

2.0 The Proposed Project and Alternatives Considered

This section describes MDTA and BCDOT’s Recommended Preferred Alternative, the process by which it was developed, and other alternatives which were considered and rejected. For further details, please refer to Appendix A, “Alternatives Development Technical Report.”

2.1 DEVELOPING THE ALTERNATIVES FOR CONSIDERATION

As described in Chapter 1, “Purpose and Need,” MDTA and BCDOT developed potential alternatives to accommodate the forecasted increased transportation demand on I-95 and the surrounding transportation network anticipated with the full build out of the City’s approved Port Covington Master Plan. In coordination with FHWA, several alternatives were considered for improvements to I-95 ramps and other nearby transportation facilities to support the ongoing and planned redevelopment of the Port Covington peninsula in south Baltimore by minimizing effects on mobility and safety, as well as enhancing multi-modal connections to the peninsula.

To simplify a complex project, the improvements under consideration were broken down into seven elements as shown in Table 2-1.

Table 2-1: Project Elements

Designation	Element	Locations
A	I-95 Northbound Off-Ramps	<ul style="list-style-type: none"> • I-95 NB to Hanover Street SB • I-95 NB to McComas Street
B	I-95 Northbound On-Ramps	<ul style="list-style-type: none"> • Key Highway to I-95 NB
C	I-95 Southbound Off-Ramps	<ul style="list-style-type: none"> • I-95 SB to Key Highway
D	I-95 Southbound On-Ramps	<ul style="list-style-type: none"> • McComas Street WB to I-95 SB • Hanover Street NB to I-95 SB
E	Hanover Street	<ul style="list-style-type: none"> • Between Wells and McComas Streets
F	McComas Street and Key Highway	
G	Pedestrian and Bicycle Connections	<ul style="list-style-type: none"> • Hanover Street • Key Highway • McComas Street • Shared-Use Path

Several options were developed for each element. These were combined into four distinct alternatives for analysis purposes – Alternative 1, the No Build Alternative, and three Build Alternatives. These four alternatives were analyzed to determine how well they meet the project’s stated Purpose and Need and the effects each has on future traffic operations both on I-95 and on surface streets.

2.2 THE ALTERNATIVES ANALYZED

Alternative 1 (No Build Alternative)

The *Port Covington Master Plan* is already approved and construction is underway. The proposed development can be built regardless of whether any improvements to I-95 or the local street network are implemented. Therefore, the No Build Alternative assumes the entire Port Covington development is in place. It also assumes the increased traffic associated with the full build out of the development, as approved. Under the No Build Alternative the various ramps to and from I-95, McComas Street, Hanover Street, and Key Highway generally remain as they are today except for at-grade intersections added to the surface streets that would be necessary to tie into the proposed development.

Alternatives 2, 3, and 4

Several build options were developed for each of the seven elements. These were combined into three distinct Build Alternatives for analysis purposes and to determine whether or not they meet the project's purpose and need. The alternatives were then analyzed to determine the effects each would have on future traffic operations, both on I-95 and on the surface streets. The options under consideration for each element were combined into the three initial Build Alternatives through MDTA's and BCDOT's professional judgment and experience with similar projects. The three initial Build Alternatives were vetted with FHWA prior to their evaluation in the alternatives analysis. For details on the elements and options in each Build Alternative, please refer to Appendix A, "Alternatives Development Technical Report."

2.3 ALTERNATIVES ANALYSIS

Several traffic operational analysis software programs were used to evaluate select measures of effectiveness (MOEs) for the existing condition, 2040 No Build condition, and the three Build Alternatives. Highway Capacity Software (HCS), VISSIM, and Synchro were used in conjunction with modeled long-range travel forecasts to form a comparison between the No Build and Build Alternatives. Roadway capacity and traffic operations analyses were conducted for the freeway mainline, weaving segments, merge and diverge junctions, surface street intersections, and ramp terminal intersections within the study area. For more details on the traffic analysis, please refer to Appendix B, "Traffic Analysis Report."

