Data Supplement C:
Probability Tables for all States

Table of Contents

List of Tables

Probability Analysis

Introduction

This supplemental data includes the probability analysis of bridge elements of National Highway System (NHS) bridges for six states; Connecticut (CT), Idaho (ID), Illinois (IL), Missouri (MO), Washington (WA) and Wisconsin (WI). Only steel bridges were studied for the states of CT, IL and WI, whereas Prestressed Concrete (PSC) bridges were analyzed for ID and WA states. The analysis in MO included both steel and PSC bridges, as shown in Table D.1. Probability analysis was also conducted for the deck, superstructure, and substructure components of these bridges and the related elements. Joint, bearings, coating condition, and wearing surface elements were also analyzed as needed. Table D.2 shows the list of elements that were included in the probability data analysis.

The scope of the probability analysis studies was limited to National Highway System (NHS) bridges having a Condition Rating (CR) of 5 and above. Attribute criteria from the risk models that defined *very high*, *high*, *moderate*, and *low* ratings were used to analyze inventory data for NHS bridges. The element data for the year 2020 were obtained from the Federal Highway Administration (FHWA) on-line database (https://www.fhwa.dot.gov/bridge/nbi/element.cfm) and analyzed for most states. Element data for the year 2023 was used for Illinois because certain parent element data were found to be missing from the 2020 FHWA data. Only state-owned bridges of the subject material were considered for the probability analysis.

The probabilities were determined by frequency analysis. For attribute criteria based on element data, only NHS bridges of the subject material type, as shown in Table D.1, were analyzed. For data recorded in the National Bridge Inventory, such as Average Daily Traffic (ADT), minimum vertical clearance, etc., the analysis included state-owned bridges of the subject material, which included both NHS and non-NHS bridges, were analyzed.

Table D.1. Table showing the bridge family for the states considered.

State	Bridge Family
Connecticut	Steel
Idaho	PSC
Illinois	Steel
Missouri	Steel, PSC
Washington	PSC

An analysis of NHS bridges was conducted to determine how many NHS bridges would be eligible for an extended 72-month inspection interval. The analysis did not consider the risk models developed by the Reliability Assessment Panel (RAP); the analysis only considered the number of bridges that would be eligible for the 72-month interval.

Table D.2. Table showing the list of elements used for the probability data analysis.

Element	Element Sub-type		Element Code
Protective Systems	Wearing Surfaces		510
	Steel Protective Coating		515
Deck	RC Deck		12
Joints	Strip Seal Joint		300
	Pourable Joint Seal		301
	Compression Joint Seal		302
	Assembly Joint with Seal		303
	Open Joint		304
	Assembly Joint w/o Seal		305
	Other Joint		306
Bearings	Elastomeric Bearing		310
	Moveable (roller, sliding, etc.)		311
	Enclosed/Concealed Bearing		312
	Fixed Bearing		313
	Pot Bearing		314
	Disk Bearing		315
	Other		316
Superstructure	Steel	Closed Web/Box Girder	102
		Girder Beam	107
		Stringer	113
	PSC	Closed Web/Box Girder	104
		Girder Beam	109
		Stringer	115
Substructure	Steel	Column	202
		Column Tower	207
		Abutment	219
		Pile	225
		Pier Cap	231
	RC	Column	205
		Pier Wall	210
		Abutment	215
		Pile Cap/Footing	220
		Pile	227
		Pier Cap	234

Table D.3. Table showing element probability data for the state of Connecticut.

