (1" diameter). The East abutment stems has random spalls (8" diameter x ½"D), gouges up to 2' long, a hollow area in the pedestal below Girder 3 and vertical and horizontal cracks up to 22" long. The backwalls have small surface spalls and paint overspray. The East abutment backwall behind Girder 4 has been chipped out to alleviate prior contact with the top and bottom flanges. The South side of Girder 4 has a full-height vertical hairline crack with efflorescence. The Southwest wingwall has pop-outs, minor scrapes and light to moderate vegetation growth. The Northwest wingwall has moderate to heavy vine and vegetation growth along the base and in the construction joint. The Southeast end block is undermined (3'L x 22"D x 8"H) due to erosion. On the abutment seats there is random pigeon debris and sand.

Bridge No. 00545

Bridge No. 00545 was built in 1960 and rehabilitated in 1991 (Project 0034-0235). The single span bridge carries US Route 7 SB over Interstate 84 EB in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 124'-0" and the curb to curb width is 40'-10". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO H20 loading is 61.3 tons.

Deck: (Rated 6 – Satisfactory)

There is new bituminous overlay in place since the last inspection and there are no significant deficiencies. The underside of the deck has areas of map cracking up to 24' long x 7' wide with and without efflorescence and random full-width transverse cracks with and without efflorescence throughout each bay. The East and West fascia overhangs have random efflorescence stains with stalactites and rust stains. The overall underside of deck deterioration is 15%. The granite curbs at the base of the parapets have scrape marks and minor chips. Where the curb meets the parapet there are random efflorescence stains. The curb reveal is 3" on the West side. The concrete parapets have random vertical hairline cracks with and without efflorescence. In most locations the transverse hairline cracks extend across the tops of the parapets. On the roadway side of the parapet there are minor impact scrapes. There is a single extruded aluminum bridge railing which has minor scrape marks. The PVC weep pipes have no significant deficiencies. There is a longitudinal construction joint in Bay 3 that has areas of light efflorescence and adjacent map cracking with efflorescence. At both abutments new asphaltic plug joints are in place since the last inspection and there are no significant deficiencies.

Superstructure: (Rated 6 – Satisfactory)

There are elastomeric expansion bearings at the North abutment which are in expansion mode at 61 degrees Fahrenheit. The elastomeric pads are painted over and there are random areas of peeling paint with surface rust on the masonry plates. There are curved sole plate fixed bearings at the South

abutment, which have peeling paint and moderate rust. The anchor bolt nuts have heavy rust and there are random tilted anchor bolts. The welded steel plate girders have areas of peeling paint and light rust. The web ends have random areas of laminated rust and pitting (6"L x 1'H) with negligible section loss and on the underside of bottom flanges for up to 1' long. There are random weld strikes and mill flaws throughout. The bottom flange of Girder 6 has scrape marks and two gouges on the West edge above the travel lanes. Near the North abutment Girder 2 has two localized bows in the upper web and top flange (12"L x 3"H x 2"D) which appears to be a result of damage caused by a previous deck replacement. Random diaphragms have laminated rust at the lower angles. The bottom flange transition welds and web splice welds are not ground smooth. Some random stiffener plates have slight undercutting welds to the web. At the North abutment Girder 2 has a weld strike. On the underside of the bottom flange over both lanes Girder 6 has several scrape marks in the paint. At the West edge of Girder 6 the bottom flange has 9" and 2" long gouges up to ¼" wide x 1/8" deep with sharp edges.

Substructure: (Rated 7 – Good)

The abutments have evidence of past deck leakage, there are areas of chipped/peeling concrete coating and random scrapes/gouges. There are vertical hairline cracks up to 10' long with and without efflorescence. The South abutment stem has a hollow area (58"H x 1'W) and a spall (20"H x 6"W x 1"D) with exposed rebar. At the Northwest corner the Girder 4 pedestal has a spall (full-height x 6"L x 3"D) with exposed rusted rebar. The North abutment has two hollow areas (3'L x 2'H) with cracks and spalls (2'H x 6"L x 1"D). There are no significant deficiencies on the abutment backwalls. The wingwalls have light to heavy vine and vegetation growth. The Southwest wingwall has isolated impact gouges (1'L x 1"H x ½"D) with shallow rebar spalls (6"L x ½"D), and there is a broken junction box cover. The Southeast wingwall has areas of light scale and moderate vegetation growth along the wingwall. The Northeast, Southeast and Southwest cheekwalls have concrete patches up to 1 square foot. There are minor impact scrapes and collision spalls (1"H x 1'L x ½"D) along the lower stem of South abutment and Southwest wingwall. The abutment seats have pigeon debris and chunks of sand blasting material around the bearings.

Bridge No. 00546

Bridge No. 00546 was built in 1962. The twin cell culvert carries Interstate-84 over Beaver Brook in Danbury, CT. The total length of the bridge is 23'-0" and the out-to-out measurement is 370'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 99.9 tons.

Culvert: (Rated 6 – Satisfactory)

The cells are 6' high x 10' wide and there are three categories for concrete inspection; (1) ceilings, (2) walls, and (3) floor. (1) In the ceiling there are short transverse hairline cracks which extend from the joints near mid-span of the cell segments. There is hairline map cracking, isolated spalls (6" diameter x ¼"D), and efflorescence stains. The ceiling joints show evidence of leakage and there is efflorescence and rust at random locations. The joints typically open up to 5/8" and isolated joints open up to ¾". (2) In the walls joint material is missing at random locations. The construction joints show evidence of leakage, rust, efflorescence stains and isolated areas of active leakage. The wall joints are typically open to 5/8" with isolated joints open up to ¾". A few joints have lateral misalignment (3/4") between the segments. All of the walls have full-height vertical hairline cracks, some with efflorescence. There are a few small surface spalls, pop-outs and areas of scale. The walls have isolated areas of spall (1' x 4" x 1"D) and areas of moderate scale along the waterline. At the inlet the center wall has chipped edges. (3) Due to the scour in Cell 1 at the inlet the floor is exposed 6' long x 4" high with no undermining. There are areas of moderate scale. There is heavy brush and tree growth, some overhanging the concrete headwalls. There is a short vertical hairline crack on the South headwall over Cell 1 and small pop-outs. The North headwall has two spalls (4'W x 5"H x 1"D) along the top edge. Both North and South headwalls have hairline cracking with isolated efflorescence and light scaling. The debris in the cells was found to be in poor condition. Cell 1 has deposits of gravel, sand and small rocks on the floor and Cell 2 has heavy rock

accumulation inside the cell. Due to the heavy debris in Cell 2 there is no flow. The Northwest and Northeast wingwalls have minor scrapes. There is heavy vegetation and brush overhanging all of the wingwalls. There is an 18” diameter discharge pipe through the base of the stem in the Southeast wingwall, which is causing erosion in front of the wall.

Channel: (Rated 6 – Satisfactory)

There is scour (6’L x 4’W x 1’D) on the inlet end of cell 1and the floor slab is exposed up to 6’ long x 4” high with no undermining. Along both upstream and downstream embankments there is erosion with undercutting (2’H x 1’D) with exposed roots. The worst erosion is on the downstream side. In front of the Southeast wingwall there is erosion up to 3’ deep due to discharge from the pipe opening. At the inlet end there is encroachment on both sides which narrows the channel. On the East side at the outlet end there is heavy encroachment with heavy brush growth on the island. There is heavy brush overhanging the channel up and downstream and small trees are overhanging the channel upstream. There are large stones in the channel upstream and downstream. Flow favors Cell 1 and flow through Cell 2 only occurs during high water events. For the full-length and full-width of Cell 2 there is heavy sand/rock accumulation with some areas having 2’+/- clearance which limits inspection access.

Bridge No. 00547

Bridge No. 00547 was built in 1960 and rehabilitated in 1991 (Project 0034-0252) and in 2008 (Project 0174-0339). The single span bridge carries Interstate-84 WB over US Route 7 NB in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 96’-0” and the curb to curb width is 40’-9”. As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 46 tons.

Deck: (Rated 7 – Good)

Since the previous inspection there is new bituminous overlay, which has no notable deficiencies. The underside of the deck has areas of hairline map cracking (16’ x 5’), longitudinal and hairline cracks with isolated efflorescence typically spanning from girder to girder, and areas of honeycombing (4’ diameter) with isolated efflorescence. The underside of deck deterioration is approximately 5%. The granite curbs have scrape and rub marks and an average reveal of 2” on both sides. The reinforced concrete parapets have scrape marks and vertical hairline cracks across the top with isolated efflorescence. There is an extruded aluminum rail which has some minor scraping. There is a weep pipe at the Southeast corner which shows signs of leakage. On the North parapet at both ends there are utility covers with missing screws. In Bay 4 there is a longitudinal construction joint with minor overpour and random areas of hairline cracks, rust stains and efflorescence. Since the previous inspection, the deck joints have been paved over and were observed to have no notable deficiencies.

Superstructure: (Rated 6 – Satisfactory)

There are two types of bearings; (1) elastomeric expansion and (2) fixed elastomeric. (1) The West abutment has elastomeric expansion bearings with steel keeper angles welded to the bottom flange. At 65 degrees Fahrenheit a few of the bearings are in expansion mode. All of the bearing plates have light surface rust. (2) The East abutment has fixed elastomeric bearings which are painted. At Bay 3 a concrete keeper block was previously installed. The sole plates of Bearings 1 to 3 are longer and the web is extended. There is spalling around the anchor bolt shank of bearing pedestals 5 and 7, however this is not affecting the bearing. The superstructure was painted in July 1994 and most of the steel is covered in exhaust residue. There are 7 total beams in which the top flanges have light to moderate surface rust at isolated locations. The bottom flanges, bottom of top flanges and webs have light to moderate spotty rust. Over the travel lanes some of the bottom flange cover plates have scraping. On the North side Beam 1 has a flaw (6’L x 1/16”D) at the top of the bottom flange 20’ from the East abutment. Beams 1 and 3 have rolling defects (12’L x 3”W x 1/16”D). On the South side Beam 4 has a flaw (3”L x 3”W x 1/16”D) that

extends 5/16” into the top of the bottom flange approximately 3’ west of the East cover plate end weld. At the East end on the soffit, Beam 5 has a mill flaw 1’ east of the cover plate. In addition, Beam 5 has ground smooth areas over the shoulder at the South side of the bottom flange. On the South side of the bottom flange, Beam 6 has several ground smooth dents. Due to leakage around the weep hole, Beam 7 has a 2’ long section of light rust on the top flange at the Southeast end. Near diaphragm connection 3 Beam 7 has gouges on the bottom flange which have been ground smooth and painted. At the East end on the South side Beam 7 has a 10’ long section of painted over pitting on the bottom of the top and bottom flanges. The gouges on the South side of the bottom flange of Beam 7 and the tear in the bottom cover plate noted in a previous inspection have been ground smooth and painted over. Some diaphragms have light to moderate spotty rust. In Bay 2, East abutment the first interior diaphragm on the South side has a gap (3/16”) between the top of the diaphragm and the vertical stiffener. At the East abutment some of the diaphragm connection are missing a few bolts but they are welded. The exterior beams (1 and 7) have full-length cover plates and the interior beams (2 to 6) have partial length cover plates. All of the cover plates were checked and no significant deficiencies were found. The plug welds at the diaphragm connections in the fascia beams were checked and no notable deficiencies were found.

Substructure: (Rated 6 – Satisfactory)

The West abutment has a total of 34 square feet of hollowed/spalled areas with exposed rusted rebar. The base of the abutment has vertical hairline cracks up to 4’ long. On the South face of Pedestal 2 there is a full-height and full-width hairline crack that extends into the anchor bolt. Pedestal 7 has a spall (full-width x 6” x 3”D) and punky concrete. The Southwest cheekwall has a large concrete patch with a 1’ long pourline crack with efflorescence. The Northwest cheekwall has vertical cracks with efflorescence. The East abutment has a concrete keeper block in Bay 3 that has a diagonal crack with efflorescence and a hollow area (1’ diameter). At this abutment there is evidence of joint leakage and active joint leakage. On the West face Pedestal 5 has a spall (16” x 8” x 8”) that has exposed the anchor bolt shank. On the West face Pedestal 6 has vertical hairline cracks that run into the anchor bolt. On the West face Pedestal 7 has a spall (10” x 6” x 5”) that has exposed the anchor bolt shank. The Northeast cheekwall has vertical cracks and pourline cracks, both with efflorescence. The Jersey barriers at the base of both abutments have vertical and horizontal cracks with rust stains. Both backwalls have short vertical hairline cracks. The West abutment backwall in Bay 1 has a spall at the top (2’ diameter x 1-1/4”) and the East abutment has evidence of joint leakage. The Southeast wingwall has peeling paint that was covering graffiti. The Southwest wingwall has hairline map cracking, minor pop-outs, hollow areas and a spall (1’L x 6”W x ¾”D) with exposed rebar. The Northwest wingwall has minor pop-outs, moderate graffiti, heavy vegetation and a spall (6” diameter x ¾”D) with exposed and rusted rebar. The Northeast wingwall has vine growth overhanging the top. The Southwest and Northeast wingwalls have Jersey barriers at the base. On the West abutment bridge seat there is light pigeon and sand debris.

Bridge No. 00548

Bridge No. 00548 was built in 1960 and rehabilitated in 1985 (Project 0034-0206), in 2008 (Project 0174-0339) and in 2016 (Project 0034-0334). The fourteen span bridge carries Interstate-84 TR 803 over Interstate 84 WB, Route 7 NB and Beaver Brook in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 885’-0” and the curb to curb width is 27’-9”. As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 56.5 tons.

Deck: (Rated 6 – Satisfactory)

The bituminous concrete overlay is new since the previous inspection and it has no notable deficiencies. The overall underside of deck deterioration is 8% with a maximum of 11% in Span 12. The underside of the deck has random transverse hairline cracks with and without efflorescence, areas of map cracking with and without efflorescence, isolated hollow areas, areas of honeycomb with exposed rebar, random concrete patches and isolated left in place wood forms. The end diaphragm haunches have spalls (2”

deep) and hollow areas. At Piers 3 through 4 the deck ends have spalls (5'L x full-width of overhang x 5"D) with exposed rebar. There are sloped granite curbs which have random scrapes and rust stains. There are sections of the Southwest and Southeast approach curbs which are dislodged. The average curb reveal is 3.5" on the West side and 2.5" on the East side. The concrete parapets have vertical hairline cracks with efflorescence, areas of light graffiti, scrapes and areas of scale (10'L x 16"H x 1"D) in Span 7. In Bay 1 the weeps in all spans do not extend below the girder bottom flanges and may drain onto the structure below. There are missing weeps at the Southeast corner of Spans 8 and 12. There is a broken weep at the East fascia over the South abutment. In Spans 11 and 13 the weeps may drain onto Piers 11 and 13. There are light standards on the West parapet in Spans 3, 6, 10 and 13. The light standard in Span 3 has a loose and cracked hand hole cover with a broken screw. The light standard in Span 6 is missing/removed. There are new sawcut and seal deck joints at the North and South abutment which have no notable deficiencies. There are new asphaltic plug deck joints, which have no notable deficiencies.

Superstructure: (Rated 5 – Fair)

The fixed bearings were painted since the previous inspection. The fixed bearings have areas of painted over section loss (up to 1/8" deep) and painted over impact rust (up to 3/8" thick) between the plates. In Span 11 at Pier 11 the masonry plates overhang the pedestals up to 2" long x 3" wide. The sliding expansion bearings have been replaced with elastomeric pads (Project 0034-0334). The steel girders have been cleaned and painted and repair plates have been installed (Project 0034-0334) but they are still in fair condition. Previously there was major section loss in the web of Girder 5 with a maximum of 50% section loss in Span 8 at Pier 8. This major section loss has been repaired under Project 0034-0334, however there are still areas of section loss that remain. The girder webs have painted over section loss (up to 3/8"D x 4"H) resulting in up to 60% loss in horizontal bearing area and less than 10% loss in web cross-sectional area. The Girder 5 bottom flanges have painted over section loss (up to 1-1/4" remaining x 5.5"W) resulting in 6% loss of bottom flange cross-sectional area. Near the bearings the bottom flanges have section loss up to ¼". The end diaphragms have painted over section loss up to 1/8". The minor section loss on Girder 5 bottom flange was repaired as part of Project 0034-0334. In Span 4 one of the diaphragm connection bolts is missing from the first diaphragm connection. The bottom flange cover plate end welds have minor undercutting and minor voids/porosity. There are plug welds in the bolt holes of the fascia girder diaphragm connection angles. There are some broken tack welds between the diaphragm channels and the connection plates. In Spans 13 and 14 Girder 2 has a 5" long piece of rebar tack welded to the end of the girder webs. The top flanges of Girders 4 and 5 are bent down (up to 6"L x 1"D) at three locations.

Substructure: (Rated 6 – Satisfactory)

The abutment stems have isolated hairline cracks and isolated hollow areas (1'H x 1.5'W). The North abutment backwall has a full-height vertical hairline crack and spalls (18"W x 6"H x 3"D) along the top. The wingwalls have isolated hairline cracks, minor spalls and hollow areas. The Northwest wingwall has light vegetation growth. Most of the deteriorated areas on the concrete pier caps have been repaired since the previous inspection, however the pier caps still have hairline cracks, areas of map cracking, hollow areas (6'W x 3'H) at Pier 13 north elevation and spalls (20"H x 1'L x 4"D) with exposed rebar at Pier 13 south elevation. There are isolated spalls (full-length x full-height x 3"D) in the pedestals. Most of the deteriorated areas on the pier columns have been repaired since the previous inspection (Project 0034-0334), however the columns have isolated areas of map cracking and hairline cracks with efflorescence. A column at Pier 8 has a spall (1' x 1' x 1"D) with exposed rebar. There is minor slope erosion on the South side of Pier 3. Minor debris on pier caps.

Channel and Channel Protection: (Rated 7 – Good)

Both embankments have areas of undercutting with exposed tree roots and they are well vegetated. There is an area of aggradation (6'L x 6"H x full-width) in the channel. Since the previous inspection there are minor changes to the drop line measurements.

Bridge No. 00549

Bridge No. 00549 was built in 1962. The twin cell culvert carries Interstate-84 TR 804 over Beaver Brook in Danbury, CT. The total length of the bridge is 53'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 36 tons.

Culvert: (Rated 6 – Satisfactory)

The twin cell reinforced cast-in-place concrete box culvert (23'W at outlet, 15'W at inlet). There are three categories for concrete inspection; (1) ceilings, (2) walls, and (3) floors. (1) The ceilings have transverse hairline cracks (up to 3' long) coming off the joints, scattered map hairline cracks and areas of active leakage at random joints. There are pop-outs, shallow rebar (1' diameter x ¼"D), a hollow area (5" diameter), and a joint spall (14"W x 8"L x 2"D) in Cell 1. (2) The walls have heavy graffiti at random locations with active leakage and chipped edges. There is light to moderate scale along the waterline. The walls have vertical hairline cracks with isolated efflorescence up to full-height, map cracking, shallow rebar, several pop-outs, and there are areas of deteriorated seal. (3) At the inlet the floor is exposed full-length x 33" high and at the outlet the floor is exposed full-length x 6" high. The headwalls have light scale, vine growth, hairline cracks up to 2' long, and shallow rebar (3" x 2" x 1"D). The East headwall has a spall at the top (12" x 6" x 3"). In Cell 2 there is stone and silt build-up, up to 6" high. The Southwest retaining wall is offset 1-3/4" at the top which is the as built condition; all other wingwalls are offset up to 11/16". The Northeast wingwall has a tree growing in the joint, there are two C.M.P. (30" and 16" diameter) with scour pockets (2' diameter x 12"D) below the 30" drain.

Channel: (Rated 5 – Fair)

Around the nose of the center wall there is a scour pocket (6' diameter x 3'D) that extend in front of both cell floors, thus exposing the vertical face of the floors. The floor is exposed 33". There is severe undercutting on the embankments especially downstream, exposing tree roots up to 4' high x 3' deep. Moderate erosion and isolated undercutting (1' deep) with exposed tree roots of the north downstream embankment. North upstream embankment has moderate to heavy erosion and undercutting (4'H x 2'D) with exposed tree roots and leaning trees. On the nose of the center wall at the inlet there is debris caught which extends across both cells. Along the North side there is severe encroachment at the inlet of the channel which has narrowed the width of the channel. At the outlet there are sticks, branches, and one large stone. Downstream there are sticks and branches in the channel and one large stone at the outlet end in the center of the channel. Both upstream and downstream there is heavy brush and tree growth that overhangs the channel. There is restricted flow at the inlet due to debris that has accumulated on the center wall and extends across both cells. The channel bed is composed of soft material upstream and more gravel-like material downstream.

Bridge No. 00550

Bridge No. 00550 was built in 1962 and rehabilitated in 1984 (Project 0174-0098) and in 2011(Project 0174-0357). The three span bridge carries US Route 7 over SR 805 (Federal Road) in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 148'-0" and the curb to curb width is 52'-9". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 46 tons.

Deck: (Rated 6 – Satisfactory)

There are areas of map cracking on the bituminous overlay and paving seams open up to ¼" wide. The underside of the deck has transverse hairline cracks up to full bay width with efflorescence, areas of

hairline map cracking (up to 3'L x 2'W) and an area of honeycombing (2'L x 1'W x 1"D). There are deck ends with spalling (2" deep) and isolated hollow and spalled haunches (1' long). In Span 2 Bay 3 there is a spall (6'L x 1'W x 1"D) with exposed rebar in panel 2 adjacent to the construction joint. There are several holes in the deck in Bay 5, which have been filled with foam. The overall deterioration of the deck underside is 4% with a maximum of 5% in Span 2. The granite curbs have scrape marks, rust stains and some missing sealant between stones. The reinforced concrete parapets have areas of peeling protective coating, small pop-outs, vertical and horizontal hairline cracks with efflorescence and minor scrapes. At the North end of the West parapet there is a spall (2'L x 3"H x ½"D). There are two spalls (up to 1'L x 6"H x 2"D) on the East parapet, one spall is near the Pier 1 deck joint and the other is a small surface spall at the Southeast end post. There is a single aluminum rail with aluminum posts on both parapets that has minor scrapes. There are PVC weep pipes in Bays 1 and 7 which have no significant deficiencies. In Span 2 there is a light pole at the East parapet that has no significant deficiencies. The junction box covers at the East parapet have several missing screws and one of the covers is cracked. Along the full-length of the longitudinal construction joints in Bays 3 and 5 there is efflorescence and rust stains. Areas of the asphaltic plug joints have exposed aggregate. There is a 30' long adhesion crack in the South abutment deck joint and a 26' long adhesion crack in the Pier 2 deck joint. There is active joint leakage onto the substructure units.

Superstructure: (Rated 6 – Satisfactory)

There are two types of bearings (1) sliding plate expansion and (2) fixed. (1) There are sliding plate expansion bearings at the South abutment and in Spans 2 and 3 at Pier 2. These bearings have moderate rust with heavy rust on the fascia bearing plates and minor lateral misalignment. All of these bearings have keeper plates. At 30 degrees Fahrenheit the bearings are in expansion mode, however they appear to be moving. (2) There are fixed bearings at the North abutment and in Spans 1 and 2 at Pier 1. These bearings have light rust on the bearing plates with heavy rust on the fascia bearing plates and pack rust (1/8" thick) between the sole plate and the masonry plate. Some of the fixed bearings were previously cleaned, but still contain pack rust between the bearing plates. The steel rolled beams have peeling paint, heavy rust, and laminated rust on the top of the bottom flanges and lower parts of the web. At Pier 1 the girder web ends have painted over pitting (<5% loss of cross-sectional area). In Span 1 the bottom flange of Girder 5 has section loss (full-width of east leg x 5/16"D) near Pier 1. Several of the beam ends have been painted and cleaned previously. The partial length cover plate end welds and plug welds in the fascia beam welds were found to have no notable deficiencies. In Span 2 at the diaphragm to girder connection plates there are isolated broken tack welds. In Span 2 near Pier 1 the West elevation of Girder 2 has two weld strikes on the web. In Span 2 Girder 8 has a 5/8" long cracked tack weld between the diaphragm and girder connection plate at the first intermediate diaphragm from Pier 1. The bottom flange cover plates have scrapes and gouges up to 1" long x ½" wide x 3/16" deep. Several of the collision damage areas noted in the previous inspection have been ground smooth and painted. In Span 2 near the mid-span the Girder 8 web is bowed to the west (6" diameter x ¾"D). In Span 2 there is a sign attached to the fascia of Girder 1 that has minor collision damage.

Substructure: (Rated 6 – Satisfactory)

There are isolated vertical and horizontal hairline cracks, hollow areas (3'W x 3'H) and minor spalling (1/2" deep) with exposed rebar on the abutment stems. There is spalling (1.5'W x 3"H x 2"D) along the top of the backwalls. There are random vertical hairline cracks on the wingwalls. The Northeast cheekwall has several shallow spalls with exposed rebar (up to 1'L x 6"H). There are hairline cracks, several concrete patches (6'L x 3'H), areas of map cracking, hollow areas (3'L x 1'H) with loose concrete removed and spalls (20"L x 8"H x 3"D), some with exposed rebar on the pier caps. There are isolated hollow areas (10"L x 4"H) and spalls (16"L x 5"H x 3"D) on the pedestals. There are vertical cracks (up to 3'L x 1/16"W), areas of map cracking (up to 2'H x 6"W), hollow areas (up to 34"H x 6"W), spalls (up to 18"H x 7"W x 1"D), minor shallow patches and several concrete patches (up to 10'H x full-width of column) on the pier columns.

Bridge No. 00551

Bridge No. 00551 was built in 1962 and rehabilitated in 1984 (Project 0174-0098) and in 2011 (Project 0174-0357). The three span bridge carries US Route 7 SB over SR 805 (Federal Road) in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 161'-0" and the curb to curb width is 52'-9". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 42 tons.

Deck: (Rated 6 – Satisfactory)

There are areas of map cracking, potholes (6" diameter x 1"D) in Span 1 and paving seams open up to ¼" wide in the bituminous concrete overlay. A pothole in Span 1 adjacent to the North abutment deck joint noted in a previous inspection has been patched. The underside of the concrete deck has transverse hairline cracks with efflorescence up to the full-width of the bay, hairline map cracking (up to 10'L x 6'W) and a 3" diameter shallow spall. The underside of the deck deterioration is 4% with a maximum of 5% in Span 2. The granite curbs have scrape marks and rust stains. The concrete parapets have numerous vertical cracks that extend across the top with efflorescence, some scrape marks and peeling protective coat. The East fascia in Span 3 has a horizontal and vertical crack with efflorescence near the North end. At the joint over Pier 2 on both sides the gland seal retainer protrudes from the parapet inside face. There is a small surface spall on the Southwest parapet extension. There is a single aluminum rail with aluminum posts on both parapets that has minor scrapes. There are broken weep pipes at the following locations: Span 1 Bay 7 at the intermediate diaphragm, Span 2 Bay 7 at the pier, and Span 3 Bay 1 at the intermediate diaphragm. There is a junction box cover at the West parapet that has several loose and missing screws. There are longitudinal construction joints in Bays 3 and 5 with efflorescence staining. There are areas of exposed aggregate in the asphaltic plug joints. There is an 18' long adhesion crack at the South abutment joint, a gouge in the West shoulder at the Pier 1 joint and a 16' long adhesion crack at the Pier 2 joint.

Superstructure: (Rated 6 – Satisfactory)

There are two types of bearings; (1) sliding plate expansion and (2) fixed. (1) There are sliding plate expansion bearings at the South abutment and in Spans 2 and 3 of Pier 2. These bearings have light rust with moderate rust on the fascia bearing plates and minor lateral misalignment. All of these bearings have keeper plates and are primed with red lead paint. At 20 degrees Fahrenheit the bearings are in expansion mode, however they appear to be moving. (2) There are fixed bearings at the North abutment and in Spans 1 and 2 at Pier 1. The fixed bearings have moderate rust on the bearing plates and pack rust (3/16") between the sole plate and the masonry plate. The steel rolled beams have light rust and peeling paint. Isolated girder web ends have section loss (<5% loss of cross-sectional area). In Span 2 Girders 2 through 7 have retrofitted cover plate ends with bolted splice plates and there is light rust on the bolts. The full-length cover plates on Girders 1 and 8 in Span 2 have no notable deficiencies. There are plug welds in the fascia beam webs at the intermediate diaphragm connections which were found to have no notable deficiencies.

Substructure: (Rated 6 – Satisfactory)

There are isolated hairline cracks, hollow areas (10'W x 1'H) which extend 1' onto the bridge seat with spalling 1" deep, and spalls (3'W x 1'H x 2"D) with exposed rebar on the abutment stems. There are random pedestals that have spalling (6"W x full-height x 1"D). There are several shallow spalls along the top of the South abutment backwall. At the West end, the South abutment footing is exposed 4' long x up to 3" high. There is heavy vegetation growth on the wingwalls. There is a 12 foot square area of severe scale and map cracking with efflorescence on the Southwest wingwall. There are hairline cracks, concrete patches (5'L x 1'H), hollow areas (5'L x 2'H) with loose concrete removed and spalls (5'L x 1'W x 2"D) with exposed rebar on the pier caps. Some pedestals have cracks (3/16" wide) and hollow areas (2'L

x 6”H). There are vertical cracks (1/16” wide), map cracks (2’H x 9”W), concrete patches (6’H x 1’W), and hollow areas (2’W x 15”H) on the pier columns. The pier caps have concrete and bituminous debris.

Bridge No. 00553

Bridge No. 00553 was built in 1962. The twin cell culvert carries SR 805 over Beaver Brook in Danbury, CT. The total length of the bridge is 27’-0” and the out-to-out measurement is 117’-7”. As provided by the Connecticut Department of Transportation the inventory rating is 35 tons.

Culvert: (Rated 6 – Satisfactory)

The twin reinforced concrete box culvert has 7’ high x 10’ wide inlets comprised of 4 sections for each cell. The inspection of concrete is broken into three sections; (1) ceilings, (2) walls, and (3) floors. (1) There is a hollow area (6’L x 2’W) in the first joint of Cell 1 with an adjacent spalled area (6’L x 9”W x 4”D) with rust staining and exposed copper flashing. There is a hollow area (7’L x 1’W) in the first joint in Cell 2 with efflorescence and rust staining. The remaining joints have evidence of past leakage and both of the cell ceilings have minor voids throughout. (2) There are random vertical hairline cracks, intermittent horizontal cracks in the upper chamfers and shallow rebar on the walls. (3) At the inlet end of Cell 2 there is minor scale on the floor where it is exposed. The vertical face of Cell 1 is exposed (11”H x 2’L). The vertical face of Cell 2 is exposed (3’L x 18”H) without any undermining. Cell 1 has 1’ of gravel built up throughout and Cell 2 has 3” of gravel built up through most of its length. The concrete retaining walls have random hairline cracks.

Channel: (Rated 5 – Fair)

Around the nose of the center wall there is a scour pocket (3’ diameter x 3’D) which exposes the floor of Cell 2. There is no undermining, however debris has blocked access to the cutoff wall. The channel embankments are undercut with isolated areas of debris. At the inlet of both cells there is heavy debris and a gravel island at the outlet of Cell 1. At the inlet of Cell 1 the debris and bank encroachment is blocking the flow through the cell. This heavy debris restricts the water flow to Cell 2 only. The channel embankments are heavily vegetated with trees and branches with some overhanging the channel. The channel bed is comprised of silt and sand.

Bridge No. 00897

Bridge No. 00897 was built in 1960 and rehabilitated in 1987 (Project 0174-0122). The three span bridge carries Interstate-84 EB over Route 25 in Newtown, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 140’-0” and the curb to curb width is 43’-0”. As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 43.2 tons.

Deck: (Rated 7 – Good)

There are random areas of map cracking and paving seams open up to ¼” wide on the bituminous concrete overlay. Adjacent to the asphaltic plug joint at both piers are intermittent transverse cracks in the overlay. On the deck underside, there are transverse cracks up to full-width of the bay with and without efflorescence. The overall underside of deck deterioration is 1% with a maximum of 2% in Span 2. The granite curbs have some scrape marks, a few chipped stones and random joints with missing mortar. The average curb reveal is 2” on the North side and 1-5/8” on the South side. The concrete parapets have vertical cracks with and without efflorescence and transverse cracks across the top. There is a single aluminum rail system on the parapet that has isolated minor scrapes. In Span 1 at the North and South edges two PVC weep pipes are broken. There is a broken weep pipe in Span 3 on the South side. These broken weep pipes are not draining onto the steel girders. At the South concrete barrier there is a utility cover plate with a missing screw. There is a construction joint in Bay 2 for all spans. There is a 40’ long adhesion crack in the asphaltic plug joint at the West abutment and a 24’ long x 1” wide adhesion crack in

the asphaltic plug joint at the East abutment. In the low speed lane, there are depressions in the wheel lines of pier deck joints.

Superstructure: (Rated 6 – Satisfactory)

There are three types of bearings; (1) expansion, (2) fixed, and (3) elastomeric expansion. (1) The East and West abutments have expansion bearings with a Teflon sheet between the bearing plates. These bearings have steel keeper blocks and some medium rust on the plates. There is impacted rust at several bearings between the sole and sliding plates and some lateral misalignment. On the West abutment Bearing 1 has the Teflon plate protruding 3-1/4" to the east, Bearing 6 shows the Teflon plate protruding 6" to the east, and Bearing 6 has heavy rust on the masonry plate and keeper bars. On the East abutment Bearing 3 has the Teflon plate protruding out 6" to the west and Bearing 4 has a 2" x 4" corner of the Teflon sheet that remains in contact (Teflon sheet is 10" x 10"). (2) There are fixed bearings in Spans 1 and 2 at Pier 1 and in Span 3 at Pier 2. At Pier 1 the fascia and interior bearings have heavy rust on the plates and impacted rust (3/16") between the plates. Several of the anchor bolts are loose and some are missing. At Pier 2 there is heavy rust on the fascia bearings and medium rust on the interior bearings. (3) Span 2 at Pier 2 has elastomeric expansion bearings with steel keeper blocks. The plates have areas of medium rust especially on the fascia beams. The masonry plates overhang the pedestals 2" on the front corner. There are concrete chips on all of the bearings and between the bearings and the pedestals which limits movement. Several of the bearings are still covered with emulsion. There are 6 beams in each span and the beams have a slight negative camber. There is powdered rust chaffing from the top flange and the deck on both sides on Beams 3 and 4 in Span 1. In Bays 3 and 4, the end diaphragms have the same condition. There is 2' of peeling paint and heavy rust on the soffit near the Pier of Beam 5. Due to past collision damage Beams 1-6 in Span 2 have numerous scrapes, dents and flaws on the soffit and edges of the bottom cover plates. All of these dents and scrapes have been ground smooth. As a result of past collision damage Beams 1, 5 and 6 are slightly distorted. There are areas of light spotty rust on the beams and painted over pitting on the web. The vertical stiffener at the center diaphragm in Beam 1 is bent at the lower half. The vertical stiffener at the center diaphragm in Beam 5 is bowed on both the North and South sides. At this same diaphragm connection there is a 1-1/4" long crack in the vertical connection weld at the base on the North face of Beam 6. In Span 3 Beams 2 and 4 have powdered rust chaffing from the top flange and the deck. At the pier the beam ends have areas of painted over pitting. In Span 2 there are random beams with large areas of chipped paint at the bottom flanges. In Span 2 the exterior beams have full-length bottom flange welded cover plates and the interior beams have partial length bottom flange cover plates, both were found to have no notable deficiencies.

Substructure: (Rated 6 – Satisfactory)

At the South end of the West abutment there are some map cracks and a 6" vertical and horizontal hairline crack in the chamfer. The East abutment stem has hollow areas (1.5'L x 1'H) between Beams 2, 3 and 4 and a full-height x ¼" wide vertical crack between Beams 3 and 4. Both abutment stems and backwalls have mud stains. There is a full-height vertical hairline crack between Beams 3 and 4 on the West abutment backwall. There is a full-height x ¼" wide vertical crack between Beams 3 and 4 and a spall (12"L x 8"H x 1"D) behind Beam 6 on the East abutment backwall. The Northeast and Northwest wingwalls have moderate vegetation and vine growth. Along the construction joint in the Northwest wingwall there is a small surface spall. There is a spall (2'H x 6"W x 2"D) with exposed rebar on the inside face on the Northwest cheekwall. There is a pourline crack on the West face of the Southeast cheekwall. The pier caps have vertical and horizontal cracks (4'L x 1/8"W), areas of map cracking (3' x 3'), spalls (1' diameter x 6"D) with exposed rebar, hollow areas (4'L x 1'H) and stains. On the pier columns there are a few minor pop-outs. At both piers there is debris, emulsion and concrete chips on the pier caps and around the bearings.

Bridge No. 00898

Bridge No. 00898 was built in 1962 and rehabilitated in 1991 (Project 0034-0252). The three span bridge carries Interstate-84 WB over Route 25 in Newtown, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 140'-0" and the curb to curb width is 53'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 59.8 tons.

Deck: (Rated 7 – Good)

The bituminous concrete overlay has areas of map cracking in all lanes and the paving seams are opening slightly. There are areas of hairline map cracking and transverse hairline cracks up to full-width of the bay with some efflorescence on the underside of the deck. In Bay 4 there is a construction joint through all spans. The overall deck deterioration is less than 1% with a maximum of 1% in Span 2. The granite curbs have scrape marks, some chipped stones, rust stains, and a few areas with missing mortar between the joints. The average curb reveal is 2-1/2" on the North side, 1-3/4" on the South side in Span 2, and 2" in Spans 1 and 3 on the South side. There are vertical hairline cracks, scrape marks and transverse cracks across the top of the concrete parapets. At the East end of the North parapet there is a spall (1'H x 3"W x 3"D) filled with seal. There is a small surface spall at the Southwest corner. There is a single aluminum rail system that has minor scrapes. All of the weeps extend below the bottom flanges of the beams. In Bay 4 there is a construction joint through all spans and the construction joint in Span 2 has efflorescence. There is a 40' adhesion crack in the asphaltic plug joint 1 at the West abutment and a 30' adhesion crack in the asphaltic plug joint 4 at the East abutment both cracks up to ¼" wide.

Superstructure: (Rated 7 – Good)

There are two types of bearings; (1) elastomeric expansion and (2) fixed. (1) There are elastomeric expansion bearings at both abutments and in Span 2 at Pier 2. These bearings have steel keepers and there are some areas of peeling paint and light rust on the plates. Bearing 8 at the West abutment and Bearing 1 at the East abutment have heavy rust on the masonry plate. (2) There are fixed bearings in Spans 1 and 2 at Pier 1 and in Span 3 at Pier 2. Some of the bearings have minor impact rust between the sole plate and the masonry plate. Additionally, isolated bearings have heavy surface rust with laminated rust on various components. The fascia bearings are in the worst condition. Span 1 Bearing 5 at Pier 1 has three shim plates between the curved plate and the masonry plate. There are eight rolled beams in each span and the girders have minor mill flaws throughout. The beam ends have painted over pitting on the webs and top and bottom flanges. Some beam ends have light surface rust and there is heavy surface rust on isolated top flanges. In Span 1, 2' from the centerline of the bearing, Beam 8 has section loss (6"L x 3"W x 3/16"D) on the top of the bottom flange. In Span 2 at Pier 2 Beam 8 has 4' of heavy laminated rust on the South side of the top flange. There is painted over pitting on the base of the web at the same location on the North side. There are isolated areas of chipping paint, which is typically at the beam ends. In Span 2 the exterior beams have full-length bottom flange welded cover plates and the interior beams have partial length bottom flange welded cover plates; both were checked and no notable deficiencies were found.

Substructure: (Rated 6 – Satisfactory)

The West abutment has several full-height hairline cracks, a few short cracks (3' long), hollow areas (1.5'W x 1.5'L) with rust stains, and a spall (3'L x 1'W x 4"D) with exposed rusted rebar adjacent to the construction joint. The East abutment has several short vertical cracks (1' long) with rust stains and two spalls (6"H x 2"W x 1"D) along the construction joint. There are full-height isolated vertical hairline cracks on the abutment backwalls. Between Beams 4 and 5 there is a full-height vertical crack on the East abutment. The Southwest wingwall has a pourline crack and light map cracking, the Northwest wingwall has vine growth, the Northeast wingwall has a joint spall (1'H x 2"W x 3"D), and the Southeast wingwall has a pourline crack. The cheekwalls have hairline cracks with efflorescence. The Northwest cheekwall has 2 surface spalls (1' x 6" x ½"D) with exposed rusted rebar on the inside face. The pier caps were found to be in fair condition. There are vertical hairline cracks, hollow areas, spalls, horizontal cracks and

stains on the pier caps. At Pier 1 the pedestal of Beam 3 has a spall (2'L x 1'H x 1"D) with exposed rebar and Pier 1 cap has a few hollow areas (4'L x 2'H). There is a spall (1' diameter x 3"D) with exposed rebar and adjacent hollow area (2' x 1') on the West elevation of Pier 1. There are a few spalls (6'L x 4'H x 4"D) with exposed rebar on the East elevation of Pier 1. At Pier 2, Span 3 there are a few pedestal spalls (2'L x 6"H x 2"D). There are spalls (6'L x 1.5'W x 3"D) with exposed rebar and hollow areas (5'L x 1.5'H) on the East elevation of Pier 2 cap. There are spalls (3'L x 1'H x 3"D) with exposed rebar and hollow areas (8'L x 1'H) on the West elevation of Pier 2 cap. In Spans 1 and 3 there is little room for expansion between the beam ends and the concrete pedestals. There are vertical hairline cracks with bleeding rust in the pier columns. The West elevation of Pier 1 Column 4 has two hollow areas (2'W x 3'H) and the East elevation of Pier 2 Column 2 has a spall (2'H x 1'W x 2"D) with exposed rusted rebar.

Bridge No. 00956

Bridge No. 00956 was built in 1960 and rehabilitated in 1982 (Project 0034-0172), in 1986 (Project 0034-0189) and in 2008 (Project 0174-0339). The single span bridge carries Interstate-84 over Route 37 (North Street) in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 114'-0" and the curb to curb width is 117'-2". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 70.9 tons.

Deck: (Rated 5 – Fair)

Since the previous inspection the bituminous concrete overlay in the eastbound and westbound lanes has been repaved. The underside of the deck was found to be in fair condition. There are transverse cracks with efflorescence and spalls (1' diameter x 2"D). In Bays 1 through 6 there are full depth patches and these patches have spalls with exposed rebar (4' x 5' x 2"D in bay 17), transverse cracks, and hollow areas (2' x 4' in bay 5). There are some random hollow areas over the sidewalks and travel way. The total underside of deck deterioration is 12%. The granite curbs have scrape marks with rust stains, vertical hairline cracks, chipped edges and cracks in the mortar. The average curb reveal was 4" at the north side. At the West end the South Jersey barrier has a spall (5'L x 1'H x full depth) with exposed rebar. At the East end the North jersey barrier has a spall (1' diameter x ½"D), a hollow area (5' x 2') at the West end and a hollow area (3' x 2') at the center. The concrete parapets have scraping, vertical cracks that extend across the top and peeling protective coating. There are luminaires in Bay 4 and 13 that hang below the bottom flanges of the girders. On the North side of Girder 10 there is a 3" diameter conduit which has heavy pigeon debris. There is a 15' long x ¼" wide adhesion crack in the left lane of the West abutment asphaltic plug joint. The asphaltic plug joints in the eastbound lanes have been paved over.

Superstructure: (Rated 6 – Satisfactory)

There are expansion rocker bearings at the West abutment which have light rust, light pigeon debris and were in expansion mode at 38 degrees Fahrenheit. There are fixed rocker bearings at the East abutment which have moderate rust on the masonry plates and heavy laminated rust on the masonry plate of Bearing 18. There are areas of peeling paint on the fascia girders. The bottom flanges of the girders have heavy rust. Girders 1 through 6 have concrete debris accumulating on the bottom flanges. On the bottom flange of Girder 10 there is pigeon debris. At the K-bracing diaphragms there are random erection bolts missing, but they are welded. The transition welds are not ground smooth and have undercut pockets. Along the edges of the welds there are torch cut flaws/gouges. The North face of the Girder 17 web has weld strikes. Due to collision there are gouges (12"L x ½"H x ¼"D on girder 9) and dents on the edges of the bottom flanges, however most have been ground smooth. Some girder bottom flanges have scrapes.

Substructure: (Rated 6 – Satisfactory)

There are silt stains and areas of peeling protective coating on both of the abutment stems. There are spalls (5'H x 8"W x ½"D) with exposed rebar and hollow areas (2' x 6') over the sidewalk on the West abutment stem. There are spalls (7'L x 1'H x 1"D) with exposed rebar and hollow areas (2' x 2') over the

sidewalk on the East abutment stem. The East abutment Pedestal 1 has a 3” diameter corner spall with a crack that extends under the bearing and Pedestal 4 has a spall (16” x 4” 2.5”D) on the North face. There are small pop-outs and random vertical cracks on both concrete backwalls. The Southwest and Northwest wingwalls have 12’ x 1’ and 8’ x 1’ hollow areas, respectively. The Southwest cheekwall has two small surface spalls on the East face and a hollow area, map cracking, and pop-outs on the South face. There are surface spalls and spalls with exposed rebar on the Northeast cheekwall. There are two spalls with exposed rebar on the Southeast cheekwall. On both abutment seats there is pigeon debris and concrete chips.

Bridge No. 00961

Bridge No. 00961 was built in 1962 and rehabilitated in 1982 (Project 0034-0172), in 1986 (Project 0034-0189) and in 2008 (Project 0174-0339). The single span bridge carries Interstate-84 over Route 39 in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 82’-0” and the curb to curb width is 129’-2”. As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 62.8 tons.

Deck: (Rated 6 – Satisfactory)

Since the last inspection a new bituminous overlay is in place and there are no notable deficiencies. On the underside of the deck there are areas of map cracking (35’L x 5’W) with and without efflorescence and transverse hairline cracks. In Bay 6 between the first and second intermediate diaphragms there is an area of dampness and efflorescence. Near both abutments Bay 7 has core holes (4” diameter x 4-1/2”D). In Bays 15 to19 there are sloppy full deck patches with mortared edges that have cracked and are beginning to flake off; these patches have areas of map cracking (4’L x 4’W). In Bay 16 between the second and third intermediate diaphragms there is evidence of past leakage. There are numerous hollow areas throughout the deck. The overall underside of deck deterioration is 9.4%. The granite curbs have scrapes, rust stains and minor chipping. The average curb reveal is 2.5” on the North side and 2” on the South side. There are Jersey type median barriers which have minor chipping, rust stains and scrapes. There are three hollow areas (15’L x 2’H) on the westbound side with adjacent spalls (3’L x 2’H x 6”D). There is a hollow area (5’L x 1’H) on the top on the eastbound side. The longitudinal median joint is sealed and deteriorated and there is active leakage below in Bay 10. There are some pop-outs and full-height vertical hairline cracks with and without efflorescence on the concrete parapets. Near the East abutment the North parapet has a hollow area (2’L x 3”H) with scaling and efflorescence. All of the PVC weep pipes extend below the girder bottom flange and no significant deficiencies were found. Bays 4 and 16 each have two underbridge luminaires. There are new asphaltic plug joints on the westbound side since the previous inspection. The eastbound joints have been milled and paved over and new joints have not been installed.

Superstructure: (Rated 6 – Satisfactory)

There are bronze plate expansion sliding bearings with keeper plates at the West abutment which have been lubricated in the past. The bearings have light rust and peeling paint. At 56 degrees Fahrenheit the girders were in expansion mode except for Girder 16 which was neutral. Girders 7 to 12, 14, 15 and 17 were over expanded up to 3/8”. Some of the bearing plates are twisted and have lateral misalignment up to 5/8”. Some of the keeper plates are in contact with the sliding and/or masonry plates and the bolts have been cut and plated over. There are curved sole plate fixed bearings at the East abutment which have areas of light to moderate rust, areas of peeling paint, and the anchor bolts have been cut and plated over. There are areas of light rust and peeling paint on the girders. Some of the girder ends have been painted over. There are isolated areas of rolling defects in the webs. There are thin plates welded to the bottom flange at the ends of the bottom flange plate. In Bay 1 the first intermediate diaphragm from the West abutment at the Girder 1 connection is welded and missing connection bolts. All of the girder bottom flange cover plate end welds were found to have no notable deficiencies. The welds at the first and third intermediate diaphragms from the West abutment at Girder 1 connections were repaired and do

not have any notable deficiencies. Due to collision, the bottom flange cover plates of Girders 1 and 2 have areas of impact scrapes and gouges. Most of these gouges were ground smooth. The bottom flange of Girder 1 is bent/laterally misaligned 1-1/2" to the north over a 10' area near the third intermediate diaphragm from the West abutment. The web is bowed ½" to the south for 15' near the mid span.

Substructure: (Rated 6 – Satisfactory)

There are areas of peeling protective coating on the abutment stems. The West abutment stem has isolated spalls (12"W x 13"H x 1"D) with exposed rebar, hollow areas (2'W x 13"H) and a 2' long horizontal hairline crack on the South end. Below Girder 3 the stem has a spall (1'W x 4"H x 3"D) in the concrete patch. The East abutment stem on the South end has vertical hairline cracks up to 8' long, isolated spalls (1.5'W x 6"H x 1"D) with exposed rebar and a full-width horizontal hairline crack. Below Bays 6 and 7 the stem has two areas of scaling (5'W x 3'H x ½"D). The backwalls have vertical hairline cracks. There is scaling (50'L x 6"H x ½"D) on the East backwall between Girders 9 to 12. On the West backwall there is active leakage through the deck joint at the North end and behind Girder 3. There are areas of peeling protective coating on the wingwalls and the expansion joint material is loose and pushed out. There is moderate vegetation growth along the Northwest, Southwest and Northeast wingwalls. The Southwest wingwall has a spall (6"L x 4"W x 1"D) and light vine growth. The Northwest cheekwall has a spall (1'H x 6"W x 1"D) with exposed rebar. The Northeast cheekwall has a 2' long horizontal hairline crack. The Southwest cheekwall has two spalls (1'L x 4"H x 1"D) with exposed rebar. The Southeast cheekwall has a few small pop-outs. There is light to moderate accumulation of silt and debris on the abutment seats.

Bridge No. 01180

Bridge No. 01180 was built in 1962 and rehabilitated in 1984 (Project 0034-0199). The four span bridge carries Kenosia Avenue over Interstate 84 and Housatonic Railroad in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 288'-0" and the curb to curb width is 30'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 51.1 tons.

Deck: (Rated 6 – Satisfactory)

There are areas of raveling and bituminous segregation in the bituminous concrete overlay. The overlay has map cracking (1/2" wide) throughout but primarily in the northbound lane, potholes (1' diameter x 1"D) and uneven patches that have settled (up to 1-1/2"D). Since the previous inspection the southbound lane has been partially repaved. The overall underside of deck deterioration is 15% with the maximum deterioration of 22% in Span 2. There are areas of honeycombing (1' x 2'), areas of light scale (7' x 5'), hollow areas (6" x 12"), spalls (2" deep), hairline map cracks and transverse cracks with efflorescence on the underside of the deck. The granite curbs have some scrapes and chipping. The average curb reveal is 5-1/8" on the West side and 6-3/4" on the East side. The concrete sidewalks have transverse cracks and missing sealant between the sidewalk and the curb. There are 1/16" wide vertical cracks with some efflorescence on the concrete parapets. There is a 5' high extruded aluminum panel fence on top of both parapets and there are no notable deficiencies. There were several short/broken weep pipes noted in the previous inspection, which have been partially repaired. In Span 2, Bay 1 there is a broken weep pipe, however it does not leak onto the superstructure. In Span 4, Bays 1 and 5 there are two short and two broken weep pipes; one of the broken weep pipes in Bay 1 drains onto the diaphragm which is causing corrosion. There is a construction joint in Bay 3 for all spans. This construction joint has efflorescence and in Span 3 there is spalling along the joint. At the wheel lines the asphaltic plug joints are uneven (up to ½"). At the abutment deck joint there are cohesion cracks up to 12' long x 1/8" wide and adhesion cracks up to 3' long x 1/16" wide. There is dirt/debris in the compression seal, primarily in the northbound lane.

Superstructure: (Rated 5 – Fair)

There are sliding plate expansion bearings at both abutments and at Pier 2. A few of the bearings have heavy rust and impacted rust (1/4”), primarily at the fascia bearings. At 15 to 20 degrees Fahrenheit all of the sliding bearings have evidence of movement. The bearings for Girders 1 and 6 at the South abutment have abnormal movement where the bearing plates are rotated relative to the sole plate. Some of the sliding plate bearings have small gaps at the corner (1/8”) but there is negligible loss of bearing area. There are curved plate fixed bearings at Piers 1 and 3. These fixed bearings have heavy rust, impacted rust up to ¼” and laminated rust up to ¾”. There are six rolled steel beams in each span which were found to be in fair condition. In Spans 1 and 2 there is approximately 5% flange loss in the bottom flange along the fascia girders at mid span (10’L x 3”W x ¼”D). Similarly there is web loss on Girder 3 in Span 2 near mid span (5.5’L x 1”H x 1/8”D). At random locations the girder ends have bottom flange loss less than 1/8”. The girders have heavy laminated rust with negligible loss. At the girder ends the webs have been painted previously but have isolated active corrosion with negligible section loss. There is heavy rust on the diaphragms due to several weeps draining onto them, however the section loss is negligible. The paint is in serious condition with 75% of the paint deteriorated. At the fixed bearings there is heavy rust on the anchor bolts and nuts. There are only cover plates in Spans 1 through 3 and the end welds were found to have no notable deficiencies. Some of the diaphragm welds are sloppy with minor undercutting.

Substructure: (Rated 6 – Satisfactory)

Both abutments have vertical cracks, random pop-outs and at the South abutment the Girder 3 pedestal has a hollow area (1’ x 1’). There are full-height vertical cracks, some with efflorescence and map cracking on both backwalls. The backwalls also have isolated spalling (4’L x 1’H x 3”D). The wingwalls have vertical and horizontal cracks, random pop-outs and shallow spalls. There are vertical cracks up to 3’ long in the concrete pier caps and the pedestals have isolated hairline cracks. The Pier 1 cap has a hollow area (1’ x 3’), map cracking and a hollow area (1’ diameter) on the underside of the pier cap. The concrete columns at Piers 1 and 2 have hollow areas (4’H x 1.5’W) and spalls (2’H x 1’W x 3”D) with exposed rebar. The West column at Pier 2 is in the worst condition as it has spalls and hollow areas at all four corners. At the West and East ends of the South abutment the drains are exposed. There is minor debris accumulation on the pier caps and abutment seats.

Bridge No. 01181

Bridge No. 01181 was built in 1962 and rehabilitated in 1980 (Project 0034-0162), in 1991 (Project 0034-0235) and in 2008 (Project 0174-0339). The three span bridge carries Interstate 84 WB over the Housatonic Railroad in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 229’-0” and the curb to curb width is 55’-6”. As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 55.5 tons.

Deck: (Rated 5 – Fair)

The bituminous concrete overlay has areas of light raveling, transverse and longitudinal cracks (1/4” wide), paving seams open up to 2” with moderate edge raveling and isolated potholes (6” diameter x ½”D). In Span 1 the right most lane has a depressed area (3’ diameter x ½”D) and map cracking (1/2” wide). The underside of the deck was observed to be in fair condition with 10.9% deterioration. The maximum deterioration of 23.3% occurs in Span 2. The deck has transverse hairline cracks with and without efflorescence, areas of hairline map cracking with and without efflorescence, hollow areas (10.5’ x 4’) and spalls (40” x 24” x 1-1/2”D) with exposed rebar. Most of the spalls are located in Span 2 over the out of service railroad and access road. In Bay 4 Span 2 there is a spall (1’ x 1’ x 3-1/2”D) with exposed rebar near Pier 2. There are spalls (full bay width x 3”W x ½”D) in the haunches and hollow areas up to 1.5’ long in the haunches at random locations. The granite curbs have minor scrapes, rust stains and average curb reveals of ½” on both the North and South sides. At the Pier 1 joint the North and South curbs have 1’ x 8” x 6”D and 30” x 12” x 8”D spalls, respectively. The concrete parapets have vertical

hairline cracks, areas of light scaling and the North parapet has lateral misalignment (1/2") at the pier joints. There is a single aluminum bridge railing on top of the North parapet which has minor scrapes and gouges in the railing and posts. In Span 3 on the North parapet there is a light standard which has anchor bolts that are backed off up to ¼" high. The junction box covers are missing up to 12 of 14 screws but the covers are secure. There are asphaltic plug joints at the abutments and piers. The joint at Pier 1 has uneven/settled areas (1" deep) and a full-length adhesion crack with a maximum opening of 1-1/2" at the right shoulder. The joint at the East abutment has a pothole/gouge (6" diameter x 1"D) in the center lane.

Superstructure: (Rated 6 – Satisfactory)

There are two types of bearings; (1) sliding expansion and (2) fixed. (1) There are sliding expansion bearings with keeper angles welded to the bottom flange at the East abutment and in Spans 1 and 2 at Pier 1. These bearings have areas of light to heavy rust with impacted rust/gaps up to 1/8" at isolated locations. At the East abutment the bearings have light abrasion rust between the bearing plates and random tilted anchor bolts. In Span 2 the bearings for Girders 1 and 2 at Pier 1 have North or South keeper bars broken off. There is a slight skew between the sole and sliding plates for the Girder 3 bearing at Pier 1 in Span 2. In Span 2 the Girder 4 bearing at Pier 1 has a masonry plate that overhangs the pedestal (1" x 1") at the Southeast corner. At 60 degrees Fahrenheit most of the bearings were in expansion mode with isolated bearings in contraction mode. Some bearings have lateral misalignment between the sole and sliding plates up to 7/8". (2) There are fixed bearings at the West abutment and in Spans 2 and 3 at Pier 2. These bearings have areas of peeling paint and light to moderate rust. There are isolated fixed bearings with heavy to laminar rust and impacted rust (1/4" thick) between the bearing plates. At the West abutment the bearings for Girders 1 and 2 have anchor bolts tilted east. In Span 3 the bearing for Girder 2 at Pier 2 has a sheared off anchor bolt. There are eight rolled steel beams in all spans. The girders have areas of peeling paint and areas of heavy to laminar rust at the ends with 3/16" section loss in the top flange. At the piers the girder webs have painted over pitting at random locations with less than 5% loss in the web area. In Span 2 at Pier 2 the web of Girder 1 has less than 5% loss (2.5'L x 3-1/2"H x 1/8"D) in web area over the bearing area. Due to a previous fire incident Girders 5 through 8 in Spans 2 and 3 are covered in heavy soot. At the girder ends at the abutments there is moderate graffiti. At the piers the end diaphragms have heavy rust and ¼" impacted rust at the top flange. At the end diaphragms there are connection bolts with no notable deficiencies. In Span 2 Bay 7 the erection bolts at the end diaphragm at Pier 2 are missing, however the welds have no notable deficiencies. Girders 1 to 6 have partial length cover plates and Girders 7 to 8 have full-length cover plates. The cover plate end welds were found to have no notable deficiencies. There are two incomplete bottom horizontal welds (2" long) at the diaphragm connection to the web stiffener on the North side of Girders 4 and 5.

