ROUTE 1 (JEFFERSON DAVIS HIGHWAY) CORRIDOR STUDY, STAFFORD, VA

ROUTE 1 FROM PORT AQUIA DR TO AUSTIN RUN BLVD (ROUTE 1) (CORRIDOR-WIDE SUMMARY)

Route 1 Project Area and Location Map

Project Description and Purpose

The primary goal of this study is to determine and assess measures to reduce congestion, recommend possible adjustments to signal phasing and/or spot improvements to alleviate congestion and address safety as well as access management deficiencies. The ***operational*** issues addressed by this study include existing and future projected congestion within the corridor. Reduction in intersection delays would mitigate congestion, improve mobility and reduce travel time. This study also addresses existing and future ***safety*** concerns within the study corridor by analyzing crashes in the recent 5-year period. Numerous ***access*** deficiencies are addressed in this study by identifying and documenting driveway locations and their spacing, with the objective of recommending access management improvements in the context of *VDOT Access Management Standards for Entrances and Intersections.*

Traffic Operations Improvements

- Improved capacity by addition and extension of lanes
- Improved lane utilization due to additional capacity
- Modification/Upgrade of existing traffic signals
- Optimization of traffic signal timings: cycles lengths, phases, offsets
- Improved Route 1 mainline corridor progression
- Improved throughput with innovative intersection layouts

Targeted Safety Improvements

- Pavement marking improvements at key intersections
- Installation of pavement markings, warning signs, and flashing beacons
- Intersection sight distance improvement.
- Improved signal visibility
- Installation of a Shared Use Path running the length of the corridor

Planning Level Cost Estimate

Phase	Six Year Improvement Program
Preliminary Engineering	$6,864,812
ROW and Utility Relocation	$26,434,245
Construction	$42,478,654
Total Cost =	**$75,777,721**

Note: Cost estimates reported in 2035 dollars

Project Benefits (Corridor-wide)

Intersection Delay Reduction	
2035 No-Build Delay*	2224 hours
2035 Build Delay*	677 hours
Δ Delay (% Change)	-1547 hours (-69.5%)
20-Year Operations Savings	$190,698,550

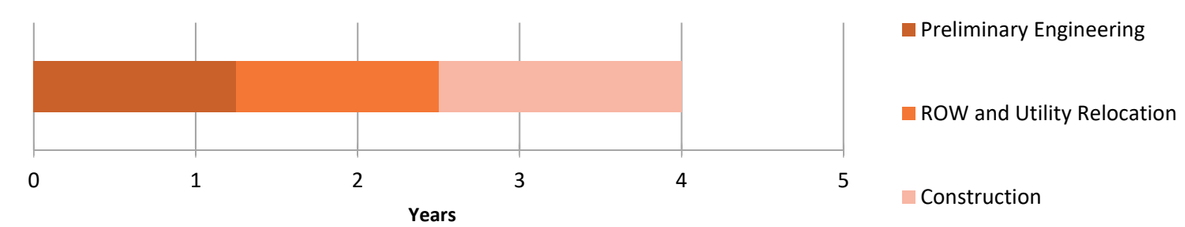
*Compounded AM and PM weekday travel delay in the influence area of all the proposed improvements

Crash Reduction	
2035 No-Build Crashes*	466
2035 Build Crashes*	422
Δ Crashes (% Change)	-44 (-9.4%)
20-Year Crash Reduction Savings	$10,728,357

*Projected Crashes in the influence area of the intersection

For more details, refer to the 'STARS Route 1 Corridor Study Report'

Project Schedule



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ROUTE 1 CORRIDOR STUDY, STAFFORD, VA

IMPROVEMENT CONCEPT: ROUTE 1/I-95 ON-RAMP INTERSECTION (ALTERNATIVE 1)

