

Design Recommendations for Achieving Excellent Safety and Traffic Flow

For the Proposed Replacement of the
Francis Scott Key Bridge in Baltimore

by Stephen Frank

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Dear Maryland Department of Transportation Authority (MDTA)
and Kiewit Corporation,

This document outlines design and operational recommendations for the proposed replacement of the Francis Scott Key Bridge in Baltimore. The aim is to enhance safety and ensure smooth traffic flow, thereby reducing incidents and congestion under various conditions. Safety and effective traffic management are crucial for the MDTA, Kiewit, and the public, and will significantly influence the bridge's overall impact and success.

To illustrate these recommendations, I present a fictional scenario of crossing the new bridge in 2028, incorporating three key features designed to improve safety and traffic management.

Fictional Crossing Scenario 2028:

1. Automated Towing System: As I drove from Annapolis to Dundalk in my 2020 Hyundai Kona, I smoothly passed through the electronic tolling facility on the new Francis Scott Key Bridge. However, I soon encountered a traffic jam due to an accident causing a right lane closure. From the left lane, I observed authorities using the **Automated Towing System** to remove the damaged vehicle.

This system, featuring a moving track embedded in the right lane, towed the vehicle safely across the bridge at normal speed, preventing further accidents and alleviating congestion.

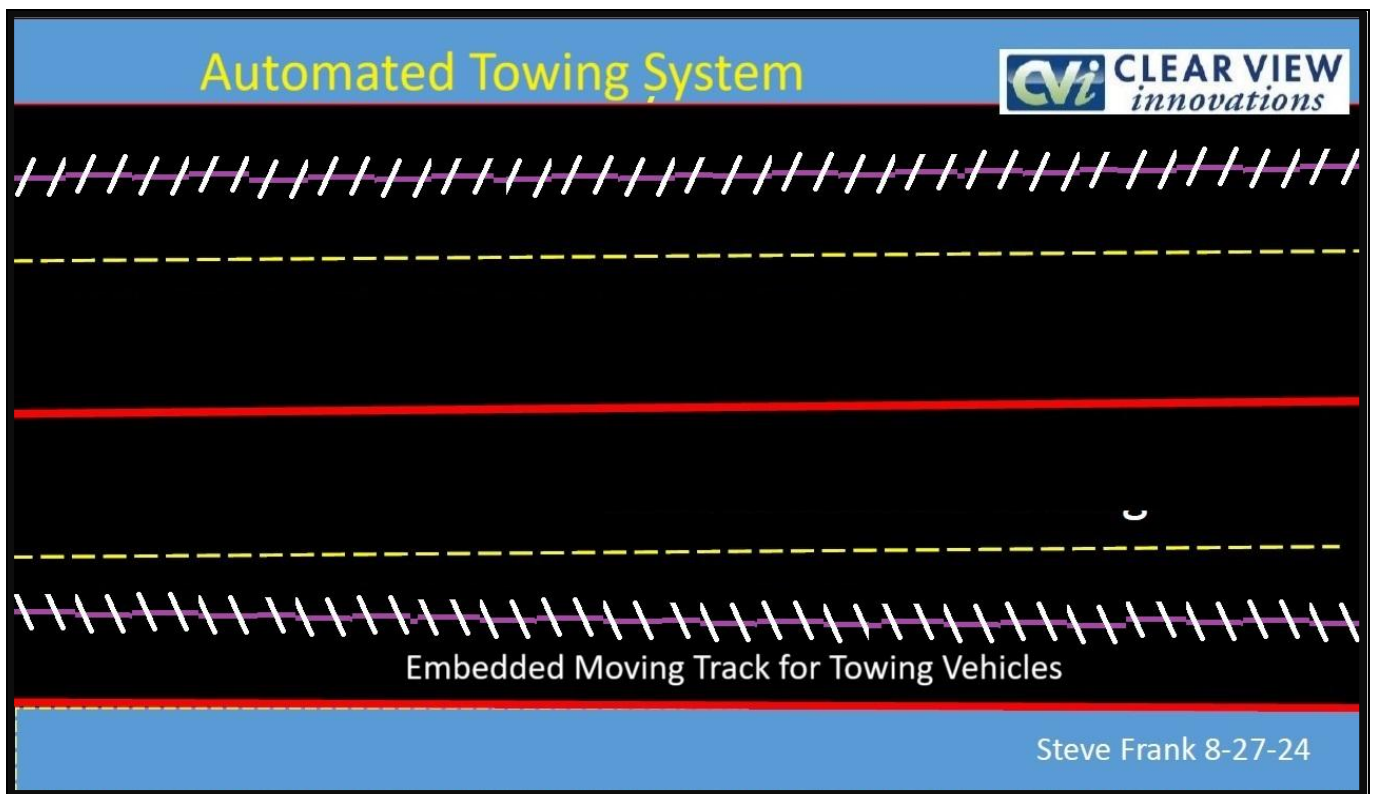


Diagram 1: Lane configuration with Automated Towing System track.

