

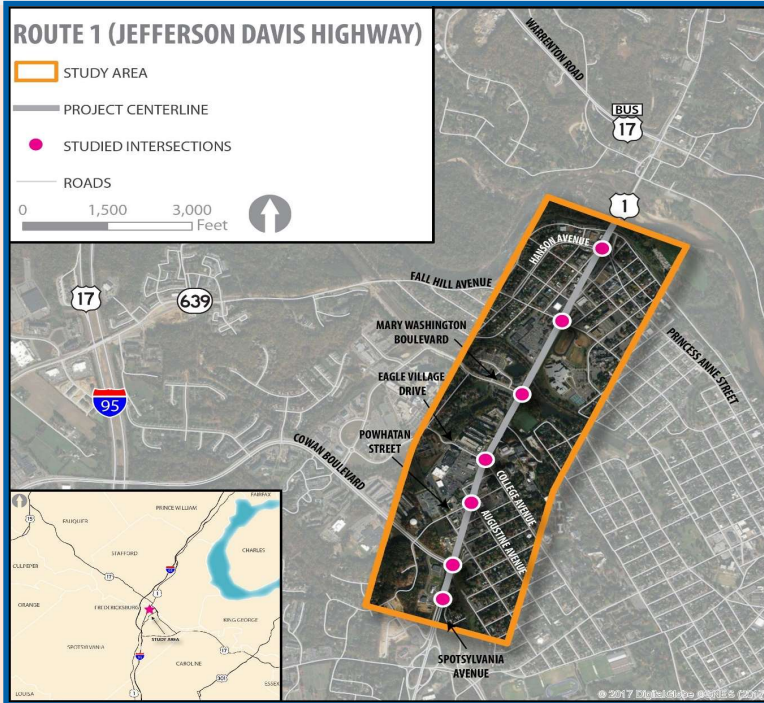
ROUTE 1 CORRIDOR STUDY

FROM NORTH OF ROUTE 3 (WILLIAM ST) INTERCHANGE TO PRINCESS ANNE STREET/HANSON AVENUE INTERSECTION (CORRIDOR-WIDE)

Project Description

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 issues. The **operational** issues intended to be addressed by this study include existing and future projected congestion within the corridor. This congestion is centered at the major intersections within the corridor, which are currently heavily utilized by passenger cars and truck traffic. Reduction in intersection delays would mitigate congestion, improve mobility and reduce travel time. This study also intends to address existing and future **safety** concerns within the study corridor. Numerous **access** deficiencies will also be addressed in this study within the limits of the study corridor 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*.

Route 1 Project Area and Location Map



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

Planning Level Cost Estimate

Total Cost Range = **\$14,605,000 - \$17,530,000**

Note: Cost estimates inflated to the 2024 construction year.

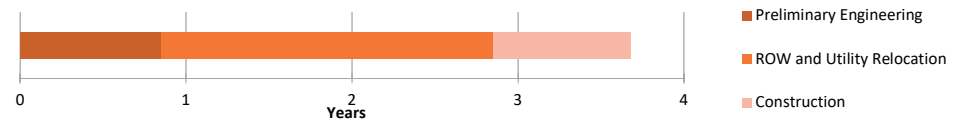
Traffic Operations Improvements

- Increased capacity by addition and extension of turn lanes.
- Traffic signal timing offset/phasing optimization.
- Traffic signal coordination with upstream and downstream signals.
- New traffic signal.
- Turn movement restrictions.

Targeted Safety Improvements

- Access management measures for the entire corridor.
- Pavement marking improvements at major study intersections.
- Visibility improvements.
- Installation of pedestrian facilities.

Project Schedule



Project Benefits

Corridor-Wide Traffic Operations Measures	
2030 No-Build Delay*	1105.6 hours
2030 Build Delay*	725.3 hours
Δ Delay (% Change)	-380.3 (-34.4%)
20-Year Operations Savings	\$52,753,174.00

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

Crash Reduction	
2030 No-Build Crashes*	84.27
2030 Build Crashes*	60.41
Δ Delay (% Change)	-23.86 (-28.3%)
20-Year Crash Reduction Savings	\$45,179,260.00

ROUTE 1 CORRIDOR STUDY

IMPROVEMENT CONCEPT: PRINCESS ANNE STREET/HANSON AVENUE INTERSECTION (2030 PREFERRED ALTERNATIVE)

Existing Conditions

- Minor Arterial (Princess Anne Street)
- 4-leg signalized intersection
- Posted speed limit (Princess Anne St/Hanson Ave) = 25 mph

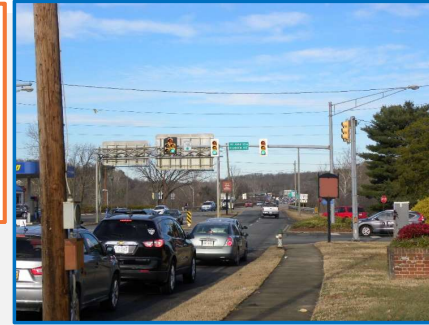
Proposed Improvements

- Modify Princess Anne St westbound approach to restrict westbound throughs
- Convert Hanson Ave eastbound approach to right-in/right-out
- Close Wallace St access to Route 1 and Hanson Ave
- Install median to prevent left turns to/from Charles Street
- Close Freedom Ln and close access from Van Buren St to Amaret St
- Install pedestrian facilities across all legs of the intersection

Planning Level Cost Estimate

Total Cost Range = **\$2,000,000 - \$2,800,000**

Note: The cost range shown for this concept is planning-level estimation, only. As a project is developed, further features and greater details will become known and a true project budget will be created. This estimate is inflated to the 2024 construction year.