The four initial alternatives (No Build and three Build Alternatives) evolved from an iterative process involving engineering, planning, and environmental considerations; review and comment; refinement and revision; and eventual screening of the alternatives. Key performance measures include travel time, vehicle throughput, queuing, and level of service. Each element's options were also compared to identify the highest performing ones. Project planning and design criteria were developed in coordination with MDTA, BCDOT, and the community.

The traffic analysis finding for each of the Build Alternatives (2, 3, and 4) provided noticeable improvements over that of Alternative 1/No Build. They were found to have less delay, lower unserved demand, and faster travel times. However, the improvements that would result from the Build Alternatives varied widely in effectiveness. As Table 2-2 shows the travel times for Alternatives 3 and 4 were found to be approximately half of the travel time for Alternative 1/No-Build. The findings indicate

that for each project element one option clearly outperforms the others. These high performing options were combined to create a fourth Build Alternative – Alternative 5, as MDTA and BCDOT believed that combining the most optimal options or variations of options for each element could improve upon the overall results.

Table 2-2: Alternatives Comparison Summary

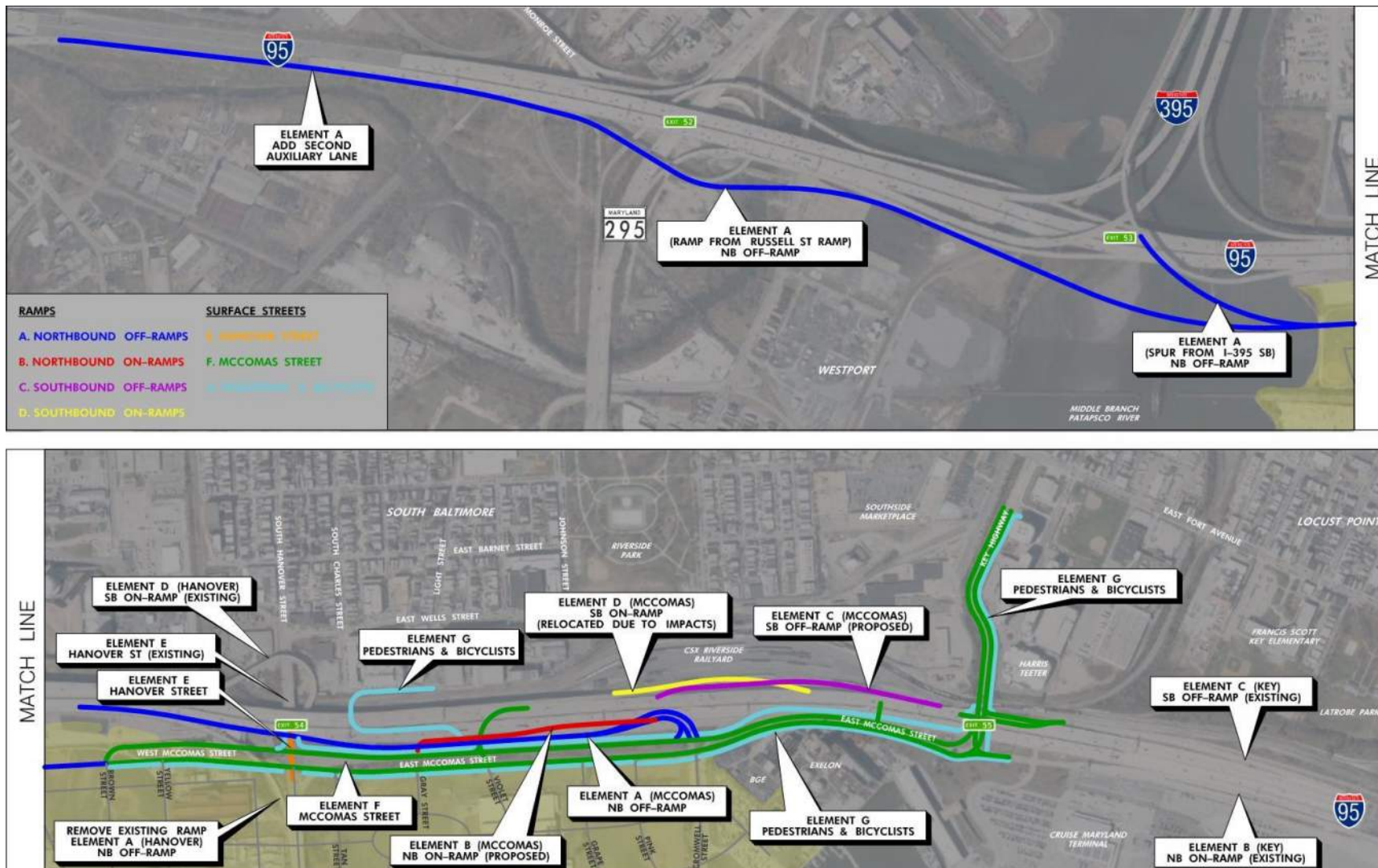
	Traffic Impacts											
	Network Measures of Effectiveness (from VISSIM)				Travel Time Comparison (I-695 to/from Fort McHenry Toll Plaza)							
	AM		PM		AM				PM			
	Total Delay (Hours)	Unserviced Demand (Vehicles)	Total Delay (Hours)	Unserviced Demand (Vehicles)	NB Travel Time (MM:SS)	NB Average Speed (MPH)	SB Travel Time (MM:SS)	SB Average Speed (MPH)	NB Travel Time (MM:SS)	NB Average Speed (MPH)	SB Travel Time (MM:SS)	SB Average Speed (MPH)
Alternative 1 / No-Build	5,221	11,304	7,312	22,629	21:30	21	13:17	33	20:20	22	13:26	33
Alternative 2	4,055	9,557	4,903	9,719	16:40	27	13:11	33	13:44	33	14:58	29
Alternative 3	3,670	8,149	3,615	9,726	11:10	40	13:17	33	9:19	48	13:15	33
Alternative 4	3,699	8,519	3,506	7,403	10:47	41	12:59	34	8:53	50	13:37	32
Alternative 5	3,355	6,910	3,027	7,025	10:42	42	12:44	34	8:28	53	13:09	33

