Richmond Regional Transportation Planning Organization

AGENDA

RICHMOND REGIONAL TRANSPORTATION PLANNING ORGANIZATION

POLICY BOARD

Thursday, November 5, 2020
9:30 a.m.

Members of the public may observe the meeting via YouTube Live Streaming on the PlanRVA YouTube Channel. Opportunities for sharing comments are described in the Public Participation guide.

WELCOME AND INTRODUCTIONS (Paige).....

PLEDGE OF ALLEGIANCE (Paige) .....

STATEMENT REGARDING VIRTUAL MEETINGS (Parsons) .....page 1

ROLL CALL & CERTIFICATION OF A QUORUM (Parsons) .....

A. ADMINISTRATION

1. **Consideration of Amendments to the Action Meeting Agenda**
   (Paige).....

2. **Approval of October 1, 2020 RRTPO Policy Board Action Meeting Minutes**
   (Paige).....page 2
   ACTION REQUESTED

3. **RRTPO Chair's Report**
   (Paige/5 minutes).....

4. **RRTPO Secretary's Report**
   (Parsons/5 minutes).....page 12
   a. Current Work Efforts
   b. RRTPO Work Status and Financial Report for September 2020
   c. Port of Virginia Update
   d. MPO Boundaries and Rural Jurisdictions – RRTPO Boundaries Adjustments Update
   e. CVTA Update

B. NEW BUSINESS

1. **Virginia Department of Rail and Public Transportation Passenger Rail Update**
   (Mitchell/VDRPT/20minutes) .....

2. **I-95/RMT/Commerce Road Corridor Access Study**
   (Parsons/15 minutes).....*page 26*
   ACTION REQUESTED

C. AGENCY AND COMMITTEE REPORTS

1. **Transportation Agency Updates**
   (VDOT, DRPT/10 minutes) .....
   a. VDOT – Mann
   b. DRPT – DeBruhl

D. OTHER BUSINESS

1. **Public Comment Period - Open**
   (Paige/5 minutes) .....

2. **Future Meeting Topics**
   (Paige/5 minutes) .....page 28

3. **RRTPO Member Comments**
   (Paige/5 minutes) .....

4. **Next Meeting: December 3, 2020**
   (Paige).....

E. ADJOURNMENT

CAP/nm
Attachments

Richmond Regional Transportation Planning Organization

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Opening Statement for Electronic Meetings

Due to the 2020 COVID-19 virus and current guidance regarding physical distancing to reduce the potential for spread, meetings of the Richmond Regional Planning District Commissions have transitioned to a virtual format in accordance with provisions of Virginia Code § 2.2-3708.2 and related legislation approved by the General Assembly of Virginia during the period of the Governor's State of Emergency Declaration for COVID-19.

While we meet in a remote/virtual format, we remain committed to public accessibility and opportunity to participate. Staff provided notice of this meeting to members and the public on October 26, 2020 through electronic posting on the PlanRVA website and email distribution of notice to members, alternates, and known interested parties, including the media.

This meeting will be recorded. Audio and visual recordings of the meeting and materials will be posted on the PlanRVA website within 48 hours of this meeting.

Any member of the public participating as an observer during the meeting today may submit comments or questions at any time prior to or during the meeting via email at rrtpoinput@PlanRVA.org. All comments and questions submitted at this time will be reviewed following the meeting and to the extent practical, responses will be provided or posted on the PlanRVA website.

We ask that members identify themselves first when speaking so we can more accurately record the activities of the meeting. All lines should be muted to minimize additional noise and feedback. You may unmute your line at any time to request acknowledgement from the Chair.

Does anyone have any questions regarding the process for assuring effective facilitation of this meeting or for how members of the public may participate?

By reading this statement, staff certifies that we have followed the approved procedures for appropriate notice of this meeting and the means by which we are convening.

Now, please indicate your presence by saying "HERE" when your name is called during a roll call. Anyone who wishes to identify themselves following the roll call of members will be invited to do so.

<Pause for Roll Call>

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Agenda Item A.2.

Minutes of the October 1, 2020 RRTPO Policy Board Action Meeting

1

REQUESTED ACTION

The RRTPO is requested to approve the Minutes of the October 1, 2020 RRTPO Policy Board action meeting as presented.

Richmond Regional Transportation Planning Organization

RICHMOND REGIONAL TRANSPORTATION PLANNING ORGANIZATION
POLICY BOARD

MINUTES OF ACTION MEETING
GoToMeeting
October 1, 2020
9:30 a.m.

MEMBERS and ALTERNATES (A) PRESENT:

Charles City County		**Chesterfield County**		**City of Richmond**	
William G. Coada FY21 Vice Chair		Kevin P. Carroll	x	Andreas D. Addison	x
		James M. Holland	x	Kimberly B. Gray	x
		Christopher Winslow	x	Stephanie A. Lynch	
		Leslie Haley (A)		Cynthia I. Newbille	x
				Chris A. Hilbert (A)	
				Michael J. Jones (A)	
				Kristen Nye Larson (A)	
				Ellen F. Robertson (A)	
Goochland County		**Hanover County**		**Henrico County**	
John L. Lumpkins Jr.		Sean M. Davis	x	Patricia S. O'Bannon	x
Neil Spoonhower	x	W. Canova Peterson IV	x	Frank J. Thornton	x
Susan F. Lascolette (A)		Faye O. Prichard (A)		Thomas Branin (A)	
Todd Kilduff (A) (NEV)		J. Michael Flagg (A) (NEV)			
New Kent County		**Powhatan County**		**Town of Ashland**	
Patricia A. Paige FY21 Chair	x	Larry J. Nordvig	x	John H. Hodges	x
C. Thomas Tiller Jr.		David T. Williams	x	Anita Barnhart (A)	
Thomas W. Evelyn (A)		Bret Schardein (A) (NEV)			
Capital Region Airport Commission		**GRTC Transit System**		**RMTA**	
John B. Rutledge		Julie E. Timm	x	Joi Taylor Dean	x
		Sheryl Adams (A)			
Secretary of Transportation or Designee		**CTAC**		**DRPT**	
R. Shane Mann	x	Robert L. Basham Jr. (non-voting)		Jennifer B. DeBruhl (non-voting)	x
Mark E. Riblett (A)	x			Tiffany T. Dubinsky (A) (non-voting)	x
FHWA		**FTA**		**RideFinders**	
Thomas L. Nelson Jr. (non-voting)		Daniel Koenig (Liason)		Von S. Tisdale (non-voting)	x
Richard Duran (A) (non-voting)	x			Cherika N. Ruffin (A) (non-voting)	
DOAV					
P. Clifford Burnette Jr. (non-voting)					

*NEV – not eligible to vote

The RRTPO Policy Board meeting was held by electronic communication means as set forth by the April 22, 2020 actions of the General Assembly in response to the continued spread of novel coronavirus, or COVID-19. The technology used for this meeting was a web-hosted service created by GoToMeeting and was open and accessible for participation by members of the public. Voting record tables are included in Appendix A. A recording of this meeting is available on our Plan RVA YouTube Channel.

CALL TO ORDER

The Richmond Regional Transportation Planning Organization (RRTPO) Policy Board Chair, Patricia A. Paige, presided and called the October 1, 2020 RRTPO Policy Board action meeting to order at 9:32 a.m.

ATTENDANCE ROLL CALL & CERTIFICATION OF MEETING QUORUM

Nicole Mueller, Program Coordinator, took attendance by roll call. Chet Parsons, RRTPO Secretary, certified that a quorum was present.

A. ADMINISTRATION

1. **Approval of RRTPO Policy Board Meeting Agenda**
   On motion of David T. Williams, seconded by Andreas D. Addison, the RRTPO Policy Board unanimously approved the October 1, 2020 meeting agenda as presented (see Appendix A).

2. **Approval of September 3, 2020 RRTPO Policy Board Meeting Minutes**
   On motion of Patricia S. O'Bannon, seconded by W. Canova Peterson IV, the RRTPO Policy Board unanimously approved the minutes of the September 3, 2020 meeting as presented (see Appendix A).

3. **Public Comment Period – October 1, 2020 Agenda**
   There were no requests to address the RRTPO Policy Board.

B. NEW BUSINESS

1. **Action on Smart Scale Round 4 Local Project Endorsements**
   On motion of Cynthia I. Newbille, seconded by Patricia S. O'Bannon, the Richmond Regional Transportation Planning Organization (RRTPO) Policy Board unanimously approved the following resolution (see Appendix A):

   ***WHEREAS**, all Smart Scale projects within the MPO area not included in or consistent with the Constrained Long-Range Plan (CLRP) require a resolution of support from the Richmond Regional Planning Organization (RRTPO) Policy Board;*

   ***WHEREAS,** all transit agency projects within the MPO study area require a resolution of support from the RRTPO policy board;*

   ***WHEREAS**, all locality-sponsored Smart Scale applications addressing needs on Corridors of Statewide Significance also require a resolution of support from the RRTPO Policy Board; therefore, be it*

***RESOLVED**, that the RRTPO Policy Board supports submission of the following locality and transit agency projects in the MPO study area for Smart Scale Round 4:*

Project ID	Sponsor	Title
7065	Ashland	Hill Carter Parkway Extension
7055	Ashland	Ashcake Road Pedestrian Improvements
7008	Ashland	Vaughn Road Overpass
6930	Chesterfield	288/360: Route 360 at Brad McNeer Continuous Green-T Intersection
6991	Chesterfield	Alverser Drive/Old Buckingham Road Roundabout
6992	Chesterfield	Ashland-to-Petersburg Trail: Route 1 NB (Elliham Avenue - Dwight Avenue)
6993	Chesterfield	Route 60 (Providence Road - Wadsworth Drive) Multiuse Trail
6994	Chesterfield	Dundas Road (Route 1 - Wentworth Street) Bike and Pedestrian Improvement
7016	Chesterfield	Courthouse Road (Route 10 - Pocahontas State Park) Trail
7128	Chesterfield	Hopkins Road/Chippenham Parkway Interchange Improvement
7129	Chesterfield	Route 60/Chippenham Parkway Access and Pedestrian Improvements
7159	Chesterfield	Ashland-to-Petersburg Trail: Route 1 (Falling Creek Ave. - Food Lion) Bike, Ped & Transit Improvements
6973	Goochland	Rte 288 - New SB Auxiliary Lane South of U.S. 250
6975	Goochland	I-64 at Ashland Rd. (Rte. 623) Interchange
6968	Goochland	I-64 at Oilville Road (Rte. 617) Interchange
6995	GRTC	Route 1 Transit Accessibility Improvements
7042	GRTC	Williamsburg Rd Pedestrian & Transit Improvements
6656	GRTC	A Arts District BRT Station Pedestrian Safety/Streetscape

6823	GRTC	Articulated Vehicles for Bus Rapid Transit Expansion
6661	Hanover	Walnut Grove Rd/Creighton Rd/Creighton Pkwy Roundabout
6667	Hanover	Route 1/Route 30 Green-T
6668	Hanover	Sliding Hill Road/Peaks Road Roundabout
6669	Hanover	Lewistown Road/Ashcake Road Roundabout
6721	Henrico	Magellan Parkway Extension Project
6724	Henrico	Springfield Road Improvements
6828	Henrico	Parham Road and I-64 Interchange Improvements
6949	Henrico	Staples Mill Road Improvements
6893	Henrico	W Broad St Short Pump
6899	Henrico	Nine Mile Road Multimodal Mobility and Safety Improvements
7014	Henrico	Nine Mile Road Roadway Reconfigurations & Ped Safety Project
6811	Henrico	Woodman Road Improvements
6898	Henrico	Brook and Hilliard Road Diet
6904	Henrico	Longdale Trail and Intersection Improvements
6986	Powhatan	Carter Gallier Boulevard Extension: Phase II
7003	Powhatan	U.S. Route 60 at Stavemill Road: Westbound Left-Turn Lane
7007	Powhatan	U.S. Route 60 at State Route 13/603 RCUT
7031	Powhatan	U.S. Route 60 at Red Lane Rd: Continuous Green-T
6653	Richmond	H Belt Boulevard (SR 161) Streetscape
6654	Richmond	I Government Road
6655	Richmond	J Hey Road Streetscape
6649	Richmond	D US Route 1 Phase II Improvements
6648	Richmond	C US 360 Hull Street Phase II
6652	Richmond	G Commerce Road Streetscape
6646	Richmond	A Gillies Creek Greenway
6647	Richmond	B James River Branch - Rail to Trail Greenway

6650	Richmond	E Forest Hill Avenue Phase II Improvements
6651	Richmond	F Clay Street Streetscape Improvements

3. Action on MPO Boundaries and Rural Jurisdictions

On motion of David T. Williams, seconded by Neil Spoonhower, the Richmond Regional Transportation Planning Organization (RRTPO) Policy Board unanimously approved the following resolution (see Appendix A):

***Resolved**, that the Richmond Regional Transportation Planning Organization (RRTPO) Policy Board refer the opportunity to expand the Metropolitan Planning Area – Planning District 15 – to the RRTPO Technical Advisory Committee (TAC) for consideration and action recommendation.*

C. AGENCY AND COMMITTEE REPORTS

1. Transportation Agency Updates

a. ** A copy of the Virginia Department of Transportation update provided by Shane Mann, Richmond District Engineer at VDOT, is available at: VDOT Update, October 1

b. ** A copy of the Virginia Department of Rail and Public Transportation update provided by Jennifer DeBruhl, Chief of Public Transportation at DRPT, is available at: DRPT Update, October 1

2. ** A copy of the Community Transportation Advisory Committee (CTAC) meeting report can be found on pages 35-37 in the October 1, 2020 RRTPO Policy Board agenda packet.

D. OTHER BUSINESS

2. Next RRTPO Policy Board Meeting: November 5, 2020

The next action meeting will be held on November 5, 2020, beginning at 9:30 a.m. in Richmond, Virginia.

E. ADJOURNMENT:

Chair Paige adjourned the meeting at approximately 11:00 a.m. on October 1, 2020.

CAP/nm

Richmond Regional Transportation Planning Organization

APPENDIX A

RRTPO Policy Board – Voting Record Tables

Item A.1. Approval of RRTPO Policy Board Meeting Agenda

Jurisdiction/Agency (No. of Votes)	Member	Aye	Nay	Abstain	Absent
Charles City County (1)	William G. Coada				x
Chesterfield County (4)	James M. Holland	x			
	Christopher Winslow	x			
	Kevin P. Carroll	x			
City of Richmond (4)	Kimberly B. Gray	x			
	Cynthia I. Newbille	x			
	Andreas D. Addison	x			
	Stephanie A. Lynch				x
Goochland County (2)	Neil Spoonhower	x			
	John L. Lumpkins				x
Hanover County (3)	W. Canova Peterson	x			
	Sean M. Davis	x			
Henrico County (4)	Patricia S. O'Bannon	x			
	Frank J. Thornton	x			
New Kent County (2)	C. Thomas Tiller				x
	Patricia A. Paige	x			
Powhatan County (2)	David T. Williams	x			
	Larry J. Nordvig				x
Town of Ashland (1)	John H. Hodges	x			
Capital Region Airport Commission (CRAC) (1)	John B. Rutledge				x
GRTC Transit System (1)	Julie Timm	x			
RIC Metropolitan Transp. Authority (RMTA) (1)	Joi Taylor Dean				x
Secty Trans Desig (1)	R. Shane Mann	x			
TOTAL		24			N/A

The bylaws of the RRTPO Policy Board define a quorum of the body to be 14 of the 27 total members.

Item A.2. Approval of September 3, 2020 RRTPO Policy Board Meeting Minutes

Jurisdiction/Agency (No. of Votes)	Member	Aye	Nay	Abstain	Absent
Charles City County (1)	William G. Coada				x
Chesterfield County (4)	James M. Holland	x			
	Christopher Winslow	x			
	Kevin P. Carroll	x			
City of Richmond (4)	Kimberly B. Gray	x			
	Cynthia I. Newbille	x			
	Andreas D. Addison	x			
	Stephanie A. Lynch				x
Goochland County (2)	Neil Spoonhower	x			
	John L. Lumpkins				x
Hanover County (3)	W. Canova Peterson IV	x			
	Sean M. Davis	x			
Henrico County (4)	Patricia S. O'Bannon	x			
	Frank J. Thornton	x			
New Kent County (2)	C. Thomas Tiller				x
	Patricia A. Paige	x			
Powhatan County (2)	David T. Williams	x			
	Larry J. Nordvig				x
Town of Ashland (1)	John H. Hodges	x			
Capital Region Airport Commission (CRAC) (1)	John B. Rutledge				x
GRTC Transit System (1)	Julie Timm	x			
RIC Metropolitan Transp. Authority (RMTA) (1)	Joi Taylor Dean				x
Secty Trans Desig (1)	R. Shane Mann	x			
TOTAL		24			N/A

The bylaws of the RRTPO Policy Board define a quorum of the body to be 14 of the 27 total members.

Item B.1. Smart Scale Round 4 Local Project Endorsements

Jurisdiction/Agency (No. of Votes)	Member	Aye	Nay	Abstain	Absent
Charles City County (1)	William G. Coada				x
Chesterfield County (4)	James M. Holland	x			
	Christopher Winslow	x			
	Kevin P. Carroll	x			
City of Richmond (4)	Kimberly B. Gray	x			
	Cynthia I. Newbille	x			
	Andreas D. Addison	x			
	Stephanie A. Lynch				x
Goochland County (2)	Neil Spoonhower	x			
	John L. Lumpkins				x
Hanover County (3)	W. Canova Peterson IV	x			
	Sean M. Davis	x			
Henrico County (4)	Patricia S. O'Bannon	x			
	Frank J. Thornton	x			
New Kent County (2)	C. Thomas Tiller				x
	Patricia A. Paige	x			
Powhatan County (2)	David T. Williams	x			
	Larry J. Nordvig	x			
Town of Ashland (1)	John H. Hodges	x			
Capital Region Airport Commission (CRAC) (1)	John B. Rutledge				x
GRTC Transit System (1)	Julie Timm	x			
RIC Metropolitan Transp. Authority (RMTA) (1)	Joi Taylor Dean	x			
Secty Trans Desig (1)	R. Shane Mann	x			
TOTAL		25			N/A

The bylaws of the RRTPO Policy Board define a quorum of the body to be 14 of the 27 total members.

Item B.3. MPO Boundaries and Rural Jurisdictions

Jurisdiction/Agency (No. of Votes)	Member	Aye	Nay	Abstain	Absent
Charles City County (1)	William G. Coada				x
Chesterfield County (4)	James M. Holland	x			
	Christopher Winslow	x			
	Kevin P. Carroll	x			
City of Richmond (4)	Kimberly B. Gray				x
	Cynthia I. Newbille	x			
	Andreas D. Addison	x			
	Stephanie A. Lynch				x
Goochland County (2)	Neil Spoonhower	x			
	John L. Lumpkins				x
Hanover County (3)	W. Canova Peterson IV	x			
	Sean M. Davis				x
Henrico County (4)	Patricia S. O'Bannon	x			
	Frank J. Thornton	x			
New Kent County (2)	C. Thomas Tiller				x
	Patricia A. Paige	x			
Powhatan County (2)	David T. Williams	x			
	Larry J. Nordvig	x			
Town of Ashland (1)	John H. Hodges	x			
Capital Region Airport Commission (CRAC) (1)	John B. Rutledge				x
GRTC Transit System (1)	Julie Timm	x			
RIC Metropolitan Transp. Authority (RMTA) (1)	Joi Taylor Dean	x			
Secty Trans Desig (1)	R. Shane Mann	x			
TOTAL		25			N/A

The bylaws of the RRTPO Policy Board define a quorum of the body to be 14 of the 27 total members.

Agenda Item A.4.

RRTPO Secretary's Report

2

NO ACTION REQUESTED – INFORMATION ITEM

RRTPO Secretary, Chet Parsons, will review items in the RRTPO Secretary's Report included under this agenda tab.

a. *Current Work Efforts..... pages 13-14*

b. *RRTPO Work Status and Financial Report for September 2020.....pages 15-25*

c. *Port of Virginia Update*

d. *MPO Boundaries and Rural Jurisdictions – RRTPO Boundaries Adjustments Update*

e. *CVTA Update*

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Current Work Efforts Update – Item A.4.a.

ConnectRVA 2045 Long-Range Transportation Plan

The Vision, Goals, and Strategies survey was closed on October 11, with 949 responses. Staff synthesized the responses and presented them to the LRTP-Advisory Committee (AC) on their October 22 meeting. With public and AC input, staff is working to develop Vision, Goals and Objectives for the plan.

Staff is also working with AC and the Project Champions to develop regionally significant transportation projects within the RRTPO's Metropolitan Planning Area (MPA) Boundary. The product will be a streamlined list of transportation projects which will be called the Universe of Projects. Staff anticipate completing the list by the end of the year.

Ashland Trolley Line Trail Study

The Ashland Trolley Line Trail advisory group is working in concert with the VDOT Ashland to Petersburg Trail Study. The localities along the corridor continue to identify segments of independent utility along the conceptual 14-mile route from Ashland to the City of Richmond. Several of these segments are the subject of funding applications either through the Transportation Alternatives (TA) program or SMART SCALE. Ashland held a ribbon-cutting for their boardwalk section on October 21, 2020. The official name of the Ashland to Petersburg Trail as the "Fall Line" was also announced at the Ashland event by Governor Ralph Northam. Staff continues to work with the National Park Service (NPS), Rivers, Trails, and Conservation Assistance Program to discuss the scope of work for the upcoming FY21. Additional design assistance is being planned with the NPS help to engage the Virginia Chapter of the American Society of Landscape Architects (ASLA) and Virginia Tech through studio projects this school year. These efforts have led to the ongoing development of two story maps for the project; one on the history of the trolley line and a second is a design sketchbook.

Regional Bicycle and Pedestrian Plan Update

The story map of existing infrastructure, bike/ped features and statistics on bike/ped injuries and fatalities in the region continues to be updated and refined. Staff held a fourth steering committee meeting on September 15, 2020 to further review local priorities, future plans, and regional priority corridors as a foundation for depicting a regional network supported by clear goals, objectives and measures of performance that define regional impact and establish a strategy for implementation. The meeting was quite productive, and staff got good feedback on Vision and Guiding Principles from committee members. The next meeting is scheduled for October 29, 2020.

Ashland Complete Streets Pilot Project

Complete streets guidelines, or a "tool-box" of resources, depicted through graphic and photographic examples are being prepared to serve as implementation support for the regional bike/ped plan. These images are intended to show specific locations where good standards have been implemented and where infrastructure improvements could incorporate complete streets elements for better solutions

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throughout the region. The illustrated story map is available for review and continues to be updated.

Active Transportation Work Group (ATWG)
Staff is working on scheduling the next meeting of the ATWG for November/December. Staff continues to work with Henrico County's Active Transportation Work Group, which is designed to advise the planning for a bicycle and pedestrian chapter of the county comprehensive plan. Henrico canceled the October work group meeting but plans to meet in November.

American Planning Association-Virginia Chapter Annual Conference, Oct 12-16
Themed "We'll Get You Moving" with a focus on multi-modal transportation, the virtual conference was held Oct 12-16. Several staff members attended and will have access to recorded sessions until April 2021. The virtual conference was well-received!

Vision Zero Work Group
The RRTPO Vision Zero Work Group, formed in June 2020, establishes regional goals and gathers support and coordination at the regional level. Additionally, it supports local transportation safety organizations to improve safety around the region. During the October 8, 2020 meeting, the work group discussed the development of a Vision Zero framework for the region. The next RRTPO Vision Zero Work Group meeting will be held on December 10, 2020.

Public Transportation Work Group
This work group met on October 5, 2020 and is working on a framework for establishing regional transit priorities for our region. GRTC staff briefed the group on the development of the draft scope of work and the project tasks required to complete the development of a Regional Public Transportation Plan. A final draft scope will be developed and come back to the work group with a due date for review so GRTC can start the procurement process. The next meeting will be held on November 2, 2020.

RSTBG/CMAQ Work Group
This work group met on October 13, 2020 to discuss the application and project screening process for regional funding. The subcommittee is currently reviewing draft language regarding project screening and will submit requested changes to staff this week. The next meeting of the subcommittee is scheduled for January 11, 2021 to allow coordination with the LRTP schedule as we work to align long-range and short-term project scoring and evaluation.

