

## **NCDOT Bridge Update**

Aaron Earwood, PE State Bridge Construction Engineer July 25, 2025

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina

### **Joint Committees**

### **Four Active Committees**

- NCDOT/CAGC Joint Cooperative Committee
- NCDOT/CAGC Joint Roadway Committee
- NCDOT/CAGC Joint Structure Committee
- NCDOT/CAGC/ACEC Alternative Delivery Committee

### Forum for Sharing Ideas and Discussing Issues Affecting the Industry





**Carolinas AGC** 

## **AGC/NCDOT Joint Bridge Committee**

### AGC Members

Adam Holcomb
Brian WeathersbySloan Construction
Chris Britton
Chris Powers
Tanya Ball
Nathan Thomas
Erick Frazier
Dane Construction
Buckeye Bridge
Lee Construction
Wright Brothers
Smith Rowe
S.T. Wooten

Pete Distefano Balfour Beatty Infrastructure

Dan Paulson
Justin Carter
Kyle Wylie
Mohammed Melad
Andy Jenkins
Caleb Ellis

Blythe Construction
Sanford Contractors
Crowder Construction
Vecellio and Grogan
Fred Smith Company

Larry Cagle APAC
Adrian Price Flatiron
Mark Newman NHM

Jerrad Stewart Conti Enterprises
Brett Dietrich Lanford Brothers
Thomas Meider Lane Construction
Seth Rowney Thalle Construction

Kevin Charrier Branch Civil

AGC Co-Chairman: Victor Barbour

### NCDOT Members

Aaron Earwood
Aaron Griffith
NCDOT Construction
Tyler Rogers
NCDOT Construction
Patrick Cheeves
Randy Hall
NCDOT Construction

Troy Brooks NCDOT Construction

Brian Skeens NCDOT Construction
Liam Shannon NCDOT Construction

Gichuru Muchane NCDOT Structures Management

James Bolden NCDOT Structures Management
Nick Pierce NCDOT Structures Management
Trey Carroll NCDOT Structures Management

**Todd WhittingtonNCDOT Materials & Tests** 

Brian Hunter NCDOT Materials & Tests
Natalie Bravo NCDOT Materials & Tests

Matthew Alexander NCDOT Geotechnical Scott Hidden NCDOT Geotechnical NCDOT Geotechnical NCDOT Geotechnical

Dan Muller FHWA

NCDOT Co-Chairman: David Snoke (State Structures Engineer)

### **NCDOT Construction Unit**

Visit Our Website | (919) 707-2400

### **Unit Leadership**

Troy Brooks, PE State Construction Engineer

(919) 707-2402 | tbbrooks2@ncdot.gov

### Brian Skeens, PE

Assistant State Construction Engineer (Western) (828) 803-1461 | bcskeens@ncdot.gov

### Liam Shannon, PE

Assistant State Construction Engineer (Eastern) (919) 707-2403 | lwshannon@ncdot.gov

Project Closeout Engineer

(336) 747-7950 | Iboulos@ncdot.gov

### **Western Region**

### **Area Construction Engineers:**

### Divisions 7 & 9

Marcus Kiser, PE (336) 215-9170 | mkkiser@ncdot.gov

#### **Division 10**

(919) 707-2481 | crblackmon@ncdot.gov

Christopher Fine, PE (336) 225-4266 | lcfine@ncdot.gov.

### Divisions 11 & 12

Scott Jones, PE, PLS (336) 972-6571 | sajones8@ncdot.gov

### Divisions 13 & 14

Aaron Powell, PE (828) 417-2629 | apowell@ncdot.gov

### **Eastern Region**

### **Area Construction Engineers:**

### Divisions 1 & 2

Daniel Waugh, PE (252) 723-5727 | dgwaugh1@ncdot.gov

### **Divisions 3 & 4**

David Candela, PE (910) 524-4931 | dacandela@ncdot.gov

#### **Division 5**

Meredith Hayes, PE (336) 266-2463 | mdhayes3@ncdot.gov

#### **Divisions 6 & 8**

John Partin, PE (336) 847-1226 | jpartin@ncdot.gov

### **Bridge Construction Engineers**

### **Western Region:**

Divisions 7, 9, 10, 12:

Aaron Griffith, PE (336) 215-9170 | aegriffith@ncdot.gov

#### Divisions 11, 13, 14:

Tyler Rogers, PE

(828) 593-7028 | rtrogers1@ncdot.gov

### **Eastern Region:**

### Divisions 1-4:

Randy Hall, PE

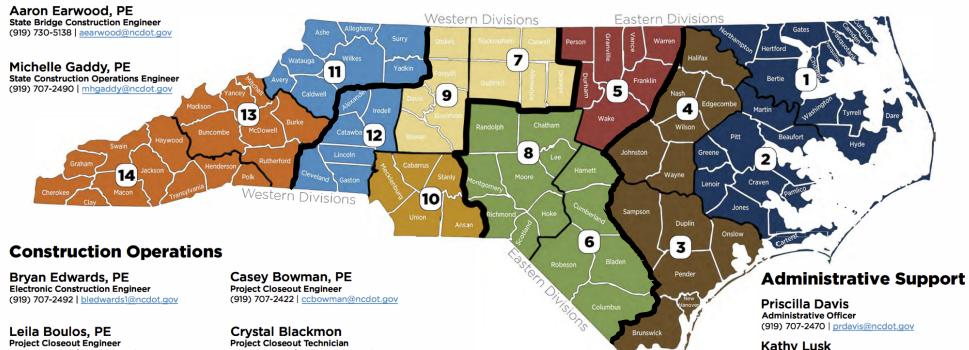
(252) 402-9957 | rshall1@ncdot.gov

#### Divisions 5, 6, 8:

Patrick Cheeves, PE

(678) 602-8504 | picheeves@ncdot.gov

**Administrative Specialist** (919) 707-2408 | klusk@ncdot.gov



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## **Bridge Program**

### ncdot.gov

## **Condition Trend Totals**

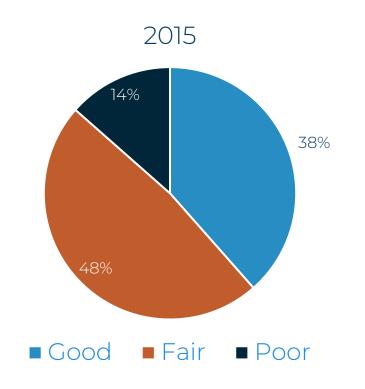
Bridge Condition	2024 Count	2025 Count			
Good	6,267	6,369			
Fair	6,346	6,231			
Poor	1,135	1,208			
Total: 13,748 13,808					
Bridges in Poor condition increased from 8.3% to 8.7%					
155 New/Replaced Bridges in 2024					

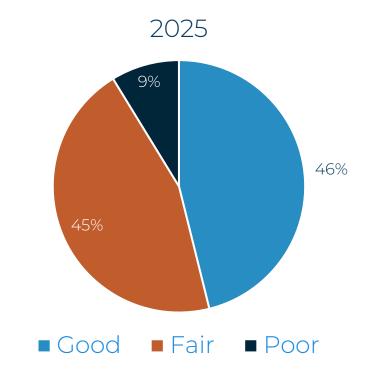
## **Bridge Condition**

2015						
13.5% Poor						
System	%	#				
Interstate	4.1%	44				
Primary	9.0%	404				
Secondary	16.7%	1,374				

Current Condition					
8.7% Poor					
System	%	#			
Interstate	2.7%	34			
Primary	6.1%	208			
Secondary	10.6%	966			

