Shot Tower Flood Mitigation Study: A Resiliency Program Initiative

MARYLAND DEPARTMENT OF TRANSPORTATION

Resiliency Transportation Programs:

MDOT MTA'S
Resilient Transportation Program

Vision: Manage increased climate risk and expedite recovery from weather events through effective and equitable program, project, and purchasing decisions.

Storm Surge

Fells Point, Baltimore City

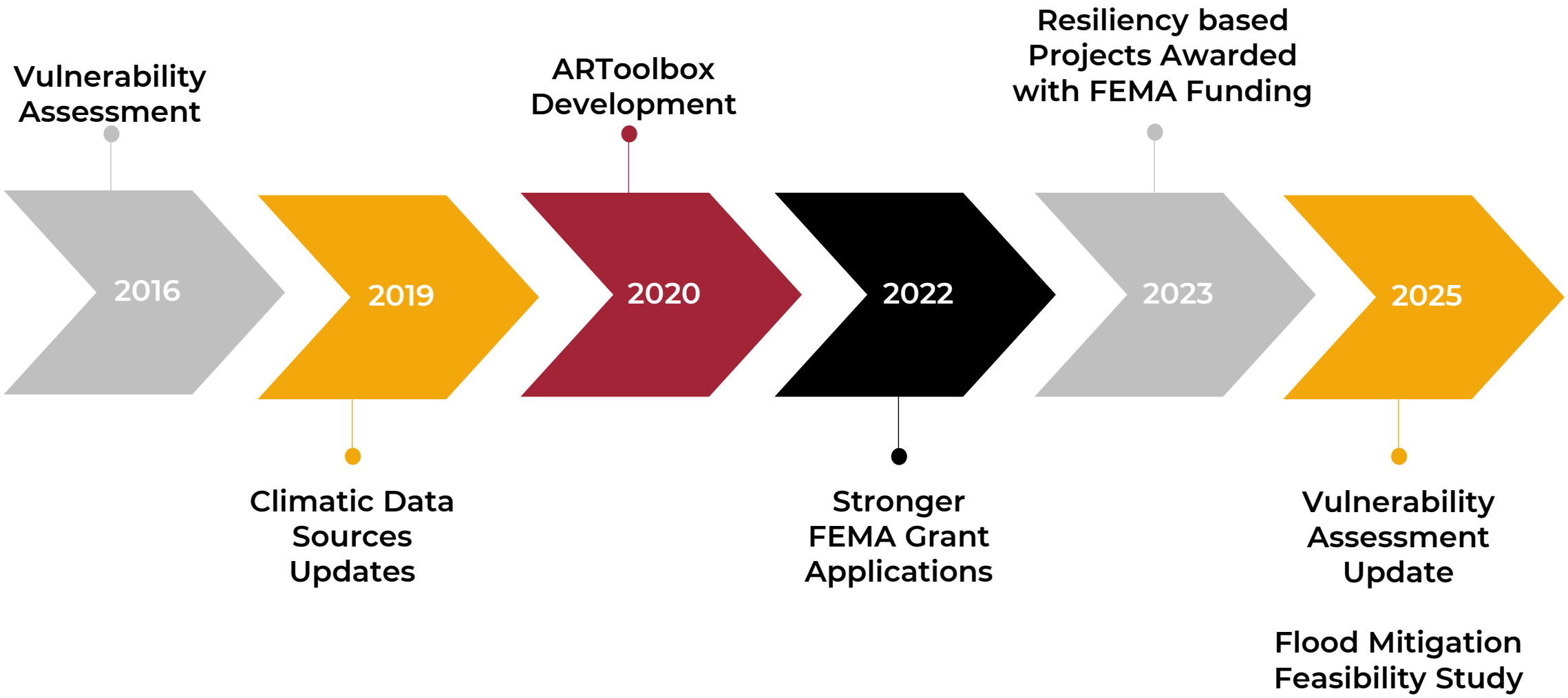
Track Wash Outs

Light Rail, Baltimore Highlands

Sea Level Rise

Smith Island, Somerset County

Resiliency Program Timeline of Progress



The Adaptation & Resiliency Toolbox (ARToolbox)