FY 2021

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Richmond Regional Transportation Planning Organization
SUPPORTED BY PlanRVA

Work Program Status Report
September 2020

PlanRVA
9211 Forest Hill Avenue, Suite 200
Richmond, Virginia 23235
MAIN 804.323.2033 | WEB WWW.PLANRVA.ORG

The RRTPO Work Program Progress Report provides a short summary of each activity for the month of September 2020. Please reference the 2021 UPWP for details concerning the approved budget and work description for each task. Table 1 identifies all the tasks in the UPWP and the associated budget.

Table 1 summarizes overall federal and local revenues budgeted by PlanRVA in FY 2021 to support the work of RRTPO. Federal funds budgeted constitute 80 percent of the total; State and local matching funds constitute 20 percent, unless otherwise noted.

TABLE 1. SUMMARY OF FY 2021 RRTPO UPWP BUDGET

Work Task	RRTPO Budget				
	PL	5303	CO 5303	OTHER (1)	
	Total	Total	Total	Total	TOTAL
7110 Program Management	145,661	67,619	-	-	213,280
7120 UPWP, Budget, and Contract Administration	45,242	7,873	-	-	53,115
7210 Public Outreach and Equity Analysis	147,980	56,457	-	-	204,437
7220 Special Planning Efforts	53,813	-	-	-	53,813
7230 Contingency Funding	16,584	-	30,000	-	46,584
7310 Metropolitan Transportation Plan	370,904	134,734	-	-	505,637
7320 Travel Demand Modeling & Emission Analysis	120,935	48,062	-	593,550	762,547
7330 Transit	47,310	137,265	-	-	184,575
7340 Active Transportation- Bicycle & Pedestrian	145,615	23,201	-	-	168,816
7350 Systems Resilience Plan	105,285	-	-	-	105,285
7410 Performance Based Transportation Planning	66,441	20,515	-	-	86,955
7420 Financial Programming/ Transportation Improvement Program	305,928	20,354	-	-	326,282
7430 Rail, Freight & Intermodal Planning	14,621	8,959	-	-	23,579
7500 Rural Transportation	-	-	-	72,500	72,500
TOTAL ($)	1,586,320	525,038	30,000	666,050	2,807,408

(1) 7320 funds are RSTBG funds for travel demand model development and scenario planning, 7500 funds are PlanRVA allocated rural transportation funds shown for reference

7100 Program Management

7100	BUDGET	Billed this month	% Funds Expended	UPWP Page
Program Management	$213,280	$7,592	20%	10

- Developed agenda packages for the RRTPO Policy Board, and Technical Advisory Committee.
- Made initial contact with and confirmed Noah Goodall's availability to provide a presentation on connected and autonomous vehicles for the November 19 CTAC meeting.
- Developed a staff report summarizing the September 17 CTAC meeting for inclusion in the October TPO and TAC agenda packets.
- Updated the list of future CTAC topics through November 21.
- Staff support for the RRTPO Policy Board, Community Transportation Advisory Committee and Technical Advisory Committee for the month of August.
- Reviewed various documents and websites and participated in webinars pertaining to the management of COVID-19 in the workplace and the development of workplace emergency action plans.
- Reviewed and provided comments on the proposed revisions to the agency's personnel policies.
- Participated the September 15 PlanRVA office renovation/relocation workshop at Baskervll's, James Center Office, and the September 28 virtual follow-up meeting. The workshop and meeting included a discussion of what is and is not working with regard to space use; potential ideas for space configuration; office space size requirements; and the pros and cons of private offices.
- Participated in the September 18 and 21 virtual meetings of the Central Virginia Transportation Authority Finance Committee and Technical Advisory Committee, respectively. The Finance Committee meeting included an update on regional revenue forecasts, draft agreements for revenue transfers and support services, and discussion of the Authority's FY21 budget. The Technical Advisory Committee business included election of a Chair and Vice-Chair, updates on regional project prioritization and the scopes of services for development of a regional transit plan and analysis of transit governance structures.
- Participated in the September 22 webinar, "Telework Strategy for the Future." The presentation by Robin Mack of Telework! VA included an assessment of the normal vs pandemic work from home conditions, a summary of the benefits of teleworking, a discussion of common traits of successful remote-working managers, suggestions for setting up home offices, and tips for managing anxiety and stress, overcoming distractions, and effective time management.

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7310 Long-Range Transportation Plan (ConnectRVA 2045)

7310	BUDGET	Billed this month	% Funds Expended	UPWP Page
LRTP	$505,638	$29,513	17%	16

Data, Analysis & Mapping:

- Continued work with LRTP-Advisory Committee (AC) and the Project Champions to develop regionally significant transportation projects within the RRTPO's Metropolitan Planning Area (MPA) Boundary. The product will be a streamlined list of transportation projects which will be called the Universe of Projects. Anticipated completion of the list is by early November.
- Developed a **Vision, Goals, and Strategies** survey that went live around mid-August asking participants to share their hopes for ConnectRVA 2045. This survey has been very active with almost 800 responses so far. Staff recommends having it shared widely to encourage participation. The survey will end on October 11 at midnight, so there is still time to share the link and get new participation. On September 3 forwarded the link to the survey to representatives of approximately 25 human service agencies and organizations and human service transportation providers. Sent a follow-up e-mail on September 23
- Continued groundwork and participation in the internal staff meetings to develop various tasks for the LRTP – including the development of Visions, Goals and Objectives for the plan, project development, project prioritization process, accessibility tool, document design and environmental justice analysis.
- The September virtual meeting of the LRTP Advisory Committee was cancelled. Staff provided an email update on the current work efforts.
- Participated in the September 8 meeting of the LRTP Public Engagement Committee. Among the topics discussed were documenting, categorizing and responding to comments on the plan, the timetable for responding, and verifying that all comments were addressed. Also discussed were boosting social media posts related to the plan, the cutoff date for public comment, and the development of draft vision and goals based on survey responses.
- Participated in the September 10 virtual meeting about writing the ConnectRVA 2045 document reviewing the outline, proposed page limitations of each section, staff writing assignments, schedule, and use of a template to ensure a consistent appearance.
- Participated in the September 22 virtual meeting of the LRTP Public Engagement Committee to discuss the closing date for the Metroquest vision, goals and strategies survey; re-contacting area agencies and organizations and encouraging them to complete the survey; analysis of survey results; configuration of the plan report website; managing the list of the universe of projects; and next steps concerning public outreach.

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- Participated in the September 23, 2020 MetroQuest webinar, "Wining Tactics for Community Engagement in the New Normal." The webinar featured a panel discussion of three public engagement specialists, who summarized how pubic engagement has changed in the past six months; the three steps to collecting public preferences (set-up, engage and analyze); and tips for successful public engagement programs.

7320 Regional Travel Demand Model (RTDM)

7320	BUDGET	Billed this month	% Funds Expended	UPWP Page
RTDM	$762,547	$9,349	4%	17

Consultant Support

- Attended web-based meetings to discuss the development of Land Use Allocation Model (Task Order 7).
- Reviewed on-call consultant invoice and developed invoice cover memo for the one delivered on September 22, 2020.
- Developed the statement of need and purpose for Task Order 8: RRTPO Project Prioritization Tools. The consultants are working to develop the scope of work based on the statement.

7330 Transit

7330	BUDGET	Billed this month	% Funds Expended	UPWP Page
Transit	$184,575	$12,382	19%	18

Greater Richmond Transit Vision Plan: Near-Term Strategic Technical Analysis

Reference is made to the following resources for the Plan officially adopted by the RRTPO on September 3, 2020:

- Web site landing page (https://planrva.org/transportation/greater-rva-transit-vision-plan/) includes Final Consolidated report and appendices covering Technical Memo 1 and 2, The following corridors were recommended to go forward with more detailed corridor planning (the three that are in bold type are considered the corridor routes which offer the greatest potential):
    1. Broad Street-Short Pump (Willow Lawn to Bon Secours Short Pump)
    2. **Midlothian Turnpike (CBD to Chesterfield Town Center)**
    3. West End South (CBD to Regency Square)
    4. **Airport via Route 60 (CBD to Richmond Airport)**
    5. **Route 1 to Ashland (CBD to Parham Road)**
- A story map of the recommendations serves as a single resource for the project and an executive summary also posted on the web site.

Other Transit related activities:

- Participated in the September 1 webinar, "Returning to the Workplace without Returning to Traffic Congestion." The webinar featured a review of return to work strategies, the development of commute management platforms, avoiding congestion through the application of science, and the elements of the Whole Foods employee commute program available.
- Reviewed the following documents:
  - Analysis of Recent Public Transit Ridership Trends. TCRP Research Report 209
  - PennDOT Connected and Autonomous Vehicles 2040 Vision
  - Autonomous Vehicle Technology-A Guide for Policymakers
- On September 11 met virtually with VCU MURP student Rebekah Cazares to review and discuss her proposed professional plan and presentation for the September 17 CTAC meeting.
- Reviewed the agenda packet for the September 15 GRTC Board of Directors meeting.
- Participated in the September 24 EnoTrans webinar "Telework During COVID-19 and Beyond." The webinar presented findings from a recent global survey regarding factors that contribute to the success of telework programs; suggestions for successful teleworking; and strategies for combining active transportation and work from home programs.
- Participated in the September 30 Eno Trans webinar, "Fare Integration for Transit." The webinar featured an overview of an Eno Foundation paper on fare integration and summarized the results of transit fare integration pilot programs in Los Angeles and Puget Sound. Among the points noted by the presenters were the benefits of fare integration, the challenges and successes of fare integration, and recommendations for implementing fare integration programs.
- Participated in the September 30 Administration for Community Living webinar, "Rethinking ID/DD Transportation Services During COVID-19." The presentations covered the impact of COVID-19 on specialized transportation services, funding sources for specialized transportation, how agencies have modified transportation services in response to the pandemic, and how one organization is using a partnership with Lyft to meet its clients' transportation needs.

Paratransit and CHSMP

- On September 2 participated along with Tony Williams of Senior Connections in the recording of a presentation on the role of Senior Connections as the regional transportation coordination entity. The presentation will be incorporated into the program for the October 2020 state conference of the Virginia Chapter of the American Planning Association.
- Participated in a September 2 video call with Annabelle Galef of the Via Transportation Services Partnership Team. In addition to discussing the current state of transportation and paratransit services in the region, potential parties for inclusion in additional discussions were identified.
- Participated in the September 15 and 16 AARP Livable Communities Transportation Workshop. The workshop featured a series of presentations and panel discussions on such topics as senior mobility issues, complete streets programs, senior driver safety programs, lessons learned from the COVID-19 pandemic, transportation equity, universal design, and how technology will affect transportation services.
- Participated in the September 22 virtual meeting of the LogistiCare Advisory Board. The meeting included an update on LogistiCare staffing levels, a summary of recent outreach efforts, statistics for utilization of the TripCare website and mobile app, a report on complaint levels, and an update on DMAS NEMT processes and procedures.

- Participated in the September 23 virtual meeting of the Longevity Project Strategic Planning Steering Committee. The meeting included a summary of the results of a survey of community members and an open discussion of the desirable traits of an age-friendly community, engaging a more diverse group of individuals in the work of the Longevity Project, and future directions for the Longevity Project. Followed up by forwarding the link to the ConnectRVA 2045 strategies survey to the members of the committee.
- Participated in the September 24 webinar "Ability in Disability: A More Inclusive Workplace Strategy." The webinar was presented by the Disability Management Employer Coalition and included a panel discussion on the factors associated with developing a workplace internship program employing individuals with disabilities. The webinar featured a discussion of suggested program goals, measures of success, insights and lessons learned, and advice for employers looking to create a similar program.
- Participated in the September 25 virtual meeting of the Longevity Project Leadership Meeting. The meeting featured a review of recent accomplishments, an overview of a new partnership between No Wrong Door and Virginia Navigator entitled Direct Connect, and an update on the update of the Longevity Project strategic plan.

7340 Active Transportation: Bicycle and Pedestrian

7340	BUDGET	Billed this month	% Funds Expended	UPWP Page
Active Transp.	$168,816	$16,587	22%	19

Active Transportation Work Group

- Staff held the Sept. 8 Active Transportation Work Group virtual meeting which included a presentation by a consultant from the Timmons Group on a project for Chesterfield County that included the identification and prioritization of sidewalk segments in the county to expand the existing sidewalk network to serve areas most in need of multi-modal options. The meeting also included an update on many bike and pedestrian projects in the region. Staff continued to work with Henrico County and their efforts to develop a bicycle and pedestrian chapter of their updated comprehensive plan.

East Coast Greenway

- The East Coast Greenway Alliance (ECG) held a virtual meeting with the Virginia committee for the ECG on Sept. 3, which included updates from throughout Virginia concerning the national trail route. Staff continued to work with ECG staff on preparations for new designations for the ECG along the new protected bike lanes along the Brook Road corridor in Richmond, including meeting at the location and biking along the corridor to document the conditions and measure the lane widths and sidewalk.

Richmond Regional Bicycle and Pedestrian Plan

- Staff held a steering committee meeting on Sept. 15 which included a robust discussion on the vision statement for the regional bicycle and pedestrian plan. Staff also reported back on the highlights of the discussions from the smaller group meetings with individual localities reviewing joint multi-jurisdictional constraints and opportunities for bike and/or pedestrian connections through infrastructure and programmatic ventures through the regional plan, including Richmond/ Chesterfield, Henrico/Hanover, Henrico/Richmond, and Henrico/Goochland. More meetings are scheduled for October.
- Staff continues to collect photos of bicycle and pedestrian infrastructure from throughout the Richmond region to help with the plan update, presentations, and other active transportation related projects. Staff continues to write and edit sections of the update to the plan in preparation for review by the steering committee.
- Continued update of a SharePoint website and a Google Drive updated for committee members to share resources and their own observations of travel around the region on foot or bike. Committee continues to update a WikiMap shared by the LRTP.

Town of Ashland pilot project and regional guidance for Complete Streets

- Staff continues to work on the illustrative guideline tool box of complete streets best practices for use by the localities in their own planning work and to support implementation of the regional bicycle and pedestrian plan; to be added to the Story Map. An update of the story map tool box will periodically be shared with RRTPO committees over the coming months.

Ashland Trolley Line Trail / Ashland to Petersburg Trail

- The ribbon-cutting event for the Ashland Trolley Line Trail segment in Ashland has been rescheduled for Oct. 21.
- Staff is working with the National Park Service (NPS) and representatives from the Virginia chapter of the America Society of Landscape Architects (ASLA) and Virginia Tech to secure landscape architecture support for design elements of the Trolley Line A meeting with the VT Landscape Architecture Department Chair on September 4th provided a number of options for class studio projects, Senior projects, and/or design charrettes or competitions for consideration. Follow up in early October is planned once the semester gets started.
- Another year of technical assistance by the NPS was approved on September 18, 2020 for FY21 starting October 1-September 30, 2021, and staff plans to reengage with the steering committee in early November to provide updates on progress, including any funding decisions affecting certain trail segments, i.e. Transportation Alternatives funding priority for Lakeside Community Trail.

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7410 Performance Based Transportation Planning

7410	BUDGET	Billed this month	% Funds Expended	UPWP Page
Perf. Based Transp. Plng.	$86,956	$9,013	17%	21

System Performance

- Updated the dashboard (https://planrva.org/transportation/covid-19-pandemic/)to track various PlanRVA transportation related metrics and the changes in those metrics due to the COVID-19 pandemic. The dashboard is on the Transportation home page of the PlanRVA website. The interactive dashboard was created using Tableau.
- Attended OIPI Quarterly MPO meeting which covered the State's submission of its Mid Performance Period Report to FHWA. The targets for the performance measures were discussed and requirements for MPO submission to the state were outlined.

7420 Transportation Improvement Program (TIP)

7420	BUDGET	Billed this month	% Funds Expended	UPWP Page
TIP	$326,282	$20,896	20%	23

Development

- Held the first subcommittee meeting to update the RSTP/CMAQ project selection guidelines on 9/10/20. The subcommittee has five voting members; one from Richmond, one from Henrico County, one from Hanover County, one from Goochland County, and one from GRTC. The goal of the subcommittee is to adopt new guidelines by May of 2021 for implementation in the FY23 – FY28 application cycle.
- Reviewed draft regional project funding guidelines on RSTBG, CMAQ and TA projects.

Maintenance

- Submitted the Emissions Reduction Analysis (ERA) results for seven new FY21 – FY26 CMAQ projects to FHWA and VDOT on 9/9/20. The seven projects were as follows: 1). Three Chesterfield County projects—Rte. 1 shared-use path from Marina Dr to Merriewood Rd, Old Bermuda Hundred Rd at Ramblewood Dr roundabout, and Brad McNeer Pkwy access management and roundabout; 2). Three Henrico County projects—Nuckols Rd pedestrian improvements, Brook Rd & Hilliard Rd trail, and Rt 33/Rt 60 Beulah Rd roundabout; and 3). One City of Richmond project—Signal system-phase IV. The project cost range is from $2.1 mil to $9.2 mil.
- Based on TPO approval at the 9/3/20 TPO meeting, submitted FY21 – FY26 RSTBG and CMAQ projects and allocations document to VDOT and DRPT to be included in FY21 – FY26 Six Year Improvement Program on 9/10/20. The allocation document showed 32 RSTBG projects including seven new RSTBG projects such as Chesterfield Rt 360 superstreet study, Chesterfield Rt 60 corridor improvement study, Chesterfield Rt 1 (Holiday Ln – Willis Rd) shared-use; Goochland IJR-Rt 288 (West Creek area); Henrico

West Broad St intersection improvements at Dominion Blvd and Cox Rd, Henrico West Broad St pedestrian and transit improvements from Glenside Dr to Parham Rd; and RRTPO plan scenario plot. Also, this document showed 21 CMAQ projects including seven new CMAQ projects that were used for the Emissions Reduction Analysis.

- Based on TPO approval on 9/3/20, initiated inserting FY21 – FY26 RSTBG and CMAQ allocations into fund allocation tracking sheets.
- Received FY21 FTA Sec 5310 projects for TIP adjustments from DRPT on 9/17/20. These projects are as follows:
    - GRTC, #GRTC060—Mobility management
    - Senior Connections, #CAA0001—Operating assistance
    - Senior Connections, #CAA0002—Mobility management
    - Chesterfield Community Service Board, #CHS0001—Paratransit vehicles
    - Chesterfield County Citizens & Response, #CHS0002—Mobility management
    - Chesterfield Community Citizen & Response, #CHS0003—Operating assistance
    - Goochland Cares, #GCS0001—Paratransit vehicles
    - Hanover County, #HCS0001—Operating assistance
    - SOAR365, #SOAR001—Paratransit vehicles
    - St. Joseph Villa, #SJV0001—Paratransit vehicles

  These ten adjustment projects have been under review, and adjustments will be conducted after FHWA approves STIP in September or October.
- Received a FY20 draft rollover amendment list for 33 highway projects from VDOT on 9/28/20. These 33 adjustment projects have been under review, and amendments will be conducted after FHWA approves STIP in September or October.

7430 Rail, Freight, Intermodal Planning

7430	BUDGET	Billed this month	% Funds Expended	UPWP Page
Rail, Freight, Interim. Pang.	$23,580	$141	8%	24

Staples Mill Road Station Advance Planning and Design Study

The final Staples Mill Road Station Area Transit-Oriented Development Concept Plan was delivered to the stakeholder team on September 28, 2020 and offered the following conclusions:

- Henrico County has a significant opportunity to change the corridor's land use mix to be more conducive to the expected increased in passenger rail handled by the Staples Mill AMTRAK Station called for as part of the Transforming Rail in Virginia Initiative.
- Areas around the station were assigned to one of three categories for exploration: Near term change, long-term change or no change.
- TOD Design Principles are featured: 1) Parking that works well remains a goal, but in an urban format; 2) buildings should relate to streets and intersections; 3) the spaces between buildings set the tone; and 4) each street should positively identify space for people riding bicycles or walking.
- VDOT supports a new sub-area roadway study to further explore details for finalizing a new cross-section for Staples Mill Road that functions well for all modes of travel and users.

- Consolidation of the function of the Glenside Park-and Ride lot with the rail access function on the Staples Mill Station site with structured parking and better transit circulation; vanpool meeting location would move north closer to I-95.
- The final concept plan makes the following recommendations: 1) establish a corridor working group consisting of Henrico, VDOT, DPRT, and PlanRVA to guide the VDOT sub-area plan and more detailed traffic studies; 2) engage east of the tracks property owners about a bridge connection to the station area; 3) seek developer feedback on concept plan; 4) establish a District Parking Strategy; 5) gauge market interest through an RFI process in the Glenside Park & Ride lot for redevelopment; and 6) coordinate with transit providers to plan for better bus connections.

The preliminary architectural/engineering phase of the Staples Mill station which calls for it to become a key station in the DC2RVA project when 6 new round-trips are added to Staples Mill by 2030 is to be completed by the consultant team in October 2020.

Agenda Item B.2.

I-95/RMT/Commerce Road Corridor Access Study

***REQUESTED ACTION**: Adoption of the I-95/RMT/Commerce Road Corridor Access Study.*

RESOLUTION

The following resolution is presented for RRTPO Policy Board review and approval:

***RESOLVED**, that the Richmond Regional Transportation Planning Organization (RRTPO) adopts the I-95/RMT/Commerce Road Corridor Access Study.*

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Richmond Regional Transportation Policy Board AGENDA 11/5/20; ITEM B.2.

I-95/RMT/COMMERCE ROAD CORRIDOR ACCESS STUDY

Richmond Regional Transportation Planning Organization

REQUESTED ACTION: Adoption of the I-95/RMT/Commerce Road Corridor Access Study.

BACKGROUND: This transportation study was commissioned by the Virginia Department of Transportation, in collaboration with PlanRVA and The Port of Virginia, to identify and develop transportation solutions to access and safety challenges in the area surrounding the I-95 Bells Road Interchange and Commerce Road. This effort builds off of previous work such as the Commerce Corridor Study Implementation Plan and Technical Report.

This plan incorporated the following steps and positions the RRTPO and its member governments to seek out funds and leverage other projects to advance the recommendations in the I-95/RMT/Commerce Road corridor.

1. Collaborate with key stakeholders;
2. Define existing and future land use activity in the study area;
3. Document transportation safety and operational challenges;
4. Identify short-term and long-term transportation infrastructure improvements to allow industrial corridor to reach its economic potential.

TAC RECOMMENDATION: RRTPO TAC has reviewed the proposed I-95/RMT/ Commerce Road Corridor Access Study at their meeting on October 13, 2020 and recommends adoption as presented. TAC action was unanimous.

REQUESTED ACTION: The following resolution is presented for RRTPO Policy Board review and approval:

RESOLVED, that the Richmond Regional Transportation Planning Organization (RRTPO) adopts the I-95/RMT/Commerce Road Corridor Access Study.

