

# Preliminary Design Report

Western Avenue / I-95 Bridge #5808

over

Interstate I-95

Augusta, Maine

2167200

WIN 21672.00



**Maine Department of Transportation  
Bridge Program**

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## BACKGROUND INFORMATION

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<b>TOWN</b>	Augusta	<b>WIN</b>	21672.00	<b>BRIDGE NO.</b>	5808
<b>BRIDGE</b>	Western Avenue / I-95 Bridge			<b>STATE ROUTE</b>	202
<b>FUNDING:</b>	State				
<b>PROGRAM SCOPE:</b>	Bridge Superstructure Replacement				
<b>PROGRAM DESCRIPTION:</b>	Western Avenue/ I-95 Bridge (#5808) over Interstate 95. Located 0.27 of a mile south of Old Winthrop Road.				
<b>PROJECT BACKGROUND:</b>	This bridge was constructed in 1955 and had a wearing surface and joint replacement in 1984 including concrete header and deck repair. Joint and sidewalk/median repair occurred in 2005. The bridge is functionally obsolete due to insufficient vertical clearance to the interstate below. Preliminary engineering, construction, and construction engineering were funded in the 2021 work plan at \$8,500,000.				
	<b>JURISDICTION</b>	State Highway		<b>NHS</b>	No
<b>FUNCTIONAL CLASSIFICATION</b>	Minor Arterial		<b>CORRIDOR PRIORITY</b>	1	
	<b>URBAN/RURAL</b>	Urban			
	<b>LOAD POSTING</b>	Open, No Restrictions		<b>POSTED SPEED</b>	35 mph
<b>TRAFFIC:</b>	2019	<b>AADT</b>	23,730 EB/WB Combined	<b>ACCIDENT DATA, CRF</b>	1.69
	2039	<b>AADT</b>	26,100 EB/WB Combined	<b>DHV</b>	1,357

## EXISTING BRIDGE

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**YEAR BUILT** 1955      **SPAN LENGTHS** 53', 63', 78', 63'      **CURB TO CURB WIDTH** 38' each

**TYPE OF SUPERSTRUCTURE:** Four-span continuous dual structures comprised of non-composite painted steel rolled beams with cover plates, 6½" concrete deck and 2 1/2" concrete wearing surface with a longitudinal deck joint at the median. Compression and gland seals at the abutments. Fixed rocker bearings at the median pier, expansion elsewhere.

**GENERAL CONDITION:** The deck is in fair condition. The underside of the deck has scattered map cracking and several 2'-0" by 2'-0" spalls throughout, some with exposed corroded reinforcing steel. A few of the beam's haunches have spalled off. The concrete wearing surface has scattered minor cracking, patches, rutting due to abrasion, and a general overall loss of tining over the entire travelway. The concrete sidewalks and curbs have scattered areas of cracking and moderate to heavy spalling with exposed corroded reinforcing steel in some locations. The steel beams are in satisfactory condition with isolated areas of corrosion and approximately 75% paint failure in the second and third span. The northernmost beam, in span 3, has collision damage over the I-95 southbound lanes. The bridge rail is in satisfactory condition with paint failure and light rust staining.

**TYPE OF SUBSTRUCTURE:** Concrete stub abutments with vertical expansion joint on native glacial till and independent concrete hammerhead piers on bedrock.

**GENERAL CONDITION:** The abutments are in fair to poor condition. Both abutments have numerous moderate spalls with exposed rebar, scattered minor to moderate map cracking, and intermittent delaminations. The spalls vary in size from 1 to 4 square feet and have a maximum depth of 4 inches. The bearing seats also have standing water in some locations. There is a severely spalled area in Abutment 2 near the vertical construction joint with several reinforcing bars exposed and no concrete section remaining. The slope protection in front of Abutment 2 is also failing. The wingwalls have widespread cracking. The piers are in good condition. The traffic faces at each pier have the most deficiencies noted, particularly the lower portions within the splash zone. The bottoms of the piers have numerous areas of delamination, isolated areas of small spalls, horizontal cracks, and some isolated exposed stirrups in the pier cap.

<b>LOAD RATINGS:</b>	<b>OPERATING</b>	<b>INVENTORY</b>
HL-93 Truck	46.08 Tons	39.96 Tons
Rating Factor	1.28	1.11

**STRUCTURALLY DEFICIENT** No      **FUNCTIONALLY OBSOLETE** Yes

**MAINTENANCE PROBLEMS:** Leaking joints, collision damage, deteriorated concrete sidewalks, median, end posts, abutments, wingwalls, and deck along with slope paving erosion.