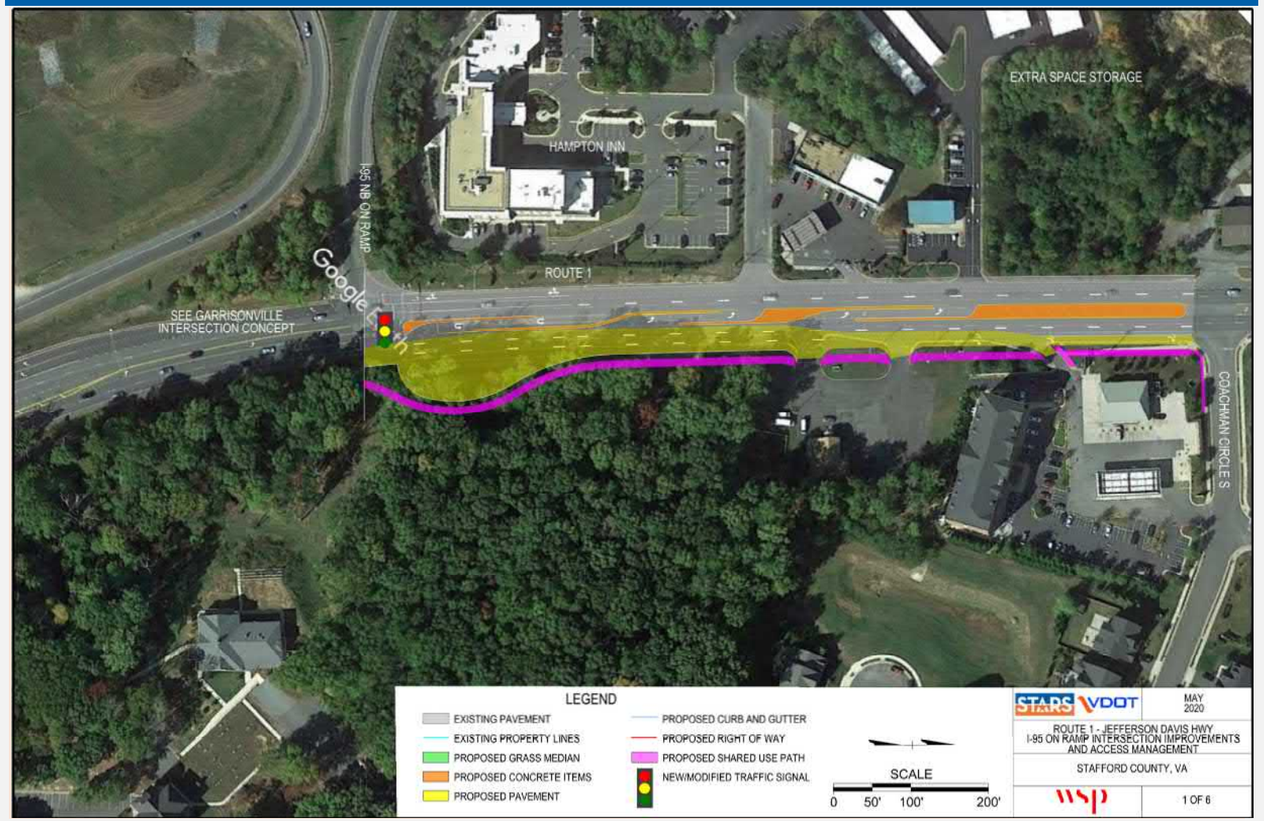
Existing Conditions

- 3-leg signalized intersection
- Posted speed limit = 45 mph along Route 1
- No pedestrian facilities currently provided
- Signal is located at the entrance to Northbound I-95
- Intersection experiences peak hour delays due to traffic volumes and high number of crashes due to permitted+protected signal phasing

Proposed Improvements

- Change the northbound left turn phasing from permitted+protected (flashing yellow) to protected only.
- Implement access management along SB approach. Reroute left-out vehicles from Holiday Inn and Extra Space Storage as SB U-turns at the intersection
- Shared Use Path is accounted for in Alternative 5