The traffic analysis findings indicate Alternative 5 performs the best. Thus, it was selected for detailed evaluation in this EA and was identified by MDTA and BCDOT as their Recommended Preferred Alternative.

2.4 RECOMMENDED PREFERRED ALTERNATIVE (ALTERNATIVE 5)

The following describes the Recommended Preferred Alternative. It is shown on Figure 2-1. For more details, please refer to Appendix A, “Alternatives Development Technical Report.”

Figure 2-1: Recommended Preferred Alternative



Element A: I-95 Northbound Off-Ramps

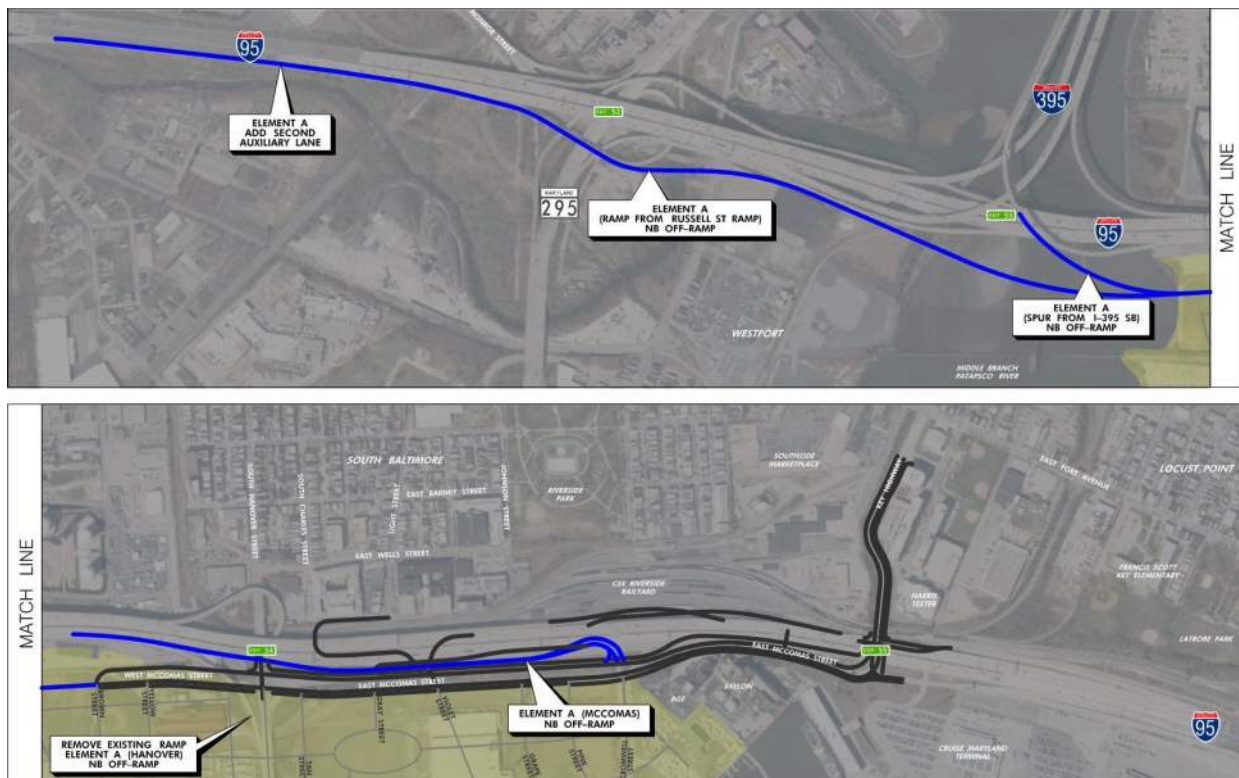
Exit 52: New Ramp from Russell Street Off-Ramp – The existing auxiliary lane between the Caton Avenue on-ramp and the Russell Street off-ramp would be widened to two lanes. The Russell Street off-ramp will also be widened to two lanes until it crosses over MD 295. At that point, the two lanes will split with one continuing to northbound Russell Street and the second continuing east, over the Middle Branch, parallel to the existing ramps adjacent to I-95 northbound, merging with the new spur ramp from I-395 southbound, to connect to McComas Street.

Exit 53 Interchange: New Spur from I-395 Southbound Ramp – A new ramp spur, splitting off from the existing I-395 southbound ramp to I-95 northbound, will merge with the new Russell Street spur ramp, connecting to McComas Street at an at-grade intersection on the western side of Port Covington.

Exit 54: Remove Ramp from I-95 Northbound to Hanover Street Southbound – The existing ramp will be removed. Vehicles traveling from I-395 southbound to MD 2 southbound will be accommodated by the new ramp spur from I-395 southbound.

Exit 55: Reconstruct Ramp from I-95 Northbound to McComas Street – The ramp will be realigned to accommodate the new I-95 northbound on-ramp, modifications to McComas Street, and the removal of the existing Hanover Street ramp from I-95 northbound. The realigned ramp will extend the existing auxiliary lane that terminates at the Hanover Street exit another 1,600 feet. The new two-lane exit ramp will run under I-95 northbound and daylight at a signalized intersection with McComas Street, near Cromwell Street.