Northbound Approach (Route 1)



Entrance to Close Southbound (Route 1)

Project Benefits

Intersection Traffic Operations Measures

2030 No-Build Delay*	258.5 hours
2030 Build Delay*	69.3 hours
Δ Delay (% Change)	-189.1 (-73.2%)
20-Year Operations Savings	\$25,509,115

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

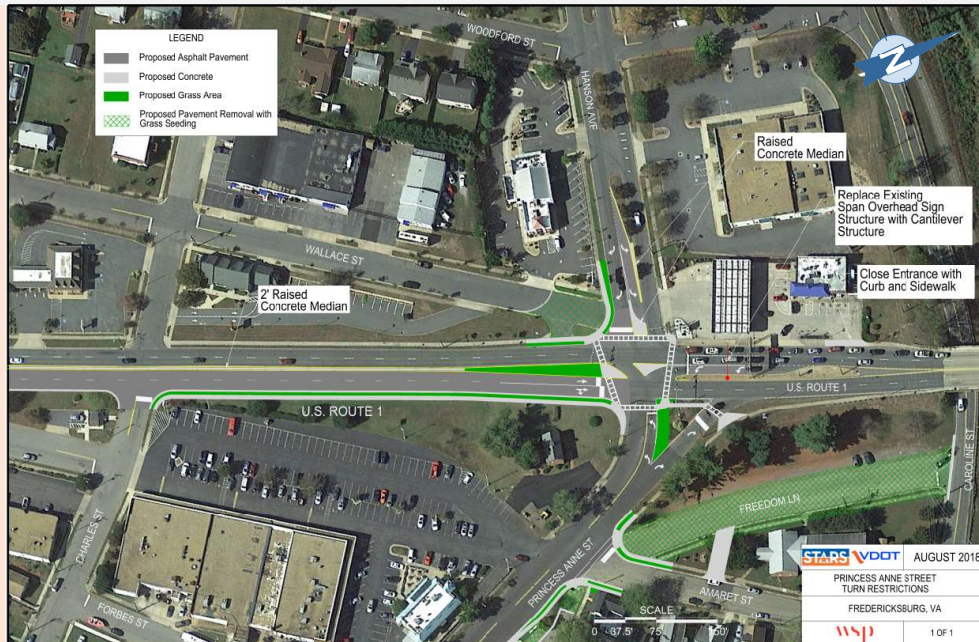
Crash Reduction

2030 No-Build Crashes*	10.19
2030 Build Crashes*	4.42
Δ Crashes (% Change)	-5.77 (-57%)
20-Year Crash Reduction Savings	\$14,331,049

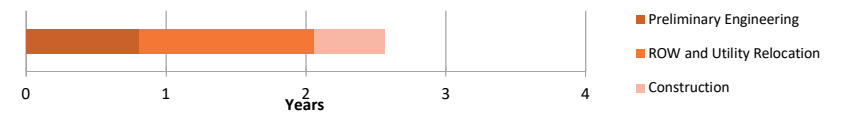
*Projected Crashes in the influence area of the intersection

- Reduces intersection delay.
- Reduces crashes at intersection.
- Improves the geometry and safety of intersection.
- Improves pedestrian safety through intersection.

Conceptual Layout: Year 2030 Preferred Alternative (Princess Anne Street/Hanson Avenue)



Project Schedule



ROUTE 1 CORRIDOR STUDY

IMPROVEMENT CONCEPT: FALL HILL AVENUE INTERSECTION (2030 PREFERRED ALTERNATIVE)

Existing Conditions

- Major Collector (Fall Hill Ave)
- 4-leg signalized intersection
- Posted speed limit (Fall Hill Ave) = 25 mph

Proposed Improvements

- Add an exclusive southbound right turn lane
- Add eastbound dual left turn lanes, making the approach layout dual lefts, through, right
- Add an exclusive westbound right turn lane, making the approach layout left, through, right
- Extend northbound right turn lane storage length to 250'
- Extend southbound left turn lane storage length to 205'
- Modify signal phasing to remove split-phased operation
- Close median opening at Wellford St making it right in/right out

Planning Level Cost Estimate

Total Cost = **\$7,200,000**

Note: The estimate shown for the proposed Route 1/Fall Hill Ave intersection improvements includes the data developed for the SMART SCALE application and contains a greater level of detail and precision than the concept-level estimates shown for the other locations. This estimate is inflated to the 2024 construction year.



