RUTGERS
Center for Advanced Infrastructure and Transportation


TEST. VALIDATE. DECIDE.

# FEED THE BEAST

a virtual "crystal ball" into the
**performance and longevity of bridge components** and materials

When making important decisions about infrastructure, how will the choices we make today stand up over time? Will they still be right 10, 20, or even 30 years from now? Everyone wishes there was a way to see into the future, especially bridge owners that have the responsibility of the public's safety and millions of taxpayer dollars resting on their shoulders.

The **Center for Advanced Infrastructure and Transportation (CAIT)** has built the first facility in the world to quantitatively measure effects of both traffic and the environment on full-scale, real-world bridges. For the first time, we have the capability to deliver performance data in mere months instead of decades of field monitoring, thanks to the Bridge Evaluation and Accelerated Structural Testing lab.

## the BEAST

Sparked by CAIT's experience as FHWA's primary university partner for the Long-Term Bridge Performance Program, the BEAST was conceived to quantify the remaining life of a bridge in a compressed time frame. This unique lab was made a reality through a collaboration among the **USDOT University Transportation Centers program, New Jersey Department of Transportation, and Rutgers University.**

**fast forward aging**
as much as **30 times** with
environmental and traffic
**loading, 24–7**

**Rutgers CAIT—a USDOT National University Transportation Center specializing in preserving and improving infrastructure**—and its partners created the BEAST so bridge owners and builders can determine, with a high level of confidence, the best approaches to maximize the life cycle and performance of bridges throughout the country.

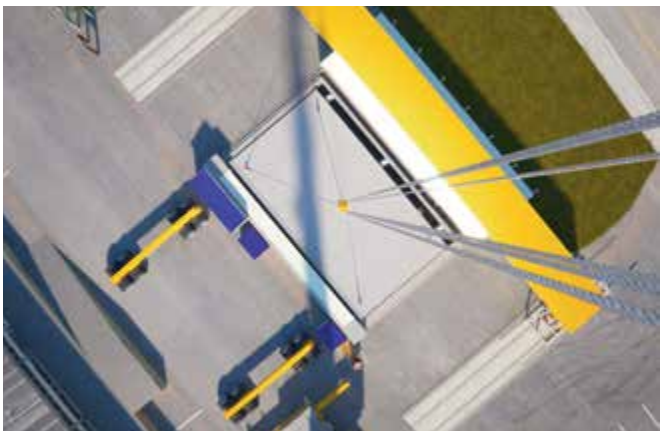
This testing will be able to validate how various bridge designs, components, rehabilitation methods, and construction materials will perform decades from now. Data from BEAST testing provides insight, helps manage expectations, and gives bridge owners **empirical evidence to optimize and support decisions**—all sooner than ever thought possible.

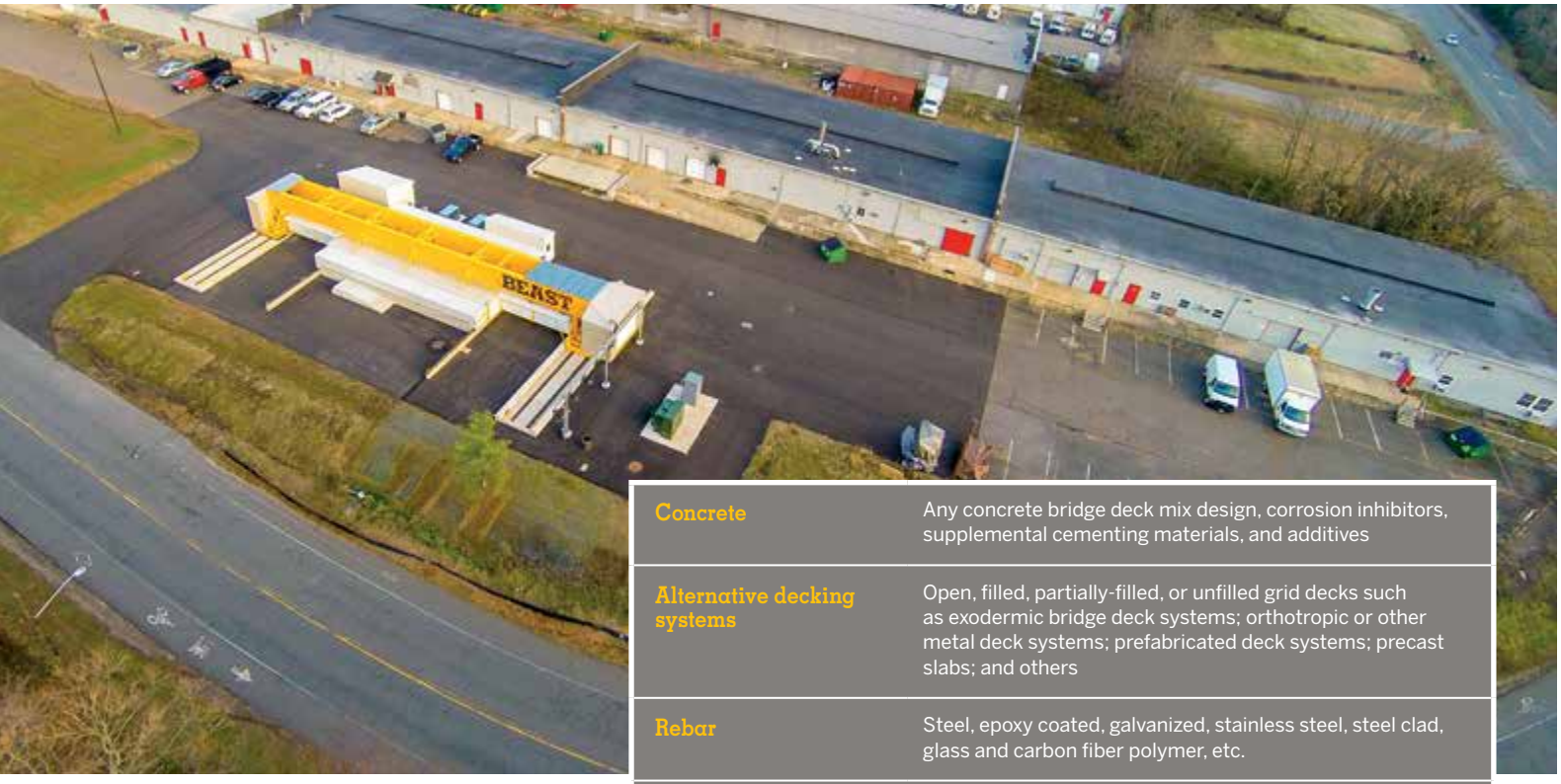
Ultimately, what we learn from the BEAST will significantly **improve public safety, facilitate commerce and economic growth, and potentially save billions of dollars in infrastructure costs.**