Figure 2-2: Recommended Preferred Alternative – Element A

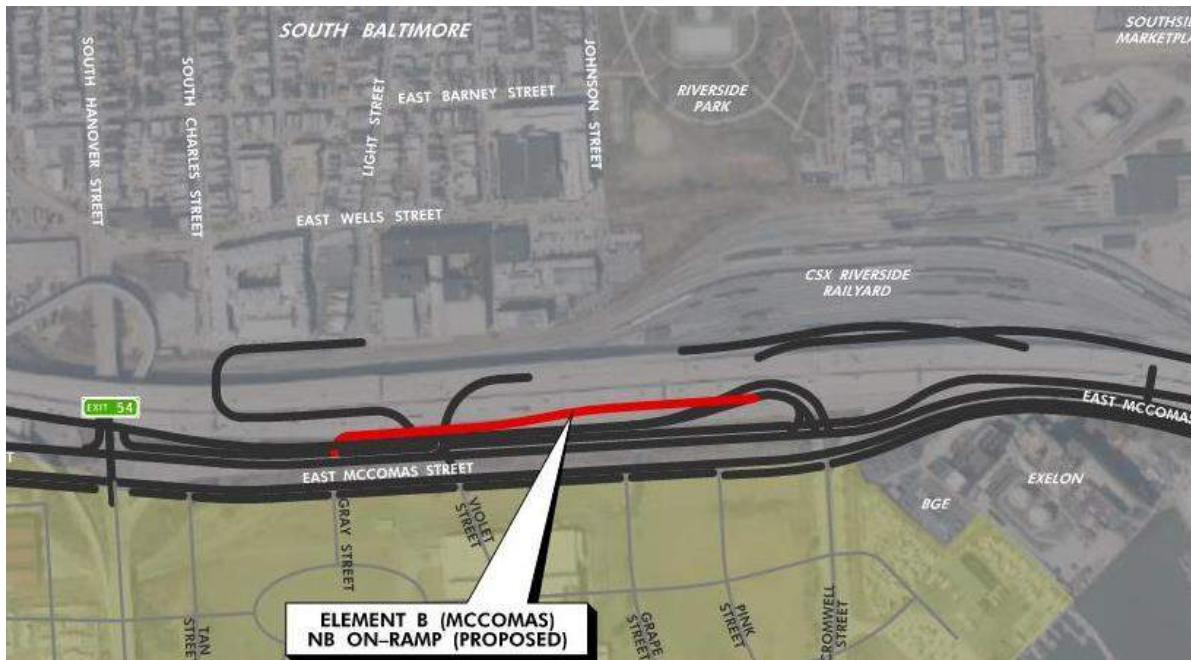


Element B: I-95 Northbound On-Ramps

Key Highway to I-95 Northbound Ramp – No modifications to the existing ramp are proposed.

McComas Street to I-95 Northbound Ramp – A new ramp from McComas Street to I-95 northbound, is proposed just east of its intersection with Hanover Street.