Substructure: (Rated 6 – Satisfactory)

There is heavy graffiti on the abutment stems. Under Bay 1 the West abutment stem has a 2' hairline crack and a 6" vertical hairline crack in the Girder 1 pedestal. Under Girder 4 the East abutment has an 8" diameter area of moderate scaling. The abutment backwalls have vertical hairline cracks up to full-height and areas of moderate graffiti. The wingwalls have light graffiti and light to moderate vegetation growth. The Northwest wingwall has missing/deteriorated joint filler material for the full-height and the Northeast wingwall has a 1' long horizontal hairline crack. The Northwest cheekwall has a 6" diameter surface spall and a 9" long shallow rebar. The pier caps have vertical and horizontal hairline cracks (1/16" wide), areas of hairline map cracking (3' x 10'), hollow areas (3' x 2') and isolated spalls (full-height x 2' x 3"D) with and without exposed rebar. The pedestals for Girder 1 and 5 at Pier 1 and Girder 6 at Pier 2 have spalls (12" x 8" x 2"D) with no undermining. The pier columns, stems and crashwalls have vertical cracks (1/16" wide) with and without efflorescence, areas of hairline map cracking (8' x 4'), and isolated areas of scaling (27" x 4" x 1-1/2"D). The West face of the stem at Pier 2 has a hollow area (6' x 4') below Girder 2. There is heavy graffiti along the crashwalls and the interface between the original columns and fill in stems has

cracks with efflorescence. The abutment seats and pier caps have light to moderate accumulation of debris.

Bridge No. 01182

Bridge No. 01182 was built in 1962 and rehabilitated in 1980 (Project 0034-0162), in 1991 (Project 0034-0235) and in 2011 (Project 0174-0357). The three span bridge carries Interstate 84 EB over the Housatonic Railroad in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 226'-0" and the curb to curb width is 55'-6". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 55.4 tons.

Deck: (Rated 5 – Fair)

The bituminous concrete overlay has areas of light to moderate raveling, transverse and longitudinal cracks (1/8" wide), and paving seams open up to ½". There are areas of map cracking up to 1/8" wide in the right lane and along the deck joint at Pier 1 there is ¼" wide separation from the concrete headers. The underside of the deck was found to be in fair condition with overall deterioration of 12.8% and a maximum of 19.4% in Span 2. The deck has transverse hairline cracks with and without efflorescence, isolated longitudinal hairline cracks and areas of hairline map cracking with and without efflorescence in 75% of the bay area. There are hollow areas up to 50% of the bay area and several spalls (3' diameter x 2"D) with and without exposed rebar. Some of these hollow areas and spalls in Span 2 are over an out of service railroad and access road. There are some haunch spalls (2' long) and hollow haunches (1' long). The curbs have minor scrapes, rust stains and an average reveal of 1-1/2" on the South side and ¾" on the North side. There is a spall (34"L x 1'H x 8"D) on the North curb over Pier 1. The concrete parapets have vertical hairline cracks up to full-height and areas of light scaling. The North parapet has a hollow area at the East abutment and spalling at Pier 1 (3'L x 10"H x 1-1/2"D) and at Pier 2 (1' x 1' x 2"D). At the East abutment both parapets have lateral misalignment (5/8"). There is a single aluminum bridge railing on top of the South parapet which has minor collision damage and vertical cracks (1" high) on the 3rd and 5th railing posts from the West abutment. In Span 3 there is a light standard on the South parapet with no notable deficiencies. The junction box cover is missing 9 of 14 screws but the cover is secure. There are asphaltic plug joints at the abutments and Pier 2. The joint at the West abutment has a heaved up area (1'L x 2'W x 2"H) in the center lane. There is a silicon expansion joint with elastomeric concrete header at Pier 1 which has no notable deficiencies.

Superstructure: (Rated 5 – Fair)

There are two types of bearings; (1) sliding expansion and (2) fixed. (1) There are sliding expansion bearings at the East abutment and in Spans 1 and 2 at Pier 1. The bearings have areas of peeling paint, areas of light to moderate rust and isolated areas of heavy to laminar rust. Some bearings have impact rust (1/4" thick) between the sole plate and sliding plate. The bearings at the East abutment have anchor bolts that are slightly tipped south. At Pier 1 in Span 1 there is heavy accumulation of sand debris around the Girder 8 bearing. In Span 2 at Pier 1 the Girder 8 bearing has a broken off South keeper bar. At the East abutment there is a gap (1/8") between the sole and sliding plates of the bearing for Girder 8. Some bearings have lateral misalignment between the sole and sliding plates up to ½". (2) There are fixed bearings at the West abutment and in Spans 2 and 3 at Pier 2. These bearings have areas of light to moderate rust and isolated areas of heavy rust mostly at the fascia bearings. At Pier 2 there are random bearings with impacted rust (1/2") between the sole and masonry plates. At the West abutment there are random bearings with tipped anchor bolts. At Pier 2 Span 2 the Girder 2 bearing has an anchor bolt nut backed off 2" and the Girder 6 bearing has a missing anchor bolt. There are eight rolled steel beam girders in all spans which were found to be in fair condition. The girders have areas of peeling paint, areas of light to moderate rust and isolated areas of heavy to laminar rust with less than 1/16" section loss. The girder ends at the piers have section losses (full-height x 1'W x 1/8"D) in the web, mainly at the fascia girders. At Pier 2 in Span 2 Girder 8 has a rust hole at the top of the web behind the bearing. The

maximum section loss in the web for shear is 16.4% and the loss in the web bearing area is 16.4%. At the girder ends the bottom flanges have section losses (3'L x full-width x 1/8"D) and there are isolated areas of heavy rust with section loss up to 1/16" deep in the top flange. Girders 1 and 2 have full-length cover plates and Girder 3 through 8 have partial length cover plates which were found to have no notable deficiencies. In Span 2 at the third diaphragm attachment to the North side of Girder 3 there is a partial length vertical weld (6" long).

Substructure: (Rated 6 – Satisfactory)

The concrete abutment stems have heavy graffiti and full-height vertical hairline cracks with and without efflorescence. The East abutment has spalls (3.5'L x 1'H x 1-1/2") and hollow areas (1' x 18"). At the West abutment the Girder 8 pedestal has a spall (15" x 4" x ¾"D) with exposed rebar. The abutment backwalls have areas of graffiti, full-height vertical hairline cracks with and without efflorescence and spalls along the top (2' x 1' x 4-1/2"D). The East abutment backwall has a 6" diameter hollow area. The wingwalls have heavy graffiti and heavy vegetation growth. The Southeast wingwall has a hollow area (4.5'L x 1.5'H) with a crack and heavy efflorescence. The Southwest wingwall has deteriorated joint filler material and the West end is laterally misaligned ¼" to the south. The Pier caps have areas of light to moderate scaling, vertical and horizontal cracks up to 1/16" wide with and without efflorescence, areas of hairline map cracking (5' x 5'), and hollow areas (4' x 2'). Between the girders there are hollow areas on top of the pier caps. The East face of Pier 1 has a spall (1' diameter x 1"D) under Girder 8 and some pedestals have full-height vertical hairline cracks. The pier columns, stems and crashwalls have vertical cracks up to 3' high with and without efflorescence, areas of hairline map cracking (3' x 15'), hollow areas (2.5' x 1.5') and spalls (2.5'W x 2'H x ¾"D). There is heavy graffiti along the crashwalls and the interface between the original columns and fill in stems has cracks with efflorescence. The abutment seats and pier caps have light to moderate accumulation of debris. At Pier 1 in Span 1 the Girder 8 bearing has heavy debris accumulation around the bearing.

Bridge No. 01183

Bridge No. 01183 was built in 1962 and rehabilitated in 1967 (Project 0034-0126), in 1983 (Project 0034-0153), in 1984 (Project 0034-0198) and in 1995 (Project 0174-0244). The four span bridge carries Westville Avenue Extension over Interstate 84 in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 233'-0" and the curb to curb width is 30'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 30.9 tons.

Deck: (Rated 6 – Satisfactory)

The bituminous concrete overlay has map cracks mostly in the Westbound lane, isolated short longitudinal cracks and light raveling in Span 1. The underside of deck deterioration is 6.4% with a maximum of 7.1% in Span 3. The underside of the deck has transverse and map hairline cracks with and without efflorescence. There is a 6" long shallow rebar in Span 1 Bay 3, a hollow area (5'W x 4"L) at Pier 1 in Span 1 Bay 2 and a spall (4'W x 4"L x 3"D) at Pier 2 in Span 3 Bay 5. Isolated end diaphragm haunches have spalls (full-width x 6"Lx 1"D) and hollow areas (2'W x 4"H). There are stay-in-place forms in Bay 1. In Spans 2 and 3 there is surface rust and efflorescence staining around the weep pipes. At the Northeast corner of Span 4 heavy rust up to 1' diameter surrounds the weep pipes and the stay-in-place form has section loss up to 1/16" deep. Bays 1 and 2 at Pier 1 and the stay-in-place forms have light smoke stains. The granite curbs have minor scrapes and missing sealant between sections of the curb and the sidewalk. The average curb reveal is 6". The concrete sidewalks have full-width transverse hairline cracks and light scaling. The North sidewalk has a hollow area (3' diameter) at Pier 3 and an area (4-1/2"L x 3"W x ¾"D) of moderate to heavy scale along the curb in Span 4. The South sidewalk has an area of heavy scale (7'L x 8"W x 1"D) along the curb in Span 4. The concrete parapets have scrape marks, vertical hairline cracks and all joints have missing sealant. There is an aluminum fence mounted on the parapet that extends 7'-3" above the sidewalk. In the North fence of Span 4 there is an area (4'H x

1'W) of damaged/broken mesh. In Spans 2 and 3 the PVC weep pipes drain onto the travel lanes. The Bay 5 PVC weep pipes in Spans 2 and 4 are not extended below the bottom flange but they do not drain onto the structure. There are fiber optics, gas, electric and telephone utilities which were observed to be in fair condition. For further details see 2016 Inspection Report. There is a longitudinal construction joint in Bay 3 and the joint in Span 4 has efflorescence leakage. The deck joints at the abutments have been paved over and the pavement has reflective transverse cracking up to full-width x ½" wide. The West abutment joint has raveling (2" wide) and the East abutment joint has intermittent short transverse cracks (6' long). There is a compression seal deck joint with concrete headers at Pier 1. The concrete headers have longitudinal cracks and areas of light scale. There is a strip seal joint with concrete headers and stainless steel retainers at Pier 2. The headers have small surface spalls along the edges and light scaling and the strip seal has been filled with sealant. There is a compression seal deck joint with concrete headers at Pier 3. The joint has repaired areas and a 1" long x full-width hole in the seal at the double yellow line. The headers have small surface spalls and light scaling. In the westbound lane the East header is hollow for 16' long x full-width and there is active leakage below Pier 3 in Bay 2.

Superstructure: (Rated 6 – Satisfactory)

There are sliding plate expansion bearings at the abutments, Span 2 at Pier 2 and Span 3 at Pier 2. At 40 to 50 degrees Fahrenheit the bearings were in contraction mode and had normal thermal movement except Bearings 5 and 6 at Pier 2 in Span 3 and Bearing 4 at Pier 2 in Span 2 which were in expansion mode. There are keeper angles mounted to the bottom flanges of the girders and there are full-height cracks in the weld to spacer blocks. Some of the spacer blocks are missing or are resting on the pedestal. Some bearings have impacted rust (1/2" thick) between the keeper angle and the spacer block. In Span 2 at Pier 2 the Girder 3 bearing has a 1" long x 1" wide gap between the sole and sliding plates (<1% loss of bearing area) due to painted over section loss in the sole plate. There is a similar condition between the masonry plate and concrete pedestal of Girder 6 bearing in Span 4 at the East abutment. The fixed bearings have laminated rust due to deck joint leakage. Due to pedestal spall the Girder 5 bearing over Pier 1 is undermined 2'L x ¼"D. The girders have random milling flaws on the edges of the plates and the web. In Spans 2 and 3 the bottom flanges, webs and cover plates are covered in exhaust fumes and smoke stains. Beyond the centerline of bearings the girder web and bottom flange ends have painted over pitting loss (<1/16" deep). The North elevation of Girder 3 web at Pier 3 has section loss (4"L x 3"H x 1/8"D). The North elevation of Girder 2 web at Pier 1 has painted over pitting (full-height x 3"W x 1/16"D) and the web over the bearing has section loss (15"L x 3"H x 3/16"D) resulting is <5% web loss for shear. The diaphragms have isolated areas of light rust. In Bay 3 Span 2 the top flange of the end diaphragm at Pier 2 has a bend (4" x 1" x ½") in the top flange near mid span. In Span 2 a bridge mounted sign was removed thus exposing the web below the anchor plates and causing laminated rust. At the girder ends there are isolated areas of bleeding rust. There are plug welds at the web of the fascia girders to plug the holes created by the utility attachments. These plug welds were found to have no notable deficiencies. Due to collision damage, Span 2 Girder 2 has scrape marks (full-width x 2' long) near mid span. In Span 3 the bottom flange of Girder 3 is in contact with the pedestal.

Substructure: (Rated 6 – Satisfactory)

The abutment stems have random pop-outs, areas of peeling protective coating, hollow areas (17"H x 13"W) and isolated spalls (16"W x 6"H x 2"D) with exposed rebar. The East abutment stem has a 4' long horizontal crack and a 1' high vertical crack. There are a few vertical hairline cracks up to full-height on the backwalls. The Southwest wingwall has a random short shallow rebar. The cheekwalls have horizontal hairline cracks at the base up to the full-width. At the interface with the underside of the parapet the Northwest cheekwall has missing joint filler and sealant up to full-width by 3' deep. The pier caps have hollow areas (5-1/2"W x 2-1/2"H) and spalls (16"L x 9"W x 1"D). At Pier 1 Span 1 pedestals 2 to 5 have corner spalls (full-height x 3"L) with exposed rebar and the spall (25"W x full-height x 6"L) at Pedestal 5 undermines the masonry plate up to 2"L x ¼"D. There is also spalling (8"L x 2"H x 1"D) at Pier 3 Span 4 Pedestal 3. The pier columns have hollow areas (36"H x 22"W), spalls (18"H x 16"W x 2"D) with and

without exposed rebar, shallow rebar up to 2' long, and hollow concrete patches (2'W x 4"H). In Span 2 at Pier 1 and 2 and in Span 3 at Pier 3 the Jersey barriers have spalls (15'L x 1'W x 3"D) with exposed rebar. The pier caps have light to moderate debris accumulation.

Bridge No. 01184

Bridge No. 01184 was built in 1962 and rehabilitated in 1982 (Project 0034-0172), in 1986 (Project 0034-0189) and in 2008 (Project 0174-0339). The single span bridge carries Interstate 84 over Franklin Street in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 116'-0" and the curb to curb width is 118'-0". As provided by the Connecticut Department of Transportation the inventory rating is 56.4 tons.

Deck: (Rated 6 – Satisfactory)

The bituminous concrete overlay has paving seams (1/4" to ½") in both directions with raveling along the seams. There are areas of map cracking (1/4") and numerous spalls and uneven patched areas on the westbound shoulder. The underside of the concrete deck has full depth patches in Bays 1 to 3 that are almost the full-length of the bays. These patches are uneven and offset with some hollow areas. In Bays 14 to 16 there are numerous areas of map cracking with and without efflorescence. Throughout the deck there are random transverse cracks with and without efflorescence. The granite curbs have scrape marks, small surface spalls along the edges, vertical hairline cracks, light scale and pop-outs. The average curb reveal is 3" on both sides. There is a Jersey median with hairline vertical cracks, light scaling and scrape marks. Near the West abutment there is an isolated hollow area (6.5' x 9") at the North side of the median. On the Southside of the median there is a 5' long horizontal crack with efflorescence. The concrete parapets have vertical and transverse cracks across the top, areas of light scale, scrape marks and areas of peeling rub coat. The Southwest parapet has a 2' long hollow area on the bottom over the West sidewalk. The Southeast parapet extension has spalling at the top (2' x 1.5' x 2-1/2"D). All of the PVC weep pipes are extended and working with the exception of one in Bay 13 at the East end which is clogged. There is an underbridge luminaire in Bays 3 and 15. Near the East abutment electrical lines and a fiber optic cable are attached to the girder bottom flanges. There is a disconnected conduit at both ends on the bottom flange of Girder 6. There is a longitudinal construction joint in 9 between the westbound and eastbound roadways. There are two asphaltic plug joints on the westbound side, one joint has 10' of adhesion cracks and the other joint has 3' of cohesion cracks and 14' of adhesion cracks. There are two asphaltic plug joints on the eastbound side, one joint has a 12' cohesion crack and 20' of adhesion cracks and the other joint has 30' of adhesion cracks and several patched areas.

Superstructure: (Rated 6 – Satisfactory)

There are expansion rockers at the West abutment which have light rust on the sole and masonry plates. Rockers 9 and 13 to 18 are in full expansion mode. On bearings 9, 16 and 18 the pintle pins are exposed which is causing a ¼" gap between the masonry plate and the bottom of the rocker pedestal. Bearings 13, 15 and 16 have powdered rust chaffing from the top of the rocker and the bottom of the sole plate. There are fixed rocker bearings at the East abutment which have medium to heavy spot rust. The masonry plate of Bearing 1 has heavy laminar rust. Bearing 4 has powdered rust chaffing from the top of the rocker and the bottom of the sole plate. Some of the anchor bolts are tipped to the west and some of the nuts are not completely tightened. There are a total of 18 girders. The girders have light blush rust on the edges of the bottom flanges, areas of concrete spillage on the girder webs and weld strikes at random locations on the soffit of the bottom flanges and webs. Girder 1 has areas of peeling paint on the top and bottom flanges, rust, and a 2' section of heavy to laminar rust at the East end on the top and bottom flanges. Girder 9 has a plug weld on the web 20' from the East abutment. Girder 18 has 20' of heavy to laminar rust on the top and bottom flange. A few of the erection bolts are missing from the diaphragm connections but are plug welded. There are two transition welds per girder and there are random gouge marks on the edges. There are transverse groove butt welds in the webs that were not ground smooth.

Substructure: (Rated 6 – Satisfactory)

The West abutment has areas of rub coat peeling, mud stains, random spalled areas and hollow areas. At the North end the abutment is tipped to the east 1-3/8" in 21.6' and at the South end the abutment is tipped to the east 13/16" in 14'. The East abutment has areas of rub coat peeling, mud stains, random spall areas and random hollow areas. The West backwall has mud stain from past leakage, hollow areas and numerous spalls with exposed rusted rebar. The East backwall has mud stains from active leakage and numerous surface spalls. The Northwest wingwall has a vertical crack with efflorescence, pop-outs and a joint spall. The Northwest cheekwall has a 4' horizontal crack with efflorescence, a horizontal crack at the top of the cheekwall and map cracks without efflorescence. The Southwest wingwall has two surface spalls with exposed rusted rebar. The Southwest cheekwall has a pop-out, horizontal crack, and some rub coat peeling. The Northeast wingwall has a single spall. The Southeast cheekwall has areas of rub coat peeling, a horizontal crack and the inside face has three separate spalls with exposed rusted rebar. At the East abutment Pedestals 2, 14, 15, 16 and 17 have corner spalls. Pedestal 7 has a vertical crack that runs into the anchor bolt.

Bridge No. 01185

Bridge No. 01185 was built in 1962 and rehabilitated in 1983 (Project 0034-0153), in 1982 (Project 034-0172), in 1986 (Project 0034-0189) and in 2017 (Project 0034-0313). The single span bridge carries Interstate-84 over Kohanza Street in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 70'-0" and the curb to curb width is 128'-7". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 57.7 tons.

Deck: (Rated 6 – Satisfactory)

The bituminous concrete overlay is new since the previous inspection and there are no notable deficiencies. The underside of deck deterioration is 10%. The underside of the deck has areas of hairline map cracking, transverse hairline cracks with and without efflorescence, hollow areas (6" x 6") in Bay 10 mid-span and a spall (1' diameter x 1-1/2"D) with exposed rebar in Bay 13 near the East abutment. The sloped concrete curbs have scrape marks, vertical hairline cracks and edge chipping. The Northwest corner has a spall (1' x 6" x 3"D) and hollow area (3.5' x 1.5') near the West abutment joint. At the Northwest joint there is up to ½" lateral misalignment. The average curb reveal on the left side is 2-7/8" and no curb on the right side due to on-going construction. The concrete Jersey type median has light scaling, vertical hairline cracks, impact scrape, rust stains, horizontal/diagonal cracks up to 3' long x 1/8" wide, and a hollow area (3'L x 1.5'W) on the westbound side. The concrete parapet has areas of light scale, areas of rub coat peeling on the caps, hairline vertical cracks with efflorescence and transverse cracks across the bottom. At the Northeast end there is a spall (40"L x 15"H x 7"D) on the outside bottom corner. There are luminaires at the underside of the deck in Bays 4 and 14, no notable deficiencies were observed. There are electrical conduits which run along both abutments. At the West abutment the conduit is attached to the bottom flange of Girder 4 through 10 and at the East abutment it is attached to Girders 10 through 15. There is a longitudinal construction joint between Girders 9 and 10. At both abutments there are paved over deck joints and no notable deterioration was observed.

Superstructure: (Rated 6 – Satisfactory)

There are sliding plate expansion bearings at the West abutment with steel keeper angles in place at all bearings. The sliding bearings have light to moderate rust. Some of the bearings are misaligned causing bearing plates to be in contact with the keeper plates. At 60 degrees Fahrenheit the bearings are in expansion mode and some bearings have the bronze plate exposed on the East side. There are fixed bearings over the East abutment which have light to heavy rust and some bearings have impacted rust ¼" thick between the plates. At the East abutment the Girder 1 bearing has heavy corrosion on the masonry and sole plates. There are 20 rolled steel girders which have scrape marks, light to moderate

rust and random areas with heavy rust. The girders have areas of section loss on the top of the bottom flange and base of the web, concrete chips and concrete spillage on the webs of several girders. The worst case is the North face of Girder 1 at the East abutment with heavy rust on the top flange and the top of the bottom flange. There is a tear (2-3/4"L x 1"H) on the South edge of the bottom flange of Girder 7. The diaphragms have peeling paint at random locations and minor corrosion. Girders 1 and 18 have full-length welded cover plates, Girders 2 to 17 have partial length welded cover plates, and the new Girders 19 and 20 do not have welded cover plates. There are plug welds in Girders 1, 9 and 18 which have no notable deficiencies.

Substructure: (Rated 7- Good)

The concrete abutment stems have vertical hairline cracks with and without efflorescence, horizontal cracks (2'L x 1/16"W), isolated locations of rust stains, evidence of leakage, pop-outs isolated spalls (1'L x 5"H x 1"D) with exposed rebar and blistered and peeling protective coating. The expansion joint at both abutments has missing joint material between Girders 9 and 10 and is open up to 1.5" at the East abutment. The Northwest and Northeast cheekwalls have spalls (6" diameter x 1"D) and moderate to heavy vine growth. The concrete backwalls have hairline cracks with and without efflorescence, hollow areas (3'H x 8'L at bay 17) with efflorescence, rust stains, evidence of leakage and spalls (2' x 1' x 2"D at bay 17). The reinforced concrete wingwalls have peeling protective coating, random hairline cracks, a few concrete patches and moderate vine growth. The construction joints have loose or missing joint filler and are open up to 1-1/2". There is light debris on the pier seats.

Bridge No. 01186

Bridge No. 01186 was built in 1962 and rehabilitated in 1983 (Project 0034-0153), in 1982 (Project 0034-0172), in 1986 (Project 0034-0189), in 1991 (Project 0034-0250), in 2001 (Project 0174-0293) and in 2008 (Project 0174-0339). The single span bridge carries Interstate 84 over Starr Avenue in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 63'-0" and the curb to curb width is 143'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 56 tons.

Deck: (Rated 6 – Satisfactory)

There is new bituminous concrete overlay since the previous inspection. There is a pothole (1' diameter x 2"D) in the right exit lane near the West abutment. The overall underside of deck deterioration is 9%. The underside of the deck has transverse and longitudinal hairline cracks with efflorescence, areas of map cracking with efflorescence, large patched areas and areas of wetness and discoloration. In Bay 19 there are spalls (2'W x 18"L x 2.5"D) with exposed and debonded rebar. There are two hollow areas (6"L x 10"W) between Girders 18 and 19 over the East sidewalk. There are concrete curbs on the South side which have areas of light to moderate scale, hairline cracks and a spall (10" diameter x 3"D) at the Southwest approach corner. There is a granite curb on the North side with minor scrapes. The average curb reveal is 1-3/4" on the Northside and 5-1/4" on the South side. The median has vertical and transverse hairline cracks. On the top of the median at the South side there is a spall (10'L x 1'H x 5"D) with an adjacent hollow area (5'L x 1'H). On the North side there is a hollow area (30'L x 1'H) offset 1.5" along the top of the median and two spalls (1.5'L x 1'H x 5"D) with exposed rebar. The concrete parapets have areas of light to moderate scale, minor scrapes, areas of peeling rub coat and random vertical hairline cracks with efflorescence. At the East end of the South parapet there is a corner spall (1' x 1' x 6"D). There is a timber noise barrier at the South parapet which has moderate checks and isolated splits. The short weeps in Bays 9, 11 and 20 noted in a previous inspection have been repaired. There is an electrical conduit which runs along the East abutment stem and a 4" diameter conduit attached to Girder 1. On the Westbound side a new asphaltic plug joint has been installed and the deck joint on the Eastbound side has been paved over. Both joints were observed to have no significant deficiencies.

Superstructure: (Rated 7 – Good)

There are sliding expansion bearings at the West abutment which have isolated areas of light rust and areas of impact rust up to 1/8" thick between the sole and sliding plates. There are some anchor bolt nuts that are backed off up to 1" and random anchor bolts are tipped. The bearing plates are laterally misaligned up to ¼". There are fixed bearings at the East abutment which have areas of light rust on the masonry plates. The rolled beams have isolated areas of light rust, areas of peeling paint and a few paint holidays along beam bottom flanges. On Girder 4 there is 2' of light rust along the North edge of the bottom cover plate. All of the bottom flange cover plate end welds were checked and no notable deficiencies were found. There are plug welded bolt holes in the web of Girders 1, 10, 11 and 21 which were inspected and no notable deficiencies were found.

Substructure: (Rated 6 – Satisfactory)

The reinforced concrete abutment stems have vertical hairline cracks up to 7' long, show rebars up to 15' long, random 3" pop-outs, areas of peeling protective coating and silts stains. The West abutment stem has a spall (18"W x 6"H x 1"D) with exposed rebar and an adjacent hollow area (1'W x 3"H) between Girders 13 and 14. The North end face has horizontal cracks (2'L x 1/6"W) with efflorescence and a spall (15"L x 6"H x 3"D) with exposed rebar. The South end face has a spall (1' diameter x 1"D) with exposed rebar. The Girder 7 pedestal has a spall (6"W x 3"H x 1.5"D) with exposed rebar, there is no undermining. The East abutment has isolated spalls (2.5'W x 15"H x 1"D) with exposed rebar and the South face has a spall (6"L x 3'H x 4"D) along the wingwall joint. The backwalls have hairline cracks and shallow surface spalls, some with exposed rebar and mostly between Girders 8 and 14. The East abutment backwall has a full-height vertical crack open 1/8" wide and an area of scale (6'W x 2'H x 1.5"D) between Girders 10 and 11. The wingwalls have areas of vine growth, areas of peeling protective paint and the joints have missing joint fill material with gaps up to ¾". The Northwest wingwall has two spalls (1'H x 6"W x 1"D) and the Northwest cheekwall has a 14" long x 1/16" wide horizontal crack with efflorescence.

Bridge No. 01187

Bridge No. 01187 was built in 1962. The twin cell culvert carries Interstate-84 over Kohanza Brook in Danbury, CT. The total length of the cast-in-place reinforced concrete box culvert is 38'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 57 tons.

Culvert: (Rated 6 – Satisfactory)

The concrete inspection was divided into three categories; (1) ceilings, (2) walls, and (3) floors. (1) The ceilings have areas of honeycombing. The ceiling joints have areas of active leakage, rust stains and efflorescence stains. There are hairline transverse cracks coming off the segment joints. Both ceilings have catch basins through them, located in Section 6 in Cell 1 and Section 18 in Cell 2. Along the edges of the catch basin openings there are spalls (2'-6"L x 6"W x 2-1/2"D) with exposed rebar. (2) The walls have vertical hairline cracks up to full-height. The wall joints have areas of active leakage, small joint spalls and a few random spalls with exposed rusted rebar. On the East wall of Cell 2 there is a large spall (2' diameter) around a 6" C.M.P. In Section 26 of Cell 2 there is a hollow area (2' x 2') on the center wall. (3) In both cells the floors are covered with various amounts of sand and gravel. Both of the headwalls have short vertical and horizontal hairline cracks. There is minor debris accumulation in both cells as well as various sized stones, large rocks and silt. The concrete retaining walls have small surface spalls, scrape marks, graffiti, vine growth and some of the joint material is falling out. The Southwest wall has an 18" R.C.P. with light scale below the pipe.

Channel: (Rated 6 – Satisfactory)

Upstream there is some embankment erosion with tree roots exposed and there are several trees lying across the channel. There is minor trash build-up throughout the channel. There is vegetation up and downstream which is overhanging the channel. There is only flow through Cell 2 with standing water in

Cell 1. The Channel bed is composed of stones of various sizes. At the inlet end in front of Cell 1 there is aggradation with rocks and gravel so only a 4' wide flow is remaining. At the outlet there is encroachment of the West bank into the channel.

Bridge No. 01188

Bridge No. 01188 was built in 1962 and rehabilitated in 1967 (Project 0034-0126), in 1983 (Project 0034-0153) and in 1984 (Project 0034-0198). The two-span bridge carries Madison Avenue over Interstate-84 in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 251'-0" and the curb to curb width is 30'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 43.9 tons.

Deck: (Rated 6 – Satisfactory)

Since the previous inspection the bituminous concrete overlay has been skim coated. There is a 2" wide gap between the overlay and the North curb, heavy raveling along the North curb (length of bridge x 2'W x 2"D) and potholes in raveling (22'L x 10"W x 2"D). The overall underside of deck deterioration is 7% with a maximum of 9% in Span 2. There are stay-in-place forms between Girders 1 and 2 which have no notable deficiencies. The underside of the deck has transverse hairline cracks, areas of hairline map cracking with efflorescence and a few spalls (8"L x 4"W x 1-1/2"D) with exposed rebar. In Bay 3 Span 2 Panel 5 has a hollow area (1.5'L x 10"W) and minor honeycomb (1'W x 1'L). Near the slab support diaphragm the haunched areas have spalls (4'L x 6"H x 4"D) at random locations. There are haunch spalls up to 25' long. The granite curbs have scrapes, missing joint mortar, rust stains, minor chipping along the edges and average curb reveals of 6" on the North side and 5-1/2" on the South side. On the South curb there is a ½" crack adjacent to the West abutment. The North curb has spalls (6" x 7" x ½"D) in both spans. There is settlement of both the Northeast and Northwest approach, 1-1/4" and 1" curb settlement, respectively. The concrete sidewalks have areas of moderate scale, full-width transverse cracks (1/16" wide) and the longitudinal joint sealant between the sidewalk and curb is separated at several locations. At the Northwest corner of the bridge there is a 2" settlement along the sidewalk joint. At the other corners bituminous concrete ramps have been installed. The concrete parapets have vertical hairline cracks up to full-height with efflorescence and minor scrapes. There is an aluminum fence on top of the parapets which has a 1' x 2' hole in the mesh at the Northwest corner and heavy vine growth. There are five PVC weep pipes in Bays 1 and 5 in both spans and the pipes near the pier drain over the roadway below. In Bay 1 there are six 4" diameter telephone conduits which are rusted out and the wires are exposed. In Bay 5 there is a 6" diameter gas pipe and there is a 2" diameter utility conduit attached to the top and bottom flange of Girder 6. There is a longitudinal construction joint in Bay 3 which has minor efflorescence and spalls with exposed rebar. At both abutments the deck joints have been paved over but the overlay has cracks (1" wide), areas of broke and loose bituminous, patches, minor settlement (1/2") and the joint at the East abutment has a pothole (6" diameter x 4"D).

Superstructure: (Rated 7 – Good)

There are expansion bearings at both abutments which have light rust and peeling paint mostly on the masonry plates and pack rust up to ½" between the rockers and the masonry plates. At the East abutment the Girder 1 bearing has an anchor bolt nut with 10% section loss and the bearings of Girders 2 and 3 have missing anchor bolt nuts. At the East abutment, the front corners of the masonry plates overhang the pedestals 7/8" which is the as-built condition. At 70 degrees Fahrenheit the bearings are in neutral and expansion modes and they show signs of normal movement. There are fixed bearings at the pier which have minor pack rust under the anchor bolt nut washers. The steel welded plate girders have areas of moderate to heavy rust and peeling paint. On the bottom flange of random girders there is moderate to heavy pigeon debris. The bottom flange transition welds and cope holes were checked and no notable deficiencies were observed. Due to collision damage there is a gouge (3/4"L x ¼"W x 1/8"D) in the bottom flange of Girder 6 in Span 2.

Substructure: (Rated 7 – Good)

The East abutment stem has a full-height vertical hairline crack and the protective coating is peeling at random locations. At the East abutment the pedestals for Girders 2 and 4 have spalls (3"L x 3"W x ½"D). The East abutment backwall has vertical hairline cracks up to full-height with efflorescence and a spall (8"L x 2"W x 1"D) with exposed rebar. The backwalls have evidence of past deck joint leakage. The West abutment footing is exposed and has a full-height ¼" wide crack under Girder 4 with minor spalling along the crack. Along the wingwalls there is moderate to heavy brush and vine growth and the Northwest wingwall has a spall (1' diameter x 2"D). The concrete pier cap has hairline cracks (18" long), a few pop-outs (3" diameter), and some areas of shallow rebar on the underside of the cap. On the Southeast face of the North column there is a spall (6" diameter x ½"D) and small pop-outs (2" diameter). Along the East face of the North column there is a 16" vertical hairline crack with rust staining. There is light accumulation if debris on top of the pier cap and on the abutment seats.

Bridge No. 01189

Bridge No. 01189 was built in 1960. The three cell culvert carries Interstate-84 over Padanaram Brook in Danbury, CT. The total length of the bridge is 240'-0" and the out-to-out measurement is 34''-0". As provided by the Connecticut Department of Transportation, the 2015 inventory rating is 99.9 tons.

Culvert: (Rated 5 – Fair)

The culvert has eight sections which measure 10' wide x 7' high. The inspection of the concrete is broken into three categories; (1) ceilings, (2) walls, and (3) floors. (1) The ceilings have small spalls, pop-outs with exposed wires, short transverse cracks, longitudinal hairline cracks with efflorescence and random joints are misaligned (1-1/4") and have active leakage. In Cell 1 there is a spall (1'W x 10'L x 3"D) with exposed copper flashing at Joint 7. Cell 2 has a longitudinal crack (22' long) in Section 8. Cell 3 has a longitudinal crack (23' long) in Section 6 and a transverse crack (60" long) with efflorescence in Section 5. (2) The walls have vertical hairline cracks up to full-height, areas of light scale along the waterline, small concrete patches and horizontal cracks in the upper chamfer up to 10' long. (3) The vertical face of the floor at the Cell 3 inlet is exposed 6" high x 3' long. There is a vertical crack in the South headwall above Cell 2 and moderate vine growth. There are areas of light scale on the North headwall. The wingwalls have graffiti, light scale along the water line and spalls (8" diameter x ½"D). There is a fence attached to the Northeast and Northwest wingwalls which is damaged due to fallen tree limbs. The Southwest wingwall has a 15" diameter C.M.P. through the stem and the Southeast wingwall has a R.C.P. through the stem.

Channel: (Rated 5 – Fair)

There is a local scour (5'L x 3'W x 20"D) in front of the Northeast wingwall. The embankments are undercut (up to 5') with tree roots exposed upstream and downstream. There are trees overhanging the channel upstream and downstream. Along the East and West sides there is debris encroaching the inlet. There are sand and gravel islands upstream. There is severe encroachment at the outlet with sand and gravel altering the channel. There is debris on the embankment from past channel clearings. At the inlet there is heavy debris build-up on the nose of the center wall. The flow is mainly through Cell 3 and the encroachment at the inlet and the gravel island at the outlet causes the channel to have poor alignment.

Bridge No. 01190

Bridge No. 01190 was built in 1960 and rehabilitated in 1982 (Project 0034-0172), in 1986 (Project 0034-0189) and in 2017 (Project 0034-0313). The single-span bridge carries Interstate-84 over Tamarack Avenue in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 69'-0" and the curb to curb width is 117'-9". As provided by the Connecticut Department of Transportation the inventory rating is 64 tons.

Deck: (Rated 7 - Good)

In the bituminous concrete overlay there are areas of raveling along the paving seams and some bituminous patches. There are signs of deterioration on the overlay with pothole spall (1.5'W x 1'L x 3"D) in the westbound center lane, raveling (10"W x 1'L x ½"D) in the eastbound center lane, and a depressed patch (1.5'W x 1'L) in the eastbound right lane. The total underside of deck deterioration is 4%. The underside of deck has scattered transverse hairline cracks with and without efflorescence, a few pop-outs, isolated areas of honeycomb (1' diameter x 2"D), areas of map cracking (4' x 4') with efflorescence, and isolated spalls (1' diameter x ½"D). There is an isolated area in Bay 9 with fine map hairline cracks and transverse cracks along the median joint. The median joint is misaligned vertically causing leakage. In Bay 17 the East abutment end haunch is spalled (3'W x 4"L x ½"D). The granite curbs have scrapes, rust stains, and average curb reveals of 1.5" at the left side and 2.75" at the right side. There is a concrete Jersey shape barrier with vertical hairline cracks, light scale, concrete patches, and scrapes. The concrete parapets have vertical hairline cracks that extend across the top with efflorescence and minor scrapes. The north elevation of the median barrier has hollow area (3' x 1') at the east abutment and an area of scale (15'L x 1.5'H x 4"D) with exposed rebar at the West approach. There are PVC weep pipes in bays 6, 8, 10 and 17 with no notable deficiencies. Construction joints in bays 4 and 13 have light efflorescence. Expansion joints have been paved over.

Superstructure: (Rated 6 – Satisfactory)

The West abutment has fixed bearings with the anchor bolts cut and the holes covered with steel plates. The bearing plates have light rust and various fixed bearings have 1/8" pack rust between the plates. Bearing 18 has laminar rust on the masonry plate. The East abutment has expansion bearings with keeper angles. These bearings have light to medium rust on the sole and masonry plates. These bearings show evidence of movement, some are in contraction mode and some are in expansion mode. Girders have areas of peeling paint and light rust, fascia girders have areas of laminar rust, and end diaphragms have light rust. The fascia girders have areas of laminated rust on the bottom flange and lower web. Due to collision damage the North fascia of Beam 1 has gouges up to 2" long x ½" deep on the bottom cover plate edge and bottom flange edge. The fascia beams have peeling paint and areas of laminar rust on the top of the bottom flanges and lower parts of the web. On the South side Beam 1 has cracked welds (4" long) at the second intermediate diaphragm connection. Beams 1, 9, 10 and 18 have plug welds on the interior face at the diaphragm connections and the bolts have been cut flush with the web.

Substructure: (Rated 6 – Satisfactory)

The concrete abutments have vertical cracks, isolated spall/shallow rebar (1'L x 3"W x ½"D), scale at pedestal (full-width x 4"W x ½"D), pedestal spalls (1'W x 1'H x 2"D), spall (2.5'W x 1'H x 2"D) with adjacent hollow areas (up to 11'W x 10"H), signs of past leakage, and concrete patches (8' x 3'). The abutment backwalls have evidence of past leakage, hollow areas (2'W x 1'H), and spalls with exposed rebar (3'W x 2'H x 1.5'D). The wingwalls have isolated hairline cracks (2' long) with efflorescence, pop-outs, and missing joint material (up to 50%) between the cheekwall and the wingwall. The Northeast cheekwall has a 1' long shallow rebar. There are areas of sand and pigeon debris on the abutment seats.

Bridge No. 01191

Bridge No. 01191 was built in 1960 and rehabilitated in 1983 (Project 0034-0153), in 1982 (Project 0034-0172), in 1986 (Project 0034-0189) and in 2008 (Project 0174-0339). The single-span bridge carries Interstate-84 over Great Plain Road in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 60'-0" and the curb to curb width is 117'-2". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 56 tons.

Deck: (Rated 5 – Fair)

The bituminous concrete overlay has been repaved since the previous inspection and there are no notable deficiencies. The underside of the concrete deck is in fair condition. In Bays 2 to 6 and 12 to 16 there are extensive full-depth concrete patching. Most of the patches are poor quality and are uneven with the adjacent deck. The patches have isolated cracking and mortar along the edges. The deck also has hairline cracks with efflorescence and hairline map cracking and spalls (6'L x 4'W x 3"D) with exposed rebar. In Bay 13 there is a spall (2'L x 2'W x 4"D) wit exposed debonded rebar. The granite curbs have minor scrapes, rust stains, chipped edges and an average reveal of 1-1/2" on the South side and 3-3/4" on the North side. There is a Jersey shaped concrete barrier with minor scrape marks, a hollow area (18'L x 1'H) on the North face and an area of heavy scale (10'L x 1'H) on the South face. There is a joint in the concrete deck at the median between Girder 9 and Girder 10. The concrete parapets have vertical hairline cracks across the top face and spalls (8'L x 2'H x 4"D) with exposed rebar on the outside faces. There are PVC weep pipes which have no notable deficiencies. Along the West abutment there are communication wires attached to the girder bottom flanges. Along the East abutment there are electric wires attached to the girder bottom flanges. The asphaltic plug deck joints have been replaced since the previous inspection with no notable deficiencies.

Superstructure: (Rated 6 – Satisfactory)

At the West abutment there are sliding expansion bearings which have been cleaned, painted, and lubricated since the previous inspection. The East abutment has fixed bearings which have areas of light rust. The fascia girders have moderate rust along the bottom flanges. There are isolated beam ends with heavy rust and minor pitting on the bottom flanges and webs. The diaphragm connection bolts have been ground flush to the web on the North face of Girder 1 and 10 and on the South face of Girder 9 and 18. Girder 9 has an incomplete weld between the first diaphragm from the West abutment and the connection plate. Girders 1 to 3 and 17 have gouges on the bottom flange cover plate near the first diaphragm which have been ground smooth.

Substructure: (Rated 6 – Satisfactory)

The abutment stems have hairline cracks, areas of peeling protective coating, spalls (2'L x 1'H x 3"D) with exposed rebar and evidence of past deck joint leakage. The backwalls have isolated hairline cracks and the abutment seats have minor debris. The wingwalls have loose/missing joint filler and moderate vegetation growth. The Southeast wingwall has an area of scale (1'H x 1'-6"W x 3"D) at the top. The Southeast cheekwall has a 6" diameter hollow area and several shallow rebar up to 2' long.

Bridge No. 01192

Bridge No. 01192 was built in 1962 and rehabilitated in 1982 (Project 0034-0160), in 1983 (Project 0034-0153), in 1986 (Project 0034-0189), in 1994 (Project 0034-0262), in 2001 (Project 0174-0293) and in 2008 (Project 0174-0339). The single-span bridge carries Interstate-84 over Rockwell Road in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 49'-0" and the curb to curb width is 119'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 76 tons.

Deck: (Rated 7 – Good)

The bituminous concrete overlay has been repaved since the previous inspection and has no notable deficiencies. The total underside of deck deterioration is 14%. The underside of deck has transverse and map cracks with and without efflorescence and patched areas with shrinkage cracks. The concrete curbs are monolithic with the parapets and have a protective coating. The curbs have scrape marks, vertical cracks, areas of rub coat peeling and a small joint spall at the Northeast corner. The curb reveals are 2-1/2" at the South parapet, 2-3/4" at the North parapet and 3" on both sides of the median. There is a concrete Jersey barrier with a concrete cap that has moderate to heavy scaling, scrape marks, horizontal

cracks at the top, vertical hairline cracks, collision damage at the East approach, hollow areas (14 square feet), and several spalls (8' x 1.5' x 2"D). The reinforced concrete parapets have areas of light scaling, vertical hairline cracks with and without efflorescence, scrapes, areas of rub coat peeling and transverse cracks across the top. There is a single aluminum extruded rail on top of both parapets which has light oxidation and a few scrape marks. There are PVC weep pipes with extensions beyond the bottom girders. In Bays 4 and 14 here are luminaries at the underside of the deck. There is a light standard mounted on the median which has a missing cover and exposed wires at the East approach. Along the bottom flange of Girder 9 and the abutment stems there are galvanized electrical conduits. In Bay 9 at the East abutment the galvanized electrical conduit has a missing junction box cover with exposed wires. The joints at both abutments have been paved over with no notable deficiencies.

Superstructure: (Rated 7 – Good)

The West abutment has elastomeric expansion bearings with minor bulging, light rust on the plates and a gap of ¼" between the elastomeric pad and the concrete pedestal. There are gaps between the sole plate and elastomeric bearing up to 3/16". These bearings are racked to the West and some pads are curled down at the top. There are fixed bearings at the East abutment which have light to moderate rust on the masonry plates and a gap between the masonry plate and the concrete pedestal up to 5/16". There are eighteen rolled steel girders with light rust, minor rolling defects at the web and bottom flange, scrape marks, dents at random locations, and several steel plugs protruding from the soffits at the South stem. The beams have slight negative camber. In the bottom flange of Girder 4 there are 4 drilled holes. Girder 8, 10, 11, 12, and 18 have scrape marks and dent at the bottom of the flanges. There are plug welds on the South fascia of Girder 9, 10 and 18 with no defects.

Substructure: (Rated 7 – Good)

The concrete abutment stems have several patches with shrinkage cracks, pop-outs, light moss growth, evidence of leakage, pigeon debris on the seats, hollow areas (2' x 1'), spalls (1' x 1' x 1'D), and areas of rub coat peeling. The concrete backwalls have vertical hairline cracks with and without efflorescence, concrete patches (2.5' x 1.5'), hollow areas (1' x 1'), and a spall (8" x 7" x 1"D) at the West abutment. In Bay 9 and 10 there is scaling/spalling (full-length x 5"H x 1-1/2"D) at the median. Near Girder 1 there is a diagonal crack in the East abutment backwall. The wingwalls have areas of rub coat peeling, missing joint filler and moderate to heavy vine growth along the wingwalls. The Southeast cheekwall has a spall (3'H x 15"W x 1-1/2"D) with exposed rusted rebar on the inside face. The Northeast cheekwall has a 8" long horizontal crack open up to 1/16" and spall (6"H x 3"W x 1"D) at the inside face.

Bridge No. 01193

Bridge No. 01193 was built in 1962. The twin cell culvert carries Interstate-84 EB over Beaver Brook in Danbury, CT. The total length of the culvert is 38'-0". As provided by the Connecticut Department of Transportation the inventory rating is 36 tons.

Culvert: (Rated 7 – Good)

The culvert is comprised of 9 sections (10'W x 7'-2"H) and the inspection of the concrete is broken into three categories; (1) ceilings, (2) walls, and (3) floors. (1) The ceiling has scattered areas of fine map hairline cracks, a few transverse cracks coming off the joints, some with efflorescence and small spalls along the ceiling joints. There are a few joints that have active leakage. (2) The walls have random full-height vertical cracks, short vertical cracks coming off the weep drains, a few small surface spalls with exposed rusted rebar, a few hollow areas and minor spalls along the joints. The weep drains have iron deposits which are flowing onto the walls. Cell 1 at the inlet has areas of medium scale at the base of the lower chamfer. In Cell 1, Wall 1 has wood embedded at the outlet end and Wall 2 has a spall (5" diameter) with exposed rusted rebar at the inlet end. In Cell 2, Wall 2 has a spall with exposed rusted rebar at the outlet and Wall 3 has wood embedded at the outlet. (3) The floor of Cell 1 is exposed (10"H x

2’L) at the inlet near the center wall, there is no undermining. The floor of Cell 1 has areas of medium scale. The vertical face of Cell 2 is exposed (2” x full-length). The South headwall has heavy vine growth and a few pop-outs. The North headwall has heavy vine growth and scattered fine map hairline cracks with light efflorescence. There is approximately 8” of gravel at the last 50’ in the culvert. The wingwalls have heavy vine growth and light scale. Slight offset at Southwest and Northeast wingwalls, as built condition.

Channel: (Rated 6 – Satisfactory)

Along the Southeast wingwall there is a scour pocket (4’L x 1’W x 1’D) at the inlet end. There is also an isolated scour pocket around the center wall. Both upstream and downstream have undercut embankments with some exposed roots. There is also heavy brush growth, some is overhanging the channel. At the inlet there is a tire embedded in the channel bed and encroachment on both sides from vegetation. There is a gravel island with vegetation downstream and a small section of corrugated pipe in the channel bed. There is a large amount of debris caught on the nose of the center wall, which is restricting flow and causing a scour pocket. The channel has good alignment but is very narrow. At the inlet there are large stones along the embankments.

Bridge No. 01194

Bridge No. 01194 was built in 1962. The twin cell culvert carries Interstate-84 WB over Beaver Brook in Danbury, CT. The total length of the culvert is 32’-0”. As provided by the Connecticut Department of Transportation the inventory rating is 36 tons.

Culvert: (Rated 6 – Satisfactory)

Twin cast-in-place concrete culvert 10’ wide x 7’ high. The inspection of the concrete is broken into three categories; (1) ceiling, (2) wall, and (3) floor. (1) The ceilings have a few surface spalls with exposed rebar. In Cell 1 there are transverse hairline cracks and map cracks at the inlet, most extend from the joint. In Cell 2, Joint 1 has a spall (5’L x 8”W) with exposed copper and vertical misalignment of ¾”. In both cells there are a few joints with leakage. (2) The walls have horizontal and vertical cracks in the upper chamfer and isolated spalls with exposed rusted rebar. In Cell 1, Wall 2 has an area of heavy to severe scale at the lower chamfer (8’ long) and several small spalls with exposed rusted rebar at the inlet. In Cell 2, Wall 2 has several spalls with exposed rusted rebar near the inlet and outlet and a hollow area (1’ x 1’) on the East elevation. (3) The floor of Cell 1 has medium scale and the vertical face at the inlet is exposed 6”. The floor of Cell 2 is covered with 20” of gravel. The headwalls have fine map and hairline cracks, areas of light scale and some vine growth. All of the wingwalls have heavy vegetation growth around the stem. The Northeast wingwall has a spall (3” diameter) with exposed rusted rebar.

Channel: (Rated 6 – Satisfactory)

At the inlet there is a scour hole (20’L x 2’W x 32”D). There is heavy brush growing along the embankments with some overhanging the channel. At the inlet there is encroachment on the East side. Both upstream and downstream the embankments are undercut with some exposed roots. There is only flow through Cell 1. The channel is narrow at both the inlet and outlet.

Bridge No. 01195

Bridge No. 01195 was built in 1962 and rehabilitated in 1984 (Project 0034-0204), in 2008 (Project 0174-0339) and in 2016 (Project 0174-0370). The five-span bridge carries Interstate-84 over Federal Road, Eagle Road, and the Housatonic Railroad in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 292’-0” and the curb to curb width is 51’-9”. As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 47 tons.

Deck: (Rated 5 – Fair)

The bituminous concrete overlay has been repaved since the previous inspection and there are no notable deficiencies. The underside of deck was found to be in fair condition with maximum deterioration in Span 4. The underside of deck has transverse hairline cracks with and without efflorescence, areas of map cracking with and without efflorescence, numerous areas of spalled concrete mostly in Spans 2 and 4 and several hollow areas. Span 1 has haunch spalls (full-width x 3"L x ½"D) at the end diaphragm at Pier 1. Span 2 and 3 had top flange hollow haunches which have been removed since the previous inspection. Span 4 has a spall (full bay width x 2'L x 2"D) with exposed rebar with light rust, hollow areas (2'W x 1'L), and another spall (20'L x 1.5'W x 2"D) along the construction joint. Underside of deck deterioration is 8% with the maximum of 13% in Span 4. The granite curbs have minor scrapes, a few chipped edges, hairline cracks and random locations with deteriorating curb seal. The average curb reveals are 2-3/16" on the North side and 1-3/8" on the South side. At the North curb near Pier 2 there is an isolated spall (10"L x 5"H x 1"D). The concrete parapets have vertical hairline cracks, scrape marks, isolated pop-outs and areas of rub coat peeling. There is a spall (2'L x 6"H x 1"D) in the North parapet near Pier 1 and multiple spalls in the South parapet. In Spans 1 and 4 there are broken weep pipes at the Southwest corner. The weep pipe at the Southeast corner of Span 3 is missing the extension. There is a light standard attached to the North parapet in Span 2 which has no notable deficiencies. The junction box covers on the West and East ends are missing screws. The construction joints have efflorescence, rust and evidence of leakage. The asphaltic plug joints have been repaired since the previous inspection and there is minor raveling throughout.

Superstructure: (Rated 5 – Fair)

There are two types of bearings; (1) bronze plate expansion and (2) fixed curved plate, which were found to be in fair condition. (1) There are bronze plate expansion bearings with steel keepers and spacer bars at the West abutment, Pier 2 in Spans 2 and 3 and at Pier 4 in Spans 4 and 5. The bearings have light to moderate rust, lateral misalignment and show signs of movement. At the West abutment the masonry plate of Bearing 2 is in contact with the keeper angle. At Pier 4 the sliding plate of Bearing 5 is in contact with the keeper angle. (2) There are fixed curved plate bearings at the East abutment, Pier 1 in spans 1 and 2 and at Pier 3 in spans 3 and 4. The bearings have light to medium rust and some bearings have ¼" impacted rust between the plates. There are 9 beams in Spans 1 and 2 and 8 beams in Spans 3, 4 and 5; the beams were found to be in fair condition. The beams have light rust and areas of peeling paint. The bottom flanges have peeling paint and moderate to heavy rust, mostly along the fascia beams. The beam ends have painted over pitting up to 1/8" deep. Beam 1 at Pier 3 has total web loss of 6% and the bottom flanges have pitting in Spans 2 and 4 resulting in <1% section loss. The top flange of Beam 7 has a full-depth tear (3.5"L x 1"W x full-depth) in Span 4. The diaphragms have light rust and some of the stiffener welds are undercut 1/16" deep in Span 5. The perimeter welds at the diaphragm connections to the fascia beams are poor quality. There are numerous cracks in the welds at the diaphragm connection to the web.

Substructure: (Rated 7 – Good)

The spalls and hollow areas in the abutment stems have been repaired since the last inspection. The West abutment has a 3' long vertical crack, an isolated pop-out and a 2' diameter concrete patch. The East abutment stem has a full-height vertical hairline crack, corner spall (3" x 3" x 1"D) and concrete patches (4'H x 3'W). The West abutment backwall has a full-height vertical crack behind Beam 4 and spalls (2'W x 10"H x 4"D) with exposed rebar. The East abutment backwall has a spall (1'W x 10"H x 1.5"D) behind Beam 2 and an isolated pop-out. The Southeast and Northeast wingwalls have spalls (8"H x 2"W x 1"D and 6" x 3" x ½"D) respectively and a 2.5" conduit attached to them. A majority of the pier cap deterioration has been repaired since the previous inspection. The pier caps have minor hollow areas, hairline cracks and rust stains. There is evidence of active leakage on Pier 3 and 4 caps. The pier caps of Pier 2 and 3 have minor spalls. The pier columns have multiple concrete patches (12'H x 40"W) and isolated columns have hairline cracks. At Pier 1, Column1 has a concrete patch (1' x 6") with

efflorescence and a 1’ long vertical crack. There is minor erosion with a run off trench at Pier 2 Span 2 between columns 2 and 3. There is minor debris on the pier caps, the majority is on Pier 4.

Bridge No. 01196

Bridge No. 01196 was built in 1962 and rehabilitated in 1984 (Project 034-0204), in 2008 (Project 0174-0339) and in 2016 (Project 0174-0370). The five span bridge carries Interstate 84 over Federal Rd, Eagle Rd and the Housatonic Railroad in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 296’-0” and the curb to curb width is 52’-9”. As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 45 tons.

Deck: (Rated 5 – Fair)

The bituminous concrete overlay has been repaved since the previous inspection and there are no notable deficiencies. The underside of the concrete deck was found to be in fair condition with 8% total deterioration and a maximum deterioration of 11% in Span 1. The underside of the deck has hairline cracks with efflorescence, hairline map cracking with efflorescence (30’L x 6’W), hollow areas (12’L x 2’W), and spalls (up to full bay width x 1’ x 7”D) with exposed rebar and light rust. Between the diaphragm top flange and the diaphragm haunch there are spalls (1/2” deep) causing gaps (up to 1/16”). In Span 3 there are carbon deposits on the deck over the railroad tracks. The granite curbs have minor scrapes with rust, vertical hairline cracks, a few chipped edges and missing joint mortar. The North curb has a minor spall adjacent to the West abutment joint. The average curb reveal for the south curb is 1-3/4” and 1-1/2” for the north curb. The concrete parapets have vertical hairline cracks with efflorescence, areas of peeling rub coat and a spall (10”L x 3”H x 1”D) with an adjacent hollow area (1’ x 1’) at the North parapet near the West abutment. There is a broken weep in Span 2 on the South side of Girder 10. There is a light standard attached to the North parapet. The junction box covers have missing screws and the bolts and plates have light rust. The construction joints under the deck have efflorescence and rust stains. The asphaltic plug deck joints have been replaced since the previous inspection and there are no notable deficiencies. There is minor raveling in the travel lanes.

Superstructure: (Rated 5 – Fair)

There are expansion bearings at the West abutment, Pier 2 in Spans 2 and 3 and at Pier 4 in Spans 4 and 5. These bearings have light to moderate rust and the fascia bearings have up to ¼” pack rust between the sole plate and the sliding plate and/or between the sliding plate and the masonry plate. Isolated bearings have laminar rust (1/4”) under the masonry plates. The keepers have heavy rust and there are some cracked welds between the keeper and the spacer plates. Isolated bearings have gaps up to 1” between the masonry plate and the pedestal. There are fixed bearings at the East abutment, Pier 1 in Spans 1 and 2 and at Pier 3 in Spans 3 and 4. These bearings have light to moderate rust, laminated rust and the fascia bearings have heavy rust up to ¼” thick between the bearing plates. There are 10 girders in Spans 1 and 2 and 8 girders in Spans 3 through 5. The girders have areas of peeling paint, heavy to moderate rust mostly at the girder ends and the fascia girders have moderate to heavy rust with pitting on the bottom flanges and webs. At the mid span the fascia girders have bottom flange section losses <1% with the worst case of 3% in Span 5. In non-critical areas there are bottom flange section losses up to 5%. Over the bearings there are web section losses up to 2%. There are random mill flaws on the girders (up to 1/16” deep) and isolated gouges. There are carbon deposits on the girders in Span 3. In Spans 2 to 4 there are poor quality plug welds on the fascia girder webs at the intermediate diaphragm connections. Some diaphragm to girder connection welds are poor quality.

