

Delaware Department of Transportation



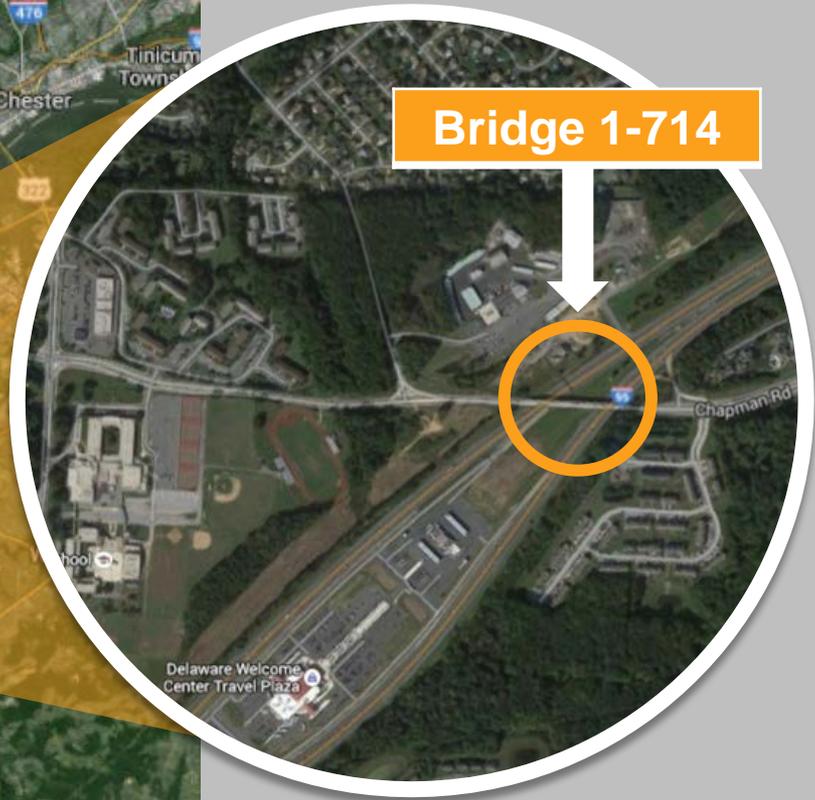
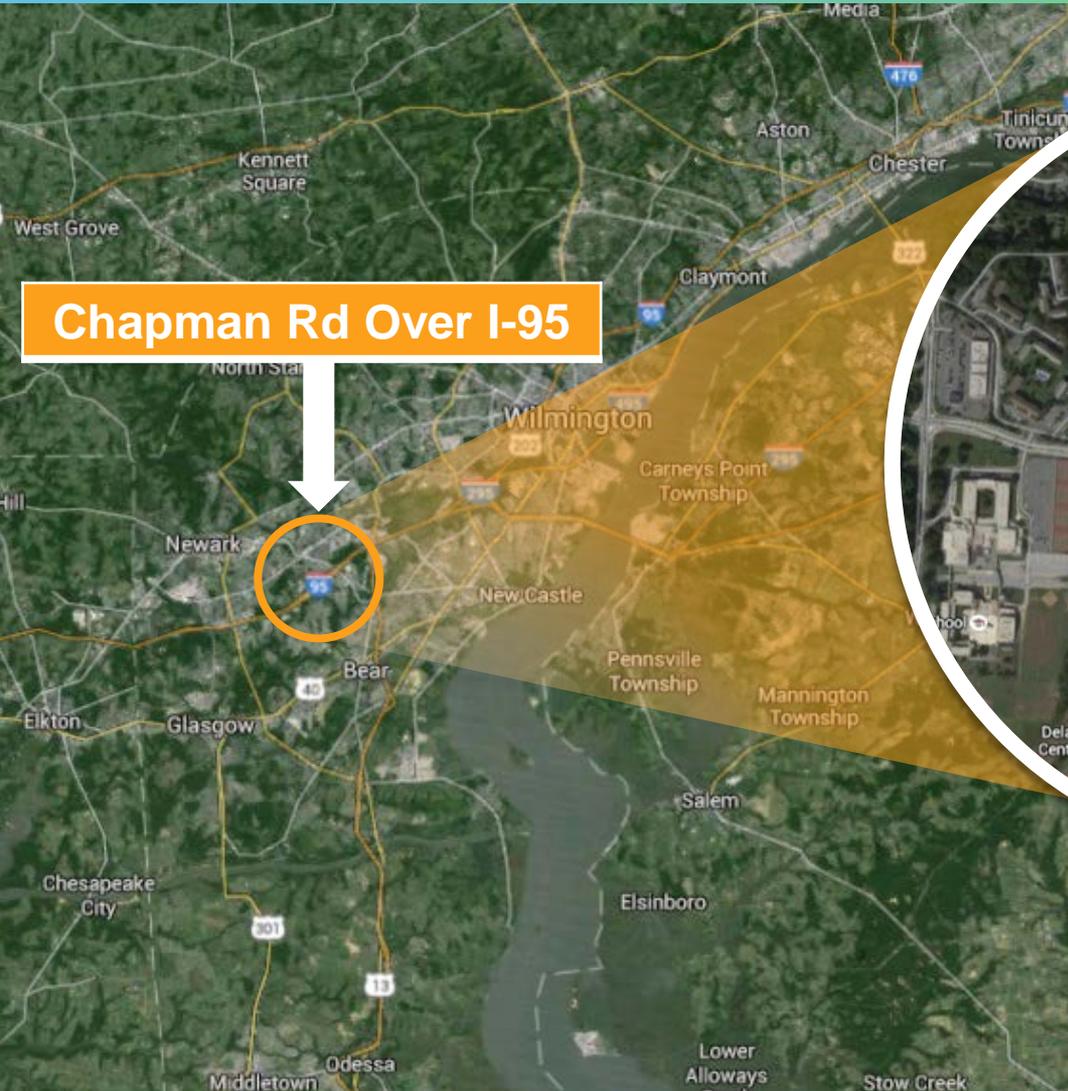
Bridge 1-714