Asset Navigation Tool

Long-Term Solutions
Mid-Term Solutions
Short-Term Solutions

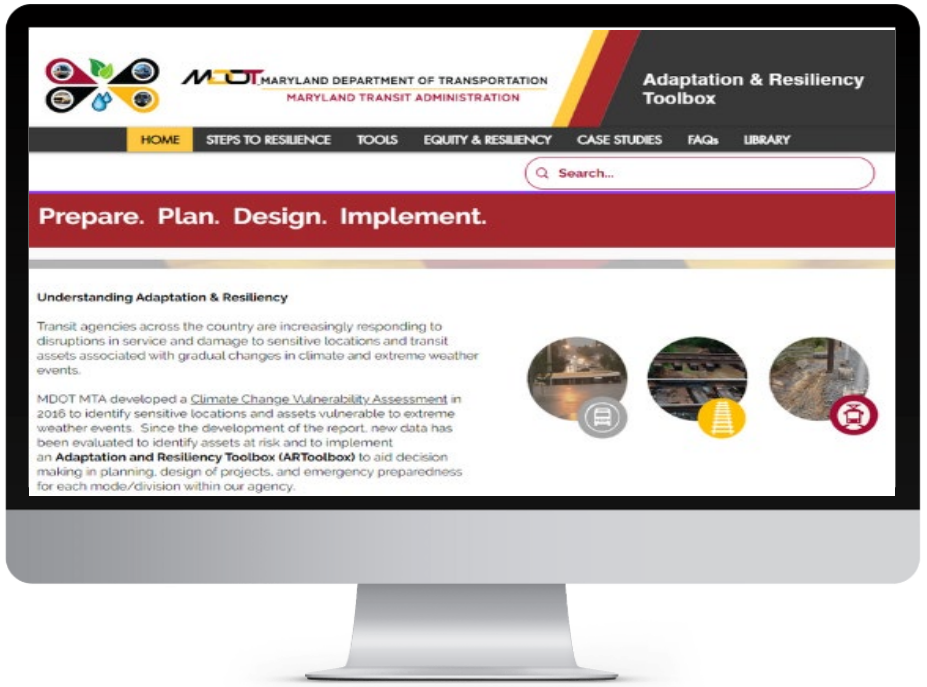
Resiliency Search Tool

Vulnerability Mapping Tool

Library

Funding Resources

Case Studies



Resilience Integration Wins & Projects

Supporting Data for Funding Program Applications

Projects Awarded FEMA Funding

Shot Tower Metro Station: Flood Mitigation Feasibility Study

Projects Awarded FEMA Funding

	Location	Problem	Solution	Funding
Design (30%)	**Metro Tunnel Pumping Stations (Baltimore City)**	▪ Outdated Pumping Infrastructure at Seven Locations ▪ Very High Risk (Due to Sea Level Rise and Floodplain Inundation) ▪ Service Interruptions	▪ Track Drainage Study ▪ 30% Design	▪ Project Cost: $750K ▪ Federal Share: $675K (90%)
Construction	**Mt Washington Light Rail Protection (Baltimore City)**	▪ Erosion and Bank Instability ▪ Potential for Track Overtopping ▪ Very High Risk (Due to Floodplain Inundation)	▪ Permanent Fix Construction ▪ Stabilization to Stream Banks ▪ Erosion and Sediment Control ▪ Riprap and Gabion Baskets	▪ Project Cost: $500K ▪ Federal Share: $450K (90%)

Shot Tower: Flood Mitigation Feasibility Study

Existing Condition Analysis of Station Components

Identification of Flood Risk Reduction Alternatives (Conceptual Engineering Level)