2. **Emergency Safety Station:** Continuing my journey, I experienced a flat tire near the bridge's halfway point. Thankfully, I was able to drive up to and pull over into an **Emergency Safety Station**, a designated bump-out adjacent to the right lane.

This station, comparable to a highway shoulder, but only the length of two cars, allowed me to safely change my tire without disrupting traffic. It served as a critical stopping point for urgent matters like flat tires.

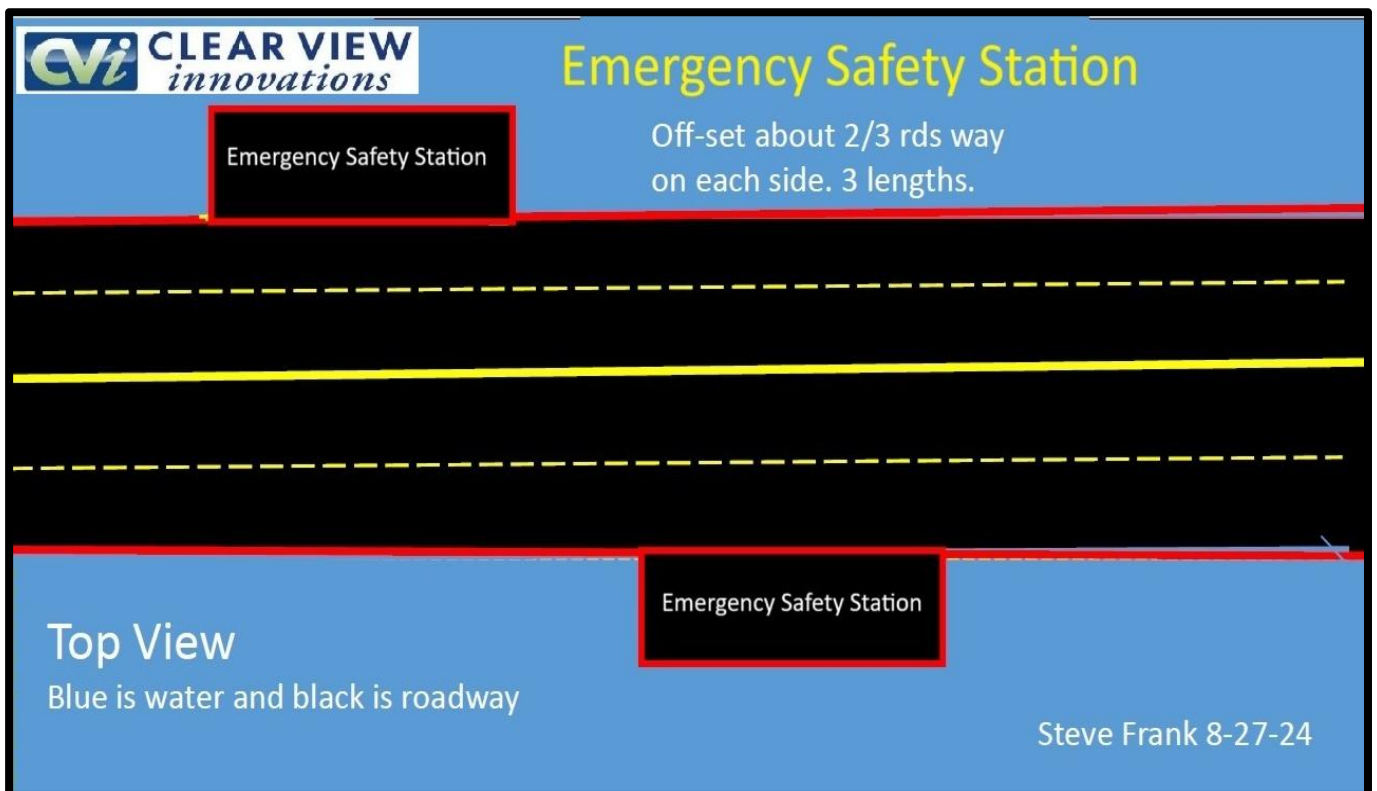


Diagram 2: Emergency Safety Stations offset about 2/3rd of the way on each side.