Substructure: (Rated 7 – Good)

The abutment stems have vertical hairline cracks, isolated hairline map cracking (3’W x 3’H), and isolated concrete patches. The abutment backwalls have vertical hairline cracks, spalls (2’W x 10”H x 3”D), and

few epoxy coated spalls (2'W x 1'H x 4"D). The wingwalls have isolated concrete patches and scale. The Northeast wingwall has a 1.5' long diagonal crack with efflorescence and rebar protruding out. A majority of the deficiencies in the pier caps and columns noted in a previous inspection have been repaired. The pier caps have concrete patches up to full-width x full-height, vertical hairline cracks up to full-height with efflorescence, isolated hollow areas (30"W x 19"L), and isolated locations with evidence of active leakage. The concrete pedestals have isolated hollow areas and hairline cracks with efflorescence. The concrete pier columns have concrete patches up to full-width x full-height and a hollow area (2'W x 2'H) at Pier 3. There is minor slope erosion at Pier 1 in Spans 1 and 2.

Bridge No. 01197

Bridge No. 01197 was built in 1962 and rehabilitated in 1991 (Project 034-0252) and in 2012 (Project 0174-0357). The two span bridge carries Interstate 84 WB over Still River in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 124'-0" and the curb to curb width is 51'-3". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 56 tons.

Deck: (Rated 7 – Good)

The bituminous concrete overlay has longitudinal and transverse cracks (¾" wide), areas of light raveling, minor wear, an open paving seam (3/4") in the high speed lane and some D-shaped cracks along the West abutment joint. The total underside of deck deterioration is 3% with the maximum deterioration in Span 1. The underside of the deck has transverse hairline cracks with and without efflorescence, a few longitudinal cracks without efflorescence, areas of hairline map cracking with and without efflorescence and a deck end spall (2'L x 6"W x 2"D). The granite curbs have scrape marks, chipped edges and rust stains. The average curb reveal is 3" at the right and ¾" at the left. The reinforced concrete parapets have areas of light scaling, scrape marks and gouges, vertical hairline cracks with and without efflorescence, a corner spall (13"L x 7"W x 2"D) at the Northeast approach and efflorescence stains between the bottom of the parapet and the curb. There is a single aluminum extruded railing on both parapets which has scrape marks, gouges, light rust and a weld crack at the post-base plate connection of the third post. There are PVC weep pipes on the North side. There are four weep pipes with missing extension causing them to drain onto the steel. As a result there is efflorescence and rust stains on the steel girders. There is a junction box at the North parapet with missing screws. There are longitudinal construction joints in Bays 2 and 4 of both spans which have random efflorescence. There are asphaltic plug joints at both abutments and the pier. These joints have exposed aggregate, minor depressed/heaved areas (1/4"), adhesion cracks up to 12' long x 1/8" wide and active leakage.

Superstructure: (Rated 7 – Good)

All of the bearings have elastomeric pads with steel sole plates and keeper plates. There are elastomeric bearings at both abutments which have minor deflection/bulging and light to moderate rust on the plates. A few of the elastomeric pads are slightly deflected to the west at the West abutment and to the east on at the East abutment. At the East abutment the bearing at Girder 1 has heavy spot rust and peeling paint on the masonry plate. There are fixed bearings at the pier which have light to moderate rust, peeling paint and heavy rust on the fascia bearings. Span 1 has 8 rolled steel girders and Span 2 has 9 girders. The girders have light surface rust, minor rolling defects in the web, painted over section loss (1/16" deep) in the web over the bearing and dents (6"L x 2"H) in the top flange in Span 2. The end diaphragms over the pier have bleeding rust. The fascia girders have laminated rust and minor section loss (full-height x 8"L x 1/16"D) on the South face over the pier. In Span 2, Bay 5 Girder 5 has an arc strike in the stiffener (2"L x ¼"D x ½"W) at the middle interior diaphragm. There are some diaphragms with missing erection bolts but welds are in place. In both spans the diaphragm connections to Girder 1 have high strength bolts and no welds.

Substructure: (Rated 6 – Satisfactory)

The abutment stems have vertical hairline cracks, horizontal cracks (3'L x 3/16"W), light scaling, rust stains, light moss growth, evidence of past leakage, hollow areas (3' x 1') with rust stains and spalls (1' x 6" x 2"D) with exposed rebar. The West abutment has moderate to heavy graffiti on the stem and there is a spall (8" x 10" x 1"D) in the concrete pedestal. The abutment backwalls have evidence of leakage, vertical hairline cracks and two full-height cracks (1/8" wide). The wingwalls have vertical hairline cracks with and without efflorescence, light scaling, light to moderate graffiti and moderate vegetation growth. The Southeast wingwall has vine growth in the expansion joint. The concrete pier stem has horizontal and vertical hairline cracks with and without efflorescence, light scaling, light moss growth, hollow areas (5'L x 5'H) with rust stains, spalls (2.5' x 2' x 2"D) with exposed rusted rebar and concrete patches with hairline map cracks. There is moderate scaling along the waterline. There is light debris accumulation on the West abutment seat.

Channel: (Rated 6 – Satisfactory)

There is channel bed aggradation as the channel depth has decreased from 11" to 6". There is minor encroachment with some undermining downstream. Downstream there are several large logs with other debris caught on them. In Span 2 on the East side of the pier there is silt accumulation up to full-length x 6'W x 1-1/2"D. There are trees and brush along the embankment, some overhanging the channel. There is flow through both spans but the channel favors Span 1. The rip-rap abutment slopes are intact with silt covered rip-rap around the pier.

Bridge No. 01198

Bridge No. 01198 was built in 1962 and rehabilitated in 1991 (Project 034-0235), in 1994 (Project 034-0266) and in 2008 (Project 0174-0339). The two span bridge carries Interstate 84 EB over Still River in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 132'-0" and the curb to curb width is 52'-6". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 54.6 tons.

Deck: (Rated 7 – Good)

The bituminous concrete overlay has random longitudinal and transverse cracks (1/4" wide), isolated areas of light raveling, minor wear, an edge pothole (6'L x 1"W x ¼"D) and an open paving seam (1/4") along the high speed lane. A previously noted pothole next to the joint at the pier has been repaired since the last inspection. The total deterioration of the concrete deck is 1.73% with the maximum deterioration in Span 1. The underside of the deck has transverse hairline cracks with and without efflorescence, areas of hairline map cracks with and without efflorescence, a few longitudinal cracks without efflorescence and deck end spalls (8"L x 4"W x 2"D). The granite curbs have random locations of missing/peeling protective coating, scrape marks, chipped edges and rust stains. The average curb reveal is 1-7/8" on the right and 7/8" on the left. The reinforced concrete parapets have areas of peeling protective coat, scrapes marks/gouges, vertical hairline cracks with and without efflorescence, transverse cracks at the top and random efflorescence stains between the bottom of the parapet and the curb. There is a single aluminum extruded railing which has scrape marks, gouges and light rust. The weep drains shown on Project 0034-0 235 were not installed at the time of inspection. There is a junction box with 12 out of 14 missing screws at the South parapet. There are longitudinal construction joints in Bays 2 and 4 in both spans. There are asphaltic plug joints at both abutments and the pier. The joints have exposed aggregate, minor depressed/heaved areas (1/2"), and adhesion cracks up to 15' long x 5/8" wide.

Superstructure: (Rated 6 – Satisfactory)

There are sliding bearings with expansion bronze plates at both abutments except for at Girder 1. These bearings have light rust on the sole and masonry plates and show signs of movement at 80 degrees Fahrenheit. There are fixed bearings at the pier which have moderate to heavy rust on the fascia bearings. The anchor bolts on these bearings have been cut and plated over. There are eight rolled

girders with bottom flange cover plates on Girders 2 through 8. Girder 1 is deeper and newer than the other girders. The girders have light to moderate rust at the top flange (3' long), blush rust at the cover plate, mill flow at soffit (3"H x 1/16"D), and painted over pitting loss (1/8" deep) mostly at the beam end web and bottom flange. There are some areas of re-rusting on the painted over pitting. The bottom flanges of Girder 6 in Span 1 and 2 are in contact at the pier. There is bleeding rust at the end diaphragm over the pier. At random intermediate and end diaphragms erection bolts are missing but welds remain. There are random poor quality welds at diaphragm channel bottom flange to stiffener connections.

Substructure: (Rated 6 – Satisfactory)

The concrete abutment stems have vertical hairline cracks, areas of map cracking (2' x 2') with and without efflorescence, light scaling, rust stains, light moss growth, evidence of past leakage, hollow areas (1' x 1') with rust stains and spalls (14" x 9" x 2"D) with exposed rebar. The West abutment stem has moderate to heavy graffiti. The backwalls have evidence of leakage for joints, vertical hairline cracks, one full-height crack open up to 1/16" wide, hollow area (18" x 1'), and pop-out (4" diameter x 1"D). The wingwalls have vertical hairline cracks with and without efflorescence, light scaling, light to moderate graffiti, isolated concrete patches, areas of hairline map cracking and moderate vegetation growth. The concrete pedestals have isolated vertical hairline cracks and small surface spalls (6" x 4" x 1"D) on the East side of the pier. The pier stem has horizontal and vertical hairline cracks with and without efflorescence, light scaling, light moss growth, hollow areas (8'L x 2'H) with rust stains and spalls (8' x 2' x 2.5"D) with exposed rusted rebar. There are additional spalls (45" x 9" x 2.5"D) under Bay 1 on the West side of the pier.

Channel: (Rated 7 – Good)

There was an increase in channel depth (25" to 28") suggesting minor channel bed scour. Near the West abutment rip rap there is a scour hole (10' x 10' x 2'D) under mid span 1. There is minor undercutting of the channel banks with exposed tree roots. At the outlet end of the pier there is silt build up with two discarded tires. There is also accumulation of silt and debris of tree branches (30'L x 10'W x 2-1/2'D) upstream near the East abutment slope protection in Span 2. Upstream there are trees and brush leaning into the channel. The flow favors Span 1 but there is flow through both spans. There is rip-rap around the pier and on embankments under the bridge at abutments.

Bridge No. 01199

Bridge No. 01199 was built in 1962 and rehabilitated in 1976 (Project 0034-0155), in 1983 (Project 0034-0153), in 1994 (Project 0034-0263) and in 2001 (Project 0174-0293). The four span bridge carries SR 911 over Interstate 84 in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 264'-0" and the curb to curb width is 42'-10". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 50 tons.

Deck: (Rated 6 – Satisfactory)

The bituminous concrete overlay has random longitudinal and transverse cracks, areas of map cracking (1/4" wide), light raveling and moderate rutting along wheel lines. The overall underside of deck deterioration is 7.5% with a maximum of 19% in Span 1. The underside of the deck has transverse hairline cracks with and without efflorescence and areas of map cracking up full-width by full-length. There is a hollow area (7" x 7") in Span 2 of Bay 4, a concrete patch (10" x 10"), and an area of deep honeycomb (1'L x 3'W x 1-1/2"D) with exposed rebar in Bay 6 near Pier 1. The West curb is integral with the sidewalk and the East curb is integral with the parapet. The average curb reveal is 5-1/4" on the West side and 2-1/2" on the East side. There is concrete sidewalk on the West side with transverse hairline cracks up to full-width, areas of scaling (10'L x 1'W x 1"D), and minor scrapes on the edge. The parapets have vertical hairline cracks up to full-height. There is a 5' chain link fence at both parapets which has

areas of peeling paint mostly along the lower portions. The west fence in Span 3 has a post that is tipped 1” outwards and the East fence has a disconnected bottom pipe rail near the north abutment. There are PVC weep pipes in Bay 1 which all extend below the bottom flanges of the girders, except for those at the East overhang, however these pipes do not drain onto the steel. There is moderate rust on the steel supports for the weeps. There is an 8” diameter gas main in Bay 5 with no notable deficiencies. There are two 4” diameter telephone conduits in Bay 6, one is resting on the diaphragm bottom horizontal angle. There are two 6” diameter electrical conduits in Bay 6 which have light rust on the steel sleeves for 15’ long. There are asphaltic plug joints over both abutments which have areas of exposed aggregate, light to moderate raveling and 2-1/2” heaved/depressed areas. The South abutment joint has random adhesion and cohesion cracks up to 5’ long that are open up to 1/8” wide, areas of active leakage, and a pothole (1’L x 6”W x 1”D) with exposed backing plate in the right lane. The North abutment joint has adhesion cracks up to 1’ long x 1/16” wide, a 3’ long x 1” wide sealed cohesion crack in the left shoulder, evidence of past leakage, and depressed sealant due to accumulation of sand.

Superstructure: (Rated 5 – Fair)

There are elastomeric bearings at both abutments and both piers. There are random pads with slight bulging and minor edge gaps below the corners of the bearings due to uneven pedestal surfaces. At Pier 1 the bearing for Girder 1 has pack rust up to 1/8” between the sole and load plates. There are isolated anchor bolts at Pier 1 which are tilted to the north or south. The girders were observed to be in fair condition. All girders have areas of light recurring rust and random torch drilled holes (1-1/2” diameter). In Spans 1 and 4 the fascia girders have painted over pitting (9”L x 4”H x 1/8”D) and section loss in the web ends <5%. The interior girders have web section loss up to 10% for shear (Girder 4). In Spans 2 and 3 the girder web ends have painted over pitting and section loss up to 12% web loss for shear (Girder 4). Some bottom flanges are wavy. At Pier 3 there is bottom flange section loss up to 26.7% in non-critical zones. At numerous locations the diaphragms are missing welds between the underside of the angles/channels and the connection plates. Some random connections have pack rust up to ½”. In Span 2 at an end diaphragm at Pier 1, the bottom horizontal angle is missing welds and erection bolts, the angle can be moved by hand. A few of the bottom flange transition welds were found to be poor quality. The vertical butt welds and bottom flange cover plate end welds were inspected and found to have no notable deficiencies.

Substructure: (Rated 6 – Satisfactory)

The abutment stems have horizontal and vertical hairline cracks up to full-height and some hollow areas with or without cracks and rust stains. At the South abutment the Girder 2 pedestal has a hollow area (full-width x full-height x 12”) that extends across the top for 6”, the Girder 4 and 6 pedestals have spalls (10” diameter x 3-1/2”D) with no undermining of the bearing, the Girder 6 pedestal has a hollow area (1’L x 3”H) adjacent to the spall and the Girder 7 pedestal has a full-height vertical crack that extends 6” across top of pedestal. At the North abutment the pedestals for Girders 1, 4 and 7 have hollow areas up to full-width x full-height. There are areas of active leakage at the South abutment and evidence of past leakage at the North abutment. The backwalls have full-height cracks (1/8” wide) with and without efflorescence. The South abutment backwall has two areas of map cracking (3’ x 1.5’) and the North abutment backwall has a spall (6”L x 31”H x 3”D) with exposed rebar. The southwest and southeast wingwalls have isolated spalls (9”W x 1’H x 2”D) and all wingwalls have light to moderate vegetation growth. The pier caps have areas of light scaling, vertical hairline cracks up to full-height, isolated cracks up to 1’ across the top and areas of hairline map cracking up to full-length x full-height. The underside of the pier caps have full-length transverse cracks, areas of map cracking and a hollow area (22”L x 50”W) on Pier 2. The columns have areas of light scaling, random concrete patches, horizontal and vertical cracks (5’L x 1/8”W) with and without efflorescence and random columns have hollow areas (8’H x 19”W) with or without hairline cracks. At Pier 3 Column 4 has a spall (3’ x 1’ x 3”D) with exposed rebar near the top. Light silt and debris accumulation on abutment seats and light to moderate accumulation of bird debris on pier caps.

Bridge No. 01200

Bridge No. 01200 was built in 1962 and rehabilitated in 1967 (Project 0034-0126), in 1983 (Project 0034-0153), in 1994 (Project 0034-0266) and in 1993 (Project 0174-0208). The four span bridge carries Garella Road over Interstate 84 in Bethel, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 190'-0" and the curb to curb width is 30'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 43 tons.

Deck: (Rated 6 – Satisfactory)

The bituminous concrete overlay has been repaved since the previous inspection. The joints have been paved over and the pavement over Piers 1 and 3 have full-length transverse cracks (3/8" wide). The overall underside of deck deterioration is 8.3% with a maximum of 17.6% in Span 4. The underside of deck has transverse hairline cracks with isolated efflorescence, areas of map cracking with efflorescence, concrete patches, random hollow areas (18" x 12"), random spalls (2' diameter x 3"D) and haunch spalls (10'L x 4"W x 2"D). There are numerous spalls and hollow areas in the deck ends over Piers 1 through 3 (1'L x 4"W x 2"D). The concrete curbs have light scale, edge spalls (6" x 3" x 1"D), and an average reveal of 6" on the West side and 6.5" on the East side. The concrete sidewalks have transverse hairline cracks and light scale. The West sidewalk has random spalls (24"L x 3"W x ½"D). The parapets have vertical hairline cracks with efflorescence, light scale and random shallow rebar. There are two pipe steel bridge rails on the parapets. The railing has light rust with random areas of heavy rust, 1/8" pitting in the rail at the post connections and rail bases. The railings have areas of chipped/peeled paint, there are ¼" gaps between the rail bases and the top of the parapets and the anchor bolts have up to 75% section loss at random locations. There is a steel chain link fence on both sides. In Span 2 the East fence has a 15' long damage area with the bottom rail pushed west and one post missing. There is a 10" diameter gas utility in Bay 5 which has rosebudding and laminated rust on the brackets, rods and nuts. There is also a utility within the West sidewalk. Asphaltic plug joints have been paved over.

Superstructure: (Rated 6 – Satisfactory)

The elastomeric bearing pads have minor bulging and curling along the top edges. At the South abutment in Span 1 the elastomeric bearing for Girder 6 has a 1/16" gap between the elastomeric pad and the concrete pedestal. The fixed bearings have light to moderate rust, up to 3/8" pack rust between the plates and gaps up to ¼" between the masonry plates and pedestals. The anchor bolts on the fixed bearings have been cut and plated over. The girders and diaphragms have areas of light rust throughout and areas of peeling paint. The end diaphragms over the piers have pack rust up to ½" between the top flanges and deck haunches. There are isolated areas of painted over section loss (3/16" deep) on the girder webs over the bearing areas. The worst case of section loss is in Girder 2 at Pier 3 with 8% loss in shear and 30% loss in bearing/buckling. In Spans 2 and 3 the girder bottom flanges have random dents and gouges. Girder 5 has a gouge (3"L x ½"W x 1/16"D) in the bottom flange cover plate due to collision damage. The bottom flange welded cover plates were checked and there were no notable deficiencies. There are random welds at the diaphragm connections which are poor quality. There is lateral misalignment with the top half of Girder 6 between Spans 1 and 2. The Girders in Spans 2 and 3 have slight negative camber.

Substructure: (Rated 6 – Satisfactory)

The abutment stems and cheekwalls have isolated vertical and horizontal hairline cracks and peeling protective coating. The abutment backwalls have vertical hairline cracks up to full-height and there are spalls (1.5'L x 1'H x 3"D) on the top of the North abutment backwall. The wingwalls have heavy vegetation growth and missing joint filler material. The pier caps have areas of light scale, random concrete patches some with hollow areas (10'W x 6"H), areas of map cracking (3' x 2'), random spalls (3'W x 10"H x 2.5"D) with exposed rebar and transverse, horizontal and vertical cracks (1/8" wide). At Pier 3 the Girder 2 pedestal has a spall (1'L x 6"H x 2"D) with exposed rebar. The pier columns have areas of

light scale, random hairline cracks and areas of map cracking. Pier 3, column east face has a 4'L x 1/8"W crack. There are rusted out and partially clogged backfill drains which are disconnected along the slopes of the abutments. There is slight erosion along the South abutment slope. Minor concrete debris on the tops of pier caps.

Bridge No. 01201

Bridge No. 01201 was built in 1962 and rehabilitated in 1983 (Project 0034-0153), in 1993 (Project 0174-0208), and in 1994 (Project 0034-0266). The two span bridge carries Vail Road over Interstate 84 in Bethel, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 175'-0" and the curb to curb width is 33'-6". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 41 tons.

Deck: (Rated 6 – Satisfactory)

The bituminous concrete overlay has isolated cracks (1/8" wide) and map cracks (1/16" wide) covering up to 50% of the overlay area and minor rutting. The total underside of deck deterioration is 6.3% with a maximum of 7.1% in Span 2. The underside of the deck has transverse hairline cracks with efflorescence, areas of map cracking with efflorescence, isolated areas of shallow rebar (16" long), areas of honeycombing, random haunch spalls and spalls (16" diameter x 3"D) with exposed rebar. In both spans there are random hollow haunches up to 7' long over the travel way. There is minor efflorescence along the construction joints. The concrete curbs are integral with the sidewalk and have an average reveal of 7" on the West side and 7-2/3" on the East side. There is a concrete sidewalk on the East side and a concrete safety walk on the West side. Both the sidewalk and the safety walk have transverse cracks, isolated cracks (1/4" wide), and areas of light scale. There is heavy accumulation of debris at the South ends of the East sidewalk. The concrete parapets have light scale, vertical hairline cracks with isolated efflorescence and lateral misalignment of 1-3/4" at the southeast, northwest, and northeast corners. There is a two pipe railing which has areas of peeling paint, moderate to heavy rust and up to ¼" impacted rust under the rail post base plates. There are some missing anchor bolt nuts and there is a sheared off anchor bolt on the West railing. There is a 5' high steel chain link fence mounted on the parapets which has light rust on the posts and rails and two holes (5' x 3') on the East fence at the South abutment. There are asphaltic plug joints at both abutments. The joint at the South abutment has cohesion cracks, a full-length x ½" deep settlement along the joint and a heaved area with cracks (4'L x 1"H) on the East end. The joint at the North abutment has cohesion and adhesion cracks up to 5' long x 1" wide and areas of exposed aggregate.

Superstructure: (Rated 7 – Good)

There are elastomeric expansion bearings at both abutments which have areas of light rust on the sole plates and light laminated rust on the keeper plates. At the South abutment the Girder 1 bearing has an edge gap (1/16") between the top of the elastomeric pad and the sole plate and there is minor cutting. There are fixed sole plate bearings at the pier which have light rust on the masonry plates and impacted rust up to 1/8" under the sole plates. The girders have areas of peeling paint, light to moderate rust, light rust along the top flange edges and laminated rust on the top flange edges at spalled haunch locations. The cover plate end welds have no notable deficiencies. The welded web splices are not ground smooth and there are plug welds in the webs at splice locations which have no notable deficiencies. In Span 1 there are missing welds at the connection of the diaphragm to the connection plate. In Span 2 the bottom flange of Girder 6 has minor scrapes and peeling paint from collision damage.

Substructure: (Rated 6 – Satisfactory)

The South abutment stem has vertical and horizontal hairline crack up to 1/8" wide, an isolated area of map cracking (2.5' x 6"), and areas of painted over graffiti along the base. The North abutment stem has several concrete patches, spalls (1' diameter x 2"D) with exposed rebar and an isolated hollow area (1'

diameter). The Girder 1 pedestal has a spall (9” x 4” x ½”D) with exposed rebar and the Girder 6 pedestal has a corner spall (8” x 2” x 1”D). The abutment backwalls have full-height vertical cracks up to 1/8” wide. The South abutment backwall has shallow rebar (6” long) and the north abutment backwall has an area of map cracks (3’ x 2’), and a hollow area (1’ x 1’). There is heavy vegetation growth along the wingwalls and missing joint filler. The Southwest and Northeast wingwalls have spalls (18” x 8” x 1”D) with exposed rebar and isolated cracks (1/16” wide). The joints between the wingwalls and abutment stems are open up to 1-15/16” at the top and laterally misaligned up to 1-1/2”. The pier cap has vertical and horizontal hairline cracks that extend up to 1’ between Girders 1 and 2. There is a hollow area (4’ x 6”) in Bay 4 and a hollow patch (10” x 6”) in Bay 5 in the North elevation of the pier cap. The pier columns have areas of light scale, vertical hairline cracks and a 1’ long x 1/16” wide vertical crack in Column 1. Along the northeast wingwall there is an isolated erosion area (1’ diameter x 1’D). Moderate to heavy pigeon debris on both abutment seats.

Bridge No. 01202

Bridge No. 01202 was built in 1962 and rehabilitated in 1967 (Project 0034-0126), in 1983 (Project 0034-0153), in 1994 (Project 0034-0266) and in 1993 (Project 0174-0208). The four span bridge carries Old Hawleyville Road over Interstate 84 in Bethel, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 204’-0” and the curb to curb width is 35’-0”. As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 42 tons.

Deck: (Rated 6 – Satisfactory)

The bituminous concrete overlay has areas of map cracking (1/4” wide) up to 80% of the total overlay area. Some of these cracks have been sealed. The total underside of deck deterioration is 7% with a maximum of 11% in Span 4. The underside of the deck has transverse hairline cracks with efflorescence, areas of map cracking with efflorescence, random spalls (18” diameter x 3”D) some epoxy coated, haunch spalls (10’L x 4”W x 3”D) and epoxy coated concrete patches. Piers 1 and 2 have edge spalling along the joints. There are three hollow areas in Span 2 over the I-84 eastbound left shoulder. The concrete curbs have light scale and an average reveal of 8.1” on the West side and 7.3” on the East side. The concrete sidewalk and safety walk have transverse hairline cracks and light sand accumulation. The concrete parapets have vertical hairline cracks with isolated efflorescence, light scale, minor spalls and bleeding rust from the fence posts. There is a two pipe steel bridge rail which has moderate rust, 1/16” pitting losses in the rail at the post connections and rail bases, areas of 3/16” impacted rust between the base plate and the top of the parapets and areas of peeling paint. There is a steel chain link fence which has light rust, vine growth near the North abutment and is unattached to the posts at random locations. The asphaltic plug joints have adhesion cracks up to 6’ long x 1/8” wide, cohesion cracks up to 3’ long and the joint material is heaving up to ½” high over Pier 3.

Superstructure: (Rated 5 – Fair)

The elastomeric bearing pads at the North abutment have minor gaps (1/8”) at the front edges. There is pedestal spalling in Span 3 at Pier 3 which is causing undermining of the bearing pad (3-1/2” x 1-1/8”) at Girder 2 and (2” x 1”) at Girder 3. The fixed bearings have light to moderate rust, heavy laminated rust at Girder 1 and areas of impacted rust up to ½” between the bearing plates. The girders were found to be in fair condition. The girders and diaphragms have areas of light rust. The end diaphragms have gaps up to ½” due to impacted rust between the top flanges and deck haunches. The girder webs have section loss typically less than 2% in shear loss and less than 25% in bearing loss. In Span 1 Girder 5 web has painted over section losses resulting in 6% shear loss and 34% bearing loss. In Span 3 Girder 1 has a 6” scrape mark with rust on the bottom flange. All of the bottom flange cover plate welds were found to have no notable deficiencies. There are random missing/poor quality welds at the diaphragm connections.

Substructure: (Rated 6 – Satisfactory)

The abutment stems have vertical and horizontal hairline cracks and areas of heavy scale on the abutment seats. The North abutment pedestals have spalls (10” x 5” x 2”D) with exposed rebar. The abutment backwalls have vertical hairline cracks up to full-height, map cracking along 40% of the backwall and spalls (1’L x 3”W x 2”D) along the top of the North abutment backwall. All of the wingwalls have heavy vegetation. The pier caps have areas of light scaling, random concrete patches with hollow areas, transverse and vertical hairline cracks with isolated efflorescence, areas of map cracking, isolated hollow areas (5’L x 6”H) and spalls (10” diameter x 2”D) with exposed rebar. The concrete pedestals have corner spalls (1’ x 5” x 2”D) with exposed rebar and there is a 8” diagonal hairline crack at Girder 1. The pier columns have areas of light scaling, minor honeycombing, random horizontal and vertical cracks (3/16” wide), areas of map cracking (3’H x 1’W), and hollow areas (3’H x 1’W). Column 1 has two spalls (1.5’H x 10”W x 3”D) with exposed rebar. There are areas of minor erosion (1’ x 3’ x 6”D) on the gravel slope adjacent to the North abutment.

Bridge No. 01203

Bridge No. 01203 was built in 1962 and rehabilitated in 1967 (Project 0034-0126), in 1993 (Project 0174-0208), and in 1994 (Project 0034-0266). The four span bridge carries Secor Road over Interstate 84 in Brookfield, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 213’-0” and the curb to curb width is 34’-0”. As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 49 tons.

Deck: (Rated 6 – Satisfactory)

The bituminous concrete overlay transverse and longitudinal cracks and areas of map cracking (1/8”). Some of the transverse/longitudinal cracks have been sealed. The total underside of deck deterioration is 3% with a maximum of 10% in Span 4. The underside of the deck has random full depth patches, minor honeycombing, pop-outs, shallow rebar, transverse and map cracking with efflorescence and rust stains. There are hollow areas and spalls (2” deep) in the deck underside, joint undersides, diaphragm haunches and girder haunches. There are random haunch spalls up to 8’ long x 3” wide x 2” deep. The concrete curbs are integral with the safety walks and they have light scaling and random hairline cracks. The average curb reveal is 6-3/8” on both sides. The concrete safety walks have light scaling and random hairline cracks. The concrete parapets have hairline cracks, light scaling, random pop-outs at the northeast corner and a spall (6” diameter x ¼”D) at the top of the southeast parapet. There is a steel two pipe railing which has areas of peeling paint, heavy rust and minor pitting along the posts and pipes. There are sheared off anchor bolts at two posts along the East railing. There are asphaltic plug joints at the abutments and piers. The joint at Pier 3 has cohesion cracks up to 1’ long x 1/16” wide.

Superstructure: (Rated 6 – Satisfactory)

The elastomeric bearings have minor bulging and were in expansion mode at 65 degrees Fahrenheit. The fixed bearings have moderate rust, ¼” impacted rust between the plates and ¼” impacted rust between the masonry plates and pedestals. At Pier 2 Girders 1 and 5 have gaps (3” x 4” x ¼”) between the masonry plate and bearing pad. The girders and diaphragms have moderate to heavy rust. The girder webs have painted over section loss (4”H x 1/16”D) over the bearings resulting in <2% loss in shear and >10% loss in bearing. There are rolling defects and bent stiffeners. The end diaphragms have minor pitting and ½” impacted rust between the top flanges and deck. There is an isolated location of ¼” impacted rust between the Girder 1 top flange and the deck at a haunch spall near Pier 1. Some of the bottom flange cover plate welds are sloppy. The welds between the diaphragm and connection plates and between the connection plates and girder top flanges are sloppy, undercut and/or have voids. The girders appear to be tipped at random locations, mainly near the diaphragm locations.

Substructure: (Rated 6 – Satisfactory)

The abutment stems have short vertical hairline cracks at the top and the North abutment has an isolated pop-out. The abutment backwalls have random spalls (10” x 3” x 1”D) at the top edges and full-height vertical hairline cracks at construction joints. The South abutment stem is tipping between 0 and 1/8”. The wingwalls are partially coated by graffiti but no other deficiencies were noted. The concrete pier caps have pop-outs, hairline cracks, light scaling and concrete patches with hairline map cracking. The Pier 1 cap has a hollow area (2.5’ x 8”) at the south face across the top, a hollow area (3’ x 3’), and a 3/16” wide horizontal crack with bleeding rust and efflorescence at the north face. The Pier 2 cap, below Girder 1, has a spall (3’ x 6” x 2”D) with exposed rebar within a (5’ x 15”) hollow area. The pier columns have pop-outs, light scaling, concrete patches with hairline map cracking, spalls up to 3” deep, and hollow areas (10’H x 4.5’W). Column 3 has hollow areas at Pier 1 and two spalls (2.5’W x 4”H x 1”D) at Pier 2. There is light debris along the pier caps.

Bridge No. 01204

Bridge No. 01204 was built in 1962 and rehabilitated in 1967 (Project 0034-0126) and in 1984 (Project 0034-0198). The four span bridge carries Old Hawleyville Road over Interstate 84 in Newtown, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 208’-0” and the curb to curb width is 34’-0”. As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 45.3 tons.

Deck: (Rated 6 – Satisfactory)

The bituminous concrete overlay has several sealed and unsealed cracks, moderate to heavy wear, random areas of raveling, random depressed patches up to 1”, and scattered potholes (10” x 13” x 1”D). The total underside of deck deterioration is 2% with a maximum of 5% in Span 4. The underside of the concrete deck has transverse hairline cracks with isolated efflorescence, areas of map cracking and random haunch spalls. There are exhaust stains in Spans 2 and 3. Span 3 has two spalls (2’ x 8” x 1”) with exposed rebar and several shallow rebar. The concrete curbs are integral with the safety walks and they have light scale and vertical hairline cracks. The average curb reveal is 7” on both sides. The concrete safety walks have light to moderate scale, light accumulation of sand and a spall (2’ x 2” x ¼”D) in Span 1. The concrete parapets have vertical hairline cracks, rust stains, deteriorated seals, areas of light graffiti, and two spalls (13” x 11” x 2”) on the top of the East parapet and (1’ x 10” x 2”) on the outside face of the East parapet. There is a double steel pipe bridge rail with peeling paint, heavy rust at the pipes and base plates and 1/8” gaps between the base plate and top of parapet. There are random bent anchor bolts and nuts with heavy rust and significant section loss. All of the PVC weep pipes in Span 2 do not extend below the girder bottom flanges, however they do not drain onto the steel. In Spans 3 and 4 there are two 2-1/2” diameter utility conduits attached to the East parapet. At the South abutment the saw and seal deck joint has ½” settlement in the northbound lane. The saw and seal deck joints are deteriorated. There are compression seal deck joints over the piers which are packed with sand and the seals are debonded from the concrete headers at random locations. The concrete headers have transverse hairline cracks and areas of light scale.

Superstructure: (Rated 5 – Fair)

The expansion sliding bearings with steel keepers have heavy rust, especially at the fascias. At random locations the sliding bearings are touching the keepers. Some bearings are misaligned. The fixed bearings have heavy rust at isolated locations and impacted rust between the sole plate and masonry plate at Pier 2 Girder 3. The girders were found to be in fair condition. Girder 6 at Pier 2 has section loss in web (12”L x 11”H x 5/8”D), resulting in 15% shear loss and 84% bearing loss. The bottom flanges and lower portions of the web have peeling paint and heavy rust with negligible section loss. Approximately half of the painted surfaces are rusting. The cover plate end welds were found to have no notable deficiencies. Over Piers 1 and 3 the web ends of Girders 2 through 5 are flame cut to clear the concrete pedestals.

Substructure: (Rated 6 – Satisfactory)

The abutment stems have random areas of graffiti and evidence of joint leakage. The South abutment stem has a full-height vertical crack along the joint and areas of peeling protective coating. The North abutment stem has a spall (6" x 4" x ¾"D) at the Girder 5 pedestal. The abutment backwalls have vertical hairline cracks up to full-height and two spalls (1' x 3" x 1"D) on the North backwall, and one spall (8" x 6" x 2"D) on the South backwall. The wingwalls have deteriorated joint material and heavy vegetation growth. The pier caps have areas of concrete patches and 1/8" wide horizontal cracks with adjacent hollow areas. Pier 2 has hollow areas (3' x 1') and spalls (15" x 7" x 1"D). Pier 3 has a hollow area (10" x 4") at Pedestal 4 and two spalls (2' x 6" x 2"D) with exposed rebar at Pedestal 5. Several pedestals at Piers 1 and 3 have vertical hairline cracks with efflorescence. The pedestals at Piers 1 and 2 have spalls (4" diameter x 1"D) with exposed rebar. The pier columns have minor pop-outs, concrete patches at random locations and two 3' x 1/16" wide vertical cracks at Pier 3 Column 3.

Bridge No. 01205

Bridge No. 01205 was built in 1962. The twin cell culvert carries Interstate 84 over Pond Brook in Danbury, CT. The total length of the culvert is 32'-0". As provided by the Connecticut Department of Transportation the inventory rating is 99.9 tons.

Culvert: (Rated 6 – Satisfactory)

Cast-in-place cell box culvert (7.5' x 14'). The concrete inspection is divided into three categories; (1) ceilings, (2) walls, and (3) floors. (1) The ceilings have areas of severe scale, spalls and hollow concrete. Random joints have short longitudinal cracks with efflorescence parallel to the joint. In both cells the soffit has pop-outs with exposed wire and a few transverse hairline cracks coming off the joints. In Cell 1 joint 1 is spalled (78"L x 6"W x 3"D) with copper trough exposed. In Cell 2 joint 1 is spalled (full-length x 12"W x 3"D) and joint 2 is spalled (6'L x 4"W x 3"D). (2) The walls have several vertical hairline cracks, staining and active leakage at the joints and severe scaling (full-height x 12"W x 7"D). The South end of the wall has fine diagonal random cracks, some are at the top chamfer. In Cell 2 the East wall has a 36" diagonal crack with efflorescence. (3) There are no notable deficiencies in the floors. The concrete headwall has light scale, minor hairline cracks and vegetation overgrowth. There is sand accumulation of 2' in Cell 1 and 3" to 6" in Cell 2. The retaining walls have short hairline cracks, areas of light scale and vertical cracks with and without efflorescence. There is a scour pocket in front of the wingwall. There is a 15" C.M.P. through the stem.

Channel: (Rated 6 – Satisfactory)

In Cell 2 the freeboard is 7'-2" and the water depth is 3". At the southwest end of Cell 1 there is restrictive freeboard of 5'-6". The banks are steep and undercut downstream. There are brush/trees along the embankments with some overhanging the channel. There is encroachment at both ends of Cell 1, resulting in no flow in Cell 1. The channel bed is mostly sand and gravel with soft material along the downstream embankments. At the outlet the channel flows into a swamp. The rip-rap is buried under vegetation and encroaching embankments.

Bridge No. 03915

Bridge No. 03915 was built in 1976 and rehabilitated in 2012 (Project 0174-0357). The single span bridge carries US Route 7 SB over Still River in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 147'-0" and the curb to curb width is 42'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 63 tons.

Deck: (Rated 7 – Good)

The bituminous concrete overlay has longitudinal cracks (1/8" wide) and paving seams that open up to ¼". The total underside of deck deterioration is <2%. The deck underside has random transverse cracks with efflorescence in all bays. At the South end of Bay 1 there is a haunch spall (2'L x full-height x full-depth). The granite curbs have scrape marks, small surface spalls and mortar loss. The curb reveals are 3/4" on the West side and 3-5/16" on the East side. The concrete parapet has vertical cracks which extend through the top of the parapet, and light scale. There is a single aluminum extruded rail which has scrape marks and gouges along the West railing. At the southeast corner the expansion coupler is missing and the sections of rail are misaligned. PVC weep pipes have extensions and are redirected away from steel. There are areas of discolored concrete, dampness, and/or rust stains around weep pipes. Junction box cover has sheared off screw and is missing 5 screws at northwest and southwest wingwall parapets. North abutment asphaltic plug joint has adhesion cracks (7'L x 1"W) and the crack in the right shoulder along curb line is filled with sand and has light vegetation growth.

Superstructure: (Rated 7 – Good)

The bearings were observed to be in fair condition. Abutment 1 has fixed rockers with stainless steel pins. Bearing 1 is in the worst condition with heavy rust, laminated rust and impacted rust on the rocker and masonry plate. Abutment 2 has expansion rockers and most of the bearings have heavy laminar rust (1/4"). Bay 2 and 3 have concrete keeper blocks. All of the rockers have drip pans with heavy accumulation of sand and rust chips on the pans. There are a total of 5 weathering steel welded plate girders. The girders have uniform patina on the webs and areas of light to moderate graffiti. The top of the bottom flange of Girder 1 has 16' of heavy rust with 1/16" deep section loss at the edge. Girder 2 has heavy rust on the top of the bottom flange and 2" high along the web. Girder 5 has small mill flaws between the 2nd and 3rd intermediate diaphragms. Areas of light to heavy sand and/or bird debris accumulation on girders. There are random horizontal lateral bracing connections missing erection bolts at gusset plate connections but the plates are welded.

Substructure: (Rated 7 – Good)

Abutments stem have moderate to heavy graffiti and deck joint leakage. The South abutment stem has a 5"L x 7"H x ½"D spall with exposed rebar and a hollow area (16"L x 12"H) under Girder 2. The North abutment stem below Girder 3 has several hollow areas (72"L x 26"H) and spalls (13"L x 8"H x 1"D) with exposed rebar. The abutment backwall has silt stains on the face. The North abutment backwall has a concrete keeper block in Bay 3 with a hollow area (full-width x 10"). The northeast, southwest, and southeast wingwalls have light to moderate graffiti on the face and vine growth. Both abutment seats and drip pans for the bearings have light to moderate accumulation sand, concrete chips, and rust chips.

Channel: (Rated 7 – Good)

There are steep embankments on both sides with undercutting up and downstream. There are some exposed roots. Both upstream and downstream brush and trees are overhanging the channel. The flow favors the North side. Sand/gravel island (40'L x 25'W x 6"H) upstream channel near bridge mid-span with light vegetation growth. Small to medium size stones at the abutment foreslope along the river on the North side.

Bridge No. 03916

Bridge No. 03916 was built in 1976 and rehabilitated in 2011 (Project 0174-0357). The single span bridge carries US Route 7 NB over Still River in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 150'-0" and the curb to curb width is 42'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 69 tons.

Deck: (Rated 7 – Good)

The bituminous concrete overlay has longitudinal and transverse cracks (1/8" wide), D-type cracks at the South abutment joint (1/2" wide), and open paving seams (1/2" wide) with light raveling. The total underside of deck deterioration is <1%. The underside of the deck has transverse hairline cracks up to 4' long with and without efflorescence, overhang spalls (1'L x 4"W x 1"D) with exposed rebar and a hollow area (1' diameter) on the West overhang near the North abutment. The granite curbs have minor scrape marks, chipping along the edges and a spall (6"W x 10"H x 2"D) with exposed rebar on the North curb. At the South abutment joint the West curb has old transflex left in place. The average curb reveal is 3" on the West side and 1-11/16" on the East side. The concrete parapets have areas of light scaling, vertical hairline cracks with and without efflorescence and minor scrape marks. There is a single aluminum extruded bridge railing which has random minor scrapes. All of the PVC weep pipes extend below the girder bottom flanges. In Bay 1 there are areas of discolored concrete/rust stains around the weep pipes. There is a lighting standard on the East parapet with no notable deficiencies. There are asphaltic plug joints at both abutments. The joint at the South abutment has 12' long x 2" wide adhesion cracks. Evidence of joint leakage at random locations.

Superstructure: (Rated 7 – Good)

There are weathering steel expansion rocker bearings at the South abutment. The rockers, masonry plates and anchor bolts have heavy laminated rust (1/4") and all bearings have evidence of movement. There are weathering steel rocker fixed bearings at the North abutment. The masonry plates have heavy laminated rust. Both fixed and expansion bearings have drip pans with light to moderate accumulation of rust and debris. The weathering steel girders have a uniform coat of patina and areas of light to moderate graffiti near the abutments. On the top flange of Girder 1 there is a 4' long section of laminated rust in Bay 1. Near the third intermediate diaphragm Girder 1 has areas of light laminated rust (4' long). There is a 13" long milling flaw in the bottom flange of Girder 4 between the first and second intermediate diaphragms from the North abutment. Bays 1 and 4 have horizontal lateral bracing with gaps up to ¼" between the lateral bracing and gusset plate. There are random horizontal lateral bracing connections missing erection bolts. On the girders and/or lateral bracing connections there are areas of light to heavy accumulation of sand and bird debris. The girder bottom flange transition welds and gusset plate to girder web connection welds were found to have no notable deficiencies. The lateral bracing connection welds have several locations with up to ¼" pack rust and partial length cracks.

Substructure: (Rated 7 – Good)

The abutment stems have areas of moderate to heavy graffiti throughout and evidence of past leakage. The abutment backwalls have silt stains from past deck joint leakage. The North abutment backwall has random hollow areas (18"W x 36"H) and a spall (16" diameter x 1-1/2"D) with exposed rebar at the West end. There are concrete wingwalls with masonry facing which have heavy vegetation/vine growth. The southwest and northwest corners have deteriorated grout fill between the stem and masonry wingwall up to full-height. There is light to moderate accumulation of sand, concrete chips and rust chips on the abutment seats.

Channel: (Rated 7 – Good)

There are steep embankments with soft sand on both sides. The North embankment has areas of small to medium size rip-rap. Both upstream and downstream the channel banks have areas of minor undercutting with and without exposed tree roots. At the South channel bank there is a tree branch below the bridge. Trees and brush overhang the channel. Along the South bank the upstream channel has sand aggradation (40'L x 6'W x 18"H) along the channel bed with light vegetation growth and a tree branch. Under the bridge near the mid span the downstream channel has a sand/gravel island (40'L x 25'W x 6"H) with light vegetation growth. Small to medium size stones at the abutment foreslope along the river of the North side.

Bridge No. 03919

Bridge No. 03919 was built in 1975 and rehabilitated in 2011 (Project 0174-0357). The single span bridge carries US Route 7 SB over US Route 202 in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 161'-0" and the curb to curb width is 42'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 75 tons.

Deck: (Rated 7 – Good)

The bituminous concrete overlay has paving seams open up to ½". In the low speed lane the paving seam has minor segregation and intermittent longitudinal cracks. Adjacent to the asphaltic plug joint on the North end there is a bituminous patch (2' diameter). The underside of the deck has scattered transverse hairline cracks with and without efflorescence and a spall with exposed rebar and adjacent hollow area over the roadway. The granite curbs have isolated hairline cracks, minor scrape marks, chipped edges and voids (1' x 1' x 2"D) at Joint 1. The curb reveals are approximately 1"-3" on the East side and 2" to 3" on the West side. The concrete parapets have vertical hairline cracks some with efflorescence, transverse cracks across the tops and efflorescence stains between the curb and the parapet. At the northeast there is a hollow area in the parapet extension with cracking at one post. There is a single aluminum extruded rail with a few scrape marks and contact at the second joint. The asphaltic plug joints were installed in 2011 as part of Project 0174-0357. Joint 1 has 20' of adhesion cracks open up to ½" along the South approach and an additional 20' of adhesion cracks. Joint 2 has 12' of adhesion cracks.

Superstructure: (Rated 7 – Good)

The South abutment has expansion pot bearings. For some bearings the piston has heavy neoprene shavings squeezing out at the base and Teflon squeezing out at the top. The bearings have heavy rust and a few bearings have impacted rust between the stainless steel plate and the sole plate. On the keeper blocks a few of the Teflon rub strips are peeling off. The North abutment has fixed pot bearings. There are areas of light to medium rust and there are heavy neoprene shavings squeezing out around the base of the piston. Bearing 3 has powdered rust chaffing out around the piston. There are five curved plate girders which have faded paint, chaulking and areas of light spot rust along the edges of the bottom flanges. The South end of Girders 3, 4 and 5 have up to 5' of laminar rust on the bottom flanges. On the West edge of the bottom flange of Girder 1 there are a series of flaws/tears 9' from the centerline of bearing. Girders 4 and 5 have a small dent on the bottom flange. The lateral bracing connection are missing several erection bolts but the connections are welded. The bottom flange transition welds, gusset plate connection welds and lateral bracing connection welds have no notable deficiencies.

Substructure: (Rated 7 – Good)

The South abutment stem has two hollow areas, a few vertical cracks and stains. The North abutment stem has a few vertical cracks, stains and a spall (3'L x 17"H x 1"D) with exposed rusted rebar. The concrete backwalls have random vertical cracks and stains. There are U-shaped wingwalls which have random hairline cracks, heavy vegetation and graffiti covered with concrete paste. There is some bituminous debris on the South abutment bridge seat.

Bridge No. 03920

Bridge No. 03920 was built in 1975 and rehabilitated in 2011 (Project 0174-0357). The single span bridge carries US Route 7 NB over US Route 202 in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 162'-0" and the curb to curb width is 42'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 78.6 tons.

Deck: (Rated 7 – Good)

The bituminous concrete overlay has paving seams that open up to ½" and intermittent longitudinal and map cracks. The underside of the concrete deck has several transverse cracks, some with efflorescence. In Bay 3 the South end has an area of delamination and potential spall. The granite curbs have scrapes, rust stains, chipped edges and a void (1' x 1' x 2"D) at Joint 1. The curb reveals are approximately 1-1/4" to 2" on the West side and 2-1/2" to 3-1/2" on the East side. The concrete parapets have vertical hairline cracks some with efflorescence, scrape marks and areas of light to medium scale on the caps. There is a single aluminum extruded rail which has a few scrape marks and gouges. All of the rail joints are in contact except for one joint on the West side; on the West side there is a 4" piece of rail missing. There is a light pole (#18-34) on the East parapet which is in contact with the railing and has a missing access cover. Junction box cover on the East side is missing screws. The asphaltic plug joints were installed in 2011 as a part of Project 0174-0357. The joint at the South abutment has 15' of adhesion cracks opened up to ¾" along the South approach and an additional 24' of adhesion cracks. The North abutment joint has areas of exposed aggregate.

Superstructure: (Rated 7 – Good)

The South abutment has expansion pot bearings which have areas of medium to heavy rust. For some bearings the piston has heavy neoprene shavings squeezing out at the base and Teflon squeezing out at the top. Bearing 4 has laminar rust between the sole plate and the stainless steel surface resulting in some distortion. The keeper have some Teflon rub strips peeling off. The North abutment has fixed pot bearings which have areas of medium to heavy rust. There are elastomer shavings squeezing out of the piston. Bearing 5 has a 2" long crack in the weld connecting the steel keeper bar. There are five curved plate girders which have areas of spotty rust and areas of flaking laminar rust along the edges of the bottom flanges. Girder 1 has a small dent on the bottom flange and 1' of pitting/heavy rust on the top of the bottom flange. Girder 3 has 10' of heavy rust on the top of the bottom flange. Girder 5 has several dents (1"L x 3/16"D) on the bottom flange. The lateral bracing connection are missing several erection bolts but the connections are welded. The bottom flange transition welds, gusset plate connection welds and lateral bracing connection welds have no notable deficiencies.

Substructure: (Rated 7 – Good)

The South abutment stem has a few vertical cracks (1/8") and hollow areas below Girder 3 and 5. The North abutment has a few vertical cracks and a hollow area (2' x 2') below Girder 3. The abutment backwalls have a few vertical cracks and mud stains. The North abutment backwall has a spall (2' x 1' x ½"D) with exposed rebar behind Girder 5. There are U-shaped concrete wingwalls which have isolated hairline cracks, areas of light scale, areas of honeycombing and heavy vegetation. There is debris from joint installation on the south abutment seat and around bearing 5.

Bridge No. 05261

Bridge No. 05261 was built in 1962 and fully replaced in 1983 (Project 0034-0162). The two span bridge carries Old Ridgebury Road over Interstate 84 and ramps in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 276'-0" and the curb to curb width is 54'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 28 tons.

Deck: (Rated 7 – Good)

The bituminous concrete overlay was found to be in poor condition. There are map cracks (3/4" wide) throughout, paving seams that open up to 1.5" and numerous potholes. In the right shoulder of the northbound lane there are 8 potholes (3'L x 1'W x 1-1/2"D). In both travel lanes there are numerous potholes (1' diameter x 1.5"D) near the North abutment deck joint. The total underside of deck deterioration is 3% with a maximum of 4% in Span 2. The underside of the deck has areas of hairline map cracking with efflorescence and transverse hairline cracks with efflorescence. There is a spall (1' x 3" x

2”D) in Span 1 at the North abutment. There is a hollow area (6” diameter) around a weep in Span 2 near the South abutment. The granite curbs have random scrapes, rust stains on the East side and vertical hairline cracks on the West side. The average curb reveal is 7” on the East side and 4” on the West side. There is a concrete median with non-mountable curbs. These curbs have scrape marks, small chips, the southeast curb is broken in half and the steel plate header at the northwest curb has a 6” crack. There is a concrete sidewalk on the East side only which has random transverse hairline cracks, minor accumulation of sand debris and an area (20’L x 2”W) of concrete deterioration along the joint between the sidewalk and the curb in Span 2. The concrete parapet has vertical hairline map cracks with and without efflorescence. There is an aluminum mesh fence which has a missing bolt connection between the panel and the vertical post resulting in misalignment of the panel. There are short weeps in Span 2 near the South abutment and Span 1 near the North abutment; all weeps drain clear of the structure. There are light standards on both parapets. There are six 5” diameter electrical conduits in Bay 2 and one is disconnected at the North abutment. There is one 18” diameter water line in Bay 4, one 12” diameter gas line in Bay 7 and eight 4” diameter PVC telephone conduits in Bay 8. The telephone conduit is disconnected with exposed wires and pull cord at numerous locations. There is a strip seal deck joint at the North abutment which has a steel extrusion in the northbound lanes, a section separated from the concrete header and sand accumulation. The concrete headers have a few transverse cracks. There is a paved over deck joint at the South abutment which has been repaved since the previous inspection. This joint has cracks up to 1” wide across the full-width of the roadway and depressed/uneven pavement up to 1” deep.

Superstructure: (Rated 7 – Good)

There are rocker bearings at the abutments. Three of the bearings at the North abutment have impacted rust (3/16” thick) between the rocker and the masonry plate. There are fixed bearings at the pier which have isolated backed off anchor bolt nuts. There are drip pans placed underneath all the bearings and the drip pan under Girder 10 at the South abutment has a crack. There are ten weathering steel plate girders. The girders have isolated areas of heavy laminated rust on the lower webs, with negligible section loss. The worst locations occur in Girder 2 at the North abutment and in Girder 10 at the bolted splices due to the heavy laminated rust on the bottom flange and bearing stiffeners. In Span 2 there is a bolted splice with a short bolt and a nut with section loss. In the utility bays the utility support plates have been cut 3” high from the bottom flanges and the welds remain in place. At a few locations there are gaps between the lateral bracing and connection plates up to 1/8”.

Substructure: (Rated 7 – Good)

The abutment stems have a few pop-outs and vertical hairline cracks. The concrete abutment backwalls have isolated hairline cracks. The Northeast, Northwest, and Southeast wingwalls are displaced from the abutments. All wingwall joints are open up to 1” and joint filler material is falling out. The wingwalls have vegetation growth. The pier cap has isolated vertical hairline cracks and the pier columns have short vertical hairline cracks below Girders 4 and 5. There is an area of erosion (4’ diameter x 1’D) on the Northwest wingwall embankment. There is sand on the north abutment seat.

Bridge No. 05437

Bridge No. 05437 was built in 1962 and rehabilitated in 1980 (Project 0034-0162). The twin cell culvert carries Interstate 84 over Brook in Danbury, CT. The total length of the culvert is 13’-0”. As provided by the Connecticut Department of Transportation the inventory rating is 34 tons.

Culvert: (Rated 6 – Satisfactory)

From 1’ above the water line to 2’ above the water line there is missing asphalt coating with heavy corrosion and pitting from 1’ above the water to 1’ below the water. There is corrosion in the nuts of the bolts above the water surface with 10% section loss. There are missing bolts causing water infiltration.

There is deformation in the crown (6” to 12”), a 2’ long area of water infiltration in the East side and a 2-3/4” gap in the top springline seam in the West side. There is a 9” diameter and 3” diameter tree grown over the culvert outlet which comes into contact with the culvert along the South elevation. There is sediment accumulation inside the culvert, up to 1.5’.

Channel: (Rated 6 – Satisfactory)

There are minor changes in the mud line (up to 0.4’) since the previous inspection. The upstream edge of the culvert floor is no longer undermined. There is minor erosion on the downstream embankments. The embankments are well vegetated. There is sediment accumulation up to 1.5’ at the outlet of the culvert. Twenty feet upstream from the inlet the channel turns 90 degrees. At the inlet the rip-rap is sparse. The downstream slope protection is rip-rap embedded in concrete.

Bridge No. 05462

Bridge No. 05462 was built in 1987 and rehabilitated in 2014 (Project 0174-0364). The two span bridge carries US Route 7 Ramp 47 over Sugar Hollow Road in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 416’-0” and the curb to curb width is 24’-0”. As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 51 tons.

Deck: (Rated 7 – Good)

The bituminous concrete overlay has several longitudinal and transverse cracks (1/2” wide) primarily in the shoulders. The overall underside of deck deterioration is 2% with a maximum of 2.4% in Span 1. There are SIP forms under the deck within the girders which have no notable deficiencies. The underside of the deck has transverse cracks, some with efflorescence. The concrete overhangs have transverse hairline cracks and a spall (6” diameter x 1”D) in Span 2. There are sloped granite curbs along both parapets which have minor scrapes and chipped edges. The average curb reveal is 2-7/8” on the South side and 2-1/4” on the North side. The concrete parapets have vertical hairline cracks extending over the top some with efflorescence and minor spalls (6”L x 3”H x 1”D). There is a chain link fence on both fascias. Near the West abutment there is a disconnected lower rail on the South fence. The North deck overhang has short weep pipes, none are draining onto the structure. There are junction boxes along the North parapet with missing 8 out of 10 screws on the covers. There are new compression seals with elastomeric headers at both abutments. At random locations the joint material has settled up to 3”. There is active deck joint leakage at both of the abutment stems.

Superstructure: (Rated 7 – Good)

There are expansion pot bearings and fixed pot bearings at the pier. All of the bearings have peeling paint and light rust. At the pier bearings the pedestals have been chipped away due to hollow areas resulting in minor undermining of the base pots. The superstructure has two welded steel box girders which have areas of peeling paint, minor surface rust and gaps (1/4”) between the bottom flange and the splice plates. The interior box girders have areas of peeling paint and light construction debris. The exterior diaphragms have random peeling paint. Both exterior and interior diaphragms have loose erection bolts. The bottom flange transition welds have no notable deficiencies. In Span 2 at mid span there is a small area of collision damage on the bottom flange which has been painted over.

Substructure: (Rated 7 – Good)

Both abutment stems have isolated vertical cracks, hairline map cracking and solid sounding concrete patches at the West abutment. The concrete pedestals have vertical hairline cracks, hollow areas (3’L x 4”H) along the masonry plate and a spall (3’L x 4”H x 2”D) at the Girder 2 East abutment. At both abutments the concrete slope protection has minor settled areas with some vegetation growth. The concrete backwalls have minor vertical cracks, spalls (1’H x 6”W x 1”D) and signs of active leakage. The

concrete wingwalls have vertical hairline cracks and minor vegetation growth. The concrete pier has hairline cracks. There is an area (2'L x 6"H x 1"D) of concrete sawcut at the pier near Girder 1. At the pier both pedestals have chipped away at their edges causing minor undermining of both masonry plates, causing up to 2% loss of bearing at Girder 2. At both abutment stems there is minor construction debris.

Bridge No. 05463

Bridge No. 05463 was built in 1987. The single span bridge carries US Route 7 SB over Park Avenue in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 143'-0" and the curb to curb width is 64'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 63 tons.

Deck: (Rated 7 – Good)

The bituminous concrete overlay has areas of map cracking (1/4") and longitudinal paving seams open up to ¼". The overall underside of deck deterioration is 3%. The underside of the concrete deck has transverse cracks with isolated efflorescence in all bays and a damp area in Bay 3. The granite sloped curbs have minor scrapes and rust stains. The average curb reveal is 2-1/4" on the West side and 2-3/4" on the East side. The concrete parapets have vertical hairline cracks with efflorescence that extend across the cap, areas of scale (1/4"D), and minor impact scrapes. All of the PVC weep pipes extend below the girder bottom flanges. There is a light pole mounted on the West parapet. There is an under bridge luminaire in Bay 4. The electric junction box covers are cracked and have missing screws. The asphaltic plug deck joints have adhesion cracks up to full-length x 1" wide and a 2' cohesion crack at the South abutment joint.

