

How Amish Buggy Bridge Deck Damage Turned into a Multidistrict Bridge Deck Maintenance and Repair Program

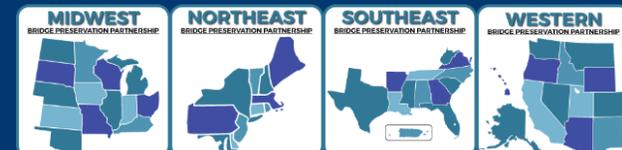
PennDOT Route 741 Bridge Repair with Fibrecrete

2024 National Bridge Preservation Partnership Conference



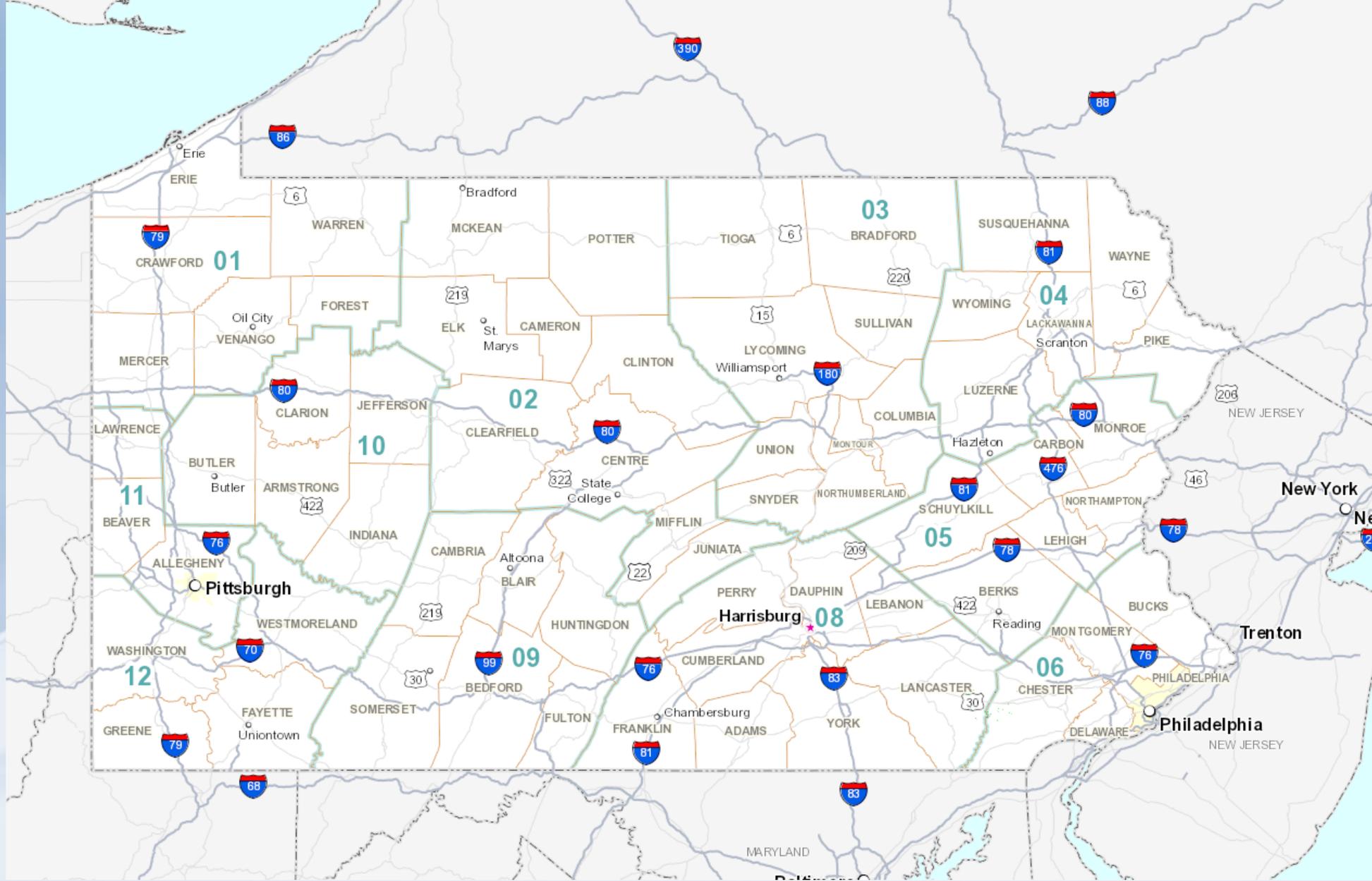
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Bridge Details