Conceptual Layout: Year 2035 Preferred Alternative 1



Planning Level Cost Estimate

Phase	Six Year Improvement Program
	Alternative 1
Preliminary Engineering	$793,729
ROW and Utility Relocation	$2,649,104
Construction	$5,669,489
Total Cost =	**$9,112,322**

Note: Cost estimates reported in 2035 dollars

Northbound Approach (Route 1 I-95 Intersection)

Project Benefits

Intersection Delay Reduction	
2035 No-Build Delay*	132 hours
2035 Build Delay*	213 hours
Δ Delay (% Change)	81 hours (61.3%)
20-Year Operations Savings	$-9,940,043

*Compounded AM and PM weekday travel delay in the influence area of all the proposed improvements

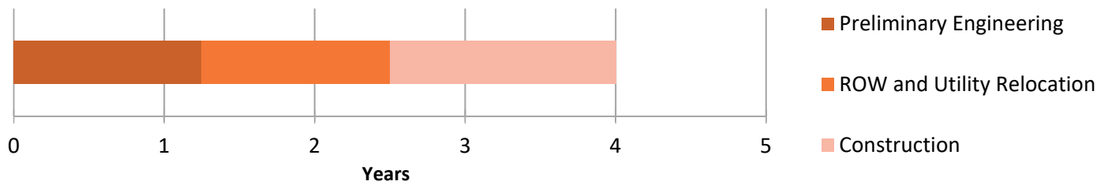
Crash Reduction	
2035 No-Build Crashes*	39
2035 Build Crashes*	23
Δ Crashes (% Change)	-16 (-41.0%)
20-Year Crash Reduction Savings	$3,357,725

*Projected Crashes in the influence area of the intersection

- Provide access management near intersection
- Aims to alleviate rear-end and angle crashes
- Allow for the U-turns at the I-95 signal for the traffic turning left out of the properties

Benefit/Cost Ratio: -0.72

Project Schedule



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ROUTE 1 CORRIDOR STUDY, STAFFORD, VA

IMPROVEMENT CONCEPT: ROUTE 1/GARRISONVILLE RD QUADRANT INTERSECTION (ALTERNATIVE 2)

Existing Conditions

- 4-leg signalized intersection
- Route 1 acts as an alternate route during periods of significant congestion on I-95
- Posted speed limit = 45 mph
- NB, SB and EB approaches are very heavily traveled and experience longer delays and queues

Proposed Improvements

- Relocate southbound left turns to Town Center Dr left turns.
- Relocate westbound left and thru movements to westbound left turns and right turns, respectively, at Town Center Dr.
- Allow only westbound free-flow right turns along Washington Dr into added northbound lane that drops at Coachman Circle S.
- Change eastbound right-turn lane to free flow condition into added southbound through lane that merges south of Town Center Dr.
- Change the northbound outside lane from right only to thru and add a right turn lane
- Construct a single lane roundabout at the intersection of Town Center Dr/Aquia Town Center Dr.
- Revise the lane configuration and signal phasing at Route 1/ Town Center Dr/I-95 off-ramp intersection:
  - Eastbound: 2-LT, 1-Thru+RT
  - Westbound: Change the WBR to free flow movement
  - Change the eastbound/westbound signal phasing from protected only to split
- Shared Use Path is accounted for in Alternative 5

Conceptual Layout: Year 2035 Preferred Alternative 2

Planning Level Cost Estimate

Phase	Six Year Improvement Program
	Alternative 2
Preliminary Engineering	$2,878,615
ROW and Utility Relocation	$16,687,531
Construction	$20,561,533
Total Cost =	**$40,127,679**

Note: Cost estimates reported in 2035 dollars

Eastbound Approach (Rt 1 at Garrisonville Rd / Washington Dr)

Project Benefits

Intersection Delay Reduction	
2035 No-Build Delay*	1287 hours
2035 Build Delay*	313 hours
Δ Delay (% Change)	-974 hours (-75.7%)
20-Year Operations Savings	$120,057,577