Superstructure: (Rated 7 – Good)

There are expansion rocker bearings at the South abutment which have light rust on all masonry plates. Bearing 1 has heavy rust on the masonry plate. The longitudinal welds on the East side of Bearing 8 and West side of Bearing 1 have heavy rust. There are fixed rocker bearings at the North abutment which have minor areas of peeling paint. Bearings 1 and 8 have heavy laminated rust and the anchor nut at Girder 8 is tilted east. The welded steel plate girders have areas of peeling paint with exposed primer on the bottom flange. The web and bottom flange of Girder 8 has graffiti, several small dents and gouges. The bottom flange transition welds and gusset plate connection to web welds have no notable deficiencies. There are wind bracing gusset plate details in Bays 1 and 7.

Substructure: (Rated 7 – Good)

The South abutment stem has areas of light scale (5'H x 3'W) and Pedestal 8 has shallow rebar. The North abutment stem has a hollow area (1'H x 1'W) under Girder 1, a 2' vertical crack with rust stains and evidence of leakage. All of the cheekwalls have horizontal hairline cracks. The abutment backwalls have evidence of past leakage with efflorescence, vertical hairline cracks and missing joint material. The wingwalls have horizontal hairline cracks up to 3' long and the Southwest, Northwest, and Northeast wingwalls have moderate vine growth. The slope protection in front of both abutments have missing mortar at random locations, areas of light scale and deteriorated blocks.

Bridge No. 05772

Bridge No. 05772 was built in 1987. The single span bridge carries US Route 7 NB over Park Avenue in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 145'-0" and the curb to curb width is 56'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 52 tons.

Deck: (Rated 7 – Good)

The bituminous concrete overlay has cracks and areas of map cracking (1/4”), some cracks have been previously sealed. The overall underside of deck deterioration is 4%. The underside of the deck has transverse cracks with isolated efflorescence, random 2’ diameter concrete patches and two surface spalls at the West overhang and at the South abutment. The granite sloped curbs have scrapes, rust stains, and 5/8” lateral misalignment at the Southwest approach. There is a void (1’L x 2”W x 2’D) between the curb and pavement at the Southwest approach. The average curb reveal is 2-1/2” on the East side and 2-1/4” on the West side. The concrete parapets have vertical hairline cracks, scrape marks, transverse cracks across the top and a spall (2’L x 8”H x 1”D) with exposed rebar in the East parapet with an adjacent hollow area. All of the PVC weep pipes extend below the girder bottom flanges. There is a light pole mounted on the East parapet and an under-bridge luminaire in Bay 3. There is a junction box cover with missing screws and a junction box cover that is cracked. The asphaltic plug joints have full-length adhesion cracks which are open up to 1”.

Superstructure: (Rated 6 – Satisfactory)

There are expansion rocker bearings at the South abutment which have areas of light to moderate rust on the masonry plates and pack rust (3/16”) between the rocker and masonry plates. There are fixed rocker bearings at the North abutment which have areas of light rust on the masonry plates. Bearing 1 has heavy rust on the masonry plate. The welded steel plate girders have areas of peeling paint with exposed primer on the bottom flanges. Girder 1 has 3’ of heavy rust on the top of the bottom flange. Girder 7 has 40’ of heavy rust on the top of the bottom flange and along the web base. The East face of Girder 7 has section loss in the web (12’L x 1”H x 1/8”D) and section loss in the bottom flange (12’L x 2”W x 1/16”D), calculated to be <1% near mid span. There are hand rails welded to all girder webs and random gusset plates have pigeon debris. In Bay 1 one of the gusset plate connections at Girder 2 has a loose erection bolt. There are lateral bracing connections in Bays 1 and 6. The lateral bracing connection plates are fillet welded to the lower girder webs in the tension regions.

Substructure: (Rated 6 – Satisfactory)

The South abutment stem has a spall (2’ x 2’ x 1”D) with exposed rebar, an adjacent hollow area and shallow rebar at Pedestal 3. Under Girder 7 there are three hollow areas (2’ x 1’), an area of scale (7’H x 2’W x ½”D), and a spall (16” x 10” x 1.5”D) with exposed rebar. Under Girder 1 there is a hollow area (8” x 3”) in the pedestal and three spalls (10” x 8” x ½”D) with exposed rebar in a hollow area (2’ x 3’) in the North abutment stem. Under Girder 7 there is a hollow area/crack (full-width x 1’L) in the pedestal and a spall (3’ x 2’ x ½”D) with exposed rebar with efflorescence/rust stains. There is a horizontal crack in both the Northeast and Southeast cheekwalls. Additionally the southeast cheekwall has a hollow area (6” x 6”). The abutment backwalls have evidence of past leakage, mud stains and vertical hairline cracks with rust stains. The southwest wingwall is laterally misaligned ½”. The southeast wingwall has heavy vine growth. The northwest wingwall has an area of shallow rebar (8”L x ½”D), areas of scale, vine growth, light graffiti and a spall (16” x 1’ x 1”D) with rust stains. The Northeast wingwall has areas of scale and hairline cracks with rust and efflorescence. There is block slope protection in front of both abutments which has missing mortar at random locations. On the South abutment slope at Girders 1 and 2 a block has settled up to 2.5”. The South abutment seat has light accumulation of pigeon debris and concrete chips.

Bridge No. 05773

Bridge No. 05773 was built in 1987. The single span bridge carries US Route 7 over Wooster Heights Road in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 139’-0” and the curb to curb width is 40’-0”. As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 52 tons.

Deck: (Rated 7 – Good)

The bituminous concrete overlay has no notable deficiencies. The overall underside of deck deterioration is 1.4% due to the presence of random transverse cracks with efflorescence. There are sloped granite curbs which have scrape marks and rust stains. The concrete parapets have vertical hairline cracks with efflorescence that extend across the top, areas of peeling protective coating and vegetation growth at the base. All of the PVC weep pipes extend below the girder bottom flanges. In Bay 2 there is an under-bridge luminaire. There is a junction box located on the East parapet that is missing several screws. There are asphaltic plug deck joints which have no notable deficiencies.

Superstructure: (Rated 7 – Good)

There are expansion rocker bearings at the South abutment which have areas of peeling paint, debris under the rockers and heavy laminated rust on the masonry plates. There are concrete chips and spillage on the bearings and there are random anchor bolts which are slightly tipped. There are fixed rocker bearings at the North abutment which have peeling paint and heavy rust on the masonry plates. The welded plate girders have areas of peeling paint with moderate rust. There are impact gouges up to 1/8" deep on the bottom flanges of Girders 4 and 5. There are loose erection bolts at random gusset plate connections. There are horizontal lateral bracing plates welded to the girder webs in tension zones which have no notable deficiencies. The bottom flange transition welds have no notable deficiencies.

Substructure: (Rated 6 – Satisfactory)

Both abutment stems have vertical and hairline cracks with efflorescence and hollow areas (2'H x 2'W) with spalls and exposed rebar. Isolated pedestals have diagonal hairline cracks and minor pop-outs. The abutment backwalls have vertical hairline cracks up to full-height. The North abutment backwall has a spall (1'H x 1'W) behind Girder 1. The wingwalls have no notable deficiencies. The cheekwalls have surface spalls with exposed rebar and hairline cracks with efflorescence. The concrete blocks on the North slope have areas of scale and voids with missing mortar. The concrete blocks on the South slope have areas of settlement up to 1" between the slope and the abutment stem.

Bridge No. 05909

Bridge No. 05909 was built in 1986 and rehabilitated in 2014 (Project 0174-0364). The two span bridge carries US Route 7 Ramp 048 over Sugar Hollow Road in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 426'-0" and the curb to curb width is 24'-0". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 81 tons.

Deck: (Rated 6 – Satisfactory)

The bituminous concrete overlay has areas of light raveling, minor rutting and transverse, longitudinal and map cracks (1/8" wide). The overall underside of deck deterioration is 19% with a maximum of 20% in Span 2. There are stay in place (SIP) forms inside the box girders which have no notable deficiencies. This area of the concrete deck is concealed and therefore the condition was not evaluated. The underside of the deck between the box girders and the deck overhangs has a few full-width transverse hairline cracks with efflorescence and extensive areas hairline map cracking. There are sloped granite curbs with minor scrapes and rust stains. The average curb reveal is 2-1/8" on the South side and 2" on the North side. The concrete parapets have vertical hairline cracks up to full-height with isolated efflorescence, scrapes and areas of light graffiti. On the South parapet there is a traffic sign which has a crack. Along the North deck overhang there are short PVC weep pipes. There are a few broken weeps flush with the underside of the deck leaving drip stains on the concrete. In Span 1 there is a short weep draining onto the top flange of Girder 1. There are light standards on the top of the South parapet in Span 1 near the pier and in Span 2 near the abutment. The junction box cover is missing screws. The light standard in Span 2 has a loose hand hole cover which is secured with tape. The asphaltic plug joints have been

replaced with compression seal joints since the previous inspection. In the North shoulder there are 3' tears in the East and West compression seal joints which are leaking onto the abutments.

Superstructure: (Rated 7 – Good)

There are expansion pot bearings at both abutments which have peeling paint and light rust on the piston, sole and anchor plates. There are fixed pot bearings at the pier which have random locations of spotty light rust. There are two curved welded steel box girders in both spans which have peeling paint and light rust at random locations. Near the ends there is pigeon debris in the box girders. At the top and bottom connection of the diaphragm over the pier there is a ¼" gap between the horizontal gusset plate and the outside face of the box girder. The diaphragms and cross-frames have areas of peeling paint with light rust and light abrasion/bleeding rust at connections. In each span there are bolted splice plates. At a few locations there are gaps up to 1/8" between the bottom flanges and the bottom flange splice plates. In Span 1 there is a 2' long poor quality weld between the top flange and web of Girder 1. The transverse full penetration groove welds at the top and bottom flanges in tension regions were evaluated and there are three locations of minor weld flaws.

Substructure: (Rated 6 – Satisfactory)

Both abutment stems have hairline cracks up to full-height, areas of hairline map cracking (2'H x 1'W), hollow areas (8'H x 2'W), random patches (6'H x 3'W), and spalls (2'W x 1'H x 2"D) with exposed rebar. The abutment stems have signs of active leakage on the North end. The concrete pedestals have vertical hairline cracks up to full-height with efflorescence. There is light debris accumulation on the abutment seats. The abutment backwalls have vertical hairline cracks with efflorescence and signs of active leakage. The wingwalls have hairline cracks (8' high) and areas of hairline map cracking (3'L x 1'H). There is missing joint filler and vegetation growth at the expansion joints. The pier wall has a few isolated vertical cracks (2' high) and exposed mire mesh. The concrete pedestals at the pier have hairline cracks and spalls (2'L x full-height x 4"D). In front of both abutments there is concrete slope protection. Adjacent to the face of the West abutment the slope protection has an area of settlement (30'L x 4'W x 2"D), vegetation growth, missing joint mortar and broken concrete blocks. There are areas of light accumulation of debris on the top of the east and west abutment seats.

Bridge No. 06569

Bridge No. 06569 was built in 2009. The single span bridge carries US Route 7 SB over Wooster Heights Road in Danbury, CT. The bridge consists of a reinforced concrete deck with a steel superstructure. The total length of the bridge is 143'-0" and the curb to curb width is 39'-4". As provided by the Connecticut Department of Transportation the inventory rating for an AASHTO HS20 loading is 61.9 tons.

Deck: (Rated 7 – Good)

The bituminous concrete overlay has isolated cracks. The total underside of deck deterioration is 4% due to transverse cracks and areas of map cracking. There are sloped concrete curbs which have scrape marks and vertical hairline cracks. The average curb reveal is 2" on both sides. The concrete parapets have vertical hairline cracks with efflorescence, transverse hairline cracks across the top, minor scrape marks, areas of peeling rub coat and a 6" long gouge in the Southwest extension. On the West fascia there is a broken PVC weep drain. There is a light pole on the West parapet and an under-bridge luminaire in Bay 3. The asphaltic plug deck joints have no notable deficiencies.

Superstructure: (Rated 8 – Very Good)

The elastomeric bearing pads have no notable deficiencies. On Girder 3 there is an area of scraped paint on the bottom flange at the north end. On Girder 5 there is a scrape mark on the bottom flange near the bolted field splice. The bottom flange transition welds have no notable deficiencies.

Substructure: (Rated 7 – Good)

Both abutment stems have vertical hairline cracks. Mortar was used to plug the stem from tie locations. This mortar has minor cracks and delaminated areas. The concrete slope protection has areas of vegetation growth.

Appendix B – Historic Ratings and Projected Deterioration

Predicting Future Conditions Methodology

In order to develop future condition rating predictions for the planning year 2037, a rational methodology is utilized which combines both historical ratings and individual bridge attributes. Below is a detailed description of the procedure developed for this purpose.

BASE CURVES

Base curves are generated based on the historical rating data to estimate the rate of deterioration for the main components of the structures. The condition ratings are available dating back to 1992. To create a larger data set for more accurate and uniform statistical analysis, the rating data is combined for all the bridges per their functional group established in this report (I-84, Over I-84, Route 7, and I-84 Culverts). These condition ratings are plotted for each year creating a series of points showing the component's state at any point in this available historical period. Statistical trend lines are added to develop a best-fit "curve" showing the average historical deterioration of the main structural components of the entire group. Below is key information for the base curves:

- The base curves establish a statistically significant basis for the estimated future condition ratings
- The combined historical data for the entire bridge group are used to develop a linear average of bridge deterioration in terms of condition ratings of major structural components
- The base curve functionality groupings are determined by the road crossing which mostly align with the construction year and Annual Average Daily Truck Traffic (AADTT). Any variation in the bridge grouping is incorporated by applying adjustment factors to the base curve, as described below. This is to accurately represent the deterioration of a grouping of structures.
- Due to significant increases in ratings from rehabilitation projects on a few structures, the pre-rehabilitation data points were excluded from the analysis to avoid inaccurately skewing the data (purpose is to model the natural deterioration of the structure without intervention)
- Equations from the base curves are trend lines generated from Excel and are in linear form ($y = mx + b$) with a slope and a y-intercept point that are then adjusted for each individual bridge (see "Customizing the Curves" discussion below)
- It is important to note that the base curve development, and condition rating predictions in general, are rational estimates which are limited by the historical rating data available, the relatively subjective nature of the rating determination based on individual inspector perspectives, and inherent variability in component deterioration rates.

CUSTOMIZING THE CURVES

The second consideration in producing the future bridge condition predictions is customizing the base curves for each individual bridge's structural component ratings (deck, superstructure, substructure, and culvert). There are certain attributes or factors that are known to affect the rate of deterioration of bridge components and several are selected for the structure groups based on applicability and local experience.

The main factors used to determine the influence on each structure are the specific factors (deck protection, feature under, etc.) varying by the structural component, if the bridge is a simple span or continuous span structure, restart curve shifts at condition rating jumps, and the consistency of the historical ratings. These adjustments assist in taking the base curves for the bridge groups and modifying each to best represent the individual bridge and create a more accurate condition rating prediction. Each individual adjustment is listed below with a description, reason for its use, range of adjustment, and applicability of the adjustment.

AADTT Adjustment Factor:

This slope factor is necessary to accurately adjust the bridge curve's slope based on the truck traffic effect on the deterioration of the bridge. Bridges with a higher AADTT have more wear and ultimately deteriorate quicker. To determine this factor the single lane AADTT for each bridge is divided by the average AADTT for each bridge grouping category (I-84, Over I-84, etc.). Larger AADTT values divided by the average will produce adjustment factors greater than 1; which generate a steeper slope, simulating the faster deterioration. The range of this factor is limited to 0.8 to 1.2 so as not to overestimate its effect on the overall estimated future rating in certain extreme cases. A bridge's AADTT adjustment factor is used for each structural component: the deck, superstructure, substructure, and culverts.

Deck Protection Adjustment Factor:

The deck protection adjustment factor represents rebar that is or is not epoxy coated. This is necessary to account for the epoxy coated rebar extending the deck life; this is shown in the NYSDOT Deck Deterioration Model (Figure 6). A slope factor of 0.9 is used if the rebar in the deck is epoxy coated, as it would deteriorate at a lesser rate and flatten the curve's slope. A slope factor of 1.1 is used for rebar that is not epoxy coated, showing a more rapid deck deterioration. This is applicable for deck ratings for each bridge group (excluding the culverts).

Feature Under Adjustment Factor:

The feature under the structure is used to adjust the curve for the superstructure and the substructure. When there is a roadway underneath the structure the deterioration is accelerated due to the salt spray used in de-icing operations compared to a bridge over a non-salt water body or railroad which will not be subjected to the higher corrosive environment. An adjustment factor of 0.9 is used to flatten the curve if the feature under the bridge is not a road, as the salt spray does not influence the condition of the superstructure or substructure. For cases where the bridge spans a road the adjustment factor of 1.1 is used to model a more accelerated deterioration. The feature under slope adjustment factor is used for the I-84 and Route 7 bridge groups; this factor is not used in the Over I-84 grouping of bridges since all of the structures cross over a roadway by definition and do not have a varying feature under. The accelerated deterioration for these bridges should be accounted for in the base curves.

Simple or Continuous Bridge Adjustment Factor:

This adjustment factor takes into account the deterioration of a simple span structure versus a continuous span structure. A simple span bridge has more joints and therefore more potential leakage and deterioration than a continuous span bridge. The bridges that are continuous span are given a slope adjustment factor of 0.9 as the superstructure and substructure should deteriorate at a slower rate. The simple span bridges are given a factor of 1.1 representing the accelerated deterioration.

Condition Rating Shift or Rehabilitation Reset Adjustment:

Another influential characteristic for each bridge is how recently a deck, superstructure, or substructure was rehabilitated or has a condition rating shift of two ratings or greater. This is important to account for as it influences the future prediction curves by having an upward shift in the condition ratings. The curves of structural components (deck, superstructure, and substructure) that recently had a condition rating shift are reset to more accurately predict the deterioration and future

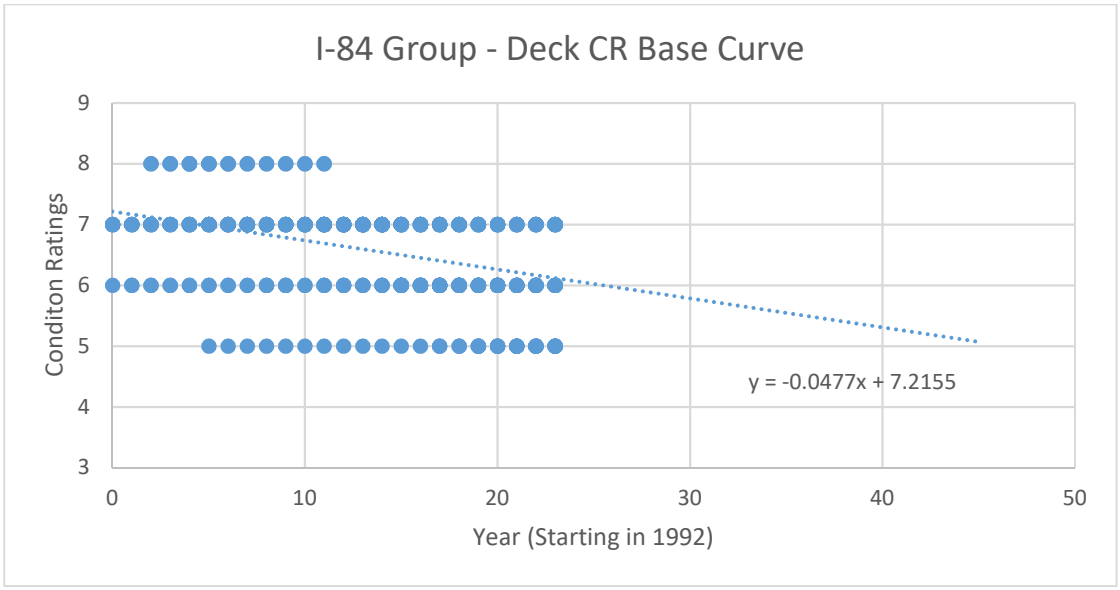
condition. This condition rating shift or rehabilitation reset curve adjustment approach is used for each structural component for all groups.

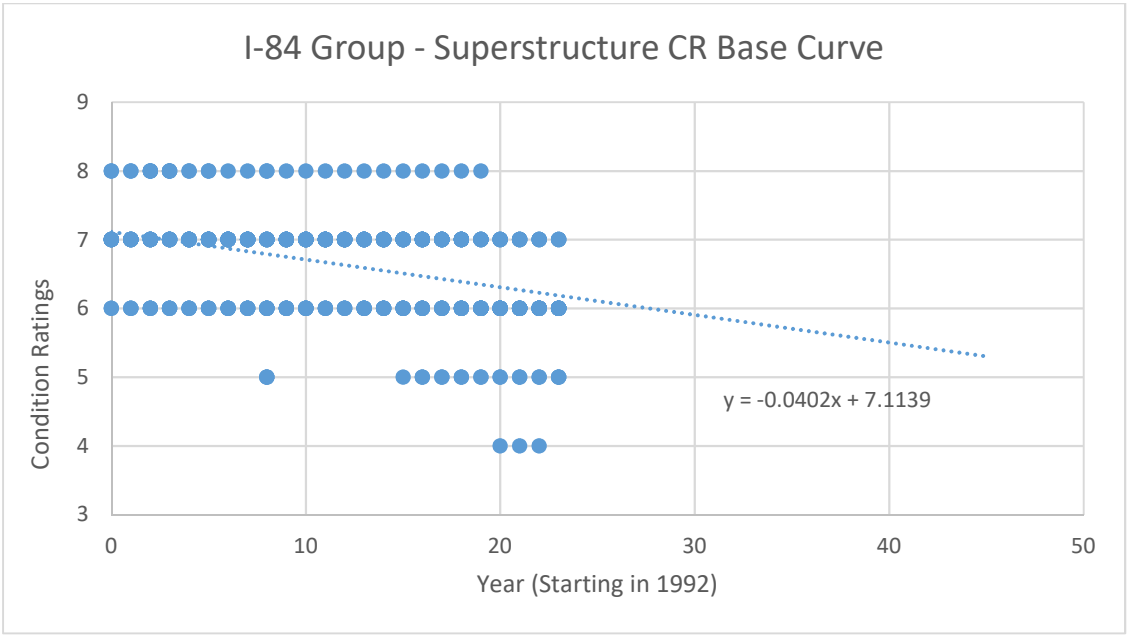
Consistency Adjustment Factor:

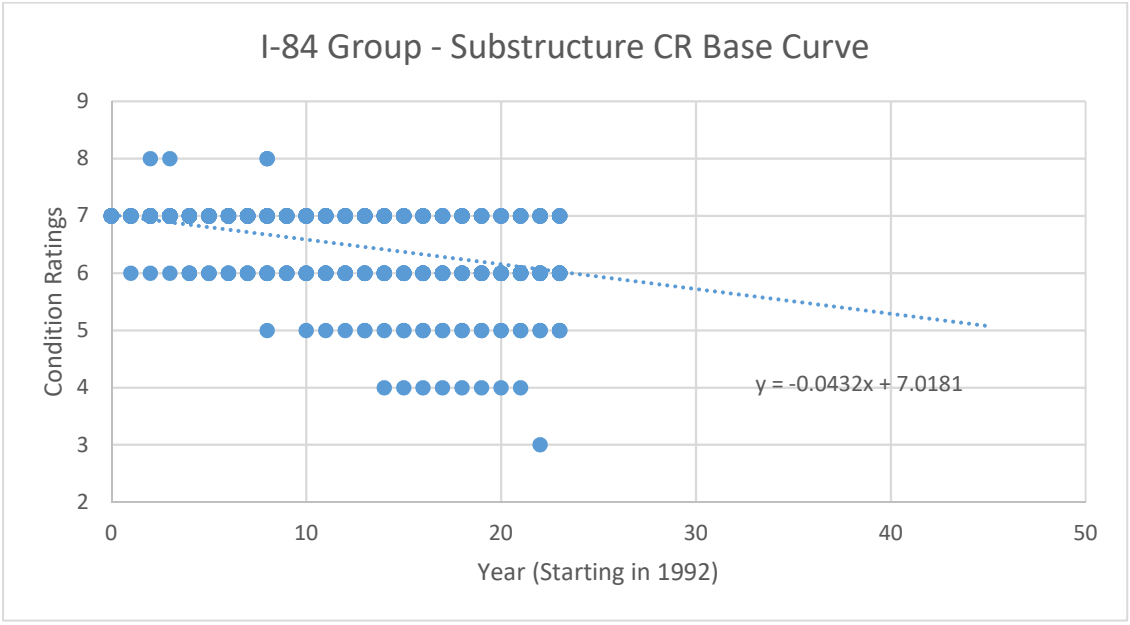
This slope adjustment factor is used to modify the curve (flatter or steeper slope) depending on the historical individualized data of the bridge. In certain cases, after all of the individualized slope adjustment factors described above are incorporated into the base curve, the curve still needs a modification to the slope to make it complement with the bridge's historical condition rating data. This slope adjustment factor is used as an alteration to account for the consistency of the ratings (or lack thereof) for all structural components in each group. In this report the factor ranges from 0.7 to 3.0 depending on the historical ratings and the use of engineering judgement to create a best fit line, while incorporating the base curve and other slope adjustment factors. A consistency adjustment factor less than one, which creates a flatter slope, is used in a scenario where the rating has remained constant for a significant period of time, but the structure has not had a rehabilitation. A consistency adjustment factor greater than one, which produces a steeper slope, is used when the rating has dropped rapidly or has fluctuated with each inspection.

Intercept Adjustment:

This adjustment does not influence the slope, but rather shifts the entire curve vertically. This adjustment is necessary for when the structural component (deck, superstructure, substructure, or culvert) has a base curve higher or lower than the individual bridge historical ratings. This is used sparingly as a final modification when needed to produce rational future prediction results. When the individual bridge has ratings much higher than the generated adjusted base curve, the curve intercept is increased to shift the curve into a position where the future prediction rating is logical based on the bridge's historical condition ratings. When the bridge has ratings a lot lower than the adjusted base curve, the curve intercept is decreased to shift the curve into a position where the future prediction rating is rational based on the bridge's historical ratings. Shifting the intercept is the final method used to adjust each bridge's curve and is ultimately based on engineering judgement. After all of the above conditions and adjustments are considered then this intercept adjustment is used.


I-84 Group - Deck CR Base Curve
Conditon Ratings
Year (Starting in 1992)
y = -0.0477x + 7.2155


I-84 Group - Superstructure CR Base Curve
Condition Ratings
Year (Starting in 1992)
y = -0.0402x + 7.1139


I-84 Group - Substructure CR Base Curve
Condition Ratings
Year (Starting in 1992)
y = -0.0432x + 7.0181

DECK:

ADTT Adj.	1.08
Deck Protection Adj.	1.1
Consistency Adj.	1
Cumulative Slope Adj.	1.19
Intercept Adjustment	0

SUPERSTRUCTURE:

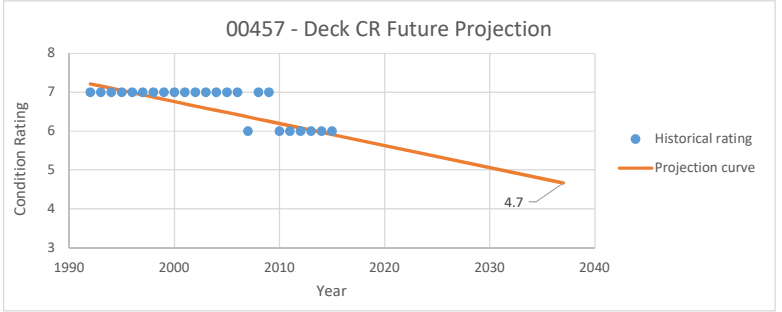
ADTT Adj.	1.08
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	1
Cumulative Slope Adj.	1.31
Intercept Adjustment	0

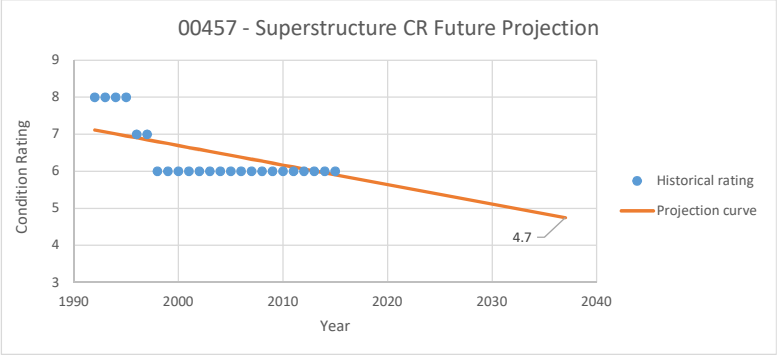
SUBSTRUCTURE:

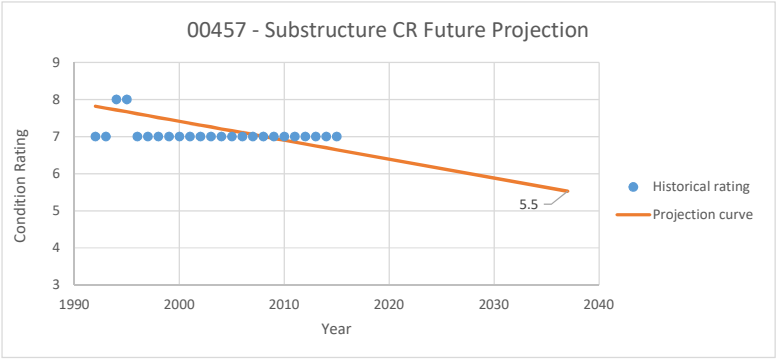
ADTT Adj.	1.08
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	0.9
Cumulative Slope Adj.	1.18
Intercept Adjustment	0.8

00457

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	7.2	8	7.1	7	7.8
1993	7	7.2	8	7.1	7	7.8
1994	7	7.1	8	7.0	8	7.7
1995	7	7.0	8	7.0	8	7.7
1996	7	7.0	7	6.9	7	7.6
1997	7	6.9	7	6.9	7	7.6
1998	7	6.9	6	6.8	7	7.5
1999	7	6.8	6	6.7	7	7.5
2000	7	6.8	6	6.7	7	7.4
2001	7	6.7	6	6.6	7	7.4
2002	7	6.6	6	6.6	7	7.3
2003	7	6.6	6	6.5	7	7.3
2004	7	6.5	6	6.5	7	7.2
2005	7	6.5	6	6.4	7	7.2
2006	7	6.4	6	6.4	7	7.1
2007	6	6.4	6	6.3	7	7.1
2008	7	6.3	6	6.3	7	7.0
2009	7	6.3	6	6.2	7	7.0
2010	6	6.2	6	6.2	7	6.9
2011	6	6.1	6	6.1	7	6.9
2012	6	6.1	6	6.1	7	6.8
2013	6	6.0	6	6.0	7	6.7
2014	6	6.0	6	6.0	7	6.7
2015	6	5.9	6	5.9	7	6.6
2037		4.7		4.7		5.5







DECK:

ADTT Adj.	1.08
Deck Protection Adj.	1.1
Consistency Adj.	0.9
Cumulative Slope Adj.	1.07
Intercept Adjustment	0.5

SUPERSTRUCTURE:

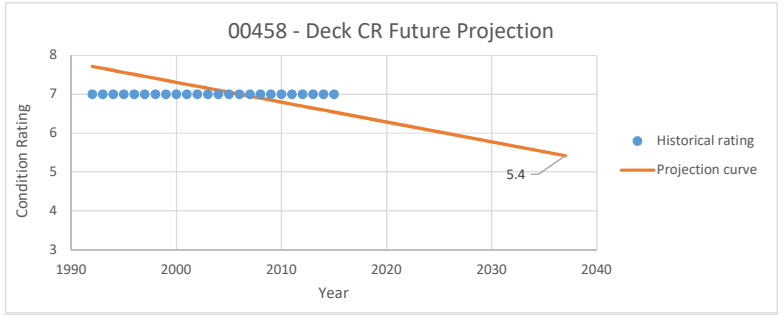
ADTT Adj.	1.08
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	1
Cumulative Slope Adj.	1.31
Intercept Adjustment	0.2

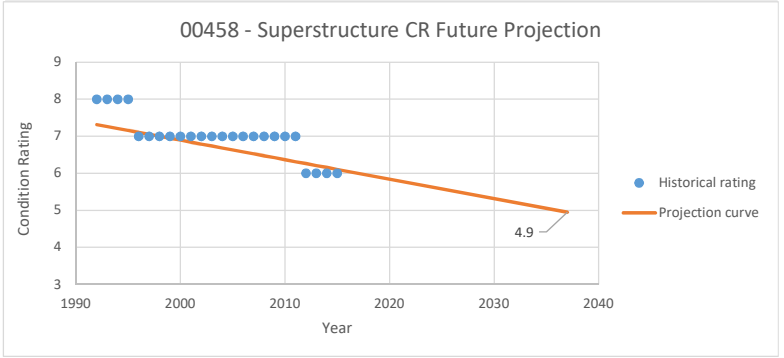
SUBSTRUCTURE:

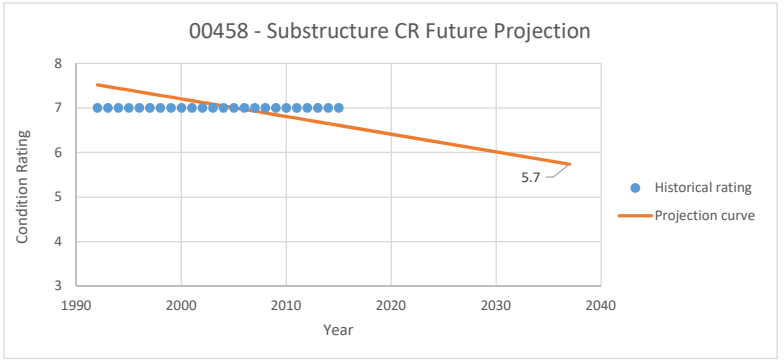
ADTT Adj.	1.08
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	0.7
Cumulative Slope Adj.	0.92
Intercept Adjustment	0.5

00458

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	7.7	8	7.3	7	7.5
1993	7	7.7	8	7.3	7	7.5
1994	7	7.6	8	7.2	7	7.4
1995	7	7.6	8	7.2	7	7.4
1996	7	7.5	7	7.1	7	7.4
1997	7	7.5	7	7.1	7	7.3
1998	7	7.4	7	7.0	7	7.3
1999	7	7.4	7	6.9	7	7.2
2000	7	7.3	7	6.9	7	7.2
2001	7	7.3	7	6.8	7	7.2
2002	7	7.2	7	6.8	7	7.1
2003	7	7.2	7	6.7	7	7.1
2004	7	7.1	7	6.7	7	7.0
2005	7	7.1	7	6.6	7	7.0
2006	7	7.0	7	6.6	7	7.0
2007	7	6.9	7	6.5	7	6.9
2008	7	6.9	7	6.5	7	6.9
2009	7	6.8	7	6.4	7	6.8
2010	7	6.8	7	6.4	7	6.8
2011	7	6.7	7	6.3	7	6.8
2012	7	6.7	6	6.3	7	6.7
2013	7	6.6	6	6.2	7	6.7
2014	7	6.6	6	6.2	7	6.6
2015	7	6.5	6	6.1	7	6.6
2037		5.4		4.9		5.7







DECK:

ADTT Adj.	0.80
Deck Protection Adj.	1.1
Consistency Adj.	1.3
Cumulative Slope Adj.	1.14
Intercept Adjustment	0

SUPERSTRUCTURE:

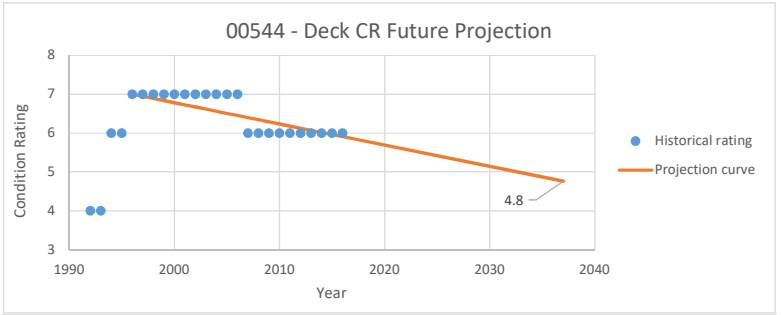
ADTT Adj.	0.80
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	1.1
Cumulative Slope Adj.	1.06
Intercept Adjustment	-0.2

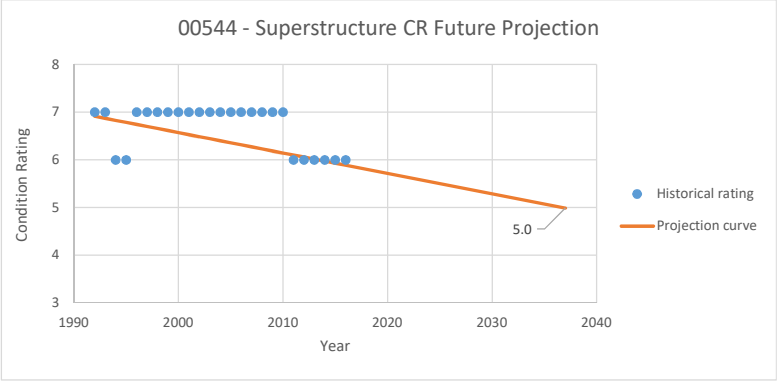
SUBSTRUCTURE:

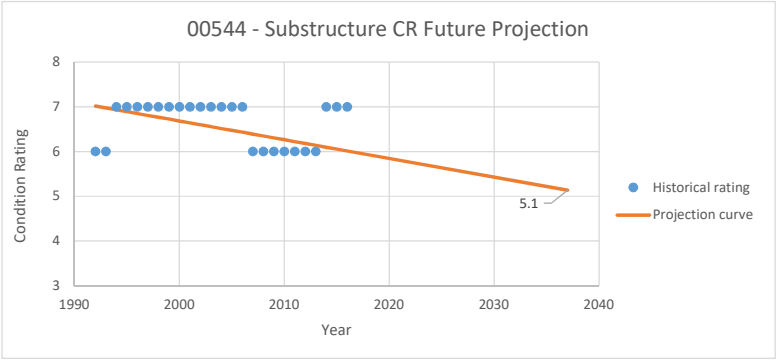
ADTT Adj.	0.80
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	1
Cumulative Slope Adj.	0.97
Intercept Adjustment	0

00544

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	4	-	7	6.9	6	7.0
1993	4	-	7	6.9	6	7.0
1994	6	-	6	6.8	7	6.9
1995	6	-	6	6.8	7	6.9
1996	7	7.0	7	6.7	7	6.9
1997	7	6.9	7	6.7	7	6.8
1998	7	6.9	7	6.7	7	6.8
1999	7	6.8	7	6.6	7	6.7
2000	7	6.8	7	6.6	7	6.7
2001	7	6.7	7	6.5	7	6.6
2002	7	6.7	7	6.5	7	6.6
2003	7	6.6	7	6.4	7	6.6
2004	7	6.6	7	6.4	7	6.5
2005	7	6.5	7	6.4	7	6.5
2006	7	6.5	7	6.3	7	6.4
2007	6	6.4	7	6.3	6	6.4
2008	6	6.3	7	6.2	6	6.3
2009	6	6.3	7	6.2	6	6.3
2010	6	6.2	7	6.1	6	6.3
2011	6	6.2	6	6.1	6	6.2
2012	6	6.1	6	6.1	6	6.2
2013	6	6.1	6	6.0	6	6.1
2014	6	6.0	6	6.0	7	6.1
2015	6	6.0	6	5.9	7	6.1
2016	6	5.9	6	5.9	7	6.0
2037		4.8		5.0		5.1







DECK:

ADTT Adj.	0.95
Deck Protection Adj.	0.9
Consistency Adj.	1.5
Cumulative Slope Adj.	1.28
Intercept Adjustment	0

SUPERSTRUCTURE:

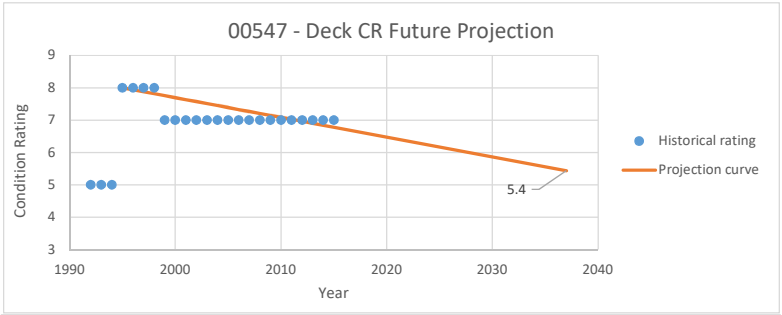
ADTT Adj.	0.95
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	1.2
Cumulative Slope Adj.	1.38
Intercept Adjustment	0

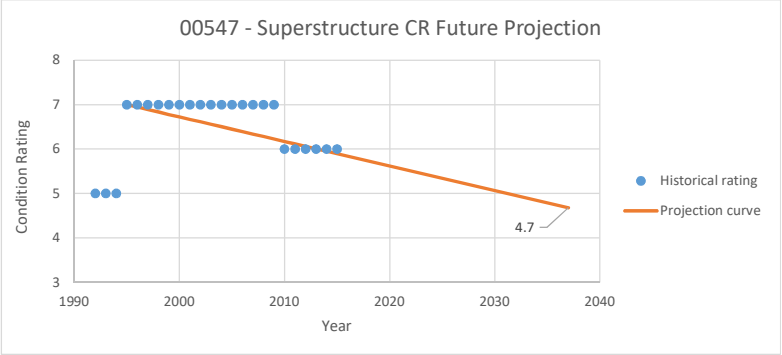
SUBSTRUCTURE:

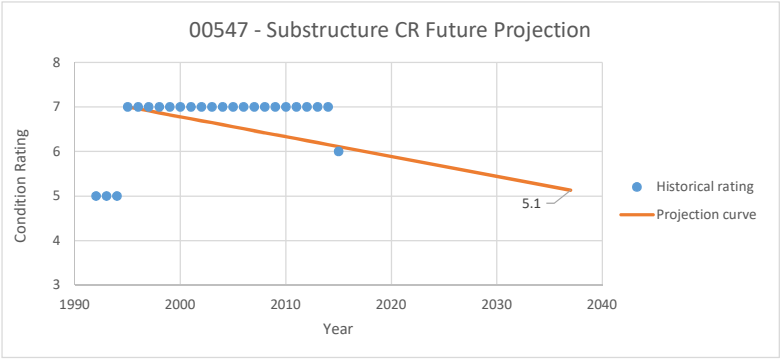
ADTT Adj.	0.95
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	0.9
Cumulative Slope Adj.	1.03
Intercept Adjustment	0

00547

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	5	-	5	-	5	-
1993	5	-	5	-	5	-
1994	5	-	5	-	5	-
1995	8	8.0	7	7.0	7	7.0
1996	8	7.9	7	6.9	7	7.0
1997	8	7.9	7	6.9	7	6.9
1998	8	7.8	7	6.8	7	6.9
1999	7	7.8	7	6.8	7	6.8
2000	7	7.7	7	6.7	7	6.8
2001	7	7.6	7	6.7	7	6.7
2002	7	7.6	7	6.6	7	6.7
2003	7	7.5	7	6.6	7	6.6
2004	7	7.5	7	6.5	7	6.6
2005	7	7.4	7	6.4	7	6.6
2006	7	7.3	7	6.4	7	6.5
2007	7	7.3	7	6.3	7	6.5
2008	7	7.2	7	6.3	7	6.4
2009	7	7.1	7	6.2	7	6.4
2010	7	7.1	6	6.2	7	6.3
2011	7	7.0	6	6.1	7	6.3
2012	7	7.0	6	6.1	7	6.2
2013	7	6.9	6	6.0	7	6.2
2014	7	6.8	6	5.9	7	6.2
2015	7	6.8	6	5.9	6	6.1
2037		5.4		4.7		5.1







DECK:

ADTT Adj.	0.80
Deck Protection Adj.	0.9
Consistency Adj.	1.3
Cumulative Slope Adj.	0.94
Intercept Adjustment	-0.2

SUPERSTRUCTURE:

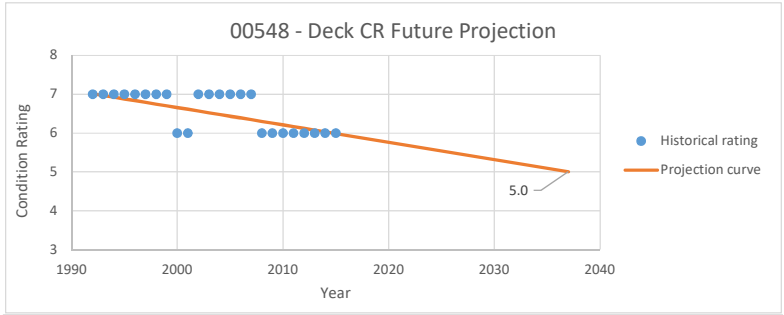
ADTT Adj.	0.80
Feature Under Adj.	0.9
Simple/Continuous Adj	1.1
Consistency Adj.	2
Cumulative Slope Adj.	1.58
Intercept Adjustment	-0.5

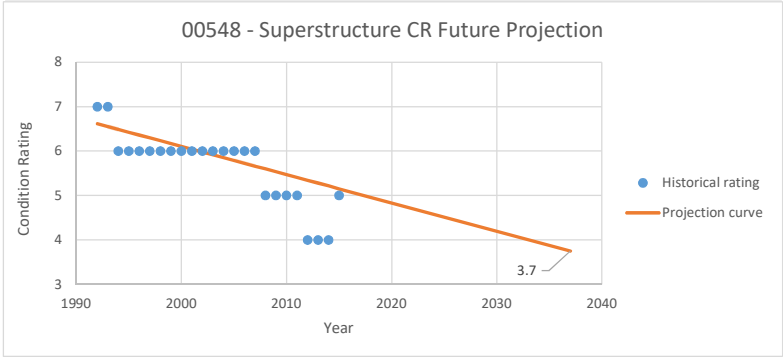
SUBSTRUCTURE:

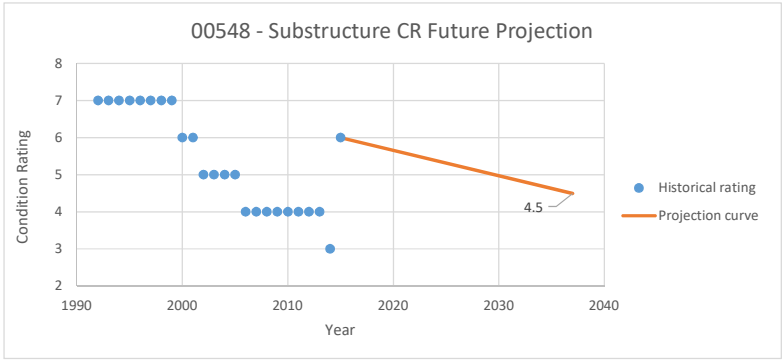
ADTT Adj.	0.80
Feature Under Adj.	0.9
Simple/Continuous Adj	1.1
Consistency Adj.	2
Cumulative Slope Adj.	1.58
Intercept Adjustment	0

00548

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	7.0	7	6.6	7	-
1993	7	7.0	7	6.6	7	-
1994	7	6.9	6	6.5	7	-
1995	7	6.9	6	6.4	7	-
1996	7	6.8	6	6.4	7	-
1997	7	6.8	6	6.3	7	-
1998	7	6.7	6	6.2	7	-
1999	7	6.7	6	6.2	7	-
2000	6	6.7	6	6.1	6	-
2001	6	6.6	6	6.0	6	-
2002	7	6.6	6	6.0	5	-
2003	7	6.5	6	5.9	5	-
2004	7	6.5	6	5.8	5	-
2005	7	6.4	6	5.8	5	-
2006	7	6.4	6	5.7	4	-
2007	7	6.3	6	5.7	4	-
2008	6	6.3	5	5.6	4	-
2009	6	6.3	5	5.5	4	-
2010	6	6.2	5	5.5	4	-
2011	6	6.2	5	5.4	4	-
2012	6	6.1	4	5.3	4	-
2013	6	6.1	4	5.3	4	-
2014	6	6.0	4	5.2	3	-
2015	6	6.0	5	5.1	6	6.0
2037		5.0		3.7		4.5







DECK:

ADTT Adj.	0.81
Deck Protection Adj.	1.1
Consistency Adj.	0.9
Cumulative Slope Adj.	0.80
Intercept Adjustment	0

SUPERSTRUCTURE:

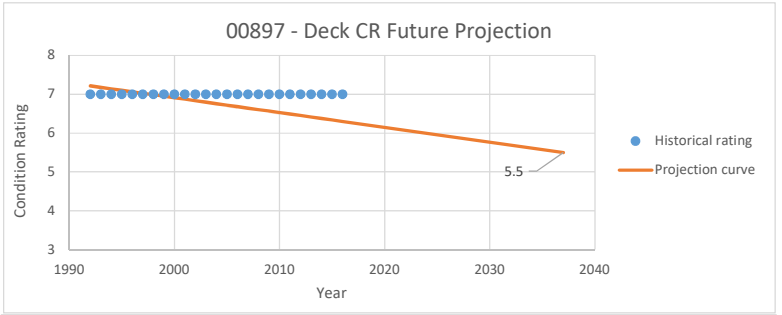
ADTT Adj.	0.81
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	1.3
Cumulative Slope Adj.	1.27
Intercept Adjustment	0

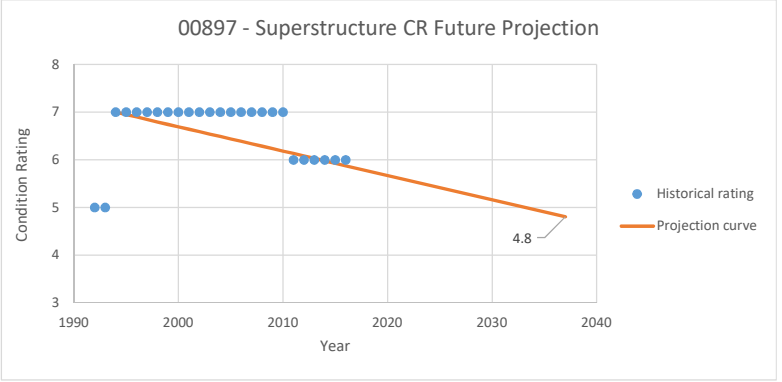
SUBSTRUCTURE:

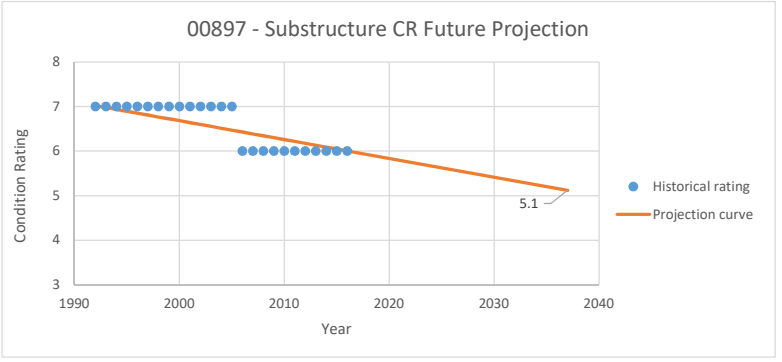
ADTT Adj.	0.81
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	1
Cumulative Slope Adj.	0.98
Intercept Adjustment	0

00897

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	7.2	5	-	7	7.0
1993	7	7.2	5	-	7	7.0
1994	7	7.1	7	7.0	7	6.9
1995	7	7.1	7	6.9	7	6.9
1996	7	7.1	7	6.9	7	6.8
1997	7	7.0	7	6.8	7	6.8
1998	7	7.0	7	6.8	7	6.8
1999	7	6.9	7	6.7	7	6.7
2000	7	6.9	7	6.7	7	6.7
2001	7	6.9	7	6.6	7	6.6
2002	7	6.8	7	6.6	7	6.6
2003	7	6.8	7	6.5	7	6.6
2004	7	6.8	7	6.5	7	6.5
2005	7	6.7	7	6.4	7	6.5
2006	7	6.7	7	6.4	6	6.4
2007	7	6.6	7	6.3	6	6.4
2008	7	6.6	7	6.3	6	6.3
2009	7	6.6	7	6.2	6	6.3
2010	7	6.5	7	6.2	6	6.3
2011	7	6.5	6	6.1	6	6.2
2012	7	6.5	6	6.1	6	6.2
2013	7	6.4	6	6.0	6	6.1
2014	7	6.4	6	6.0	6	6.1
2015	7	6.3	6	5.9	6	6.0
2016	7	6.3	6	5.9	6	6.0
2037		5.5		4.8		5.1







DECK:

ADTT Adj.	0.80
Deck Protection Adj.	0.9
Consistency Adj.	1.7
Cumulative Slope Adj.	1.22
Intercept Adjustment	0

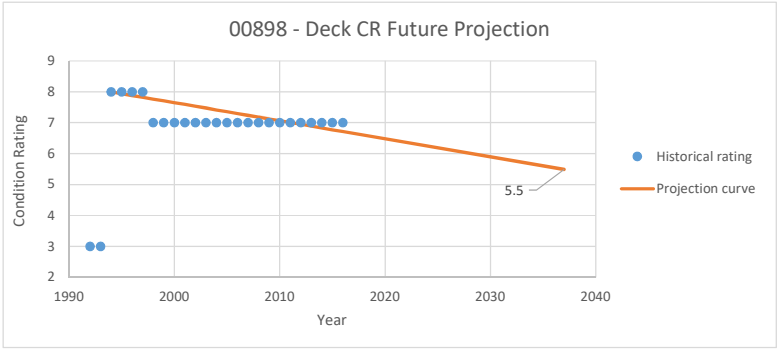
SUPERSTRUCTURE:

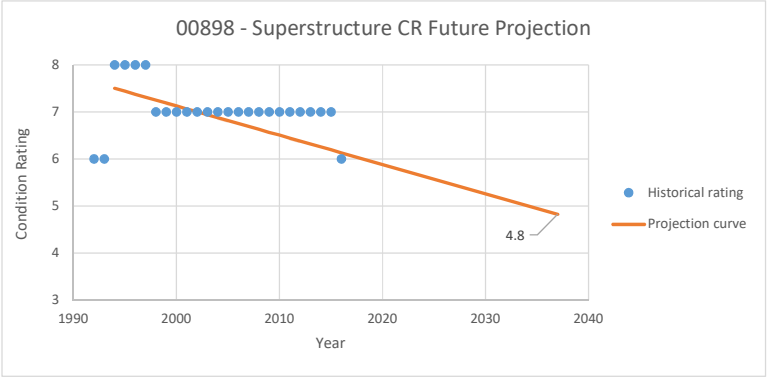
ADTT Adj.	0.80
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	1.6
Cumulative Slope Adj.	1.55
Intercept Adjustment	-0.5

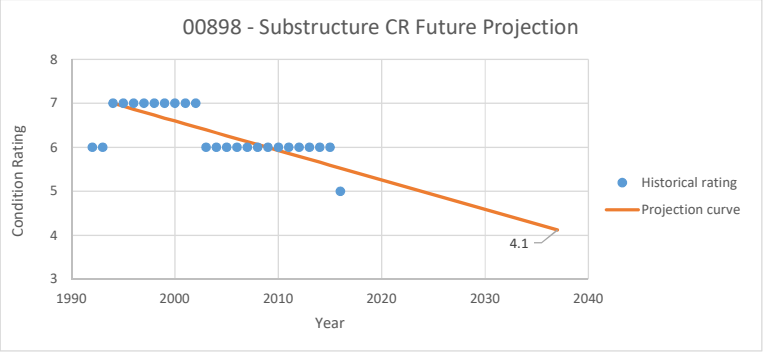
SUBSTRUCTURE:

ADTT Adj.	0.80
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	1.6
Cumulative Slope Adj.	1.55
Intercept Adjustment	0

00898						
	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	3	-	6	-	6	-
1993	3	-	6	-	6	-
1994	8	8.0	8	7.5	7	7.0
1995	8	7.9	8	7.4	7	6.9
1996	8	7.9	8	7.4	7	6.9
1997	8	7.8	8	7.3	7	6.8
1998	7	7.8	7	7.3	7	6.7
1999	7	7.7	7	7.2	7	6.7
2000	7	7.6	7	7.1	7	6.6
2001	7	7.6	7	7.1	7	6.5
2002	7	7.5	7	7.0	7	6.5
2003	7	7.5	7	6.9	6	6.4
2004	7	7.4	7	6.9	6	6.3
2005	7	7.4	7	6.8	6	6.3
2006	7	7.3	7	6.8	6	6.2
2007	7	7.2	7	6.7	6	6.1
2008	7	7.2	7	6.6	6	6.1
2009	7	7.1	7	6.6	6	6.0
2010	7	7.1	7	6.5	6	5.9
2011	7	7.0	7	6.4	6	5.9
2012	7	6.9	7	6.4	6	5.8
2013	7	6.9	7	6.3	6	5.7
2014	7	6.8	7	6.3	6	5.7
2015	7	6.8	7	6.2	6	5.6
2016	7	6.7	6	6.1	5	5.5
2037		5.5		4.8		4.1







DECK:

ADTT Adj.	1.20
Deck Protection Adj.	1.1
Consistency Adj.	1.5
Cumulative Slope Adj.	1.98
Intercept Adjustment	0

SUPERSTRUCTURE:

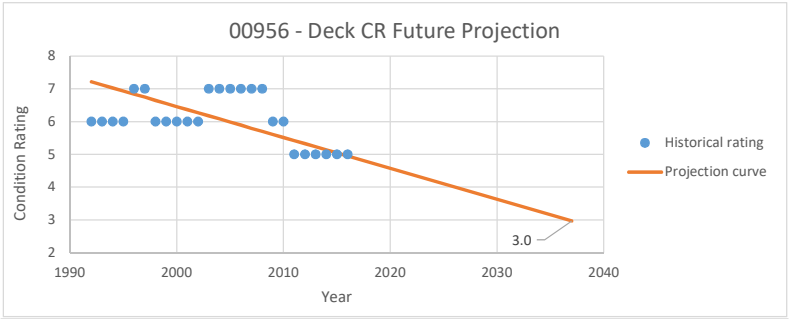
ADTT Adj.	1.20
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	1
Cumulative Slope Adj.	1.45
Intercept Adjustment	0

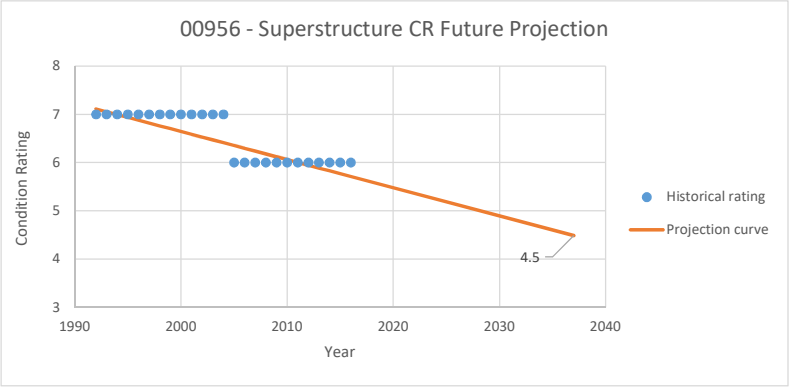
SUBSTRUCTURE:

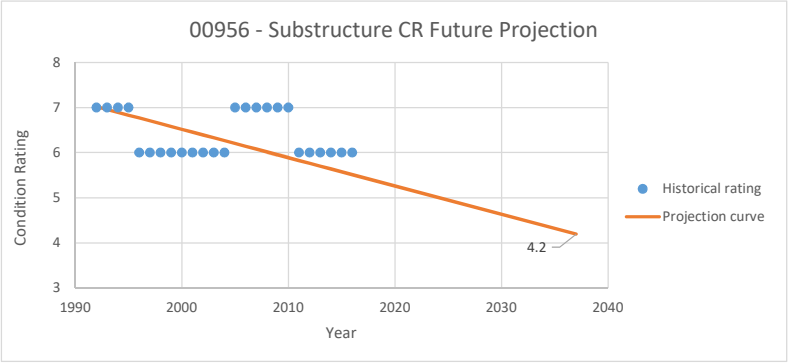
ADTT Adj.	1.20
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	1
Cumulative Slope Adj.	1.45
Intercept Adjustment	0

00956

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	6	7.2	7	7.1	7	7.0
1993	6	7.1	7	7.1	7	7.0
1994	6	7.0	7	7.0	7	6.9
1995	6	6.9	7	6.9	7	6.8
1996	7	6.8	7	6.9	6	6.8
1997	7	6.7	7	6.8	6	6.7
1998	6	6.6	7	6.8	6	6.6
1999	6	6.6	7	6.7	6	6.6
2000	6	6.5	7	6.6	6	6.5
2001	6	6.4	7	6.6	6	6.5
2002	6	6.3	7	6.5	6	6.4
2003	7	6.2	7	6.5	6	6.3
2004	7	6.1	7	6.4	6	6.3
2005	7	6.0	6	6.4	7	6.2
2006	7	5.9	6	6.3	7	6.1
2007	7	5.8	6	6.2	7	6.1
2008	7	5.7	6	6.2	7	6.0
2009	6	5.6	6	6.1	7	6.0
2010	6	5.5	6	6.1	7	5.9
2011	5	5.4	6	6.0	6	5.8
2012	5	5.3	6	5.9	6	5.8
2013	5	5.2	6	5.9	6	5.7
2014	5	5.1	6	5.8	6	5.6
2015	5	5.0	6	5.8	6	5.6
2016	5	4.9	6	5.7	6	5.5
2037		3.0		4.5		4.2







DECK:

ADTT Adj.	1.15
Deck Protection Adj.	1.1
Consistency Adj.	0.8
Cumulative Slope Adj.	1.01
Intercept Adjustment	-0.5

SUPERSTRUCTURE:

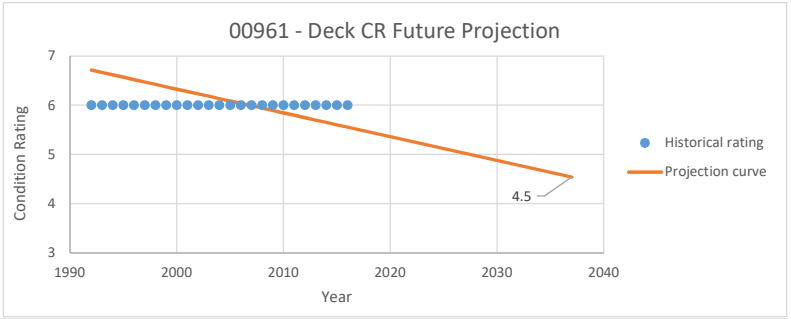
ADTT Adj.	1.15
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	0.8
Cumulative Slope Adj.	1.12
Intercept Adjustment	-0.5

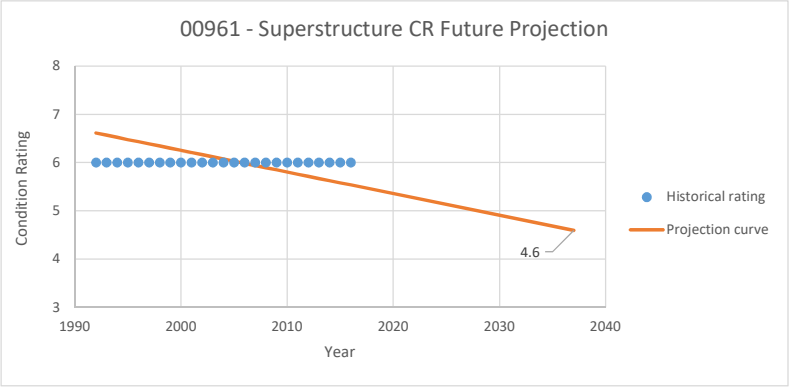
SUBSTRUCTURE:

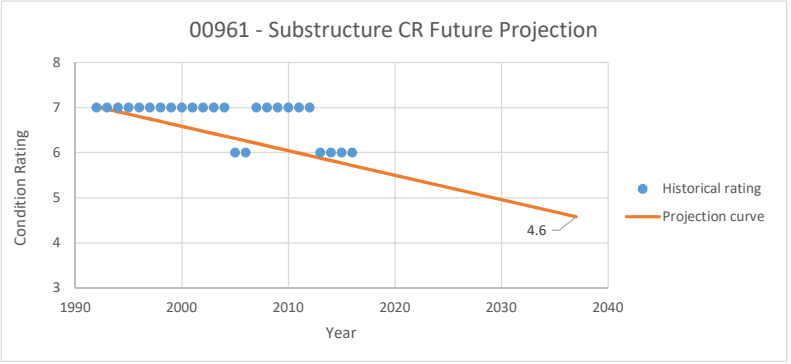
ADTT Adj.	1.15
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	0.9
Cumulative Slope Adj.	1.26
Intercept Adjustment	0

00961

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	6	6.7	6	6.6	7	7.0
1993	6	6.7	6	6.6	7	7.0
1994	6	6.6	6	6.5	7	6.9
1995	6	6.6	6	6.5	7	6.9
1996	6	6.5	6	6.4	7	6.8
1997	6	6.5	6	6.4	7	6.7
1998	6	6.4	6	6.3	7	6.7
1999	6	6.4	6	6.3	7	6.6
2000	6	6.3	6	6.3	7	6.6
2001	6	6.3	6	6.2	7	6.5
2002	6	6.2	6	6.2	7	6.5
2003	6	6.2	6	6.1	7	6.4
2004	6	6.1	6	6.1	7	6.4
2005	6	6.1	6	6.0	6	6.3
2006	6	6.0	6	6.0	6	6.3
2007	6	6.0	6	5.9	7	6.2
2008	6	5.9	6	5.9	7	6.2
2009	6	5.9	6	5.9	7	6.1
2010	6	5.8	6	5.8	7	6.0
2011	6	5.8	6	5.8	7	6.0
2012	6	5.7	6	5.7	7	5.9
2013	6	5.7	6	5.7	6	5.9
2014	6	5.7	6	5.6	6	5.8
2015	6	5.6	6	5.6	6	5.8
2016	6	5.6	6	5.5	6	5.7
2037		4.5		4.6		4.6







DECK:

ADTT Adj.	1.20
Deck Protection Adj.	1.1
Consistency Adj.	1.1
Cumulative Slope Adj.	1.45
Intercept Adjustment	-0.6

SUPERSTRUCTURE:

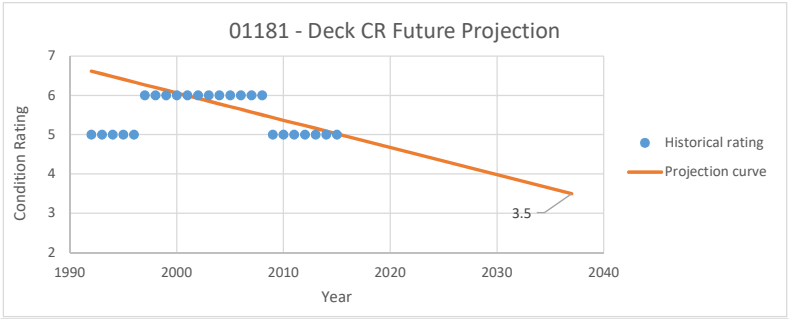
ADTT Adj.	1.20
Feature Under Adj.	0.9
Simple/Continuous Adj	1.1
Consistency Adj.	1.1
Cumulative Slope Adj.	1.31
Intercept Adjustment	0

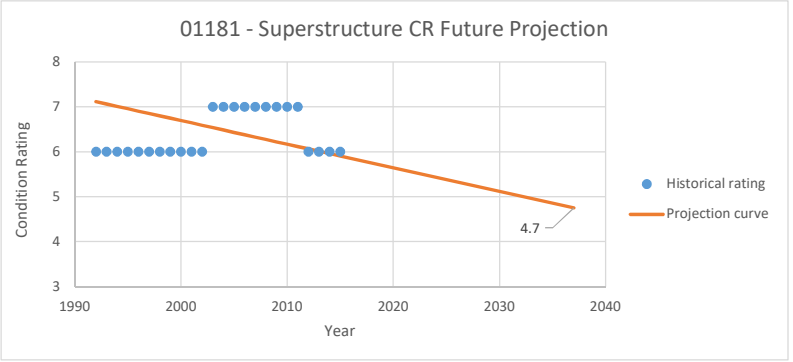
SUBSTRUCTURE:

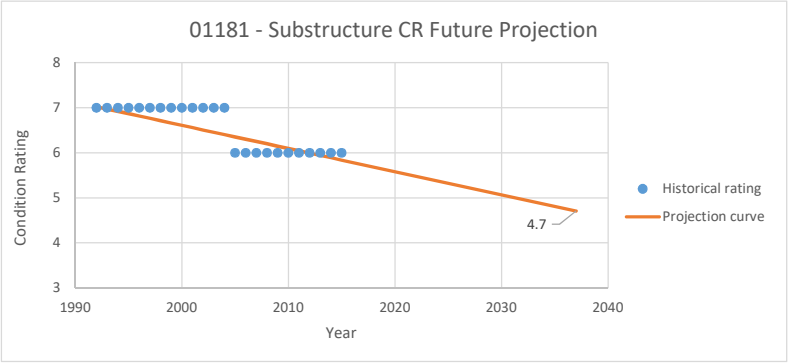
ADTT Adj.	1.20
Feature Under Adj.	0.9
Simple/Continuous Adj	1.1
Consistency Adj.	1
Cumulative Slope Adj.	1.19
Intercept Adjustment	0

01181

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	5	6.6	6	7.1	7	7.0
1993	5	6.5	6	7.1	7	7.0
1994	5	6.5	6	7.0	7	6.9
1995	5	6.4	6	7.0	7	6.9
1996	5	6.3	6	6.9	7	6.8
1997	6	6.3	6	6.9	7	6.8
1998	6	6.2	6	6.8	7	6.7
1999	6	6.1	6	6.7	7	6.7
2000	6	6.1	6	6.7	7	6.6
2001	6	6.0	6	6.6	7	6.6
2002	6	5.9	6	6.6	7	6.5
2003	6	5.9	7	6.5	7	6.5
2004	6	5.8	7	6.5	7	6.4
2005	6	5.7	7	6.4	6	6.4
2006	6	5.6	7	6.4	6	6.3
2007	6	5.6	7	6.3	6	6.2
2008	6	5.5	7	6.3	6	6.2
2009	5	5.4	7	6.2	6	6.1
2010	5	5.4	7	6.2	6	6.1
2011	5	5.3	7	6.1	6	6.0
2012	5	5.2	6	6.1	6	6.0
2013	5	5.2	6	6.0	6	5.9
2014	5	5.1	6	6.0	6	5.9
2015	5	5.0	6	5.9	6	5.8
2037		3.5		4.7		4.7







DECK:

ADTT Adj.	1.20
Deck Protection Adj.	1.1
Consistency Adj.	1
Cumulative Slope Adj.	1.32
Intercept Adjustment	-1

SUPERSTRUCTURE:

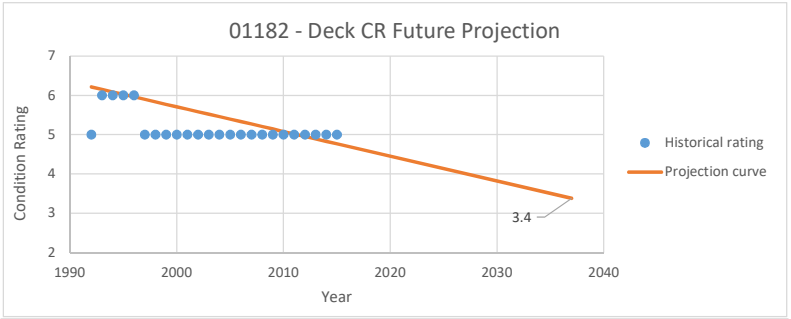
ADTT Adj.	1.20
Feature Under Adj.	0.9
Simple/Continuous Adj	1.1
Consistency Adj.	1.5
Cumulative Slope Adj.	1.78
Intercept Adjustment	-0.5

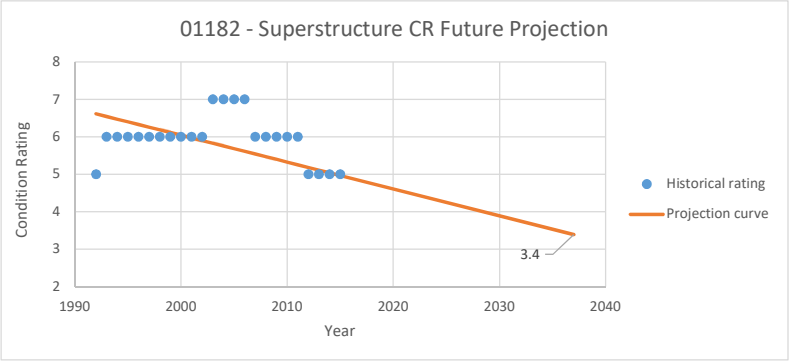
SUBSTRUCTURE:

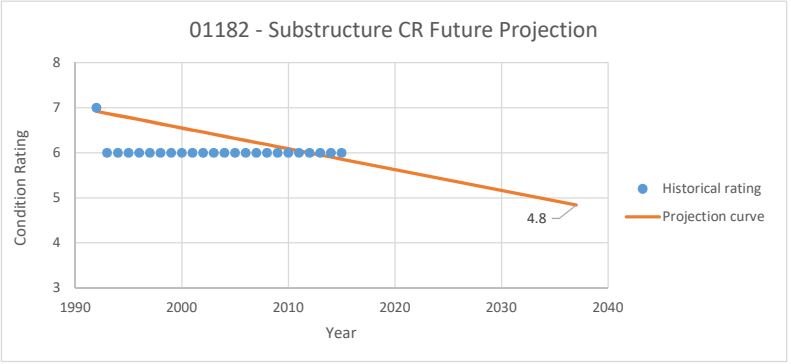
ADTT Adj.	1.20
Feature Under Adj.	0.9
Simple/Continuous Adj	1.1
Consistency Adj.	0.9
Cumulative Slope Adj.	1.07
Intercept Adjustment	-0.1

01182

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	5	6.2	5	6.6	7	6.9
1993	6	6.2	6	6.5	6	6.9
1994	6	6.1	6	6.5	6	6.8
1995	6	6.0	6	6.4	6	6.8
1996	6	6.0	6	6.3	6	6.7
1997	5	5.9	6	6.3	6	6.7
1998	5	5.8	6	6.2	6	6.6
1999	5	5.8	6	6.1	6	6.6
2000	5	5.7	6	6.0	6	6.5
2001	5	5.6	6	6.0	6	6.5
2002	5	5.6	6	5.9	6	6.5
2003	5	5.5	7	5.8	6	6.4
2004	5	5.5	7	5.8	6	6.4
2005	5	5.4	7	5.7	6	6.3
2006	5	5.3	7	5.6	6	6.3
2007	5	5.3	6	5.5	6	6.2
2008	5	5.2	6	5.5	6	6.2
2009	5	5.1	6	5.4	6	6.1
2010	5	5.1	6	5.3	6	6.1
2011	5	5.0	6	5.3	6	6.0
2012	5	5.0	5	5.2	6	6.0
2013	5	4.9	5	5.1	6	5.9
2014	5	4.8	5	5.0	6	5.9
2015	5	4.8	5	5.0	6	5.9
2037		3.4		3.4		4.8







DECK:

ADTT Adj.	1.20
Deck Protection Adj.	1.1
Consistency Adj.	1
Cumulative Slope Adj.	1.32
Intercept Adjustment	-0.5

SUPERSTRUCTURE:

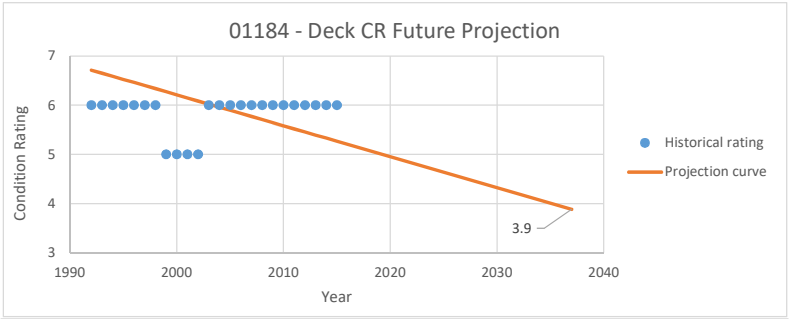
ADTT Adj.	1.20
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	0.9
Cumulative Slope Adj.	1.31
Intercept Adjustment	0

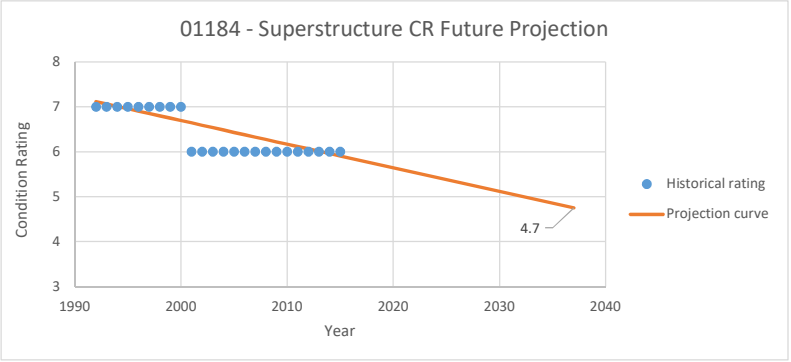
SUBSTRUCTURE:

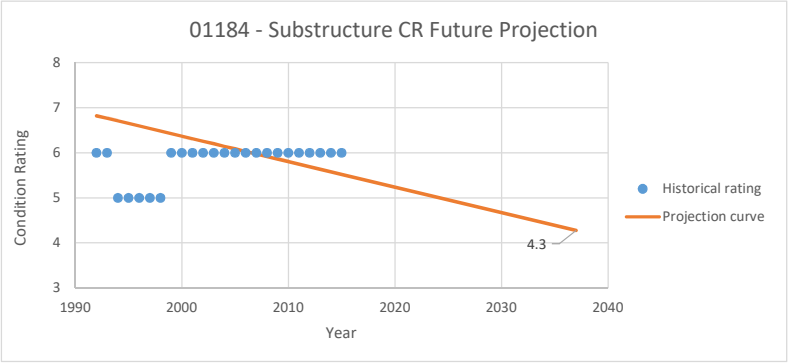
ADTT Adj.	1.20
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	0.9
Cumulative Slope Adj.	1.31
Intercept Adjustment	-0.2

01184

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	6	6.7	7	7.1	6	6.8
1993	6	6.7	7	7.1	6	6.8
1994	6	6.6	7	7.0	5	6.7
1995	6	6.5	7	7.0	5	6.6
1996	6	6.5	7	6.9	5	6.6
1997	6	6.4	7	6.9	5	6.5
1998	6	6.3	7	6.8	5	6.5
1999	5	6.3	7	6.7	6	6.4
2000	5	6.2	7	6.7	6	6.4
2001	5	6.1	6	6.6	6	6.3
2002	5	6.1	6	6.6	6	6.3
2003	6	6.0	6	6.5	6	6.2
2004	6	6.0	6	6.5	6	6.1
2005	6	5.9	6	6.4	6	6.1
2006	6	5.8	6	6.4	6	6.0
2007	6	5.8	6	6.3	6	6.0
2008	6	5.7	6	6.3	6	5.9
2009	6	5.6	6	6.2	6	5.9
2010	6	5.6	6	6.2	6	5.8
2011	6	5.5	6	6.1	6	5.7
2012	6	5.5	6	6.1	6	5.7
2013	6	5.4	6	6.0	6	5.6
2014	6	5.3	6	6.0	6	5.6
2015	6	5.3	6	5.9	6	5.5
2037		3.9		4.7		4.3







DECK:

ADTT Adj.	1.20
Deck Protection Adj.	1.1
Consistency Adj.	1.1
Cumulative Slope Adj.	1.45
Intercept Adjustment	0

SUPERSTRUCTURE:

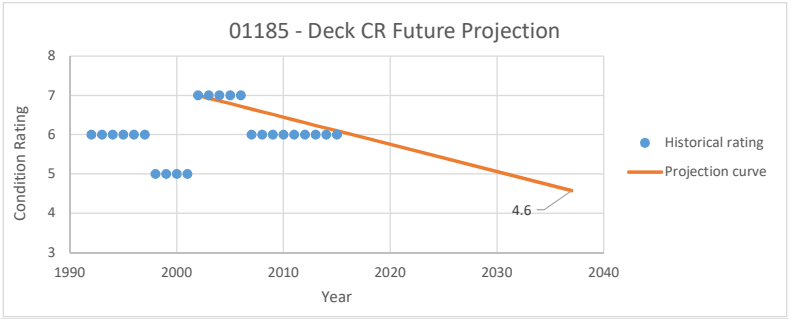
ADTT Adj.	1.20
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	1
Cumulative Slope Adj.	1.45
Intercept Adjustment	0.3

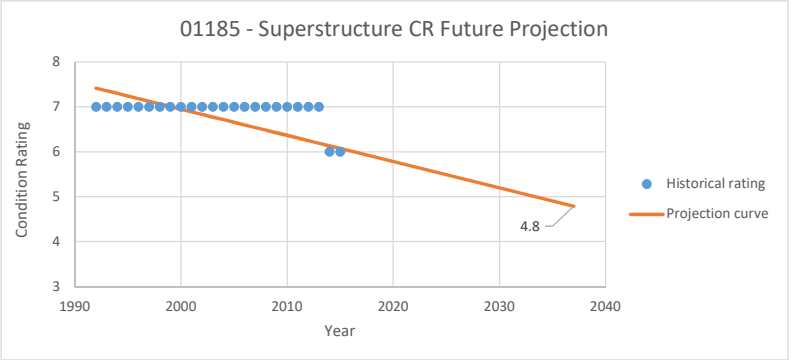
SUBSTRUCTURE:

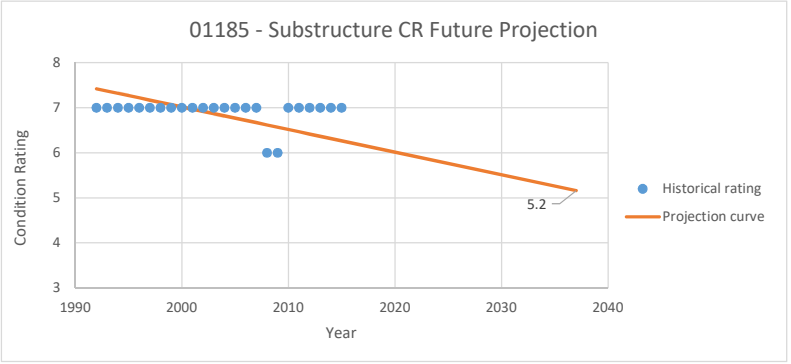
ADTT Adj.	1.20
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	0.8
Cumulative Slope Adj.	1.16
Intercept Adjustment	0.4

01185

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	6	-	7	7.4	7	7.4
1993	6	-	7	7.4	7	7.4
1994	6	-	7	7.3	7	7.3
1995	6	-	7	7.2	7	7.3
1996	6	-	7	7.2	7	7.2
1997	6	-	7	7.1	7	7.2
1998	5	-	7	7.1	7	7.1
1999	5	-	7	7.0	7	7.1
2000	5	-	7	6.9	7	7.0
2001	5	-	7	6.9	7	7.0
2002	7	7.0	7	6.8	7	6.9
2003	7	6.9	7	6.8	7	6.9
2004	7	6.9	7	6.7	7	6.8
2005	7	6.8	7	6.7	7	6.8
2006	7	6.7	7	6.6	7	6.7
2007	6	6.7	7	6.5	7	6.7
2008	6	6.6	7	6.5	6	6.6
2009	6	6.5	7	6.4	6	6.6
2010	6	6.4	7	6.4	7	6.5
2011	6	6.4	7	6.3	7	6.5
2012	6	6.3	7	6.2	7	6.4
2013	6	6.2	7	6.2	7	6.4
2014	6	6.2	6	6.1	7	6.3
2015	6	6.1	6	6.1	7	6.3
2037		4.6		4.8		5.2







DECK:

ADTT Adj.	1.01
Deck Protection Adj.	1.1
Consistency Adj.	1.1
Cumulative Slope Adj.	1.22
Intercept Adjustment	0

SUPERSTRUCTURE:

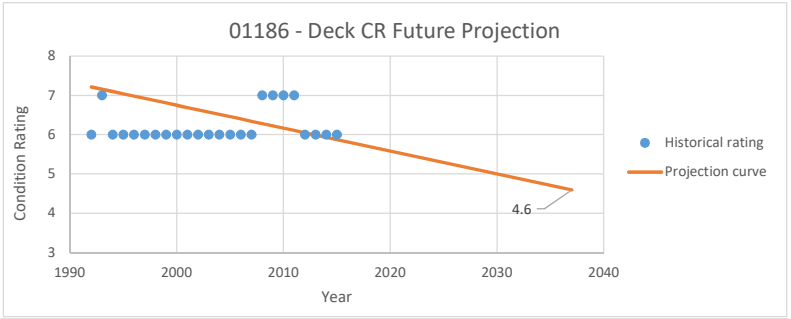
ADTT Adj.	1.01
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	0.7
Cumulative Slope Adj.	0.85
Intercept Adjustment	0

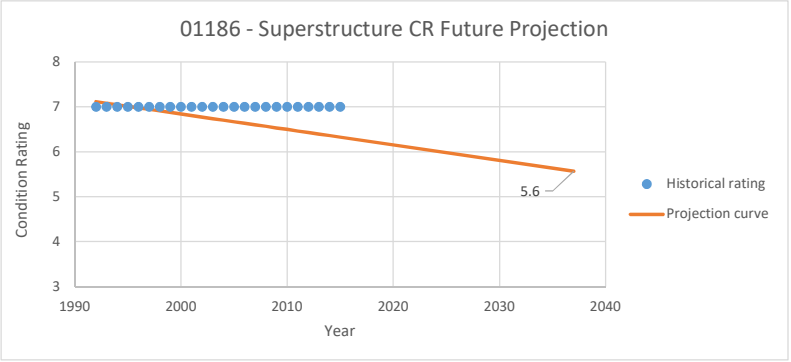
SUBSTRUCTURE:

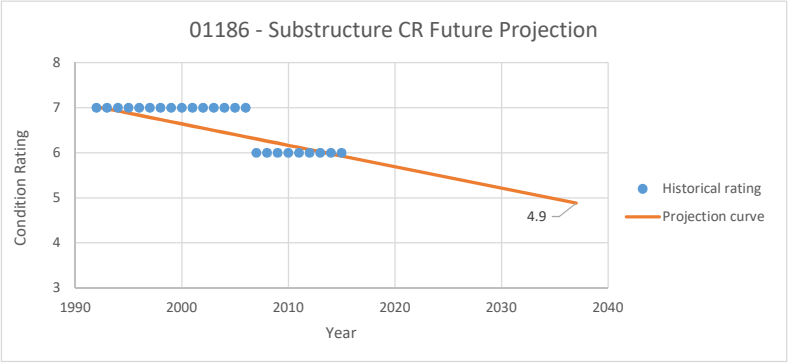
ADTT Adj.	1.01
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	0.9
Cumulative Slope Adj.	1.10
Intercept Adjustment	0

01186

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	6	7.2	7	7.1	7	7.0
1993	7	7.2	7	7.1	7	7.0
1994	6	7.1	7	7.0	7	6.9
1995	6	7.0	7	7.0	7	6.9
1996	6	7.0	7	7.0	7	6.8
1997	6	6.9	7	6.9	7	6.8
1998	6	6.9	7	6.9	7	6.7
1999	6	6.8	7	6.9	7	6.7
2000	6	6.7	7	6.8	7	6.6
2001	6	6.7	7	6.8	7	6.6
2002	6	6.6	7	6.8	7	6.5
2003	6	6.6	7	6.7	7	6.5
2004	6	6.5	7	6.7	7	6.4
2005	6	6.5	7	6.7	7	6.4
2006	6	6.4	7	6.6	7	6.4
2007	6	6.3	7	6.6	6	6.3
2008	7	6.3	7	6.6	6	6.3
2009	7	6.2	7	6.5	6	6.2
2010	7	6.2	7	6.5	6	6.2
2011	7	6.1	7	6.5	6	6.1
2012	6	6.1	7	6.4	6	6.1
2013	6	6.0	7	6.4	6	6.0
2014	6	5.9	7	6.4	6	6.0
2015	6	5.9	7	6.3	6	5.9
2037		4.6		5.6		4.9







DECK:

ADTT Adj.	1.06
Deck Protection Adj.	1.1
Consistency Adj.	0.7
Cumulative Slope Adj.	0.81
Intercept Adjustment	0

SUPERSTRUCTURE:

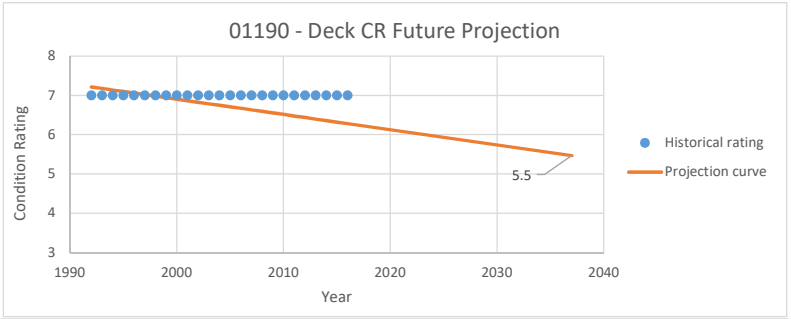
ADTT Adj.	1.06
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	0.9
Cumulative Slope Adj.	1.15
Intercept Adjustment	0

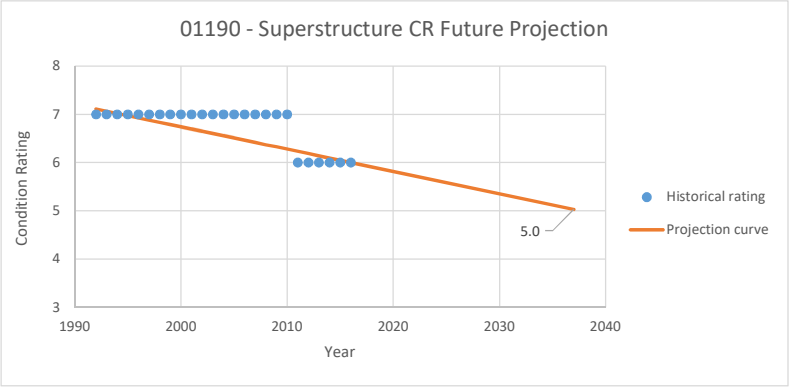
SUBSTRUCTURE:

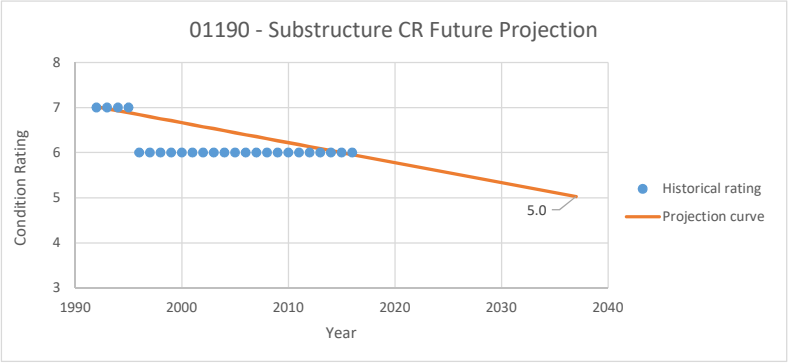
ADTT Adj.	1.06
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	0.8
Cumulative Slope Adj.	1.02
Intercept Adjustment	0

01190

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	7.2	7	7.1	7	7.0
1993	7	7.2	7	7.1	7	7.0
1994	7	7.1	7	7.0	7	6.9
1995	7	7.1	7	7.0	7	6.9
1996	7	7.1	7	6.9	6	6.8
1997	7	7.0	7	6.9	6	6.8
1998	7	7.0	7	6.8	6	6.8
1999	7	6.9	7	6.8	6	6.7
2000	7	6.9	7	6.7	6	6.7
2001	7	6.9	7	6.7	6	6.6
2002	7	6.8	7	6.7	6	6.6
2003	7	6.8	7	6.6	6	6.5
2004	7	6.7	7	6.6	6	6.5
2005	7	6.7	7	6.5	6	6.4
2006	7	6.7	7	6.5	6	6.4
2007	7	6.6	7	6.4	6	6.4
2008	7	6.6	7	6.4	6	6.3
2009	7	6.6	7	6.3	6	6.3
2010	7	6.5	7	6.3	6	6.2
2011	7	6.5	6	6.2	6	6.2
2012	7	6.4	6	6.2	6	6.1
2013	7	6.4	6	6.1	6	6.1
2014	7	6.4	6	6.1	6	6.0
2015	7	6.3	6	6.0	6	6.0
2016	7	6.3	6	6.0	6	6.0
2037		5.5		5.0		5.0







DECK:

ADTT Adj.	1.06
Deck Protection Adj.	1.1
Consistency Adj.	1.8
Cumulative Slope Adj.	2.09
Intercept Adjustment	0

SUPERSTRUCTURE:

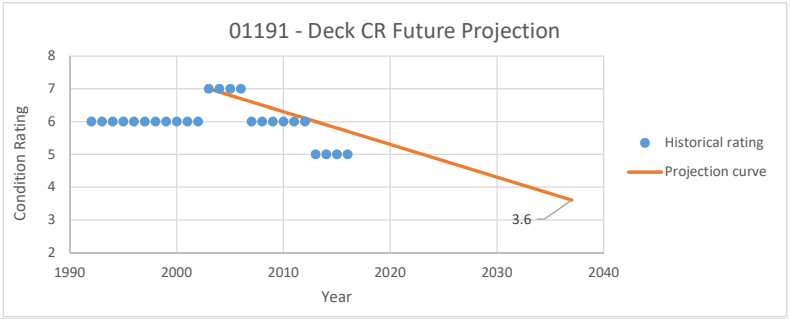
ADTT Adj.	1.06
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	1
Cumulative Slope Adj.	1.28
Intercept Adjustment	0

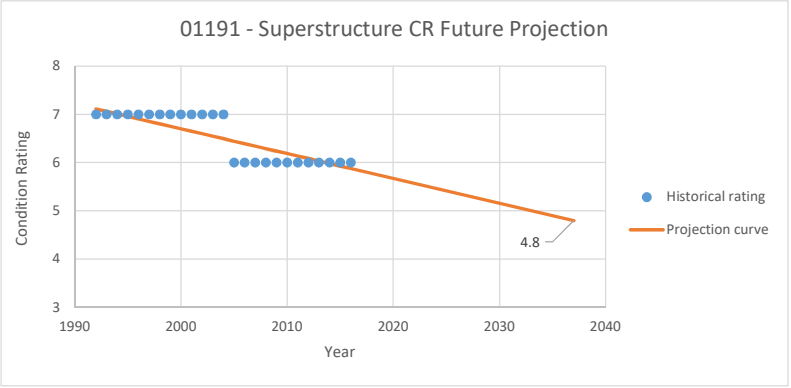
SUBSTRUCTURE:

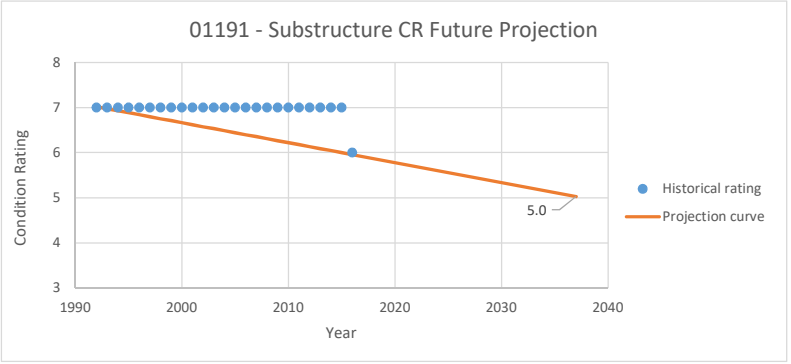
ADTT Adj.	1.06
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	0.8
Cumulative Slope Adj.	1.02
Intercept Adjustment	0

01191

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	6	-	7	7.1	7	7.0
1993	6	-	7	7.1	7	7.0
1994	6	-	7	7.0	7	6.9
1995	6	-	7	7.0	7	6.9
1996	6	-	7	6.9	7	6.8
1997	6	-	7	6.9	7	6.8
1998	6	-	7	6.8	7	6.8
1999	6	-	7	6.8	7	6.7
2000	6	-	7	6.7	7	6.7
2001	6	-	7	6.7	7	6.6
2002	6	-	7	6.6	7	6.6
2003	7	7.0	7	6.5	7	6.5
2004	7	6.9	7	6.5	7	6.5
2005	7	6.8	6	6.4	7	6.4
2006	7	6.7	6	6.4	7	6.4
2007	6	6.6	6	6.3	7	6.4
2008	6	6.5	6	6.3	7	6.3
2009	6	6.4	6	6.2	7	6.3
2010	6	6.3	6	6.2	7	6.2
2011	6	6.2	6	6.1	7	6.2
2012	6	6.1	6	6.1	7	6.1
2013	5	6.0	6	6.0	7	6.1
2014	5	5.9	6	6.0	7	6.0
2015	5	5.8	6	5.9	7	6.0
2016	5	5.7	6	5.9	6	6.0
2037		3.6		4.8		5.0







DECK:

ADTT Adj.	1.06
Deck Protection Adj.	0.9
Consistency Adj.	1
Cumulative Slope Adj.	0.95
Intercept Adjustment	0

SUPERSTRUCTURE:

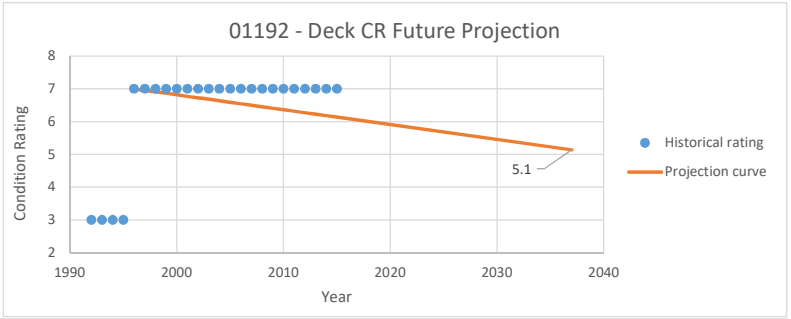
ADTT Adj.	1.06
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	0.7
Cumulative Slope Adj.	0.90
Intercept Adjustment	0

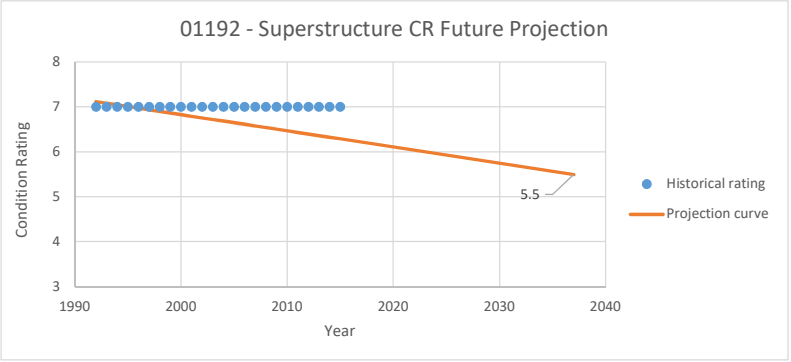
SUBSTRUCTURE:

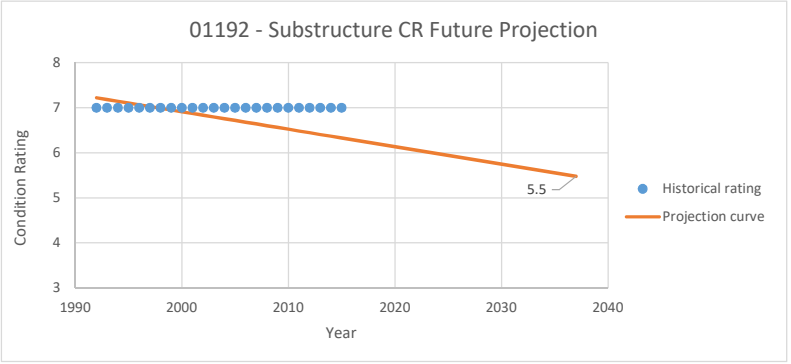
ADTT Adj.	1.06
Feature Under Adj.	1.1
Simple/Continuous Adj	1.1
Consistency Adj.	0.7
Cumulative Slope Adj.	0.90
Intercept Adjustment	0.2

01192

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	3	-	7	7.1	7	7.2
1993	3	-	7	7.1	7	7.2
1994	3	-	7	7.0	7	7.1
1995	3	-	7	7.0	7	7.1
1996	7	7.0	7	7.0	7	7.1
1997	7	7.0	7	6.9	7	7.0
1998	7	6.9	7	6.9	7	7.0
1999	7	6.9	7	6.9	7	6.9
2000	7	6.8	7	6.8	7	6.9
2001	7	6.8	7	6.8	7	6.9
2002	7	6.7	7	6.8	7	6.8
2003	7	6.7	7	6.7	7	6.8
2004	7	6.6	7	6.7	7	6.8
2005	7	6.6	7	6.6	7	6.7
2006	7	6.5	7	6.6	7	6.7
2007	7	6.5	7	6.6	7	6.6
2008	7	6.5	7	6.5	7	6.6
2009	7	6.4	7	6.5	7	6.6
2010	7	6.4	7	6.5	7	6.5
2011	7	6.3	7	6.4	7	6.5
2012	7	6.3	7	6.4	7	6.4
2013	7	6.2	7	6.4	7	6.4
2014	7	6.2	7	6.3	7	6.4
2015	7	6.1	7	6.3	7	6.3
2037		5.1		5.5		5.5







DECK:

ADTT Adj.	0.89
Deck Protection Adj.	1.1
Consistency Adj.	1.5
Cumulative Slope Adj.	1.47
Intercept Adjustment	-0.3

SUPERSTRUCTURE:

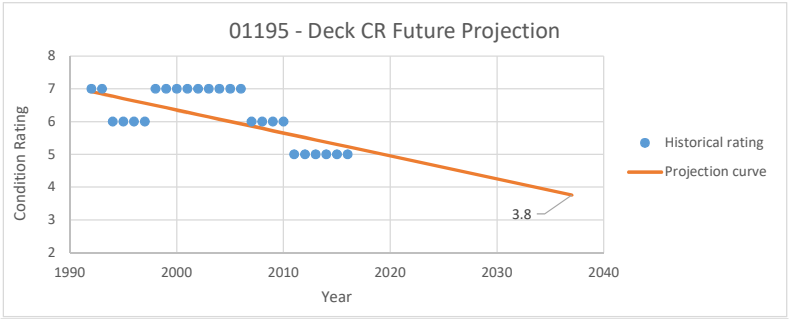
ADTT Adj.	0.89
Feature Under Adj.	0.9
Simple/Continuous Adj	1.1
Consistency Adj.	1.8
Cumulative Slope Adj.	1.59
Intercept Adjustment	-0.2

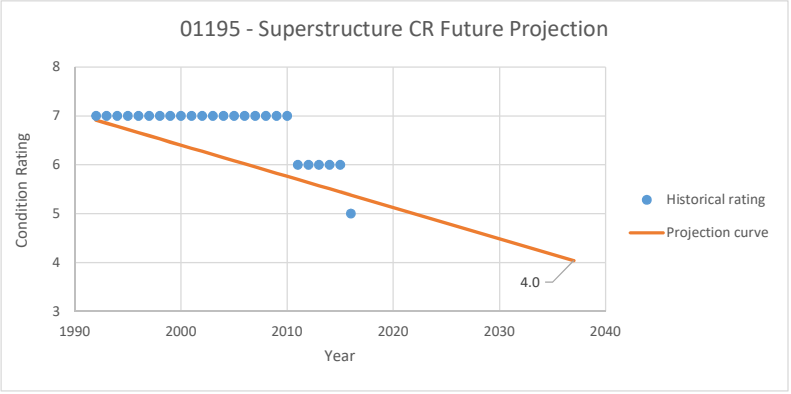
SUBSTRUCTURE:

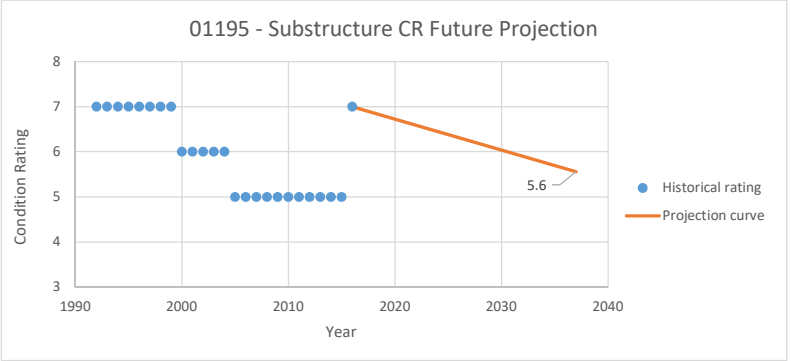
ADTT Adj.	0.89
Feature Under Adj.	0.9
Simple/Continuous Adj	1.1
Consistency Adj.	1.8
Cumulative Slope Adj.	1.59
Intercept Adjustment	0

01195

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	6.9	7	6.9	7	-
1993	7	6.8	7	6.9	7	-
1994	6	6.8	7	6.8	7	-
1995	6	6.7	7	6.7	7	-
1996	6	6.6	7	6.7	7	-
1997	6	6.6	7	6.6	7	-
1998	7	6.5	7	6.5	7	-
1999	7	6.4	7	6.5	7	-
2000	7	6.4	7	6.4	6	-
2001	7	6.3	7	6.3	6	-
2002	7	6.2	7	6.3	6	-
2003	7	6.1	7	6.2	6	-
2004	7	6.1	7	6.1	6	-
2005	7	6.0	7	6.1	5	-
2006	7	5.9	7	6.0	5	-
2007	6	5.9	7	6.0	5	-
2008	6	5.8	7	5.9	5	-
2009	6	5.7	7	5.8	5	-
2010	6	5.7	7	5.8	5	-
2011	5	5.6	6	5.7	5	-
2012	5	5.5	6	5.6	5	-
2013	5	5.4	6	5.6	5	-
2014	5	5.4	6	5.5	5	-
2015	5	5.3	6	5.4	5	-
2016	5	5.2	5	5.4	7	7.0
2037		3.8		4.0		5.6







DECK:

ADTT Adj.	0.89
Deck Protection Adj.	0.9
Consistency Adj.	1.7
Cumulative Slope Adj.	1.36
Intercept Adjustment	-0.4

SUPERSTRUCTURE:

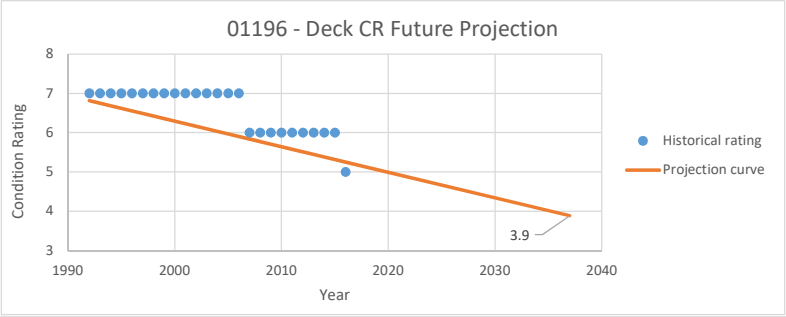
ADTT Adj.	0.89
Feature Under Adj.	0.9
Simple/Continuous Adj	1.1
Consistency Adj.	2
Cumulative Slope Adj.	1.77
Intercept Adjustment	-0.2

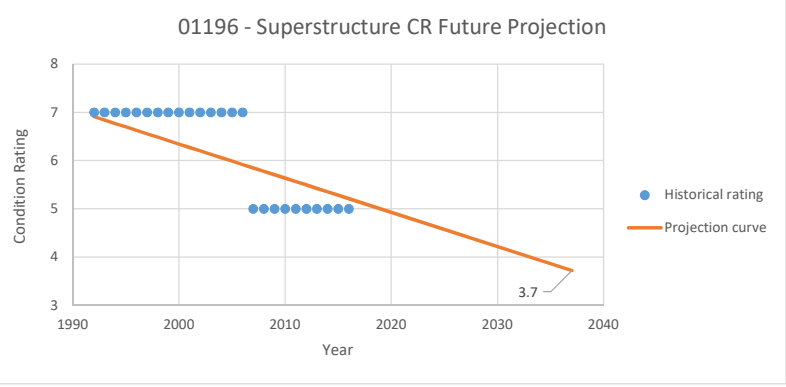
SUBSTRUCTURE:

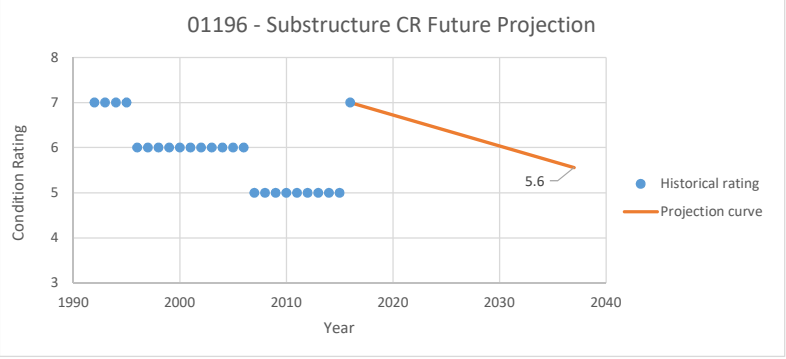
ADTT Adj.	0.89
Feature Under Adj.	0.9
Simple/Continuous Adj	1.1
Consistency Adj.	1.8
Cumulative Slope Adj.	1.59
Intercept Adjustment	0

01196

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	6.8	7	6.9	7	-
1993	7	6.8	7	6.8	7	-
1994	7	6.7	7	6.8	7	-
1995	7	6.6	7	6.7	7	-
1996	7	6.6	7	6.6	6	-
1997	7	6.5	7	6.6	6	-
1998	7	6.4	7	6.5	6	-
1999	7	6.4	7	6.4	6	-
2000	7	6.3	7	6.3	6	-
2001	7	6.2	7	6.3	6	-
2002	7	6.2	7	6.2	6	-
2003	7	6.1	7	6.1	6	-
2004	7	6.0	7	6.1	6	-
2005	7	6.0	7	6.0	6	-
2006	7	5.9	7	5.9	6	-
2007	6	5.8	5	5.8	5	-
2008	6	5.8	5	5.8	5	-
2009	6	5.7	5	5.7	5	-
2010	6	5.6	5	5.6	5	-
2011	6	5.6	5	5.6	5	-
2012	6	5.5	5	5.5	5	-
2013	6	5.4	5	5.4	5	-
2014	6	5.4	5	5.4	5	-
2015	6	5.3	5	5.3	5	-
2016	5	5.3	5	5.2	7	7.0
2037		3.9		3.7		5.6







DECK:

ADTT Adj.	0.98
Deck Protection Adj.	0.9
Consistency Adj.	1.6
Cumulative Slope Adj.	1.41
Intercept Adjustment	0

SUPERSTRUCTURE:

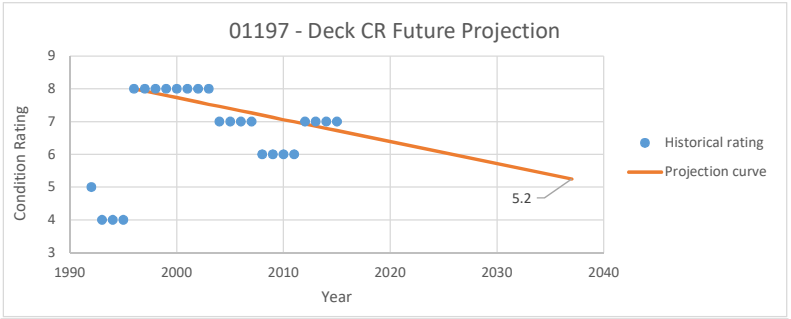
ADTT Adj.	0.98
Feature Under Adj.	0.9
Simple/Continuous Adj	1.1
Consistency Adj.	1
Cumulative Slope Adj.	0.97
Intercept Adjustment	0

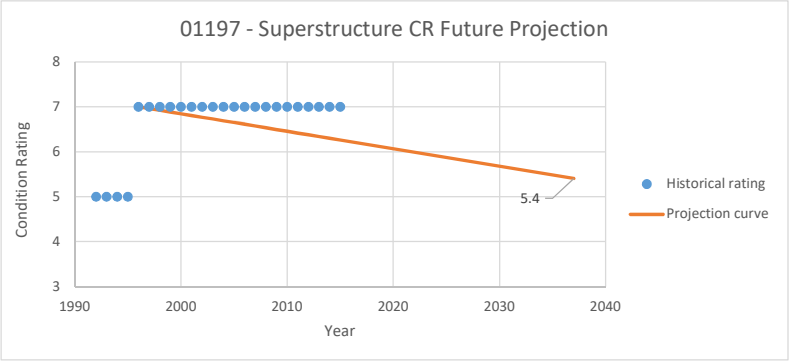
SUBSTRUCTURE:

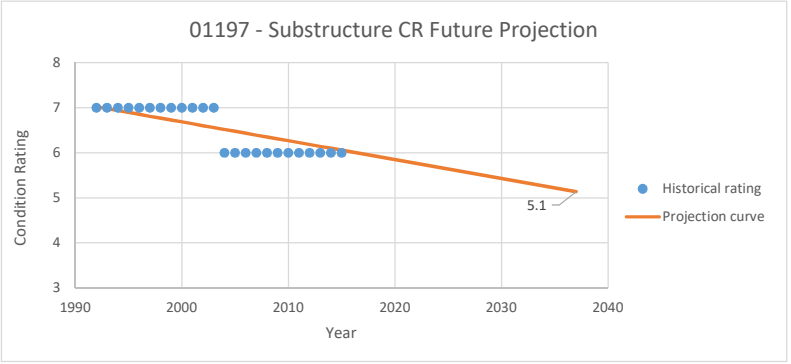
ADTT Adj.	0.98
Feature Under Adj.	0.9
Simple/Continuous Adj	1.1
Consistency Adj.	1
Cumulative Slope Adj.	0.97
Intercept Adjustment	0

01197

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	5	-	5	-	7	7.0
1993	4	-	5	-	7	7.0
1994	4	-	5	-	7	6.9
1995	4	-	5	-	7	6.9
1996	8	8.0	7	7.0	7	6.9
1997	8	7.9	7	7.0	7	6.8
1998	8	7.9	7	6.9	7	6.8
1999	8	7.8	7	6.9	7	6.7
2000	8	7.7	7	6.8	7	6.7
2001	8	7.7	7	6.8	7	6.6
2002	8	7.6	7	6.8	7	6.6
2003	8	7.5	7	6.7	7	6.6
2004	7	7.5	7	6.7	6	6.5
2005	7	7.4	7	6.6	6	6.5
2006	7	7.3	7	6.6	6	6.4
2007	7	7.3	7	6.6	6	6.4
2008	6	7.2	7	6.5	6	6.3
2009	6	7.1	7	6.5	6	6.3
2010	6	7.1	7	6.5	6	6.3
2011	6	7.0	7	6.4	6	6.2
2012	7	6.9	7	6.4	6	6.2
2013	7	6.9	7	6.3	6	6.1
2014	7	6.8	7	6.3	6	6.1
2015	7	6.7	7	6.3	6	6.1
2037		5.2		5.4		5.1







DECK:

ADTT Adj.	0.98
Deck Protection Adj.	0.9
Consistency Adj.	1.5
Cumulative Slope Adj.	1.32
Intercept Adjustment	0

SUPERSTRUCTURE:

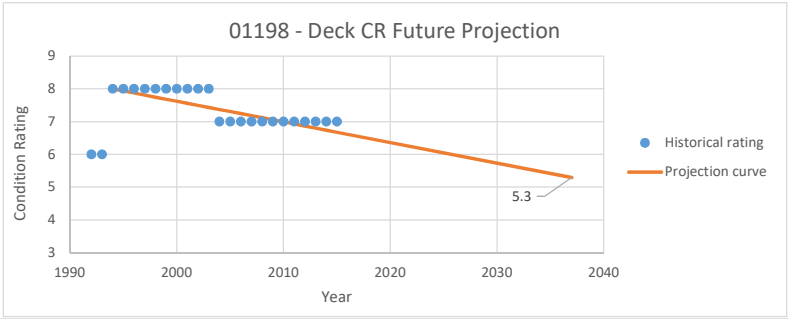
ADTT Adj.	0.98
Feature Under Adj.	0.9
Simple/Continuous Adj	1.1
Consistency Adj.	1.9
Cumulative Slope Adj.	1.84
Intercept Adjustment	0

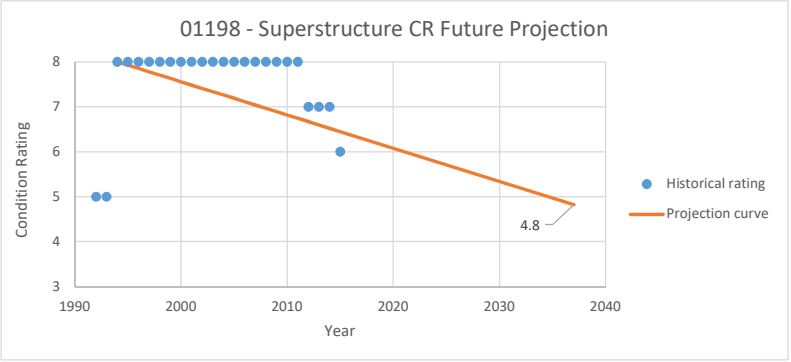
SUBSTRUCTURE:

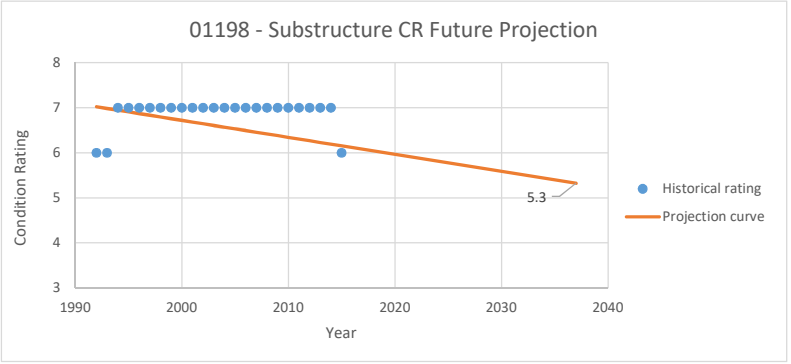
ADTT Adj.	0.98
Feature Under Adj.	0.9
Simple/Continuous Adj	1.1
Consistency Adj.	0.9
Cumulative Slope Adj.	0.87
Intercept Adjustment	0

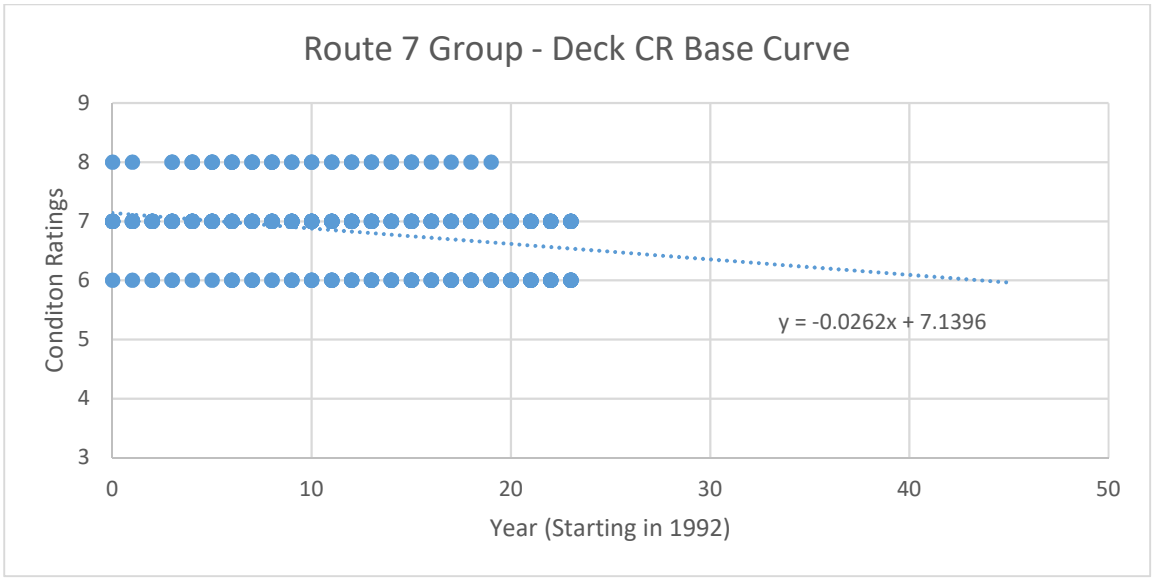
01198

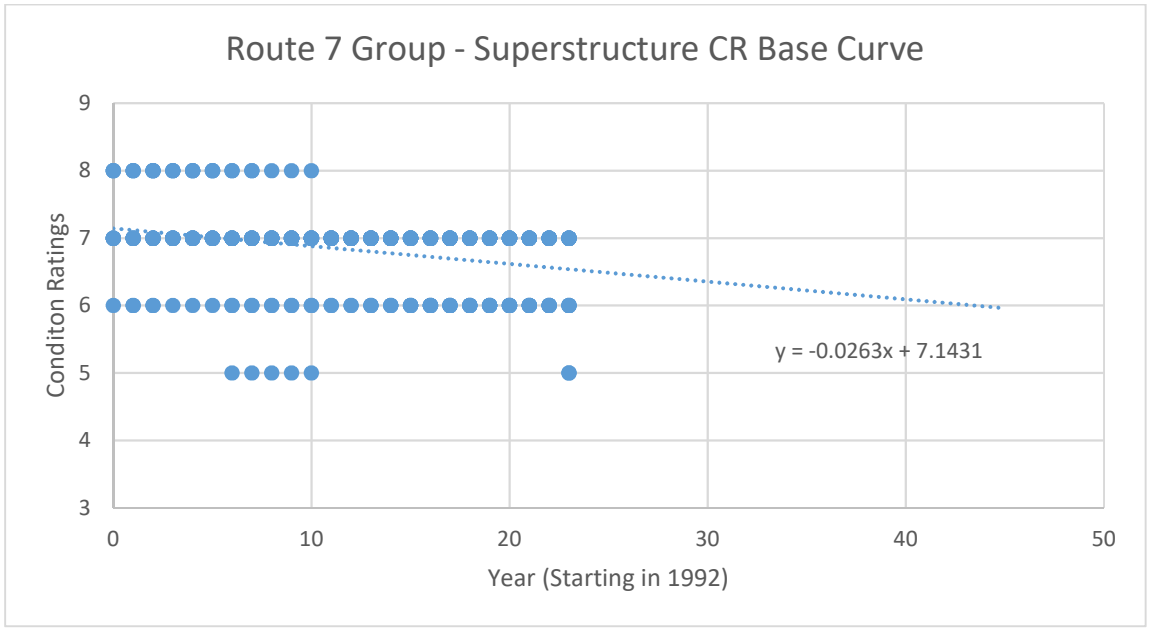
	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	6	-	5	-	6	7.0
1993	6	-	5	-	6	7.0
1994	8	8.0	8	8.0	7	6.9
1995	8	7.9	8	7.9	7	6.9
1996	8	7.9	8	7.9	7	6.9
1997	8	7.8	8	7.8	7	6.8
1998	8	7.7	8	7.7	7	6.8
1999	8	7.7	8	7.6	7	6.8
2000	8	7.6	8	7.6	7	6.7
2001	8	7.6	8	7.5	7	6.7
2002	8	7.5	8	7.4	7	6.6
2003	8	7.4	8	7.3	7	6.6
2004	7	7.4	8	7.3	7	6.6
2005	7	7.3	8	7.2	7	6.5
2006	7	7.2	8	7.1	7	6.5
2007	7	7.2	8	7.0	7	6.5
2008	7	7.1	8	7.0	7	6.4
2009	7	7.1	8	6.9	7	6.4
2010	7	7.0	8	6.8	7	6.3
2011	7	6.9	8	6.7	7	6.3
2012	7	6.9	7	6.7	7	6.3
2013	7	6.8	7	6.6	7	6.2
2014	7	6.7	7	6.5	7	6.2
2015	7	6.7	6	6.4	6	6.2
2037		5.3		4.8		5.3

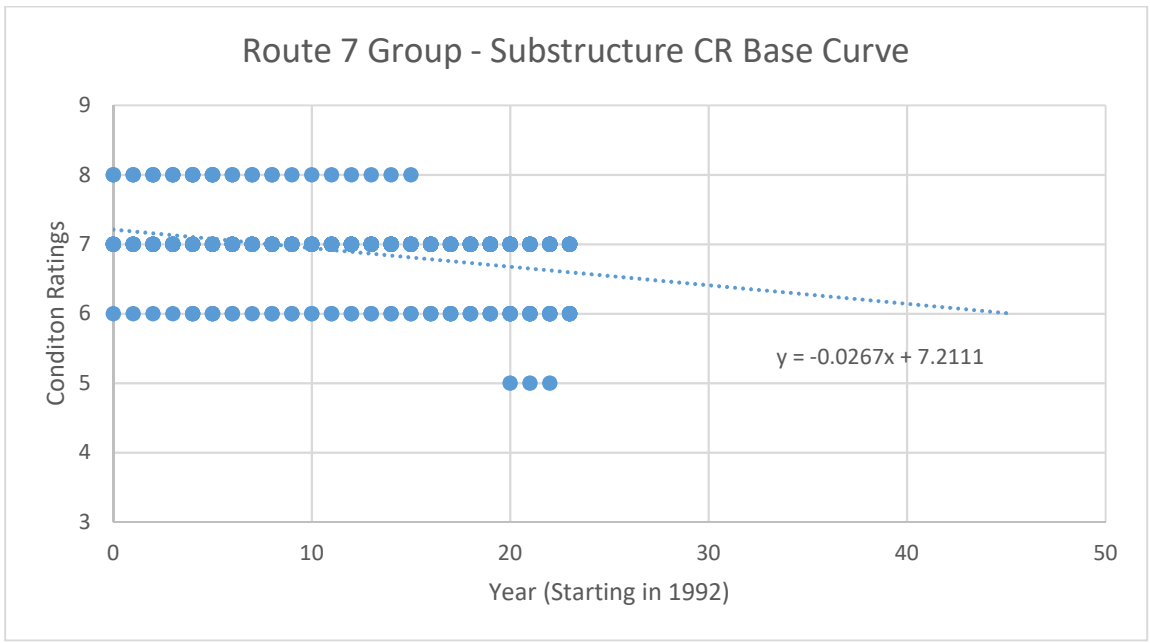







Route 7 Group - Deck CR Base Curve
Conditon Ratings
Year (Starting in 1992)
y = -0.0262x + 7.1396
9
8
7
6
5
4
3
0
10
20
30
40
50


Route 7 Group - Superstructure CR Base Curve
Conditon Ratings
Year (Starting in 1992)
y = -0.0263x + 7.1431
9
8
7
6
5
4
3
0
10
20
30
40
50


Route 7 Group - Substructure CR Base Curve
Conditon Ratings
Year (Starting in 1992)
y = -0.0267x + 7.2111
9
8
7
6
5
4
3
0
10
20
30
40
50

DECK:

ADTT Adj	0.99
Deck Protection Adj	1.1
Consistency Adj	1.8
Cumulative Slope Adj	1.97
Intercept Adjustment	0

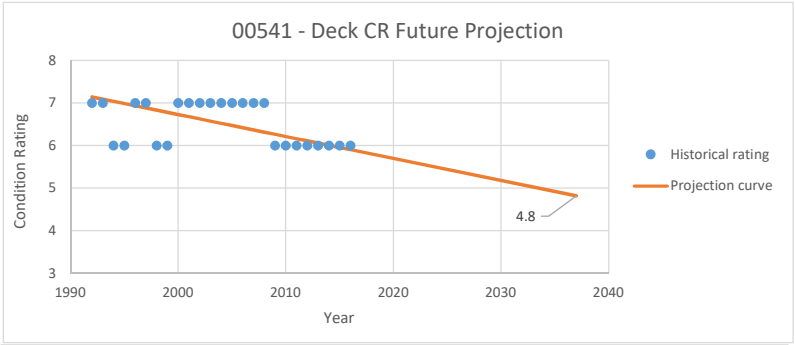
SUPERSTRUCTURE:

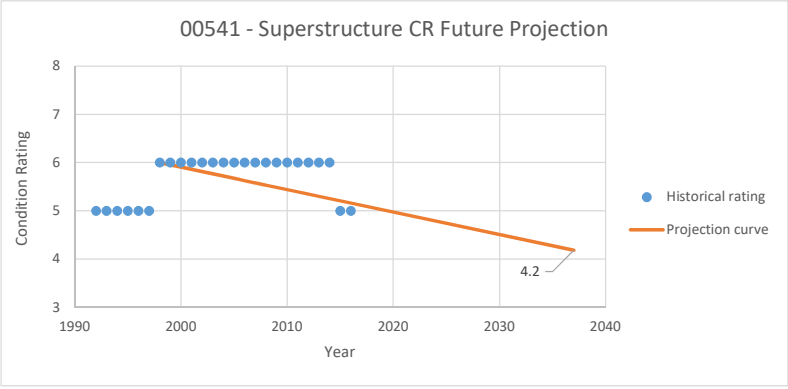
ADTT Adj	0.99
Feature Under Adj	0.9
Simple/Continuous Adj	1.1
Consistency Adj	1.8
Cumulative Slope Adj	1.77
Intercept Adjustment	0

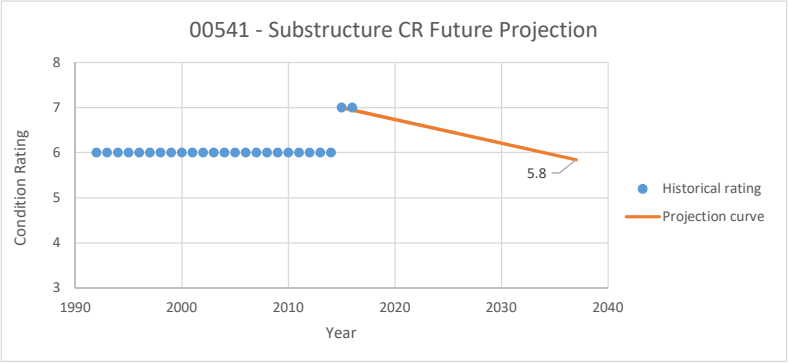
SUBSTRUCTURE:

ADTT Adj	0.99
Feature Under Adj	0.9
Simple/Continuous Adj	1.1
Consistency Adj	2
Cumulative Slope Adj	1.97
Intercept Adjustment	0

00541						
	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	7.1	5	-	6	-
1993	7	7.1	5	-	6	-
1994	6	7.0	5	-	6	-
1995	6	7.0	5	-	6	-
1996	7	6.9	5	-	6	-
1997	7	6.9	5	-	6	-
1998	6	6.8	6	6.0	6	-
1999	6	6.8	6	6.0	6	-
2000	7	6.7	6	5.9	6	-
2001	7	6.7	6	5.9	6	-
2002	7	6.6	6	5.8	6	-
2003	7	6.6	6	5.8	6	-
2004	7	6.5	6	5.7	6	-
2005	7	6.5	6	5.7	6	-
2006	7	6.4	6	5.6	6	-
2007	7	6.4	6	5.6	6	-
2008	7	6.3	6	5.5	6	-
2009	6	6.3	6	5.5	6	-
2010	6	6.2	6	5.4	6	-
2011	6	6.2	6	5.4	6	-
2012	6	6.1	6	5.3	6	-
2013	6	6.1	6	5.3	6	-
2014	6	6.0	6	5.3	6	-
2015	6	6.0	5	5.2	7	7.0
2016	6	5.9	5	5.2	7	6.9
2037		4.8		4.2		5.8







DECK:

ADTT Adj	0.99
Deck Protection Adj	0.9
Consistency Adj	2
Cumulative Slope Adj	1.79
Intercept Adjustment	-0.2

SUPERSTRUCTURE:

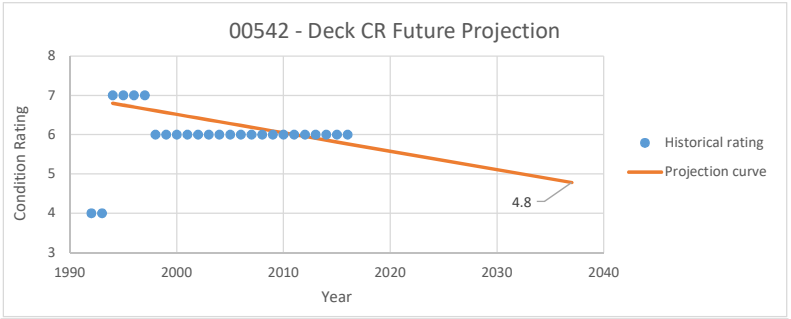
ADTT Adj	0.99
Feature Under Adj	0.9
Simple/Continuous Adj	1.1
Consistency Adj	1.6
Cumulative Slope Adj	1.58
Intercept Adjustment	-1.2

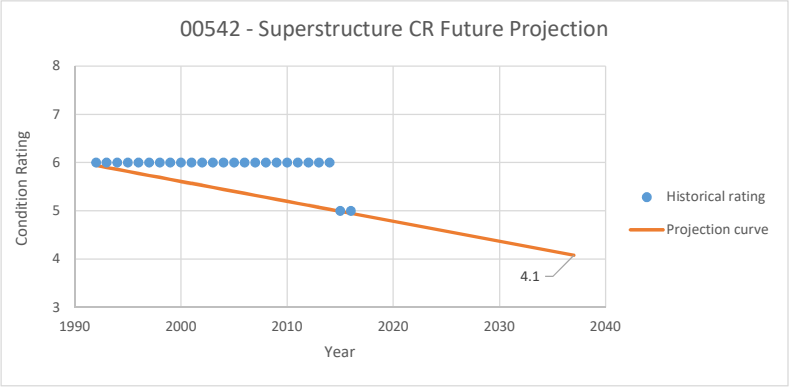
SUBSTRUCTURE:

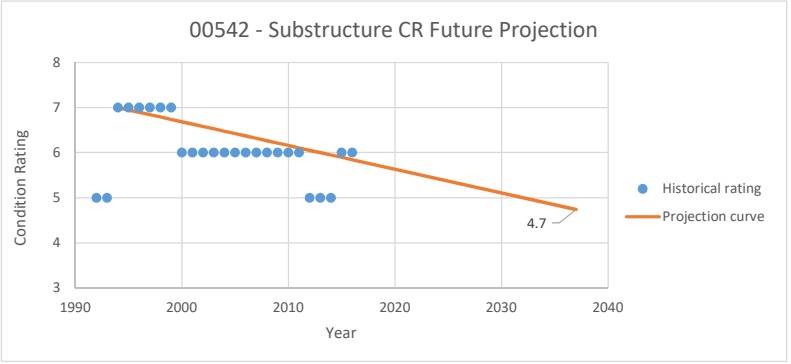
ADTT Adj	0.99
Feature Under Adj	0.9
Simple/Continuous Adj	1.1
Consistency Adj	2
Cumulative Slope Adj	1.97
Intercept Adjustment	0

00542

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	4	-	6	5.9	5	-
1993	4	-	6	5.9	5	-
1994	7	6.8	6	5.9	7	7.0
1995	7	6.8	6	5.8	7	6.9
1996	7	6.7	6	5.8	7	6.9
1997	7	6.7	6	5.7	7	6.8
1998	6	6.6	6	5.7	7	6.8
1999	6	6.6	6	5.7	7	6.7
2000	6	6.5	6	5.6	6	6.7
2001	6	6.5	6	5.6	6	6.6
2002	6	6.4	6	5.5	6	6.6
2003	6	6.4	6	5.5	6	6.5
2004	6	6.3	6	5.4	6	6.5
2005	6	6.3	6	5.4	6	6.4
2006	6	6.2	6	5.4	6	6.4
2007	6	6.2	6	5.3	6	6.3
2008	6	6.1	6	5.3	6	6.3
2009	6	6.1	6	5.2	6	6.2
2010	6	6.0	6	5.2	6	6.2
2011	6	6.0	6	5.2	6	6.1
2012	6	6.0	6	5.1	5	6.1
2013	6	5.9	6	5.1	5	6.0
2014	6	5.9	6	5.0	5	5.9
2015	6	5.8	5	5.0	6	5.9
2016	6	5.8	5	4.9	6	5.8
2037		4.8		4.1		4.7







DECK:

ADTT Adj	0.80
Deck Protection Adj	1.1
Consistency Adj	2.5
Cumulative Slope Adj	2.20
Intercept Adjustment	0

SUPERSTRUCTURE:

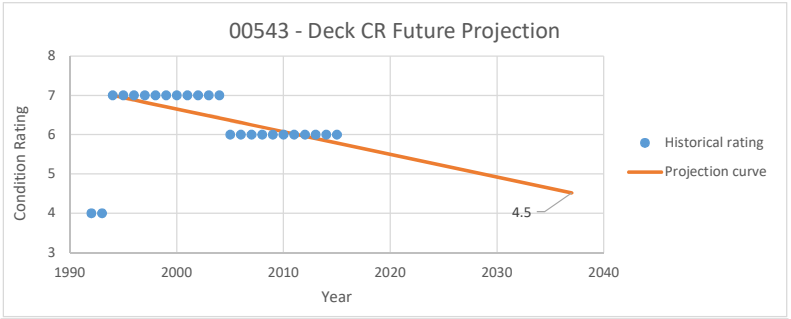
ADTT Adj	0.80
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	1
Cumulative Slope Adj	0.97
Intercept Adjustment	0

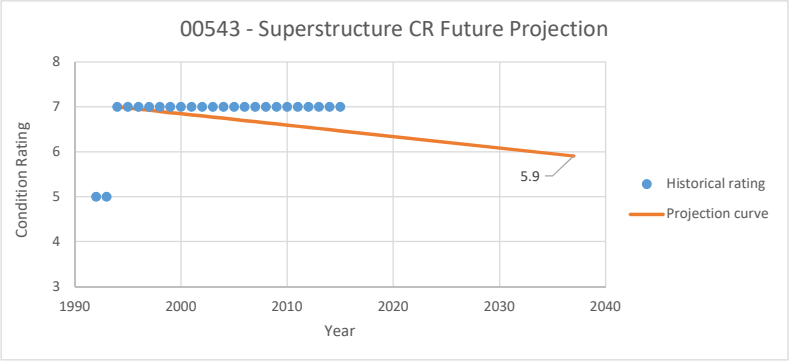
SUBSTRUCTURE:

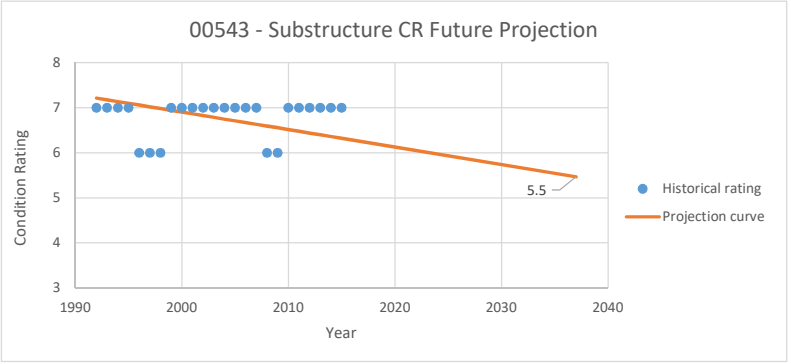
ADTT Adj	0.80
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	1.5
Cumulative Slope Adj	1.45
Intercept Adjustment	0

00543

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	4	-	5	-	7	7.2
1993	4	-	5	-	7	7.2
1994	7	7.0	7	7.0	7	7.1
1995	7	6.9	7	7.0	7	7.1
1996	7	6.9	7	6.9	6	7.1
1997	7	6.8	7	6.9	6	7.0
1998	7	6.8	7	6.9	6	7.0
1999	7	6.7	7	6.9	7	6.9
2000	7	6.7	7	6.8	7	6.9
2001	7	6.6	7	6.8	7	6.9
2002	7	6.5	7	6.8	7	6.8
2003	7	6.5	7	6.8	7	6.8
2004	7	6.4	7	6.7	7	6.7
2005	6	6.4	7	6.7	7	6.7
2006	6	6.3	7	6.7	7	6.7
2007	6	6.3	7	6.7	7	6.6
2008	6	6.2	7	6.6	6	6.6
2009	6	6.1	7	6.6	6	6.6
2010	6	6.1	7	6.6	7	6.5
2011	6	6.0	7	6.6	7	6.5
2012	6	6.0	7	6.5	7	6.4
2013	6	5.9	7	6.5	7	6.4
2014	6	5.8	7	6.5	7	6.4
2015	6	5.8	7	6.5	7	6.3
2037		4.5		5.9		5.5







DECK:

ADTT Adj	0.96
Deck Protection Adj	0.9
Consistency Adj	3
Cumulative Slope Adj	2.60
Intercept Adjustment	-0.5

SUPERSTRUCTURE:

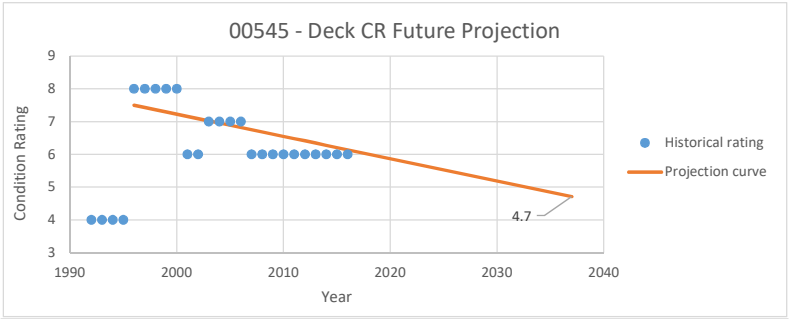
ADTT Adj	0.96
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	2.5
Cumulative Slope Adj	2.91
Intercept Adjustment	-0.2

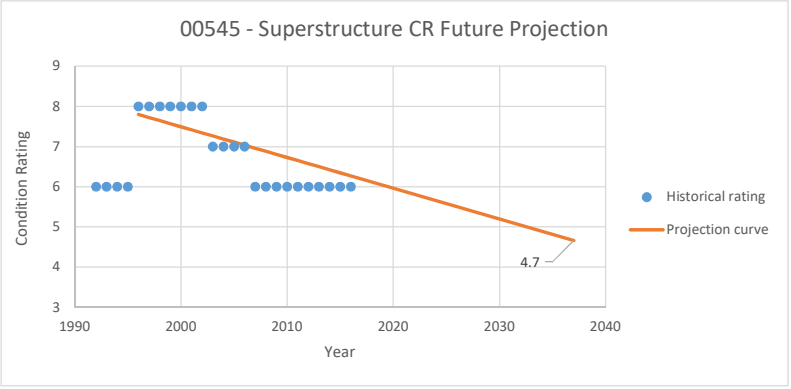
SUBSTRUCTURE:

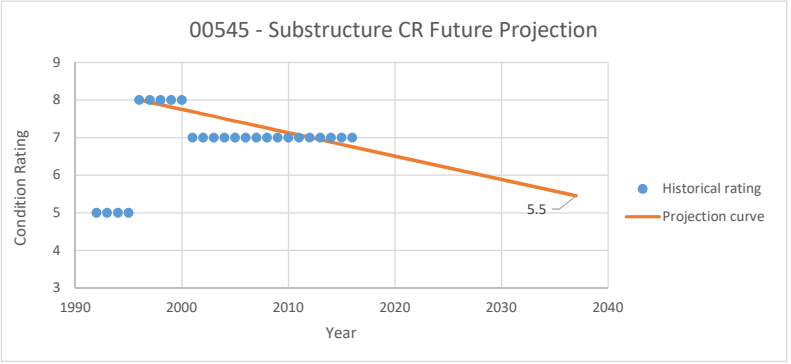
ADTT Adj	0.96
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	2
Cumulative Slope Adj	2.33
Intercept Adjustment	0

00545

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	4	-	6	-	5	-
1993	4	-	6	-	5	-
1994	4	-	6	-	5	-
1995	4	-	6	-	5	-
1996	8	7.5	8	7.8	8	8.0
1997	8	7.4	8	7.7	8	7.9
1998	8	7.4	8	7.6	8	7.9
1999	8	7.3	8	7.6	8	7.8
2000	8	7.2	8	7.5	8	7.8
2001	6	7.2	8	7.4	7	7.7
2002	6	7.1	8	7.3	7	7.6
2003	7	7.0	7	7.3	7	7.6
2004	7	7.0	7	7.2	7	7.5
2005	7	6.9	7	7.1	7	7.4
2006	7	6.8	7	7.0	7	7.4
2007	6	6.8	6	7.0	7	7.3
2008	6	6.7	6	6.9	7	7.3
2009	6	6.6	6	6.8	7	7.2
2010	6	6.5	6	6.7	7	7.1
2011	6	6.5	6	6.7	7	7.1
2012	6	6.4	6	6.6	7	7.0
2013	6	6.3	6	6.5	7	6.9
2014	6	6.3	6	6.4	7	6.9
2015	6	6.2	6	6.3	7	6.8
2016	6	6.1	6	6.3	7	6.8
2037		4.7		4.7		5.5







DECK:

ADTT Adj	1.02
Deck Protection Adj	0.9
Consistency Adj	1.8
Cumulative Slope Adj	1.65
Intercept Adjustment	-0.1

SUPERSTRUCTURE:

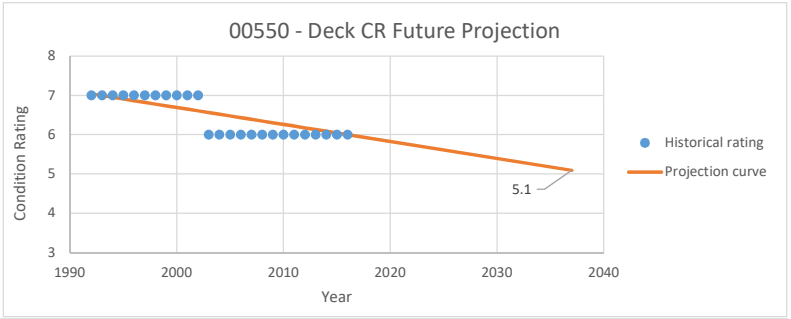
ADTT Adj	1.02
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	1.3
Cumulative Slope Adj	1.60
Intercept Adjustment	-0.1

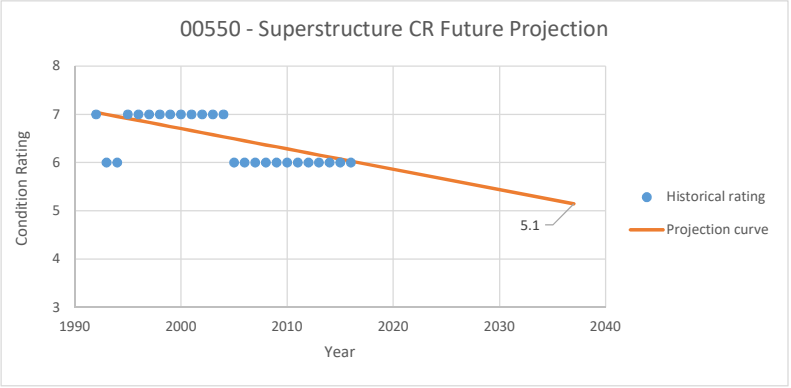
SUBSTRUCTURE:

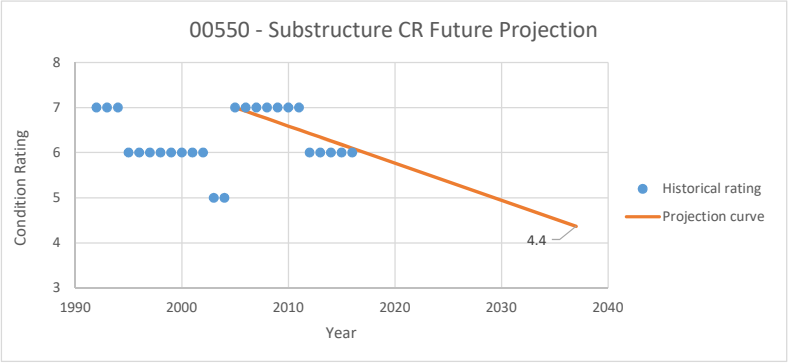
ADTT Adj	1.02
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	2.5
Cumulative Slope Adj	3.08
Intercept Adjustment	0

00550

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	7.0	7	7.0	7	-
1993	7	7.0	6	7.0	7	-
1994	7	7.0	6	7.0	7	-
1995	7	6.9	7	6.9	6	-
1996	7	6.9	7	6.9	6	-
1997	7	6.8	7	6.8	6	-
1998	7	6.8	7	6.8	6	-
1999	7	6.7	7	6.7	6	-
2000	7	6.7	7	6.7	6	-
2001	7	6.7	7	6.7	6	-
2002	7	6.6	7	6.6	6	-
2003	6	6.6	7	6.6	5	-
2004	6	6.5	7	6.5	5	-
2005	6	6.5	6	6.5	7	7.0
2006	6	6.4	6	6.5	7	6.9
2007	6	6.4	6	6.4	7	6.8
2008	6	6.3	6	6.4	7	6.8
2009	6	6.3	6	6.3	7	6.7
2010	6	6.3	6	6.3	7	6.6
2011	6	6.2	6	6.2	7	6.5
2012	6	6.2	6	6.2	6	6.4
2013	6	6.1	6	6.2	6	6.3
2014	6	6.1	6	6.1	6	6.3
2015	6	6.0	6	6.1	6	6.2
2016	6	6.0	6	6.0	6	6.1
2037		5.1		5.1		4.4







DECK:

ADTT Adj	1.08
Deck Protection Adj	0.9
Consistency Adj	2
Cumulative Slope Adj	1.95
Intercept Adjustment	0

SUPERSTRUCTURE:

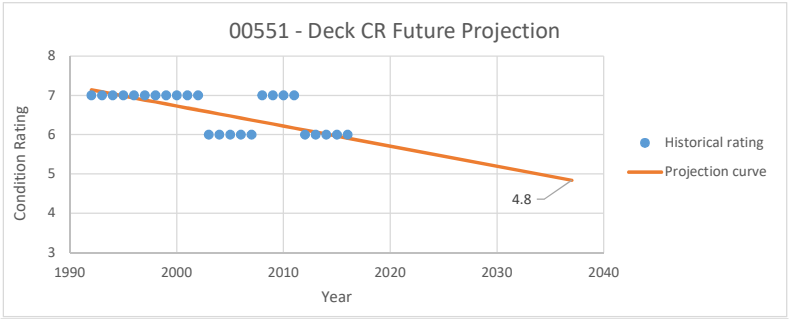
ADTT Adj	1.08
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	1.2
Cumulative Slope Adj	1.57
Intercept Adjustment	-0.1

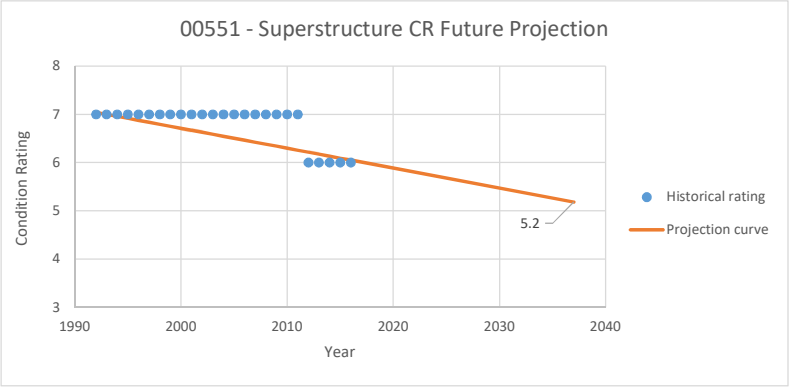
SUBSTRUCTURE:

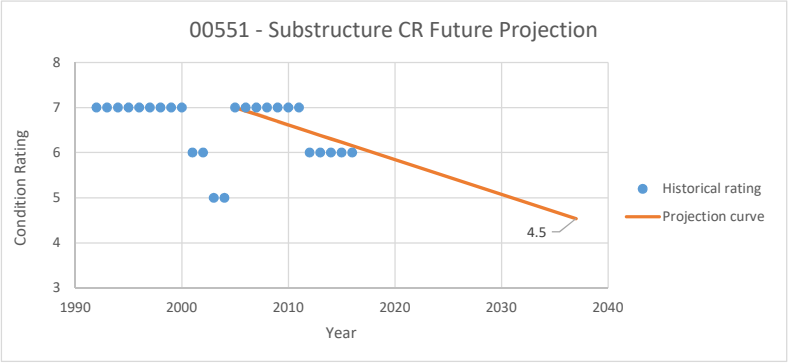
ADTT Adj	1.08
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	2.2
Cumulative Slope Adj	2.88
Intercept Adjustment	0

00551

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	7.1	7	7.0	7	-
1993	7	7.1	7	7.0	7	-
1994	7	7.0	7	7.0	7	-
1995	7	7.0	7	6.9	7	-
1996	7	6.9	7	6.9	7	-
1997	7	6.9	7	6.8	7	-
1998	7	6.8	7	6.8	7	-
1999	7	6.8	7	6.8	7	-
2000	7	6.7	7	6.7	7	-
2001	7	6.7	7	6.7	6	-
2002	7	6.6	7	6.6	6	-
2003	6	6.6	7	6.6	5	-
2004	6	6.5	7	6.5	5	-
2005	6	6.5	7	6.5	7	7.0
2006	6	6.4	7	6.5	7	6.9
2007	6	6.4	7	6.4	7	6.8
2008	7	6.3	7	6.4	7	6.8
2009	7	6.3	7	6.3	7	6.7
2010	7	6.2	7	6.3	7	6.6
2011	7	6.2	7	6.3	7	6.5
2012	6	6.1	6	6.2	6	6.5
2013	6	6.1	6	6.2	6	6.4
2014	6	6.0	6	6.1	6	6.3
2015	6	6.0	6	6.1	6	6.2
2016	6	5.9	6	6.1	6	6.2
2037		4.8		5.2		4.5







DECK:

ADTT Adj	1.20
Deck Protection Adj	1.1
Consistency Adj	0.8
Cumulative Slope Adj	1.06
Intercept Adjustment	0

SUPERSTRUCTURE:

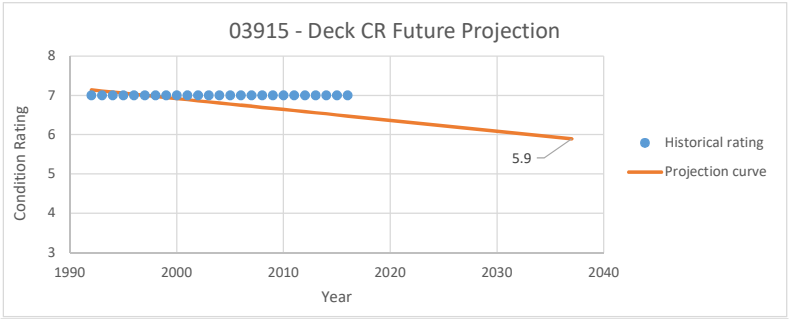
ADTT Adj	1.20
Feature Under Adj	0.9
Simple/Continuous Adj	1.1
Consistency Adj	0.8
Cumulative Slope Adj	0.95
Intercept Adjustment	0

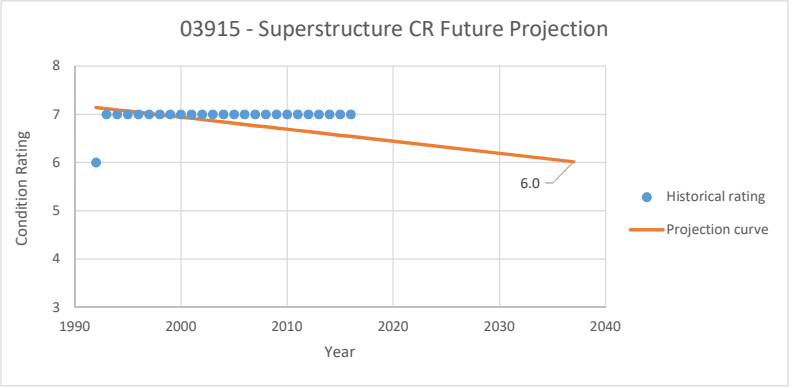
SUBSTRUCTURE:

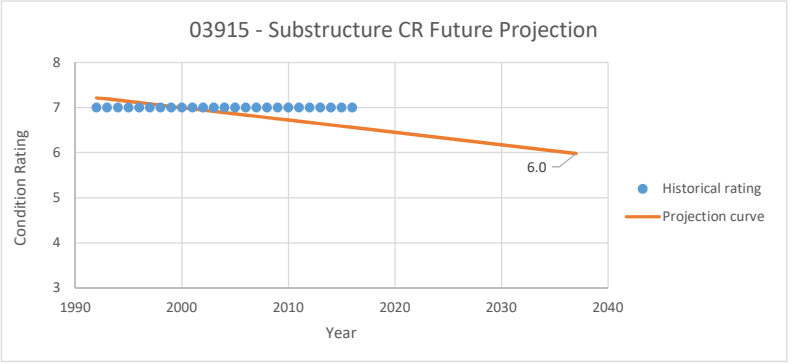
ADTT Adj	1.20
Feature Under Adj	0.9
Simple/Continuous Adj	1.1
Consistency Adj	0.8
Cumulative Slope Adj	0.95
Intercept Adjustment	0

03915

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	7.1	6	7.1	7	7.2
1993	7	7.1	7	7.1	7	7.2
1994	7	7.1	7	7.1	7	7.2
1995	7	7.1	7	7.1	7	7.1
1996	7	7.0	7	7.0	7	7.1
1997	7	7.0	7	7.0	7	7.1
1998	7	7.0	7	7.0	7	7.1
1999	7	6.9	7	7.0	7	7.0
2000	7	6.9	7	6.9	7	7.0
2001	7	6.9	7	6.9	7	7.0
2002	7	6.9	7	6.9	7	6.9
2003	7	6.8	7	6.9	7	6.9
2004	7	6.8	7	6.8	7	6.9
2005	7	6.8	7	6.8	7	6.9
2006	7	6.8	7	6.8	7	6.8
2007	7	6.7	7	6.8	7	6.8
2008	7	6.7	7	6.7	7	6.8
2009	7	6.7	7	6.7	7	6.8
2010	7	6.6	7	6.7	7	6.7
2011	7	6.6	7	6.7	7	6.7
2012	7	6.6	7	6.6	7	6.7
2013	7	6.6	7	6.6	7	6.6
2014	7	6.5	7	6.6	7	6.6
2015	7	6.5	7	6.6	7	6.6
2016	7	6.5	7	6.5	7	6.6
2037		5.9		6.0		6.0







DECK:

ADTT Adj	1.20
Deck Protection Adj	1.1
Consistency Adj	0.8
Cumulative Slope Adj	1.06
Intercept Adjustment	0

SUPERSTRUCTURE:

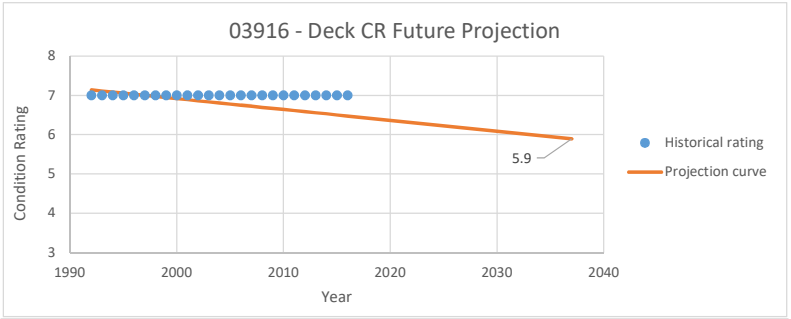
ADTT Adj	1.20
Feature Under Adj	0.9
Simple/Continuous Adj	1.1
Consistency Adj	0.8
Cumulative Slope Adj	0.95
Intercept Adjustment	0

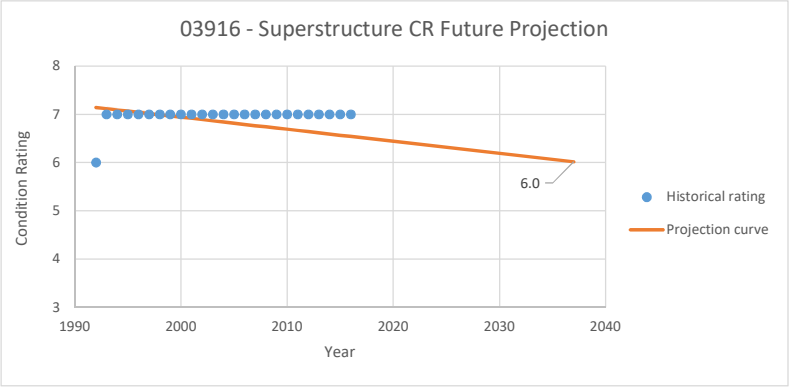
SUBSTRUCTURE:

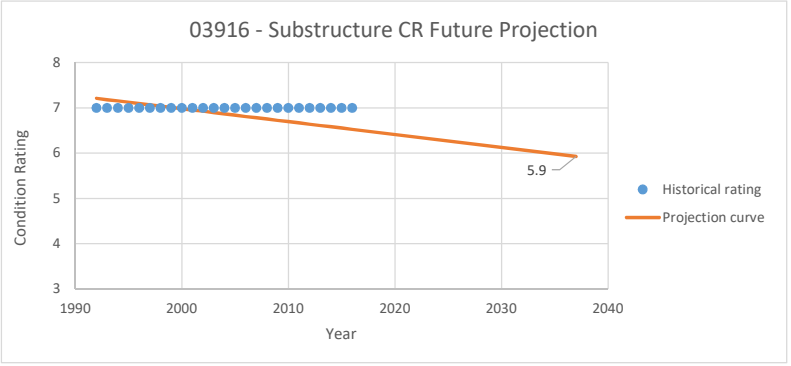
ADTT Adj	1.20
Feature Under Adj	0.9
Simple/Continuous Adj	1.1
Consistency Adj	0.9
Cumulative Slope Adj	1.07
Intercept Adjustment	0

03916

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	7.1	6	7.1	7	7.2
1993	7	7.1	7	7.1	7	7.2
1994	7	7.1	7	7.1	7	7.2
1995	7	7.1	7	7.1	7	7.1
1996	7	7.0	7	7.0	7	7.1
1997	7	7.0	7	7.0	7	7.1
1998	7	7.0	7	7.0	7	7.0
1999	7	6.9	7	7.0	7	7.0
2000	7	6.9	7	6.9	7	7.0
2001	7	6.9	7	6.9	7	7.0
2002	7	6.9	7	6.9	7	6.9
2003	7	6.8	7	6.9	7	6.9
2004	7	6.8	7	6.8	7	6.9
2005	7	6.8	7	6.8	7	6.8
2006	7	6.8	7	6.8	7	6.8
2007	7	6.7	7	6.8	7	6.8
2008	7	6.7	7	6.7	7	6.8
2009	7	6.7	7	6.7	7	6.7
2010	7	6.6	7	6.7	7	6.7
2011	7	6.6	7	6.7	7	6.7
2012	7	6.6	7	6.6	7	6.6
2013	7	6.6	7	6.6	7	6.6
2014	7	6.5	7	6.6	7	6.6
2015	7	6.5	7	6.6	7	6.6
2016	7	6.5	7	6.5	7	6.5
2037		5.9		6.0		5.9







DECK:

ADTT Adj	0.80
Deck Protection Adj	1.1
Consistency Adj	1.5
Cumulative Slope Adj	1.32
Intercept Adjustment	0.4

SUPERSTRUCTURE:

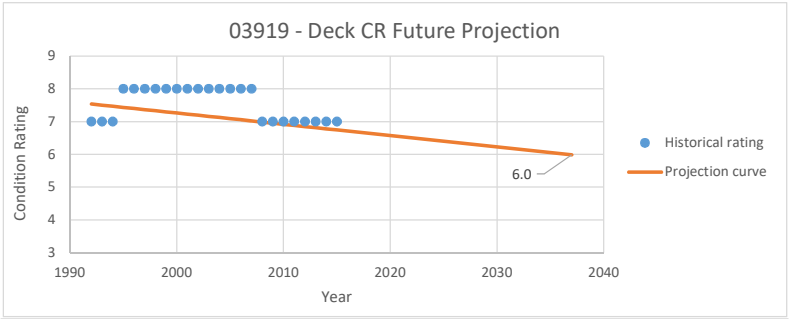
ADTT Adj	0.80
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	1
Cumulative Slope Adj	0.97
Intercept Adjustment	0

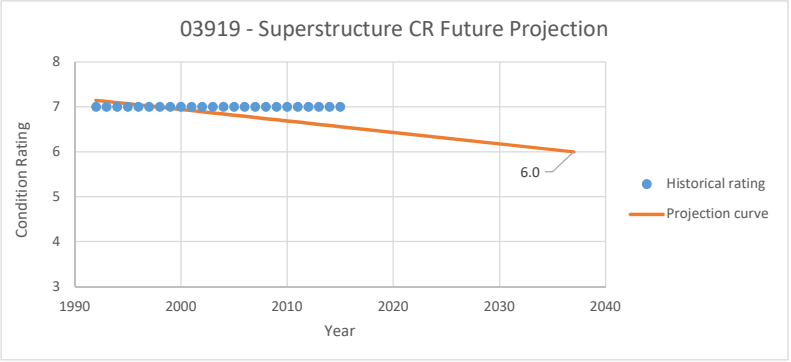
SUBSTRUCTURE:

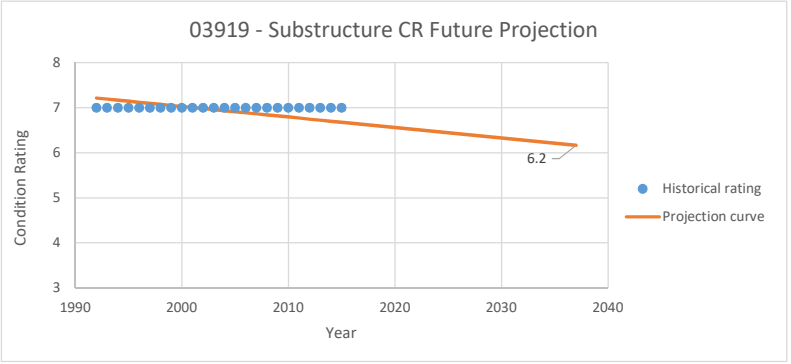
ADTT Adj	0.80
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	0.9
Cumulative Slope Adj	0.87
Intercept Adjustment	0

03919

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	7.5	7	7.1	7	7.2
1993	7	7.5	7	7.1	7	7.2
1994	7	7.5	7	7.1	7	7.2
1995	8	7.4	7	7.1	7	7.1
1996	8	7.4	7	7.0	7	7.1
1997	8	7.4	7	7.0	7	7.1
1998	8	7.3	7	7.0	7	7.1
1999	8	7.3	7	7.0	7	7.0
2000	8	7.3	7	6.9	7	7.0
2001	8	7.2	7	6.9	7	7.0
2002	8	7.2	7	6.9	7	7.0
2003	8	7.2	7	6.9	7	7.0
2004	8	7.1	7	6.8	7	6.9
2005	8	7.1	7	6.8	7	6.9
2006	8	7.1	7	6.8	7	6.9
2007	8	7.0	7	6.8	7	6.9
2008	7	7.0	7	6.7	7	6.8
2009	7	7.0	7	6.7	7	6.8
2010	7	6.9	7	6.7	7	6.8
2011	7	6.9	7	6.7	7	6.8
2012	7	6.8	7	6.6	7	6.7
2013	7	6.8	7	6.6	7	6.7
2014	7	6.8	7	6.6	7	6.7
2015	7	6.7	7	6.6	7	6.7
2037		6.0		6.0		6.2







DECK:

ADTT Adj	0.80
Deck Protection Adj	1.1
Consistency Adj	1.5
Cumulative Slope Adj	1.32
Intercept Adjustment	0.4

SUPERSTRUCTURE:

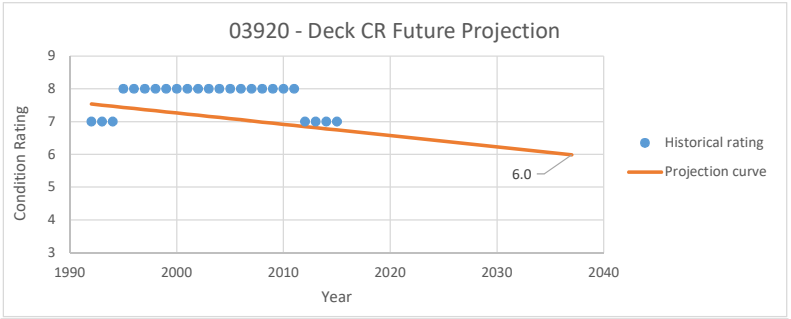
ADTT Adj	0.80
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	1.3
Cumulative Slope Adj	1.26
Intercept Adjustment	0

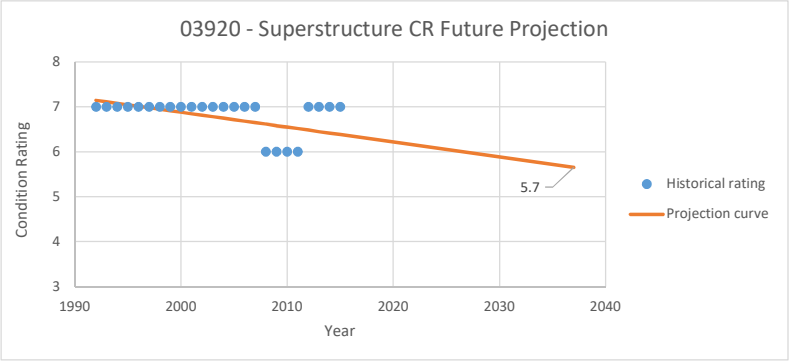
SUBSTRUCTURE:

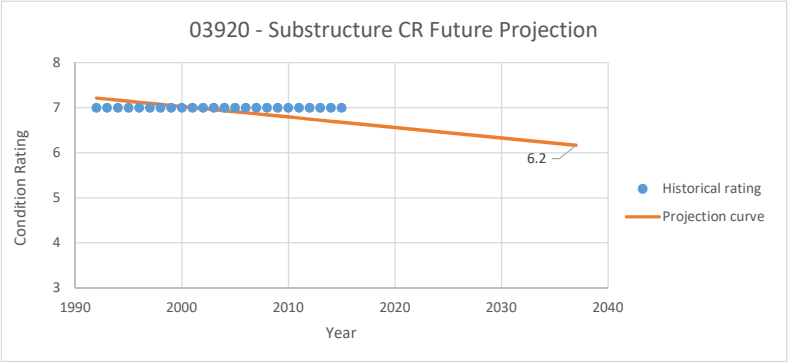
ADTT Adj	0.80
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	0.9
Cumulative Slope Adj	0.87
Intercept Adjustment	0

03920

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	7.5	7	7.1	7	7.2
1993	7	7.5	7	7.1	7	7.2
1994	7	7.5	7	7.1	7	7.2
1995	8	7.4	7	7.0	7	7.1
1996	8	7.4	7	7.0	7	7.1
1997	8	7.4	7	7.0	7	7.1
1998	8	7.3	7	6.9	7	7.1
1999	8	7.3	7	6.9	7	7.0
2000	8	7.3	7	6.9	7	7.0
2001	8	7.2	7	6.8	7	7.0
2002	8	7.2	7	6.8	7	7.0
2003	8	7.2	7	6.8	7	7.0
2004	8	7.1	7	6.7	7	6.9
2005	8	7.1	7	6.7	7	6.9
2006	8	7.1	7	6.7	7	6.9
2007	8	7.0	7	6.6	7	6.9
2008	8	7.0	6	6.6	7	6.8
2009	8	7.0	6	6.6	7	6.8
2010	8	6.9	6	6.5	7	6.8
2011	8	6.9	6	6.5	7	6.8
2012	7	6.8	7	6.5	7	6.7
2013	7	6.8	7	6.4	7	6.7
2014	7	6.8	7	6.4	7	6.7
2015	7	6.7	7	6.4	7	6.7
2037		6.0		5.7		6.2







DECK:

ADTT Adj	0.80
Deck Protection Adj	0.9
Consistency Adj	1
Cumulative Slope Adj	0.72
Intercept Adjustment	-0.2

SUPERSTRUCTURE:

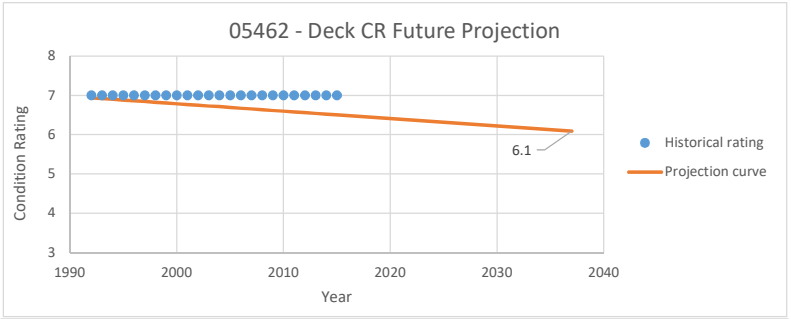
ADTT Adj	0.80
Feature Under Adj	1.1
Simple/Continuous Adj	0.9
Consistency Adj	1
Cumulative Slope Adj	0.79
Intercept Adjustment	0

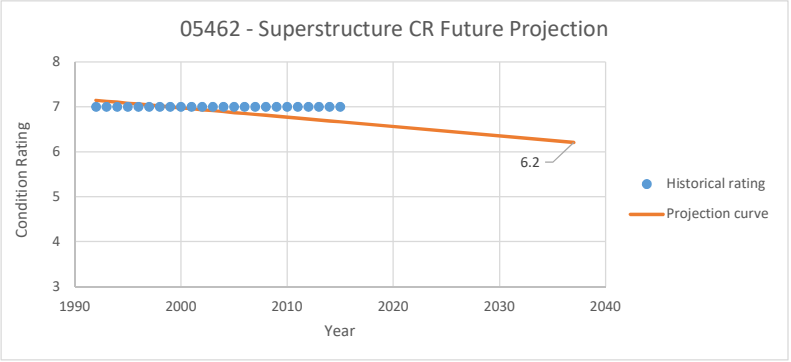
SUBSTRUCTURE:

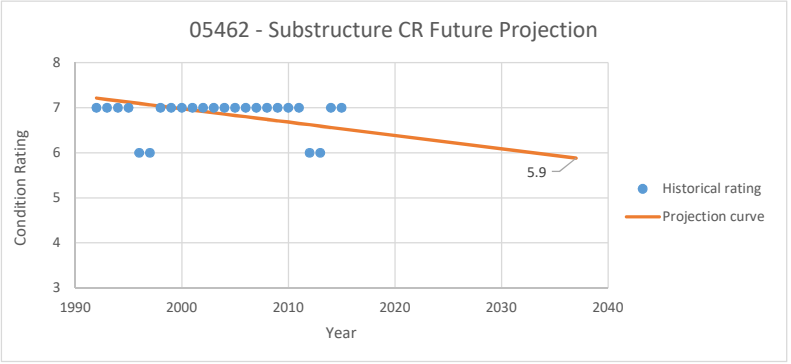
ADTT Adj	0.80
Feature Under Adj	1.1
Simple/Continuous Adj	0.9
Consistency Adj	1.4
Cumulative Slope Adj	1.11
Intercept Adjustment	0

05462

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	6.9	7	7.1	7	7.2
1993	7	6.9	7	7.1	7	7.2
1994	7	6.9	7	7.1	7	7.2
1995	7	6.9	7	7.1	7	7.1
1996	7	6.9	7	7.1	6	7.1
1997	7	6.8	7	7.0	6	7.1
1998	7	6.8	7	7.0	7	7.0
1999	7	6.8	7	7.0	7	7.0
2000	7	6.8	7	7.0	7	7.0
2001	7	6.8	7	7.0	7	6.9
2002	7	6.8	7	6.9	7	6.9
2003	7	6.7	7	6.9	7	6.9
2004	7	6.7	7	6.9	7	6.9
2005	7	6.7	7	6.9	7	6.8
2006	7	6.7	7	6.9	7	6.8
2007	7	6.7	7	6.8	7	6.8
2008	7	6.6	7	6.8	7	6.7
2009	7	6.6	7	6.8	7	6.7
2010	7	6.6	7	6.8	7	6.7
2011	7	6.6	7	6.7	7	6.6
2012	7	6.6	7	6.7	6	6.6
2013	7	6.5	7	6.7	6	6.6
2014	7	6.5	7	6.7	7	6.6
2015	7	6.5	7	6.7	7	6.5
2037		6.1		6.2		5.9