Attribute	Criteria	Rating	CR7 (%)	CR6 (%)	CR5 (%)
Element 12	≥ 10% element in CS 3 poor overlay condition, pumping, known delamination or spalling, rutting, map cracking, or potholes	High	0	1	5
	1% ≤ CS3 < 10%	Moderate	1	8	24
	CS3 < 1%	Low	99	91	71
Element 510 Wearing surface CS (membrane condition)	≥ 10% element in CS 3 poor overlay condition, pumping, known delamination or spalling, rutting, map cracking, or potholes	High	1	9	8
	1% ≤ CS 3 < 10%	Moderate	8	10	4
	CS 3 < 1%	Low	91	81	88
Joint Condition Elements 300-306	Joint in CR 4 or 5 or joint CS 3 ≥ 5%, CS 2 ≥ 20%,	High	44	50	42
	Joint in CR 6, Joint CS 0 < CS 3 < 5%, 5% < CS 2 <20%	Moderate	23	28	20
	Jointless/joint in CR≥7, Joint In-place with joint CS2≤5%, no CS 3	Low	34	24	38
Bearing condition rating Elements 310-316	CR 5, DE 2240 CS 3 ≥ 10%, CS 4 > 1%	High	12	36	47
	CR 6, DE 2240 1% ≤ CS 3 <10%, CS 2 > 20%	Moderate	47	35	36
	CR ≥ 7	Low	41	29	17
Element Condition State Elements 102,107,113	Element CS 3 ≥ 5%	High	1	18	33
	Element CS3 < 5%, CS 2 > 10%	Moderate	30	71	65
	Other	Low	68	11	3
Constructed of Weathering steel / Protective coating condition Element 515	Protective Coating or Weathering Steel Corrosion in CS3 >10% and / or CS 4>1% (BME 515)	High	19	42	48
	Protective Coating or Weathering Steel Corrosion in CS2 > 20%	Moderate	11	11	16
	Protective Coating or Weathering Steel Corrosion in CS 1	Low	70	47	36
Current Element Condition State Elements 205, 210, 215, 220, 227, 234	CS 3 > 10%	High	5	18	37
	5% ≤ CS 3 > 10%, CS 2 > 20%	Moderate	40	46	32
	CS1, CS 3 < 5%, CS 2 < 20%	Low	56	36	31

Table D.4. Table showing probability data for NBI / SNBI Items for the state of Connecticut.

Attribute	Criteria	Rating	Probability (%)
Average Daily Traffic (ADT) Item 29, B.H.09	ADT > 10,000	High	64
	1000 < ADT < 10,000	Moderate	32
	ADT < 1,000	Low	4
ADTT/ ADT Item 109, B.H.10/ Item 29, B.H.09	ADT > 10,000	High	64
	1,000 < ADT < 10,000	Moderate	32
	ADT < 1,000	Low	4
Feature under the bridge Item 6, B.F.02	Over traffic/Roadway, high ADT (ADT > 10,000)	High	-
	Roadway, moderate ADT (1,000 < ADT < 10,000)	Moderate	-
	Roadway, moderate ADT (ADT < 1,000)	Low	-
Feature under the bridge Item 6, B.F.02	Over traffic/Roadway, high ADT (ADT > 10,000)	High	-
	Roadway, moderate ADT (1,000<ADT< 10,000)	Moderate	-
	Roadway, low ADT (ADT <1,000)/Anything else	Low	-
Minimum Vertical Clearance Item 54, B.H.13	Vertical clearance ≤ 14.5 ft	High	24
	Vertical clearance >14.5 ft, ≤ 17 ft	Moderate	37
	>17 ft	Low	40
Subjected to Overspray Item 54, B.H.13	Weathering steel inside splash zone (≤ 20' vert. clear.), coated steel over interstate ≤ 17 ft vert. clearance	High	60
	Coated steel over interstate with vertical clearance > 17 ft, < 20 ft	Moderate	9
	Coated steel and / or ≥ 20' vertical clearance	Low	31
Year of construction (as compared with AASHTO FCP)	Designed before 1975	High	76
	Designed between 1975 and 1984	High-Moderate	8
	Designed between 1985 and 1993	Moderate	9
	Designed after 1994	Low	8

Table D.5. Table showing element probability data for the state of Idaho.

Attribute	Criteria	Rating	CR7 (%)	CR6 (%)	CR5 (%)
Current Element Condition State Element 12	CS 3 ≥ 5% or CS 2 ≥ 20%	High	8	27	67
	1%≤ CS3 < 5% or 10% ≤ CS2 < 20%	Moderate	15	20	9
	CS 3 < 1% or CS 2 < 10%	Low	78	53	24
Element Condition State Element 510	CS 3 ≥ 5% or CS 2 ≥ 20%	High	1	23	44
	1%≤ CS3 < 5% or 10% ≤ CS2 < 20%	Moderate	4	7	6
	CS 3 < 1% or CS 2 < 10%	Low	95	69	50
Joint Condition Rating Elements 300-306	CR 4 & 5, ≥ 20% CS 3 / CS 4	High	35	41	45
	CR 6, 1% ≤ CS 3 / CS 4 < 20%	Moderate	14	16	10
	CR ≥ 7, CS 1 or 2, CS 3 < 1%	Low	50	43	43
Bearing condition rating Elements 310-316	CR 5, DE 2240 CS 3 ≥10%, CS 4>1%	High	3	12	8
	CR 6, DE 2240 1% ≤CS3<10%, CS 2>20%	Moderate	11	18	19
	CR ≥ 7	Low	86	70	73
Current Element Condition State Elements 104, 109, 115	CS 3 ≥ 1% or CS 2 ≥ 20%	High	2	26	75
	CS 3 < 1% or 5% ≤ CS 2 < 20%	Moderate	13	49	20
	No CS 3, CS 2 < 5%	Low	85	25	5
Element Condition State Elements 205, 210, 215, 220, 227, 234	CS 3 ≥ 5% or CS 2 ≥ 20%	High	11	46	56
	1% ≤ CS 3 < 5% or 5% ≤ CS 2 < 20%	Moderate	19	30	27
	CS 3 < 1% or CS 2 < 5%	Low	70	24	16