Benefit-Cost Analysis of Alternatives

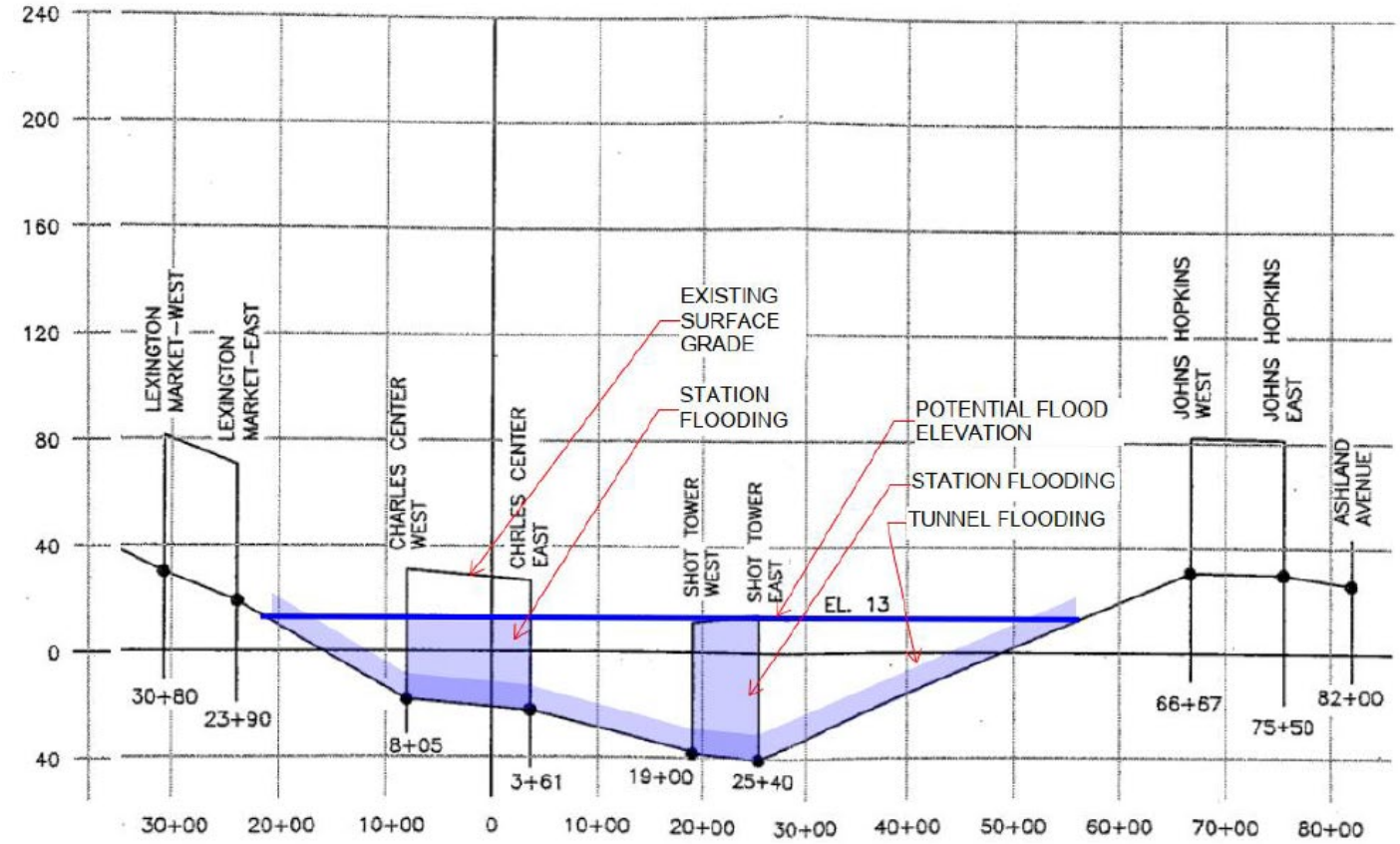
Support Data for Funding Application

(e.g., FEMA Grant Programs)

Existing Conditions

Part of the underground section of the Metro system and located at the lowest elevation.