DECK:

ADTT Adj	1.20
Deck Protection Adj	0.9
Consistency Adj	1
Cumulative Slope Adj	1.08
Intercept Adjustment	0

SUPERSTRUCTURE:

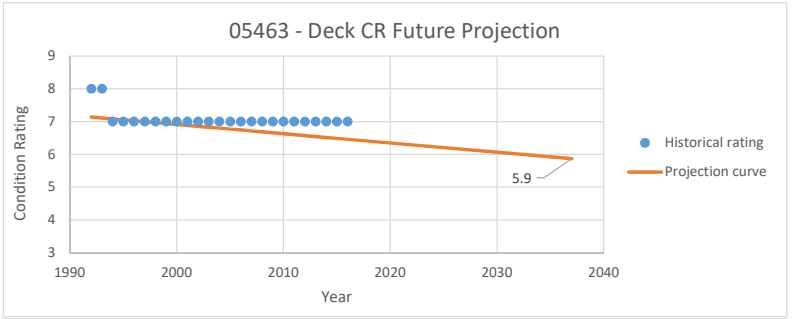
ADTT Adj	1.20
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	1.2
Cumulative Slope Adj	1.74
Intercept Adjustment	0.5

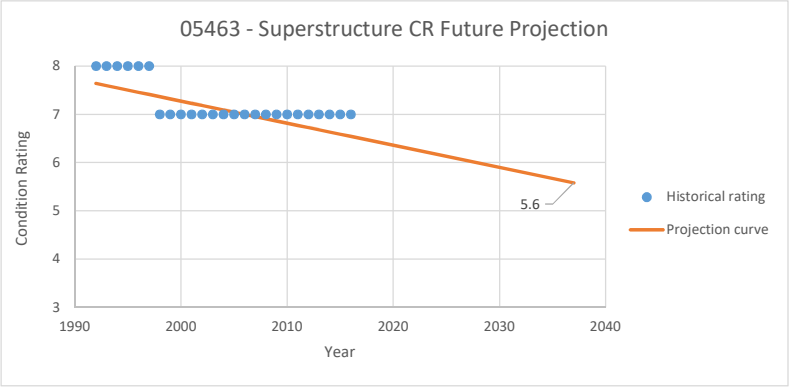
SUBSTRUCTURE:

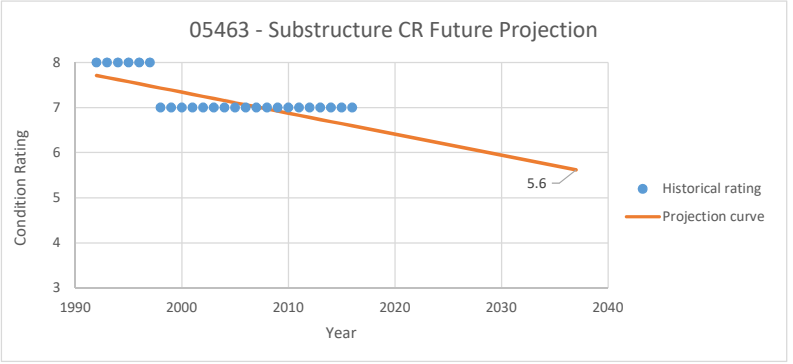
ADTT Adj	1.20
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	1.2
Cumulative Slope Adj	1.74
Intercept Adjustment	0.5

05463

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	8	7.1	8	7.6	8	7.7
1993	8	7.1	8	7.6	8	7.7
1994	7	7.1	8	7.6	8	7.6
1995	7	7.1	8	7.5	8	7.6
1996	7	7.0	8	7.5	8	7.5
1997	7	7.0	8	7.4	8	7.5
1998	7	7.0	7	7.4	7	7.4
1999	7	6.9	7	7.3	7	7.4
2000	7	6.9	7	7.3	7	7.3
2001	7	6.9	7	7.2	7	7.3
2002	7	6.9	7	7.2	7	7.2
2003	7	6.8	7	7.1	7	7.2
2004	7	6.8	7	7.1	7	7.2
2005	7	6.8	7	7.0	7	7.1
2006	7	6.7	7	7.0	7	7.1
2007	7	6.7	7	7.0	7	7.0
2008	7	6.7	7	6.9	7	7.0
2009	7	6.7	7	6.9	7	6.9
2010	7	6.6	7	6.8	7	6.9
2011	7	6.6	7	6.8	7	6.8
2012	7	6.6	7	6.7	7	6.8
2013	7	6.5	7	6.7	7	6.7
2014	7	6.5	7	6.6	7	6.7
2015	7	6.5	7	6.6	7	6.6
2016	7	6.5	7	6.5	7	6.6
2037		5.9		5.6		5.6







DECK:

ADTT Adj	1.20
Deck Protection Adj	0.9
Consistency Adj	0.9
Cumulative Slope Adj	0.97
Intercept Adjustment	0

SUPERSTRUCTURE:

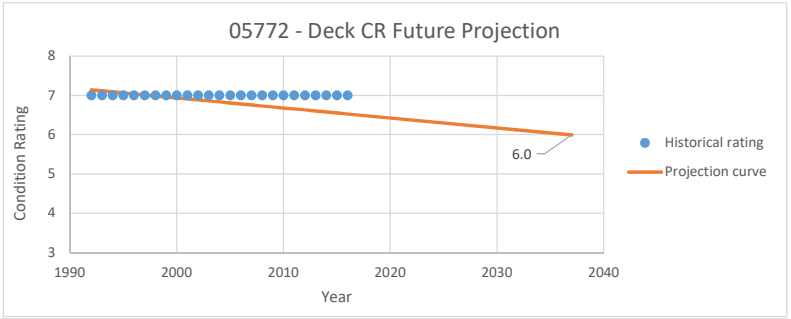
ADTT Adj	1.20
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	1.5
Cumulative Slope Adj	2.18
Intercept Adjustment	0.3

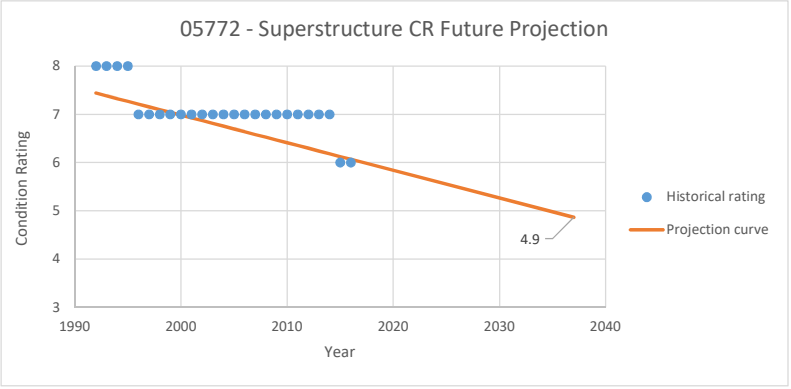
SUBSTRUCTURE:

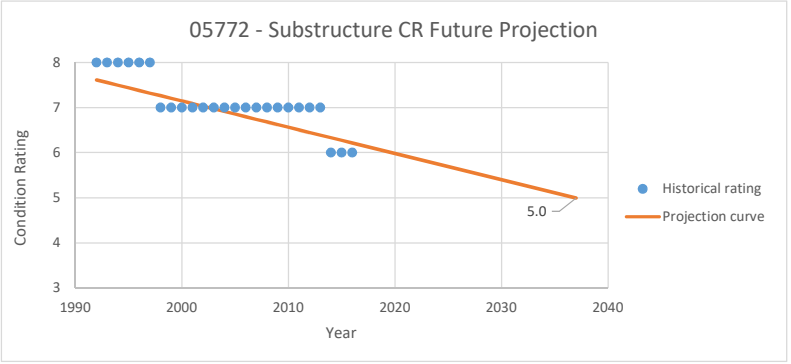
ADTT Adj	1.20
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	1.5
Cumulative Slope Adj	2.18
Intercept Adjustment	0.4

05772

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	7.1	8	7.4	8	7.6
1993	7	7.1	8	7.4	8	7.6
1994	7	7.1	8	7.3	8	7.5
1995	7	7.1	8	7.3	8	7.4
1996	7	7.0	7	7.2	8	7.4
1997	7	7.0	7	7.2	8	7.3
1998	7	7.0	7	7.1	7	7.3
1999	7	7.0	7	7.0	7	7.2
2000	7	6.9	7	7.0	7	7.1
2001	7	6.9	7	6.9	7	7.1
2002	7	6.9	7	6.9	7	7.0
2003	7	6.9	7	6.8	7	7.0
2004	7	6.8	7	6.8	7	6.9
2005	7	6.8	7	6.7	7	6.9
2006	7	6.8	7	6.6	7	6.8
2007	7	6.8	7	6.6	7	6.7
2008	7	6.7	7	6.5	7	6.7
2009	7	6.7	7	6.5	7	6.6
2010	7	6.7	7	6.4	7	6.6
2011	7	6.7	7	6.4	7	6.5
2012	7	6.6	7	6.3	7	6.4
2013	7	6.6	7	6.2	7	6.4
2014	7	6.6	7	6.2	6	6.3
2015	7	6.6	6	6.1	6	6.3
2016	7	6.5	6	6.1	6	6.2
2037		6.0		4.9		5.0







DECK:

ADTT Adj	0.80
Deck Protection Adj	0.9
Consistency Adj	1.5
Cumulative Slope Adj	1.08
Intercept Adjustment	0

SUPERSTRUCTURE:

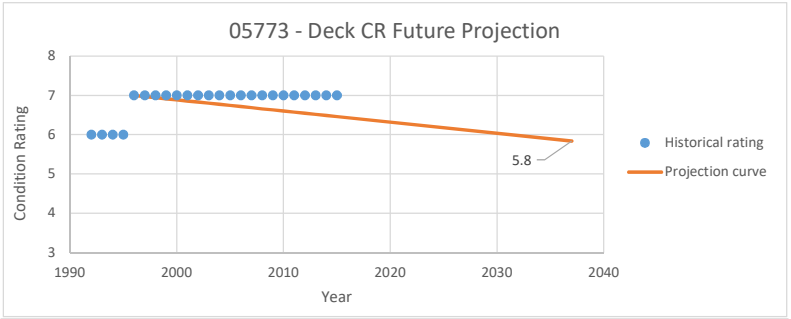
ADTT Adj	0.80
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	1.7
Cumulative Slope Adj	1.65
Intercept Adjustment	0

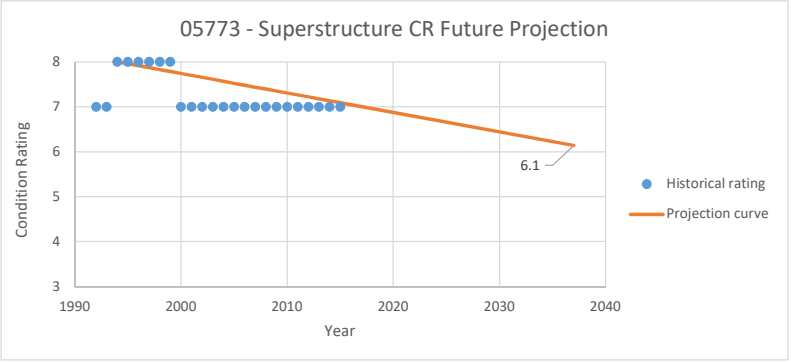
SUBSTRUCTURE:

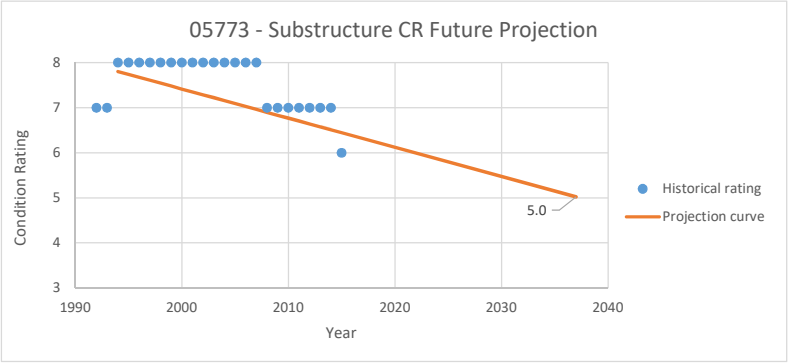
ADTT Adj	0.80
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	2.5
Cumulative Slope Adj	2.42
Intercept Adjustment	-0.2

05773

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	6	-	7	-	7	-
1993	6	-	7	-	7	-
1994	6	-	8	8.0	8	7.8
1995	6	-	8	8.0	8	7.7
1996	7	7.0	8	7.9	8	7.7
1997	7	7.0	8	7.9	8	7.6
1998	7	6.9	8	7.8	8	7.5
1999	7	6.9	8	7.8	8	7.5
2000	7	6.9	7	7.7	8	7.4
2001	7	6.9	7	7.7	8	7.3
2002	7	6.8	7	7.7	8	7.3
2003	7	6.8	7	7.6	8	7.2
2004	7	6.8	7	7.6	8	7.2
2005	7	6.7	7	7.5	8	7.1
2006	7	6.7	7	7.5	8	7.0
2007	7	6.7	7	7.4	8	7.0
2008	7	6.7	7	7.4	7	6.9
2009	7	6.6	7	7.4	7	6.8
2010	7	6.6	7	7.3	7	6.8
2011	7	6.6	7	7.3	7	6.7
2012	7	6.5	7	7.2	7	6.6
2013	7	6.5	7	7.2	7	6.6
2014	7	6.5	7	7.1	7	6.5
2015	7	6.5	7	7.1	6	6.4
2037		5.8		6.1		5.0







DECK:

ADTT Adj	0.80
Deck Protection Adj	0.9
Consistency Adj	1
Cumulative Slope Adj	0.72
Intercept Adjustment	-1.1

SUPERSTRUCTURE:

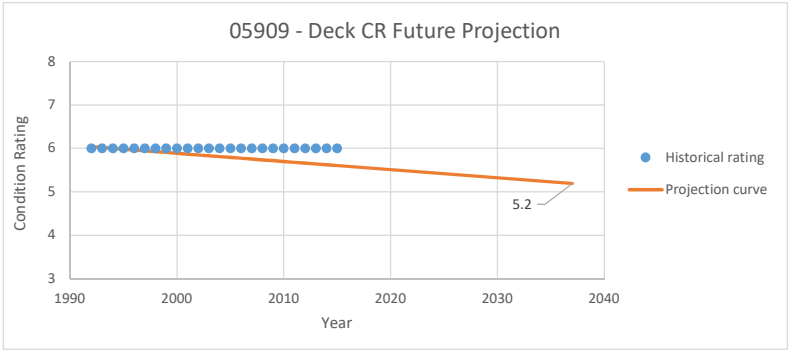
ADTT Adj	0.80
Feature Under Adj	1.1
Simple/Continuous Adj	0.9
Consistency Adj	2
Cumulative Slope Adj	1.58
Intercept Adjustment	0

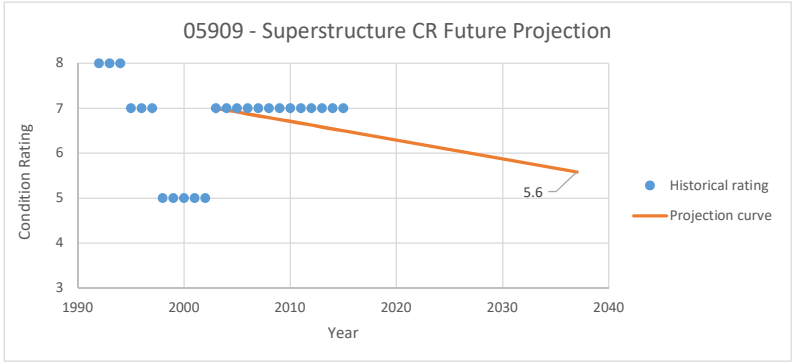
SUBSTRUCTURE:

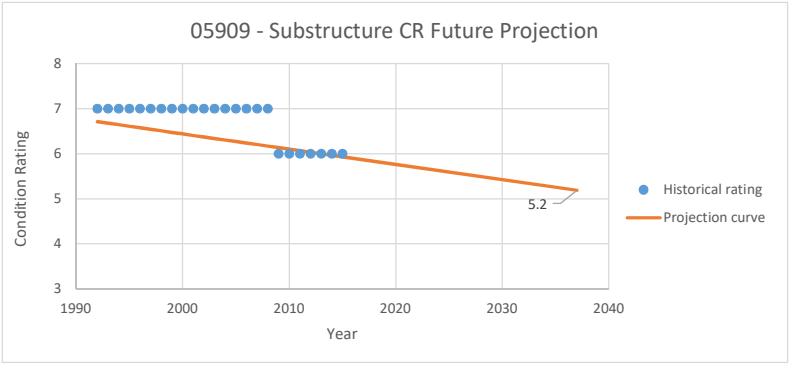
ADTT Adj	0.80
Feature Under Adj	1.1
Simple/Continuous Adj	0.9
Consistency Adj	1.6
Cumulative Slope Adj	1.27
Intercept Adjustment	-0.5

05909

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	6	6.0	8	-	7	6.7
1993	6	6.0	8	-	7	6.7
1994	6	6.0	8	-	7	6.6
1995	6	6.0	7	-	7	6.6
1996	6	6.0	7	-	7	6.6
1997	6	5.9	7	-	7	6.5
1998	6	5.9	5	-	7	6.5
1999	6	5.9	5	-	7	6.5
2000	6	5.9	5	-	7	6.4
2001	6	5.9	5	-	7	6.4
2002	6	5.9	5	-	7	6.4
2003	6	5.8	7	7.0	7	6.3
2004	6	5.8	7	7.0	7	6.3
2005	6	5.8	7	6.9	7	6.3
2006	6	5.8	7	6.9	7	6.2
2007	6	5.8	7	6.8	7	6.2
2008	6	5.7	7	6.8	7	6.2
2009	6	5.7	7	6.8	6	6.1
2010	6	5.7	7	6.7	6	6.1
2011	6	5.7	7	6.7	6	6.1
2012	6	5.7	7	6.6	6	6.0
2013	6	5.6	7	6.6	6	6.0
2014	6	5.6	7	6.5	6	6.0
2015	6	5.6	7	6.5	6	5.9
2037		5.2		5.6		5.2







DECK:

ADTT Adj	0.80
Deck Protection Adj	0.9
Consistency Adj	1.1
Cumulative Slope Adj	0.79
Intercept Adjustment	0

SUPERSTRUCTURE:

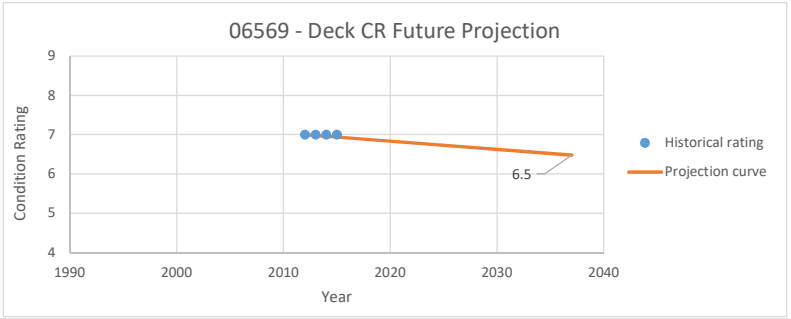
ADTT Adj	0.80
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	1.1
Cumulative Slope Adj	1.06
Intercept Adjustment	0

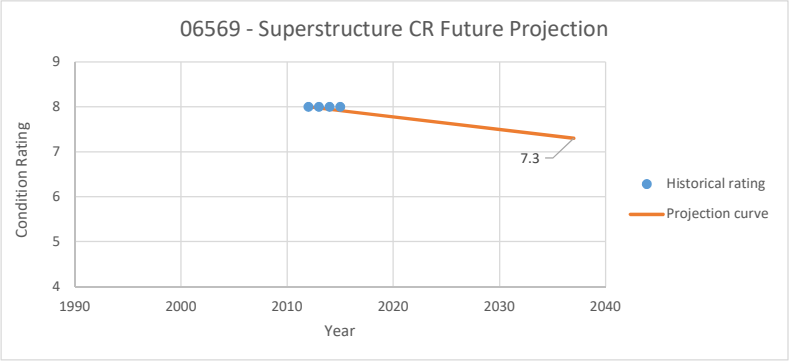
SUBSTRUCTURE:

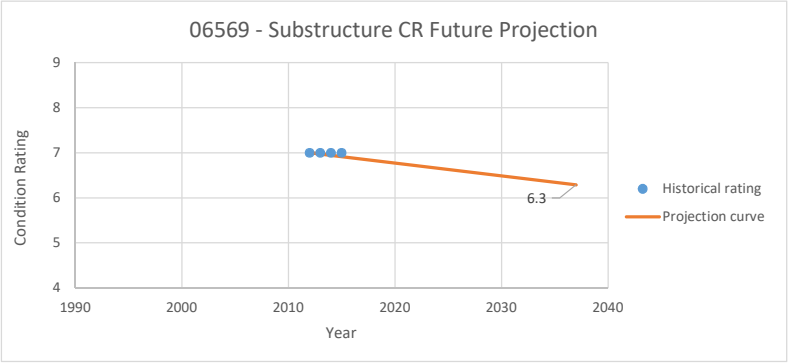
ADTT Adj	0.80
Feature Under Adj	1.1
Simple/Continuous Adj	1.1
Consistency Adj	1.1
Cumulative Slope Adj	1.06
Intercept Adjustment	0

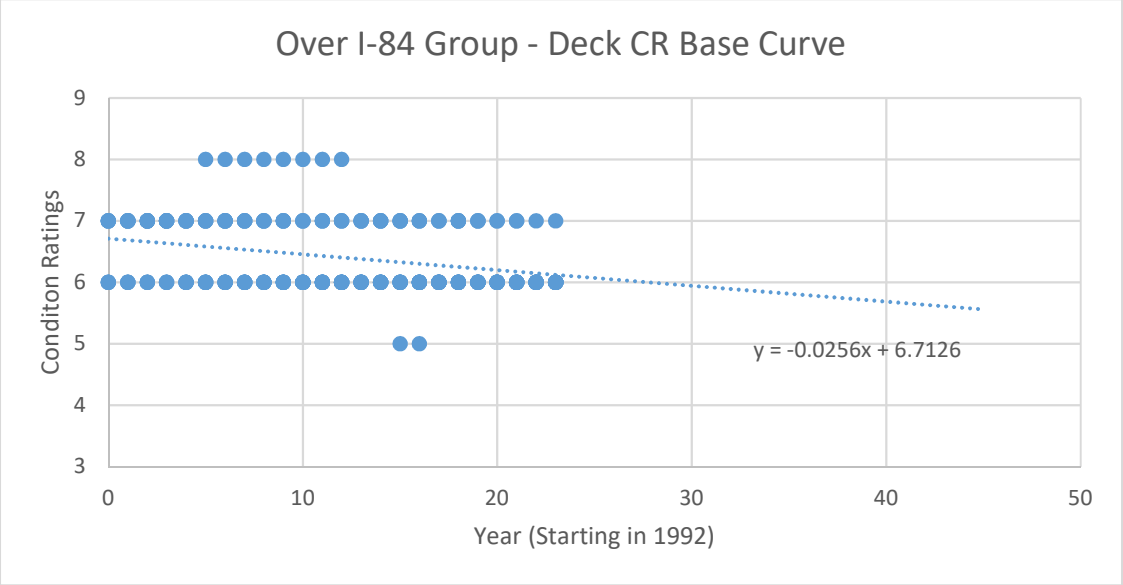
06569

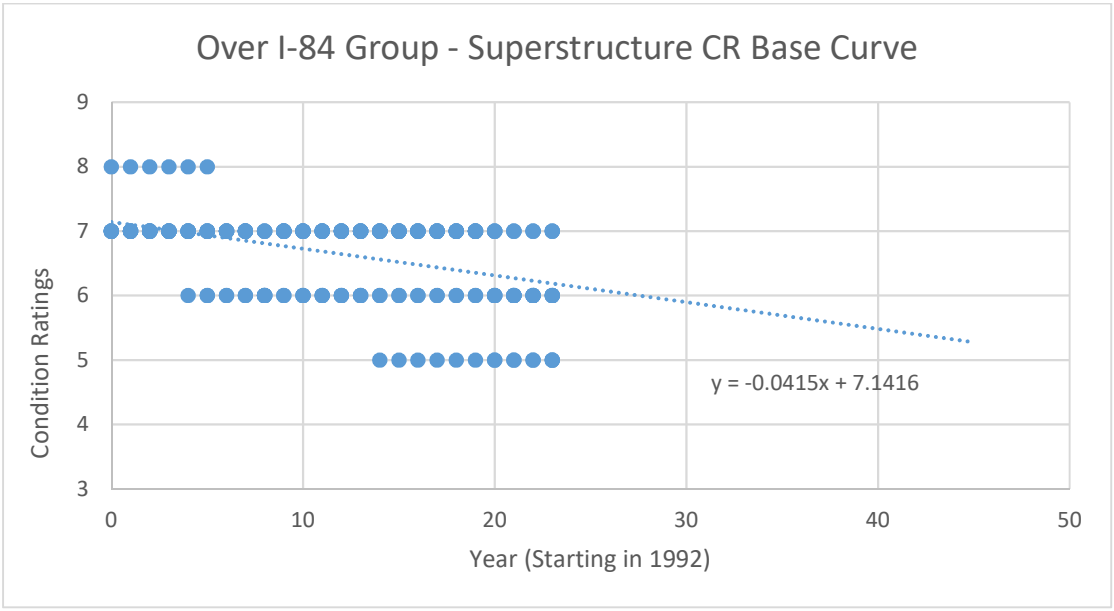
	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	#N/A	-	#N/A	-	#N/A	-
1993	#N/A	-	#N/A	-	#N/A	-
1994	#N/A	-	#N/A	-	#N/A	-
1995	#N/A	-	#N/A	-	#N/A	-
1996	#N/A	-	#N/A	-	#N/A	-
1997	#N/A	-	#N/A	-	#N/A	-
1998	#N/A	-	#N/A	-	#N/A	-
1999	#N/A	-	#N/A	-	#N/A	-
2000	#N/A	-	#N/A	-	#N/A	-
2001	#N/A	-	#N/A	-	#N/A	-
2002	#N/A	-	#N/A	-	#N/A	-
2003	#N/A	-	#N/A	-	#N/A	-
2004	#N/A	-	#N/A	-	#N/A	-
2005	#N/A	-	#N/A	-	#N/A	-
2006	#N/A	-	#N/A	-	#N/A	-
2007	#N/A	-	#N/A	-	#N/A	-
2008	#N/A	-	#N/A	-	#N/A	-
2009	#N/A	-	#N/A	-	#N/A	-
2010	#N/A	-	#N/A	-	#N/A	-
2011	#N/A	-	#N/A	-	#N/A	-
2012	7	7.0	8	8.0	7	7.0
2013	7	7.0	8	8.0	7	7.0
2014	7	7.0	8	7.9	7	6.9
2015	7	6.9	8	7.9	7	6.9
2037		6.5		7.3		6.3

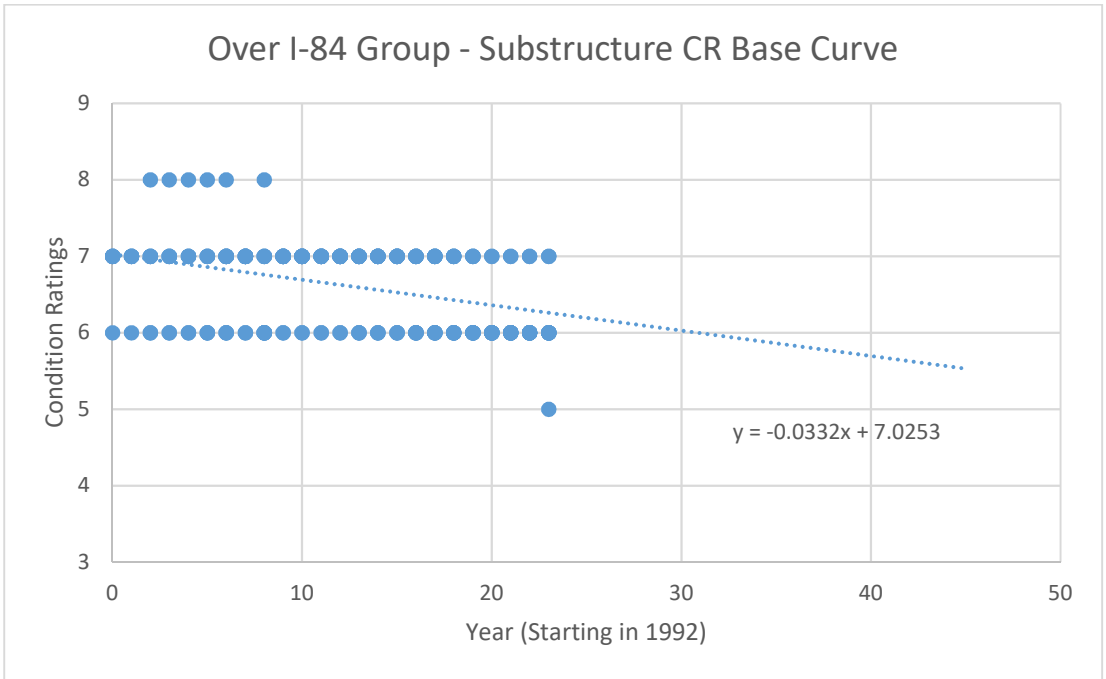







Over I-84 Group - Deck CR Base Curve
Conditon Ratings
Year (Starting in 1992)
y = -0.0256x + 6.7126
9
8
7
6
5
4
3
0
10
20
30
40
50


Over I-84 Group - Superstructure CR Base Curve
Condition Ratings
Year (Starting in 1992)
y = -0.0415x + 7.1416
9
8
7
6
5
4
3
0
10
20
30
40
50


Over I-84 Group - Substructure CR Base Curve
Condition Ratings
Year (Starting in 1992)
y = -0.0332x + 7.0253
9
8
7
6
5
4
3
0
10
20
30
40
50

DECK:

ADTT Adj	1.20
Deck Protection Adj	0.9
Consistency Adj	1.3
Cumulative Slope Adj	1.40
Intercept Adjustment	0

SUPERSTRUCTURE:

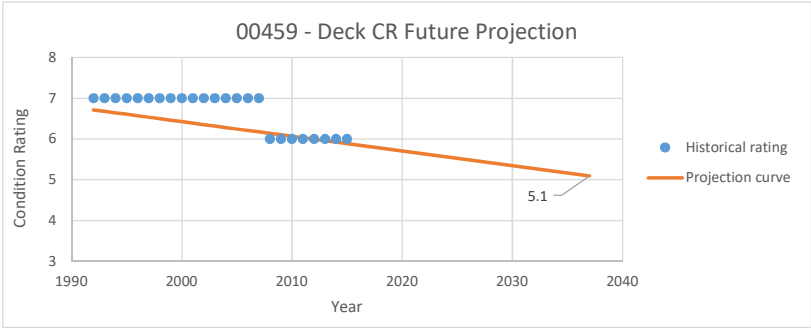
ADTT Adj	1.20
Simple/Continuous Adj	1.1
Consistency Adj	1.1
Cumulative Slope Adj	1.45
Intercept Adjustment	0

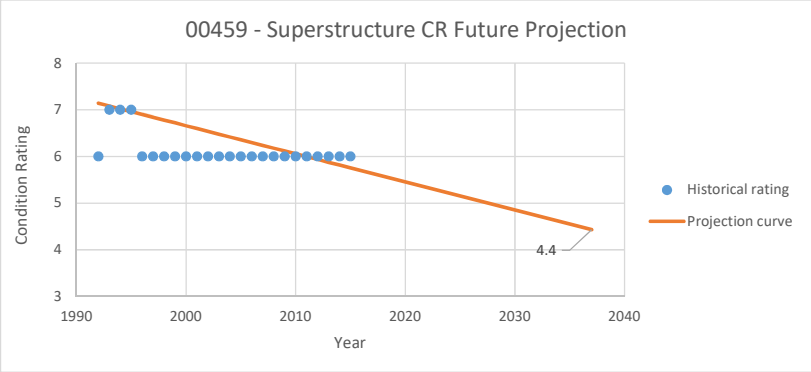
SUBSTRUCTURE:

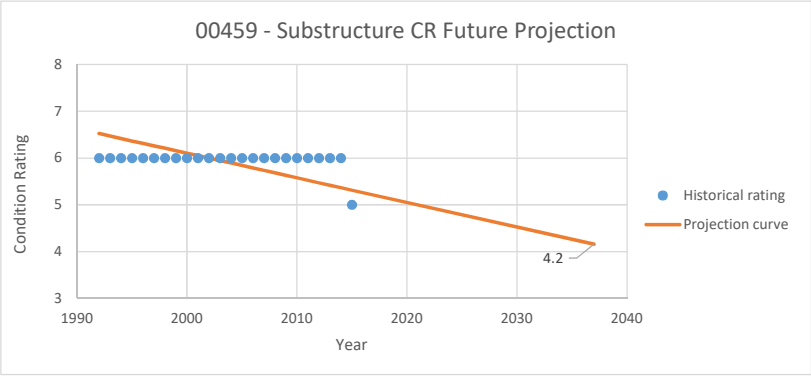
ADTT Adj	1.20
Simple/Continuous Adj	1.1
Consistency Adj	1.2
Cumulative Slope Adj	1.58
Intercept Adjustment	-0.5

00459

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	6.7	6	7.1	6	6.5
1993	7	6.7	7	7.1	6	6.5
1994	7	6.6	7	7.0	6	6.4
1995	7	6.6	7	7.0	6	6.4
1996	7	6.6	6	6.9	6	6.3
1997	7	6.5	6	6.8	6	6.3
1998	7	6.5	6	6.8	6	6.2
1999	7	6.5	6	6.7	6	6.2
2000	7	6.4	6	6.7	6	6.1
2001	7	6.4	6	6.6	6	6.1
2002	7	6.4	6	6.5	6	6.0
2003	7	6.3	6	6.5	6	5.9
2004	7	6.3	6	6.4	6	5.9
2005	7	6.2	6	6.4	6	5.8
2006	7	6.2	6	6.3	6	5.8
2007	7	6.2	6	6.2	6	5.7
2008	6	6.1	6	6.2	6	5.7
2009	6	6.1	6	6.1	6	5.6
2010	6	6.1	6	6.1	6	5.6
2011	6	6.0	6	6.0	6	5.5
2012	6	6.0	6	5.9	6	5.5
2013	6	6.0	6	5.9	6	5.4
2014	6	5.9	6	5.8	6	5.4
2015	6	5.9	6	5.8	5	5.3
2037		5.1		4.4		4.2







DECK:

ADTT Adj	0.80
Deck Protection Adj	0.9
Consistency Adj	1.2
Cumulative Slope Adj	0.86
Intercept Adjustment	-0.5

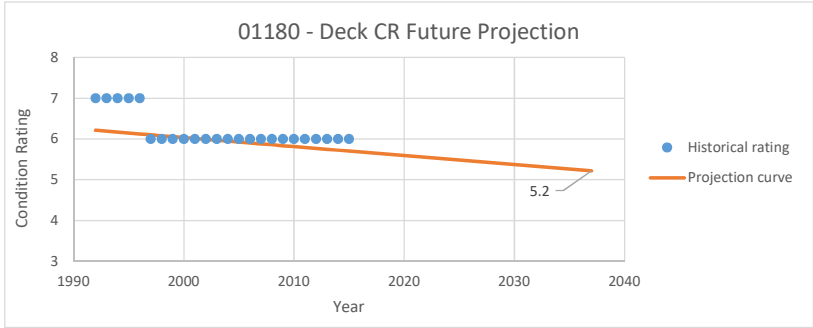
SUPERSTRUCTURE:

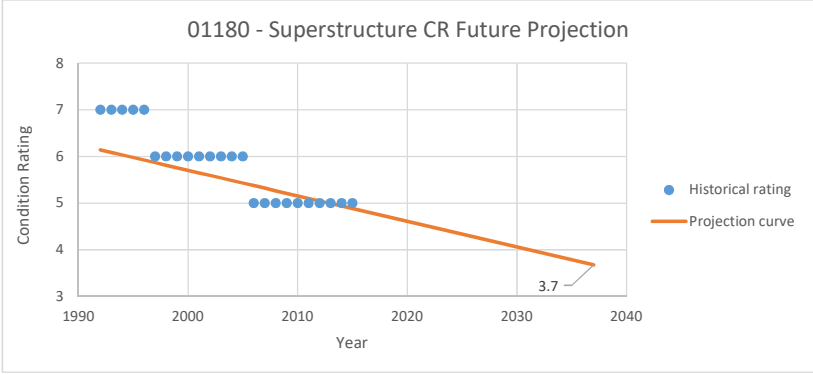
ADTT Adj	0.80
Simple/Continuous Adj	1.1
Consistency Adj	1.5
Cumulative Slope Adj	1.32
Intercept Adjustment	-1

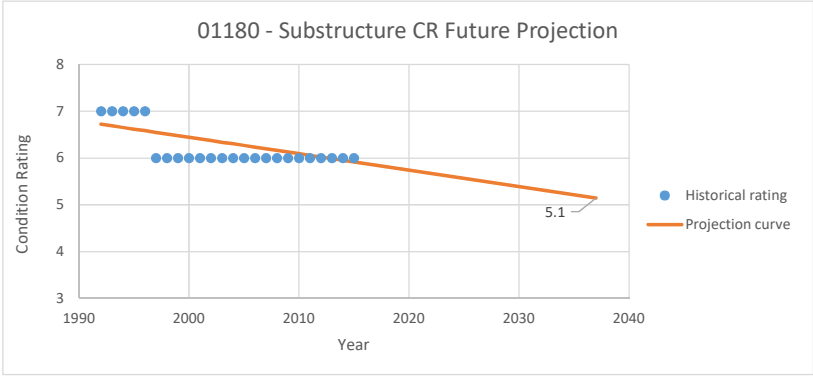
SUBSTRUCTURE:

ADTT Adj	0.80
Simple/Continuous Adj	1.1
Consistency Adj	1.2
Cumulative Slope Adj	1.06
Intercept Adjustment	-0.3

01180						
	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	6.2	7	6.1	7	6.7
1993	7	6.2	7	6.1	7	6.7
1994	7	6.2	7	6.0	7	6.7
1995	7	6.1	7	6.0	7	6.6
1996	7	6.1	7	5.9	7	6.6
1997	6	6.1	6	5.9	6	6.6
1998	6	6.1	6	5.8	6	6.5
1999	6	6.1	6	5.8	6	6.5
2000	6	6.0	6	5.7	6	6.4
2001	6	6.0	6	5.6	6	6.4
2002	6	6.0	6	5.6	6	6.4
2003	6	6.0	6	5.5	6	6.3
2004	6	5.9	6	5.5	6	6.3
2005	6	5.9	6	5.4	6	6.3
2006	6	5.9	5	5.4	6	6.2
2007	6	5.9	5	5.3	6	6.2
2008	6	5.9	5	5.3	6	6.2
2009	6	5.8	5	5.2	6	6.1
2010	6	5.8	5	5.2	6	6.1
2011	6	5.8	5	5.1	6	6.1
2012	6	5.8	5	5.0	6	6.0
2013	6	5.7	5	5.0	6	6.0
2014	6	5.7	5	4.9	6	6.0
2015	6	5.7	5	4.9	6	5.9
2037		5.2		3.7		5.1







DECK:

ADTT Adj	0.82
Deck Protection Adj	1.1
Consistency Adj	1.4
Cumulative Slope Adj	1.27
Intercept Adjustment	-0.5

SUPERSTRUCTURE:

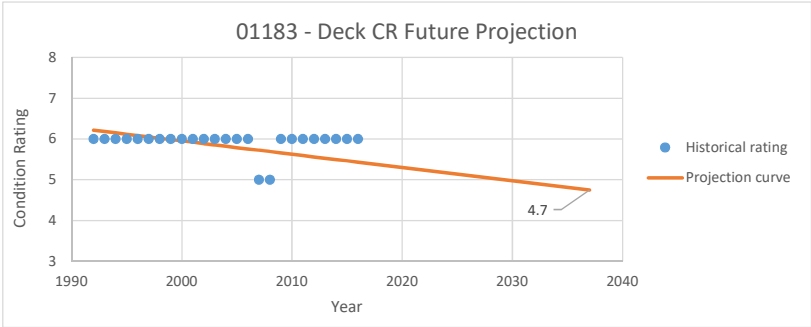
ADTT Adj	0.82
Simple/Continuous Adj	1.1
Consistency Adj	1.1
Cumulative Slope Adj	1.00
Intercept Adjustment	-0.2

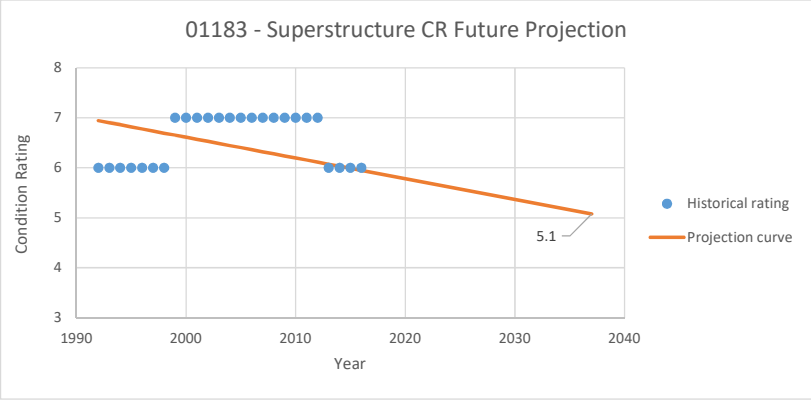
SUBSTRUCTURE:

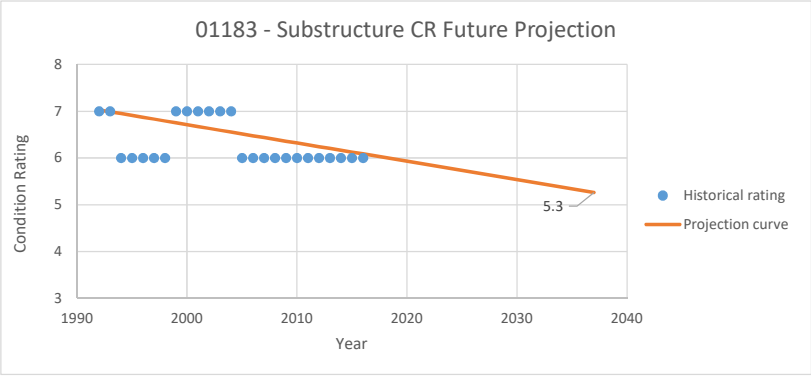
ADTT Adj	0.82
Simple/Continuous Adj	1.1
Consistency Adj	1.3
Cumulative Slope Adj	1.18
Intercept Adjustment	0

01183

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	6	6.2	6	6.9	7	7.0
1993	6	6.2	6	6.9	7	7.0
1994	6	6.1	6	6.9	6	6.9
1995	6	6.1	6	6.8	6	6.9
1996	6	6.1	6	6.8	6	6.9
1997	6	6.0	6	6.7	6	6.8
1998	6	6.0	6	6.7	6	6.8
1999	6	6.0	7	6.7	7	6.8
2000	6	6.0	7	6.6	7	6.7
2001	6	5.9	7	6.6	7	6.7
2002	6	5.9	7	6.5	7	6.6
2003	6	5.9	7	6.5	7	6.6
2004	6	5.8	7	6.4	7	6.6
2005	6	5.8	7	6.4	6	6.5
2006	6	5.8	7	6.4	6	6.5
2007	5	5.7	7	6.3	6	6.4
2008	5	5.7	7	6.3	6	6.4
2009	6	5.7	7	6.2	6	6.4
2010	6	5.6	7	6.2	6	6.3
2011	6	5.6	7	6.2	6	6.3
2012	6	5.6	7	6.1	6	6.2
2013	6	5.5	6	6.1	6	6.2
2014	6	5.5	6	6.0	6	6.2
2015	6	5.5	6	6.0	6	6.1
2016	6	5.4	6	5.9	6	6.1
2037		4.7		5.1		5.3







DECK:

ADTT Adj	0.80
Deck Protection Adj	0.9
Consistency Adj	1.6
Cumulative Slope Adj	1.15
Intercept Adjustment	-0.5

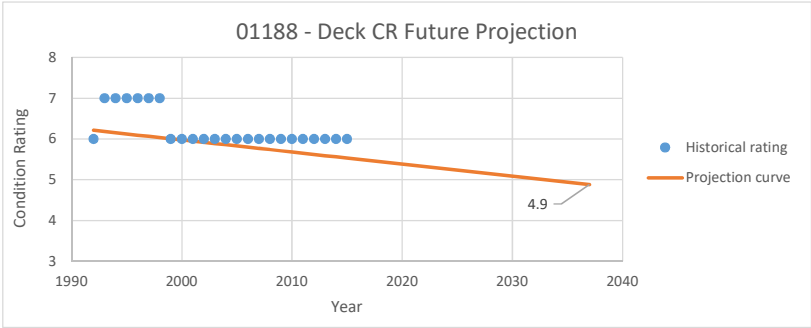
SUPERSTRUCTURE:

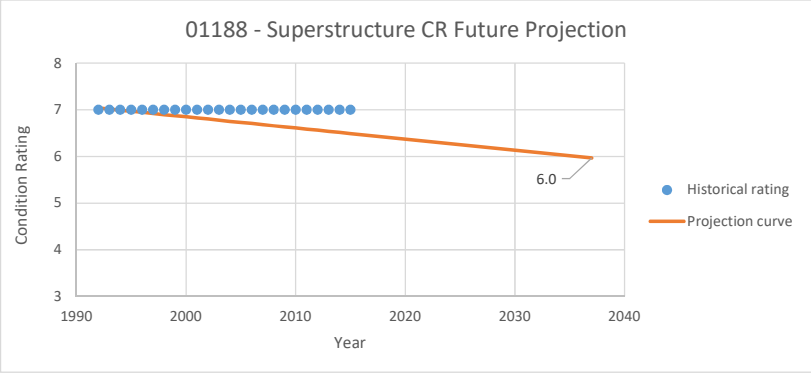
ADTT Adj	0.80
Simple/Continuous Adj	0.9
Consistency Adj	0.8
Cumulative Slope Adj	0.58
Intercept Adjustment	-0.1

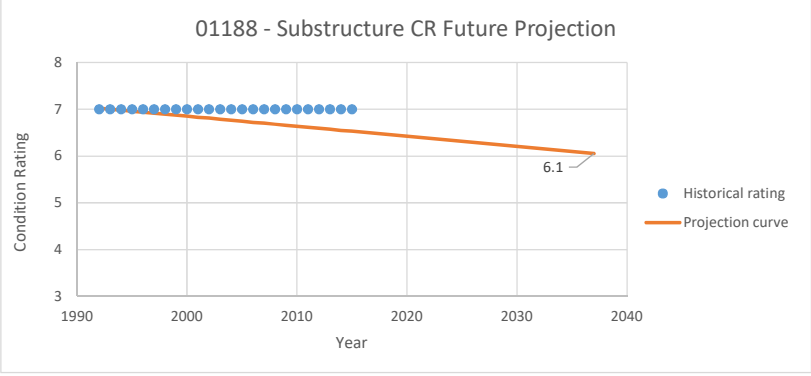
SUBSTRUCTURE:

ADTT Adj	0.80
Simple/Continuous Adj	0.9
Consistency Adj	0.9
Cumulative Slope Adj	0.65
Intercept Adjustment	0

01188						
	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	6	6.2	7	7.0	7	7.0
1993	7	6.2	7	7.0	7	7.0
1994	7	6.2	7	7.0	7	7.0
1995	7	6.1	7	7.0	7	7.0
1996	7	6.1	7	6.9	7	6.9
1997	7	6.1	7	6.9	7	6.9
1998	7	6.0	7	6.9	7	6.9
1999	6	6.0	7	6.9	7	6.9
2000	6	6.0	7	6.9	7	6.9
2001	6	5.9	7	6.8	7	6.8
2002	6	5.9	7	6.8	7	6.8
2003	6	5.9	7	6.8	7	6.8
2004	6	5.9	7	6.8	7	6.8
2005	6	5.8	7	6.7	7	6.7
2006	6	5.8	7	6.7	7	6.7
2007	6	5.8	7	6.7	7	6.7
2008	6	5.7	7	6.7	7	6.7
2009	6	5.7	7	6.6	7	6.7
2010	6	5.7	7	6.6	7	6.6
2011	6	5.7	7	6.6	7	6.6
2012	6	5.6	7	6.6	7	6.6
2013	6	5.6	7	6.5	7	6.6
2014	6	5.6	7	6.5	7	6.6
2015	6	5.5	7	6.5	7	6.5
2037		4.9		6.0		6.1







DECK:

ADTT Adj	1.20
Deck Protection Adj	0.9
Consistency Adj	2.7
Cumulative Slope Adj	2.92
Intercept Adjustment	-0.5

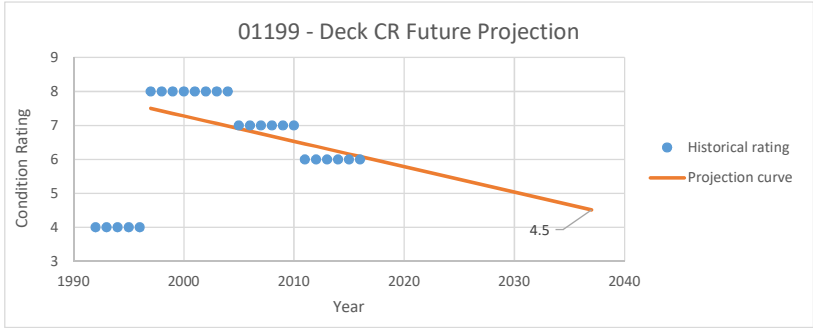
SUPERSTRUCTURE:

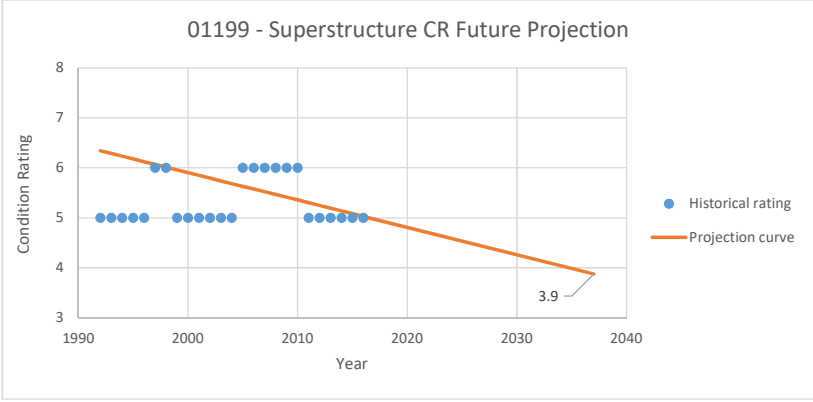
ADTT Adj	1.20
Simple/Continuous Adj	1.1
Consistency Adj	1
Cumulative Slope Adj	1.32
Intercept Adjustment	-0.8

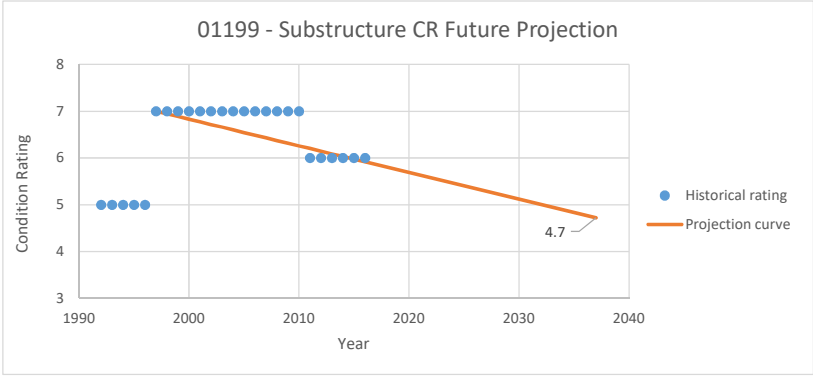
SUBSTRUCTURE:

ADTT Adj	1.20
Simple/Continuous Adj	1.1
Consistency Adj	1.3
Cumulative Slope Adj	1.72
Intercept Adjustment	0

01199						
	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	4	-	5	6.3	5	-
1993	4	-	5	6.3	5	-
1994	4	-	5	6.2	5	-
1995	4	-	5	6.2	5	-
1996	4	-	5	6.1	5	-
1997	8	7.5	6	6.1	7	7.0
1998	8	7.4	6	6.0	7	6.9
1999	8	7.4	5	6.0	7	6.9
2000	8	7.3	5	5.9	7	6.8
2001	8	7.2	5	5.8	7	6.8
2002	8	7.1	5	5.8	7	6.7
2003	8	7.1	5	5.7	7	6.7
2004	8	7.0	5	5.7	7	6.6
2005	7	6.9	6	5.6	7	6.5
2006	7	6.8	6	5.6	7	6.5
2007	7	6.8	6	5.5	7	6.4
2008	7	6.7	6	5.5	7	6.4
2009	7	6.6	6	5.4	7	6.3
2010	7	6.5	6	5.4	7	6.3
2011	6	6.5	5	5.3	6	6.2
2012	6	6.4	5	5.2	6	6.1
2013	6	6.3	5	5.2	6	6.1
2014	6	6.2	5	5.1	6	6.0
2015	6	6.2	5	5.1	6	6.0
2016	6	6.1	5	5.0	6	5.9
2037		4.5		3.9		4.7







DECK:

ADTT Adj	0.80
Deck Protection Adj	1.1
Consistency Adj	1.7
Cumulative Slope Adj	1.50
Intercept Adjustment	0

SUPERSTRUCTURE:

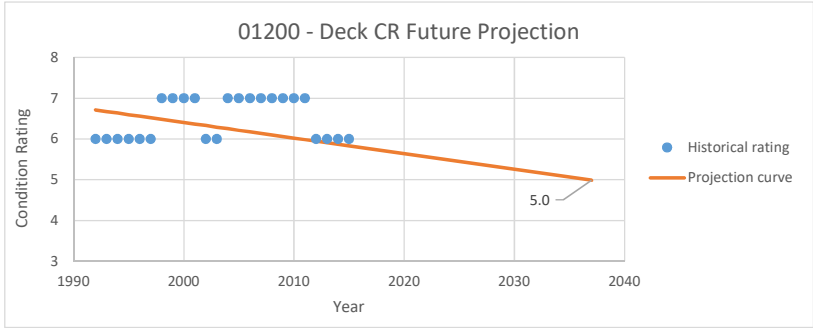
ADTT Adj	0.80
Simple/Continuous Adj	1.1
Consistency Adj	1.1
Cumulative Slope Adj	0.97
Intercept Adjustment	-0.2

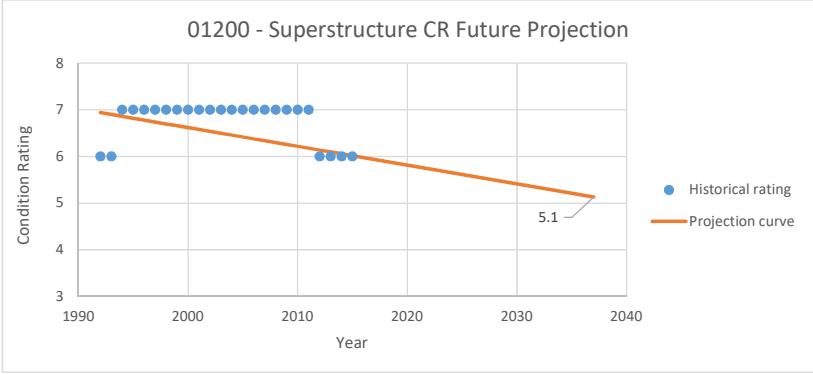
SUBSTRUCTURE:

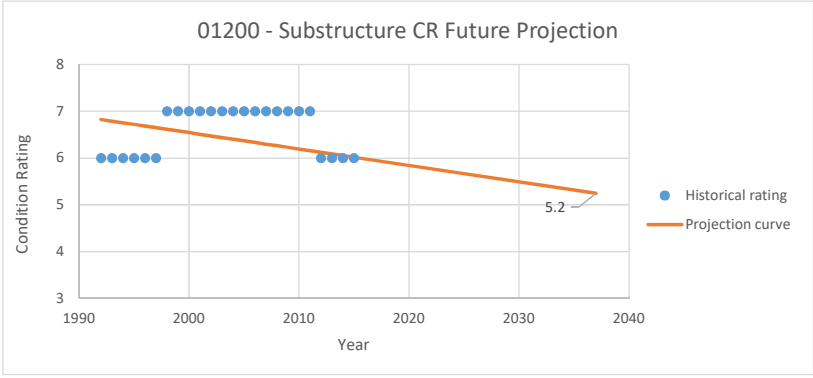
ADTT Adj	0.80
Simple/Continuous Adj	1.1
Consistency Adj	1.2
Cumulative Slope Adj	1.06
Intercept Adjustment	-0.2

01200

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	6	6.7	6	6.9	6	6.8
1993	6	6.7	6	6.9	6	6.8
1994	6	6.6	7	6.9	6	6.8
1995	6	6.6	7	6.8	6	6.7
1996	6	6.6	7	6.8	6	6.7
1997	6	6.5	7	6.7	6	6.7
1998	7	6.5	7	6.7	7	6.6
1999	7	6.4	7	6.7	7	6.6
2000	7	6.4	7	6.6	7	6.5
2001	7	6.4	7	6.6	7	6.5
2002	6	6.3	7	6.5	7	6.5
2003	6	6.3	7	6.5	7	6.4
2004	7	6.3	7	6.5	7	6.4
2005	7	6.2	7	6.4	7	6.4
2006	7	6.2	7	6.4	7	6.3
2007	7	6.1	7	6.3	7	6.3
2008	7	6.1	7	6.3	7	6.3
2009	7	6.1	7	6.3	7	6.2
2010	7	6.0	7	6.2	7	6.2
2011	7	6.0	7	6.2	7	6.2
2012	6	5.9	6	6.1	6	6.1
2013	6	5.9	6	6.1	6	6.1
2014	6	5.9	6	6.1	6	6.1
2015	6	5.8	6	6.0	6	6.0
2037		5.0		5.1		5.2







DECK:

ADTT Adj	0.80
Deck Protection Adj	1.1
Consistency Adj	0.9
Cumulative Slope Adj	0.79
Intercept Adjustment	-0.9

