WELCOME

US 50 at Severn River Bridge Feasibility Study

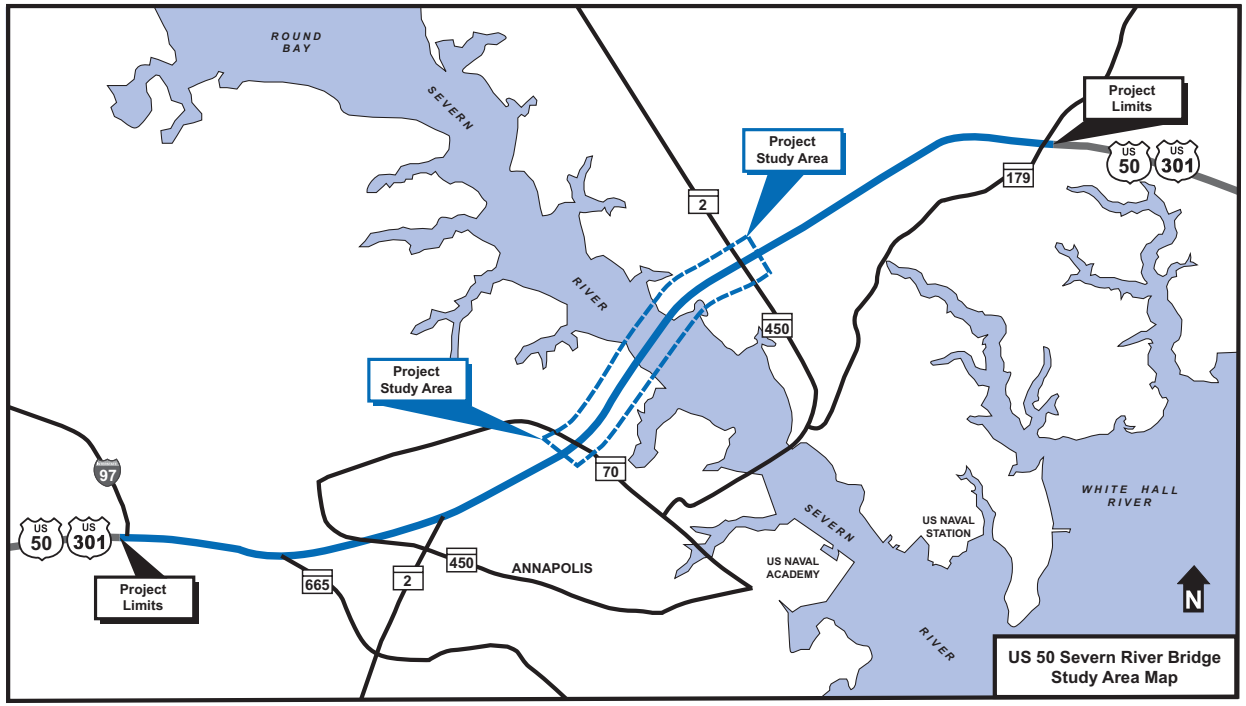
Open House - December 16, 2009

Purpose of the Meeting

- To introduce the US 50 at Severn River Bridge Feasibility Study
- To explain specific terminology and new engineering and design technologies
- To present preliminary concepts developed in the study

Project Location

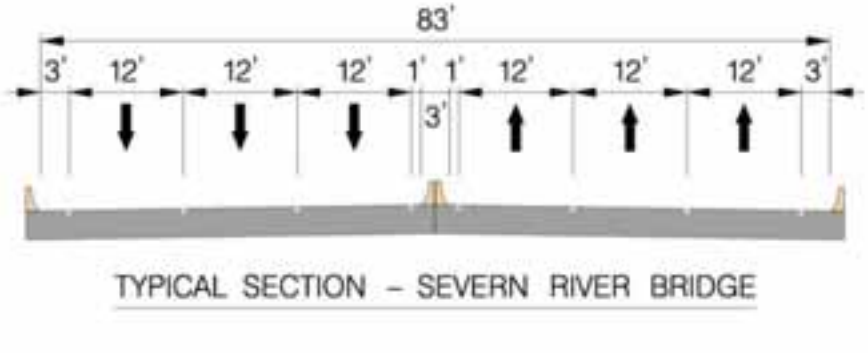
- US 50 from I-97 to MD 179 (St. Margarets Road)
- Eight Miles
- Eight Interchanges
- Severn River Bridge



Reasons for the Study

- Eliminate peak-period congestion approaching the Severn River Bridge
- Citizens have complained about recurring congestion
- The City of Annapolis has expressed concern that local streets are being used to avoid the congestion
- Anne Arundel and Queen Anne's counties have identified capacity improvements along US 50 as a priority in their annual transportation priority letter

US 50 Existing Conditions



TYPICAL SECTION – SEVERN RIVER BRIDGE

Original structure built in 1953

- Rehabilitated/widened in 1969 and 1988
- Not due for deck replacement for 20 years

What is a Feasibility Study?