Table D.6. Table showing probability data for NBI / SNBI Items for the state of Idaho.

Component	Attribute	Criteria	Rating	Probability (%)
Deck	Average Daily Truck Traffic (ADTT) Item 109, B.H.10	ADTT ≥ 5,000 or ADT ≥ 16,000	High	11
		1,000 ≤ ADTT < 5,000 or 7,500 ≤ ADT < 16,000	Moderate	30
		ADTT < 1,000 or ADT < 7,500	Low	59
	Rate of De-icing Chemical application Item 29, B.H.09	Interstate / NHS or ADT ≥ 16,000	High	54
		ADT between 7,500 & 16,000	Moderate	35
		Local, Low ADT ≤ 7500	Low	11
Superstructure	Average Daily Truck Traffic Item 109, B.H.10	ADTT ≥ 5000 or ADT≥16,000	High	11
		1,000 ≤ ADTT < 5,000 or 7,500 ≤ ADT < 16,000	Moderate	30
		ADTT < 1,000 or ADT < 7,500	Low	59
	Rate of De-icing Chemical application Item 29, B.H.09	Interstate / NHS or ADT ≥ 16,000	High	54
		ADT between 7,500 & 16,000	Moderate	35
		Local, Low ADT ≤ 7,500	Low	11
	Average Daily Truck Traffic Item 109, B.H.10	High ADTT (≥ 5,000)	High	2
		Moderate ADTT (1,000-5,000)	Moderate	31
		Low ADTT (< 1,000)	Low	67
Substructure	Rate of de-icing chemical application Item 29, B.H.09	Interstate / NHS or ADT ≥ 16,000	High	54
		ADT between 7500 & 16,000	Moderate	35
		Local, Low ADT ≤ 7,500	Low	11
	Minimum vertical Clearance Item 54, B.H.13	< 14 ft or 14 ft- 16 ft 6 in. with high ADT	High	58
		14 ft – 16 ft 6 in.	Moderate	11
		> 16 ft 6 in.	Low	31

Table D.7. Table showing element probability data for the state of Illinois.