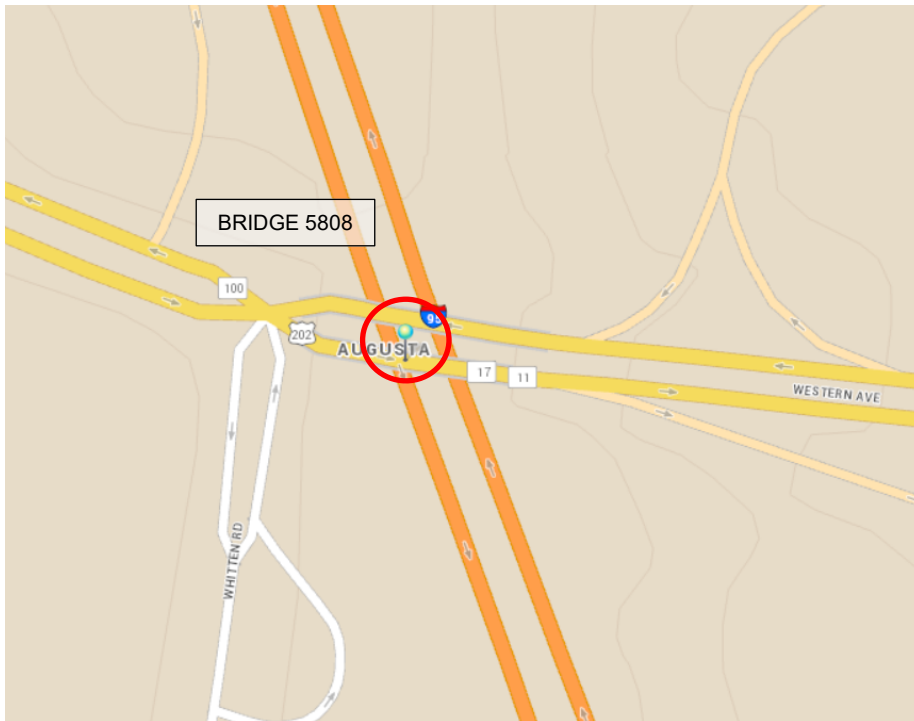
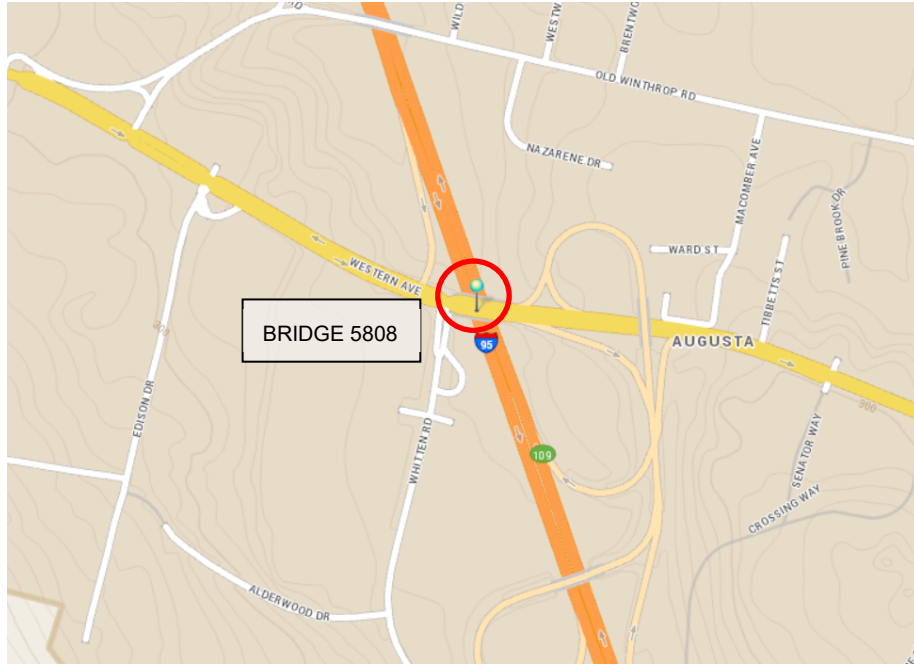
**MAINTENANCE WORK:** 1959 – Concrete Slope Paving construction  
1984 – Wearing surface and joint replacement with some deck repair  
2005 – Joint repair and concrete sidewalk and curb repairs

**PREVIOUS STRUCTURE:** No pre-existing structure.

**OTHER COMMENTS:** This is a non-historic bridge located in a non-historic district.

## LOCATION MAP

Augusta, Western Avenue / I-95 Bridge #5808, WIN 21672.00  
Route 202 over Interstate I-95



Latitude: 44° 18' 59" N, Longitude: 69° 48' 41" W

## BRIDGE RECOMMENDATION FORM

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**WIN** 21672.00                      **TOWN** Augusta  
**BRIDGE NO.** 5808                      **BRIDGE** Western Avenue / I-95 Bridge

**PROJECT MANAGER** Devan Eaton  
**DESIGNED BY** Stantec                      **DATE** 5/26/2022  
**APPROVED BY** D.Eaton                      **DATE** 5-27-2022  
**APPROVED BY** J.S. Folsom                      **DATE** 6/16/2022

**PROJECT:** Bridge replacement with 765' of approaches, including side roads and transitions.

**ALIGNMENT DESCRIPTION:** A 1,637' radius horizontal curve on the bridge, with a tangent in the east approach and a 2,963' radius horizontal curve in the west approach. A 1% tangent longitudinal grade on the bridge and east approach. There are 137' and 200' sag vertical curves in the west and east approaches, respectively. The finished centerline grade is approximately 9" higher than the existing bridge. The centerline of construction matches existing. The bridge centerline is shifted 1.5' to the south of the centerline of construction.