- A feasibility study is an initial phase preceding SHA's formal project planning process.

- It is used to:
  - Define critical issues and study limits
  - Establish a problem statement
  - Develop and evaluate potential solutions and preliminary concepts

- It includes:
  - Travel demand, traffic operations, and safety
  - Engineering feasibility and costs
  - Identification of environmental resources

Feasibility Study Timeline

Project Development Process

This project is <u>not funded</u> beyond this Feasibility Study.

Concepts Being Considered

- Concept 1A – Reversible Lane
- Concept 1B – Add Eastbound Lane
- Concept 2A – Barrier-Separated ContraFlow Reversible Lanes
- Concept 4 – Lane Speed Control and Variable Speed Limits

Movable Barrier System

- A system of flexible concrete barrier and a barrier transfer machine to add capacity without widening the highway or bridge
- Lifts and moves a concrete median barrier to add a lane in the peak direction, while eliminating a lane in the non-peak direction
- Can be used as a permanent system or for temporary roadway construction

Concept 1A – Reversible Lane

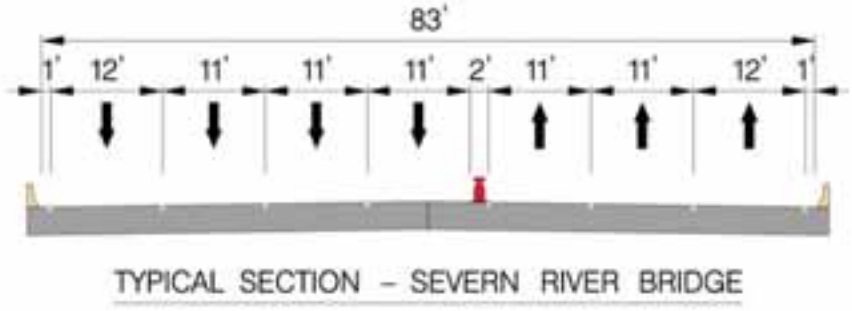
(Remove Existing Median Barrier, Install Movable Barrier)

- Remove existing median barrier from Ridgely Avenue Overpass to MD 2/MD 450 Interchange (1.6 miles)
- Re-stripe Severn River Bridge from six lanes to seven lanes
- **Install movable barrier**
- Four lanes in the peak direction
- Three lanes in the non-peak direction

Concept 1A – Reversible Lane

(Remove Existing Median Barrier, Install Movable Barrier)

A.M. Peak Hours

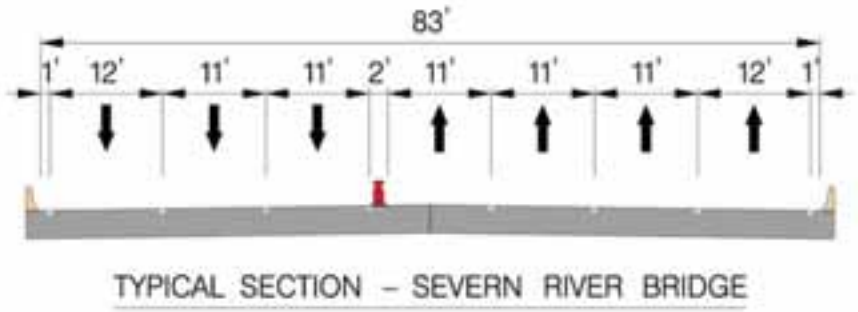


TYPICAL SECTION – SEVERN RIVER BRIDGE

Concept 1A – Reversible Lane

(Remove Existing Median Barrier, Install Movable Barrier)