Attribute	Criteria	Rating	CR7 (%)	CR6 (%)	CR5 (%)
Element Condition State Element 12	CS 3 ≥ 5% or CS 2 ≥ 20%	High	12	38	60
	1% ≤ CS 3 < 5% or 5% ≤ CS 2 < 20%	Moderate	27	34	29
	CS 3 < 1% or CS 2 <5 %	Low	61	28	10
Current Element CS or Plow damage Element 510	Deck Surface (8000, 85XX) CS 3 > 10% or Plow damage at joint (DE 2360, CS 3 > 5%)	High	3	1	10
	Deck Surface (8000, 85XX) CS 3 1-10%, CS 2 ≥ 15% or DE 2360 CS 3 1≤ CS 3 ≤ 5% (moderate plow damage)	Moderate	32	42	63
	Deck Surface (8000, 85XX) CS 1 or CS 2 <15%, CS 3 < 1%, or minor / no plow damage	Low	65	57	28
Joint type/ Joint Condition Elements 300-306	Joint in CR 4 & 5 or Joint seal leakage DE 2310 CS 3 (any amount) CS 2 ≥1% Other defects: CS 3 ≥ 5%, CS 2 ≥ 20%	High	55	61	64
	Joint in CR 6, DE 2310 No CS 3, CS 2 < 1% Other defects: 0 < CS 3 < 5%, 5% < CS 2 < 20%	Moderate	7	7	4
	Jointless/joint in CR ≥ 7, Joint In-place with joint CS 2 ≤ 5%, no CS 3	Low	37	33	33
Bearing Condition rating Elements 310-316	CR 5, DE 2240 CS 3 ≥10%, CS 4 > 1%	High	8	14	22
	CR 6, DE 2240 1% ≤ CS 3 < 10%, CS 2 > 20%	Moderate	31	38	34
	CR ≥7	Low	61	48	44
Element Condition State Elements 102, 107, 113	Element CS 3 ≥ 5%	High	1	8	19
	Element CS 3 < 5%, CS 2 >10% (DE 1000)	Moderate	20	55	59
	Other	Low	78	37	23
Coating Condition Element 515	Weathering Steel or Coated Steel: Beam End CS 3 DE 1000 or Steel Coating EL 515 CS 2 ≥ 25%, CS 3 ≥ 10%	High	6	19	30
	El. 515 10% ≤ CS 2 < 25%, 1% ≤ CS 3 < 10%	Moderate	8	21	27
	Coated steel: Metalized or Galvanized Steel, Lead-based, Good Paint El. 515 CS2 < 10%, CS 3 < 1%	Low	86	60	43
Element Condition State Elements 205, 210, 215, 220, 227, 234	CS 3 ≥ 5% or CS 2 ≥ 20%	High	7	24	35
	1% ≤ CS 3 < 5% or 5% ≤ CS 2 < 20%	Moderate	17	26	25
	CS 3 < 1% or CS 2 < 5%	Low	75	50	40

Table D.8. Table showing probability data for NBI / SNBI Items for the state of Illinois.

Component	Attribute	Criteria	Rating	Probability (%)
Deck	Average Daily Truck Traffic (ADTT) Item 109, B.H.10	ADTT ≥ 5,000	High	10
		ADTT 501 - 4999	Moderate	46
		ADTT ≤ 500	Low	44
	Rate of De-icing Chemical application Item 29, B.H.09	North of I-80, High ADT (> 10, 000 ADT)	High	56
		Between I-70 and I-80, High ADT (> 10,000 ADT)	Moderate	29
		South of I-70, Low ADT (< 10,000)	Low	15
Superstructure	Rate of De-icing Chemical application Item 29, B.H.09	North of I-80, High ADT (> 10,000 ADT)	High	56
		Between I-70 and I-80, High ADT (> 10,000 ADT)	Moderate	29
		South of I-70, Low ADT (< 10,000)	Low	15
	Average Daily Truck Traffic Item 109, B.H.10	ADTT ≥ 5,000	High	10
		ADTT 501 - 4999	Moderate	45
		ADTT ≤ 500	Low	44
	Feature under Item 6, B.F.02	Roadway, high ADT (≥ 9,000 ADT)	High	-
		Roadway, moderate ADT (2,000 to 8,999 ADT)	Moderate	-
		Roadway with low ADT (< 2,000 ADT)	Low	-
	Year of Construction	Bridge designed before 1975/unknown	High	57
		Bridge designed between 1976 and 1984	Moderate	10
		Bridge designed between 1985 and 1993	Minor	9
		Bridge designed after 1994	Low	24
	Subjected to Overspray Item 54, B.H.13	Vertical Clearance under 17 ft	High	73
		Vertical Clearance 17 to 24 ft	Moderate	12
		Vertical Clearance > 24 ft	Low	15
Substructure	Rate of de-icing chemical application Item 29, B.H.09	North of I-80, High ADT (> 10, 000 ADT)	High	56
		Between I-70 and I-80, High ADT (>10,000 ADT)	Moderate	29
		South of I-70, Low ADT (<10,000)	Low	15
	Feature under Item 6, B.F.02	Roadway, high ADT (≥ 9,000 ADT)	High	-
		Roadway, moderate ADT (2,000 to 8,999 ADT)	Moderate	-
		Roadway with low ADT (< 2000 ADT)	Low	-
	Minimum vertical clearance Item 54, B.H.13	< 15 ft	High	50
		15 ft to 17 ft	Moderate	24
		> 17 ft	Low	26

Table D.9. Table showing element probability data for the state of Missouri.