Chapman Road over I-95 Newark, DE



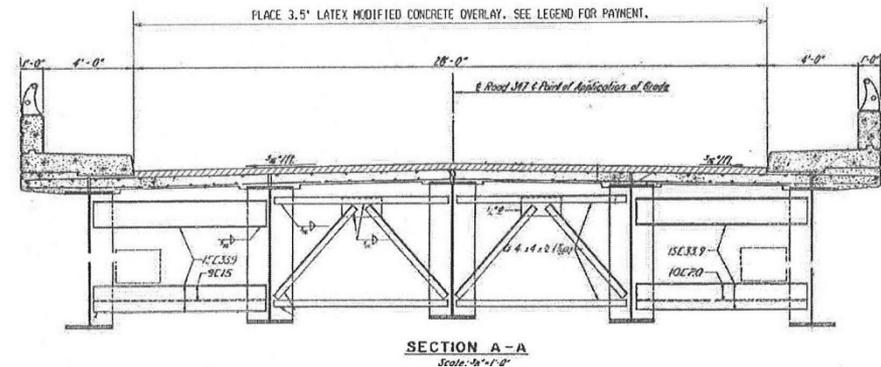
AECOM

Project Location



Bridge Background

- Constructed – 1963
- 6 simple spans
– 53.75'-135'-108.5'-108.5'-122.5'-53.75'
- Steel plate girders & rolled beams
- 5 girder X-section (38' out-to-out)
- RC multi-column bents on spread footings
- RC stub abutments on piles



Proposed Project Scope



- Bridge inspection
- Develop a rehabilitation strategy
 - Bridge deck replacement
 - Cleaning and painting of superstructure
 - **Elimination of deck joints**
 - Welded cover plate retrofit for fatigue resistance
 - Substructure repairs

Typical Condition Deck



Typical Condition Sidewalk



Typical Condition Tooth Dam at Pier



Typical Condition Deck Joint at Pier



Typical Condition Superstructure



Typical Condition Welded Cover Plate



04/20/2015

Typical Condition Superstructure under Tooth Dam



Typical Condition Pier



Typical Condition Pier Column



Why ABC?