P.M. Peak Hours



TYPICAL SECTION – SEVERN RIVER BRIDGE

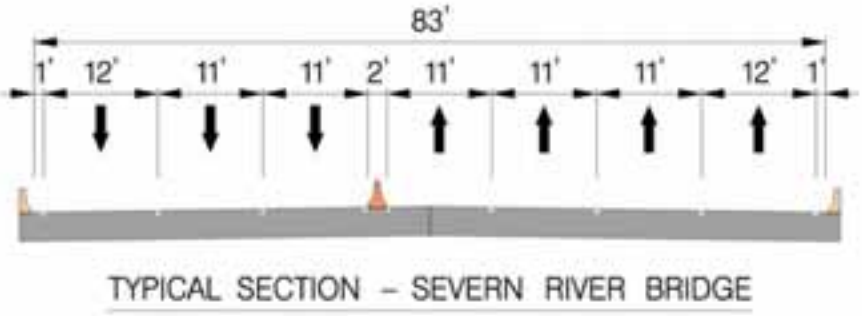
Concept 1B – Add Eastbound Lane

(Relocate Existing Median Barrier)

- Remove existing median barrier from Rowe Boulevard ramp merge to MD 2/MD 450 Interchange (1 mile)
- Re-stripe Severn River Bridge from six lanes to seven lanes
- **Install new permanent barrier**
- Four lanes in the eastbound direction
- Three lanes in the westbound direction
- Eastbound lanes shift to the left to eliminate the Rowe Boulevard merge

Concept 1B – Add Eastbound Lane

(Relocate Existing Median Barrier)



TYPICAL SECTION – SEVERN RIVER BRIDGE

Concept 2A – Reversible Lane

(Maintain Existing Median Barrier, Install Movable Barrier)

Concept 2A – Reversible Lane

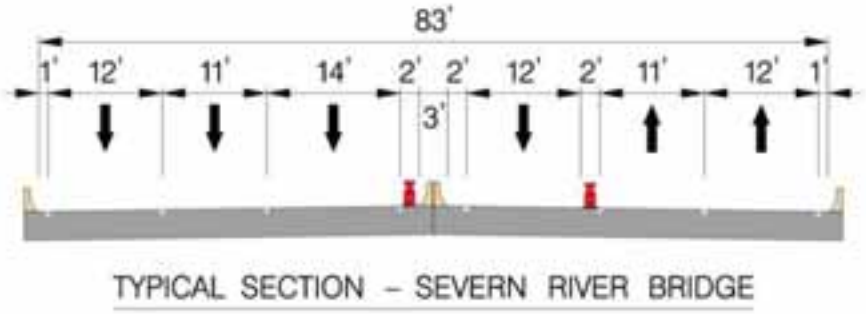
(Maintain Existing Median Barrier, Install Movable Barrier)

- Maintain existing median barrier
- Install movable barrier (two runs)
- Four lanes in the peak direction
- Two lanes in the non-peak direction

Concept 2A – Reversible Lane

(Maintain Existing Median Barrier, Install Movable Barrier)

A.M. Peak Hours

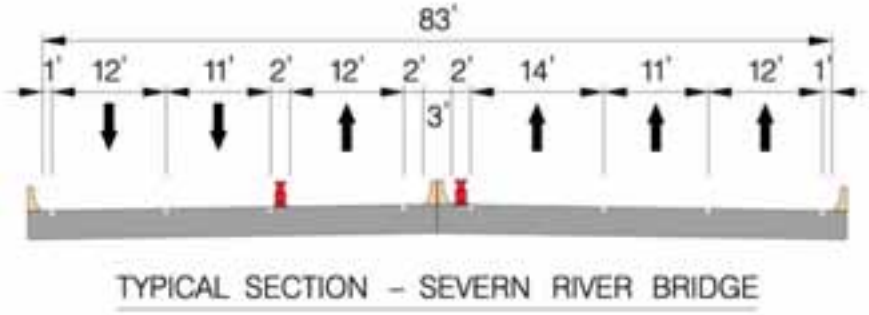


TYPICAL SECTION – SEVERN RIVER BRIDGE

Concept 2A – Reversible Lane

(Maintain Existing Median Barrier, Install Movable Barrier)