3. Emergency Parking Lot: As I neared the end of the bridge, I encountered a cluster of emergency vehicles blocking both lanes. Authorities promptly diverted traffic to the **Emergency Parking Lot**. It was a designated area for official use that helped clear vehicles off the bridge and reduces congestion which facilitated access for emergency responders.

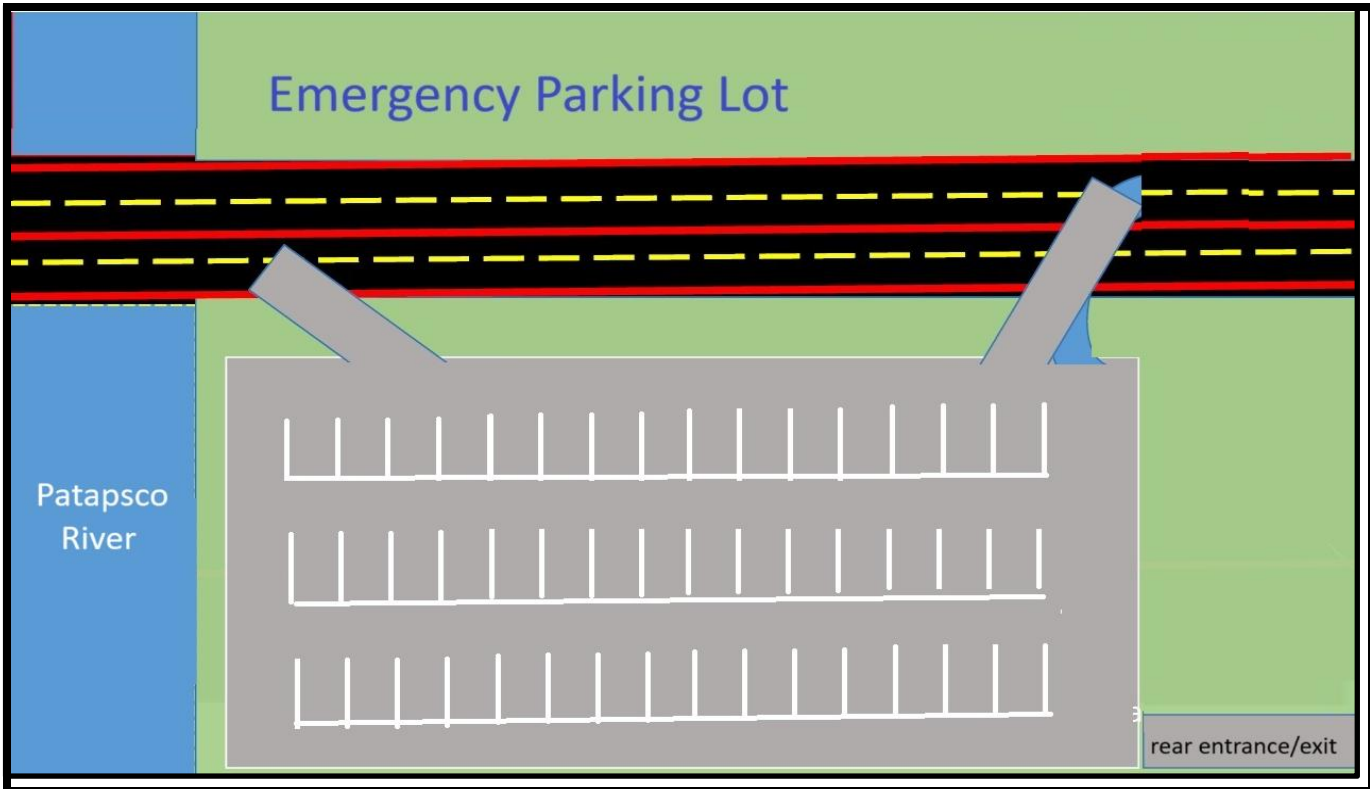


Diagram 3 shows one of four parking lots (2 on each end of the bridge) that the transportation authority police would have at their disposal when managing traffic during incidents on the bridge.