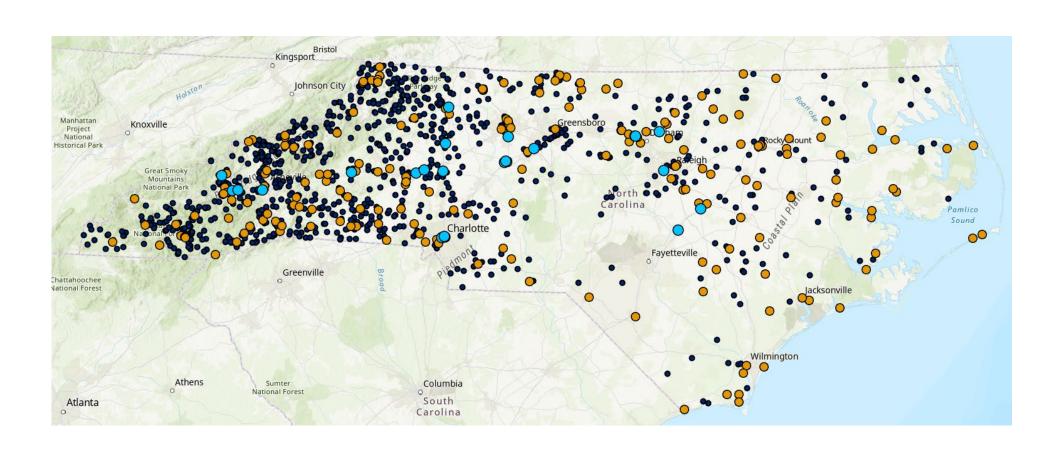
## **Bridge Condition**



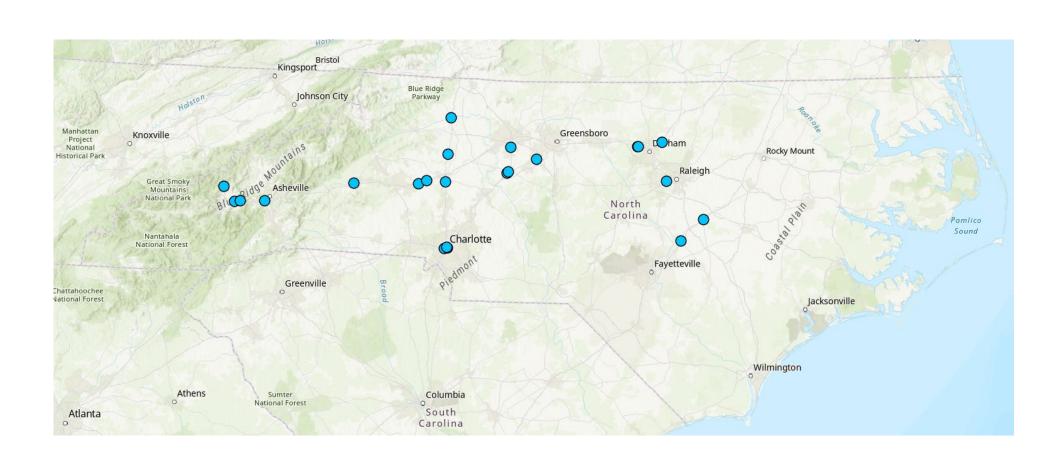


## Poor Condition Bridge Map – By System

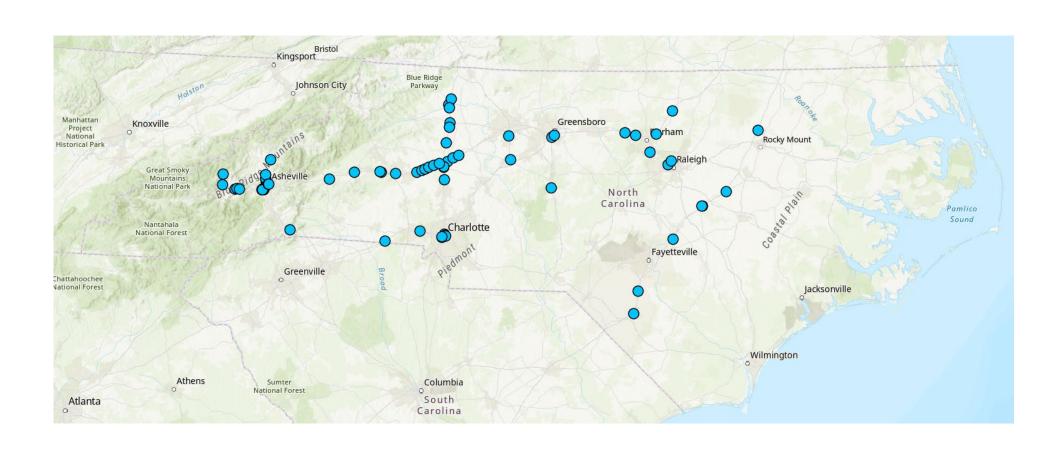
SecondaryPrimaryInterstate



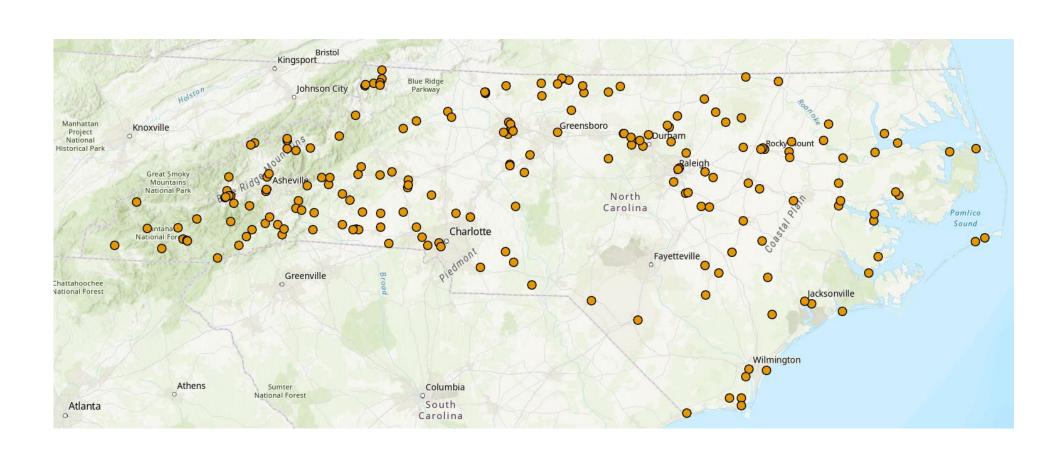
## Interstate Bridge Map - Current Poor Condition 34 Structures



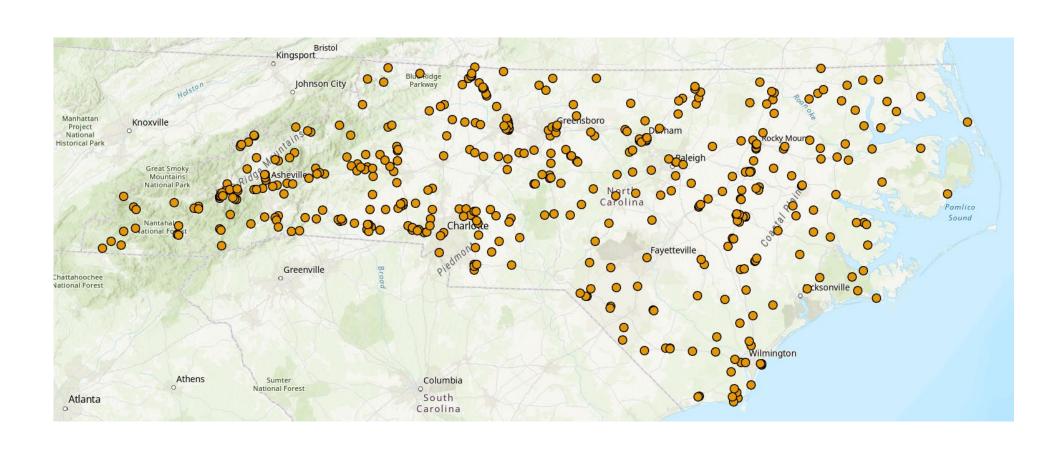
## Interstate Bridge Map - Projected Poor Condition Within 10 Years 102 Structures



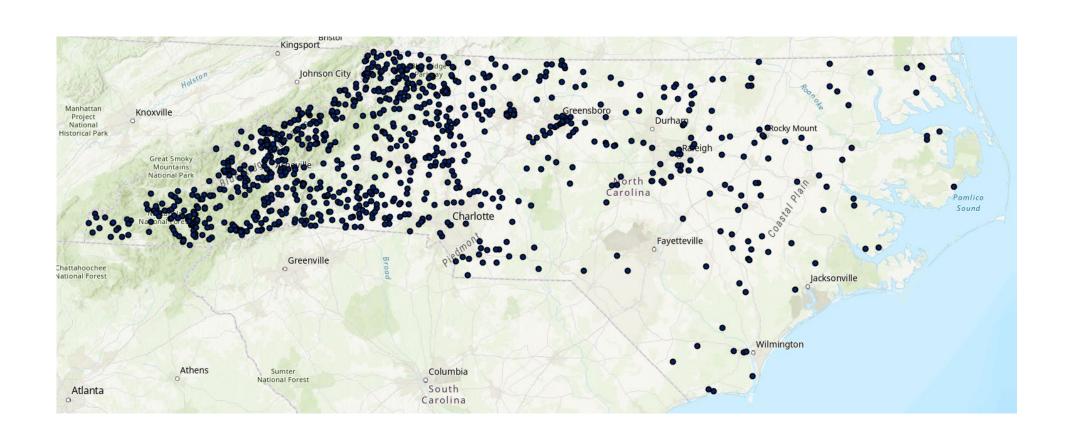
## Primary Bridge Map - Current Poor Condition 208 Structures