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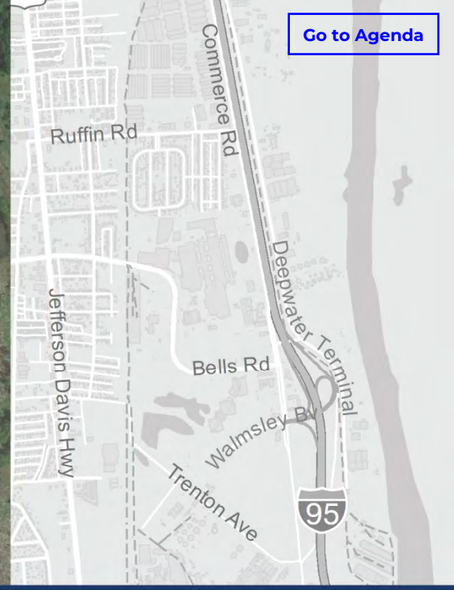
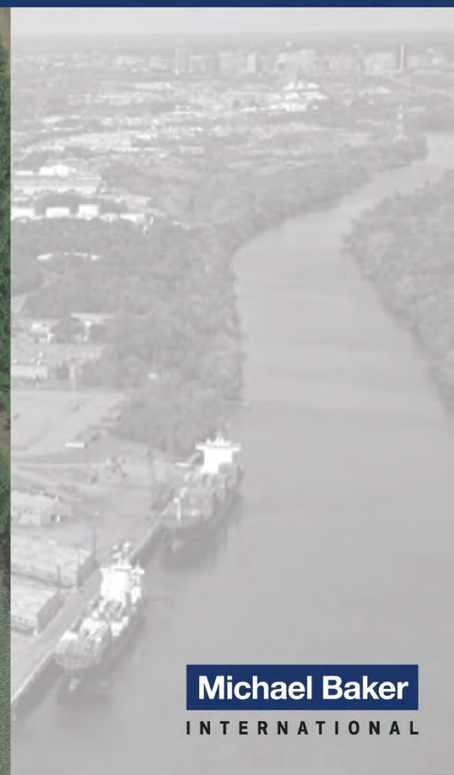


I-95/Richmond Marine Terminal/ Commerce Corridor Access Study

Final Report (DRAFT)

10/5/2020



Michael Baker
INTERNATIONAL

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List of Acronyms

AADT	Average Annual Daily Traffic
DDI	Diverging Diamond Interchange
HCM	Highway Capacity Manual
LOS	Level of Service
MOE	Measures of Effectiveness
NEPA	National Environmental Policy Act
QR	Quadrant Roadway Intersection
SPUI	Single Point Urban Interchange
TAZ	Traffic Analysis Zone
TOSAM	Traffic Operations and Safety Manual
TPO	Transportation Planning Organization
TTI	Travel Time Index
VDOT	Virginia Department of Transportation

1. Introduction

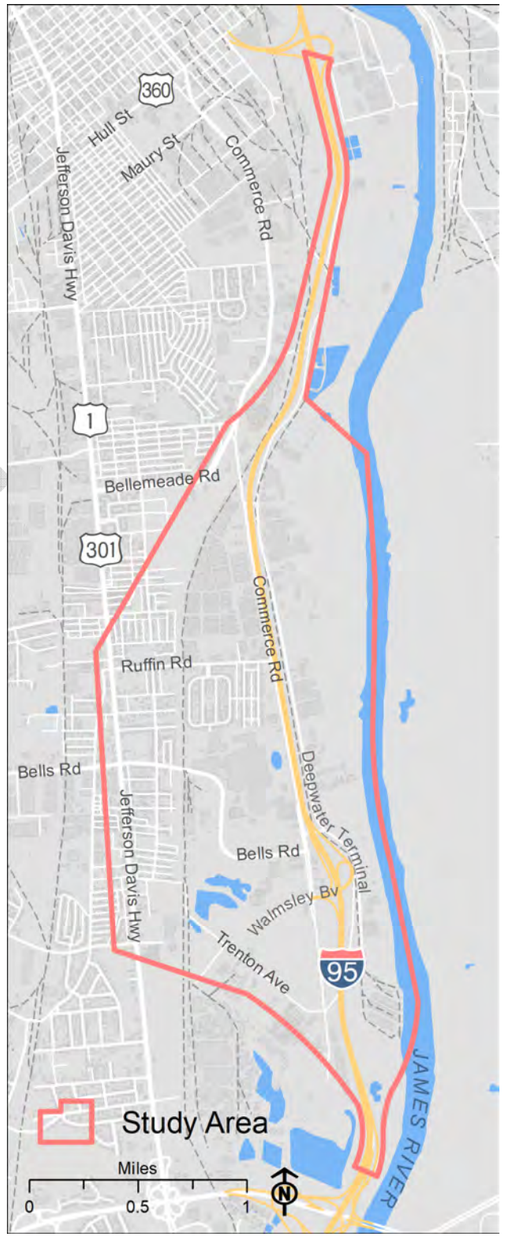
1.1 Background

The purpose of the I-95/Richmond Marine Terminal/Commerce Corridor Access Study is to identify cost-effective short- and long-term improvements to enhance safety and improve access to industrial land uses. This study was commissioned by the Virginia Department of Transportation, in collaboration with PlanRVA and The Port of Virginia, to identify and develop transportation solutions to access and safety challenges in the area surrounding the I-95 Bells Road Interchange and Commerce Road. This effort builds off of previous work such as the Commerce Corridor Study Implementation Plan and Technical Report. In that 2017 effort, a number of recommendations were made at a conceptual level. This 2020 study was intended to provide more project development detail for recommendations H2.4.1, H2.4.2, H2.6, H5.1, H7.2 as well as P1.2 and P1.3 found in the Implementation Plan mentioned above.

1.2 Study Area

The study area is shown in Figure 1. This area, bounded by the color shown in the legend, represents approximately 2,000 acres and consists of both freeway and arterial network. It extends from the south-facing ramps at Exit 73 (Maury Street interchange) on I-95 and the north-facing ramps at Exit 67 (Chippenham Pkwy). The arterial network includes Jefferson Davis Highway between Ruffin Road and Walmsley Boulevard, Commerce Road between Trenton Avenue and Bellemeade Road, Deepwater Terminal and east-west local roads connecting the three. Although this represents a definitive boundary, it is necessary for the study team to look beyond this area for the purpose of considering external influences such as regional land use changes and highway demand.

Figure 1: Study Area



1.3 Stakeholder Engagement

This study was conducted as a collaborative effort with a group of stakeholders identified at the onset of the study. Communication with these stakeholders was paramount in defining the deficiencies and developing meaningful solutions for the corridor. The involvement process began with the July 15th, 2019 project kick-off/scoping meeting and subsequent discussion within the core study team. The stakeholders included are listed below:

- City of Richmond
- County of Chesterfield
- County of Henrico
- The Port of Virginia
- Richmond Regional Transportation Planning Organization (PlanRVA)
- Federal Highway Administration (FHWA)
- Virginia Department of Transportation (VDOT)

This stakeholder group consisted of staff-level representatives from each of the organizations. This group met at key milestones throughout the study to review progress and results. As the consultant member of the study team, Michael Baker International prepared content and facilitated the discussions. These meetings were typically held at the PlanRVA office in Richmond. Table 1 lists the dates and topics of these meetings.

Table 1: Core Study Team Meetings

Meeting Date	Meeting Topic
July 15, 2019	Study Kick-Off/Orientation
August 12, 2019	Existing Conditions (WebEx)
September 16, 2019	Forecasting Methodology
October 28, 2019	2045 No-build vs Existing Conditions
November 18, 2019	Short-term Concepts Overview
December 18, 2019	Short-term Concepts Operational Results (WebEx)
February 3, 2020	Short-term Concepts Recommendations & Long-term Concepts Overview
March 9, 2020	Long-term Concepts Operational Results & Recommendations
May 20, 2020	Project Outreach Strategy (WebEx)

Figure 2: Stakeholder Logos

2. Existing Conditions

2.1 Existing Land Use

As shown in Table 2 below, the existing land use is mostly industrial with over 65% of the total land use in the study area. While the western part of the study area on Jefferson Davis Highway is mostly residential, industrial development is greatest in the eastern part, which includes Commerce Road and Deepwater Terminal Road.

The Richmond Marine Terminal (RMT) shown in Figure 3 and located on the south end of Deepwater Terminal Road, is a major contributor to the development and industrial activity in the area. The facility is owned by the City of Richmond and leased by The Port of Virginia, under an agreement that began in late 2010; the lease was extended by 40-years through an agreement in October 2015. The RMT has warehouse space and a 1,570-foot long wharf and handles containers, temperature-controlled containers, and break-bulk, bulk, and neo-bulk cargo. The facility is a U.S. Customs-designated port of entry, and the full range of customs functions is available to customers. The James River Barge Service, a container-on-barge service from Hampton Roads to Richmond, provides a maritime alternative to I-64 by transporting goods on the James River via barges, removing container traffic from local roads and highways. This service was originally provided three days a week at RMT and today provides five-day a week service. Moving cargo from terminals in Hampton Roads to RMT reduces truck turn times; reduces air polluting emissions; increase customer's service levels and increases economic opportunities. The Richmond Marine Terminal has grown by double digits every year since 2015. This growth is driving the success of the terminal and bringing jobs and economic development to the area.

Figure 3: RMT

Table 2: Existing Study Area Land-Use Summary

Land Use Class	Acres	Percent of Study Area
Commercial	24.8	1.3%
Industrial	1213.5	65.3%
Economic Development	23.9	1.3%
Mixed Use	80.4	4.3%
Residential	339.1	18.3%
Public	175.7	9.5%

2.2 Existing Roadway Conditions

A field review was conducted in October 2019 to observe roadway and intersection configurations; collect travel times, identify deficiencies and areas of concern; identify unique roadway features; and observe traffic operations. This information was then utilized to conduct traffic operational analyses for the study intersections and freeway for typical weekday AM and PM peak hours. The key findings from the field visit are presented below:

- Southbound approach on Commerce Rd at Walmsley Blvd/I-95 ramps intersection - queue spilling out of available turn lanes in the PM peak hour
- Southbound right turn on Commerce Rd at Walmsley Blvd/I-95 ramps intersection – inadequate truck turning radius
- Westbound approach at Walmsley/I-95 ramps intersection – vehicles coming from the I-95 southbound ramp with a destination south of intersection have difficulty weaving over to the left turn lane when queue in that lane extends to 250 ft and more
- Westbound approach on Bells Rd Access Rd at Commerce Rd intersection – queue extends to Deepwater Terminal Rd in the PM peak hour
- Northbound left turn on Jefferson Davis Hwy at Bells Rd intersection - queue spilling out of available turn lane in both peak hours
- Intersection of Commerce Rd and Commerce Rd Access inadequate pavement markings and rough road

The following section provides a brief description of existing roadway characteristics of main facilities in the study area.

Interstate 95 (I-95) is a six-lane divided limited-access highway, functionally classified as an Interstate, with a posted speed limit of 60 mph. According to the 2018 Published VDOT Counts, I-95 carries an average annual daily traffic (AADT) volume of around 53,000 vehicles per day (VPD) between Maury Street and Chippenham Parkway in each direction. Exit 67 (Chippenham) is classified as a system interchange (freeway-to-freeway), while Exits 69 (Bells) and 73 (Maury) are classified as a service interchanges.

Commerce Road is classified as a minor arterial according to VDOT's 2014 Functional Classification map. The section of roadway within the study area is oriented in a north-south direction and is a two-lane undivided roadway for the most part with sections in the vicinity of Bells Road interchange being four-lane divided roadway. The posted speed limit is 35 MPH south of Bells Road Access Road and increases to 45 MPH to the north. The segment between the I-95 ramps and Bells Road carries an AADT of 20,000 VPD per 2018 VDOT Counts, which is three to five times higher than the other segments in the study area.

Deepwater Terminal Road is also classified as a minor arterial and is serving a lot of truck traffic as it is located in a primarily industrial area. It is a two-lane undivided roadway oriented in north-south direction. The posted speed limit is 35 MPH and the 2018 AADT was 1,400 VPD.

Bells Road is a four-lane divided roadway in west-east direction. This minor arterial has around 9,000 VPD according to 2018 VDOT Counts and serves as a primary connector between Jefferson Davis Highway and Commerce Road. The posted speed limit is 35 MPH.

Jefferson Davis Highway is classified as other principal arterial according to VDOT's 2014 Functional Classification map. The section of the roadway within the study area is a six-lane divided roadway oriented in north-south direction. The posted speed limit is 40 MPH and an AADT is estimated to be 11,000 VPD according to 2018 VDOT Counts.

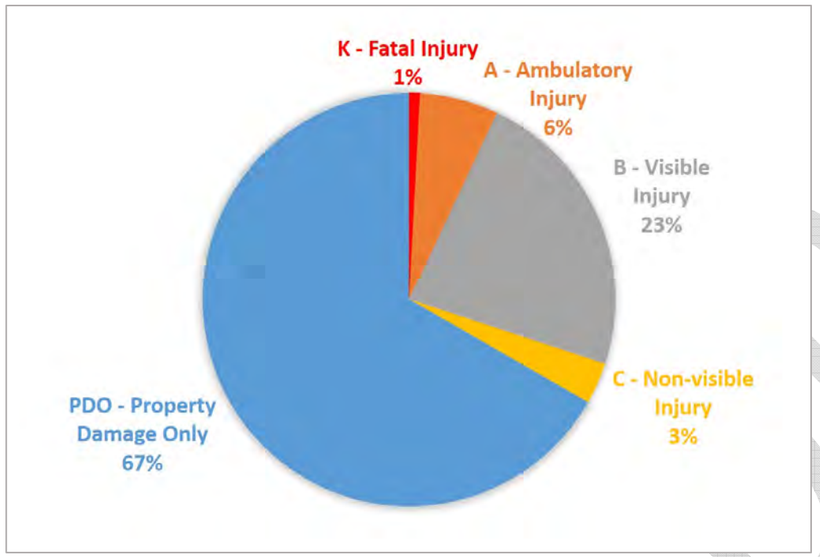
Ruffin Road is a two-lane undivided major collector. It is oriented east-west connecting Jefferson Davis Highway and Commerce Road. The posted speed limit is 25 MPH and a 2018 AADT is around 2,000 VPD. There is a truck restriction on this road except for local deliveries.

2.3 Crash Analysis

An evaluation of corridor safety was conducted based on an analysis of crash summary information. A crash analysis for the study area over the latest six years of available crash data (January 1, 2013 to December 31, 2018) was obtained from VDOT's Roadway Network System. Figure 4 illustrates the crash severity that occurred in the study corridor during this timeframe. Figure 5 illustrates the collision type within the study corridor during the same period. Figure 6 presents the crash densities, location, and severity along the corridor. On the crash density map, locations with more frequent crashes are indicated in darker red areas, while lower frequency locations are lighter red.

As illustrated in Figure 7 the analysis of existing conditions found that the crash rate of I-95 is below the statewide average when compared to other interstates within the Commonwealth. Bells Road crash rate is slightly higher than the statewide average of similar roadway types, while Jefferson Davis Highway and a portion of Commerce Road between Bells Road and I-95 ramps have crash rates that are greater than 100% above the statewide average.

Figure 4: Crash Severity



Key Findings

- In 67% of crashes only property damage occurred with no injuries or fatalities. 1% of crashes resulted in fatal injury.
- The greatest number of crashes were angle collisions, which accounted for 29% of crashes. This is followed closely by rear end collisions, which accounted for 27% of crashes.
- Most off-road collisions, 137 crashes, occurred within the interchange of I-95 at Commerce Road including the ramps
- Rear end crashes are generally higher at signalized intersections compared to unsignalized intersections along the corridor. For example, the signalized intersection at Commerce and Bells Road had 24 crashes, whereas the unsignalized intersection at Commerce and Ruffin Rd has two crashes.
- The crash rate is highest around the I-95 and Commerce interchange, which includes the section of Commerce Road between the interchange ramps and Bells Road. Also, the crash rate is very high on Jefferson Davis Highway at the intersection with Bells Road.

Figure 5: Collision Type

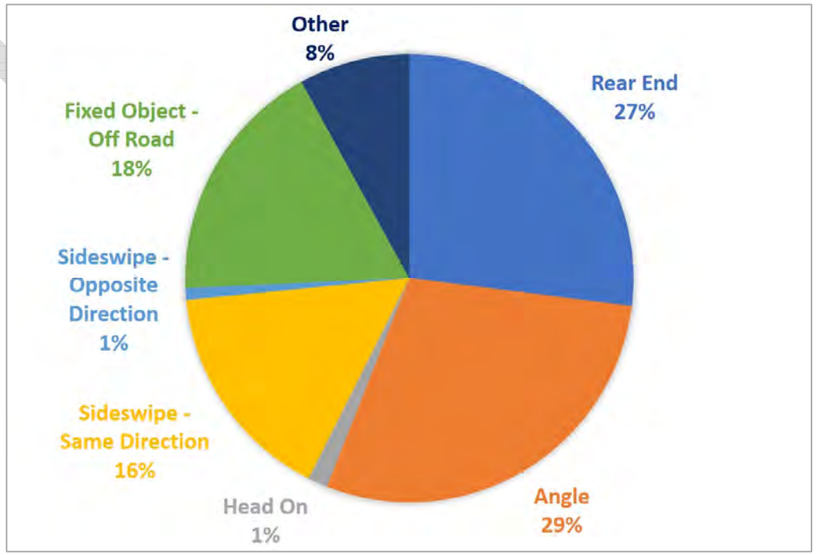
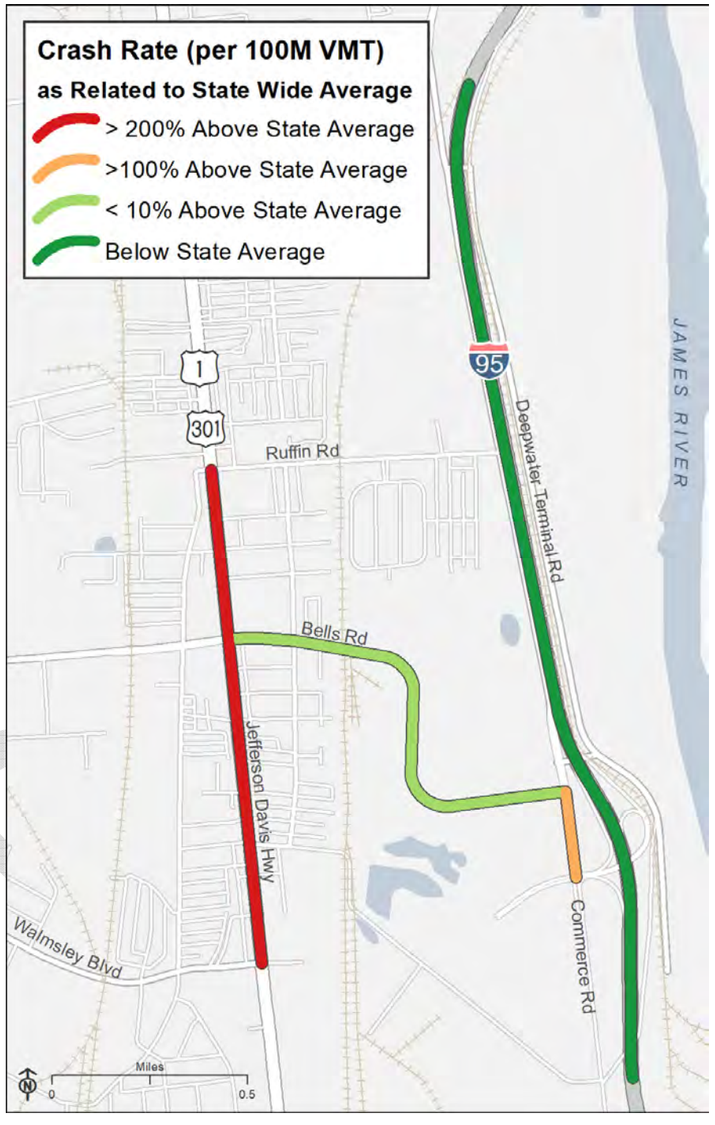


Figure 6: Crash Density, Location, and Severity

Figure 7: Crash Rate vs Statewide Average

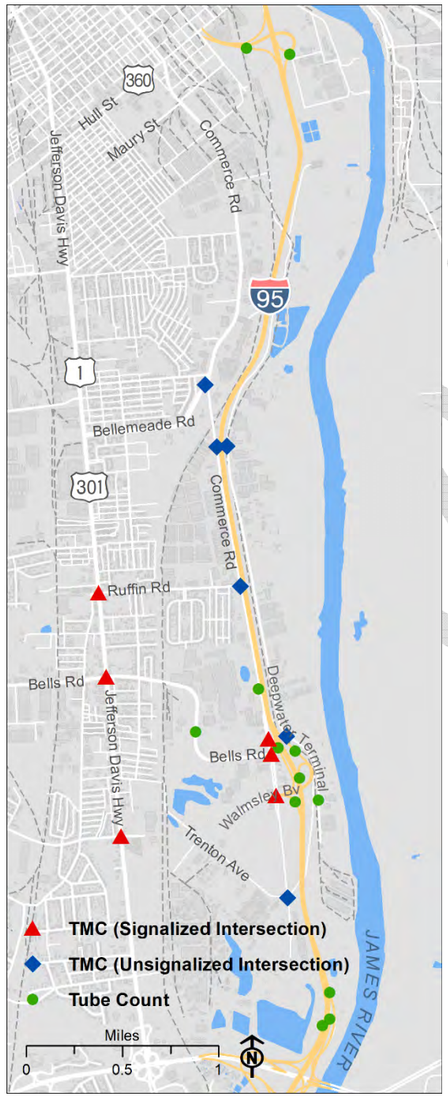


2.4 Existing Traffic Volumes

Existing peak hour traffic volumes were developed using turn movement counts (TMC) and tube counts collected in June 2019 at the locations shown in Figure 9.

Additionally, the I-95 volumes were developed using permanent count station data collected between July 2018 and June 2019. A full list of 2019 volumes by AM and PM peak hour can be found in Appendix X. The AM and PM peak hours are the times with the highest traffic volumes in the study area. The AM and PM peak hour for the analysis were computed to be 7:00-8:00 AM and 3:30-4:30 PM, respectively. Figure 8 contains a graphical depiction of the existing peak hour volumes for intersection in proximity of Bells Road interchange. The volumes for other intersections within the study area are shown in Appendix X. The I-95 volumes are shown in Figure 10.

Figure 9: Count Locations



2.5 Existing Traffic Operations

The peak hour volumes developed in the previous section were analyzed in VISSIM simulation software, which was used as a primary analysis tool. Several measures of effectiveness (MOEs) were reported per Highway Capacity Manual (HCM) methodology for study intersections, which include delay, level of service (LOS) and queuing by approach and lane as appropriate. For the I-95, speed and density were used as MOE's for different freeway segments, respectively. To ensure proper calibration of the models, travel times were also reported and compared to the actual travel times collected during the field visit as well as estimated by Streetlight , which is one of the 'Big Data' sources based on cell-phone data commonly used by transportation professionals to help understand traffic patterns and reduce congestion. Per TOSAM guidelines, for a network analysis which includes both freeways and arterials, simulated traffic volume and simulated travel times should be used for calibration. At least 85% of the travel time routes and network links should meet calibration thresholds. Table 3 shows existing conditions travel times simulated in VISSIM and how they compare to 'actual' travel times estimated by Streetlight or observed during the field visit. As shown in the table, almost all simulated values meet calibration thresholds, which is within ±20% for average observed travel times on freeway and ±30% on arterials. The only route not meeting the minimum threshold is the segment of Bells Road and Commerce Road in the eastbound/southbound direction for the PM peak hour when compared to the Streetlight estimated value. However, the travel time for the same segment compared to the observed value in the field meets the minimum calibration threshold. The actual versus simulated traffic volumes are presented in Appendix X.

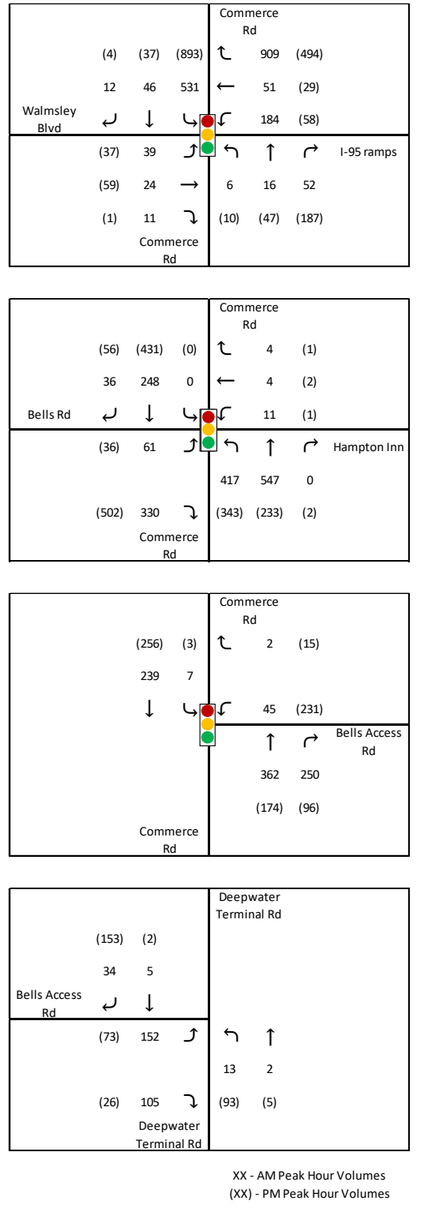
Figure 11 represents the Travel Time Index (TTI) across the study area, where TTI is defined as the ratio of congested travel time to free-flow travel time. For example, a TTI of 1.10 indicates that the peak-period travel time is 10% greater than free-flow travel time.

