RITIS CATT Lab

Sit-Reps & Early Analytics

Mobility Performance Measures and Safety Monitoring for the Closure of the Francis Scott Key Bridge, Maryland

April 30, 2025

Photo: Al Drago/Bloomberg via Getty

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Agenda

- Call to action
- Real-time flight and vessel tracking
- Mobility analytics for safety prioritization
- Resilience observations
- Q&A





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Call to Action

- Governor Wes Moore and Secretary Paul Wiedefeld
 - All hands on deck
 - Immediate outreach to CATT Lab
 - Internal response team to support Secretary Wiedefeld
 - Full depth and breadth of RITIS capabilities to support rescue, operations and safety prioritization



Real-time Maritime Vessel and Aircraft Location Monitoring

Tracking of Maritime Vessels Globally





Maritime Search and Rescue Vessel Movements



Vessels Bound for Seagirt Were Anchored/Loitering



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Last Updated: 03/26/2024 - 10:34 AM

Helicopter Monitoring / Search and Rescue Movements



Real-time Aircraft Tracking



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Last Updated: 01/22/2025 - 12:07 PM

Real-time Dashboards

State of Maryland Common Operational Picture

- Secretary of Transportation's COP
- Multi-modal situational awareness
- Proactive Incident Response
- Improved Communication & Coordination
- Reducing port dwell times
- Data sharing and collaboration



Real-time Port of Baltimore Performance



Real-time Travel Time & Speed Dashboards

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Real-time Transit Impacts Near Key Bridge



Impacts to Chesapeake Bay Bridge



Alternate Approaches to Travel Time Trend Analysis Reporting: PDA Suite

Prioritizing SSP and Trooper Patrolling

Secretary's Daily Travel Time Reports







Category 1: Regional Summary + Route Details

Category 2: Travel Scenarios + Route Details

April 30, 2025

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DETAIL SHEET EXAMPLE Regional Summary

How bad is traffic?



Compare travel times by **time of day**



Signal System Performance Monitoring Near the Bridge with Connected Vehicle Data

Signal Outage Monitoring in COP



Each Turning Movement at Signals Near Key Bridge and Port can be Monitored Remotely for Issues

Signal Analytics 👫 🛃						Welcome, Michael My	History Help Logo
Intersection Analysis							8086
						·	0-1
Movement Approach Intersection						Filters (U)	Columns (14/65)
		Ranked movements for 66 inter	rsections from March 26, 2024 through	April 14, 2024			
Rank Intersection	Approach Movement	Vehicle Coun 🚺 🔻 Vehicle Count S 🌒	POG 🌒 Turn Percentage 🌗	LOS () Travel Time: Avg()	Travel Time: Ma 🌒 Approach Spee	Control Delay: A Control Delay: A	ol Delay: M 🕕
1 MD 2 & MVA	Southbound Through	1955 1062	48% 98%	C 38	365	26 28	355
2 MD 2 & Governor Plaza	Northbound Through	1230 136	89% 99%	A 18	86	28 7	75
3 MD 2 & MVA	Northbound Through	1150 376	67% 98%	В 27	112	33 17	102
4 German Hill Road & Merritt Boulevard	Southbound Through	1142 491	57% 85%	C 34	140	30 24	130
5 MD 2 & Glen Burnie Mall	Southbound Through	1133 289	74% 90%	B 23	111	32 13	101
6 MD 2 & MD 710	Southbound Through	1104 657	50% 88%	D 49	158	28 38	147
7 MD 2 & MD 3 Bus	Northbound Through	1019 292	71% 100%	B 21	392	29 13	384
Map 🚽 MD 2 & MVA		Dis	splay Options Intersection Breakdown	✓ MD 2 & MVA			
Denti Ave Centre Ave C	Uter Loop TB TB Back Creek Dower Pd Tst St Furnace Creek	Baltimore Beltway Inner Loop	Guidden P Guidden P Percent on Gre %	en S	Ritchie Highway 34% 46% 2% ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	Rtche Highway	

Route Analysis – Impacts to System Performance and Safety Monitoring with CV Trip Data