Figure 2-3: Recommended Preferred Alternative – Element B

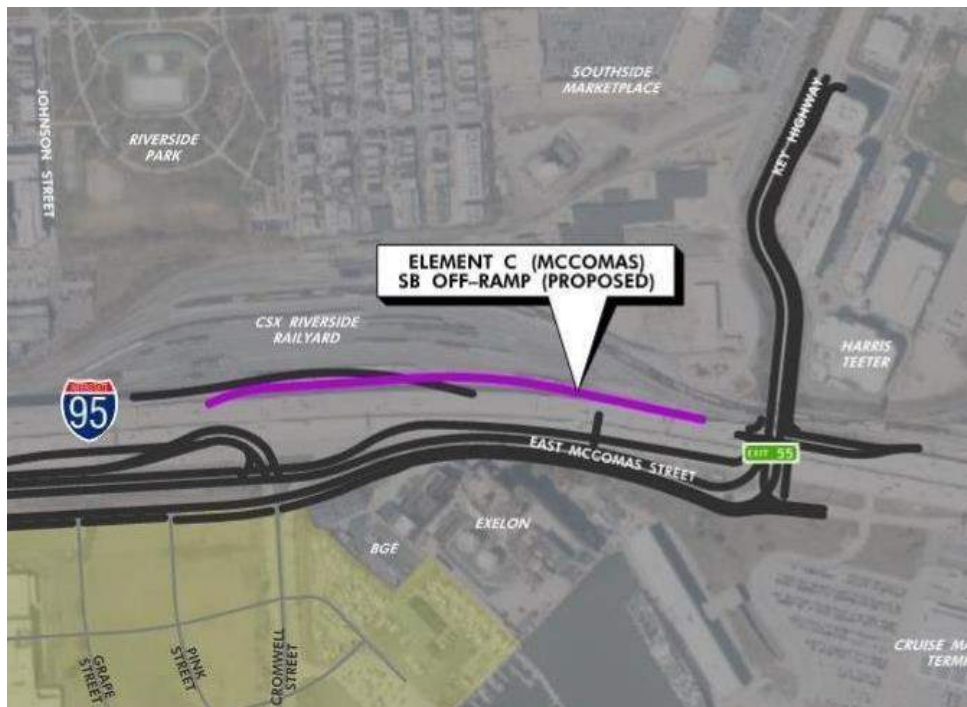


Element C: I-95 Southbound Off-Ramps

Exit 55: I-95 Southbound to Key Highway Ramp – No modifications to the existing ramp are proposed.

Exit 54: I-95 Southbound to McComas Street Westbound Ramp – A new ramp, with a gore located approximately 400 feet west of the Key Highway overpass is proposed. It will provide access to the one-way section of McComas Street westbound located directly beneath I-95 southbound and will require the relocation of two CSX storage tracks.

Figure 2-4: Recommended Preferred Alternative – Element C

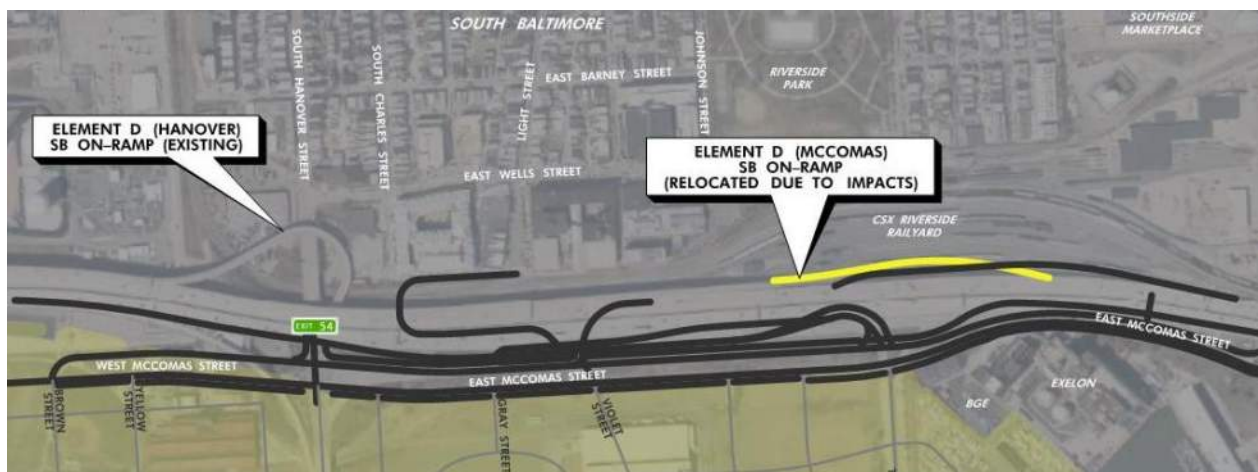


Element D: I-95 Southbound On-Ramps

Exit 55 Interchange: McComas Street Westbound to I-95 Southbound – The existing ramp will continue to provide access from the one-way section of McComas Street westbound to I-95 southbound, but will be realigned to minimize construction cost and duration.