LOS is a qualitative measure used to relate the quality of traffic operations using letters A through F with A being the best and F being the worst. Table 5 shows HCM Delay LOS Criteria for Signalized and Unsignalized Intersections. The operational analysis results for select study intersections in vicinity of Bells interchange are presented in Table 5, while the results for all other intersections within the study area can be found in Appendix X. As shown in Table 5, Bells Road and Bells Road Access Road intersections on Commerce Road operate at LOS C in both AM and PM peak hour. Even though the intersection of Commerce Road and Walmsley Boulevard/I-95 ramps operates at a very good LOS B in both peak hours, maximum queues for the southbound left turn movement exceed the available storage length. This is consistent with field observations. Northbound right turn maximum queue for the same intersection also slightly exceeds the available storage length. The intersection of Bells Road Access Road and Commerce does not have separate turn lanes in the westbound direction, so the maximum queues in Table 5 do not seem too long. However, Bells Road Access Road is approximately 500 feet long connector between Commerce Road and Deepwater Terminal. Therefore, maximum queue lengths reported for the westbound movement in the PM peak hour indicate the queues extend to Deepwater Terminal Road. The intersection of Bells Road Access Road operates at LOS A in both AM and PM peak. Maximum queues reported are around 100 or less. Some of it may be due to vehicles not being able to turn to Bells Road Access Road due to long queues extending from Commerce Road. The individual movements at all four intersections and for both peak hours range from LOS A to D.

The I-95 existing conditions results are presented in Table 6.

The results indicate in the AM peak the interstate is more congested in the northbound direction, while in the PM peak there is more congestion in the southbound direction. Most of the segments operate at LOS B or C, except for the northbound basic segment between Bells Rd on-ramp and Maury Street off-ramp, which operates at LOS D in the AM, and southbound basic segment between Bells Road on-ramp and Chippenham Parkway off-ramp, which operates at LOS D in the PM.

Figure 8: Existing Peak Hour Volumes - Intersections



XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 10: I-95 Lane Schematic and Existing Peak Hour Volumes

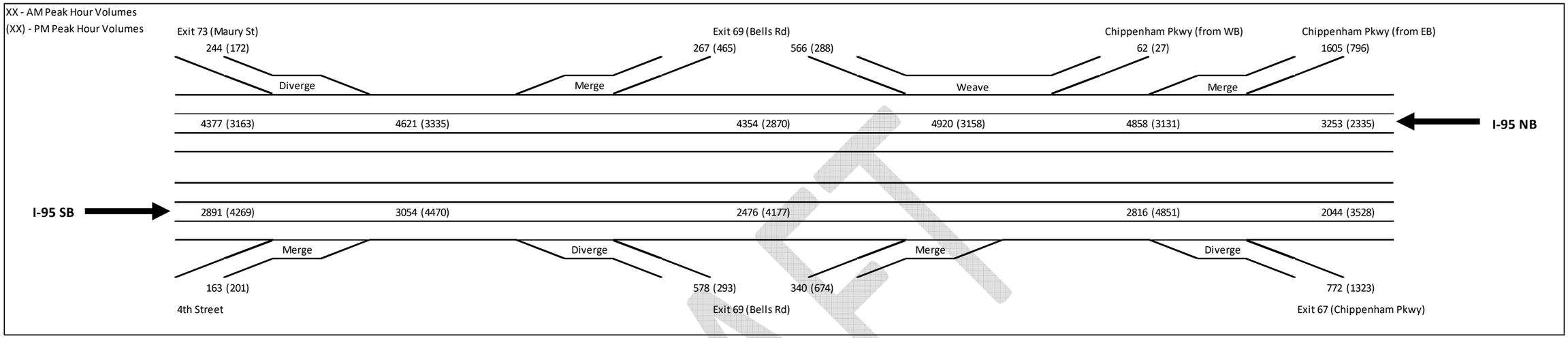


Table 3: Existing Conditions Travel Times (min)

Route	From	To	AM Peak Hour					PM Peak Hour				
			VISSIM Simulated	Streetlight		Field Visit		VISSIM Simulated	Streetlight		Field Visit	
				Estimated Value	% Compared to VISSIM Simulated	Observed	% Compared to VISSIM Simulated		Estimated Value	% Compared to VISSIM Simulated	Observed	% Compared to VISSIM Simulated
I-95 NB	Chippenham Pkwy ramps	1 Mile South of Maury St	3.7	4.5	21.3%	3.4	-7.8%	3.7	3.5	-5.8%	3.3	-9.4%
I-95 SB	1 Mile South of Maury St	Chippenham Pkwy ramps	3.7	3.2	-12.2%	3.2	-12.2%	3.7	3.5	-6.5%	3.9	4.2%
Commerce Rd NB	I-95 ramps	Bellemeade Rd	4.1	4.0	-1.7%	3.3	-19.2%	4.2	4.0	-3.7%	3.9	-5.7%
Commerce Rd SB	Bellemeade Rd	I-95 ramps	4.0	3.3	-17.4%	4.5	12.5%	4.3	5.1	17.9%	4.5	5.1%
Jefferson Davis Hwy NB	Walmsley Blvd	Bellemeade Rd	3.7	3.8	1.7%	4.2	13.8%	3.9	4.4	11.7%	3.4	-13.7%
Jefferson Davis Hwy SB	Bellemeade Rd	Walmsley Blvd	3.6	3.7	1.6%	3.9	6.6%	3.7	4.1	9.1%	3.9	4.2%
Bells Rd WB & Commerce Rd NB	I-95 ramps	Jefferson Davis Hwy	3.3	2.9	-12.4%	2.7	-19.0%	3.6	4.2	15.9%	3.2	-12.0%
Bells Rd EB & Commerce Rd SB	Jefferson Davis Hwy	I-95 ramps	2.7	2.3	-16.2%	2.4	-12.5%	3.1	4.4	42.4%	2.7	-12.7%

Figure 11: Peak Period Travel Time Index

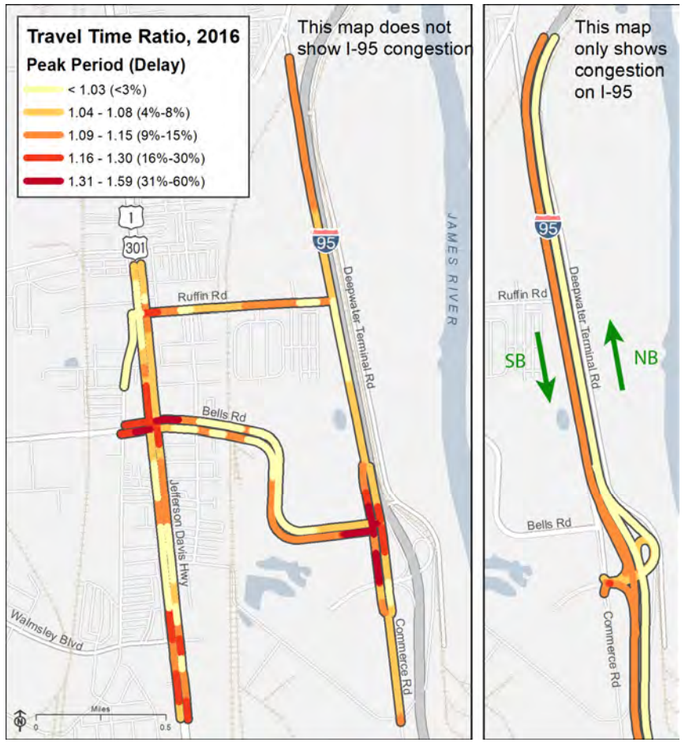


Table 4: HCM Delay LOS Criteria for Signalized and Unsignalized Intersections

LOS	Typical LOS per HCM for Signalized Intersection Delay (s)	Typical LOS per HCM for Unsignalized Intersection Delay (s)
A	≤10	≤10
B	10-20	10-15
C	20-35	15-25
D	35-55	25-35
E	55-80	35-50
F	>80	>50

Table 5: Existing Conditions VISSIM Analysis Results - Intersections

Intersection	Approach	Movement	AM Peak Hour			PM Peak Hour			Available Storage Length (ft)
			Delay (sec)	LOS	Max Queue Length (ft)	Delay (sec)	LOS	Max Queue Length (ft)	
Commerce Rd & Walmsley Blvd/I-95 ramps (Signalized)	EB	EBL	32.2	C	101	43.6	D	109	150
		EBT	29.0	C	97	41.0	D	133	-
		EBR	4.2	A	113	4.4	A	149	-
	WB	WBL	40.8	D	319	48.9	D	177	450
		WBT	36.1	D	235	41.1	D	160	-
		WBR	1.6	A	182	0.8	A	112	-
	NB	NBL	43.1	D	37	36.9	D	63	250
		NBT	44.2	D	94	35.1	D	130	-
		NBR	5.8	A	115	11.4	B	246	200
	SB	SBL	18.6	B	533	25.0	C	746	410
		SBT	14.4	B	533	16.3	B	746	-
		SBR	4.1	A	391	5.1	A	607	-
	Intersection		**13.2**	**B**	**533**	**18.8**	**B**	**746**	-
Commerce Rd & Bells Rd (Signalized)	EB	EBL	38.0	D	157	37.7	D	128	-
		EBR	11.3	B	303	22.8	C	510	-
	WB	WBL	42.9	D	98	52.5	D	24	-
		WBT	43.4	D	98	50.1	D	25	-
		WBR	7.1	A	29	6.5	A	18	70
	NB	NBL	31.0	C	248	46.1	D	351	375
		NBT	16.7	B	282	17.0	B	179	-
		NBR	0.0	A	343	8.7	A	239	-
	SB	SBT	38.3	D	304	45.4	D	350	-
		SBR	20.0	B	252	33.1	C	298	-
	Intersection		**23.6**	**C**	**380**	**33.5**	**C**	**510**	-
Commerce Rd & Bells Rd Access Rd (Signalized)	WB	WBL	36.3	D	156	45.5	D	495	450
		WBR	13.5	B	192	35.1	D	531	450
	NB	NBT	27.2	C	410	27.3	C	223	-
		NBR	23.5	C	386	18.6	B	200	-
	SB	SBL	39.2	D	28	39.7	D	59	210
		SBT	5.5	A	108	10.3	B	137	-
	Intersection		**20.7**	**C**	**410**	**26.0**	**C**	**531**	-
Bells Rd Access Rd & Deepwater Terminal Rd (Unsignalized)	EB	EBL	1.8	A	52	3.7	A	107	-
		EBR	1.8	A	18	2.4	A	6	-
	NB	NBL	1.0	A	18	10.4	B	92	-
		NBT	0.2	A	0	0.3	A	42	-
	SB	SBT	0.5	A	0	1.5	A	22	-
		SBR	0.5	A	0	3.8	A	22	-
	Intersection		**1.6**	**A**	**57**	**5.3**	**A**	**119**	-

Table 6: Existing Conditions VISSIM Analysis Results - I-95

AM Peak Hour				PM Peak Hour			
Freeway Segment	**Speed[1]**	**Density[2]**	**LOS**	**Freeway Segment**	**Speed[1]**	**Density[2]**	**LOS**
I-95 Northbound				**I-95 Northbound**			
Diverge Segment at the off-ramp to Maury Street	56	20.5	C	Diverge Segment at the off-ramp to Maury Street	57	14.5	B
Basic Segment between Bells Rd on-ramp and Maury Street off-ramp	58	26.4	D	Basic Segment between Bells Rd on-ramp and Maury Street off-ramp	59	18.7	C
Merge Segment at the on-ramp from Bells Road	59	19.6	B	Merge Segment at the on-ramp from Bells Road	60	13.9	B
Basic Segment between Bells Rd on-and-off-ramps	59	24.6	C	Basic Segment between Bells Rd on-and-off-ramps	60	15.9	B
Weaving Segment between Chippenham Parkway Westbound on-ramp and Bells Road off-ramp	59	20.7	C	Weaving Segment between Chippenham Parkway Westbound on-ramp and Bells Road off-ramp	60	13.1	B
I-95 Southbound				**I-95 Southbound**			
Merge Segment at the 4th Street	58	13.2	B	Merge Segment at the 4th Street	57	19.3	B
Basic Segment between 4th Street on-ramp Bells Road off-ramp	59	17.2	B	Basic Segment between 4th Street on-ramp Bells Road off-ramp	58	25.2	C
Diverge Segment at the off-ramp to Bells Road	60	12.8	B	Diverge Segment at the off-ramp to Bells Road	59	18.8	B
Basic Segment between Bells Road on-and-off-ramps	60	13.8	B	Basic Segment between Bells Road on-and-off-ramps	59	23.2	C
Merge Segment at the on-ramp from Bells Road	59	12.0	B	Merge Segment at the on-ramp from Bells Road	56	21.5	C
Basic Segment between Bells Road on-ramp and Chippenham Parkway off-ramp	59	15.8	B	Basic Segment between Bells Road on-ramp and Chippenham Parkway off-ramp	58	27.3	D
Diverge Segment at the off-ramp to Chippenham Parkway	60	11.8	B	Diverge Segment at the off-ramp to Chippenham Parkway	59	20.1	C

Source: VISSIM 10 Link Evaluation based on the average of 10 VISSIM model runs.
1 Average simulated speed, expressed in miles per hour.
2 Average simulated density, expressed in vehicle per mile per lane.

LOS	A	B	C	D	E	F
Density (Basic)	≤11	11-18	18-26	26-35	35-45	>45
Density (Merge/Diverge/Weaving)	≤10	10-20	20-28	28-35	35-45	>45

3. Future Conditions

3.1 Development of Growth Rates

As mentioned in the previous sections, The Port facility has experienced significant growth in the past few years. This growth makes the area very attractive for economic development and traffic volumes are anticipated to continue increasing. To get a better understanding of how much growth is expected in the study area, the study team looked at the historic traffic counts and RRTPO Regional Travel Demand Model data. The growth rates were developed based on the findings from the two sources as well as the stakeholder input. The following sections outline the steps taken to develop the future 2045 traffic volumes.

3.1.1 Historic Average Annual Traffic Volumes and Travel Patterns

Historic average annual traffic volumes help establish a trend along the corridor and highlight segments where traffic volume may increase. VDOT collects traffic counts from sensors in or along streets and highways and compiles a blended annual average daily traffic count. From this data, estimates of the number of vehicles that traveled each segment of road can be calculated. Table 7 outlines these historic traffic volumes from 2007 to 2018.

Table 7: VDOT Historic Traffic Counts

Road Segment															
Road Name	Length	From	To	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
I-95 NB	1.12	SCL Richmond	SR 161 Bells Rd	47,000	46,000	47,000	48,000	44,000	45,000	45,000	47,000	50,000	52,000	53,000	53,000
I-95 NB	3.81	SR 161 Bells Rd	Maury St	46,000	45,000	46,000	46,000	43,000	44,000	45,000	46,000	49,000	50,000	52,000	52,000
I-95 SB	1.39	SCL Richmond	SR 161 Bells Rd	43,000	42,000	42,000	48,000	46,000	46,000	46,000	47,000	50,000	52,000	54,000	53,000
I-95 SB	3.86	SR 161 Bells Rd	Maury St	47,000	46,000	46,000	43,000	45,000	46,000	44,000	46,000	50,000	52,000	53,000	53,000
US 1, US 301 (Jefferson Davis Hwy)	2.13	SCL Richmond	Bellemeade Rd	20,000	19,000	20,000	19,000	17,000	15,000	14,000	14,000	15,000	15,000	14,000	11,000
VA 161 (Commerce Rd)	0.21	I-95	Bells Rd	19,000	19,000	18,000	18,000	18,000	19,000	18,000	19,000	22,000	21,000	21,000	20,000
127-7521 (Commerce Rd)	0.88	Bells Rd	Ruffin Rd	5,900	6,000	6,000	6,100	5,900	5,600	5,400	5,600	6,500	6,100	6,000	6,400
127-7521 (Commerce Rd)	1.08	Ruffin Rd	Bellemeade Rd	4,300	4,400	4,300	4,400	4,300	4,200	4,000	4,200	4,000	3,700	3,600	3,900
VA 161 (Bells Rd)	1.17	Commerce Rd	US 1, US 301 Jefferson Davis Hwy	9,200	9,400	9,000	9,100	8,900	8,900	8,500	8,800	9,400	8,800	8,700	8,900
127-8 (Ruffin Rd)	0.75	Jeff Davis Hwy	Commerce Rd	2,200	2,200	2,500	2,600	2,500	1,800	1,700	1,800	1,900	1,800	1,700	2,100
127-7545 (Bellemeade Rd)	0.75	US 1 Jeff Davis Hwy	Commerce Rd	5,800	5,900	5,500	5,500	5,400	5,300	5,100	5,300	5,800	5,400	5,300	6,800

Between 2007 and 2014, traffic counts show very little to no growth along the study area. Some segments even saw the volume drop. This phenomenon coincided with the economic recession. However, since 2015 the study area has mostly seen 1-2% growth.

3.1.2 Socio-Economic Data

The estimated changes in population, households, and employment for the study area were derived from the Regional Travel Demand Model. The estimates are for the traffic analysis zones (TAZs). Figure 12 shows TAZs for which the data was collected. The 2017 and 2045 estimates for population, households and employment are summarized in Table 8. Based on the employment data, the study area is going to see most growth in TAZs centered around Bells Road interchange and on Deepwater Terminal Road, which is as expected since these TAZs are mostly industrial. A discussed in the previous sections of this report, the land use along Jefferson Davis Highway is mostly residential. Therefore, the highest increase in population and households is expected along TAZs on that road.

3.1.3 Annualized Background Growth Rate

The non-compounded annual background growth rate of 1.5% for I-95 and 1% for arterial network was developed using the historic traffic counts, RRTPO Regional Travel Demand Model, and coordination with VDOT and other stakeholders. The trip generation for the study area (discussed in the following section) and this background growth rate was added to the existing traffic volumes to develop the future 2045 traffic volumes.

Figure 12: Study Area TAZs

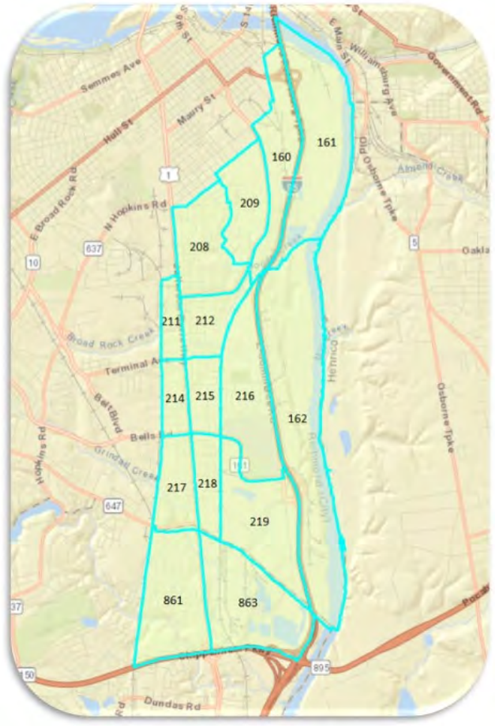


Table 8: Socio-Economic Data for Study Area TAZs

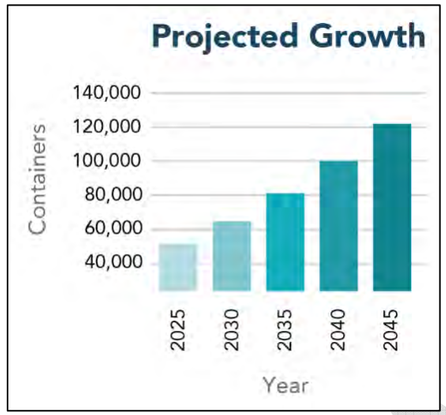
TAZ	Jurisdiction	Total Population					Total Households					Total Employment				
		2017	2045	Increase (2045-2017)	% Change (2045-2017)	Avg Annual % Change	2017	2045	Increase (2045-2017)	% Change (2045-2017)	Avg Annual % Change	2017	2045	Increase (2045-2017)	% Change (2045-2017)	Avg Annual % Change
160	Richmond	2	2	0	0%	0.0%	1	1	0	0%	0.0%	567	572	5	1%	0.0%
161	Richmond	2	2	0	0%	0.0%	0	0	0	0%	0.0%	58	80	22	38%	1.4%
162	Richmond	0	0	0	0%	0.0%	0	0	0	0%	0.0%	638	857	219	34%	1.2%
208	Richmond	2309	2465	156	7%	0.2%	980	1048	68	7%	0.2%	123	124	1	1%	0.0%
209	Richmond	1327	1418	91	7%	0.2%	577	617	40	7%	0.2%	680	686	6	1%	0.0%
211	Richmond	231	247	16	7%	0.2%	101	108	7	7%	0.2%	351	354	3	1%	0.0%
212	Richmond	1009	1622	613	61%	2.2%	438	704	266	61%	2.2%	57	72	15	26%	0.9%
214	Richmond	249	266	17	7%	0.2%	108	115	7	6%	0.2%	183	184	1	1%	0.0%
215	Richmond	903	1120	217	24%	0.9%	392	486	94	24%	0.9%	32	34	2	6%	0.2%
216	Richmond	580	620	40	7%	0.2%	252	269	17	7%	0.2%	2601	2626	25	1%	0.0%
217	Richmond	716	766	50	7%	0.2%	311	333	22	7%	0.3%	420	422	2	0%	0.0%
218	Richmond	489	598	109	22%	0.8%	212	259	47	22%	0.8%	186	202	16	9%	0.3%
219	Richmond	0	0	0	0%	0.0%	0	0	0	0%	0.0%	428	528	100	23%	0.8%
861	Chesterfield	2386	2814	428	18%	0.6%	803	947	144	18%	0.6%	487	491	4	1%	0.0%
863	Chesterfield	0	0	0	0%	0.0%	0	0	0	0%	0.0%	1913	1913	0	0%	0.0%

3.2 Projected Future Growth (2045) and Traffic Volumes

3.2.1 Future Land Use and Approved Development

Future land use was based on the socio-economic data in the travel demand models and stakeholder input. As described earlier, The Port facility is expected to experience growth in the near and long-term. However, other industrial development and re-development is forecast to occur in the study area as well. The growing business at RMT solidified the Panattoni Development Co., an international development firm, decision to build one million square feet in two distribution centers near the Richmond Marine Terminal, and influenced Hourigan Group, a real estate development and construction management company based in Richmond, to commit to developing Deepwater Industrial Park, totaling 1.5-million-square-feet of development. These three sites along with The Port are anticipated to significantly contribute to growth in the study area.

Figure 13:The Projected Growth of the RMT



3.2.2 Trip Generation and Distribution

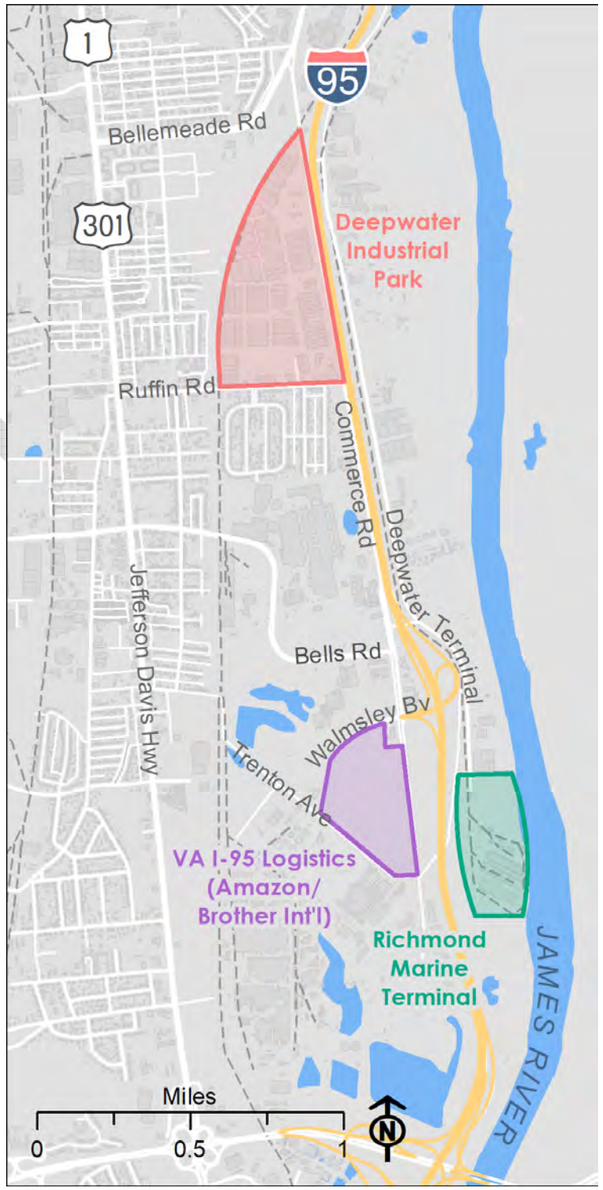
The major trip generators in the study area are shown in Figure 14. For the RMT, average annual non-compounded growth rate of 3.5% was computed from data provided in the RMT Strategic Master Plan. Since the two I-95 Virginia Logistics sites became fully operational in the third quarter of 2019, the counts were collected in the field and a growth rate of 1% was applied to estimate future travel forecast for the year 2045. Brother International counts were collected in October 2019, while the counts for Amazon were collected in November the same year. The count data can be found in Appendix X. For Deepwater Industrial Park site work is still underway. Therefore, the ITE Trip Generation Manual 10th edition for land use code 150 (warehousing) was used to estimate the number of trips in and out of the facility. The estimated values are shown in Table 9 below.