Attribute	Criteria	Rating	CR7 (%)	CR6 (%)	CR5 (%)
Element Condition State Element 12	≥ 10% element in CS 3	High	1	6	35
	1% < CS 3 <10%, CS 2 > 20%	Moderate	23	63	52
	CS3 ≤ 1%, CS2 ≤ 20%	Low	77	30	13
WS Element 510	≥ 10% element in CS 3 poor overlay condition, pumping, known delamination or spalling, rutting, map cracking, or potholes	High	10	16	23
	1% ≤ CS 3 < 10%	Moderate	27	38	36
	CS 3 < 1%	Low	63	46	41
Joint Type/Joint Condition Elements 300-306	Leaking or CR ≤ 4, CS 3 ≥ 25%, CS 4 ≥ 5%	High	20	25	39
	Not leaking or CR 5-6, 5% < CS 3<25%, CS 4 < 5%	Moderate	3	5	4
	Jointless or Joint in CR 7-9, CS 3≤5%	Low	76	69	57
Bearing condition rating Elements 310-316	CR 5, DE 2240 CS 3 ≥10%, CS 4>1%	High	2	13	14
	CR 6, DE 2240 1% ≤CS 3 < 10%, CS 2 > 20%	Moderate	2	5	9
	CR 7+	Low	96	82	77
Element Condition state Elements 102, 107, 113	≥ 10% element in CS 3	High	0	3	7
	1% < CS 3 < 10%, CS 2 > 20%	Moderate	17	40	48
	CS 3≤1%	Low	82	57	45
Element Condition State Elements 104, 109, 115	≥ 10% element in CS 3	High	0	2	5
	1% < CS 3<10%, CS 2 > 20%	Moderate	1	16	21
	CS 3 ≤ 1%	Low	99	82	74
Coating condition Element 515	CR ≤ 4, EL 515 CS 2 ≥25%, CS3 ≥ 10%, CS 4 ≥ 1% weathering steel w/o patina	High	57	32	27
	CR 5-6, 10% ≤ CS2 < 25%, 1% ≤ CS 3 < 10%, CS 4 < 1% or weathering steel with patina	Moderate	10	14	10
	CR ≥7	Low	33	54	63
Element Condition State Elements 202, 207, 219, 225, 231	CS3 ≥ 10%, or lamellar corrosion reported	High	2	24	39
	CS3 1% to < 10%, CS2 ≥ 25%	Moderate	41	51	41
	CS2 < 25%, no CS3	Low	57	25	20
Delamination, spalling, scaling, or wide crack- Element Condition State Elements 205, 210, 215, 220, 227, 234	CS3 ≥ 10% or CS2 ≥ 20% by sounding Scaling: Loss of surface mortar between 1/2" & 1" deep, exposed coarse aggregate	High	14	38	53
	10% ≤ CS2 < 20%, 1% < CS3 < 10% or exposed rebar Scaling: Loss of surface mortar between 1/4" & 1/2" deep, mortar loss between coarse aggregate	Moderate	12	19	14
	< 10% CS 2 CS 3 ≤ 1% Scaling: Light-Loss of surface mortar up to 1/4" deep with surface exposure of coarse aggregates	Low	73	43	32

Table D.10. Table showing probability data for NBI / SNBI Items for the state of Missouri.

Component	Attribute	Criteria	Rating	Probability (%)	
				Steel Bridges	PSC Bridges
Deck	Average Daily Truck Traffic (ADTT) Item 109, B.H.10	≥ 7,000 ADT, ≥ 500 Trucks	High	42	40
		500 < ADT < 7,000, 50 < Trucks < 500	Moderate	36	41
		≤ 500 ADT, ≤ 50 Trucks	Low	22	19
Superstructure	Average Daily Truck Traffic (ADTT) Item 109, B.H.10	≥ 7,000 ADT, ≥ 500 Trucks	High	42	-
		500 < ADT < 7,000, 50 < Trucks < 500	Moderate	36	-
		≤ 500 ADT, ≤ 50 Trucks	Low	22	-
	ADT/ADTT Item 109, B.H.10/ Item 29, B.H.09	≥ 7,000 ADT, ≥ 500 ADTT	High	42	-
		500 < ADT < 7000, 50 < ADTT < 500	Moderate	36	-
		≤ 500 ADT, ≤ 50 ADTT	Low	22	-
	Worst fatigue detail category Item 109, B.H.10, B.IR.02	-	High	-	-
		Category of Details categories A-D with High ADTT (≥ 500 trucks)	Moderate	40	-
		Category of Details (A-D) and/or Low ADTT (< 500 trucks)	Low	60	-
	Feature Under Item 6, B.F.02	Roadway, high ADT (≥ 5,000 ADT, ≥ 500 Trucks)	High	-	-
		Roadway, moderate ADT (500 < ADT < 5,000, 50 < ADTT <500)	Moderate	-	-
		Waterway or Roadway, low ADT (≤ 500 ADT, ≤ 50 ADTT)	Low	-	-
	ADTT Item 109, B.H.10	≥ 7,000 ADT, 500 Trucks	High	-	40
		500 < ADT < 7,000, 50 < Trucks < 500	Moderate	-	41
		≤ 500 ADT, ≤ 50 Trucks	Low	-	19
	Year of Construction	Bridge designed before 1975/unknown	High	70	-
		Bridge designed between 1976 and 1984	Moderate	10	-
		Bridge designed between 1985 and 1993	Minor	5	-
		Bridge designed after 1994	Low	16	-
	Minimum Vertical Clearance Item 54, B.H.13	≤ 15 ft Roadway	High	63	74
		Other	Low	37	26