P.M. Peak Hours

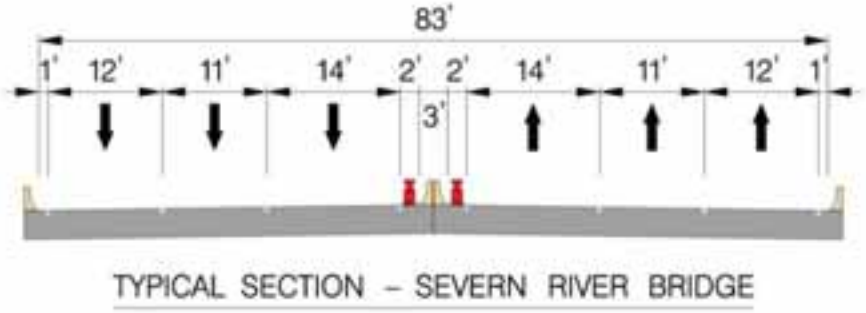


TYPICAL SECTION – SEVERN RIVER BRIDGE

Concept 2A – Reversible Lane

(Maintain Existing Median Barrier, Install Movable Barrier)

Off-Peak Hours



TYPICAL SECTION – SEVERN RIVER BRIDGE

Concept 4 – Lane Speed Control and Variable Speed Limits (VSL)

- No Lane Speed Control examples in the US.
- Federal Highway Administration identifies VSLs for work zones, congestion management, incident management, and weather advisories.
- Missouri uses VSLs for congestion management.
- Preliminary analyses are inconclusive or indicate a minimal reduction in traffic density. No measurable reduction in congestion observed.

Concepts Dropped from Consideration

- **Concept 2B, 2C, 2D – Barrier-Separated ContraFlow Reversible Lanes**
  Included varying lengths of Concept 2A. Analysis showed no benefit to the system or the bridge crossing by increasing the length of the reversible lane.

- **Concept 2E, 2F, 2G, 2H – No Barrier-Separation ContraFlow Reversible Lanes**
  Included varying lengths of Concept 2A without barrier separation (similar to current Bay Bridge operations). Analysis showed no benefit to the system or the bridge crossing by increasing the length of the reversible lane.

- **Concept 3 – Collector-Distributor (CD) Road / Express Lane**
  Extended the CD road from I-97 to Rowe Blvd. The CD system would provide barrier separation for local and commuter traffic but would not resolve congestion across the bridge.

- **Concept 5 – Ramp Metering / Signal Timing**
  Placed a signal at the Rowe Blvd. on-ramp to US 50. Analysis showed no reduction in congestion across the bridge.

- **Concept 6 – New Severn River Bridge**
  Would place a new bridge structure across the Severn River. Removed from the Feasibility Study as a short-term measure to relieve existing traffic congestion. The Feasibility Study allows for a new bridge study in the future, if needed.

Impact on User Delay

Roadway Conditions		Average Delay Per Vehicle (minutes)	
		US 50 EB	US 50 WB
Existing (2007)	Summer Friday	8	0
	Typical AM	0	4
	Typical PM	7	0
Concept 1A (2007)	Summer Friday	1	0
	Typical AM	0	1
	Typical PM	1	0
Concept 1B (2007)	Summer Friday	1	0
	Typical AM	0	5
	Typical PM	1	0
Concept 2A (2007)	Summer Friday	1	8
	Typical AM	0	1
	Typical PM	1	2
Concept 4* (2007)	Summer Friday	8	0
	Typical AM	0	4
	Typical PM	7	0

* Although simulation model shows no delay benefit for Concept 4, in actual practice Concept 4 may improve operations.

Notes: 1. All results based on calibrated VISSIM simulation model runs.

Better than Existing

Worse than Existing

Operational Benefits Summary

Benefit	Concept 1A	Concept 1B	Concept 2	Concept 4
Improves peak-period operations in the eastbound direction toward the Bay Bridge	Yes	Yes	Yes	Minimal
Improves peak-period operations in the westbound direction toward I-97	Yes	No*	Yes	No
Maintains good operations in the off-peak direction	Yes	Yes	No	Yes
Reduces overall system delay during the summer Friday peak period	Yes	Yes	No	Minimal
Preliminary cost (Millions, 2008 dollars)	$21 - $25	$16 - $19	$47 - $57	$1 - $2.5

* Concept 1B actually makes peak-period operations slightly worse in the WB direction

Environmental Inventory

- Streams and floodplains: Severn River, Mill Creek, Weems Creek, and associated tributaries
- Wildlife: anadromous fish and oysters
- Wetlands
- Woodlands
- State Wild and Scenic River: Severn River
- Parks / recreation areas: Baltimore and Annapolis Trail
- Hazardous material sites: gas station, armory, garage
- Located within Maryland's Coastal Zone and Critical Area of the Chesapeake and Atlantic Coastal Bays
- Environmental Justice Populations