Table 9: Deepwater Industrial Park Trip Generation

Land Use	AM Peak Hour			PM Peak Hour			Daily		
	IN	OUT	Total	IN	OUT	Total	IN	OUT	Total
Deepwater Industrial Park (LU Code 150)	219	65	284	86	231	317	1,342	1,342	2,684

The trips estimated for the above-mentioned redevelopment sites were added to the calculated background growth for the study area and then used in the year 2045 analyses. Traffic was then distributed at the study intersections based on the existing travel patterns derived from Streetlight data and the existing turning movement counts. Engineering judgement was used to make reasonable adjustments to the trip distribution to achieve volume balancing in the network.

Figure 14: Major Trip Generators within the Study Area

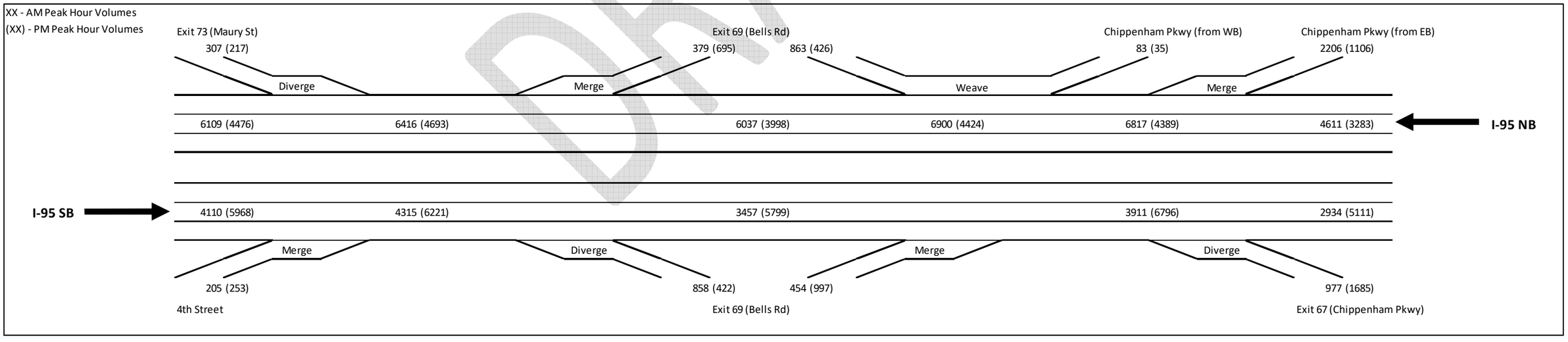


3.2.3 Future (2045) Traffic Volumes

Traffic volumes for the year 2045 were developed based on the trip generation and the background growth rate as discussed in the previous sections. Figure 15 contains a graphical depiction of the existing peak hour volumes for intersections in proximity of Bells Road interchange. The volumes for other intersections within the study area are shown in Appendix X. The I-95 volumes are shown in Figure 16.

Figure 15: Future Peak Hour Volumes - Intersections

Figure 16: I-95 Lane Schematic and Future Peak Hour Volumes



4. Concepts Development

4.1 Overview

The study team took the approach of developing two types of project concepts for the stakeholder group. The first set are projects that could provide a benefit that accomplished the immediate study's goals and would be less costly but may not sustain the benefit. These projects were termed "Short-Term Concepts" by the study team. The second set of projects include interchange modifications and local connectors, which would likely change travel patterns in the study area. These projects were termed "Long-Term Concepts" and seek to accomplish the study goals beyond the horizon year of 2045, but potentially with more significant costs.

4.2 Short-Term Concepts

A total of seven projects were developed as short-term concepts. The locations of these projects are shown in Figure 17. Concepts S1, S3 and S7 were analyzed as stand-alone ideas, while S2, S4, S5 and S6 cannot function properly without being combined with another project and were therefore only analyzed as combined ideas.

Figure 17: Short-term Concept Locations

The following section provides a brief description of short-term concepts.

Concept S1 is located on I-95 in the southbound direction between Bells Rd and Chippenham Parkway interchanges. It would require widening of I-95 in the southbound direction to construct an auxiliary lane approximately 3,800 feet long. This would be consistent with the solution on the northbound side and would help alleviate congestion, especially in the PM peak hour. The major obstacles for this concept are possible Right of Way impacts and bridge widening, which would increase the cost, however in general, the benefit-to-cost ratio for adding auxiliary lanes is typically high, averaging 20:1 for a ten-year life (Source: FHWA). The planning level construction cost estimate is between $15.4 and $25.6 Million. Figure 18 shows a sketch of concept S1.

Concept S2 is converting the outer left lane on Bells Road eastbound approach at Commerce Road intersection to left and right instead of left only. The eastbound right turn greatly exceeds left turn demand. Therefore, converting the outer left lane to left and right would provide additional storage for right turning vehicles. Concept S2 would require adjustments to the signal and pavement markings without any additional construction. Though, due to inadequate turning radius, trucks would have to be restricted to the use of the outer lane. This concept is only analyzed as a combined concept with S3, which is discussed in the following section. The combined **concept S2-S3** is shown in Figure 19. The planning level cost estimate for S2-S3 is between $1.5 to $2.0 Million.

Concept S3 is extending the southbound left turn lane on Commerce Road from Bells Road to Walmsley Boulevard. It is shown in Figure 20. Currently, the left lane has around 400 feet of storage. Extending the lane to Bells Rd intersection would provide an additional 600 feet of storage to help accommodate long queues that exceed the existing storage capacity in the southbound approach at Walmsley Boulevard intersection. There exists space in the median to accomplish the proposed construction, so no additional Right of Way would need to be acquired. However, some stormwater impacts are expected, which would be determined during a future design phase. Also, the existing turn lane to commercial properties along Commerce Road would have to be shifted further inside of the median. Concept S3 would help facilitate concepts 2 and 4. The planning level construction cost-estimate for this concept is between $1.0 and $1.6 Million.

Concept S4 is adding another southbound through lane from Bells Road Access Road to Bells Road. The existing road segment is relatively short, which causes queues to spill back on Commerce and Bells Road Access Road, as well as Deepwater Terminal, especially in the PM peak hour. Adding another lane would provide more storage, which would then reduce queues. There exists space in the median to accomplish the proposed construction, however stormwater system, utility, and signal impacts are expected. This concept is only analyzed as a combined concept with S3, which is discussed in the previous section. The combined **concept S3-S4** is shown in Figure 21. The planning level cost estimate for S3-S4 is between $2.9 to $5.0 Million.

Concept S5 includes relocation of the I-95 southbound on-ramp at Bells Road interchange further south. Most traffic at Walmsley Boulevard and Commerce Road intersection comes from or is destined to I-95. In the AM peak hour, the movement with the most demand is westbound right, while southbound left has the highest volume in the PM peak hour. The existing conditions analysis indicate that the southbound approach is the most congested with queues extending back to Bells Road and beyond. Concept S5 would reduce southbound left turning volume by rerouting traffic destined to I-95 south to through movement at this intersection and left at the new intersection with the relocated on-ramp to I -95 southbound. This would require signal timings to be adjusted and coordinated with the signal at the new intersection of Commerce Road and relocated southbound I-95 on-ramp, should the signal be warranted at that location. To ensure enough storage, southbound double lefts are recommended in this concept. Even though concept S5 could theoretically function as a stand-alone concept, it was only analyzed as a combined concept with S6, which is discussed in the next section. Some of the drawbacks of concept S5 include private property/right-of-way requirement. Also, vertical clearance below power lines would need to be verified during future design phase.

Concept S6 requires rerouting eastbound through and left turn movements to the right on Walmsley Boulevard at Commerce Road intersection. This concept was only analyzed as a combined concept with S5 described previously.

Due to a change in traffic assignment as a result of concept S5 at this intersection, rerouting eastbound through and left movements would improve signal efficiency by allowing less phases and more green time given to the southbound approach. Concept S6 would also reduce conflict points, which would therefore improve safety. The combined **concept S5-S6** is shown in Figure 22. The planning level cost estimate for S5-S6 is between $4.5 to $7.3 Million.

Concept S7 is a reconfiguration of the I-95 southbound off-ramp termini at Bells Road interchange. With the existing lane configuration, vehicles coming from I-95 southbound destined to a location north of Walmsley Boulevard and Commerce Road intersection could stay in either of the two lanes on the off-ramp, while vehicles destined to Walmsley Boulevard or south on Commerce would have to stay in the leftmost lane on the on-ramp and then weave over to a desired through or left turn lane in the westbound approach. As observed during the field review, poor sight distance and high volumes from both I-95 off-ramps in the AM peak hour can make this movement very difficult to accomplish. Concept S7 would eliminate a weave by reconfiguring the I-95 off-ramp termini to a right turn lane only and a through and left only, which would have to yield to I-95 northbound traffic. The yielding point is relocated slightly to the east for better sight distance and to allow for more storage at the westbound through and left lanes. Also, a barrier is recommended between the rightmost lane coming from I-95 southbound and an inside right turning lane for I-95 northbound traffic to ensure no weaving. This concept was analyzed as a stand-alone concept, but it can be combined with other concepts. The sketch of concept S7 is shown in Figure 23 and the planning level cost estimate is between $0.5 and $1.0 Million.

Another short-term idea discussed but removed from consideration is a quadrant roadway concept at Commerce Road/Walmsley Boulevard intersection with the I-95 ramps. Although, this concept often has great benefits such as improved safety and increased operational efficiency, it does not seem feasible for this particular location. The quadrant roadway consists of a main intersection and two secondary intersections, which are typically T-intersections to allow for three phase signals. This is not achievable at the junction with I-95 southbound ramps. Other challenges of implementing the quadrant roadway at this location include possible bridge widening, southbound ramp relocation and acquisition of Right of Way.

Figure 18: Concept S1

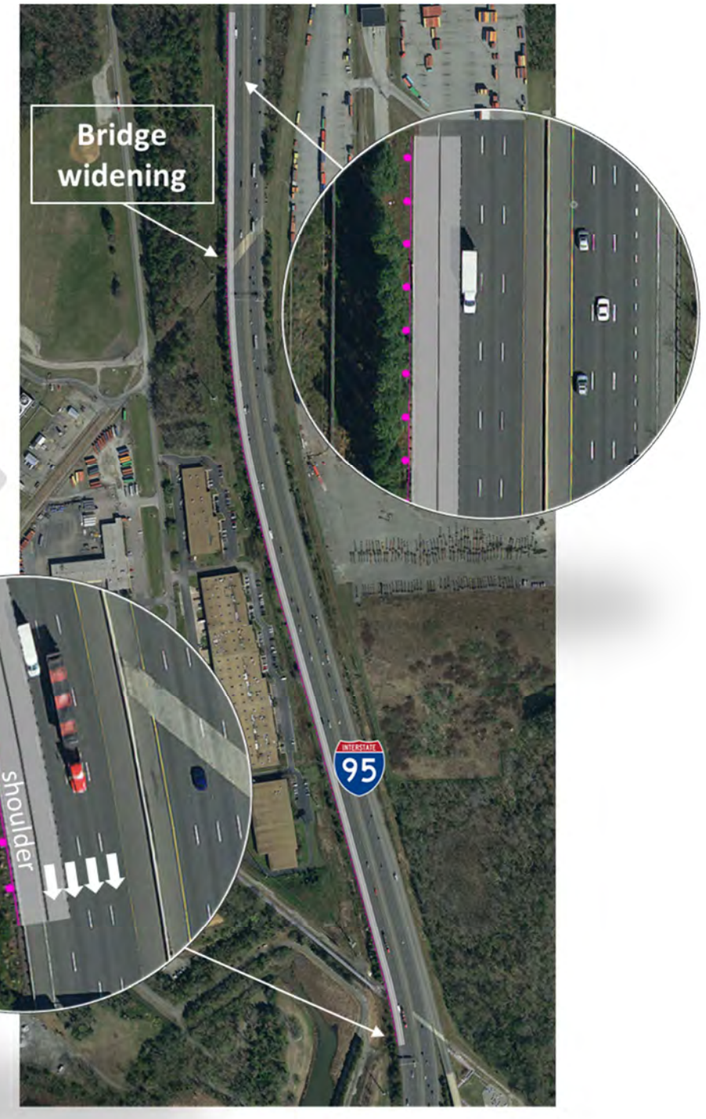


Figure 19: Concept S2-S3

Figure 20: Concept S3

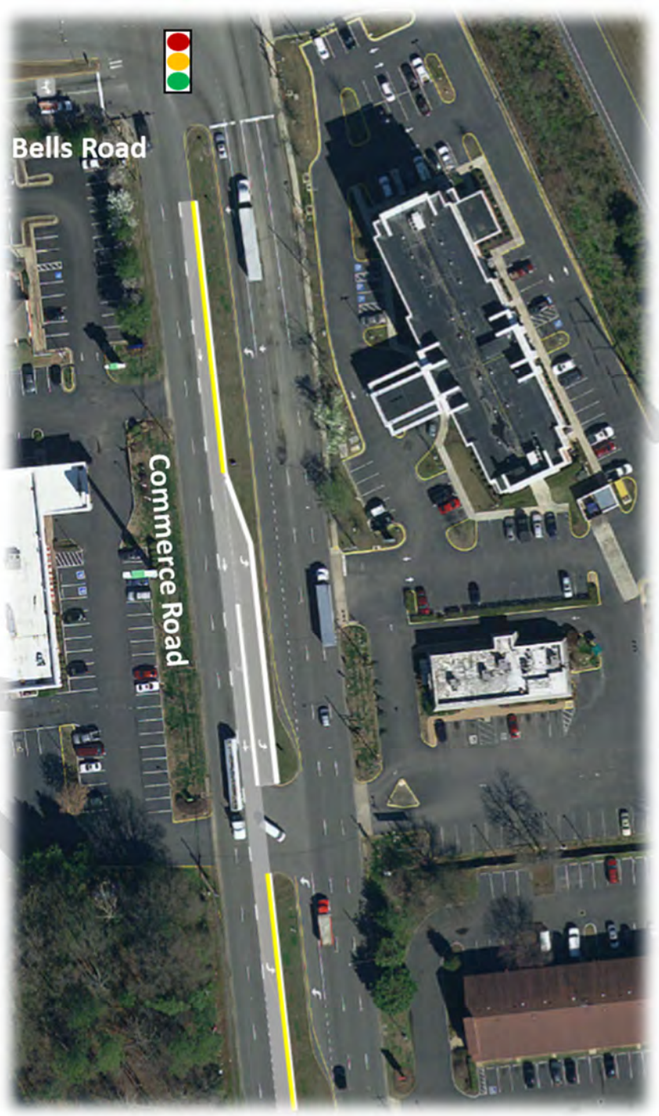


Figure 21: Concept S3-S4

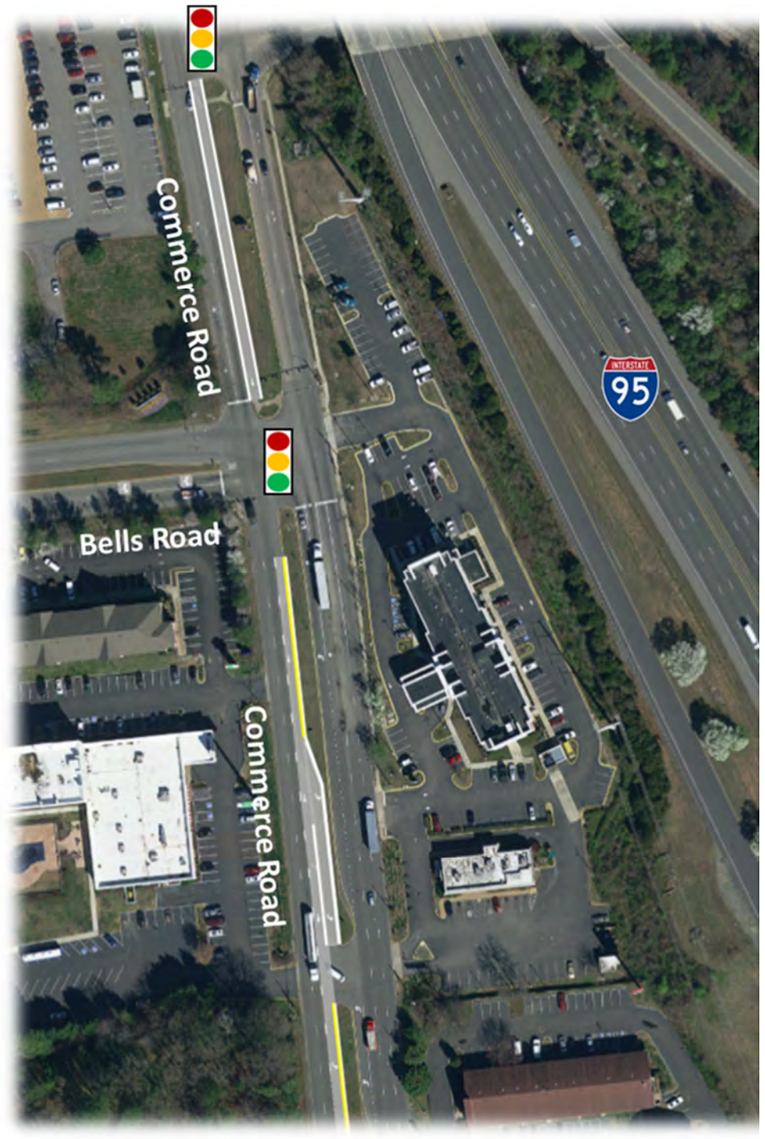


Figure 22: Concept S5-S6

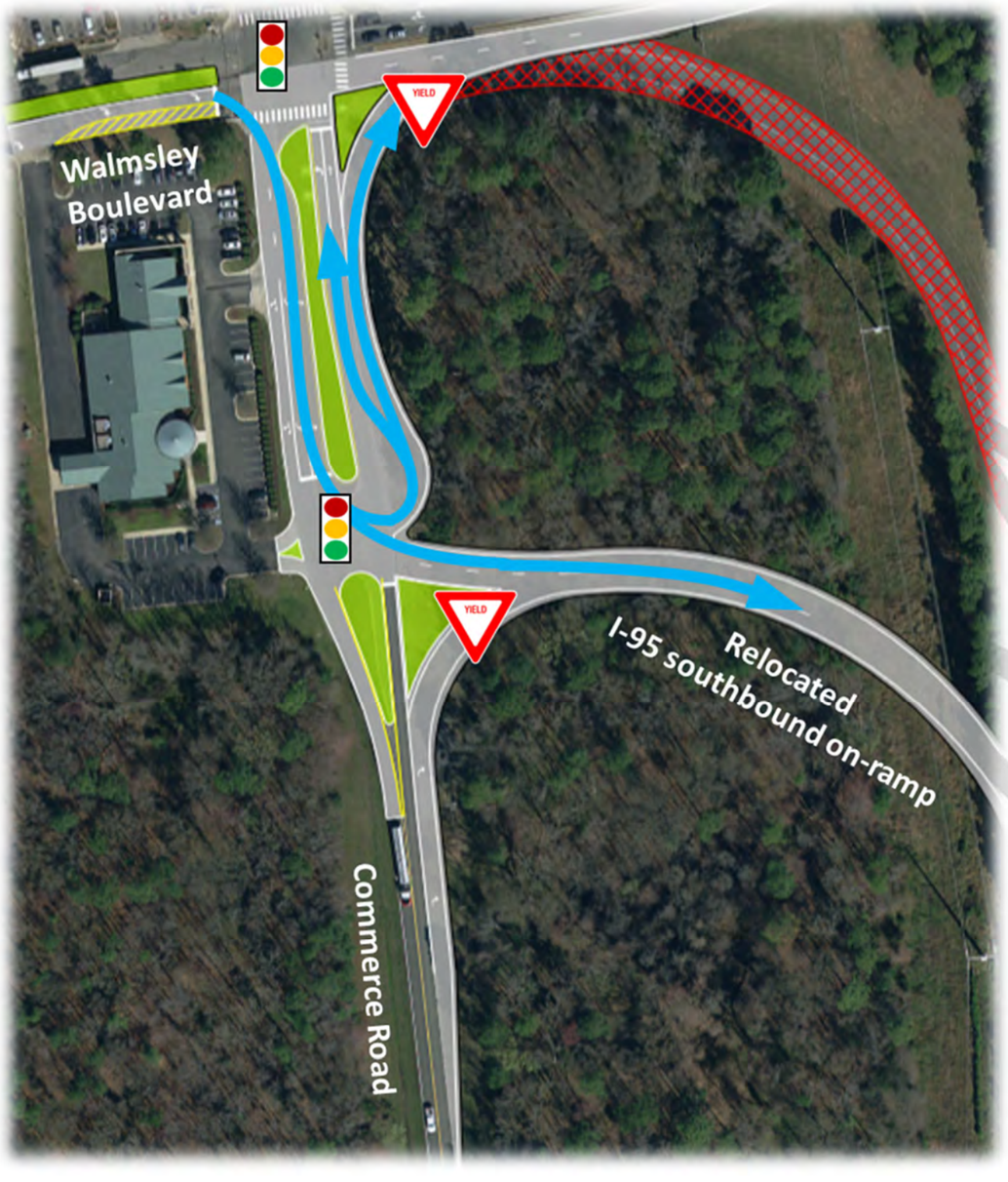
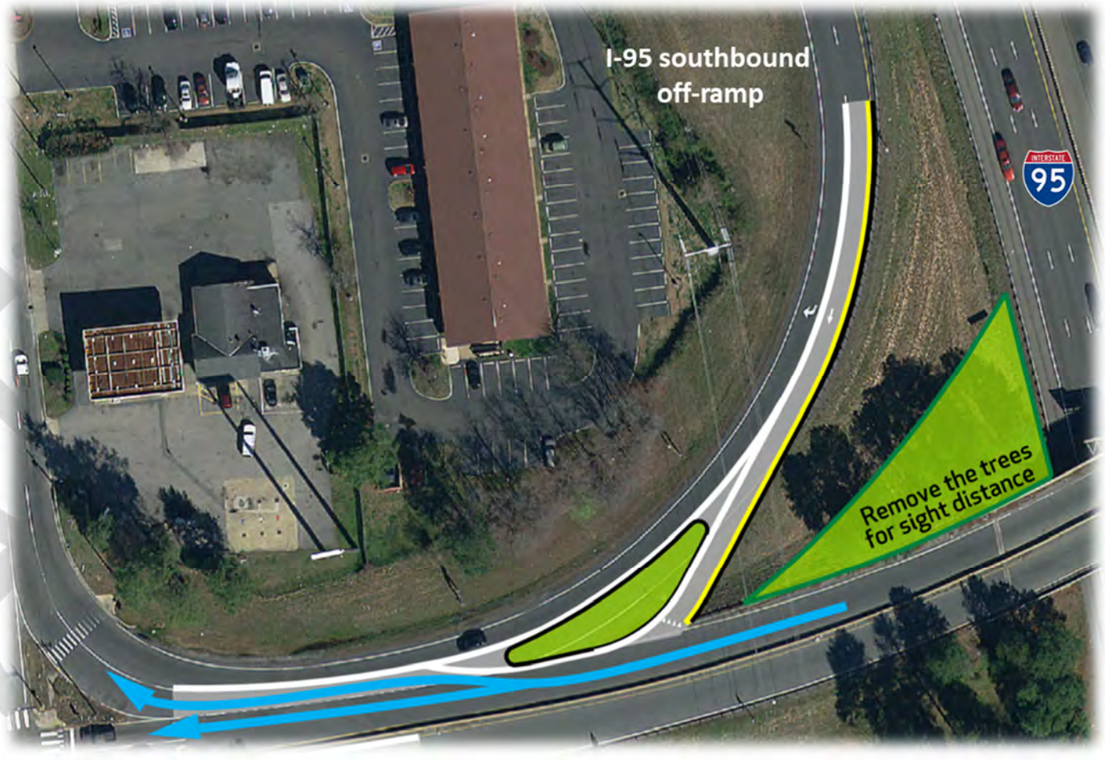


Figure 23: Concept S7



4.3 Long-Term Concepts

The study team developed two types of long-term project concepts. The first set are projects that include modifying the Bells Road interchange or Commerce Road at the Walmsley Boulevard intersection to provide better access to I-95. A total of four such projects were developed, however two were eliminated from further consideration. New interchange ideas, such as DDI, SPUI and a combination of DDI and a roundabout (Divergabout) were also discussed and removed from consideration. The second set of long-term concepts are local connector roads. A total of two such projects were considered.