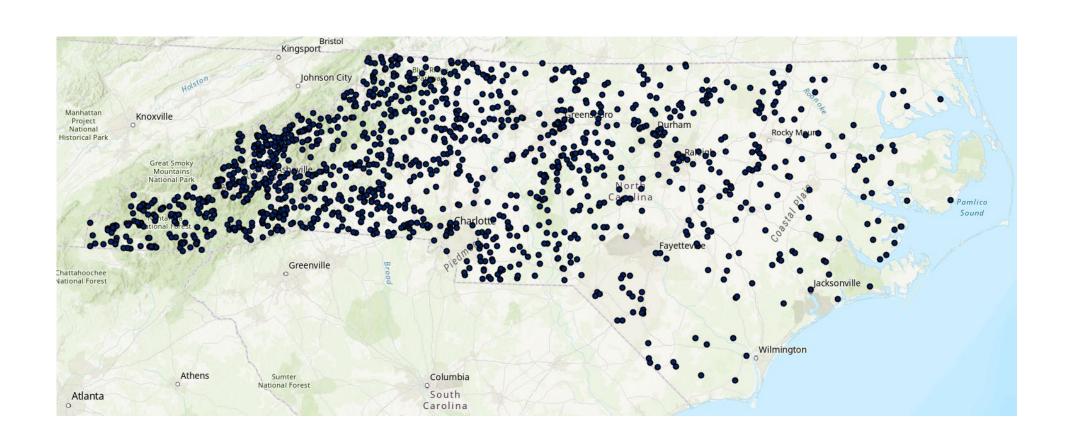
## Primary Bridge Map - Projected Poor Condition Within 10 Years 486 Structures



## Secondary Bridge Map - Current Poor Condition 966 Structures



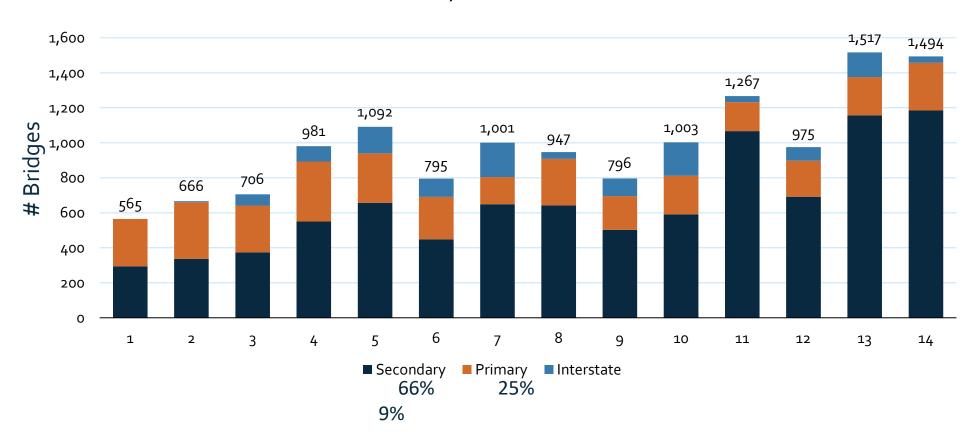
# Secondary Bridge Map – Projected Poor Condition Within 10 Yrs 1375 Structures



## NCDOT Maintains 13,805 Bridges Statewide

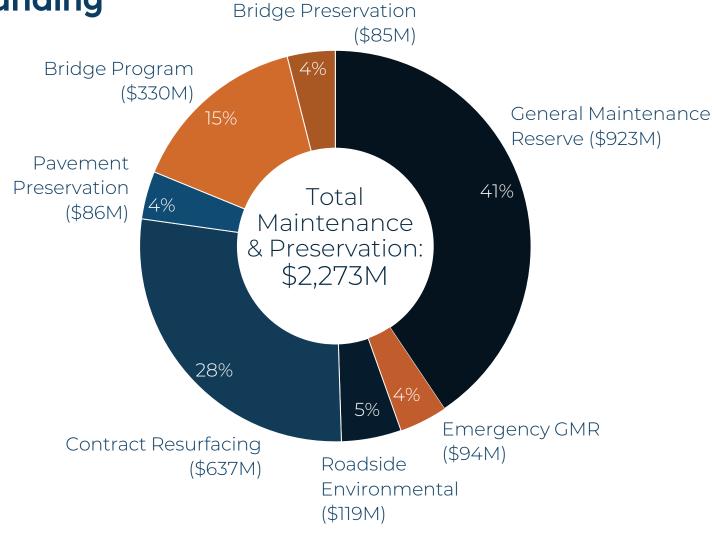
### **Total Bridge Count**

By Division





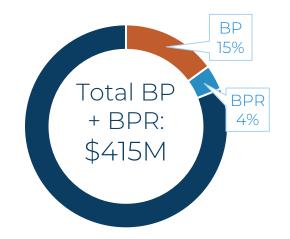
**FY 2025** 



### **Bridge Program and Bridge Preservation**

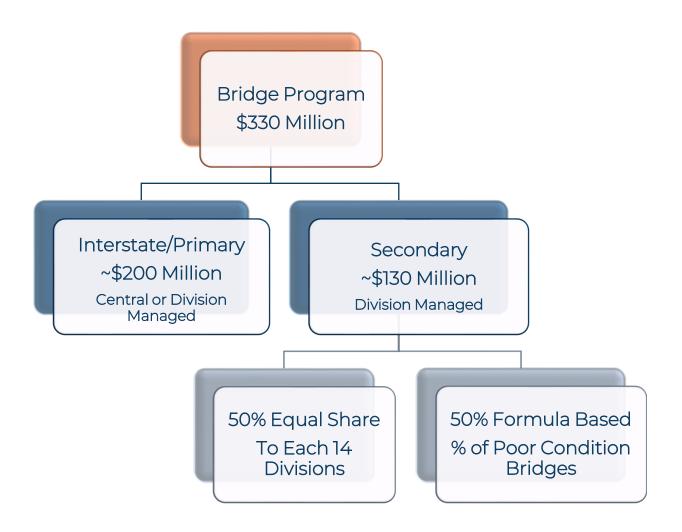
- Bridge Program
  - \$330M
  - §136-76.2
  - Replacing poor condition bridges
- Bridge Preservation
  - \$85M
  - Preventative maintenance and critical finds
  - Preservation of High Value Bridges (HVB)

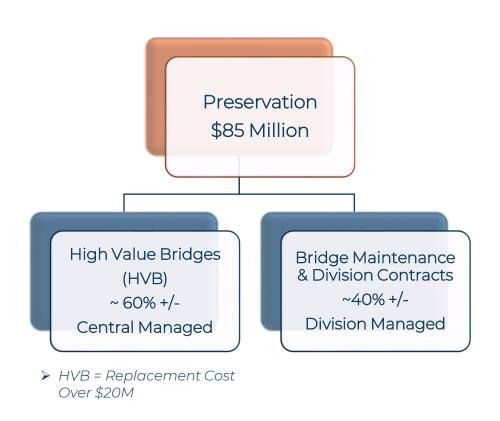
Bridge program and bridge preservation is approximately 20% of the budget for FY 2025.



