

PROJECT OVERVIEW REPORT

1. UTC Identifying Number
69A3551847102
2. Center Identifying Number
CAIT-UTC-REG 16
3. Project Title
Fire in Tunnel Collaborative Project
4. Principal Investigator & Contact Information
Negar Elhami-Khorasani, Ph.D.
Assistant Professor
University at Buffalo (UB)
136 Ketter Hall
Buffalo, NY 14260
5. Rutgers/CAIT Project Manager
Patrick Szary, Ph.D.
6. Customer Principal
Harry Capers, Vice President
Arora and Associates, P.C.
1200 Lenox Drive, Suite 200
Lawrenceville, NJ 08648
7. Project Description
The primary goal of this proposal is to increase safety and minimize economic losses in the transportation network by enhancing resilience of existing and new tunnels subject to fire events. This is achieved by developing a better understanding on the effects of a fire on tunnel structure integrity, and establishing a scenario-based risk assessment methodology to quantify fire damage to tunnel lining considering soil-liner interaction. The methodology can be used to assess and decide on proper mitigation measures, such as the design of passive fire protection of tunnel linings, to minimize life cycle costs and achieve resilience of the tunnel structure in the event of a fire.
8. Implementation of Research Outcomes (or why not implemented)
The intended outcome of the project can be used to make recommendations and propose design guidelines for structural fire resistance of tunnels based on performance requirements, such as acceptable downtime duration (for repair) given a potential fire event. The methodology will be applicable to both new and existing roadway and railway tunnels, and in particular to the Gateway Tunnel

Project—which will be an extension of the Northeast rail corridor to link New Jersey and New York.

9. Impacts/Benefits of Implementation (actual, not anticipated)
To Be Determined

10. Dates and Budget

Start date: 10/1/2018

End date: 11/30/2020

UTC (CAIT) Dollars: \$266,273

Cost Sharing: \$264,030 (UB: \$139,030, NJIT: 100,000; PU: \$25,000)

Total Dollars: \$530,303

11. Keywords

Tunnel fire, risk assessment, concrete lining, fire protection, downtime, resilience

12. Web Links (Reports and Project Website)

<https://cait.rutgers.edu/research/fire-in-tunnel-collaborative-project/>