END OF SCENARIO

These three features—the **Automated Towing System**, **Emergency Safety Station**, and **Emergency Parking Lot** — are designed to ensure safety and efficient traffic flow, addressing potential issues before they escalate. They reflect a deep consideration for the needs of drivers, passengers, and first responders, emphasizing prompt detection and action.

I urge you to collaborate with the Maryland Transportation Authority Police to explore these recommendations. It is their mission to “provide Safety, Security and Service in partnership with the community to all who use and work on MDTA facilities...”

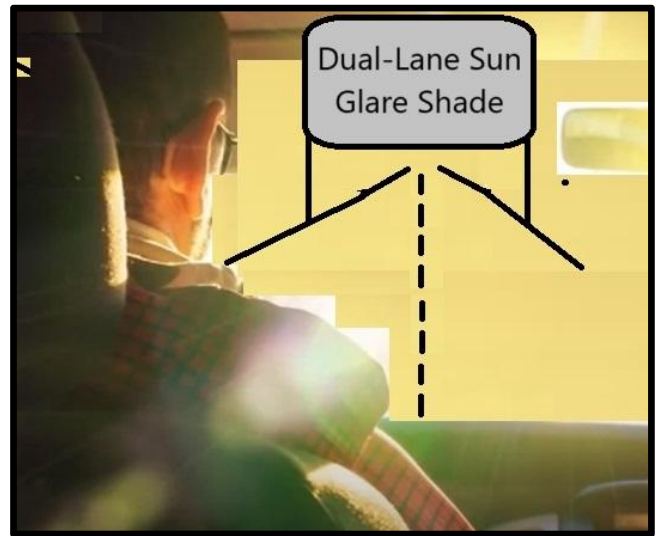
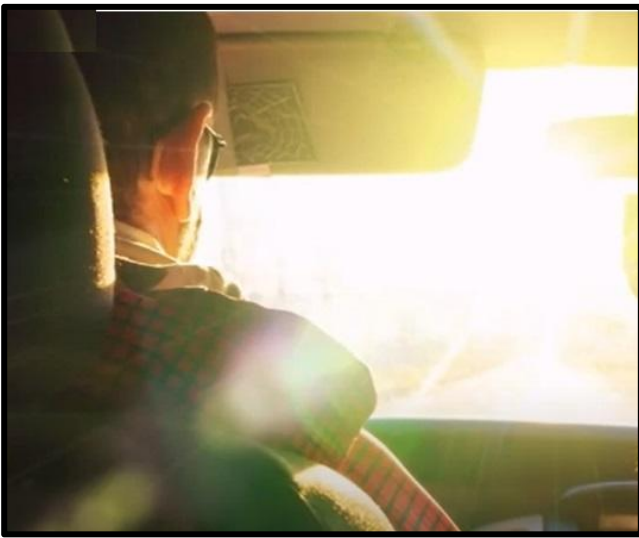
Furthermore, I recommend studying best practices from existing transportation systems—bridges, aviation, rail, tunnels, and maritime operations—to identify proven measures applicable to the new bridge.

Looking ahead, we must also consider future innovations. In the next 50 years, the bridge will likely need to accommodate self-driving vehicles, electric charging surfaces, virtual and augmented reality applications, drones, and more. It’s crucial that we prepare and proof for a future where transportation mechanisms may evolve dramatically.

Additional Recommendations for Safety and Traffic Flow

A. Dual-Lane Sun Glare Shades

Large, curved structures, shades, spanning the width of the bridge to block sun glare during sunrise and sunset, enhancing driver visibility and reducing slowdowns.



B. Emergency Vehicle Lift

A heavy-duty scissor lift system to vertically transfer vehicles between the bridge and the roadway below, assisting in emergency situations.



C. Jumbotrons

Large display screens mounted on the bridge to convey important information to watercraft below, including weather updates and navigational guidance. Sample below.



D. Monitoring/Research-Ready Equipment Perchs

Designated areas for installing monitoring equipment, such as weather stations and cameras, to facilitate research and provide data for traffic management. This may be a method of collaboration with other state departments, educational and research institutions and the media.

E. Observation and Information Area

A strategically located site for public observation and education about the bridge, fostering community engagement during construction.

Thank you for considering these recommendations.

Respectfully submitted by

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