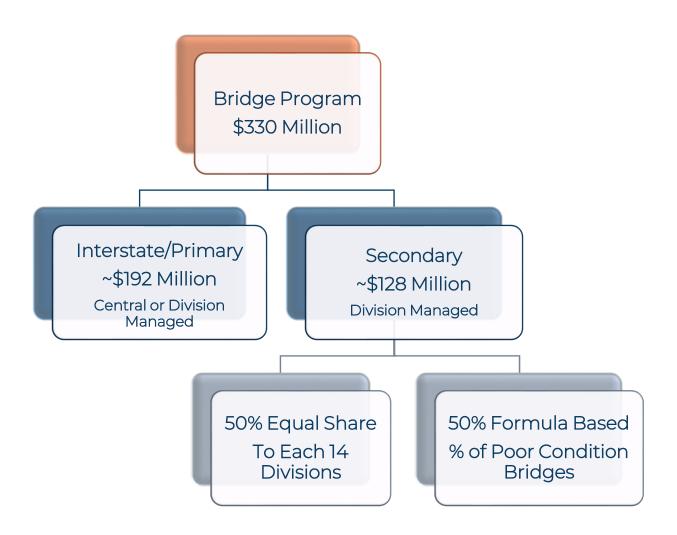


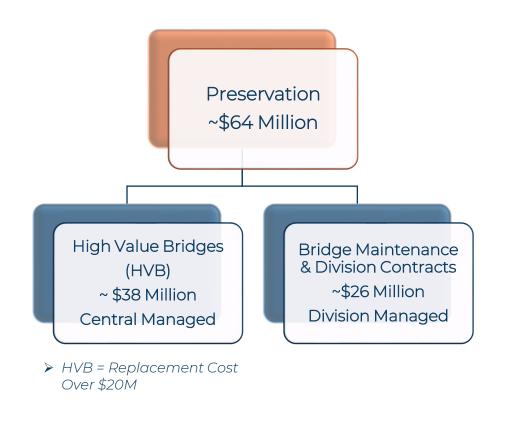
## **Bridge Program - State Funded**



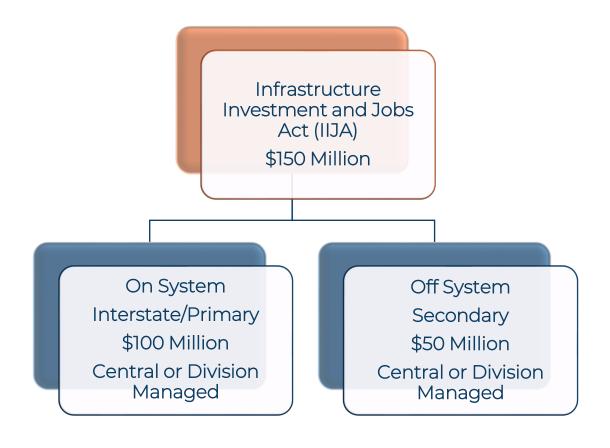


## **Bridge Program - State Funded**





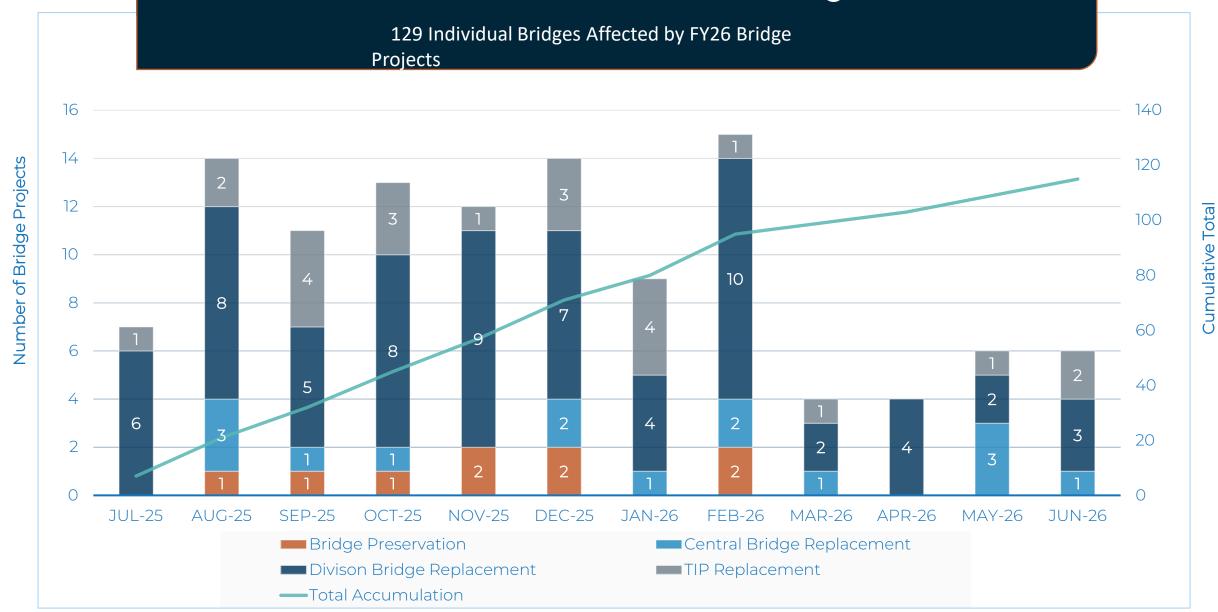
## **Bridge Program - Federal Funded**



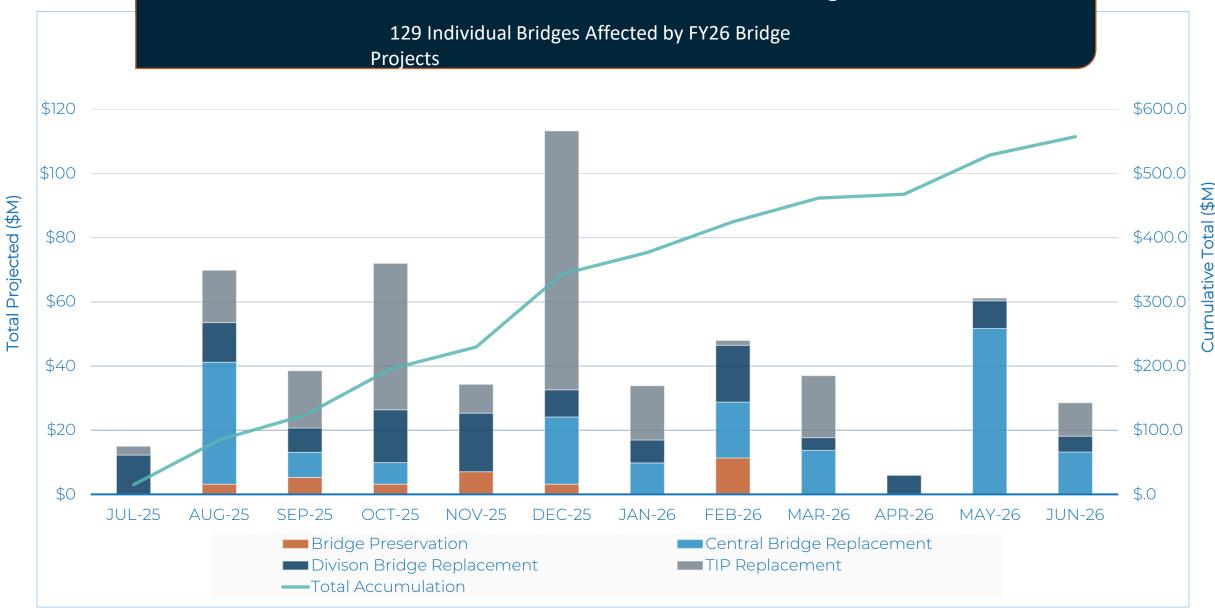
## Bridge Program - FY 2026 Division Breakdown

	Schedule III	Schedule IV	Schedule V	Schedule VI
Division	Contract Resurfacing	Pavement Preservation	Bridge Program	Bridge Preservation
1	22,156,002	1,252,186	5,364,057	1,956,342
2	20,961,193	1,310,373	6,310,847	1,560,147
3	23,927,128	1,487,880	5,543,678	2,091,340
4	27,432,733	1,695,464	8,799,717	1,758,674
5	28,567,286	1,769,150	8,582,000	2,291,292
6	21,752,017	1,729,929	5,473,973	1,483,330
7	21,564,148	1,448,935	10,527,703	1,989,701
8	26,072,842	1,787,961	8,135,547	1,526,237
9	19,604,955	1,339,866	10,033,108	1,564,729
10	23,278,042	1,411,572	7,961,339	2,011,218
11	16,839,736	1,486,587	12,147,571	1,619,115
12	22,440,752	1,594,953	12,037,348	1,635,237
13	17,291,484	1,310,338	15,736,548	2,141,227
14	17,251,682	1,185,953	11,380,614	1,944,608
Subtotal	\$309,140,000	\$20,811,147	\$128,034,050	\$25,573,197
Cashflow Repayment	315,000,000	42,900,134	0	0
Asset Maintenance & Operations	5,860,000	0	0	0
Research and Development	0	0	0	0
State and Federal Obligation	0	0	10,000,000	0
Central Distribution	0	0	192,051,074	38,359,796
Subtotal	\$320,860,000	\$42,900,134	\$202,051,074	\$38,359,796
Grand Total	\$630,000,000	\$63,711,281	\$330,085,124	\$63,932,993

## **Twelve Month Let List - Bridge**



## **Twelve Month Let List - Bridge**



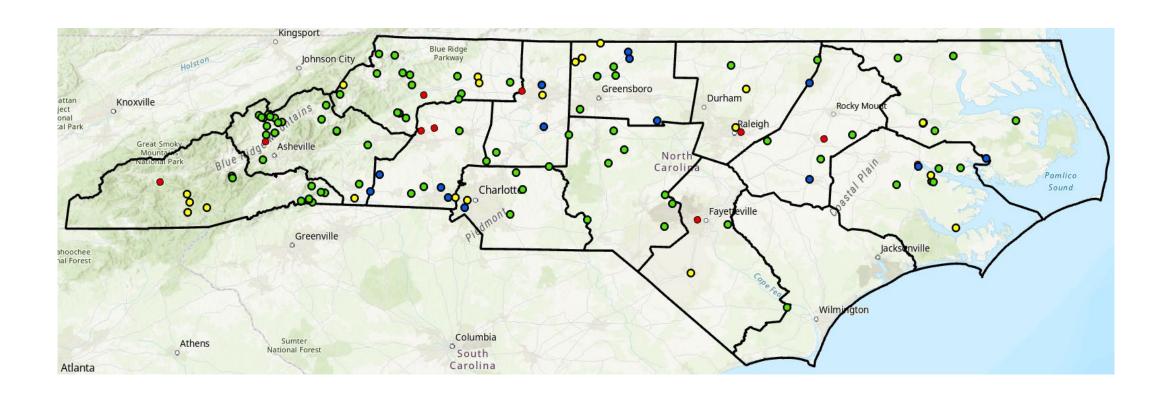
**ncdot.gov** FY 26 Bridge Lettings

## **Anticipated Bridge Lettings**

	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Total
Bridge Preservation		1	1	1	2	2		2					9
Central Bridge Replacement		3	1	1		2	1	2	1		3	1	15
Division Bridge Replacement	6	8	5	8	9	7	4	10	2	4	2	3	68
TIP Bridge Replacement	1	2	4	3	1	3	4	1	1		1	2	23
Total	7	14	11	13	12	14	9	15	4	4	6	6	115