'BEFORE': Route Map Isolating I-70 Pathways

🗹 Map	Rank	Route	# of Trips ▼	Medium Vehicles	Heavy Vehicles	Avg Speed	Length	Avg TT	5% TT	50% TT	95% TT	Reliability	
	1	▶ Wharf Road; Bethlehem Boulevard, MD 158; Peninsula Expressway, MD 157; Ba	16	13	3	47 mph	45 mi	58 m	46 m	56 m	1 h 15 m	1.12	
	2	► Tin Mill Road; Riverside Drive; Bethlehem Boulevard; Bethlehem Boulevard, MD	13	0	13	42 mph	29 mi	42 m	36 m	42 m	52 m	1.1	
	3	Peninsula Expressway, MD 157; Baltimore Beltway, I 695; I 95; I95, I 95	10	10	0	49 mph	29 mi	36 m	30 m	33 m	48 m	1.21	
	4	► Tin Mill Road; Riverside Drive; Bethlehem Boulevard; Bethlehem Boulevard, MD	10	0	10	47 mph	31 mi	40 m	34 m	37 m	55 m	1.19	
	5	Shipyard Road; Riverside Drive; Bethlehem Boulevard; Bethlehem Boulevard, MI	9	4	5	46 mph	45 mi	1 h 00 m	53 m	58 m	1 h 09 m	1.17	
	Total		914	531	383								



`AFTER': Route Map Isolating I-70 Pathways

🖃 Map	Rank	Route	# of Trips▼	Medium Vehicles	Heavy Vehicles	Avg Speed	Length	Avg TT	5% TT	50% TT	95% TT	Reliability
	1	► Tin Mill Road; Riverside Drive; Bethlehem Boulevard; Bethlehem Boulevard, MD 158; Balti	17	0	17	43 mph	34 mi	48 m	42 m	46 m	1 h 02 m	1.12
	2	► Cold Mill Road; Bethlehem Boulevard, MD 158; Baltimore Beltway, I 695; North Point Boule	7	0	7	41 mph	33 mi	48 m	36 m	45 m	1 h 02 m	1.25
	3	► 7th Street West; B Street; Tradepoint Avenue; Sparrows Point Boulevard, MD 151; Sparrov	6	2	4	41 mph	33 mi	48 m	42 m	49 m	54 m	1.04
	4	Tradepoint Avenue; Sparrows Point Boulevard, MD 151; Sparrows Point Road, MD 151; Net State S	5	1	4	42 mph	33 mi	47 m	38 m	44 m	57 m	1.15
	5	9th Street; 7th Street West; B Street; Tradepoint Avenue; Sparrows Point Boulevard, MD 1:	5	5	0	40 mph	26 mi	40 m	38 m	40 m	41 m	1
	Total		465	245	220							
				=						_		
₩ + - +	Lin	yanore T 70, US 40 90 displayed trips crossed here (both directions) 19% of all 465 trips 82 routes (highlighted on the map and the table) Routes: 6, 9, 8, 410, 409, 403, 401, 391, 388, 385, 38 Right-click segment to see full list of routes	dersburg	Holbrook DAFTEI Granite	Owings Mills	Pikesville		Tow	rson (41	Carne Parkville	Perry H	Hall
Urba	ana 270	G VA Screen line summary: Direction 2 ↓ Switch Cooksville © Zoom to screen line	H			A ^D 1%		Baltim	ore	6	Esse	×
5	109	Direction 1 🖍 Direction 2 🖍 Crossing Flow # Trips* % Trips		CALL.	Ellicott City	Catonsv [:] lle	X	55%	B	Bunde	цк	e ick River
irnesville		B Fort McHenry Tunnel (Bore 1), I C 50 55% Dayton		Columbia	λA		T					Er, emere
\sim		Beltway, I 695		ootunibid	S-2 Sala					Catal St	F	rom
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0000-000		E Baltimore Harbor Tunnel, I 895 I 1 1%		m			F	erndale		Т	-	
2		Total 91 100%					G	len Burni	e		0	Omapbox
Satellite		*# Trips is the sum of displayed routes through each crossing. Routes not	2				17		O Mart		A Contraction	and the second
		shown on map are not included.							© Mapb	ox @ Opens	reervap in	iprove this map

'BEFORE': Route Map Isolating I-95 Pathways (via black dot)