The following section provides a brief description of long-term concepts.

Concept L1 is a roundabout at Commerce Road and Walmsley Boulevard intersection. This concept also includes a reconfiguration of the I-95 southbound off-ramp termini, or what is mentioned as a short-term concept S7 in the previous sections. It was analyzed as a stand-alone and in combination with another long-term concept. Right of Way, utility and access impacts would have to be determined during future design phase. The planning level construction cost estimate for concept L1 is $10.5 - $12.8 Million. The sketch is shown in Figure 24.

Concept L2 is one of the long-term projects discussed and removed from consideration. It is a roundabout on Deepwater Terminal Road with access to I-95 northbound. The roundabout and Deepwater Terminal Road would have to be raised to meet interchange grade. Adding another northbound off-ramp is also included in this concept. A single-lane roundabout and yield controlled ramp junctions were proposed. Concept L2, shown in Figure 25, would have to be combined with another concept on the west side of I-95 to provide better access to I-95 southbound, such as L1. Following detailed discussion with the stakeholders, this concept was removed from further consideration.

Concept L3 is shown in Figure 26. It is a single-lane roundabout on I-95 northbound ramps with flyovers to Deepwater Terminal Road. The configurations of the termini of these flyover ramps on Deepwater Terminal Road were proposed to be unsignalized. It is important to note that this concept was analyzed as a combined concept with L1 to provide access to I-95 southbound for vehicles traveling from Deepwater Terminal Road. The planning level construction cost estimate for concept L3 excluding L1 is $35.3 - $43.2 Million.

Concept L4 is another long-term project that was discussed and removed from consideration. As shown in Figure 27 this concept is another version of L3. Both concepts include flyover ramps to Deepwater Terminal Road, however a conventional intersection was proposed in concept L4 compared to the roundabout in L3. Relocating northbound off-ramp and shifting the on-ramp was also proposed in this concept. Following detailed discussion with the stakeholders, this concept was removed from further consideration.

Concept LC1 is connecting Walmsley Boulevard from Jefferson Davis Highway to Commerce Road. The approximate location of the connector road proposed is shown in Figure 28. The regional travel demand model was utilized to predict traffic re-routing resulting from this idea and how it may create benefit or collateral requirements within study area roadway network. The planning level construction cost estimate for concept LC1 is $42.8 - $52.3 Million.

Concept LC2 proposes a connection between Commerce Road and The Port by using an existing I-95 underpass. The location of this concept is shown in Figure 29. The tunnel connects to existing 'DuPont property' and it is within VDOT I-95 Right of Way. Some of the challenges include shallow utility pipelines in vicinity that proposed vehicle traffic would have to cross. Another challenge is the existing vertical clearance of 14.2 feet, which would make the proposed crossing a private road only. Furthermore, soil characteristics are unknown in this area. The construction of the crossing could cost $3.0 – $5.0 Million.

Figure 24: Concept L1

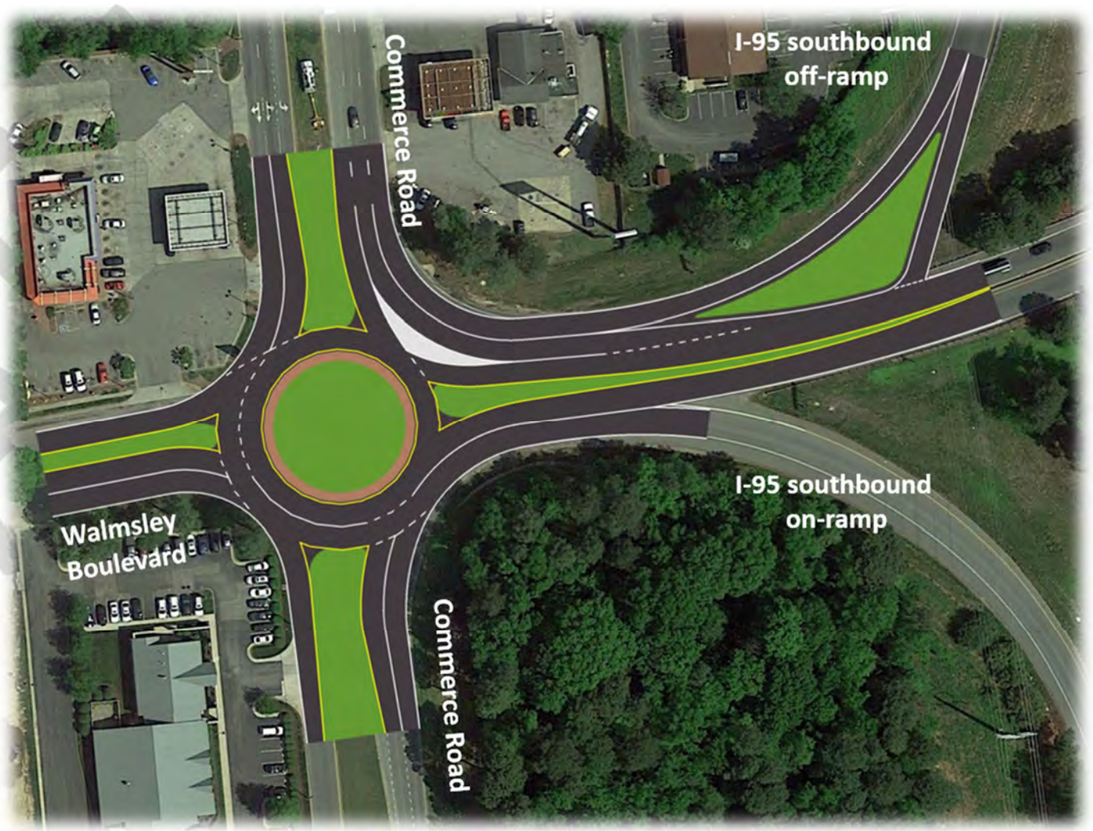


Figure 25: Concept L2

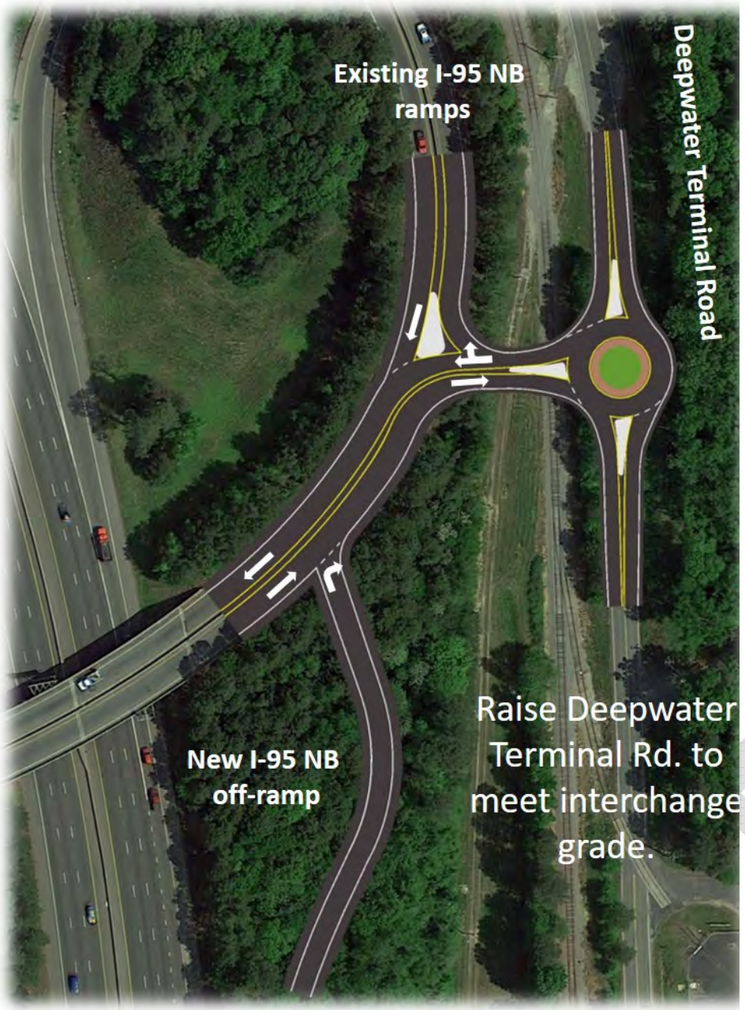


Figure 26: Concept L3

Figure 27: Concept L4

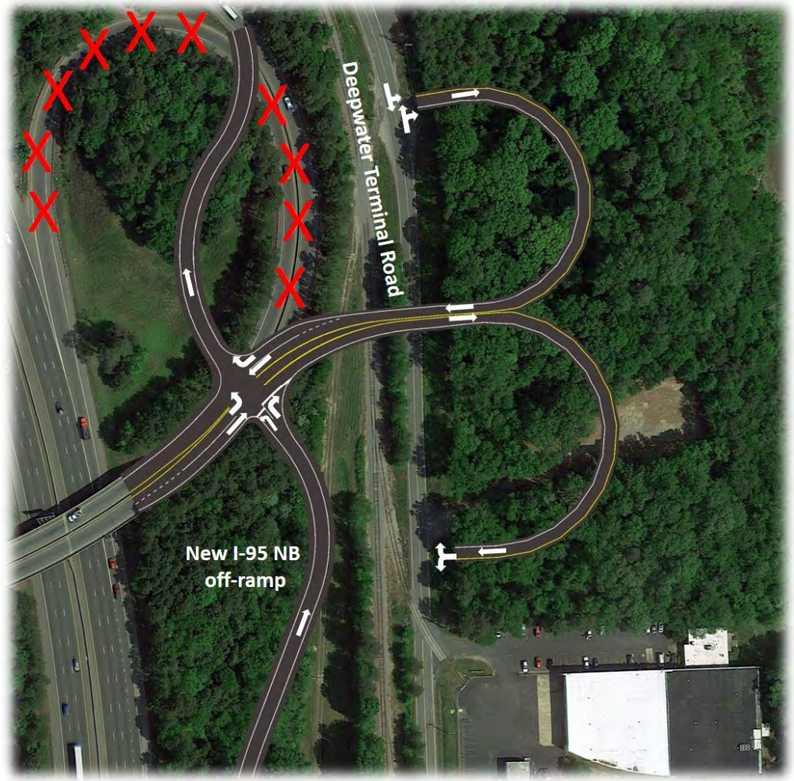


Figure 28: Concept LC1

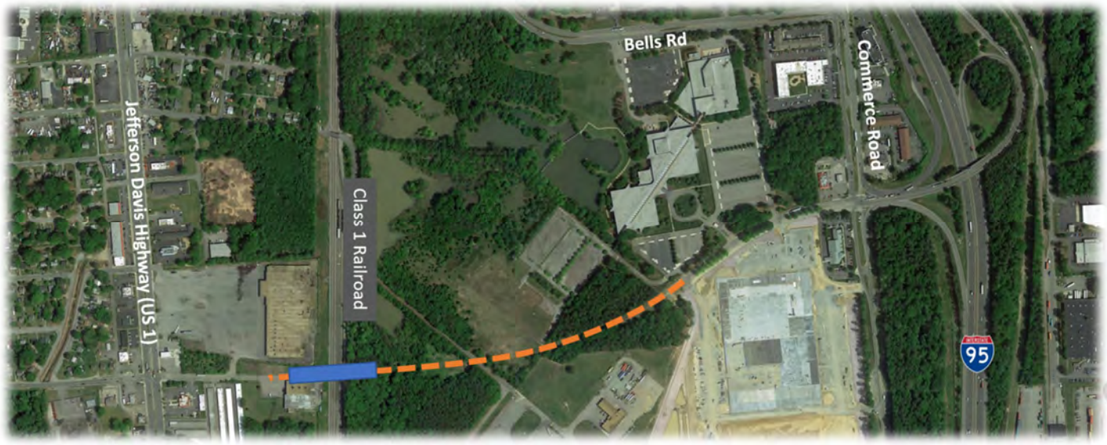


Figure 29: Concept LC2

5. Future Conditions Traffic Operations

5.1 No-Build Conditions

As the name implies, the future no-build models were created to represent future traffic conditions without considered concepts being implemented. These models were used as a baseline for generating and comparing future build scenarios. The following section details the deficiencies of the study area under the 2045 No-Build conditions. Although it is not known when the full build-out of future land use will occur, the operational analysis for the 2045 scenarios includes the future traffic volumes for the full build-out of development to maximize the project life span for the recommended improvements.

Table 10 shows future no-build conditions travel times simulated in VISSIM compared to the existing scenario travel times. As shown in the table, Bells Road westbound and Commerce Road southbound segments between Jefferson Davis Highway and I-95 ramps are expected to experience the longest travel time increase of more than 16 minutes in the PM peak hour. Table 10 also indicates an increase in travel time of around 2 minutes for the following southbound segments: I-95 segment withing the study area and Jefferson Davis Highway segment between Bellemeade Road and Walmsley Boulevard in the PM peak hour, as well as Commerce Road between Bellemeade Road and Walmsley Boulevard in the AM peak hour. The travel times for all other segments shown in Table 10 show increase that of 40% or less, or less than 2 minutes.

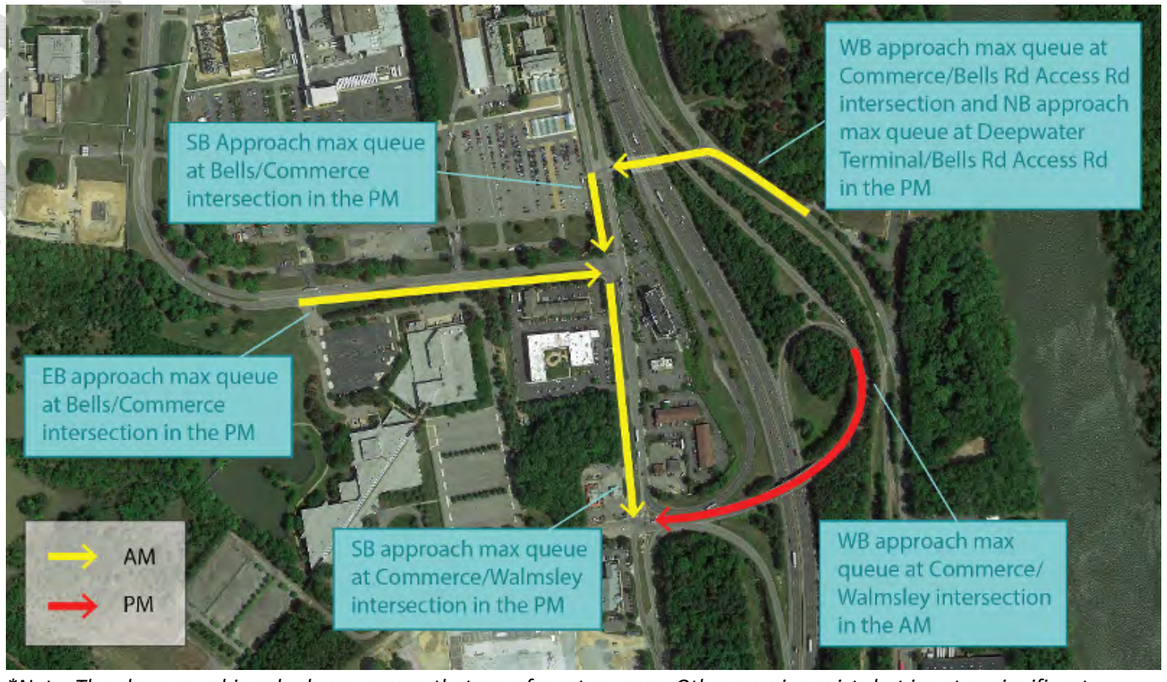
The operational analysis results for select study intersections in vicinity of Bells interchange are presented in Table 11, while the results for all other intersections within the study area can be found in Appendix X. As shown in Table 11 the intersections along Commerce Road operate at LOS B in the AM peak hour and LOS C in the PM peak hour. The intersection of Bells Road Access Road and Deepwater Terminal operates at LOS A in the AM peak hour and LOS B in the PM peak hour. These results are very similar to the existing scenario, however some individual movement experience much longer delays and queues in the no-build scenario compared to individual movement delays and queues in the existing conditions. Queues of most concern are in the westbound direction in the AM and southbound in the PM at Commerce Road and Walmsley Boulevard/I-95 ramps intersection, which extend to more than a thousand feet. Table 11 also indicates queue spillback in the westbound direction at Bells Road Access Road and Commerce Road intersection during the PM peak hour as the maximum queue lengths exceed the available storage length on Bells Road Access Road. The maximum queues reported in the northbound direction on Deepwater Terminal Road at Bells Road Access Road are around 500 feet. As mentioned in the existing conditions operations analysis, this queue on Deepwater is likely due to vehicles not being able to turn to Bells Road Access Road because of long queues extending from Commerce Road. The maximum queues for the no-build scenario were also depicted in Figure 30.

The I-95 future no-build conditions results are presented in Table 12. The results indicate the interstate is more congested in the PM peak hour in both directions. In the AM peak hour, the I-95 northbound segments operate at LOS C or D, while the southbound segment operate at LOS B or C. The segments surrounding Bells Road interchange seem to be most congested during the PM peak hour as they operate at LOS E in the northbound direction of I-95 and LOS F in the southbound.

Table 10: Future No-Build Conditions Travel Times (min)

Route	From	To	Average Travel Time (minutes)					
			Existing AM	No-build AM	% Change	Existing PM	No-build PM	% Change
I-95 NB	I-95 South	I-95 North	3.7	3.8	2.9%	3.7	3.9	6.7%
I-95 SB	I-95 North	I-95 South	3.7	3.7	1.2%	3.7	6.1	63.4%
Commerce Rd NB	I-95 ramps	Bellemeade Rd	4.1	3.9	-3.6%	4.2	3.8	-7.5%
Commerce Rd SB	Bellemeade Rd	I-95 ramps	4.0	6.1	50.7%	4.3	5.8	33.6%
Jefferson Davis Hwy NB	Walmsley Blvd	Bellemeade Rd	3.7	5.2	40.7%	4.0	4.7	18.1%
Jefferson Davis Hwy SB	Bellemeade Rd	Walmsley Blvd	3.6	4.5	24.0%	3.8	6.4	69.7%
Bells Rd WB & Commerce Rd NB	I-95 ramps	Jefferson Davis Hwy	3.3	3.3	0.2%	3.7	3.3	-9.2%
Bells Rd EB & Commerce Rd SB	Jefferson Davis Hwy	I-95 ramps	2.7	3.6	34.9%	3.1	21.0	580.6%

Figure 30: 2045 No-Build Maximum Queue Lengths



**Note: The above graphic only shows queues that are of most concern. Other queuing exists but is not as significant.*

Table 11: Future No-Build Conditions VISSIM Analysis Results - Intersections

Intersection	Approach	Movement	AM Peak Hour			PM Peak Hour			Available Storage Length (ft)
			Delay (sec)	LOS	Max Queue Length (ft)	Delay (sec)	LOS	Max Queue Length (ft)	
Commerce Rd & Walmsley Blvd/I-95 ramps	EB	EBL	32.0	C	142	42.5	D	136	150
		EBT	31.5	C	97	45.0	D	176	-
		EBR	4.1	A	113	4.6	A	191	-
	WB	WBL	49.6	D	1355	68.8	E	269	450
		WBT	45.1	D	1049	42.4	D	226	-
		WBR	7.8	A	1296	1.1	A	155	-
	NB	NBL	45.9	D	48	52.1	D	59	250
		NBT	52.5	D	134	71.0	E	210	-
		NBR	8.6	A	152	32.7	C	418	200
	SB	SBL	21.7	C	934	20.6	C	1166	410
		SBT	15.3	B	934	12.2	B	1166	-
		SBR	6.8	A	795	5.4	A	1027	-
	Intersection		**18.2**	**B**	**1420**	**20.8**	**C**	**1166**	-
Commerce Rd & Bells Rd	EB	EBL	44.2	D	202	49.8	D	146	-
		EBR	11.4	B	403	27.6	C	739	-
	WB	WBL	49.9	D	92	66.5	E	24	-
		WBT	56.3	E	92	59.3	E	25	-
		WBR	8.6	A	29	6.1	A	28	70
	NB	NBL	28.6	C	357	28.2	C	315	375
		NBT	9.1	A	360	3.2	A	143	-
		NBR	0.0	A	420	2.0	A	203	-
	SB	SBT	32.3	C	397	29.3	C	470	-
		SBR	18.1	B	345	24.5	C	417	-
	Intersection		**19.5**	**B**	**504**	**24.8**	**C**	**739**	-
Commerce Rd & Bells Rd Access Rd	WB	WBL	43.8	D	291	38.3	D	548	450
		WBR	23.5	C	328	29.5	C	585	450
	NB	NBT	11.1	B	426	18.9	B	269	-
		NBR	10.9	B	403	11.8	B	245	-
	SB	SBL	43.6	D	109	48.4	D	136	210
		SBT	5.6	A	137	19.7	B	266	-
	Intersection		**11.7**	**B**	**426**	**24.0**	**C**	**585**	-
Bells Rd Access Rd & Deepwater Terminal Rd	EB	EBL	1.8	A	46	1.9	A	83	-
		EBR	2.0	A	28	1.3	A	14	-
	NB	NBL	1.2	A	20	28.7	D	532	-
		NBT	0.5	A	6	14.7	B	486	-
	SB	SBT	0.4	A	0	1.9	A	144	-
		SBR	0.6	A	0	8.6	A	144	-
	Intersection		**1.7**	**A**	**62**	**13.2**	**B**	**532**	-

Table 12: Future No-Build Conditions VISSIM Analysis Results - I-95

AM Peak Hour			
Freeway Segment	**Speed[1]**	**Density[2]**	**LOS**
I-95 Northbound			
Diverge Segment at the off-ramp to Maury Street	56	27.3	C
Basic Segment between Bells Rd on-ramp and Maury Street off-ramp	58	35.0	D
Merge Segment at the on-ramp from Bells Road	57	26.4	C
Basic Segment between Bells Rd on-and-off-ramps	58	32.7	D
Weaving Segment between Chippenham Parkway Westbound on-ramp and Bells Road off-ramp	57	28.4	D
I-95 Southbound			
Merge Segment at the 4th Street	57	18.8	B
Basic Segment between 4th Street on-ramp Bells Road off-ramp	58	24.6	C
Diverge Segment at the off-ramp to Bells Road	59	18.2	B
Basic Segment between Bells Road on-and-off-ramps	59	19.4	C
Merge Segment at the on-ramp from Bells Road	58	17.1	B
Basic Segment between Bells Road on-ramp and Chippenham Parkway off-ramp	59	22.2	C
Diverge Segment at the off-ramp to Chippenham Parkway	59	16.5	B

PM Peak Hour			
Freeway Segment	**Speed[1]**	**Density[2]**	**LOS**
I-95 Northbound			
Diverge Segment at the off-ramp to Maury Street	56	20.9	C
Basic Segment between Bells Rd on-ramp and Maury Street off-ramp	39	44.1	E
Merge Segment at the on-ramp from Bells Road	32	36.7	E
Basic Segment between Bells Rd on-and-off-ramps	34	39.9	E
Weaving Segment between Chippenham Parkway Westbound on-ramp and Bells Road off-ramp	39	28.6	D
I-95 Southbound			
Merge Segment at the 4th Street	53	29.1	D
Basic Segment between 4th Street on-ramp Bells Road off-ramp	42	49.3	F
Diverge Segment at the off-ramp to Bells Road	27	51.1	F
Basic Segment between Bells Road on-and-off-ramps	23	74.1	F
Merge Segment at the on-ramp from Bells Road	23	65.1	F
Basic Segment between Bells Road on-ramp and Chippenham Parkway off-ramp	51	37.0	E
Diverge Segment at the off-ramp to Chippenham Parkway	57	26.0	C

Source: VISSIM 10 Link Evaluation based on the average of 10 VISSIM model runs.