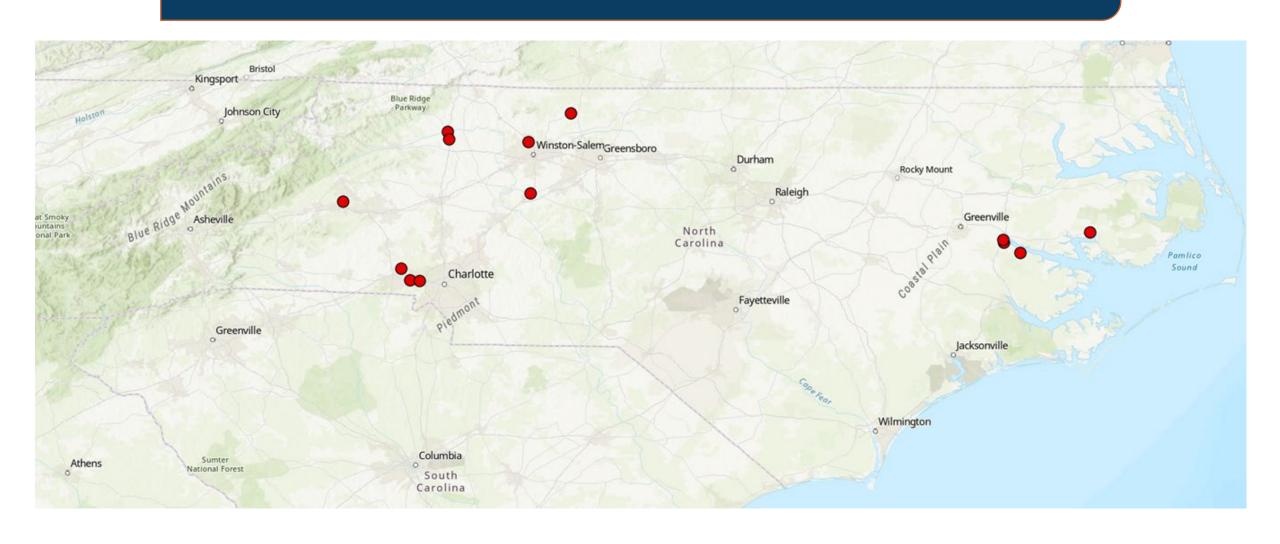
	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Total (\$M)
Bridge Preservation		\$3.2	\$5.3	\$3.2	\$7.1	\$3.2		\$11.4					\$33.3
Central Bridge Replacement		\$38.0	\$7.8	\$6.7		\$20.9	\$9.8	\$17.4	\$13.7		\$51.7	\$13.2	\$179.2
Division Bridge Replacement	\$12.3	\$12.4	\$7.6	\$16.5	\$18.3	\$8.5	\$7.2	\$17.7	\$4.0	\$5.9	\$8.7	\$5.0	\$123.8
TIP Bridge Replacement	\$2.8	\$16.3	\$17.9	\$45.6	\$9.0	\$80.7	\$16.9	\$1.5	\$19.3		\$0.8	\$10.4	\$221.1
Total (\$M)	\$15.0	\$69.9	\$38.6	\$72.0	\$34.3	\$113.3	\$33.9	\$48.0	\$37.0	\$5.9	\$61.2	\$28.6	\$557.4

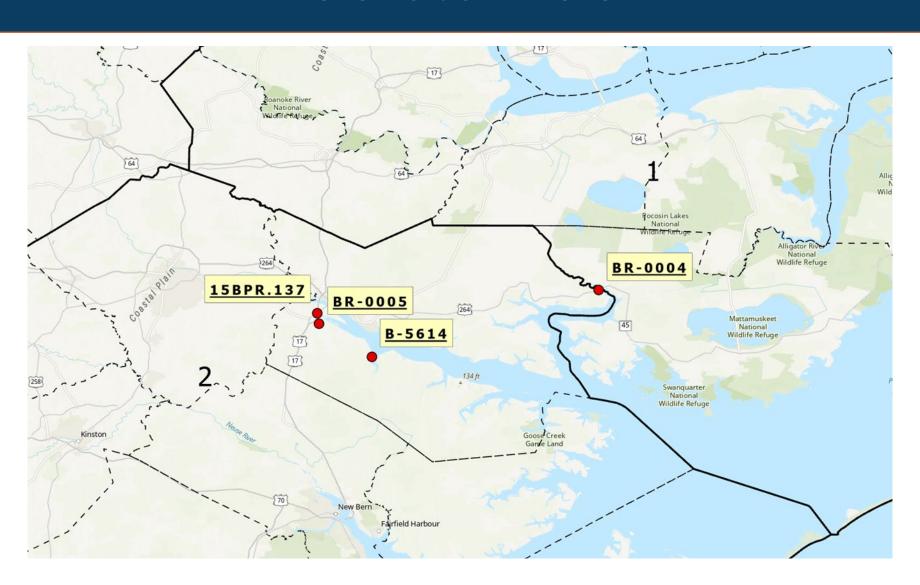
## FY 26 Bridge Lettings By Funding Source

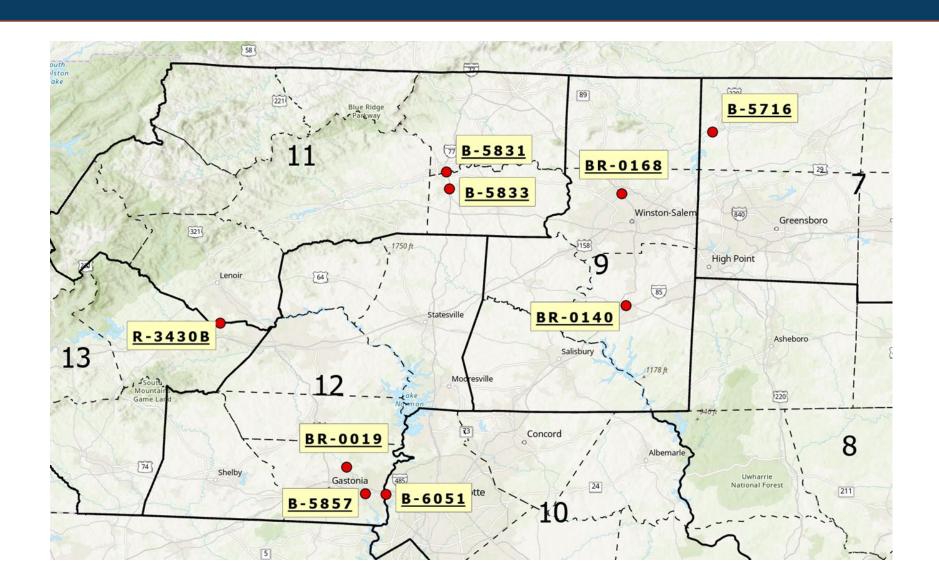


### ncdot.gov

Let Date	TIP#	County	Division	Description	Latest Estimate
8/19/2025	B-5716	ROCKINGHAM	7	780140 - ON: SR1138 - OVER: DAN RIVER	\$13,700,000
8/19/2025	R-3430B	BURKE	13	110010- ON: SR1001 -OVER: CATAWBA RIVER	\$22,900,000
10/21/2025	B-5614	BEAUFORT	2	060009 - ON SRIII2 OVER BLOUNTS CREEK	\$17,200,000
10/21/2025	B-5831	SURRY	11	850006 - ON: I-77 NBL - OVER: NC268,SOU.RR,YADKIN RVR.	\$24,000,000
12/16/2025	B-5857	GASTON	12	350082 - ON: US29 & US74 - OVER: SOUTH FORK CATAWBA RIVER	\$11,800,000
12/16/2025	B-6051	GASTON	12	350091 - ON: US29,US74 - OVER: CATAWBA RIVER	\$76,000,000
2/17/2026	15BPR.137	BEAUFORT	2	060353 - ON US017 OVER TAR RIVER	\$10,400,000
3/17/2026	B-5833	YADKIN	11	980029 - ON: US21BUS - OVER: I-77	\$19,300,000
3/17/2026	BR-0019	GASTON	12	350056 - ON: NC275 - OVER: S. FORK CATAWBA RIVER	\$13,700,000
5/19/2026	BR-0004	BEAUFORT	2	060066 - ON US264 OVER PUNGO RIVER	\$17,000,000
5/19/2026	BR-0140	DAVIDSON	9	280087 - ON: I85N.BUS,US29,US70 - OVER: WSSB RAILROAD 280089 - ON: I85BUSS,US29,US70 - OVER: WSSB RR	\$14,900,000
5/19/2026	BR-0168	FORSYTH	9	330289 - ON: SR4000 - OVER: US52	\$19,800,000
6/16/2026	BR-0005	BEAUFORT	2	060075 - ON NC33 OVER CHOCOWINITY CREEK	\$13,200,000
July 2025 to June 2026 TOTAL COST ESTIMATE FOR BRIDGES > \$10M					