	Subjected To Overspray Item 54, B.H.13	Over Traffic, < 20 ft vertical clearance, Over lake-continuous wet environment (< 10 ft nominal)	High	31	20
		Stream, < 6 ft vertical clearance from water	Moderate	59	72
		Other	Low	9	8

Table D.11. Table showing element probability data for the state of Washington.

Attribute	Criteria	Rating	CR7 (%)	CR6 (%)	CR5 (%)
Element Condition State Element 12	CS 3 ≥ 5% or CS 2 ≥ 20% DE 1080-1130 DE 1190 CS 3 ≥ 10%	High	0	1	8
	1% ≤ CS 3 < 5% DE 1080-1130 or 5% ≤ CS 2 < 20%, 5% ≤ CS 3 < 10% DE 1190,	Moderate	1	1	5
	CS3 < 1% or CS 2 < 5%	Low	99	99	87
Element Condition State Element 510	CS 3≥5% or CS 2 ≥ 20% DE 1080-1130 (corrosion related) Presence of wear and abrasion or traffic with studded tires/poor material quality of wearing surface, DE 1190 CS 3≥10%	High	1	0	2
	1% ≤ CS 3 < 5% DE 1080-1130 or 5% ≤ CS 2 < 20%, 5% ≤ CS 3 < 10% DE 1190,	Moderate	99	100	98
	CS 3 < 1% or CS 2 < 5%	Low	0	0	0
Joint Condition Elements 300-306	Joint in CR 4 & 5, Failed, or Leaking Or Joint CS 3 ≥ 5%, CS 2 ≥ 20%	High	75	77	82
	Joint in CR 6, or Joint 0 < CS 3 < 5%, 5% < CS 2 < 20%	Moderate	0	0	1
	Jointless or Joint in CR ≥ 7 or Joint In-place with joint CS 2 ≤ 5%, no CS 3	Low	25	23	17
Bearing condition rating Elements 310-316	CR 5, DE 2240 CS 3 ≥ 10%, CS 4 > 1%	High	4	8	24
	CR 6, DE 2240 1% ≤ CS 3 < 10%, CS 2 > 20%	Moderate	1	4	7
	CR ≥ 7	Low	95	88	69
Current element Condition State Elements 104, 109, 115	CS 3 ≥ 1% or CS 2 ≥ 20%	High	1	13	21
	CS 3 < 1% or 5% ≤ CS 2 < 20%	Moderate	27	70	63
	CS 3, CS 2 < 5%	Low	72	16	16
Current Element Condition State Elements 205, 210, 215, 220, 227, 234	CS 3 ≥ 5% or CS 2 ≥ 30%	High	6	27	46
	1% ≤ CS 3 < 5% or 5% ≤ CS 2<30%	Moderate	2	9	10
	CS 3 < 1% or CS 2 < 5%	Low	92	64	44

Table D.12. Table showing probability data for NBI / SNBI Items for the state of Washington.

