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.

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

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.

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:

- Federal Highway Administration: [FHWA website on security of bridges and structures](https://www.fhwa.dot.gov).
- American Association of State Highway and Transportation Officials Special Committee on Transportation Security and Emergency Management: [AASHTO website on transportation security and emergency management](https://www.aashto.org).
- Transportation Research Board Committee on Critical Transportation Infrastructure Protection: [TRB information resource center website for protecting critical transportation infrastructure](https://www.trb.org).

### Learn more about NTSB investigations and safety recommendations at [www.ntsb.gov](https://www.ntsb.gov)

The NTSB is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—highway, marine, railroad, and pipeline. The NTSB determines the probable cause of the accidents and issues safety recommendations aimed at preventing future accidents. For more information, visit [www.ntsb.gov](https://www.ntsb.gov).