Map	Rank	Route	# of Trips ▼	Medium Vehicles	Heavy Vehicles	Avg Speed	Length	Avg TT	5% TT	50% TT	95% TT	Reliability	
2	1	▼ Wharf Road; Bethlehem Boulevard, MD 158; Peninsula Expressway, MD 157; Baltimore Beltway, I 695; I 70; I 70, US 40; Baltimore National Pike, I 70, US 40	16	13	3	47 mph	45 mi	58 m	46 m	56 m	1 h 15 m	1.12	
2	2	► Tin Mill Road; Riverside Drive; Bethlehem Boulevard; Bethlehem Boulevard, MD	13	0	13	42 mph	29 mi	42 m	36 m	42 m	52 m	1.1	
	3	Peninsula Expressway, MD 157; Baltimore Beltway, I 695; I 95; I95, I 95	10	10	0	49 mph	29 mi	36 m	30 m	33 m	48 m	1.21	
	4	► Tin Mill Road; Riverside Drive; Bethlehem Boulevard; Bethlehem Boulevard, MD	10	0	10	47 mph	31 mi	40 m	34 m	37 m	55 m	1.19	
1	5	 Shipyard Road; Riverside Drive; Bethlehem Boulevard; Bethlehem Boulevard, MI 	9	4	5	46 mph	45 mi	1 h 00 m	53 m	58 m	1 h 09 m	1.17	
	Total		914	531	383								

'AFTER': Route Map Isolating I-95 Pathways (via black dot)

🖨 Map	Rank	Route	# of Trips ▼	Medium Vehicles	Heavy Vehicles	Avg Speed	Length	Avg TT	5% TT	50% TT	95% TT	Reliability
	1	▼ Tin Mill Road; Riverside Drive; Bethlehem Boulevard; Bethlehem Boulevard, MD 158; Baltimore Beltway, I 695; North Point Boulevard, MD 151; Eastern Avenue, MD 150; I 95; Fort McHenry Tunnel (Bore 1), I 95; I95, I 95	17	0	17	43 mph	34 mi	48 m	42 m	46 m	1 h 02 m	1.12
	2	Cold Mill Road; Bethlehem Boulevard, MD 158; Baltimore Beltway, I 695; North Point Boulevard, MD 151; Eastern Avenue, MD 150; I 9	7	0	7	41 mph	33 mi	48 m	36 m	45 m	1 h 02 m	1.25
	3	> 7th Street West; B Street; Tradepoint Avenue; Sparrows Point Boulevard, MD 151; Sparrows Point Road, MD 151; North Point Bouleva	6	2	4	41 mph	33 mi	48 m	42 m	49 m	54 m	1.04
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'BEFORE': Route Map Isolating Bay Bridge Pathways (via black dot)

🕜 Map	Rank	Route	# of Trips ▼	Medium Vehicles	Heavy Vehicles	Avg Speed	Length	Avg TT	5% TT	50% TT	95% TT	Reliability	
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	4	Tin Mill Road; Riverside Drive; Bethlehem Boulevard; Bethlehem Boulevard, MD	10	0	10	47 mph	31 mi	40 m	34 m	37 m	55 m	1.19	
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	Total		914	531	383								

'AFTER': Route Map Isolating Bay Bridge Pathways (via black dot)

Observations Regarding Baltimore Port Resiliency

Less System Resiliency

Baltimore Harbor had three Crossings:

- Fort McHenry Tunnel
- Baltimore Harbor Tunnel
- Francis Scott Key Bridge

Impact to Daily Commuters

Francis Scott Key Bridge carried 12.4 million vehicles in 2023, averaging more than 34k vehicles/day. **Represents 15% of the total traffic** for the harbor crossings.

Impact to Commercial Traffic

Only crossing allowed for vehicles carrying HazMat's

Source: U.S. Department of Transportation, Bureau of Transportation Statistics April 30, 2025

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Thanks!

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The number of cargo vessels has decreased

Larger number of port ops / gov. vessels

South of the Key Bridge: Where were trucks coming FROM?

Trip Analytics

South of the Key Bridge: Where were trucks going TO?

North of the Key Bridge: Where were trucks coming

North of the Key Bridge: Where were trucks going TO?