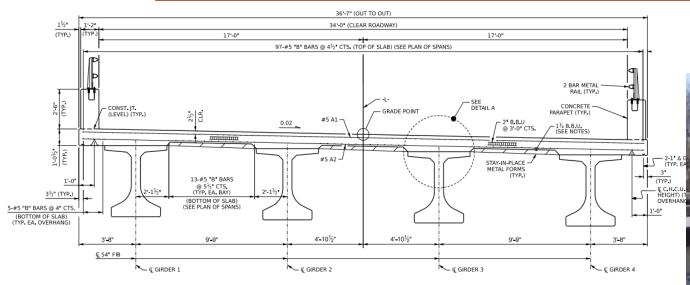






# B-5716 Division 7, Rockingham County Bridge 780140 - ON: SR1138 - OVER: DAN RIVER





### Let Date: August 2025

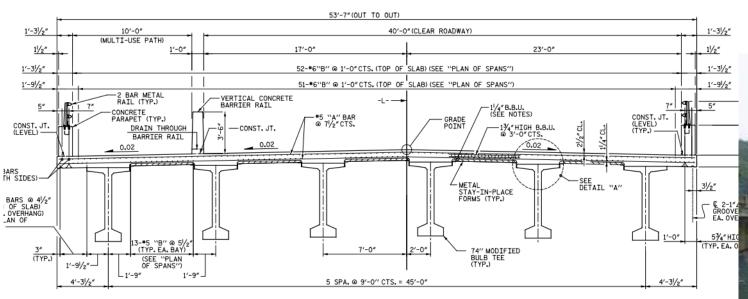
Estimate: \$13.7M

Project Type	Replacement			
Structure Type	54" FIB	<b>Drilled Piers</b>		
Approx. Span and Total Length	2@115', 2@116', 1@81'	= 543'		
Structure Width	36'-7"			



## R-3430B Division 13, Burke County Bridge 110010- ON: SR1001 -OVER: CATAWBA RIVER





Let Date: August 2025
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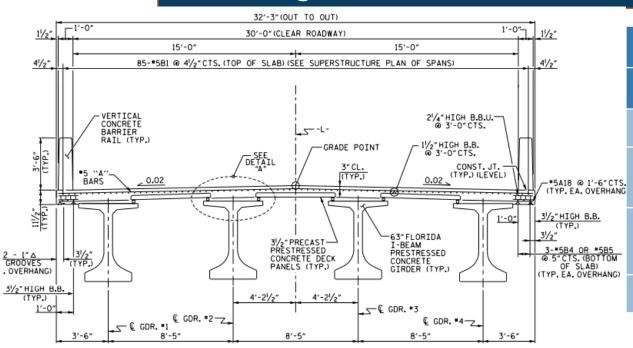
Estimate: \$22.9M

	<u> </u>			
Project Type	Replacement			
Structure Type	74" MBT	Drilled Piers		
Approx. Span and Total Length	1@134', 3@132', 1@131', 2@138', 1@139'	=1,077'		
Structure Width	53'-7"			



# B-5614 Division 2, Beaufort County Bridge 060009 - ON SR1112 OVER BLOUNTS CREEK



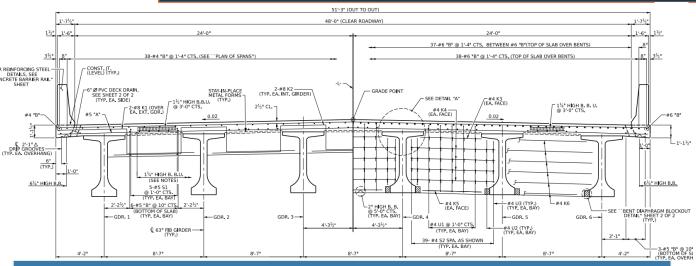


Let Date: October 2025						
Estimate: \$17.2M						
Project Type	Replacement					
Structure Type	63" FIB	30" Prestressed Piles				
Approx. Span and Total Length	1@122', 6@120', 1@122'	= 964'				
Structure Width	32'-3"					



# B-5831 Division 11, Yadkin & Surry County Bridge 850006 - ON: I-77 NBL - OVER: NC268,SOU.RR,YADKIN RVR.





### Let Date: October 2025

Estimate: \$24.0M

Project Type	Replacement			
Structure Type	63" FIB	<b>Drilled Piers</b>		
Approx. Span and Total Length	1@95', 1@125', 1@120', 1@130', 1@125', 1@130', 1@90'	= 815'		
Structure Width	51'-3"			

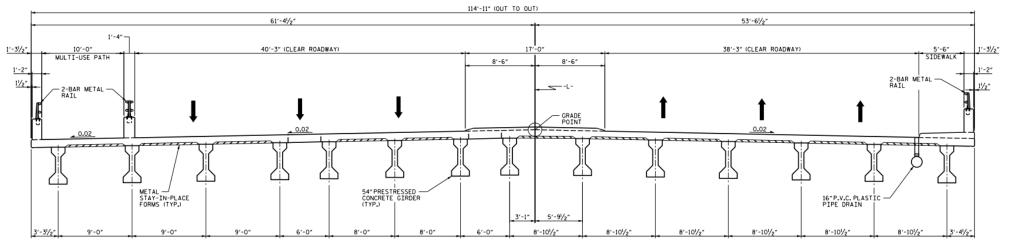


# B-5857 Division 12, Gaston County Bridge 350082 - ON: US29 & US74 - OVER: SOUTH FORK CATAWBA RIVER



Let Date: December 2025			
Estimate: \$11.8M			
Project Type	Replacement		
Structure Type	54" PCG	Drilled Piers	
Approx. Span and Total Length	5@90'	= 450'	
Structure Width	114'-11"		



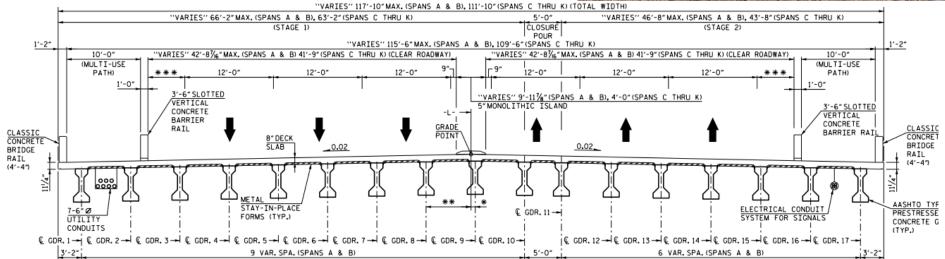


## B-6051 Division 12, Gaston County Bridge 350091 - ON: US29,US74 - OVER: CATAWBA RIVER



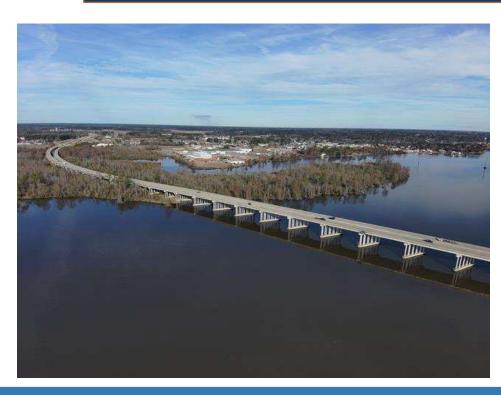
Let Date: December 2025			
Estimate: \$76M			
Project Type	Replacement		
Structure Type	54" PCG	Drilled Piers	
Approx. Span and Total Length	3@110', 2@78', 6@110'	= 1,145'	
Structure Width	111'-10"		