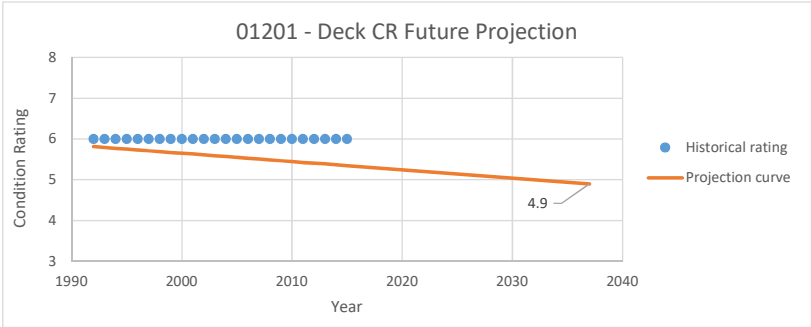
SUPERSTRUCTURE:

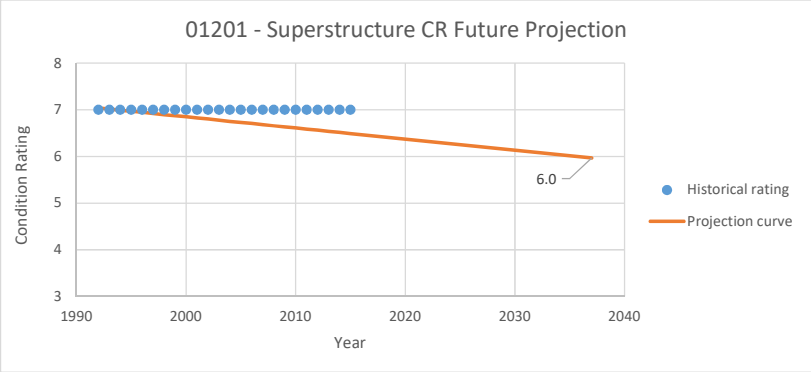
ADTT Adj	0.80
Simple/Continuous Adj	0.9
Consistency Adj	0.8
Cumulative Slope Adj	0.58
Intercept Adjustment	-0.1

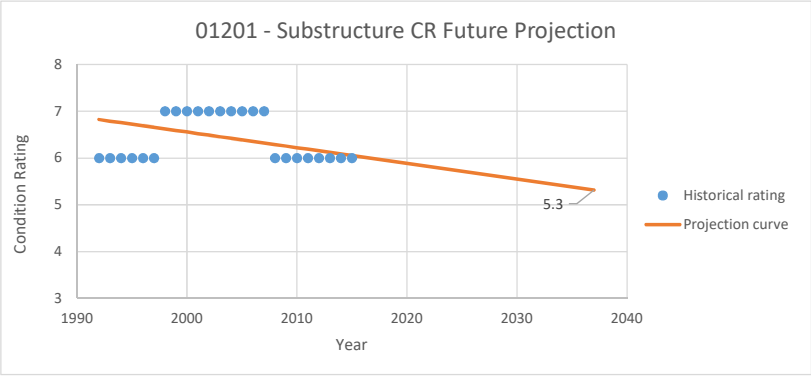
SUBSTRUCTURE:

ADTT Adj	0.80
Simple/Continuous Adj	0.9
Consistency Adj	1.4
Cumulative Slope Adj	1.01
Intercept Adjustment	-0.2

01201						
	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	6	5.8	7	7.0	6	6.8
1993	6	5.8	7	7.0	6	6.8
1994	6	5.8	7	7.0	6	6.8
1995	6	5.8	7	7.0	6	6.7
1996	6	5.7	7	6.9	6	6.7
1997	6	5.7	7	6.9	6	6.7
1998	6	5.7	7	6.9	7	6.6
1999	6	5.7	7	6.9	7	6.6
2000	6	5.7	7	6.9	7	6.6
2001	6	5.6	7	6.8	7	6.5
2002	6	5.6	7	6.8	7	6.5
2003	6	5.6	7	6.8	7	6.5
2004	6	5.6	7	6.8	7	6.4
2005	6	5.5	7	6.7	7	6.4
2006	6	5.5	7	6.7	7	6.4
2007	6	5.5	7	6.7	7	6.3
2008	6	5.5	7	6.7	6	6.3
2009	6	5.5	7	6.6	6	6.3
2010	6	5.4	7	6.6	6	6.2
2011	6	5.4	7	6.6	6	6.2
2012	6	5.4	7	6.6	6	6.2
2013	6	5.4	7	6.5	6	6.1
2014	6	5.4	7	6.5	6	6.1
2015	6	5.3	7	6.5	6	6.1
2037		4.9		6.0		5.3







DECK:

ADTT Adj	0.80
Deck Protection Adj	1.1
Consistency Adj	0.9
Cumulative Slope Adj	0.79
Intercept Adjustment	-0.9

SUPERSTRUCTURE:

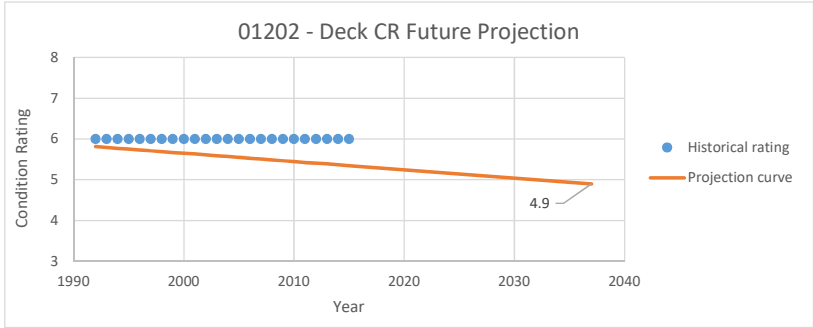
ADTT Adj	0.80
Simple/Continuous Adj	1.1
Consistency Adj	2
Cumulative Slope Adj	1.76
Intercept Adjustment	-0.2

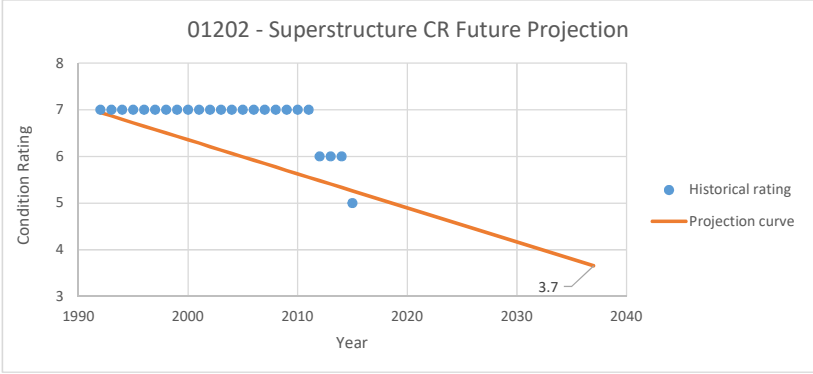
SUBSTRUCTURE:

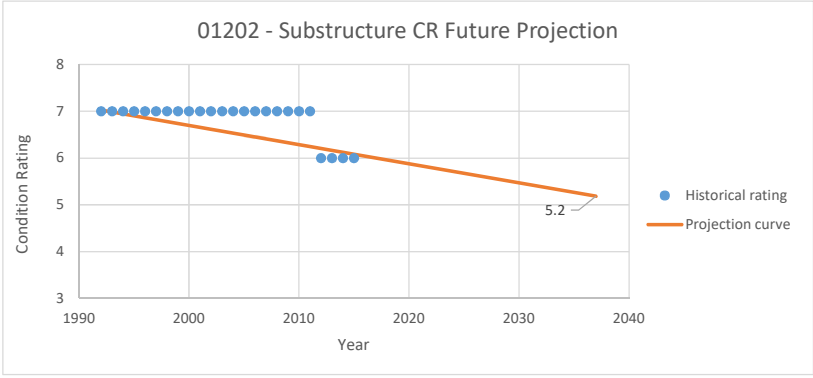
ADTT Adj	0.80
Simple/Continuous Adj	1.1
Consistency Adj	1.4
Cumulative Slope Adj	1.23
Intercept Adjustment	0

01202

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	6	5.8	7	6.9	7	7.0
1993	6	5.8	7	6.9	7	7.0
1994	6	5.8	7	6.8	7	6.9
1995	6	5.8	7	6.7	7	6.9
1996	6	5.7	7	6.6	7	6.9
1997	6	5.7	7	6.6	7	6.8
1998	6	5.7	7	6.5	7	6.8
1999	6	5.7	7	6.4	7	6.7
2000	6	5.7	7	6.4	7	6.7
2001	6	5.6	7	6.3	7	6.7
2002	6	5.6	7	6.2	7	6.6
2003	6	5.6	7	6.1	7	6.6
2004	6	5.6	7	6.1	7	6.5
2005	6	5.5	7	6.0	7	6.5
2006	6	5.5	7	5.9	7	6.5
2007	6	5.5	7	5.8	7	6.4
2008	6	5.5	7	5.8	7	6.4
2009	6	5.5	7	5.7	7	6.3
2010	6	5.4	7	5.6	7	6.3
2011	6	5.4	7	5.6	7	6.2
2012	6	5.4	6	5.5	6	6.2
2013	6	5.4	6	5.4	6	6.2
2014	6	5.4	6	5.3	6	6.1
2015	6	5.3	5	5.3	6	6.1
2037		4.9		3.7		5.2







DECK:

ADTT Adj	0.80
Deck Protection Adj	1.1
Consistency Adj	2
Cumulative Slope Adj	1.76
Intercept Adjustment	0

SUPERSTRUCTURE:

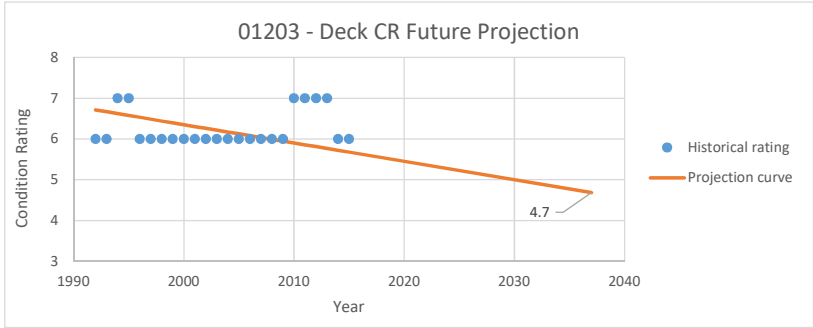
ADTT Adj	0.80
Simple/Continuous Adj	1.1
Consistency Adj	1.1
Cumulative Slope Adj	0.97
Intercept Adjustment	-0.2

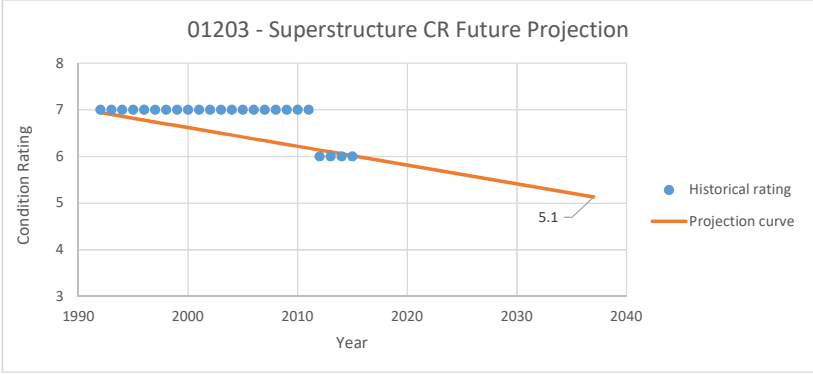
SUBSTRUCTURE:

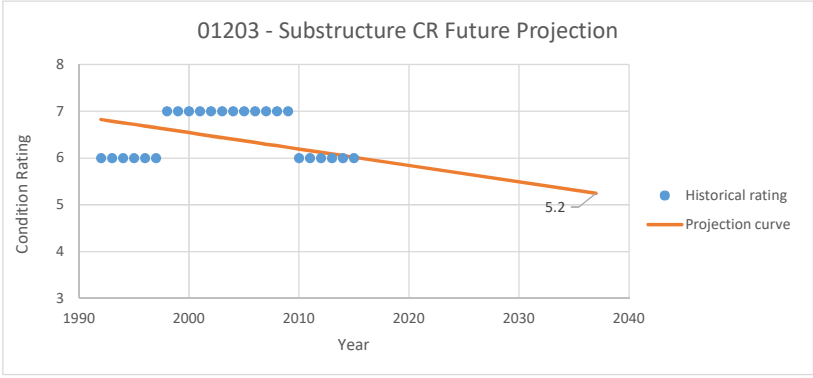
ADTT Adj	0.80
Simple/Continuous Adj	1.1
Consistency Adj	1.2
Cumulative Slope Adj	1.06
Intercept Adjustment	-0.2

01203

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	6	6.7	7	6.9	6	6.8
1993	6	6.7	7	6.9	6	6.8
1994	7	6.6	7	6.9	6	6.8
1995	7	6.6	7	6.8	6	6.7
1996	6	6.5	7	6.8	6	6.7
1997	6	6.5	7	6.7	6	6.7
1998	6	6.4	7	6.7	7	6.6
1999	6	6.4	7	6.7	7	6.6
2000	6	6.4	7	6.6	7	6.5
2001	6	6.3	7	6.6	7	6.5
2002	6	6.3	7	6.5	7	6.5
2003	6	6.2	7	6.5	7	6.4
2004	6	6.2	7	6.5	7	6.4
2005	6	6.1	7	6.4	7	6.4
2006	6	6.1	7	6.4	7	6.3
2007	6	6.0	7	6.3	7	6.3
2008	6	6.0	7	6.3	7	6.3
2009	6	5.9	7	6.3	7	6.2
2010	7	5.9	7	6.2	6	6.2
2011	7	5.9	7	6.2	6	6.2
2012	7	5.8	6	6.1	6	6.1
2013	7	5.8	6	6.1	6	6.1
2014	6	5.7	6	6.1	6	6.1
2015	6	5.7	6	6.0	6	6.0
2037		4.7		5.1		5.2







DECK:

ADTT Adj	0.80
Deck Protection Adj	1.1
Consistency Adj	1.5
Cumulative Slope Adj	1.32
Intercept Adjustment	-0.2

SUPERSTRUCTURE:

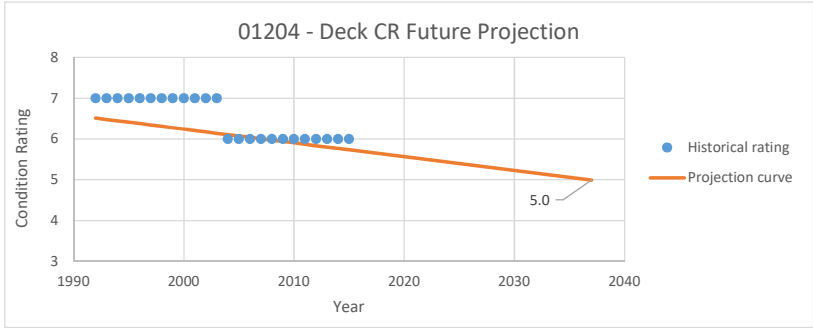
ADTT Adj	0.80
Simple/Continuous Adj	1.1
Consistency Adj	2
Cumulative Slope Adj	1.76
Intercept Adjustment	-0.2

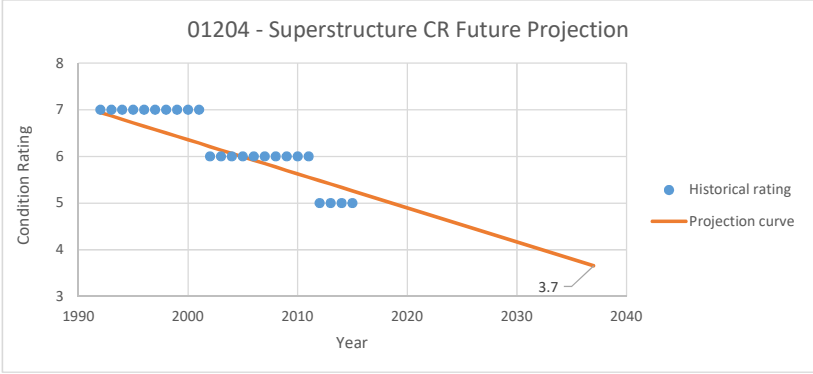
SUBSTRUCTURE:

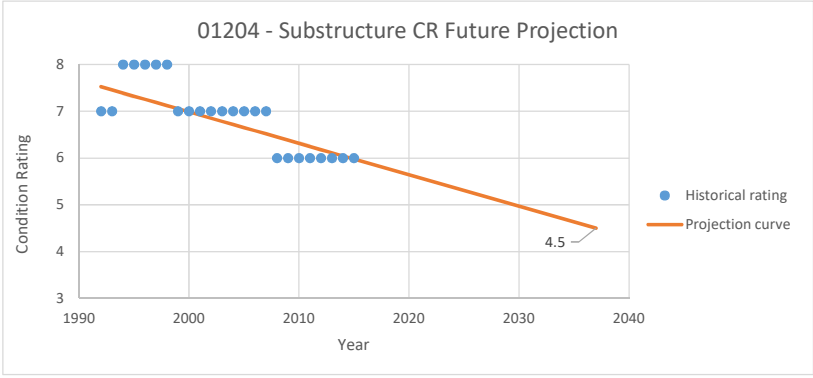
ADTT Adj	0.80
Simple/Continuous Adj	1.1
Consistency Adj	2.3
Cumulative Slope Adj	2.02
Intercept Adjustment	0.5

01204

	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	6.5	7	6.9	7	7.5
1993	7	6.5	7	6.9	7	7.5
1994	7	6.4	7	6.8	8	7.4
1995	7	6.4	7	6.7	8	7.3
1996	7	6.4	7	6.6	8	7.3
1997	7	6.3	7	6.6	8	7.2
1998	7	6.3	7	6.5	8	7.1
1999	7	6.3	7	6.4	7	7.1
2000	7	6.2	7	6.4	7	7.0
2001	7	6.2	7	6.3	7	6.9
2002	7	6.2	6	6.2	7	6.9
2003	7	6.1	6	6.1	7	6.8
2004	6	6.1	6	6.1	7	6.7
2005	6	6.1	6	6.0	7	6.7
2006	6	6.0	6	5.9	7	6.6
2007	6	6.0	6	5.8	7	6.5
2008	6	6.0	6	5.8	6	6.5
2009	6	5.9	6	5.7	6	6.4
2010	6	5.9	6	5.6	6	6.3
2011	6	5.9	6	5.6	6	6.2
2012	6	5.8	5	5.5	6	6.2
2013	6	5.8	5	5.4	6	6.1
2014	6	5.8	5	5.3	6	6.0
2015	6	5.7	5	5.3	6	6.0
2037		5.0		3.7		4.5







DECK:

ADTT Adj	1.20
Deck Protection Adj	1.1
Consistency Adj	0.8
Cumulative Slope Adj	1.06
Intercept Adjustment	0.3

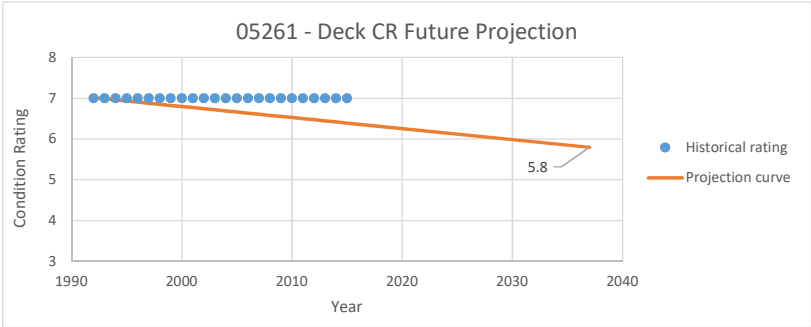
SUPERSTRUCTURE:

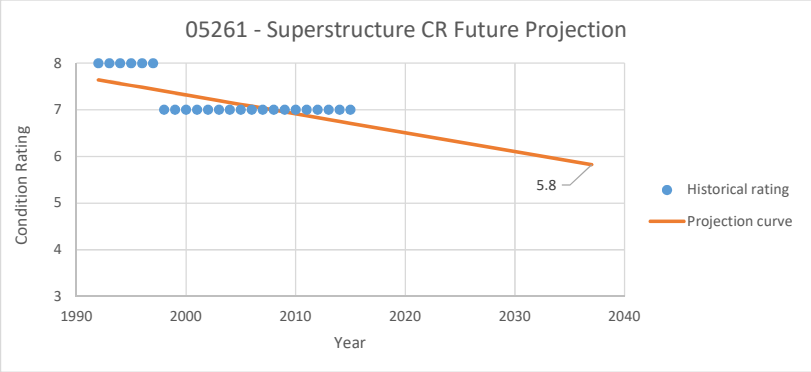
ADTT Adj	1.20
Simple/Continuous Adj	0.9
Consistency Adj	0.9
Cumulative Slope Adj	0.97
Intercept Adjustment	0.5

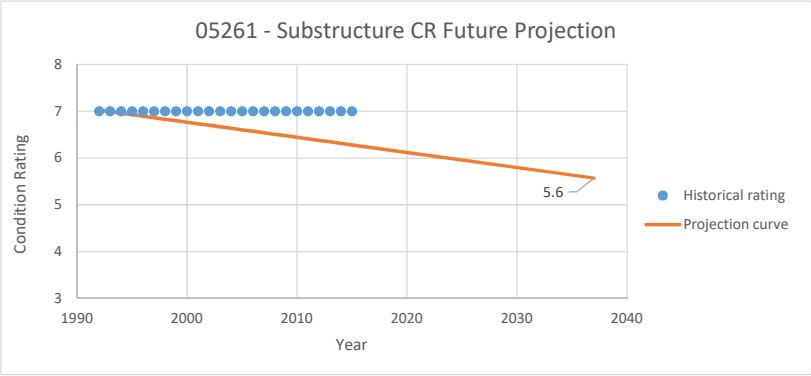
SUBSTRUCTURE:

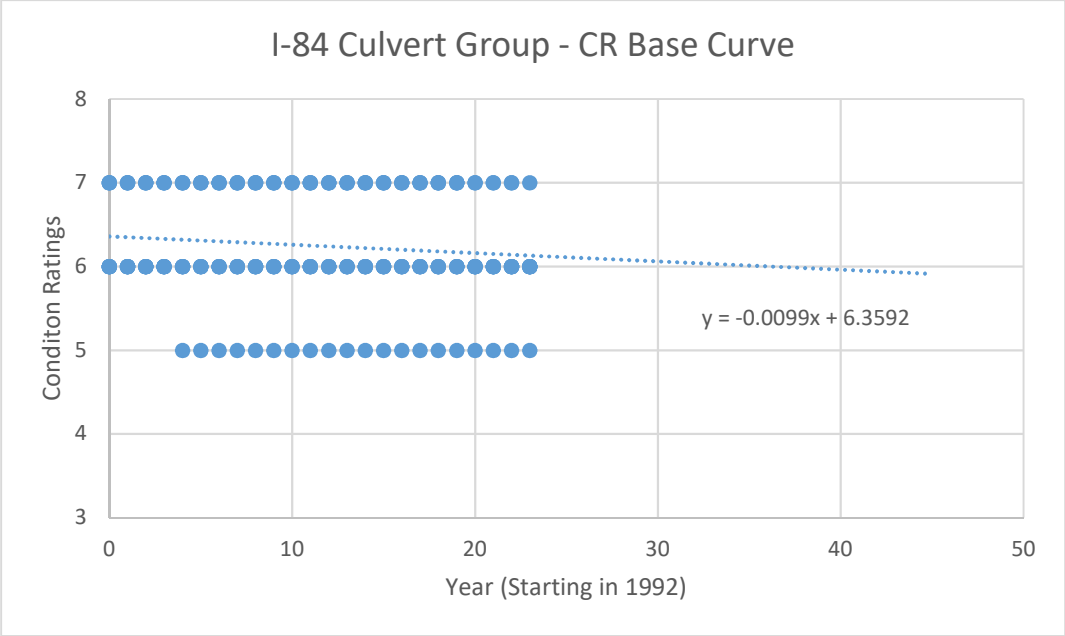
ADTT Adj	1.20
Simple/Continuous Adj	0.9
Consistency Adj	0.9
Cumulative Slope Adj	0.97
Intercept Adjustment	0

05261						
	Deck	Deck Eqn.	Superstr	Superstr. Eqn	Substructure	Substr. Eqn
1992	7	7.0	8	7.6	7	7.0
1993	7	7.0	8	7.6	7	7.0
1994	7	7.0	8	7.6	7	7.0
1995	7	6.9	8	7.5	7	6.9
1996	7	6.9	8	7.5	7	6.9
1997	7	6.9	8	7.4	7	6.9
1998	7	6.9	7	7.4	7	6.8
1999	7	6.8	7	7.4	7	6.8
2000	7	6.8	7	7.3	7	6.8
2001	7	6.8	7	7.3	7	6.7
2002	7	6.7	7	7.2	7	6.7
2003	7	6.7	7	7.2	7	6.7
2004	7	6.7	7	7.2	7	6.6
2005	7	6.7	7	7.1	7	6.6
2006	7	6.6	7	7.1	7	6.6
2007	7	6.6	7	7.0	7	6.5
2008	7	6.6	7	7.0	7	6.5
2009	7	6.6	7	7.0	7	6.5
2010	7	6.5	7	6.9	7	6.4
2011	7	6.5	7	6.9	7	6.4
2012	7	6.5	7	6.8	7	6.4
2013	7	6.4	7	6.8	7	6.3
2014	7	6.4	7	6.8	7	6.3
2015	7	6.4	7	6.7	7	6.3
2037		5.8		5.8		5.6





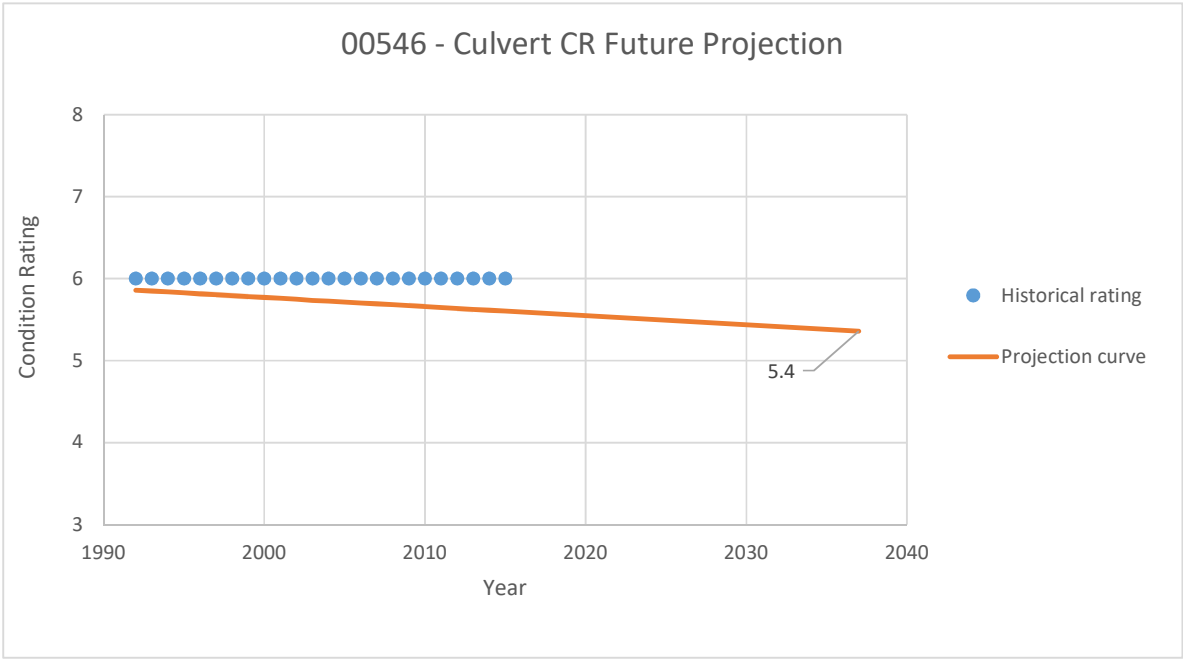



I-84 Culvert Group - CR Base Curve
Conditon Ratings
8
7
6
5
4
3
0
10
20
30
40
50
Year (Starting in 1992)
y = -0.0099x + 6.3592

CULVERT:

ADTT Adj.	1.12
Consistency Adj.	1
Cumulative Slope Adj.	1.12
Intercept Adjustment	-0.5

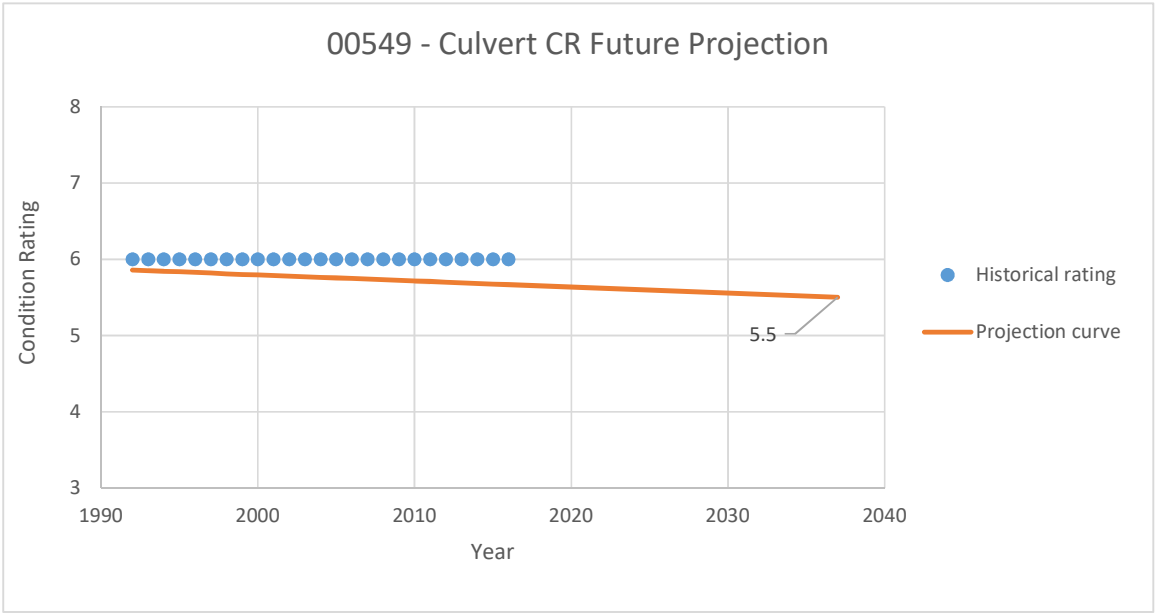
00546		
	Culvert	Deck Eqn.
1992	6	5.9
1993	6	5.8
1994	6	5.8
1995	6	5.8
1996	6	5.8
1997	6	5.8
1998	6	5.8
1999	6	5.8
2000	6	5.8
2001	6	5.8
2002	6	5.7
2003	6	5.7
2004	6	5.7
2005	6	5.7
2006	6	5.7
2007	6	5.7
2008	6	5.7
2009	6	5.7
2010	6	5.7
2011	6	5.6
2012	6	5.6
2013	6	5.6
2014	6	5.6
2015	6	5.6
2037		5.4



CULVERT:

ADTT Adj.	0.80
Consistency Adj.	1
Cumulative Slope Adj.	0.80
Intercept Adjustment	-0.5

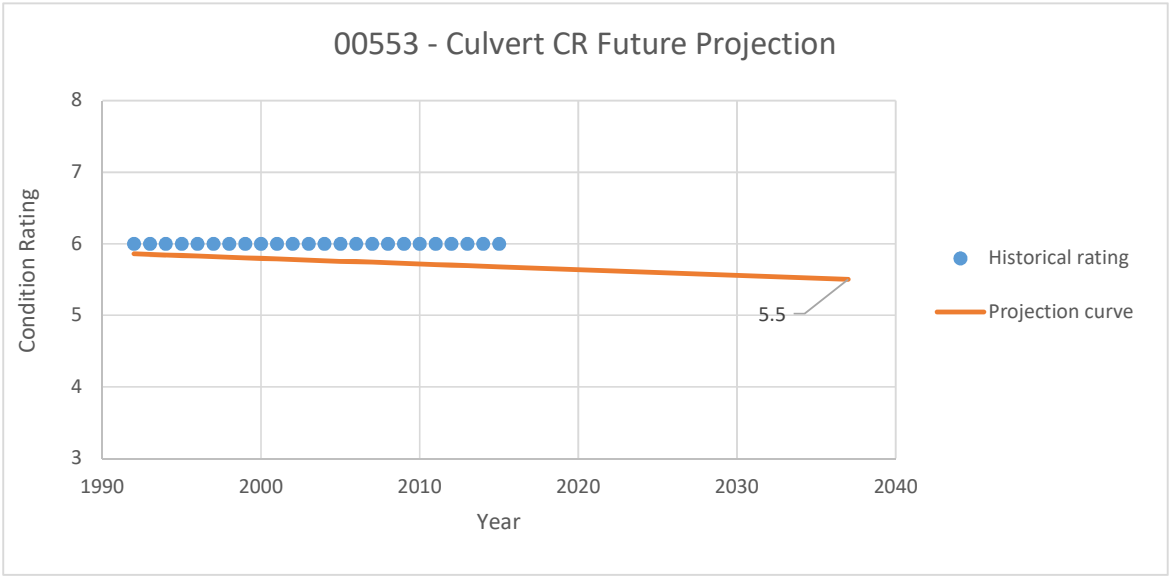
00549		
	Culvert	Deck Eqn.
1992	6	5.9
1993	6	5.9
1994	6	5.8
1995	6	5.8
1996	6	5.8
1997	6	5.8
1998	6	5.8
1999	6	5.8
2000	6	5.8
2001	6	5.8
2002	6	5.8
2003	6	5.8
2004	6	5.8
2005	6	5.8
2006	6	5.7
2007	6	5.7
2008	6	5.7
2009	6	5.7
2010	6	5.7
2011	6	5.7
2012	6	5.7
2013	6	5.7
2014	6	5.7
2015	6	5.7
2016	6	5.7
2037		5.5



CULVERT:

ADTT Adj.	0.80
Consistency Adj.	1
Cumulative Slope Adj.	0.80
Intercept Adjustment	-0.5

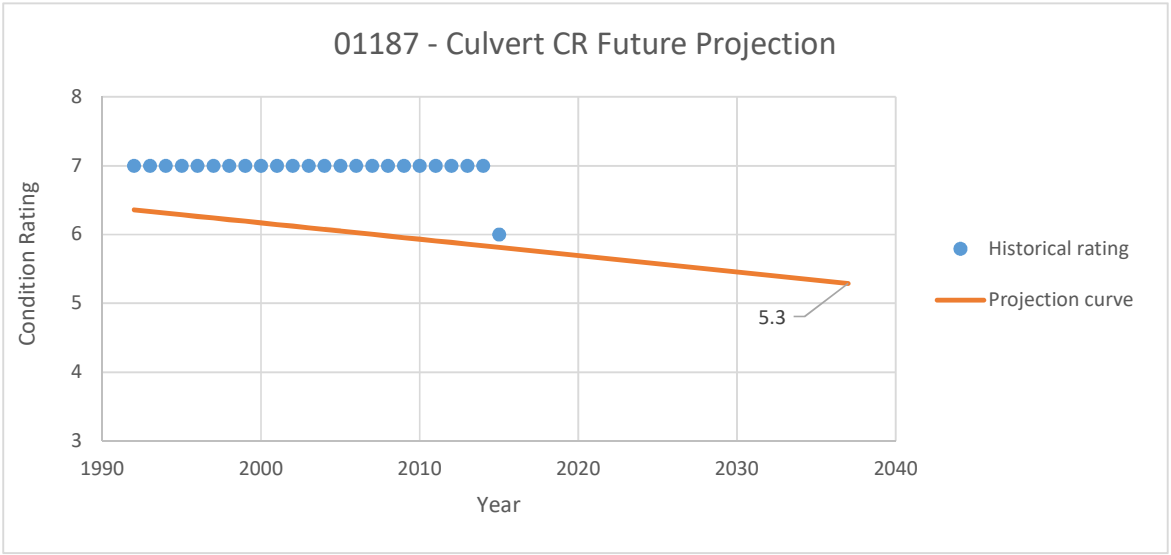
00553		
	Culvert	Deck Eqn.
1992	6	5.9
1993	6	5.9
1994	6	5.8
1995	6	5.8
1996	6	5.8
1997	6	5.8
1998	6	5.8
1999	6	5.8
2000	6	5.8
2001	6	5.8
2002	6	5.8
2003	6	5.8
2004	6	5.8
2005	6	5.8
2006	6	5.7
2007	6	5.7
2008	6	5.7
2009	6	5.7
2010	6	5.7
2011	6	5.7
2012	6	5.7
2013	6	5.7
2014	6	5.7
2015	6	5.7
2037		5.5



CULVERT:

ADTT Adj.	1.20
Consistency Adj.	2
Cumulative Slope Adj.	2.40
Intercept Adjustment	0

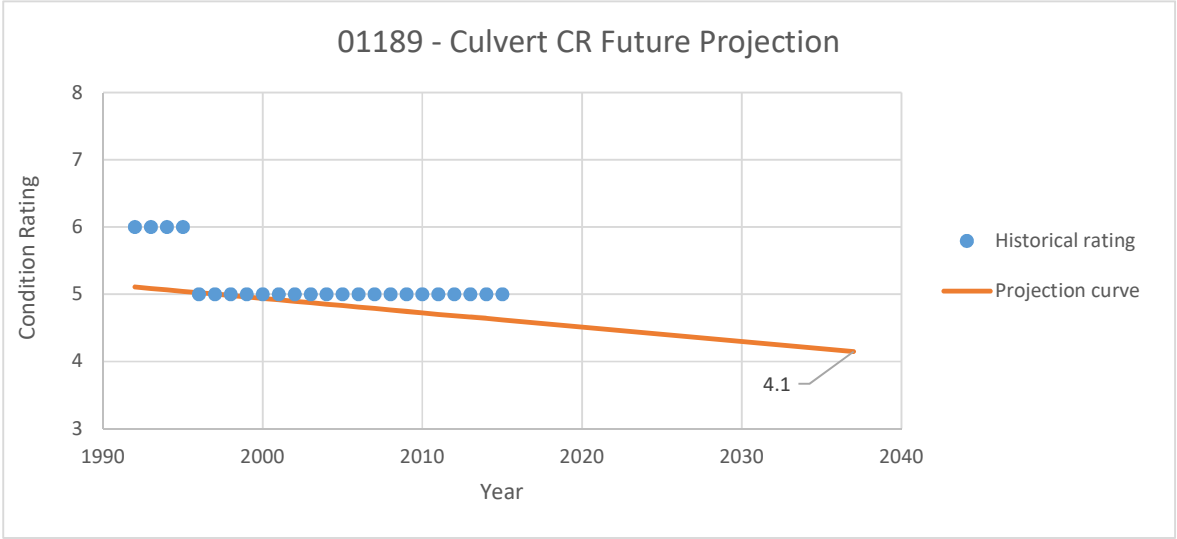
01187		
	Culvert	Deck Eqn.
1992	7	6.4
1993	7	6.3
1994	7	6.3
1995	7	6.3
1996	7	6.3
1997	7	6.2
1998	7	6.2
1999	7	6.2
2000	7	6.2
2001	7	6.1
2002	7	6.1
2003	7	6.1
2004	7	6.1
2005	7	6.1
2006	7	6.0
2007	7	6.0
2008	7	6.0
2009	7	6.0
2010	7	5.9
2011	7	5.9
2012	7	5.9
2013	7	5.9
2014	7	5.8
2015	6	5.8
2037		5.3



CULVERT:

ADTT Adj.	1.20
Consistency Adj.	1.8
Cumulative Slope Adj.	2.16
Intercept Adjustment	-1.25

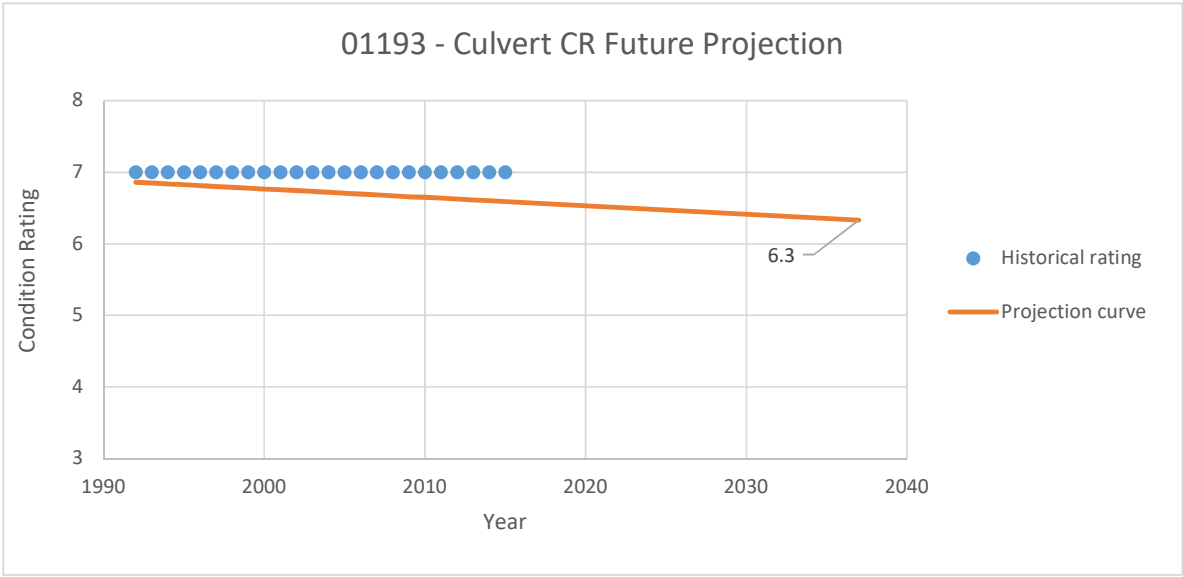
01189		
	Culvert	Deck Eqn.
1992	6	5.1
1993	6	5.1
1994	6	5.1
1995	6	5.0
1996	5	5.0
1997	5	5.0
1998	5	5.0
1999	5	5.0
2000	5	4.9
2001	5	4.9
2002	5	4.9
2003	5	4.9
2004	5	4.9
2005	5	4.8
2006	5	4.8
2007	5	4.8
2008	5	4.8
2009	5	4.7
2010	5	4.7
2011	5	4.7
2012	5	4.7
2013	5	4.7
2014	5	4.6
2015	5	4.6
2037		4.1



CULVERT:

ADTT Adj.	1.19
Consistency Adj.	1
Cumulative Slope Adj.	1.19
Intercept Adjustment	0.5

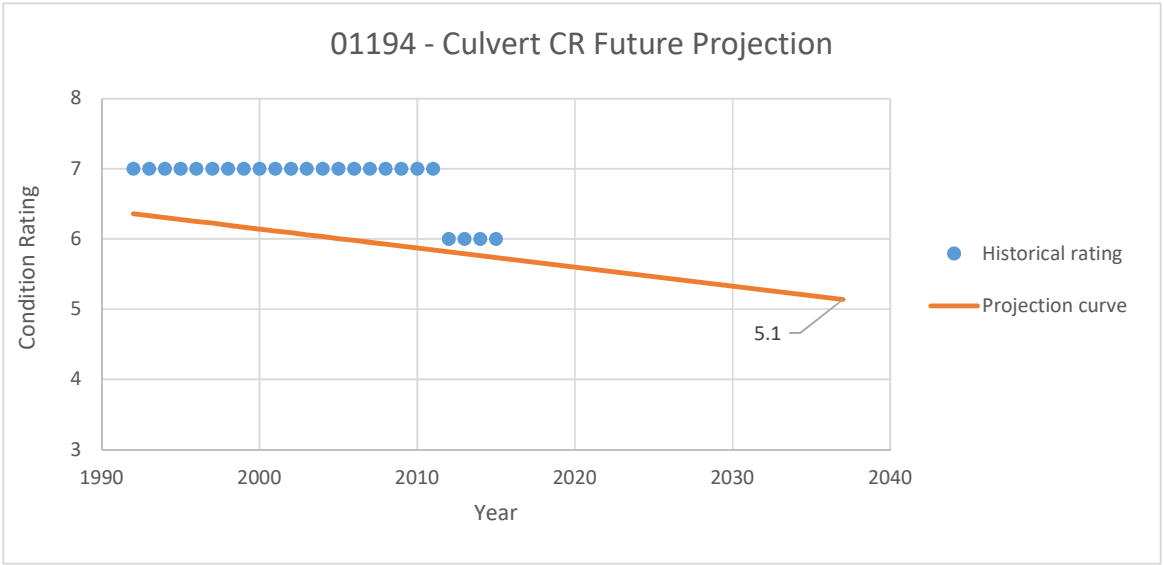
01193		
	Culvert	Deck Eqn.
1992	7	6.9
1993	7	6.8
1994	7	6.8
1995	7	6.8
1996	7	6.8
1997	7	6.8
1998	7	6.8
1999	7	6.8
2000	7	6.8
2001	7	6.8
2002	7	6.7
2003	7	6.7
2004	7	6.7
2005	7	6.7
2006	7	6.7
2007	7	6.7
2008	7	6.7
2009	7	6.7
2010	7	6.6
2011	7	6.6
2012	7	6.6
2013	7	6.6
2014	7	6.6
2015	7	6.6
2037		6.3



CULVERT:

ADTT Adj.	1.19
Consistency Adj.	2.3
Cumulative Slope Adj.	2.74
Intercept Adjustment	0

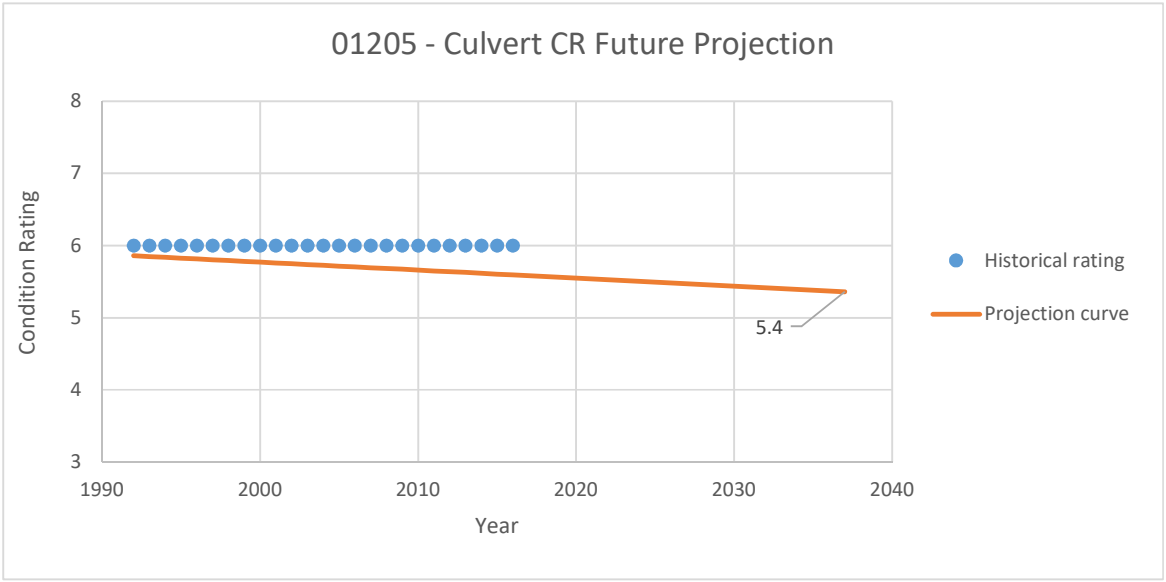
01194		
	Culvert	Deck Eqn.
1992	7	6.4
1993	7	6.3
1994	7	6.3
1995	7	6.3
1996	7	6.3
1997	7	6.2
1998	7	6.2
1999	7	6.2
2000	7	6.1
2001	7	6.1
2002	7	6.1
2003	7	6.1
2004	7	6.0
2005	7	6.0
2006	7	6.0
2007	7	6.0
2008	7	5.9
2009	7	5.9
2010	7	5.9
2011	7	5.8
2012	6	5.8
2013	6	5.8
2014	6	5.8
2015	6	5.7
2037		5.1



CULVERT:

ADTT Adj.	1.12
Consistency Adj.	1
Cumulative Slope Adj.	1.12
Intercept Adjustment	-0.5

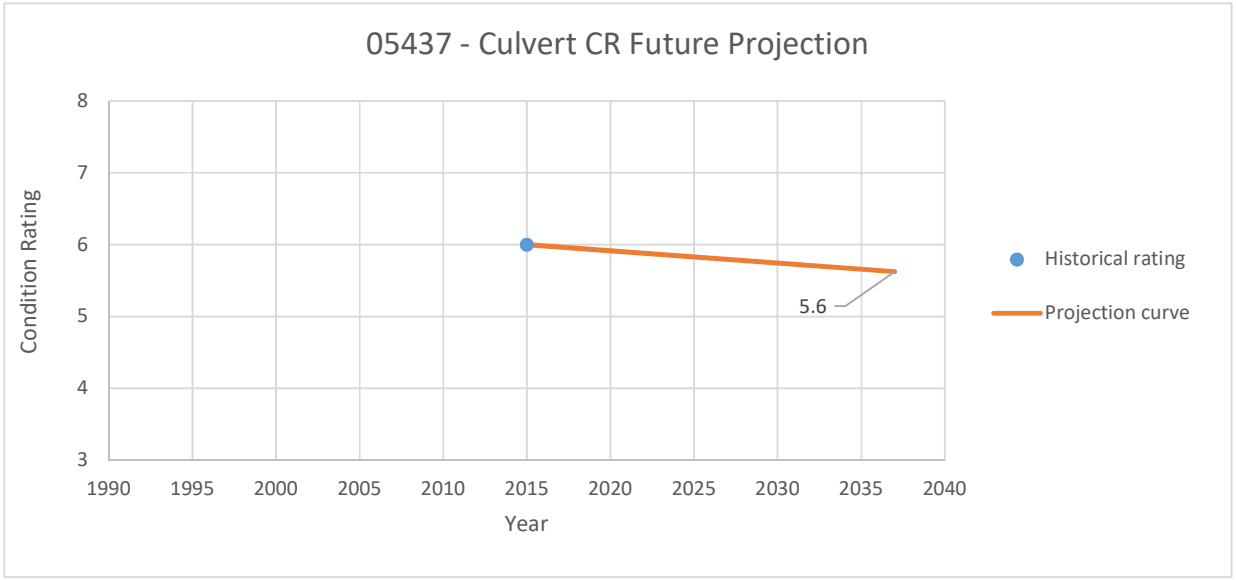
01205		
	Culvert	Deck Eqn.
1992	6	5.9
1993	6	5.8
1994	6	5.8
1995	6	5.8
1996	6	5.8
1997	6	5.8
1998	6	5.8
1999	6	5.8
2000	6	5.8
2001	6	5.8
2002	6	5.7
2003	6	5.7
2004	6	5.7
2005	6	5.7
2006	6	5.7
2007	6	5.7
2008	6	5.7
2009	6	5.7
2010	6	5.7
2011	6	5.6
2012	6	5.6
2013	6	5.6
2014	6	5.6
2015	6	5.6
2016	6	5.6
2037		5.4



CULVERT:

ADTT Adj.	1.15
Consistency Adj.	1.5
Cumulative Slope Adj.	1.73
Intercept Adjustment	0

05437		
	Culvert	Deck Eqn.
1992	#N/A	6.4
1993	#N/A	6.3
1994	#N/A	6.3
1995	#N/A	6.3
1996	#N/A	6.3
1997	#N/A	6.3
1998	#N/A	6.3
1999	#N/A	6.2
2000	#N/A	6.2
2001	#N/A	6.2
2002	#N/A	6.2
2003	#N/A	6.2
2004	#N/A	6.2
2005	#N/A	6.1
2006	#N/A	6.1
2007	#N/A	6.1
2008	#N/A	6.1
2009	#N/A	6.1
2010	#N/A	6.1
2011	#N/A	6.0
2012	#N/A	6.0
2013	#N/A	6.0
2014	#N/A	6.0
2015	6	6.0
2037		5.6



Appendix C – Project Table and Bridge Rehabilitation Timelines

I-84

Plan Year	Project No.	Description	Structures
1958	0034-0084	Original Plans	00547, 00548, 00956, 00961, 01184, 01185, 01186, 01190, 01191, 01192, 01195, 01196
1958	0034-0093	Original Plans	01181, 01182
1958	0034-0094	Original Plans	00897, 00898, 01197, 01198
1958	0034-0102	Original Plans	00956, 01190, 01191
1958	0034-0103	Original Plans	00457, 00458, 00544
1980	0034-0162	Widening - median girders	01181, 01182
1982	0034-0172	Deck repairs, remove/replace bituminous overlay, install weepholes, clean/reseal expansion joints, curb repair	00956, 00961, 01184, 01185, 01186, 01190, 01191
	0034-0160	Deck repairs, remove/replace bituminous overlay, install weepholes, clean/reseal expansion joints	00457, 00458, 01192
1983	0034-0153	Safety improvements (protective fence)	01185, 01186, 01190, 01191, 01192
1984	0034-0204	Deck replacement, repairs to end cover plates, bearing repair, steel painting, pier cap support	01195, 01196
1985	0034-0206	Deck replacement, new shear studs, new parapet/MBR, wingwall reconstruction, substructure repair, expansion bearings keeper device, performed expansion joints, bolted splices with end cover plate welds	00548
1986	0034-0189	Br. 00457 to be widened by 4 girders on the west side, clean/paint existing steel, remove/replace bituminous overlay reconstruct parapets/curbing	00457, 00458, 00956, 00961, 01184, 01185, 01186, 01190, 01191, 01192
1987	0174-0122	Replace parapet/sidewalk, MBR and fence, wingwall modification, install weepholes, substructure repairs, deck replacement and cut cross frames to remove concrete, replace expansion bearings, bearing pad replacement	00897
1991	0034-0235	Deck repairs, repair joints, substructure repair, expansion bearing keeper device	00544, 01181, 01182, 01198
	0034-0250	Bridge widening on south side	01186
	0034-0252	Deck repairs, replace deck joints, substructure repairs, expansion bearing keeper device	00547, 00898, 01197
1994	0034-0262	Deck replacement except in mid 36' area, shear studs, bearing replacement, new parapet/MBR	01192
	0034-0266	Bridge widening and abutment drilling and grouting modifications, deck patching and resurfacing, new expansion bearings, keeper blocks	01198
2001	0174-0293	Bridge painting	01186, 01192
2008	0174-0339	Remove/repair existing joints, replace with asphaltic plug expansion joint systems	00457, 00458, 00547, 00548, 00956, 00961, 01181, 01184, 01186, 01191, 01192, 01195, 01196, 01198
2012	0174-0357	Asphaltic plug expansion joint system (installed joint with bridging plate when pavement on both sides of joint are concrete (approach slab), no bridging plate when one side is bituminous)	00544, 01182, 01197
2016	0174-0370	Substructure repairs	01195, 01196
	0034-0334	Substructure repairs, cleaning and painting, bearing replacement, deck resurfacing	00548
2017	0034-0313	I-84 EB widening of superstructure and substructure, deck patching	01185, 01190

Over I-84

Plan Year	Project No.	Description	Structures
1958	0034-0084	Original Plans	01183, 01188
	0034-0093	Original Plans	01180, 05261
	0034-0094	Original Plans	00459, 01199, 01200, 01201, 01202, 01203, 01204
1967	0034-0126	MBR treatment	01183, 01188, 01200, 01202, 01203, 01204
1976	0034-0155	New elastomeric bearing pads, new steel pedestal and braces, new keeper angles	00459, 01199
1980	0034-0162	Full bridge replacement	05261
1983	0034-0153	Safety improvements (protective fence)	00459, 01183, 01188, 01199, 01200, 01201, 01202
1984	0034-0198	Deck replacement, new shear connectors, new sidewlaks/MBR, substructure repairs. Br. 01204 clean and paint steel, deck repairs, joints	01183, 01188, 01204
	0034-0199	Deck replacement, new shear connectors, new sidewalks/MBR, substructure repairs, expasnion bearing keeper device, trough installed at joints, bolted splice with end cover plate welds.	01180
1987	0009-0077	Replace parapet/sidewalk, MBR and fence, wingwall modifications, install weepholes, substructure repairs, deck replacement and cut cross frames to remove concrete, bridge scuppers	00459
1993	0174-0208	Bridge painting	01200, 01201, 01202, 01203
1994	0034-0263	Bridge widening, deck replacement, new shear connectors, substructure repair/modifications, keeper blocks at abutments, pier 2 and 3, new elastomeric bearing pads	01199
	0034-0266	Deck patching and resurfacing, new expansion bearings, keeper blocks	01200, 01201, 01202, 01203
1995	0174-0244	Bridge painting	01183
2001	0174-0293	Bridge painting	01199
2014	0174-0364	Installation of asphaltic plug expansion joints	00459

Route 7

Plan Year	Project No.	Description	Structures
1958	0034-0084	Original Plans	00550, 00551
	0034-0103	Original Plans	00543, 00545
	0034-0105	Original Plans	00541, 00542
1973	0034-0124	Relocation of Route 7 - Original plans	03915, 03916, 03919, 03920
1984	0034-0190	Relocation of Route 7 - Original plans	05462, 05463, 05772, 05773, 05909
1984	0034-0202	Deck replacement, new shear connectors, chain link fence added to span 2 only, substructure repairs, concrete bearing pad extension, concrete keeper blocks at fascias, performed expansion joints	00541
	0174-0098	Deck replacement, new shear connectors, new parapet/MBR, substructure repairs, expansion bearing keeper device, bolted splice with end cover plate welds, trough at joints	00550, 00551
1986	0174-0112	Bridge painting	00542
1991	0034-0235	Deck repairs, repair joints, substructure repair, expansion bearing keeper device	00545
	0034-0252	Deck repairs, replace deck joints, substructure repairs, expansion bearing keeper device	00543
1992	0034-0254	Remove top 1.5" of existing slab, add 2.5" min Class F and 1.5" latex modified concrete layers to top of deck, replace MBR, new chain link fence, substructure repairs, keeper blocks, new elastomeric bearings	00542
2008	0034-0260	Original Plans	06569
2011	0174-0357	Asphaltic plug expansion joint system (installed joint with bridging plate when pavement on both sides of joint are concrete (approach slab), no bridging plate when one side is bituminous)	00550, 00551, 03915, 03916, 03919, 03920
2014	0174-0364	Installation of asphaltic plug expansion joints	05462, 05909
2016	0174-0370	Substructure repairs	00541, 00542

Culverts

Plan Year	Project No.	Description	Structures
1958	0034-0084	Original Plans	00546, 00549, 00553, 01187, 01193, 01194
	0034-0093	Original Plans	05437
	0034-0094	Original Plans	01205
	0034-0102	Original Plans	01189
1980	0034-0162	Culvert extension	05437