## Bonner Bridge: Standing on Borrowed Time, August 2013

The Herbert C. Bonner Bridge is a lifeline along the Outer Banks. It provides the only highway connection for thousands of Hatteras Island residents to work, schools and healthcare on the mainland. As many as 13,000 vehicles cross over the bridge during peak travel days in the summer, an important part of North Carolina's $19.4 billion a year tourism industry. With landmarks like the Cape Hatteras Lighthouse, one quarter of the county's overall economic impact comes from Hatteras Island tourism alone.

"It would be catastrophic if something happened to the Bonner Bridge," said Hatteras Island resident and business owner Beth Midgett. "The bridge is a necessary part of our lives and our livelihood, and all of our electrical and communications lines run underneath it. Losing this critical connection would be a devastating blow to our community and a big hit to the state's tourism industry."

The crucial lifeline is in trouble. After 50 years of weathering many storms, enduring harsh current and sustaining numerous boat crashes, engineers say the bridge needs to be replaced. That necessary replacement project is on hold because of lawsuits, so the North Carolina Department of Transportation is pressing forward with costly repair work to keep the barrier island connected.

The department has already spent nearly $56 million on repairs, maintenance and special inspections since 1990 to fortify the bridge. Another $2 million in required repair work is scheduled to begin this fall.

"We simply can't sustain this model much longer," said NCDOT Chief Deputy Secretary of Operations Jim Trogdon. "The longer we wait, the more taxpayer money is spent patching a bridge that must be replaced, and the risk becomes greater that we could have to close the Bonner Bridge before the new one is ready."

### The Bridge's History

NCDOT built the $4.1 million bridge in 1963 to extend N.C. 12 over the Oregon Inlet, providing better access and service for residents and visitors of Hatteras Island. At that time, the existing ferry route could no longer keep up with the growing traffic.

NCDOT first began the process of investing in a new bridge in 1989. However, a number of roadblocks over the years delayed construction. The most recent are two lawsuits filed by the Southern Environmental Law Center (one in July 2011 and another in August 2013) on behalf of the Defenders of Wildlife and the National Wildlife Refuge Association, in an attempt to delay or stop the bridge replacement on environmental grounds. Until those lawsuits are resolved, NCDOT cannot move forward with the project.

"As an Outer Banks resident and an engineer, I always want to do what's best for our community," said NCDOT Resident Engineer Pablo Hernandez, who is based in Manteo and oversees highway and bridge projects in the area. "Every project we do goes through careful planning and permitting to ensure it's done safely, efficiently and with minimal environmental impact."

### Keeping the Current Bridge Safe for Travel

The harsh salt air has taken a toll on the bridge's steel and concrete, and the turbulent waters of the Oregon Inlet are constantly shifting the sand on the ocean floor, which causes problems around the piers that support the bridge.

"The concrete is essentially rotting from the inside out as salt has found its way to the internal reinforcing steel causing the steel to corrode," said State Bridge Management Engineer Greg Perfetti. "We've also had problems with what's called scour over the years, where the sand around the piers in the ocean floor gets washed away. The sand is critical to keeping the piers steady, so we've had to take many steps to protect and secure the piers."

Perfetti emphasized that the bridge is safe for drivers right now because of the extensive repair work and says NCDOT would close it immediately if safety becomes a concern.

The poor condition of the bridge dictates close monitoring, especially following storms. In 2012, the department installed technology that allows crews to quickly check for any movement of the piers. A series of points are marked along 150 of the bridge's 200 spans. Each point is surveyed before the start of hurricane season and after each storm to see if it has moved. This technology enables engineers to determine if the bridge is safe for NCDOT crews to cross immediately after a storm, ensuring both quick response time and safety of employees. A full survey and additional inspections are conducted before the bridge can open to the public. NCDOT also uses sonar technology to conduct underwater surveys monthly, as well as after each storm, to look for problems.

The new bridge will be built with materials and a design that will protect it from these problems, as well as better serve navigation needs through Oregon Inlet. It will allow natural channel movement and will not be endangered by shoreline movement.

The patchwork of repairs to the existing Bonner Bridge can be seen from Oregon Inlet, marking several chapters in the bridge's history.

"The most visible repairs are probably where we've installed bents around the piers to protect them from scour," said Hernandez. "You can see several different designs and steel supports we've added in some locations. You can also see the span that had to be replaced after it was hit by a barge in 1990. The newer concrete is a stark contrast against the older concrete that is darker and marked with concrete patches."

## Challenges to Completing the New Bridge

Over the course of two decades, NCDOT has completed detailed studies analyzing options for replacing the bridge and their potential impact on the people, wildlife and environment of the area. The department studied two main corridors and at least eight alternatives for the new bridge. Some groups, including the Southern Environmental Law Center, are advocating for a 17-mile-long bridge that goes into the Pamlico Sound, referred to as the "long bridge."

"The long bridge would cost about $1.15 billion in taxpayer money to build," said Trogdon. "That is not a financially viable option, nor the most efficient way to get this project done."

Studies determined that replacing the bridge with additional ferries would also be too expensive. Instead, NCDOT hopes to proceed with a design that runs parallel with the current bridge.

The department submitted the final environmental document to the Federal Highway Administration (FHWA), which identified the parallel bridge with a coastal monitoring program as the preferred alternative to replace the existing bridge. The coastal monitoring program will allow the department to build the new bridge now and address conditions on N.C. 12 south of the bridge as needed. FHWA agreed with the decision and issued what is called the Record of Decision in December 2010. State agencies also agreed with the parallel bridge decision and issued the necessary environmental permits, allowing the department to move forward with a contract for design and construction of a new bridge more than 20 years after the process began.

In July 2011, the department awarded a $215.8 million contract for design and construction of a new bridge. Design work began immediately and construction of the new bridge was set to begin in early 2013. Again, however, a lawsuit filed in July 2011 by the SELC put the project on hold.

"This project has been studied more than any other project in the state's history," said Trogdon. "We held extensive public outreach and addressed concerns and comments from state and federal environmental agencies, and took all of this into account in making our decision. Anytime we plan a transportation project, we have a responsibility to meet the needs of that community while also doing the least harm to the environment."

For now, NCDOT will continue doing all it can to keep the bridge safe and the lifeline open. The residents along the Outer Banks watch and wait with great anticipation. They know all too well that the unpredictability of Mother Nature means the Bonner Bridge stands now on borrowed time.