1 Average simulated speed, expressed in miles per hour.

2 Average simulated density, expressed in vehicle per mile per lane.

LOS	A	B	C	D	E	F
Density (Basic)	≤11	11-18	18-26	26-35	35-45	>45
Density (Merge/Diverge/Weaving)	≤10	10-20	20-28	28-35	35-45	>45

5.2 Build Conditions

The build conditions represent future traffic conditions with considered concepts being implemented. VISSIM models were created for short-term and long-term concept ideas described in Chapter 4 of this report. The following section details the operations of the study area under the 2045 build conditions. For a better insight of the operational and safety benefits the construction of these concept ideas would add to the study area, the results were compared to the no-build conditions. MOEs such as travel times, delay, LOS and maximum queues were discussed in comparison. The travel times were collected between the measurement points shown in Figure 31. While only most significant travel time savings were presented in result tables, the complete results can be found in Appendix X. As far as intersection delay, LOS and maximum queues, they were reported in separate tables. For easy comparison, the results for all concept ideas including the no-build scenario were shown side by side. Speed, density and LOS for freeway segments were only reported for concepts S1 and S5-S6 as these are the only concepts that includes a modifiction to I-95 main lanes.

Figure 31: Travel Time Measurement Points for Build vs No-Build Results Comparison

5.2.1 Short-Term

The following section provides operational results of the short-term concepts.

Concept S1

Since this concept is located along I-95 between Bells Road and Chippenham Parkway interchange, it has significant impact on I-95 with little to no influence on the arterial network in the study area. Therefore, other than the travel times, the operational results of only I-95 were discussed for this concept. A full set of results including the study intersections can be found in Appendix X. The PM travel time change in seconds and % change of this concept compared to the no-build scenario are shown in Table 13. The results indicate significant time savings for all measurement points with a destination of I-95 South, or point B. Adding an auxiliary lane in this concept especially improved travel times on I-95 southbound with savings of more than 50 percent. The operational benefits of concept S1 are shown in Table 19 as well. Since this is an improvement for southbound direction of I-95, the northbound direction was not affected and therefore the build vs. no-build results for the northbound direction look very much alike in both peak hours. The results look very similar for the southbound direction in the AM peak hour as well. However, in the PM peak hour, which is very congested in the southbound direction on I-95, concept S1 shows most benefit when compared to the no-build conditions. The LOS improved from F to C, D or E with speed increases of over 30 MPH for some segments. Concept S1 also has substantial safety benefits. Based on the key findings regarding the safety impacts of adding auxiliary lanes, the frequency of traffic conflicts for both weaving segments and ramp influence areas can be significantly reduced by adding auxiliary lanes (FHWA).

Table 13: Concept S1 vs No-Build Travel Times

PM travel time change in seconds and % change compared to 2045 no-build scenario			DESTINATION
			B
			I-95 South
ORIGIN	A	I-95 North	-83.0 sec (-57.4%)
	B	I-95 South	
	C	Commerce South (by Amazon entrance)	-22.8 (-14.7%)
	D	Walmsley (by Brother Int'l car entrance)	-24.2 (-18.0%)
	E	Bells Rd @ Jefferson Davis Hwy	-22.2 (-7.7%)
	F	Commerce North @ Bellemeade Rd	-24.7 (-6.8%)
	G	Deepwater Terminal South (The Port)	-34.0 (-11.5%)

Concept S2-S3

The main idea behind this concept was to add more capacity for the eastbound right-turning vehicles by allowing right turn from the left lane on Bells Road. While it is true this concept adds more 'storage' to the right-turning vehicles on Bells Road, it is also true that vehicles spend more time waiting for the light to turn green, especially if they happen to be in the left lane as no right turn on red is allowed from that lane. This would result in reduced queues, but higher delay as shown in Table 20 and Table 21 for Bells Road and Commerce Road intersection. When it comes to the other three intersections, there was little to no change in results between no-build and build scenario. Also, the travel times shown in Table 13 indicate some travel time savings in the PM, however most less than 5 percent. During the AM peak, there were little to no savings. Table X shows top six O-D pairs with the most change in travel times in concept S2-S3 compared to the travel times during the no-build scenario. The travel times between all other O-D pairs not shown in the table, as well as the AM peak hour can be found in Appendix X.

Table 14: Concept S2-S3 vs No-Build Travel Times

PM travel time change in seconds and % change compared to 2045 no-build scenario			DESTINATION		
			A	B	C
			I-95 North	I-95 South	Commerce South (by Amazon entrance)
ORIGIN	E	Bells Rd @ Jefferson Davis Hwy	-7.9 (-2.8%)	-2.7 (-0.9%)	6.0 (2.5%)
	F	Commerce North @ Bellemeade Rd	-12.5 (-3.5%)	-3.9 (-1.1%)	-20.1 (-6.1%)
	G	Deepwater Terminal South (The Port)	-9.3 (-3.2%)	-2.2 (-0.7%)	-4.5 (-1.8%)

Concept S3

The delay and LOS results displayed in Table 20 for concept S3 indicate little to no difference in comparison with the results for the no-build scenario, at least in the AM peak hour. Though in the PM peak hour, the intersection delay was reduced by approximately 4 seconds at Bells Road and Bells Road Access Road intersections on Commerce Road, as well as the intersection of Deepwater Terminal Road and Bells Road Access Road for which the LOS also improved from B to A. When it comes to maximum queues, as mentioned in the concept overview in Chapter 4, current and future queues on the southbound approach at Commerce Road and Walmsley intersection exceed the existing storage capacity. Table 21 shows that extending the southbound left turn lane from Bells Road to Walmsley Boulevard would reduce the maximum queue by approximately 300 feet in both AM and PM peak hour. This would also help reduce queues at other intersections in proximity of Commerce Road and Walmsley Boulevard. For example, as indicated in Table 21 the maximum queue was reduced by 260 feet or 49 percent in the northbound approach at Bells Road Access Road and Deepwater Terminal Road in the PM peak hour. Also, the eastbound right maximum queue at Bells Road and Commerce Road was reduced by 143 feet or 19 percent in the PM peak hour. As far as travel times, the most significant savings for the PM peak hour are shown in Table 15 below. Concept S3 resulted in some travel times savings for the AM peak hour as well, however not significant. The travel times between all other O-D pairs not shown in the table, as well as the AM peak hour can be found in Appendix X.

Table 15: Concept S3 vs No-Build Travel Times

PM travel time change in seconds and % change compared to 2045 no-build scenario			DESTINATION			
			A	B	C	D
			I-95 North	I-95 South	Commerce South (by Amazon entrance)	Walmsley (by Brother Int'l entrance)
ORIGIN	E	Bells Rd @ Jefferson Davis Hwy	-23.1 (-8.2%)	-13.0 (-4.5%)	-10.3 (-4.3%)	-18.7 (-8.9%)
	F	Commerce North @ Bellemeade Rd	-22.4 (-6.2%)	-15.9 (-4.4%)	-22.4 (-6.8%)	-18.1 (-7.2%)
	G	Deepwater Terminal South (The Port)	-24.5 (-8.6%)	-18.7 (-6.3%)	-13.0 (-5.3%)	-20.6 (-10.1%)

Concept S3-S4

Similar to concepts S2 and S2-S3, this concept delay and LOS results in Table 20 show little to no difference when compared to the no-build results in the AM peak hour. However, in the PM peak hour the intersection LOS was improved from C to B for Bells Road and Bells Road Access Road intersections on Commerce Road, and B to A for the intersection of Deepwater Terminal Road and Bells Road Access Road. When looking at maximum queues for concept S3-S4 in Table 21, the results look very similar to concept S3 analyzed as a stand-alone concept, though adding concept S4 to S3 provides even more benefit. The maximum queue in the northbound approach at Bells Road Access Road and Deepwater Terminal Road was reduced by 282 feet or more than 50 percent in the PM peak hour. The southbound approaches on Commerce Road saw queue reductions of around 25 percent, while the eastbound right turning queue on Bells Road was reduced by 18 percent in the PM peak hour. As far as the change in travel times, the results look somewhat similar to concept S3. However, concept S3-S4 appears to add even more benefit to The Port traffic, which had travel time improvements of more than 10 and even 20 percent in the PM peak hour as shown in Table 16.

Table 16: Concept S3-S4 vs No-Build Travel Times

PM travel time change in seconds and % change compared to 2045 no-build scenario			DESTINATION			
			A	B	C	D
			I-95 North	I-95 South	Commerce South (by Amazon entrance)	Walmsley (by Brother Int'l entrance)
ORIGIN	E	Bells Rd @ Jefferson Davis Hwy	-23.1 (-8.2%)	-12.2 (-4.2%)	-9.6 (-4.1)	-12.3 (-5.9%)
	F	Commerce North @ Bellemeade Rd	-27.3 (-7.6%)	-16.7 (-4.6%)	-16.2 (-5.0)	5.2 (2.1%)
	G	Deepwater Terminal South (The Port)	-35.7 (-12.5%)	-24.1 (-8.1%)	-19.5 (-7.9%)	-43.9 (-21.5%)

Concept S5-S6

Based on the delay and LOS results in Table 20 and maximum queue results in Table 21, concept S5-S6 brings little to no improvement in the AM peak hour. Relocating the I-95 southbound off-ramp further south resulted in some improvement at Commerce Road and Walmsley Boulevard intersection. As shown in Table 20, the overall intersection delay was reduced by about 6 seconds and the LOS changed from C to B in the PM peak hour. The northbound right queue was also reduced by almost 300 feet or 70 percent. However, the benefits of concept S5-S6 were offset by the new intersection on Commerce Road with the relocated I-95 southbound off-ramp. Even though the newly proposed intersection operates at LOS A in the AM and B in the PM with maximum queues of around 200 feet, the benefit of re-routing some movements from Walmsley Boulevard and Commerce Road does not outweigh the cost it would take to relocate the ramp and construct the new intersection. The operational results for the proposed intersection can be found in Appendix X. The travel time results for concept S5-S6 tell the same story. As shown in Table 17, concept S5-S6 resulted in improvements in travel times for some movements and increases for other in the PM peak hour. The AM peak hour results were similar can be found in Appendix X along with the travel time results for all other O-D pairs analyzed for both peak hours. Particularly, eastbound left and through movements were at a disadvantage in this concept as these movements were re-routed to the proposed intersection with the relocated I-95 southbound ramp. As far as the I-95 southbound, concept S5-S6 had little to no impact. The operational results for the interstate in this concept are included in Appendix X.

Table 17: Concept S5-S6 vs No-Build Travel Times

PM travel time change in seconds and % change compared to 2045 no-build scenario			DESTINATION						
			A	B	C	D	E	F	G
			I-95 North	I-95 South	Commerce South (by Amazon entrance)	Walmsley (by Brother Int'l entrance)	Bells Rd @ Jefferson Davis Hwy	Commerce North @ Bellemeade Rd	Deepwater Terminal South (The Port)
ORIGIN	A	I-95 North		-	-24.8 (-14.2%)	-13.8 (-12.7%)	-	-	-
	B	I-95 South	-		-22.7 (-10.1%)	-	-	-	-
	C	Commerce South (by Amazon entrance)	-	-42.2 (-27.3%)		-14.9 (-13.0%)	-28.7 (-9.1%)	-18.4 (-5.3%)	-30.6 (-13.4%)
	D	Walmsley (by Brother Int'l car entrance)	18.4 (15.3%)	-21.5 (-16.0%)	13.9 (21.2%)		42.7 (16.7%)	46.0 (15.9%)	28.8 (16.0%)
	E	Bells Rd @ Jefferson Davis Hwy	-	-	-	-22.7 (-10.8%)		-	-

**Note: The above graphic only shows most significant changes in travel times.*

Concept S7

Compared to all other short-term concepts which show most benefit in the PM peak hour, concept S7 has the most impact on the study area in the AM peak hour. Specifically, concept S7 was created to reduce congestion in the westbound direction at Walmsley Boulevard and Commerce Road. As shown in Table 21, the maximum queues in the no-build scenario as well as all other concepts previously discussed, extend to about 1,300 feet in the AM peak hour. In concept S7 these queues were reduced by about a thousand feet or more than 70%. For a better visual, this was illustrated in Figure 32. If the traffic continues to back up on I-95 northbound off-ramp, the queue could reach the mainline, which would cause serious safety issues. As far as the intersection delay and LOS, Table 20 indicates the most significant delay reduction for the intersection of Walmsley Boulevard and Commerce Road in the AM peak hour, which was reduced by 5 seconds in concept S7 compared to the no-build scenario. The delay and LOS for all other intersections in concept S7 shown in Table 20 look very similar to the no-build scenario. When it comes to travel times, due to substantial queue reduction on the I-95 northbound off-ramp, concept S7 has the most travel time reduction for vehicles coming from I-95 south of Bells Road interchange and traveling to any destination displayed in Table 18. This concept also resulted in some travel time savings for vehicles with the origin north of I-95. The travel times between all other O-D pairs not shown in Table 18, as well as the AM peak hour can be found in Appendix X.

Figure 32: Concept S7 vs No-Build Maximum Queue Comparison

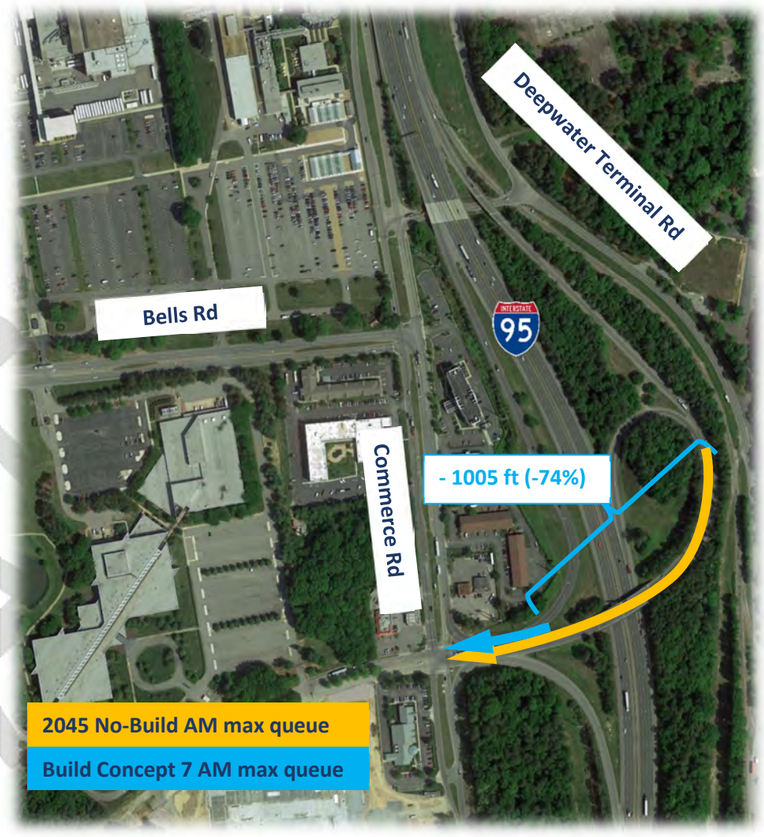


Table 18: Concept S7 vs No-Build Travel Times

AM travel time change in seconds and % change compared to 2045 no-build scenario			DESTINATION				
			C	D	E	F	G
			Commerce South (by Amazon entrance)	Walmsley (by Brother Int'l entrance)	Bells Rd @ Jefferson Davis Hwy	Commerce North @ Bellemeade Rd	Deepwater Terminal South (The Port)
ORIGIN	A	I-95 North	-7.4 (-4.6%)	-7.0 (-6.2%)	-0.8 (-0.3%)	1.6 (0.6%)	-0.4 (-0.3%)
	B	I-95 South	-11.0 (-5.5%)	-19.7 (-12.5%)	-12.5 (-4%)	-12.6 (-3.7%)	-9.9 (-4.6%)

Table 19: 2045 Build vs No-Build Conditions VISSIM Analysis Results - I-95

Freeway Segment		AM Peak Hour						PM Peak Hour					
		No-Build			Build Concept 1			No-Build			Build Concept 1		
No-Build	Build	Speed[1]	Density[2]	LOS	Speed[1]	Density[2]	LOS	Speed[1]	Density[2]	LOS	Speed[1]	Density[2]	LOS
I-95 Northbound													
Diverge Segment at the off-ramp to Maury Street		56	27.3	C	56	27.3	C	56	20.9	C	56	20.9	C
Basic Segment between Bells Rd on-ramp and Maury Street off-ramp		58	35.0	D	58	35.0	D	39	44.1	E	39	44.2	E
Merge Segment at the on-ramp from Bells Road		57	26.4	C	57	26.4	C	32	36.7	E	32	36.8	E
Basic Segment between Bells Rd on-and-off-ramps		58	32.7	D	58	32.7	D	34	39.9	E	34	39.8	E
Weaving Segment between Chippenham Parkway Westbound on-ramp and Bells Road off-ramp		57	28.4	D	57	28.4	D	39	28.6	D	39	28.6	D
I-95 Southbound													
Merge Segment at the 4th Street		57	18.8	B	57	18.8	B	53	29.1	D	56	27.4	C
Basic Segment between 4th Street on-ramp Bells Road off-ramp		58	24.6	C	58	24.6	C	42	49.3	F	57	35.9	E
Diverge Segment at the off-ramp to Bells Road		59	18.2	B	59	18.2	B	27	51.1	F	58	26.4	C
Basic Segment between Bells Road on-and-off-ramps		59	19.4	C	59	19.4	C	23	74.1	F	59	32.5	D
Merge Segment at the on-ramp from Bells Road	Weaving Segment between Bells Road on-ramp and Chippenham Parkway off-ramp	58	17.1	B	59	16.6	B	23	65.1	F	58	28.9	D
Basic Segment between Bells Road on-ramp and Chippenham Parkway off-ramp		59	22.2	C				51	37.0	E			
Diverge Segment at the off-ramp to Chippenham Parkway		59	16.5	B				57	26.0	C			

Source: VISSIM 10 Link Evaluation based on the average of 10 VISSIM model runs.

1 Average simulated speed, expressed in miles per hour.

2 Average simulated density, expressed in vehicle per mile per lane.

LOS	A	B	C	D	E	F
Density (Basic)	≤11	11-18	18-26	26-35	35-45	>45
Density (Merge/Diverge/Weaving)	≤10	10-20	20-28	28-35	35-45	>45

Table 20: 2045 Short-term Build vs No-Build Conditions VISSIM Analysis Results – Intersection Delay (sec) and LOS

Intersection	Approach	Movement	AM Peak Hour Delay (sec) - LOS						PM Peak Hour Delay (sec) - LOS					
			No-Build	Concept S2-S3	Concept S3	Concept S3-S4	Concept S5-S6	Concept S7	No-Build	Concept S2-S3	Concept S3	Concept S3-S4	Concept S5-S6	Concept S7
Commerce Rd & Walmsley Blvd/I-95 ramps	EB	EBL	32.0 - C	31.3 - C	31.9 - C	31.3 - C	N/A	31.9 - C	42.5 - D	42.2 - D	42.3 - D	42.5 - D	N/A	42.0 - D
		EBT	31.5 - C	31.0 - C	30.7 - C	31.2 - C	N/A	31.8 - C	45.0 - D	44.9 - D	45.3 - D	45.1 - D	N/A	45.1 - D
		EBR	4.1 - A	4.0 - A	3.9 - A	4.1 - A	9.9 - A	4.1 - A	4.6 - A	4.6 - A	4.6 - A	4.6 - A	11.1 - B	4.6 - A
	WB	WBL	49.6 - D	49.6 - D	51.1 - D	50.2 - D	49.4 - D	37.6 - D	68.8 - E	69.1 - E	70.2 - E	70.6 - E	41.3 - D	67.0 - E
		WBT	45.1 - D	44.4 - D	46.1 - D	45.6 - D	39.8 - D	30.3 - C	42.4 - D	41.3 - D	41.8 - D	43.6 - D	32.5 - C	39.0 - D
		WBR	7.8 - A	7.8 - A	8.0 - A	7.9 - A	8.8 - A	0.6 - A	1.1 - A	1.1 - A	1.1 - A	1.1 - A	1.0 - A	0.4 - A
	NB	NBL	45.9 - D	45.7 - D	44.9 - D	44.1 - D	9.5 - A	45.5 - D	52.1 - D	53.1 - D	54.0 - D	54.2 - D	14.3 - B	53.1 - D
		NBT	52.5 - D	53.8 - D	53.3 - D	52.6 - D	30.2 - C	54.1 - D	71.0 - E	70.6 - E	69.8 - E	71.0 - E	26.3 - C	70.1 - E
		NBR	8.6 - A	8.2 - A	8.2 - A	8.1 - A	2.9 - A	8.8 - A	32.7 - C	32.6 - C	33.6 - C	34.4 - C	4.6 - A	34.2 - C
	SB	SBL	21.7 - C	21.9 - C	21.6 - C	21.1 - C	23.2 - C	21.6 - C	20.6 - C	20.2 - C	20.4 - C	21.3 - C	16.0 - B	21.0 - C
		SBT	15.3 - B	15.4 - B	14.8 - B	14.0 - B	29.1 - C	16.2 - B	12.2 - B	9.8 - A	11.1 - B	12.4 - B	22.6 - C	11.7 - B
		SBR	6.8 - A	5.6 - A	6.2 - A	6.3 - A	7.4 - A	6.9 - A	5.4 - A	3.0 - A	5.5 - A	5.8 - A	5.8 - A	5.5 - A
	Intersection		**18.2 - B**	**18.2 - B**	**18.4 - B**	**18.1 - B**	**19.7 - B**	**13.2 - B**	**20.8 - C**	**20.5 - C**	**20.8 - C**	**21.4 - C**	**14.6 - B**	**20.8 - C**
Commerce Rd & Bells Rd	EB	EBL	44.2 - D	50.2 - D	43.5 - D	44.1 - D	42.8 - D	44.2 - D	49.8 - D	61.2 - E	49.3 - D	48.3 - D	48.7 - D	49.0 - D
		EBR	11.4 - B	12.8 - B	11.4 - B	10.1 - B	11.6 - B	11.3 - B	27.6 - C	31.1 - C	21.6 - C	19.3 - B	26.2 - C	28.2 - C
	WB	WBL	49.9 - D	51.5 - D	53.4 - D	50.7 - D	54.3 - D	50.7 - D	66.5 - E	53.6 - D	54.6 - D	67.1 - E	60.8 - E	66.3 - E
		WBT	56.3 - E	55.8 - E	59.5 - E	58.1 - E	56.6 - E	53.0 - D	59.3 - E	60.4 - E	58.4 - E	59.2 - E	65.5 - E	59.8 - E
		WBR	8.6 - A	8.8 - A	9.1 - A	9.6 - A	9.0 - A	9.4 - A	6.1 - A	6.2 - A	6.1 - A	6.2 - A	6.4 - A	6.4 - A
	NB	NBL	28.6 - C	33.9 - C	28.4 - C	28.8 - C	28.7 - C	28.7 - C	28.2 - C	31.9 - C	27.9 - C	28.7 - C	28.4 - C	29.0 - C
		NBT	9.1 - A	13.3 - B	9.7 - A	9.5 - A	8.6 - A	10.0 - B	3.2 - A	5.5 - A	3.2 - A	3.4 - A	3.2 - A	3.3 - A
		NBR	0.0 - A	0.0 - A	0.0 - A	0.0 - A	0.0 - A	0.0 - A	2.0 - A	4.0 - A	2.6 - A	4.5 - A	2.8 - A	6.0 - A
	SB	SBT	32.3 - C	35.7 - D	30.1 - C	28.0 - C	34.5 - C	31.3 - C	29.3 - C	30.8 - C	24.9 - C	21.9 - C	26.7 - C	28.2 - C
		SBR	18.1 - B	21.8 - C	17.6 - B	14.4 - B	21.0 - C	18.9 - B	24.5 - C	25.8 - C	21.6 - C	15.5 - B	21.8 - C	23.3 - C
	Intersection		**19.5 - B**	**25.4 - C**	**19.3 - B**	**18.6 - B**	**20.0 - B**	**19.6 - B**	**24.8 - C**	**29.4 - C**	**21.5 - C**	**19.9 - B**	**23.6 - C**	**24.6 - C**
Commerce Rd & Bells Rd Access Rd	WB	WBL	43.8 - D	42.2 - D	41.3 - D	41.0 - D	45.8 - D	43.1 - D	38.3 - D	38.4 - D	33.1 - C	31.9 - C	35.8 - D	37.1 - D
		WBR	23.5 - C	22.4 - C	24.2 - C	23.6 - C	20.4 - C	25.2 - C	29.5 - C	31.3 - C	25.3 - C	24.3 - C	25.1 - C	29.7 - C
	NB	NBT	11.1 - B	11.7 - B	11.2 - B	10.7 - B	10.0 - A	11.8 - B	18.9 - B	18.2 - B	18.2 - B	16.9 - B	17.2 - B	19.0 - B
		NBR	10.9 - B	11.5 - B	10.8 - B	10.1 - B	9.6 - A	11.6 - B	11.8 - B	11.8 - B	11.1 - B	10.5 - B	10.1 - B	12.9 - B
	SB	SBL	43.6 - D	42.3 - D	44.3 - D	45.0 - D	47.0 - D	45.8 - D	48.4 - D	44.0 - D	47.9 - D	44.9 - D	46.1 - D	45.9 - D
		SBT	5.6 - A	5.8 - A	5.1 - A	4.1 - A	6.7 - A	5.4 - A	19.7 - B	19.9 - B	17.8 - B	13.7 - B	18.3 - B	18.7 - B
	Intersection		**11.7 - B**	**12.0 - B**	**11.5 - B**	**10.8 - B**	**11.4 - B**	**12.1 - B**	**24.0 - C**	**24.1 - C**	**21.8 - C**	**19.5 - B**	**22.4 - C**	**23.5 - C**
Bells Rd Access Rd & Deepwater Terminal Rd	EB	EBL	1.8 - A	1.9 - A	1.9 - A	1.8 - A	1.8 - A	1.9 - A	1.9 - A	2.0 - A	2.1 - A	2.0 - A	1.9 - A	2.0 - A
		EBR	2.0 - A	2.1 - A	2.0 - A	2.0 - A	2.0 - A	2.1 - A	1.3 - A	1.3 - A	1.4 - A	1.3 - A	1.3 - A	1.3 - A
	NB	NBL	1.2 - A	1.1 - A	1.3 - A	1.0 - A	0.9 - A	1.0 - A	28.7 - D	30.6 - D	18.9 - C	15.3 - C	28.0 - D	26.6 - D
		NBT	0.5 - A	0.5 - A	0.5 - A	0.4 - A	0.0 - A	0.5 - A	14.7 - B	4.2 - A	5.1 - A	3.3 - A	3.5 - A	5.4 - A
	SB	SBT	0.4 - A	0.4 - A	0.5 - A	0.3 - A	0.3 - A	0.4 - A	1.9 - A	3.4 - A	3.1 - A	2.2 - A	1.3 - A	3.7 - A
		SBR	0.6 - A	0.6 - A	0.6 - A	0.6 - A	0.6 - A	0.6 - A	8.6 - A	6.6 - A	3.8 - A	3.5 - A	5.8 - A	6.3 - A
	Intersection		**1.7 - A**	**1.7 - A**	**1.7 - A**	**1.6 - A**	**1.6 - A**	**1.7 - A**	**13.2 - B**	**13.3 - B**	**8.5 - A**	**7.1 - A**	**12.1 - B**	**11.9 - B**