## 15BPR.137 Division 2, Beaufort County Bridge 060353 - ON US017 OVER TAR RIVER





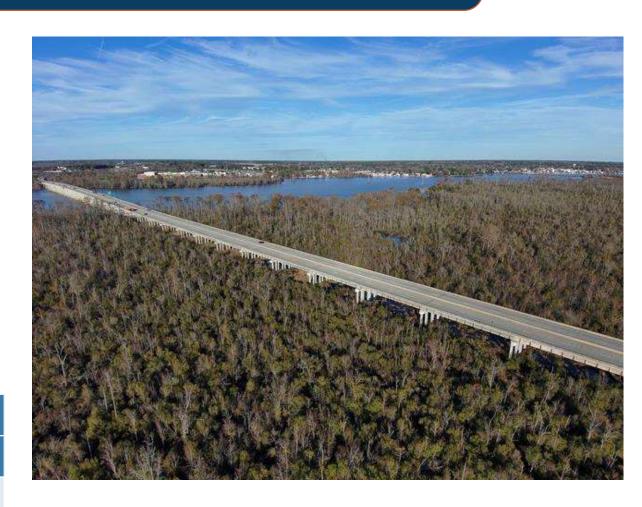
Let Date: February 2026

Estimate: \$10.4M

Project Type

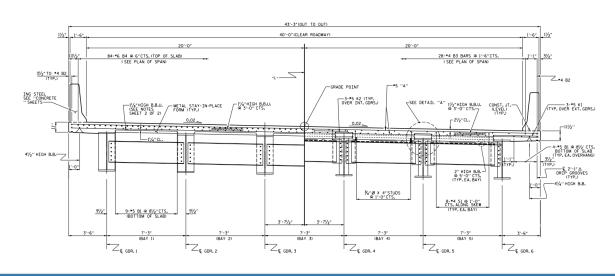
Scope of Work

Silane Treatment, Joint Seals, Shotcrete, Epoxy Injection



### B-5833 Division 11, Yadkin County Bridge 980029 - ON: US21BUS - OVER: I-77





Let Date: March 2026

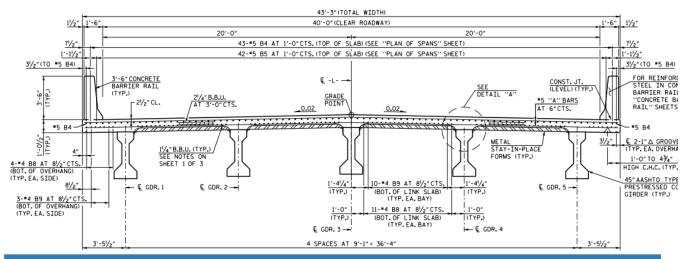
Estimate: \$19.3M

Project Type	Replacement	
Structure Type	Steel Plate Girder	<b>Drilled Piers</b>
Approx. Span and Total Length	2@125'	= 250'
Structure Width	43'-3"	



# BR-0019 Division 12, Gaston County Bridge 350056 - ON: NC275 - OVER: S. FORK CATAWBA RIVER





#### Let Date: March 2026

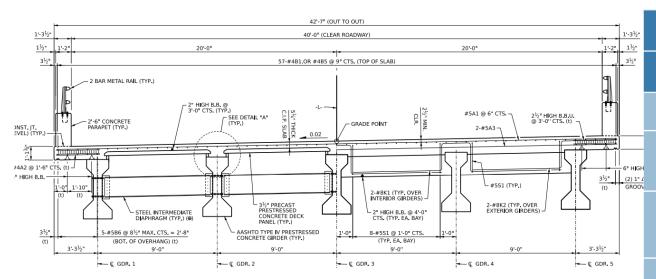
Estimate: \$13.7M

Project Type	Replacement	
Structure Type	45" PCG	Drilled Piers
Approx. Span and Total Length	5@80'	= 400'
Structure Width	43'-3"	



## BR-0004 Division 2, Beaufort County Bridge 060066 - ON US264 OVER PUNGO RIVER





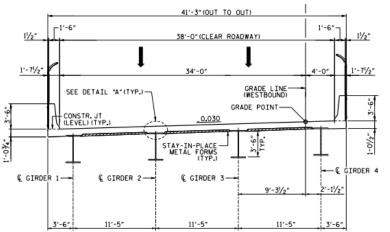
Let Date: May 2026			
Estimate: \$17.0M			
Project Type	Replacement		
Structure Type	54" PCG	30" Prestressed Piles	
Approx. Span and Total Length	1@103', 4@102', 1@103'	= 614'	
Structure Width	42'-7"		



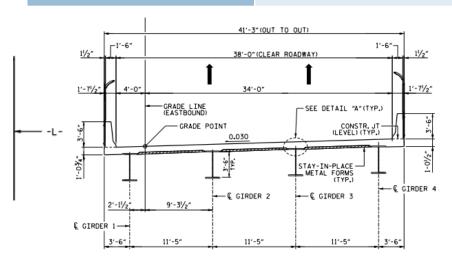
# BR-0140 Division 9, Davidson County Bridges 280087 & 280089 - ON: I85BUS,US29,US70 - OVER: WSSB RAILROAD







Let Date: May 2026			
Estimate: \$14.9M			
Project Type	Replacements		
Structure Type	Steel Plate Girder	30" Pipe Piles	
Approx. Span and Total Length	1@53', 1@113', 1@53'	= 219'	
Structure Width	41'-3"		

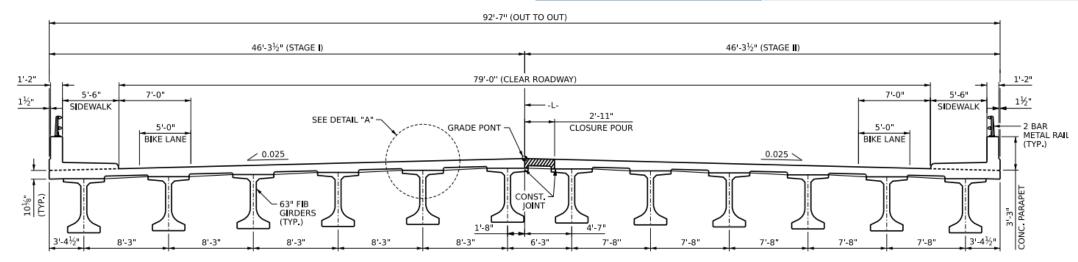


## BR-0168 Division 9, Forsyth County Bridge 330289 - ON: SR4000 - OVER: US52



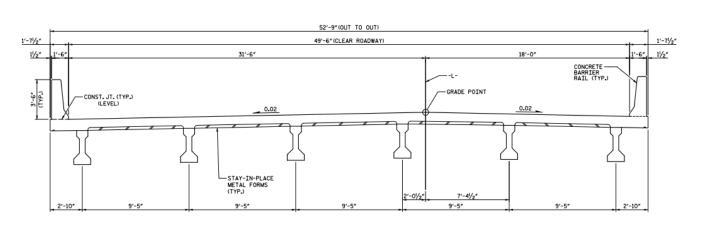


Let Date: May 2026		
Estimate: \$19.8M		
Project Type	Replacement	
Structure Type	63" FIB	Footing on Steel Piles
Approx. Span and Total Length	1@100', 1@140'	= 240'
Structure Width	92'-7"	



## BR-0005 Division 2, Beaufort County Bridge 060075 - ON NC33 OVER CHOCOWINITY CREEK





Let Date: June 2026		
Estimate: \$13.2M		
Project Type	Replacement	
Structure Type	36" PCG	20" Prestressed Piles
Approx. Span and Total Length	1@56', 2@55', 1@56'	= 222'
Structure Width	52'-9"	

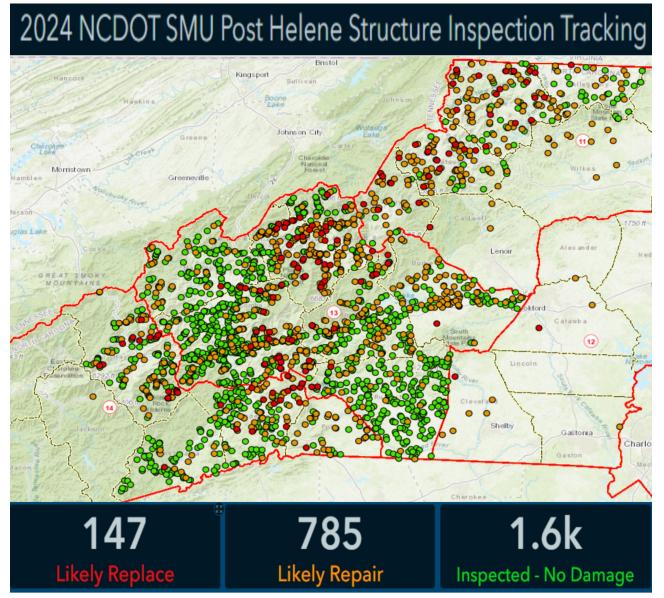


## Helene Bridges

#### **Current Estimates**

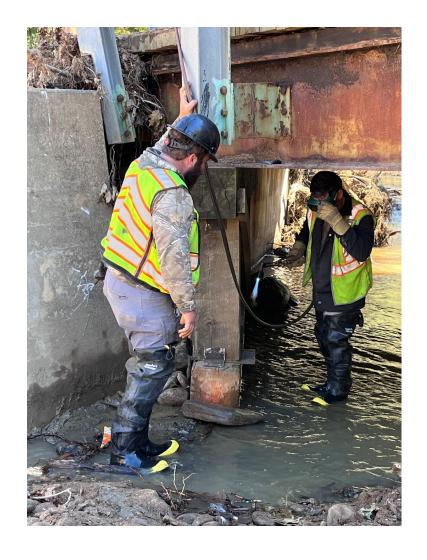
- Estimated Number of Structures
  - 846 Bridges Damaged
    - 55% Repaired
  - 156 Bridges To Be Replaced
    - 17 Completed
  - 92 Culverts Damaged
    - 63% Complete

- Initial Replacement Cost Estimate
  - ~\$206 Million



## Temporary Measures

## **Emergency Repairs**





## **Approach Washouts**





## **Approach Washouts**





## **Approach Washouts**





## **Temporary Pipes**





## **Temporary Bridges**





## **Temporary Bridges**



## **Temporary Bridges - Contractor Used Materials**





## **Temporary Bridges - Contractor Used Materials**





## **Temporary - Pedestrian Access**





## **Temporary Bridges - Acrow**

ncdot.gov







## **Temporary Bridges - Rail Cars**





## **Temporary Bridges - Rail Cars**





## **Temporary Bridges - Rail Cars**





## **Rail Cars - Bracing and Crutch Bents**

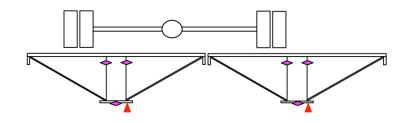




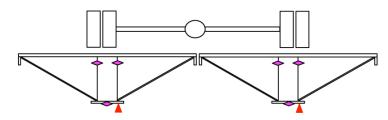
#### **Rail Car Load Testing Plan**

#### Two Rail Cars – 1 Lane Bridge

Loading Path 1: The truck will be placed approximately 2 ft from the left edge of the bridge.