*Compounded AM and PM weekday travel delay in the influence area of all the proposed improvements

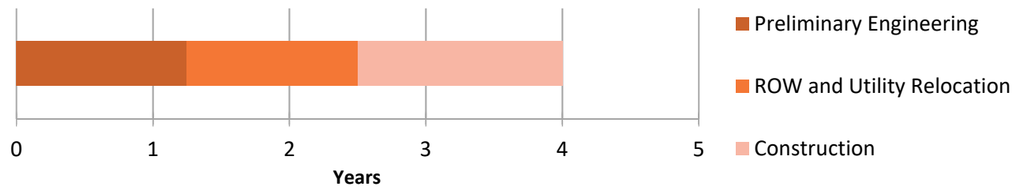
Crash Reduction	
2035 No-Build Crashes*	48
2035 Build Crashes*	44
Δ Crashes (% Change)	-4 (-8.3%)
20-Year Crash Reduction Savings	$4,873,844

*Projected Crashes in the influence area of the intersection

- Eliminates through and left movements conflict points from westbound or southbound approaches

Benefit/Cost Ratio: 3.11

Project Schedule



ROUTE 1 CORRIDOR STUDY, STAFFORD, VA

IMPROVEMENT CONCEPT: ROUTE 1/FORESTON WOODS DRIVE/AUSTIN PARK DRIVE INTERSECTION (ALTERNATIVE 3)

Existing Conditions

- 4-leg signalized intersection
- Posted speed limit = 45 mph (Route 1), 35 mph (Foreston Woods Drive)
- Intermittent sidewalks present along Route 1 and Foreston Woods Drive

Proposed Improvements

- Restripe the westbound and eastbound approach to new lane configuration: 1-LTL, 1-Thru, 1-RTL
- Change the minor street signal phasing from split to permitted + protected.
- Optimize signal timings and splits
- Shared Use Path is accounted for in Alternative 5

Eastbound Approach (Austin Park Dr)

Planning Level Cost Estimate

Phase	Six Year Improvement Program
	Alternative 3
Preliminary Engineering	$426,645
ROW and Utility Relocation	$1,334,317
Construction	$3,047,458
Total Cost =	**$4,080,420**

Note: Cost estimates reported in 2035 dollars

Project Benefits

Intersection Delay Reduction	
2035 No-Build Delay*	184 hours
2035 Build Delay*	66 hours
Δ Delay (% Change)	-117 hours (-63.6%)
20-Year Operations Savings	$14,466,113

*Compounded AM and PM weekday travel delay in the influence area of all the proposed improvements