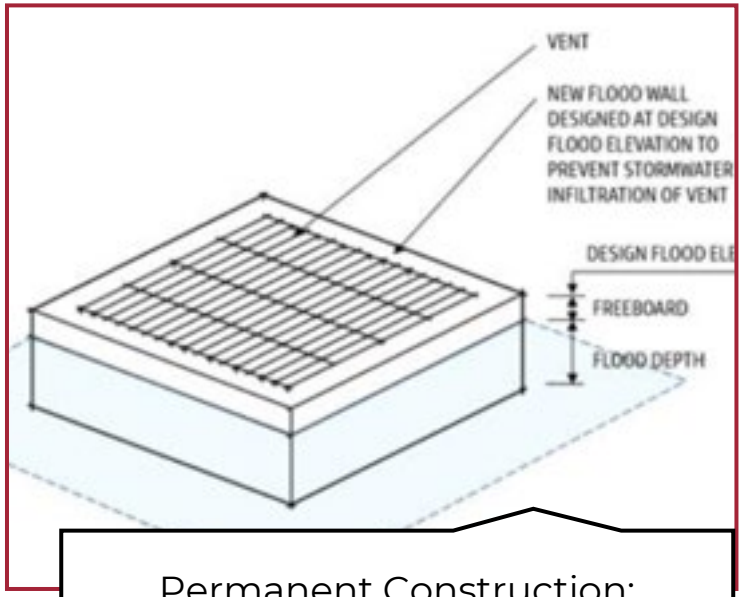
In an area with Very High risk of flooding due to surge events, major rainfall events, and sea-level rise.



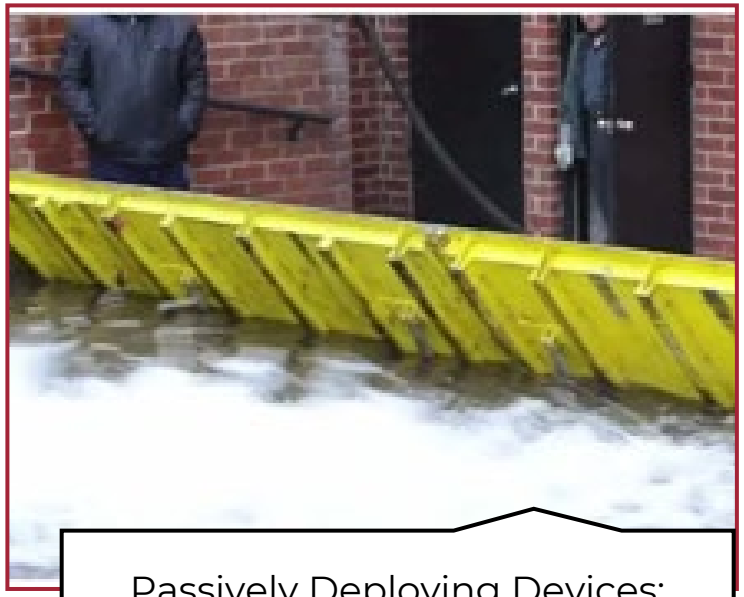
Existing Conditions (cont'd)

Complex solution needed due to the multiple potential water entry points to station, platform, and tunnel.

Proposed Risk Reduction Measures



Permanent Construction: Building structures that provide constant protection



Passively Deploying Devices: Systems that activate without human intervention

Manual Deployment System: Procedures requiring human action to set up flood defenses

BCA Findings

Vertical Passive Barrier

Flip-Up Barrier

Horizontal Vent Flood Barrier

Waterproof Doors

Alternative 2

- Passively Deployed Mitigation Measures

Total Benefits	$266 Million
Total Costs	$17.3 Million
Benefit-Cost Ratio	15.4

Next Steps

Explore a phased approach to implement proposed measures

Finalize the feasibility study

Use the study to pursue funding opportunities through established grant programs (e.g., FEMA, PROTECT) and other potential sources

Replicate the study for other vulnerable MTA assets

THANK YOU!

Any Questions?

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