Component	Attribute	Criteria	Rating	Probability (%)
Deck	Average Daily Truck Traffic (ADTT) Item 109, B.H.10	≥ 1,000 ADTT	High	52
		< 1,000 ADTT	Low	48
Superstructure	Average Daily Truck Traffic Item 109, B.H.10	≥ 1,000 ADTT	High	52
		< 1,000 ADTT	Low	48
	Feature Under Item 6, B.F.02	Roadway, high ADT (≥ 5000 ADT, ≥ 500 ADTT)	High	-
		Roadway, moderate ADT (500 < ADT < 5,000, 50 < ADTT < 500)	Moderate	-
		Waterway or Roadway, low ADT (≤ 500 ADT, ≤ 50 ADTT)	Low	-
	Minimum Vertical Clearance Item 54, B.H.13	≤ 15 ft	High	34
		15 – 17 ft	Moderate	33
		> 17 ft	Low	33
	Subjected to overspray & Adjacent to Traffic Item 54, 55, 56 B.H.13,14.15	Eastern urban / interstate routes - Passes – 3 majors, 2 US routes / Interstate Routes) Feature under: Roadway, horizontal clearance < 15 ft.	High	34
		Benign -Other routes, Feature under is not a roadway or horizontal clearance > 15 ft	Low	66

Table D.13. Table showing element probability data for the state of Wisconsin.

Attribute	Criteria	Rating	CR7 (%)	CR6 (%)	CR5 (%)
Current Element CS or Plow damage Element 12	Deck Surface (8000, 85XX) CS 3 > 10% or Plow damage at joint (DE 2360, CS 3 > 5%)	High	0	2	14
	Deck Surface (8000, 85XX) CS 3 1-10%, CS 2 ≥ 15% or DE 2360 CS 3 1 ≤ CS 3 ≤ 5% (moderate plow damage)	Moderate	10	23	42
	Deck Surface (8000, 85XX) CS 1 or CS 2 < 15%, CS 3 < 1%, or minor/no plow damage	Low	90	75	44
Current Element CS or Plow damage Element 510	Deck Surface (8000, 85XX) CS 3 > 10% or Plow damage at joint (DE 2360, CS 3 > 5%)	High	0	2	12
	Deck Surface (8000, 85XX) CS 3 1-10%, CS 2 ≥ 15% or DE 2360 CS 3 1 ≤ CS3 ≤ 5% (moderate plow damage)	Moderate	17	22	35
	Deck Surface (8000, 85XX) CS 1 or CS 2 < 15%, CS 3 < 1%, or minor/no plow damage	Low	83	77	53
Joints condition rating/ Condition State Elements 300-306	CS 3 ≥ 10%, CR 4 > 1 % – Leaking joint	High	17	25	50
	CS 2 > 20% or 1% ≤ CS 3 ≤ 10%, CR 5, 6 – min. leakage	Moderate	56	48	32
	CS 1, CS 2 < 20%, CS 3 < 1%, CR ≥ 7	Low	28	27	17
Bearing condition rating Elements 310-316	CR 5, DE 2240 CS 3 ≥ 10%, CS 4 > 1%	High	10	27	43
	CR 6, DE 2240 1% ≤ CS 3 < 10%, CS 2 > 20%	Moderate	33	43	41
	CR ≥ 7	Low	57	30	16
Current element condition state Elements 102, 107, 113	CS 3 ≥ 10% Section Loss (DE 1000)	High	3	19	49
	CS 2 ≥ 20%, 1%< CS 3 < 10%	Moderate	31	53	39
	CS 1, CS 2 < 20%, CS 3 < 1%	Low	66	28	12
Constructed of Weathering steel/ Coating Condition Element 515	Protective Coating or Weathering Steel Corrosion in CS 3 > 10% and / or CS 4 > 1% (BME 515)	High	20	45	70
	Protective Coating or Weathering Steel Corrosion in CS 2 > 20%	Moderate	5	5	10
	Protective Coating or Weathering Steel Corrosion in CS 1	Low	75	50	20
Delamination, spalling, scaling or wide crack- element CS (DE's 1080, 1090, 1120, 1130, 1190) Elements 205, 210, 215, 220, 227, 234	CS 2 ≥ 20% Or CS 3 ≥ 10%	High	24	47	61
	1% ≤ CS 2 < 20%, 1% ≤ CS 3 < 10%	Moderate	45	39	27
	CS 2 < 1%, CS 3 < 1%	Low	31	14	12

Table D.14. Table showing probability data for NBI / SNBI Items for the state of Wisconsin.