- Bridge Type – 3 span P/S spread box beam
- Built in 1984
- Bridge Location – State Route 741 over Amtrak Rail Lines in Gap, PA
- 6,050 Average Daily Traffic with 9% Truck Traffic
- Owner – PennDOT, District 8, Lancaster County



Bridge Site



Summary

- Bridge has major rutting due to horse hooves and buggy wheels
- Bridge has exposed rebar
- Bridge has several spalled areas
- Bridge has open expansion joint



Project Details

- Project Date – February 7th, 2023
- Project Location – Route 741 Bridge in Gap, PA
- Temperature at Application – 28^o F at the start
- Demonstration Project Installed by FPT Infrastructure team
- Gray mastic system – Primer, Fibrecrete G, bulking stone, topping stone

What is gray mastic?

- Combination of aggregate, polymers, fiberglass, metal fibers, and suspension agents in a 50 lb meltable bag



Demonstration Parameters

- Apply gray mastic to the deformations
 - Fill in the rutted area
 - Cover the exposed rebar
 - Spalls
- Apply gray mastic over a 3” expansion joint
- Show the flexibility of the gray mastic
- No saw cut and seal of the joint!
- Complete work in cold temps - mastics can be used at any time of the year



Site Preparation

- Preparation for Fibrecrete quicker than Type 1 or Type 2 repairs (per Lancaster County DOT Maintenance estimations)
 - Prepare deformation to sound concrete
 - Use a hammer to sound the concrete; listen for hollow sounds
 - Remove additional unstable material
 - Remove loose material and vegetation
 - Ensure surface is clean and dry
 - No need to remove or replace rebar
 - Apply Primer to rebar
 - Fill in and around with gray mastic
 - Saw cut only when less than 1 inch reveal, and at edge with traffic