The BEAST subjects full-scale bridge spans to extreme traffic loading and rapid-cycling environmental changes simultaneously in a controlled enclosure around the clock, "compressing time" to induce and speed up the deterioration process.


## SPECIFICATIONS

- Test spans up to 50 feet long by 28 feet wide
- Traffic loading cycles with up to 60,000 pounds continuous at 20 mph; more than 17,000 cycles per day
- 0 to 104F degrees temperature fluctuation
- Salt brine application, 1 to 15 percent solution






## TESTING CAPABILITIES FOR BRIDGE SYSTEMS, COMPONENTS & MATERIALS

| | |
|---|---|
| Concrete | Any concrete bridge deck mix design, corrosion inhibitors, supplemental cementing materials, and additives |
| Alternative decking systems | Open, filled, partially-filled, or unfilled grid decks such as exodermic bridge deck systems; orthotropic or other metal deck systems; prefabricated deck systems; precast slabs; and others |
| Rebar | Steel, epoxy coated, galvanized, stainless steel, steel clad, glass and carbon fiber polymer, etc. |
| Prestressing & post-tensioning | Bar, wire, strands, couplers, anchorages, ducts, and other components |
| Coatings & sealants | Latex-modified concrete, joint sealants, epoxy waterproofing, seal coating, etc. |
| Superstructure frames | Structural steel, reinforced concrete, precast concrete, prestressed concrete, and timber |
| Bearings | Bearing pads, reinforced elastomeric bearing assemblies, high-load multi-rotational bearing assemblies, and others |
| Joints | Preformed joint filler, elastomeric joint assemblies, strip seal expansion dams, modular bridge joint systems, longitudinal joints, shear locks, and others |
| Deck drainage | Scuppers, inlets, downspouts, grates, and other drainage |
| Safety devices | Striping paint, pavement reflectors, auditory/tactile safety devices (e.g., Bott's dots, rumble strips), ITS sensors and devices, traffic cams, signage materials, and more |

### PARTNERS

Rutgers School of Engineering

New Jersey Department of Transportation

Applied Research Associates

### For testing information and opportunities, contact

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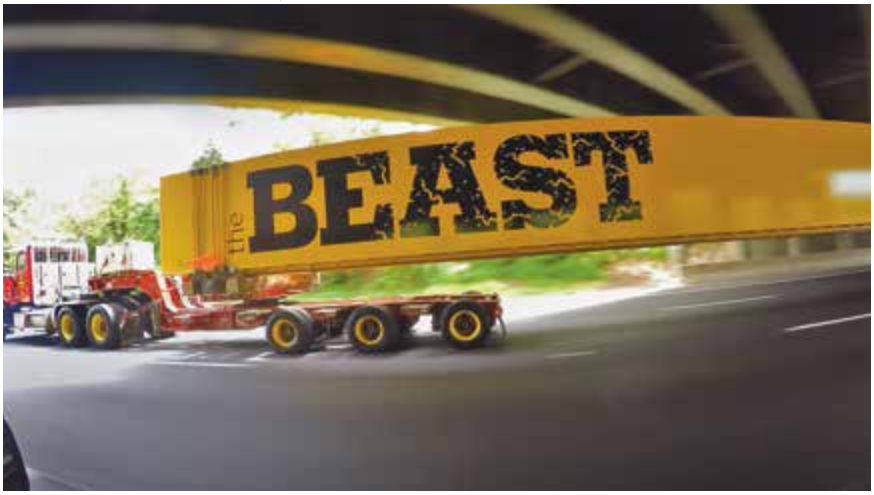


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