Exit 54 Interchange: Hanover Street Northbound to I-95 Southbound – No modifications to the existing ramp are proposed.

Figure 2-5: Recommended Preferred Alternative – Element D



Element E: Hanover Street

From Wells Street to McComas Street – No modifications to this section of Hanover Street are proposed.

From Southern end of CSX Bridge to McComas – Hanover Street will be reconstructed to accommodate the new grading for the proposed development.

Figure 2-6: Recommended Preferred Alternative – Element E



Element F: McComas Street & Key Highway

McComas Street west of Key Highway – McComas Street will be converted to a two-way boulevard from the western side of the Port Covington peninsula to Key Highway. The boulevard will accommodate vehicular and multi-modal connections between South Baltimore, I-95, and the Port Covington development. The median will be designed to accommodate a future light rail spur from Westport anticipated to terminate prior to the existing intersection of McComas and Cromwell Streets. The existing one-way section of McComas Street westbound beneath I-95 southbound will remain in its current location, but be modified to accommodate the addition of an exclusive right-turn lane at the approach to the Key Highway intersection, the addition of the I-95 southbound to McComas Street westbound ramp (Element C), and the tie-in to the proposed two-way McComas Street “boulevard”.

Key Highway – The existing roadway will be widened from a four-lane section (2 northbound & 2 southbound) to a five-lane section (3 northbound & 2 southbound) between the McHenry Row and McComas Street intersections. Additionally, a 450’ long southbound right-turn lane will be added at the McComas Street intersection. The CSX bridge over Key Highway, just north of the McComas Street intersection, will be reconstructed to accommodate the new width of Key Highway.

Figure 2-7: Recommended Preferred Alternative – Element F



Element G: Pedestrians and Bicycles

Hanover Street – The existing sidewalks on Hanover Street will remain unchanged on the bridge over the CSX tracks. South of the bridge over the CSX tracks, a new sidewalk is proposed along the west side of Hanover Street, running south to the Mccomas Street intersection.

Key Highway – An 11-foot wide shared-use path will be provided on the east side of Key Highway between the intersections of McHenry Row and Mccomas Street.

Mccomas Street – Sidewalks will be installed along both sides of the new Mccomas Street “boulevard”. Likewise, a shared-use path will be installed along the north side of Mccomas Street between the Cromwell Street and Key Highway intersections.

New Shared-Use Bridge/Path – A new shared-use path, linking South Baltimore to Port Covington will be constructed. The path will run parallel to the south side of Winder Street, ramping up from the Light Street intersection. A pedestrian staircase will connect to the path from Charles Street. At the Charles Street intersection, the ramp will turn south, cross over the CSX tracks (but beneath I-95), then turn east to connect to the shared-use path proposed along the north side of Mccomas Street.

Figure 2-8: Recommended Preferred Alternative – Element G



2.5 CONCEPTUAL COST ESTIMATE – RECOMMENDED PREFERRED ALTERNATIVE

Conceptual cost estimates for the improvements proposed by Alternative 5 were developed using the MDOT SHA 2016 Highway Cost Estimating Manual as guidance. The estimate used major quantities and conservatively estimated unit prices. Percentages were applied to Category 1 (Preliminary/MOT), Category 3 (SWM/Drainage), and Category 7 (Landscaping). Utility relocation costs were assumed to be 8% for elevated elements and 15% for at-grade elements. A 40% contingency and 12.3% overhead and administration were applied. An additional 7.91% was applied as a general overhead rate for the elements anticipated to require CSX coordination. The conceptual estimated costs per element is provided in Table 2-3.

Right-of-way will be acquired to accommodate the proposed improvements. The acquisitions will provide access to the proposed improvements from public right-of-way and provide sufficient space for all construction and staging activities. Preliminary right-of-way acquisition costs total \$16.7 million. The right-of-way costs include one property displacement for the warehouse located at 1915 Annapolis Road which is being impacted by Element A, full and partial acquisitions, and temporary construction easements. The land values and displacement costs were estimated based on recent transactions in the area and information included in the Maryland Department of Taxation and Assessment Real Property Database, Maryland Land Records Database, and Costar Database.