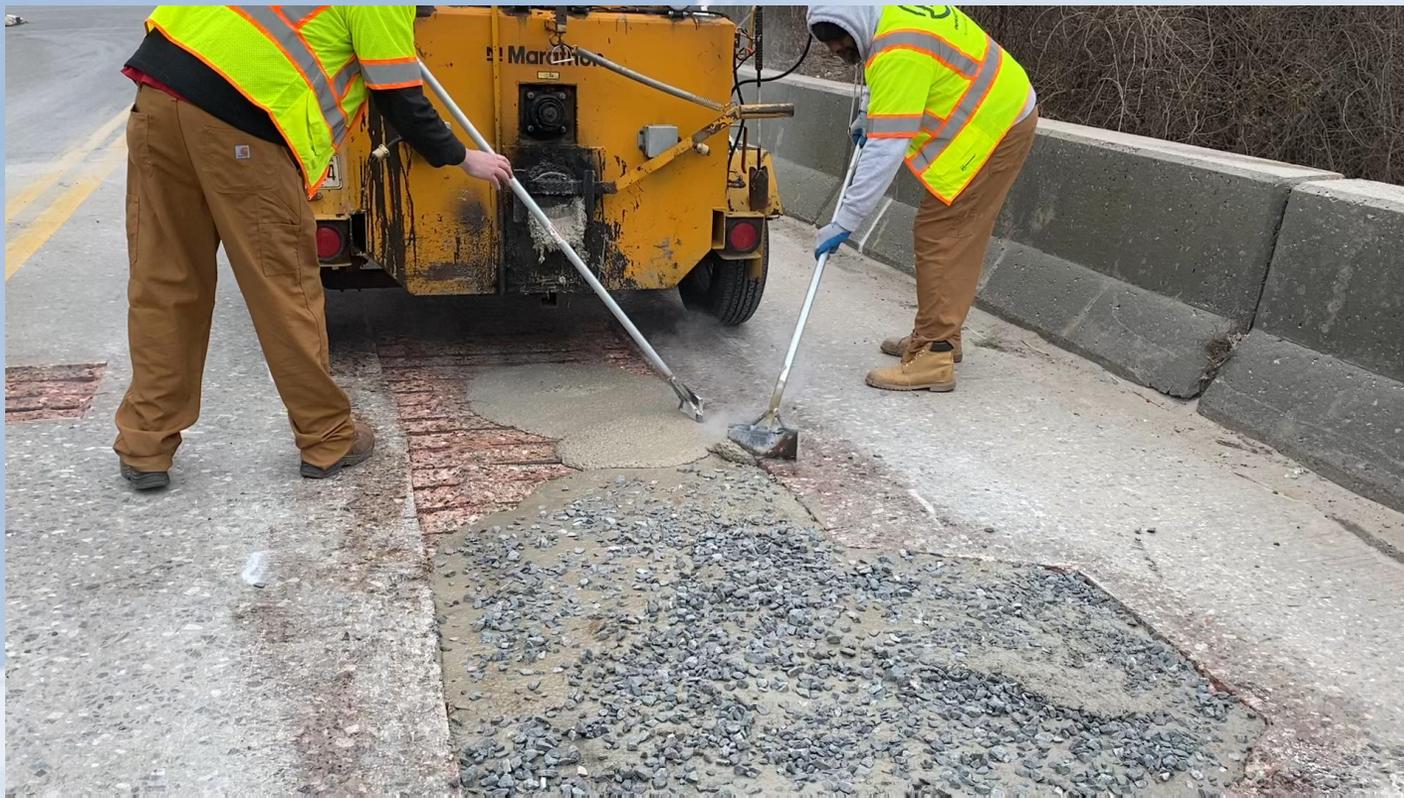
Application – Primer



Application – Expansion Joint



Application – First Lift



Application – Final Lift

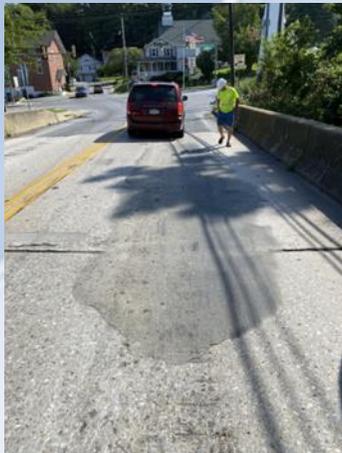


Review of Rutted Area

Before



6 Months



1 Year



18 Months



Review of Expansion Joint

Before



6 Months



One Year



18 Months



Review of Spall

Before



6 Months



1 Year



18 Months



Where has this gone from the demo? PennDOT crews completed repairs on this bridge.



Demo Repair Extended



Demo Joint Repair Extended



Opposite Lane Full Repair

Where has this gone from the demo?

Completed PennDOT Lancaster County projects

- Spring/Summer 2024
 - Hunsicker road (SR 1068) over US 222
 - Deck Spall Repair

- Conestoga Blvd over Stehman run
 - Deck Spall Repair

- SR 741 over Little Conestoga
 - Joint Repair

- Norman Wood Bridge
 - Deck Spall Repair

- PA 372 over Rail Trail
 - Horse Track Repair (at steel faced joints)

Where has this gone from the demo?

- Completed PennDOT projects
 - 10th Street Bypass - 1 mile
 - SR 22 Ramps – 6 ramps in total
 - SR 50 - 1.2 miles
 - I 79 - 10 miles (3 of 10 miles completed)
 - SR 2015 - 6' x 6' patch with 6" average depth
 - Ramp repair near Philadelphia

Where has this gone from the demo?

- New program developed in PennDOT Lancaster County
 - Fall 2024 plans for the repair of 2-3 additional bridges
- PennDOT planned projects
 - Rt 11/15 Bridge repairs – 4 miles
 - I 81 Bridge repairs – 1.5 miles
 - Bridge repairs in multiple districts

Questions?

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