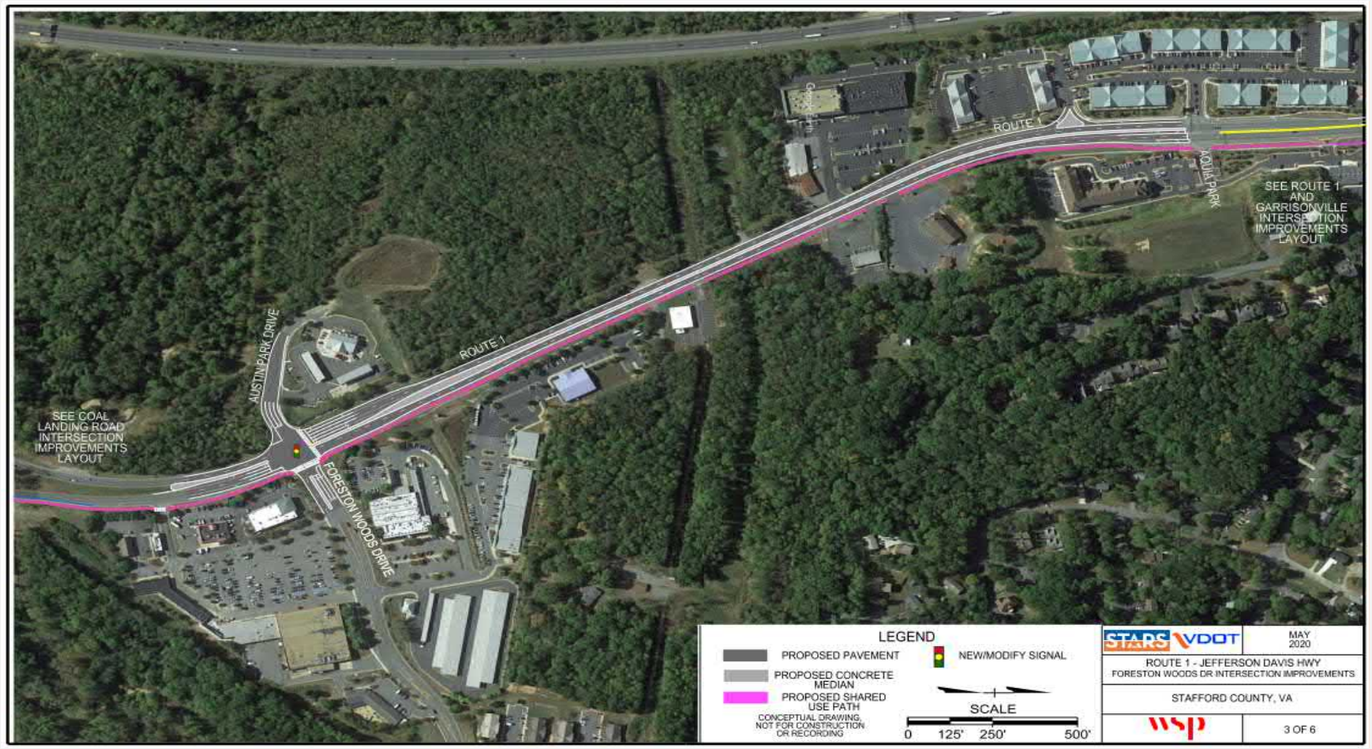
Crash Reduction	
2035 No-Build Crashes*	16
2035 Build Crashes*	13
Δ Crashes (% Change)	-3 (-18.75%)
20-Year Crash Reduction Savings	$2,044,971

*Projected Crashes in the influence area of the intersection

- Aims to improve safety at the intersection
- Reduces delay for minor street approaches
- Improves Route 1 corridor progression
- Alleviates recurring congestion and queuing

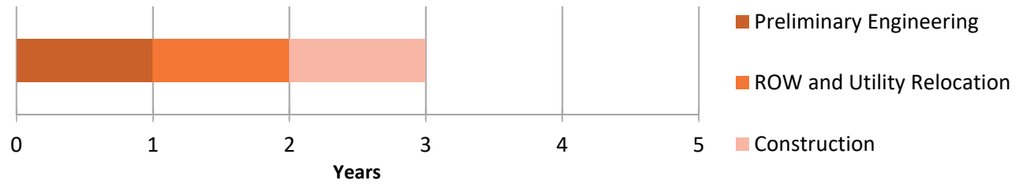
Benefit/Cost Ratio: 3.43

Conceptual Layout: Year 2035 Preferred Alternative 3



Southbound Approach (Route 1)

Project Schedule



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ROUTE 1 CORRIDOR STUDY, STAFFORD, VA

IMPROVEMENT CONCEPT: ROUTE 1/BELLS HILL/COAL LANDING RD-AUSTIN RUN BLVD INTERSECTIONS (ALTERNATIVE 4)

Conceptual Layout: Year 2035 Preferred Alternative 4

Proposed Improvements

Route 1/ Bells Hill/Coal Landing Road-Austin Run Blvd

- Prohibit eastbound left turns and through movements from Bells Hill Road, making it right in/ right out only.
- Relocate the eastbound left-turns further south to Austin Run Blvd as U- turns via Carnaby Street.
- Change the intersection control at Austin Run Blvd to signalized.
- Prohibit westbound through movements from Coal Landing Rd and reassign the left-turns as northbound U-turns at Foreston Woods Dr.
- Prohibit northbound lefts at Coal Landing Rd and assign them as northbound U-turns at Foreston Woods Dr.
- Shared Use Path is accounted for in Alternative 5