Costs associated with impacts to the CSX Riverside Railyard and the CSX tracks impacted by the reconstruction of the CSX bridge over Key Highway are anticipated, but have not yet been estimated due to coordination difficulties with CSX.

Table 2-3: Conceptual Cost Estimate* – Recommended Preferred Alternative

Project Element	Estimated Cost
Right of Way**	\$15M to \$20M
Element A: I-95 Northbound Off-Ramps	\$300M to \$315M
Element B: I-95 Northbound On-Ramps	\$20M to \$25M
Element C: I-95 Southbound Off-Ramps	\$25M to \$30M
Element D: I-95 Southbound On-Ramps	\$10M to \$15M
Element E: Hanover Street	\$0M
Element F – McComas Street & Key Highway	\$60M to \$65M
Element G – Pedestrian & Bicycle Connections	\$20M to \$25M
Total	\$450M to \$495M

*Estimated construction costs only

** Does not include CSX acquisition or track costs

2.6 CONSTRUCTION PHASING

Potential construction phasing, as shown in Table 2-4, has been developed based on the sequence that would minimize disruption to existing traffic. This phasing is preliminary and will be refined during final design. It is anticipated that the number of existing lanes will be maintained throughout construction and lane shifts will be necessary to maintain the number of lanes during construction.

Table 2-4: Potential Construction Phasing

Project/ Contract	Description/ Elements	Duration	Start	End
1	<ul style="list-style-type: none"> SB exit ramp to McComas St. (Element C) SB entrance ramp from McComas St. (Element D) CSX ROW acquisition/track relocation Notes: Construction cannot start until CSX ROW acquired and tracks are relocated	36 months	Early 2020	End 2022
10	CSX bridge over Key Highway (Element C) Notes: Must be completed before Key Hwy. widening (Contract 4)	30 months	Mid 2020	End 2022
2	McComas St. from Hanover St. to Key Highway (Element F) Notes: Construction cannot start until preliminary work is complete	30 months	Early 2021	Mid/Late 2023
3	NB exit ramp to McComas St. (Element A) Notes: <ul style="list-style-type: none"> Must be completed concurrent with McComas Street (Contract 2) Exit must remain open at all times 	36 months	Mid/Late 2020	Mid/Late 2023
4	<ul style="list-style-type: none"> Key Highway SB exit ramp intersection improvements (Element C) Key Highway widening (Element C) Notes: <ul style="list-style-type: none"> Preferable for ramp construction to begin after new SB exit ramp is constructed (Contract 1) Cannot widen Key Hwy. until CSX bridge replaced 	18 months	Mid 2023	End 2024
5	McComas St. west of Hanover St. (Element F) Notes: Must be completed, at least sufficiently to provide eastbound access to Hanover Street, prior to new NB exit ramps (Russell St. and I-395) (Contract 6)	18 months	Mid 2025	End 2026
6	<ul style="list-style-type: none"> NB Russell St. ramp/spur/bridge (Element A) I-395 SB ramp spur (Element A) Notes: Constructed prior to beginning of development and infrastructure improvements on the west side of the PC site	48 months	Early/Mid 2022	Early/Mid 2026
7	Removal of NB ramp to Hanover St. (Element A) Notes: Cannot remove ramp until new NB exit ramps have been constructed (Contracts 3 and 5)	12 months	Late 2025	Mid/Late 2026
8	NB entrance ramp from McComas St. (Element B) Notes: Can be constructed any time after McComas St., but likely not needed until after other ramps	30 months	Early 2026	Mid 2028
9	New pedestrian bridge over CSX/under I-95 (Element G) Notes: Can be constructed any time after McComas St.	30 months	Early 2029	Late 2029