Table 21: 2045 Short-term Build vs No-Build Conditions VISSIM Analysis Results – Intersection Maximum Queues

Intersection	Approach	Movement	AM Peak Hour Max Queues (ft)						PM Peak Hour Max Queues (ft)					
			No-Build	Concept S2-S3	Concept S3	Concept S3-S4	Concept S5-S6	Concept S7	No-Build	Concept S2-S3	Concept S3	Concept S3-S4	Concept S5-S6	Concept S7
Commerce Rd & Walmsley Blvd/I-95 ramps	EB	EBL	142	142	142	142	N/A	142	136	136	136	136	N/A	136
		EBT	97	97	97	97	N/A	97	176	176	176	176	N/A	178
		EBR	113	113	113	113	130	113	191	191	191	191	140	193
	WB	WBL	1355	1265	1432	1332	1237	349	269	263	256	260	232	243
		WBT	1049	1142	1321	979	1010	294	226	236	204	205	162	180
		WBR	1296	1191	1362	1256	1174	212	155	152	151	144	144	106
	NB	NBL	48	48	50	48	39	46	59	59	59	59	42	59
		NBT	134	136	139	136	163	137	210	243	210	210	182	210
		NBR	152	141	159	153	62	151	418	460	490	499	136	432
	SB	SBL	934	661	652	677	1082	957	1166	832	851	853	1171	1140
		SBT	934	661	652	677	1082	957	1166	832	851	853	1171	1140
		SBR	795	522	513	538	943	818	1027	694	715	715	1033	1002
	Intersection		1420	1293	1442	1351	1422	957	1166	832	853	858	1171	1140
Commerce Rd & Bells Rd	EB	EBL	202	440	197	178	182	181	146	427	138	142	172	133
		EBR	403	254	416	385	373	435	739	531	596	604	762	728
	WB	WBL	92	91	92	99	105	92	24	24	24	24	24	24
		WBT	92	91	92	100	105	93	25	24	25	25	24	25
		WBR	29	29	29	29	26	29	28	28	28	28	27	28
	NB	NBL	357	368	349	350	330	318	315	358	351	343	325	325
		NBT	360	418	442	397	322	385	143	164	142	139	128	158
		NBR	420	478	502	458	383	445	203	224	202	199	188	218
	SB	SBT	397	423	399	244	426	406	470	468	468	353	471	462
		SBR	345	371	347	192	374	354	417	416	416	301	419	410
	Intersection		504	514	528	492	471	513	739	569	606	610	762	728
Commerce Rd & Bells Rd Access Rd	WB	WBL	291	277	288	281	260	280	548	533	528	527	528	539
		WBR	328	314	325	317	296	316	585	569	564	563	564	567
	NB	NBT	426	424	442	440	401	442	269	290	275	281	290	291
		NBR	403	400	418	417	377	418	245	266	251	258	266	267
	SB	SBL	109	103	114	110	102	104	136	128	141	138	151	136
		SBT	137	146	138	124	143	143	266	283	241	232	271	234
	Intersection		426	425	444	440	403	450	585	569	564	563	564	572
Bells Rd Access Rd & Deepwater Terminal Rd	EB	EBL	46	63	72	51	62	63	83	81	92	76	78	96
		EBR	28	25	28	11	39	28	14	12	8	13	31	11
	NB	NBL	20	20	21	22	18	15	532	460	272	249	393	400
		NBT	6	6	0	0	0	0	486	415	226	204	348	355
	SB	SBT	0	0	0	0	0	0	144	95	45	41	59	82
		SBR	0	0	0	0	0	0	144	95	45	41	59	82
	Intersection		62	73	81	55	72	64	532	460	272	249	394	400

5.2.2. Long-Term

As mentioned in Chapter 4, concepts L1 and L3 are the only two long-term concepts carried forward in the analysis. The following section provides operational results of the two.

Concept L1

Reconfiguring the intersection of Commerce Road and Walmsley Boulevard to a roundabout would have great benefits. The travel time results for this concept indicate significant savings in both AM and PM peak hour. The AM results that improved the most compared to the no-build scenario are shown in Table 23, while PM travel times can be found in Appendix X. As shown in Table 22, some travel times were reduced by almost 30 percent in concept L1. As far as the overall intersection delay and LOS shown in Table 23, concept L1 operates at LOS A in both peak hour with overall intersection delays reduced by than 10 seconds per vehicle in both peak hours. Some individual movements were improved from LOS D or E to A. Perhaps, the greatest benefit of concept L1 is showed in Table 24, which shows the maximum queues compared to the no-build scenario. The southbound approach queue was reduced by almost 70 percent or 800 feet in both peak hours, while the westbound approach queues are barely existent with queue reductions of about 90 percent or over a thousand feet. Table 24 indicates some increases in queue lengths as well, especially in the northbound approach, however it could be overlooked as the benefits or this concept greatly outweigh the negatives.

Table 22: Concept L1 vs No-Build Travel Times

AM travel time change in seconds and % change compared to 2045 no-build scenario			DESTINATION						
			A	B	C	D	E	F	G
			I-95 North	I-95 South	Commerce South (by Amazon entrance)	Walmsley (by Brother Int'l entrance)	Bells Rd @ Jefferson Davis Hwy	Commerce North @ Bellemeade Rd	Deepwater Terminal South (The Port)
ORIGIN	A	I-95 North			-43.1 (-26.9%)	-28.6 (-25.5%)	-	-	-
	B	I-95 South	-		-51.2 (-25.5%)	-45.4 (-28.7%)	-	-	-
	C	Commerce South (by Amazon entrance)	-	-		-30.9 (-28.4%)	-37.0 (-12.2%)	-38.8 (-11.7%)	-41.3 (-19.4%)
	D	Walmsley (by Brother Int'l car entrance)	-11.6 (-10.7%)	-20.7 (-22.7%)	-11.7 (-14.6%)		-	-	-
	E	Bells Rd @ Jefferson Davis Hwy	-19.0 (-7.4%)	-16.9 (-7.2%)	-	-		-	-

**Note: The above graphic only shows most significant changes in travel times.*

Table 23: 2045 Long-term Build vs No-Build Conditions VISSIM Analysis Results – Intersection Delay (sec) and LOS

Intersection	Approach	Movement	AM Peak Hour Delay (sec) - LOS		PM Peak Hour Delay (sec) - LOS	
			No-Build	Concept L1	No-Build	Concept L1
Commerce Rd & Walmsley Blvd/I-95 ramps	EB	EBL	32.0 - C	10.5 - B	42.5 - D	22.0 - C
		EBT	31.5 - C	11.7 - B	45.0 - D	18.1 - B
		EBR	4.1 - A	9.2 - A	4.6 - A	15.8 - B
	WB	WBL	49.6 - D	2.6 - A	68.8 - E	3.4 - A
		WBT	45.1 - D	5.6 - A	42.4 - D	6.3 - A
		WBR	7.8 - A	0.5 - A	1.1 - A	0.3 - A
	NB	NBL	45.9 - D	8.3 - A	52.1 - D	50.3 - D
		NBT	52.5 - D	7.0 - A	71.0 - E	47.7 - D
		NBR	8.6 - A	7.3 - A	32.7 - C	50.4 - D
	SB	SBL	21.7 - C	5.5 - A	20.6 - C	4.3 - A
		SBT	15.3 - B	6.0 - A	12.2 - B	4.7 - A
		SBR	6.8 - A	6.0 - A	5.4 - A	3.9 - A
	Intersection		**18.2 - B**	**3.1 - A**	**20.8 - C**	**10.0 - A**

Table 24: 2045 Long-term Build vs No-Build Conditions VISSIM Analysis Results – Intersection Maximum Queues

Intersection	Approach	Movement	AM Peak Hour Max Queues (ft)		PM Peak Hour Max Queues (ft)	
			No-Build	Concept L1	No-Build	Concept L1
Commerce Rd & Walmsley Blvd/I-95 ramps	EB	EBL	142	94	136	132
		EBT	97	94	176	132
		EBR	113	94	191	132
	WB	WBL	1355	97	269	69
		WBT	1049	97	226	69
		WBR	1296	101	155	69
	NB	NBL	48	116	59	533
		NBT	134	116	210	533
		NBR	152	116	418	533
	SB	SBL	934	378	1166	399
		SBT	934	378	1166	399
		SBR	795	378	1027	399
	Intersection		**1420**	**378**	**1166**	**546**

Concept L3

Since this concept involves construction of a proposed roundabout at a location on I-95 northbound ramps along with flyovers connecting to Deepwater Terminal Road, it is not directly comparable to the no-build scenario for the same location. Therefore, concept L3 operational results were displayed graphically in Figure 33 instead of a tabular format. As mentioned in Chapter 4, it is important to note that concept L3 was analyzed in a combination with concept L1. Since the operational results of concept L1 analyzed as a combined concept with L3 show little to no difference when compared to L1 analyzed as a stand-alone concept, the results were not discussed in this section of the report, however they are reported in Appendix X. The operational results for proposed unsignalized intersections on Deepwater Terminal Rd were also reported in Appendix X. As shown in Figure 33, the proposed roundabout operates at LOS A with minimal delay in both peak hours. When it comes to maximum queues, the longest 2045 queue was about 200 feet in the westbound direction in the PM peak hour. All other queues were about a hundred feet or less. As far as the travel time results, this concept had significant travel time savings in both peak hours. As expected, providing a direct connection to I-95 and Commerce Road from Deepwater Terminal Road would result in the most reduction in travel times from Deepwater Terminal Road to any destination mentioned in Table 25. That is true for both peak hours. The travel times between all other O-D pairs not shown in the table can be found in Appendix X.

Figure 33: Concept L3 Operational Results

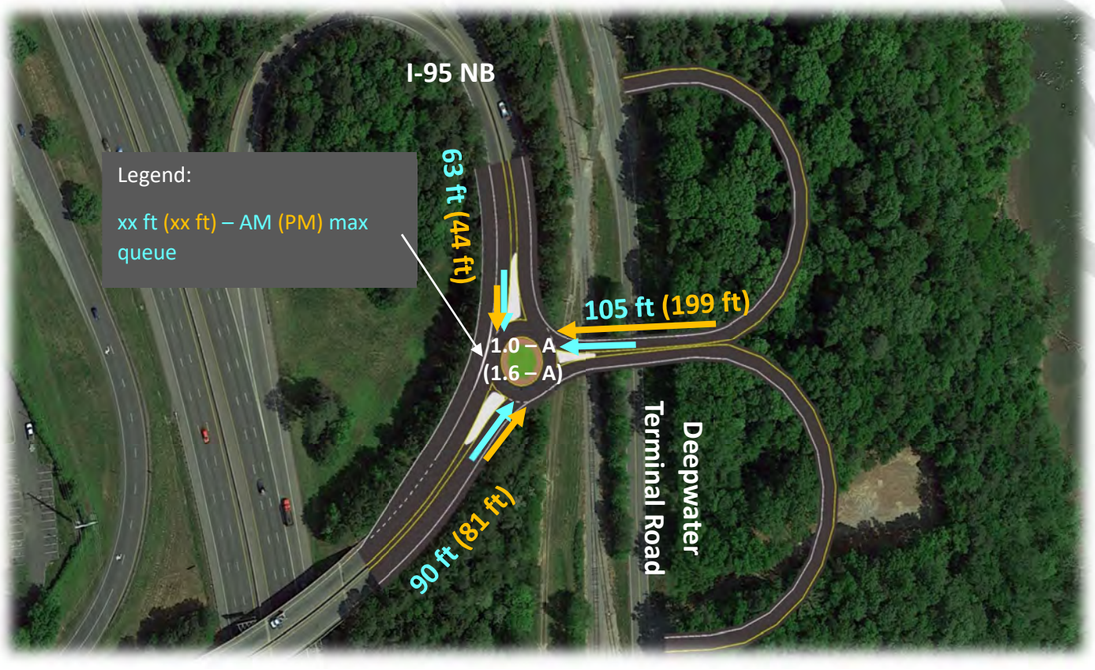


Table 25: Concept L3 vs No-Build Travel Times:

Travel time change in seconds and % change compared to 2045 no-build scenario				DESTINATION			
				A	B	C	D
				I-95 North	I-95 South	Commerce South (by Amazon entrance)	Walmsley (by Brother Int'l entrance)
ORIGIN	G	Deepwater Terminal South (The Port)	AM	-190.3 (-68.4%)	-110.0 (-44.4%)	-96.0 (-42.9%)	-83.6 (-46.9%)
			PM	-203.7 (-71.0%)	-131.7 (-44.5%)	-116.9 (-47.5%)	-111.0 (-54.3%)

Other concepts discussed in this chapter are local connector ideas LC 1 and LC 2. Both ideas were analyzed from a high-level planning perspective and no VISSIM analysis was performed.

Concept LC 1

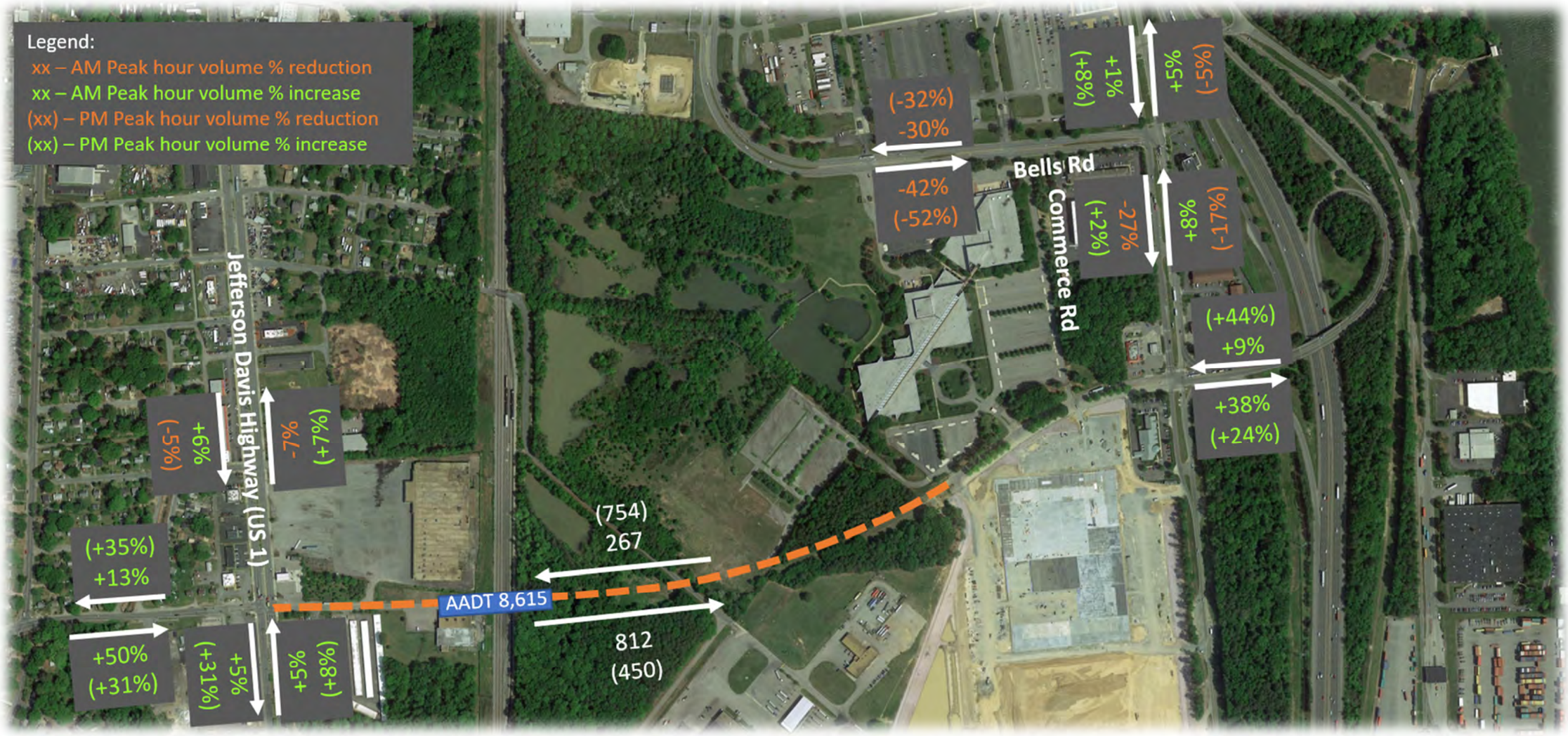
As mentioned in Chapter 4, for concept LC 1 or Walmsley Boulevard Extension, the regional travel demand model was used to predict changes in traffic patterns with the construction of a proposed extension. The estimated traffic re-routing is shown in Figure 26. Based on the numbers shown in the graphic, with Walmsley Extension in place, it is very likely the intersection improvements would be needed at Walmsley Boulevard intersections with Jefferson Davis Highway and Commerce Road and these intersections are expected to see significant increases in traffic volumes. Bells Road, however, would experience less traffic in this concept with another route available for vehicles traveling from Jefferson Davis Highway to Commerce Road/I-95 or vice versa.

Concept LC 2

Concept LC 2 asks the question "Is it feasible and what would be involved in brokering The Port of Virginia vehicle easement in this existing I-95 underpass?" The Port of Virginia easement would theoretically allow cargo containers to be moved back and forth under I-95, utilizing a potential future storage area as an off-hours drop lot on the west side of I-95 along Commerce Road. Most of the challenges of this concept were mentioned in Chapter 4. There also exists an unapproved draft agreement between The Port and DuPont. Before spending dollars on engineering study, it is recommended that The Port approach VDOT about willingness to cooperate and reconnect with DuPont about draft agreement. If the response seems encouraging, an engineering, environmental and real estate study should be conducted to include:

- Utility location services (overhead / underground)
- Conduct environmental studies
- Federal & state permitting (NEPA & R/W access)
- Develop preliminary design plans
- Negotiate shared use / access agreements with Dupont & owners of utilities
- Explore real estate costs for drop lot
- Explore what's involved with permitting The Port of Virginia tractors to travel on public roads (e.g. Commerce)
- Other

Table 26: Concept LC 1 - Walmsley Boulevard Extension 2045 Traffic Re-routing



6. Recommendations, Current Actions & Next Steps

6.1 Core Working Group Recommendations

The evaluation matrix for short-term concepts is shown in Figure 34. The Core Working Group recommends concepts S1, S3, and S7 as the most cost-effective improvements in the short term. Regarding the long-term concepts, The Core Working Group recommends further study of long-term concepts L1 and L3 as good candidates to accomplish the long-term access, safety, and economic goals of the area. The Working Group also supports Local Connector Concept LC 2 for its potential to provide much-needed redundant access to the growing deepwater port asset, offering better freight logistics during off-hours operations.

Figure 34: Short-term Concepts Evaluation Matrix

Concepts	Description	Construction Cost	Utility and ROW Impact	Operational Benefit	
				Interstate	Local
S1	Add I-95 southbound auxiliary lane between Bells Road Interchange and Chippenham Parkway	High: $15.4 - $25.6 Million	Significant	Significant Benefit	No Benefit
S3	Extend southbound left turn lane from Bells Rd to Walmsley	Low: $1.0 - $1.6 Million	Minimal	No Benefit	Significant Benefit
S2-S3	Convert left lane at Bells Rd approach to left and right (S2) Extend southbound left turn lane from Bells Rd to Walmsley (S3)	Low: $1.5 - $2.0 Million	Minimal	No Benefit	Minor Benefit
S3-S4	Extend southbound left turn lane from Bells Rd to Walmsley Blvd (S3) Add another southbound through lane from Bells Rd Access Rd to Bells Rd (S4)	Moderate: $2.9 - $5 Million	Moderate	No Benefit	Significant Benefit
S5-S6	Relocate I-95 SB on-ramp (S5) Re-route through and left movements from Walmsley Blvd (S6)	Moderate: $4.5 - $7.3 Million	Significant	Minor Benefit	Moderate Benefit
S7	Reconfigure termini of southbound off-ramp	Low: $0.5 - $1.0 Million	Minimal	Moderate Benefit	Moderate Benefit

Cost Legend:
Low: < $2.5 Million
Moderate: $2.5 – $8 Million
High: > $8 Million

6.2 Current Actions & Next Steps

All of the information presented above paints the picture of an industrial area that's experiencing growth and plays an important economic part in the region. Without targeted transportation safety and operational improvements, the area will struggle to reach its economic potential through attracting private investment in a highly competitive market along the east coast.

This technical report was developed to present all details and back-up data from the study process. While the short-term recommendations could be candidates for SMART SCALE or other grant programs, the longer-term concepts will require additional study. Specifically, Long-term recommendations L1 and L3 will require an Interchange Modification Request (IMR) in order to fully vet the idea and seek VDOT and FHWA approval. Local Connector Concept LC 2 will require an engineering and legal/real-estate study to further determine feasibility (as described earlier). This I-95/RMT/Commerce Corridor Access Study is now in a draft phase and is currently being shared with the TPO, City officials, and others for feedback before being finalized.

Go to Agenda

Agenda Item D.2.

Future Meeting Topics

NO ACTION REQUESTED – INFORMATION ITEM

Enclosed under this agenda tab is a brief list of topics for the December 2020 RRTPO Policy Board meeting and a list of future meeting topics to be scheduled later in FY21.

4

RRTPO POLICY BOARD AGENDA 11/5/2020; Item D.2.
FUTURE MEETING TOPICS*

December 3

- MPO Boundaries Adjustments
- 2020 Richmond Regional Structural Inventory and Assessment Report
- Bridges and Culverts Update
- CVTA Update
- Public Engagement/Community Outreach Efforts

April 2021

- Complete Streets Guidance/Toolbox Update

OTHER FUTURE MEETING TOPICS

- BUILD (Better Utilizing Investments to Leverage Development) Grant Program

*Draft: This is not a comprehensive list of considerations and is subject to change.