SAFETY ALERT 073

NTSB National Transportation Safety Board

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Protecting Bridges From Fire Damage and Collapse

The problem

Of the 600,000 highway bridges in the United States, roughly 1,000 bridges—if destroyed by a catastrophic event—could result in substantial fatalities, injuries, and other negative societal ramifications.[1] Vulnerabilities to highway bridges include collisions by vessels or highway vehicles; natural disasters such as earthquakes, hurricanes, and flooding; and fire, which can cause buckling of steel beams, damage to concrete, or collapse. The costs to repair or replace a bridge structure can be enormous and often extend beyond materials and labor to include other losses, such as traffic congestion and increased crash risk associated with construction zones and rerouting traffic.

I-85 fire and bridge collapse, Atlanta, Georgia

In 2017, the NTSB investigated an incident in which construction materials stored under an interstate bridge were set on fire, resulting in the collapse of the bridge. Although catastrophic fires fueled by materials stored underneath bridges are relatively rare events, the loss of this structure demonstrates what can happen if bridge owners are not vigilant about monitoring and controlling such materials.

1 Federal Highway Administration–American Association of State Highway and Transportation Officials. 2003. *Recommendations for Bridge and Tunnel Security,* prepared by the Blue Ribbon Panel on Bridge and Tunnel Security.

Prefire storage area under span 30 NB of the I-85 bridge, showing numerous reels of high-density polyethylene conduit.

The Georgia Department of Transportation (GDOT) used the area beneath an elevated section of Interstate 85 (I-85) over Piedmont Road, in Atlanta, as a storage location for construction materials, which included 76 reels of high-density polyethylene conduit and nine racks of fiberglass conduit (see figure above). The materials were left over from a project that had ended several years earlier and were secured inside a chain-link fence. At 6:05 p.m. on March 30, 2017, the materials were set on fire. The fire propagated throughout the storage area and burned out of control. Just over 1 hour later, the northbound traffic lanes within a 92-foot-long elevated span collapsed. GDOT subsequently determined that five additional bridge spans adjacent to the collapse—two in the northbound direction and three in the southbound direction—required replacement due to structural damage from excessive heat.

No fatalities or injuries were reported from the fire and subsequent bridge collapse. One person was arrested and later charged with criminal damage to property.

The replacement cost for the bridge spans was $15 million, and the project required more than 40 days to complete. In addition, the loss of roadway usage for this segment of I-85 significantly disrupted businesses and motorists and increased traffic congestion.

The Society of Fire Protection Engineers provides additional information on best practices and procedures for storing materials under bridge structures. The Greater Atlanta Chapter of the society prepared a report on the I-85 bridge collapse in response to a GDOT request for assistance in conducting a state-wide review of related department procedures. Along with other information related to the fire and subsequent bridge collapse, it is accessible from the NTSB public docket (see link below).

What can bridge owners do?

To protect and secure bridges from catastrophic events, such as fire damage, bridge owners can take the following steps:

- **Evaluate materials under bridges** and remove those that could pose the risk of a fire event.
- **Work with local law enforcement** to improve bridge surveillance.
- Lock, block, or otherwise **protect storage areas to restrict entry** to authorized personnel only.

Interested in more information?

See the following websites for additional information on bridge security and protection:

- National Transportation Safety Board (HWY17IH012): NTSB public docket.
- Federal Highway Administration: FHWA website on security of bridges and structures.
- American Association of State Highway and Transportation Officials Special Committee on Transportation Security and Emergency Management: AASHTO website on transportation security and emergency management.
- Transportation Research Board Committee on Critical Transportation Infrastructure Protection: TRB information resource center website for protecting critical transportation infrastructure.

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