- Avoid Long Term Disruption to I-95
- Limited bridge closure time due to nearby high school (includes pedestrian traffic)



- Median area adjacent to the rest stop provides large and accessible staging areas adjacent to the bridge
- Additional overpasses in close proximity for detour route during summer (non-school months)

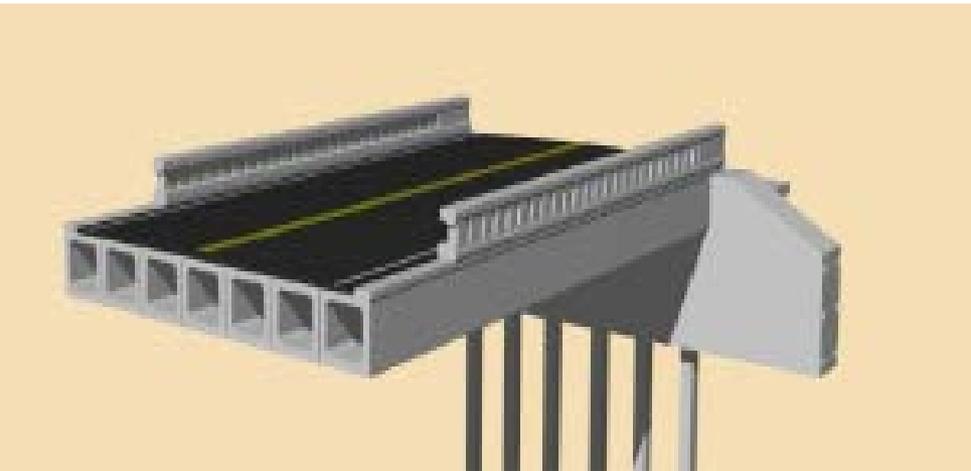
Prefabricated Bridge Elements and Systems (PBES)

- Deck Elements
 - Precast Deck Panels
 - Partial-Depth Panels; and
 - Full-Depth Panels