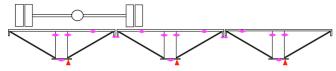


Loading Path 2: The truck will be centered down the bridge.

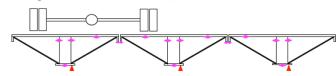


#### Three Rail Cars – 2 Lane Bridge

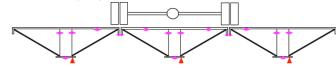
Loading Path 1: The truck will be placed approximately 2 ft from the left edge of the bridge.



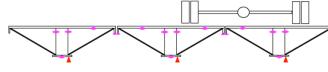
Loading Path 2: The truck will be centered down the typical left lane.



Loading Path 3: The truck will be centered down the bridge with a focus to align at least one wheel line right over top of the joint.



Loading Path 4: The truck will be centered down the right hand lane



Loading Path 5: The truck will be placed approximately 2 ft from the right edge of the bridge

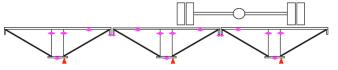


Figure 4. Loading Paths for 580383

#### Test Dump Trucks

12 Ton

20 Ton

28 Ton

## **Permanent Replacements**

#### **Internal Acceleration Efforts**

- Shortlisting of Emergency Express Design Build Teams (38 Teams)
- Preordering of Materials
- Drone Deploy Models of Each Site
- Alternative Delivery Unit
- Bridge Maintenance Teams



### **Bridge Replacement Delivery Methods**

Timber Bridge Replacements 30 Bridges

Emergency Express Design Build 72 Bridges (29 packages)

• Design Bid Build 27 Bridges

Progressive Design Build & CMGC9 Bridges

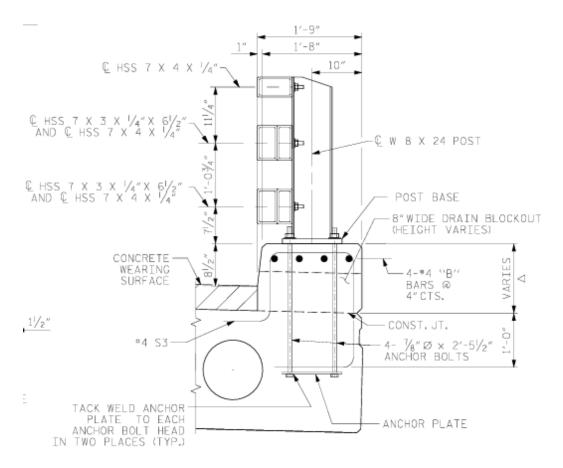


### **Emergency Express Design Build**

- 3 Teams Shortlisted per package
- 1-5 Bridges/Culverts per package
- 29 Packages (72 Bridges)
- 24 Packages Awarded
- 5 Packages Advertised
- 15 Different Winning Contractors
- Total Bids = ~ \$136 Million



#### **Oregon Rail - Anchor Bolts**



#### SECTION THRU RAIL

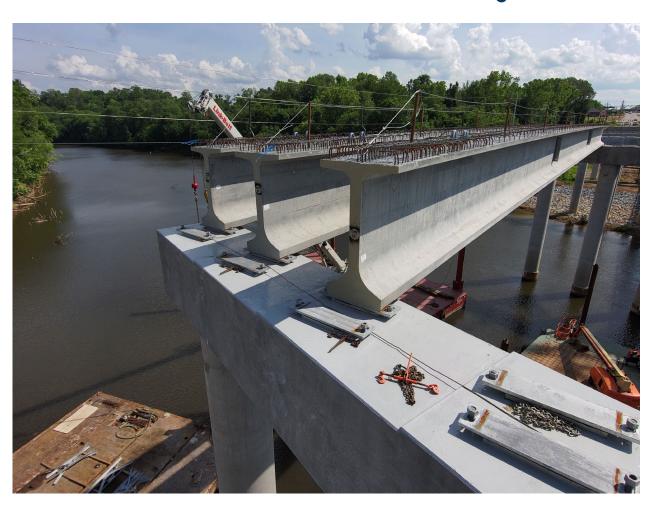
DECK DRAIN IN RIGHT SIDE CURB ONLY.

A SEE CURB HEIGHT TABLE ON SHEET S-20 AND S-21

THE #4 "B" BARS IN THE CURB MAY BE FIELD CUT TO AVOID DRAIN BLOCKOUTS

## Prestressed Girders FIB Policy; Raking

#### Florida I-Beams (FIBs) Policy

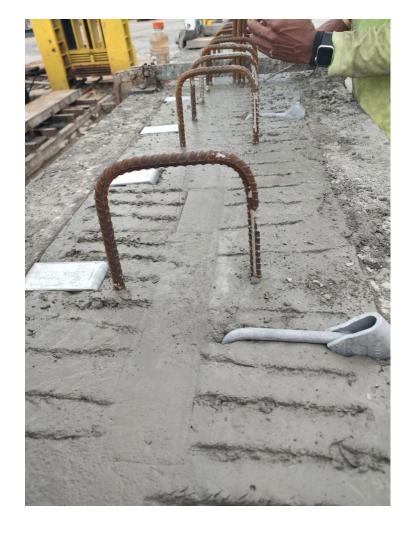


#### New Policy Coming Soon....

- Strand pattern is different than FDOT and others by having two strands in the web vs. a single strand.
- Four legs coming out the top of the girder like MBT
- Limit design-bid-build to 63" FIB and below to central and western areas of the state due to girder weight and shipping concerns.
- Link Slabs will be used with FIBs.

#### **Prestressed Girders**





## **GFRP Update**

#### **GFRP Reinforcement in Bridge Decks**

- SMU to start designing some bridge decks with GFRP soon
- Option to switch on active projects
  - NCDOT or Contractor initiated
  - NCDOT would facilitate the plan revision & design cost
  - Supplemental Agreement with Contractor
- Keeping as close to original plan as possible
  - Same spacing (except B bars in top mat)
  - Bars upsized one size
  - Bent bars and barrier reinforcement epoxy steel





#### **GFRP – Approved Facilities**

- MST Rebar Inc, Vaughan ON (Canada)
  - Working on getting the Buffalo, NY plant approved
  - Also working on another US facility
- Pultrall aka V-Rod, Woodbridge, Canada
  - Working on getting the Rochester, NY plant approved
- Mateenbar, Concord, NC
  - Joint venture between Owens Corning and Pultron has expired, so it is just known as Mateenbar.

Approved facilities are listed in Vendor under Fiber Reinforcement Product (facility numbers start with FRP)

M&T has added sampling of Composite Rebar to the SOP for rebar sampling which can be found on the M&T website.

## **Drone Illumination for Worksite Safety**

#### **STIC Incentive Grant Approval**

**Project Title:** Drone Illumination for Worksite Safety

**Requesting Unit:** Division of Aviation

Proposed work: Procure two tethered drone systems that are equipped with industrial lighting to help illuminate NCDOT's nighttime operations. These two systems will be tested on DOT projects and compared to see how this technology can be incorporated in the future.

Interested Partners: Construction Unit, Division 11 Traffic, Traffic Systems Operations, Division 9 Maintenance, and Division 7 Construction



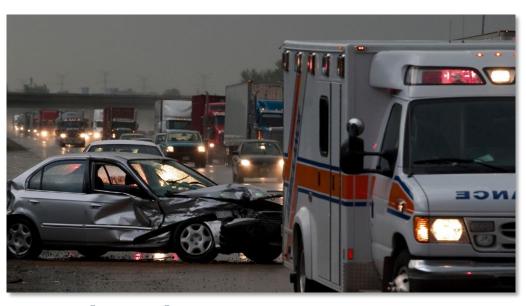


#### **Teather drone technology**



- Mobile
- Light weight
- Quick setup (single person)
- Extended run time
- High output (100-500K Lumens)
- Top-down light
- Reduced glare
- Current cost ~ \$56K





#### **Teather drone use cases**

- Nighttime Emergency Response and Damage
   Assessment
- Traffic Incident Management
- Construction Site lighting
- Public Safety and Event Management
- Maintenance lighting

## CalTrans Demo - Drone Illumination of Work Zone



#### **CalTrans Demo - Drone Illumination of Work Zone**



Thank you!