**APPROACH SECTION:** Eastbound: Three 11' lanes with 6' outside and 2' median shoulders. Westbound: Three 11' lanes with 4' outside and 2' median shoulders and 5'-1" sidewalk. 1:2 sideslopes with standard steel guardrail and 1:4 sideslopes without guardrail.

**SPANS** 71'-2.5"/85'-9.5"                      **SKEW** 28.97° back on left

**LOADING** HL-93 modified for Strength 1                      **DESIGN SPEED** 35 mph

**SUPERSTRUCTURE:** Prefabricated Bridge Units (PBU) consisting of thermal-spray-coated (metalized) steel plate girders and a reinforced concrete deck with a 3" bituminous wearing surface on ¼" high performance waterproofing membrane. The deck will have an out-to-out width of 91'-4" with 3.2% superelevation, with corrosion resistant reinforcing in the deck, curb, sidewalk, median, and transition barriers. Reinforced elastomeric bearings and asphaltic plug joint.

**ABUTMENTS:** Full-height cantilevered abutments and wingwalls on spread footings which are founded on bedrock with engineered backfill, buried approach slab.

**PIERS:** Hammer head median pier on rock with existing footing re-use.

<b>CLEARANCES:</b>	<b>EXISTING</b>	<b>PROPOSED</b>	
<b>VERTICAL</b>	14.3 FT	16.0 FT	
<b>HORIZONTAL</b>	66.4 FT	72.6 FT	NB
	51.8 FT	58.0 FT	SB

**AVAILABLE SOILS INFORMATION:** Existing plans and 3 preliminary borings show bedrock to be present at about 23'-35' below proposed Western Avenue roadway grade at the abutments and 7'-8' below I-95 roadway grade at the piers. Overburden generally consists of glacial till and embankment fill. Piers appear to be founded on bedrock and abutments are located on native glacial till. For more information, please refer to the Preliminary Geotechnical Memorandum.

**ADDITIONAL DESIGN FEATURES:** Begin project at STA 16+50, end project at STA 60+50. Median reconstruction is necessary beyond the full depth roadway construction limits due to the maintenance of traffic cross overs. Enhanced pier protection is provided in the I-95 median with W-beam guardrail – mid-way splice with halved post spacing. I-95 outside guardrail will be replaced with standard W-beam guardrail – mid-way splice to facilitate the reconstruction. Existing pier footings to remain below grade and abutments to remain below the bearing seat level.

**COMPLETE STREETS:** Increased outside shoulder widths of 4'-0" and 6'-0" are proposed on the bridge for snow plowing and storage compared to 2'-6" existing, which will also provide improved bicycle accommodation. The corridor would need further shoulder improvement for full bicycle accommodation. The existing south sidewalk dead ends awkwardly at the east end of the bridge immediately adjacent to the Exit 109 I-95 on-ramp with no approach sidewalk beyond that. Due to pedestrian safety concerns and limited pedestrian volumes, the south bridge sidewalk will be eliminated which allows the shoulder widening without deck widening. A new ADA compliant crosswalk will be constructed across Western Avenue to the north sidewalk on the west side of the Whitten Road intersection with a pedestrian refuge island. Flashing sign assemblies will be installed for the crosswalk across the right turn lane. The existing three ramps on the north side of Western Ave will also be reconstructed meeting ADA compliance. A 2'-0" minimum outside shoulder and a 4'-0" minimum sidewalk will be maintained throughout construction.

**MAINTENANCE OF TRAFFIC:** Maintain two-way traffic on temporary detour bridge with two lanes westbound and one lane eastbound and utilize the Whitten Road Connector for diversion. Maintain two 11'-0" lanes in each direction during median reconstruction. Nighttime final paving and traffic signal relocation on Western Avenue and Whitten Road. Unlimited nighttime (7PM or 8PM-6AM) I-95 single lane closures as needed or nighttime 25-minute rolling closures of 1 bound for critical construction tasks such as bridge demolition and girder erection. Nighttime I-95 SB detour at Exit 109B to Edison Drive jug handle and then back on I-95 SB at the Whitten Road Connector will be used to shift I-95 NB into the two respective barrels to free up work zone under whole span at a time (capped at X hours per bound). Exit 109A and 109B off-ramps will be temporarily closed at night on two occasions for temporary detour bridge construction and removal.

**CONSTRUCTION SCHEDULE:** Two construction seasons.

**ADVERTISING DATE:** May 2023