Planning Level Cost Estimate

Phase	Six Year Improvement Program
	Alternative 4
Preliminary Engineering	$777,248
ROW and Utility Relocation	$0
Construction	$5,551,770
Total Cost =	**$6,329,018**

Note: Cost estimates reported in 2035 dollars

Existing Conditions

Bells Hill Road/ Coal Landing Road

- 5-leg split signalized intersection
- Two intersections are controlled by one controller
- No pedestrian accommodations

Austin Run Blvd

- 3-leg split unsignalized intersection
- No pedestrian accommodations

Project Benefits

Intersection Delay Reduction	
2035 No-Build Delay*	621 hours
2035 Build Delay*	85 hours
Δ Delay (% Change)	-536 hours (-86.3%)
20-Year Operations Savings	$66,114,903

*Compounded AM and PM weekday travel delay in the influence area of all the proposed improvements

Crash Reduction	
2035 No-Build Crashes*	7
2035 Build Crashes*	8
Δ Crashes (% Change)	1 (14.3%)
20-Year Crash Reduction Savings	$207,354

*Projected Crashes in the influence area of the intersection

- Improves geometry of the intersections
- Reduces delay
- Alleviates recurring congestion and queuing

Benefit/Cost Ratio: 10.48

Project Schedule

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ROUTE 1 CORRIDOR STUDY, STAFFORD, VA

IMPROVEMENT CONCEPT: ROUTE 1 CORRIDOR WIDE IMPROVEMENTS (ALTERNATIVE 5)

Existing Conditions

- Limited pedestrian facilities along the corridor
- Several bus stops with no pedestrian access or accommodations

Proposed Improvements

- Install a Shared Use Path that runs the length of the corridor per Stafford County's Bicycle and Pedestrian Facilities Plan.

Bus Stop along SB Route 1 (Near Foreston Woods intersection)

Planning Level Cost Estimate

Phase	Six Year Improvement Program
	Alternative 5
Preliminary Engineering	$1,988,586
ROW and Utility Relocation	$5,763,292
Construction	$7,648,404
Total Cost =	**$15,400,282**

Note: Cost estimates reported in 2035 dollars

Project Benefits

Intersection Delay Reduction	
2035 No-Build Delay*	0 hours
2035 Build Delay*	0 hours
Δ Delay (% Change)	0 hours (0.0%)
20-Year Operations Savings	$0

*Compounded AM and PM weekday travel delay in the influence area of all the proposed improvements

Crash Reduction	
2035 No-Build Crashes*	123
2035 Build Crashes*	123
Δ Crashes (% Change)	0.0 (0%)
20-Year Crash Reduction Savings	$244,462

*Projected Crashes in the influence area of the intersection

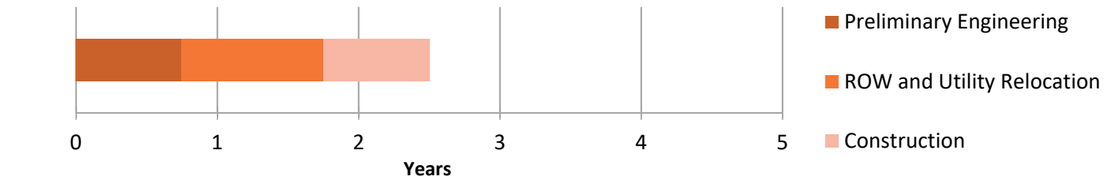
- Install a Shared Use Path that runs the length of the corridor to provide a separate/safer travelway for pedestrians/bicyclists/transit riders

Benefit/Cost Ratio: 0.02

Conceptual Layout: Year 2035 Preferred Alternative 5

Worn path to Bus Stop along NB Route 1 (Near Town Center Dr intersction)

Project Schedule



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