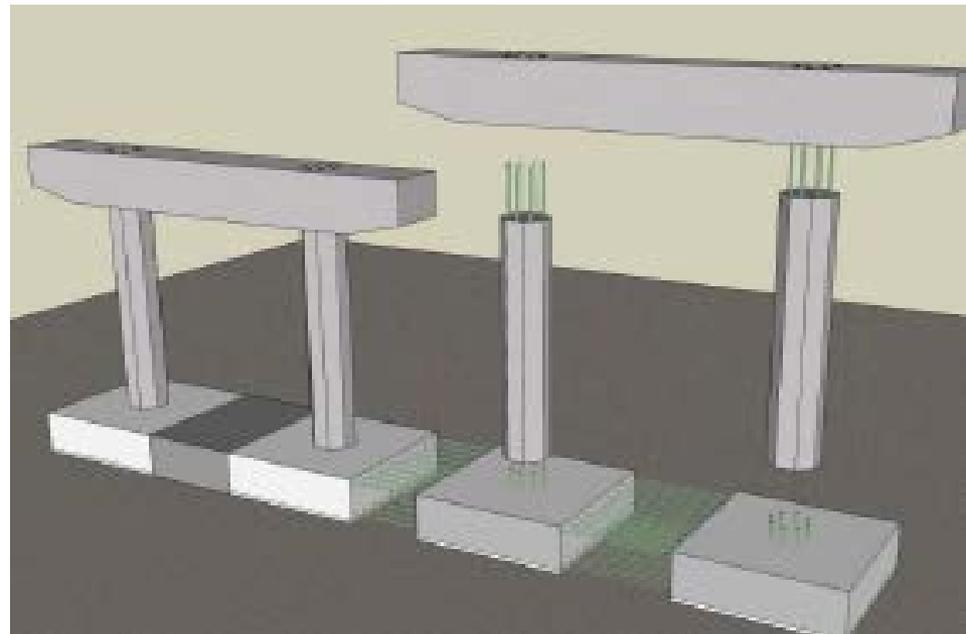
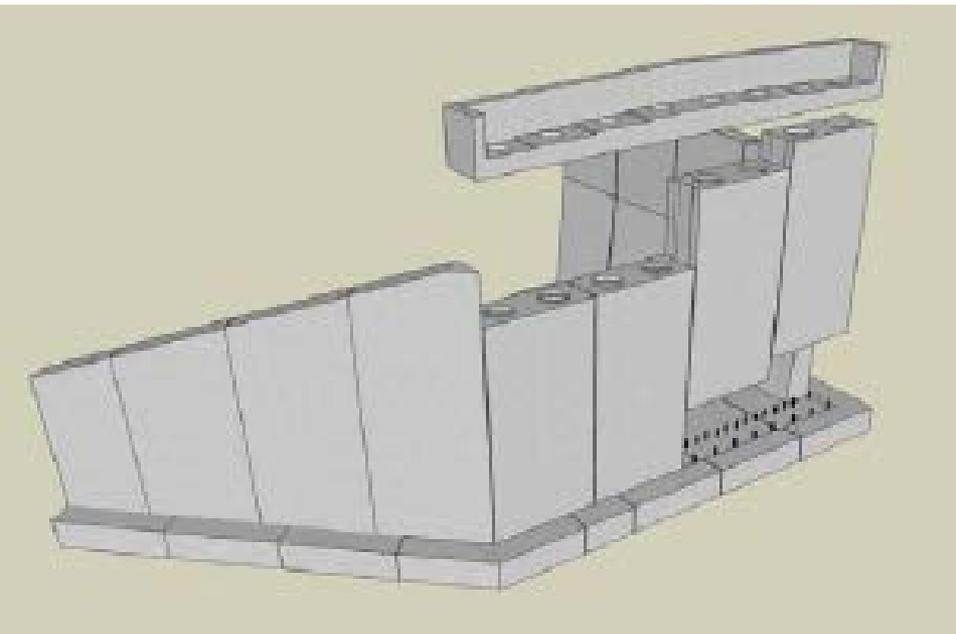
Prefabricated Bridge Elements and Systems (PBES)

- Beam Elements
 - Eliminate Conventional Onsite Deck Forming
 - Adjacent Box Beams; or
 - Adjacent Bulb-tee Beams



Prefabricated Bridge Elements and Systems (PBES)

- Substructure Elements
 - Prefabricated Caps for Pile Foundations
 - Prefabricated Wall Panels
 - Prefabricated Columns



Prefabricated Bridge Elements and Systems (PBES)

- Substructure Elements
 - Modular Precast Walls
 - Mechanically Stabilized Earth Systems (MSE)
 - Modular Block Systems (T-Wall)



Conceptual Bridge Replacement Options



Three-span steel plate girder



Two single-span P/S PA bulb tee

Prefabricated Bridge Elements and Systems (PBES)

- PBES

- A partial or total bridge that is procured in a modular manner, such that traffic operations can be allowed to resume after placement.
- Systems are rolled, launched, slid, lifted, or otherwise transported into place.
- Often require innovation in planning, engineering design and construction methods.

Prefabricated Bridge Elements and Systems (PBES)

- Placement Methods
 - Self Propelled Modular Transporter (SPMT's)



Prefabricated Bridge Elements and Systems (PBES)

- Placement Methods
 - Longitudinal Launching



Prefabricated Bridge Elements and Systems (PBES)

Placement Methods

Horizontal Skidding or Sliding



Prefabricated Bridge Elements and Systems (PBES)

- Placement Methods
 - Conventional Cranes



Conceptual Bridge Replacement Options



Three-span steel plate girder



Two single-span P/S PA bulb tee

Questions & Answers