Component	Attribute	Criteria	Rating	Probability (%)
Deck	Average Daily Traffic Item 109, B.H.10	ADT ≥ 20,000	High	20
		ADT 10,000 – 19,999	Moderate	22
		ADT < 10,000	Low	57
	Rate of De-icing Chemical application Item 29, B.H.09	Interstate / Urban or ADT > 10,000	High	62
		Rural, non-interstate, 2,000 < ADT < 10,000	Moderate	16
		Rural, Non- Interstate, ADT < 2,000	Low	22
Superstructure	Rate of De-icing Chemical application Item 29, B.H.09	Interstate / Urban or ADT > 10,000	High	62
		Rural, non-interstate, 2,000 < ADT < 10,000	Moderate	16
		Rural, Non- Interstate, ADT < 2000	Low	22
	Subjected to Overspray Item 54, B.H.13	Clearance < 16 ft, Bridge highway (Interstate), Bridge over non-interstate, > 200 ADTT	High	20
		Clearance 16 -20 ft, bridge over highway (interstate) Bridge over non-interstate, <200 ADTT	Moderate	36
		Clearance > 20 ft	Low	44
	Average Daily Truck Traffic Item 109, B.H.10	20,000 ADT – 15% Trucks	High	20
		10,000 – 20,000 ADT	Moderate	22
		< 10,000 ADT	Low	57
	Feature under Item 6, B.F.02	Roadway, high ADT (> 10,000)	High	-
		Roadway, moderate ADT 1,000-9,999 ADT	Moderate	-
		Roadway, low ADT (< 1,000ADT)	Low	-
	Minimum Vertical Clearance Item 54, B.H.13	Clearance < 15 ft	High	10
		15 – 17 ft	Moderate	40
		>17 ft	Low	50
	Subjected to Overspray Item 54, B.H.13	Clearance < 16 ft, over any Interstate Bridge over non-interstate with > 200 ADTT	High	20
		Clearance 16 -20 ft, bridge over highway (interstate) Bridge over non-interstate, > 200 ADTT	Moderate	36
		Clearance > 20 ft	Low	44

	Year of Construction	Bridge designed before 1975/unknown	High	64
		Bridge designed between 1976 and 1984	Moderate	15
		Bridge designed between 1985 and 1993	Minor	8
		Bridge designed after 1994	Low	13

Analysis of NHS Bridges

An analysis of NHS bridges was conducted to determine how many NHS bridges would be eligible for an extended 72-month inspection interval. The analysis did not consider the risk models developed by the RAP; the analysis only analyzed the number of bridges that would be eligible for the 72-month interval. The criteria considered for determining inspection intervals for NHS bridges was as follows:

1) Deck, Superstructure and Substructure with a CR 7 or greater
2) No CS 4 elements
3) Highway Minimum Vertical Clearance (Item B.H.13) ≥ 14.0 [Minimum Vertical Clearance Over Bridge Roadway and Minimum Vertical Underclearance (Items 53 and 54B) ≥ 0420 (i.e., 4.20m)]
4) Channel Protection Condition (Item B.C.10) ≥ 6 [Channel and Channel Protection Condition Rating (Item 61) ≥ 6]
5) Bridge Posting (Item 70) ≥ legal loads
6) No Fracture Critical details (Item 92A)
7) Scour Vulnerability (Item B.AP.03) = A or B [Scour Critical Bridges (Item 113) = 5 or 8]

The results of the analysis are shown in Table D.15, which shows the number of NHS bridges that satisfy the criteria, the total number of NHS bridges in each state, and the percentage of bridges that meet the criteria. As shown in the table, the number of bridges that would be eligible for an extended inspection interval of 72-months varies significantly between different states ranging from a high of 51% and a low of 20%.

Table D.15. Analysis of NHS bridges that qualify for an extended inspection interval.

State	No. of NHS bridges satisfying criteria	Total No. NHS bridges	% NHS Bridges
CT	356	1,823	20%
ID	221	830	27%
IL	1,443	4,808	30%
MO	1,132	3,670	31%
WA	1,217	2,596	47%
WI	1,822	3,591	51%

Percentile ADT Data

Table D.16 shows the results of analysis of percentile ADT data for the bridges of six states as per NBI 2023 data. The bridges considered for this analysis were in accordance with the bridge family for the respective states as mentioned in Table D.1

Table D.16. ADT percentile data for state-owned bridges.

Percentile	State					
	CT	ID	IL	MO	WA	WI
90th	75,450	17,000	30,050	21,212	56,185	37,180
75th	41,200	9,125	14,750	8,707	28,791	17,050
50th	15,300	3,900	6,650	2,484	12,198	7,900
25th	6,500	1,400	2,050	529	5,000	2,418