Southbound Approach (Route 1)



Northbound Approach (Route 1)

Project Benefits

Intersection Traffic Operations Measures

2030 No-Build Delay*	193.4 hours
2030 Build Delay*	121.8 hours
Δ Delay (% Change)	-71.6 (-37.0%)
20-Year Operations Savings	\$9,655,648

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

Crash Reduction

2030 No-Build Crashes*	12.62
2030 Build Crashes*	8.73
Δ Crashes (% Change)	-3.89 (-31%)
20-Year Crash Reduction Savings	\$13,302,426

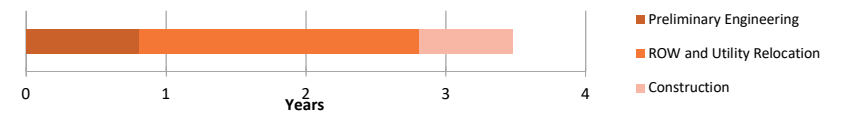
*Projected Crashes in the influence area of the intersection

- Provides additional lane capacity for southbound right turn movement.
- Provides additional lane capacity for eastbound and westbound movements.
- Reduces intersection delay.
- Reduces crashes at intersection.

Conceptual Layout: Year 2030 Preferred Alternative (Fall Hill Avenue)



Project Schedule



ROUTE 1 CORRIDOR STUDY

IMPROVEMENT CONCEPT: POWHATAN STREET/AUGUSTINE AVENUE INTERSECTION (2030 PREFERRED ALTERNATIVE)

Existing Conditions

- Minor Collector (Powhatan St)
- 6-leg unsignalized intersection, with a service road running parallel to Route 1 to the west
- No posted speed limit along Powhatan St/Augustine Ave

Proposed Improvements

- Add southbound Route 1 right turn bay at Augustine Ave
- Remove access to/from Snowden Dr both east and west of Route 1
- Restrict turns from Thornton St to Route 1
- Restrict northbound Route 1 right turn to Augustine Ave
- Remove service road west of Route 1
- Install pedestrian facilities and relocate pedestrian ramps across westbound approach of Eagle Village Dr/College Ave
- Relocate right turn stop bars on Eagle Village Dr and College Ave

Planning Level Cost Estimate

Total Cost Range = **\$775,000 - \$1,100,000**

Note: The cost range shown for this concept is planning-level estimation, only. As a project is developed, further features and greater details will become known and a true project budget will be created. This estimate is inflated to the 2024 construction year.



Westbound Approach (Powhatan St)



Eastbound Approach (Augustine Ave)

Project Benefits

Intersection Traffic Operations Measures

2030 No-Build Delay*	466.8 hours
2030 Build Delay*	360.9 hours
Δ Delay (% Change)	-105.9 (-22.7%)
20-Year Operations Savings	\$14,290,082

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

Crash Reduction

2030 No-Build Crashes*	12.14
2030 Build Crashes*	8.8
Δ Crashes (% Change)	-3.34 (-27.5%)
20-Year Crash Reduction Savings	\$10,145,056

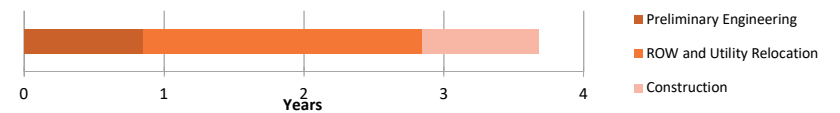
*Projected Crashes in the influence area of the intersection

- Provides additional capacity for southbound right turn movement.
- Reduces intersection delay.
- Reduces crashes at intersection.
- Improves the geometry and safety of intersection by reducing conflict points.
- Improves safety for pedestrians through intersection.

Conceptual Layout: Year 2030 Preferred Alternative (Powhatan Street/Augustine Avenue)



Project Schedule



ROUTE 1 CORRIDOR STUDY

IMPROVEMENT CONCEPT: COWAN BLVD/ROWE STREET INTERSECTION (2030 PREFERRED ALTERNATIVE)

Existing Conditions

- Major Collector (Cowan Blvd)
- 4-leg signalized intersection
- Posted speed limit (Cowan Blvd) = 35 mph

Proposed Improvements

- Add second eastbound right turn bay
- Add westbound left turn bay
- Relocate eastbound right turn lane stop bar closer to intersection
- Install pedestrian facilities across northbound and eastbound approaches

Planning Level Cost Estimate

Total Cost Range = **\$1,380,000 - \$1,910,000**

Note: The cost range shown for this concept is planning-level estimation, only. As a project is developed, further features and greater details will become known and a true project budget will be created. This estimate is inflated to the 2024 construction year.



Northbound Approach (Route 1)



Southbound Approach (Route 1)

Project Benefits

Intersection Traffic Operations Measures

2030 No-Build Delay*	133.7 hours
2030 Build Delay*	92.0 hours
Δ Delay (% Change)	-41.7 (-31.2%)
20-Year Operations Savings	\$5,622,048

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

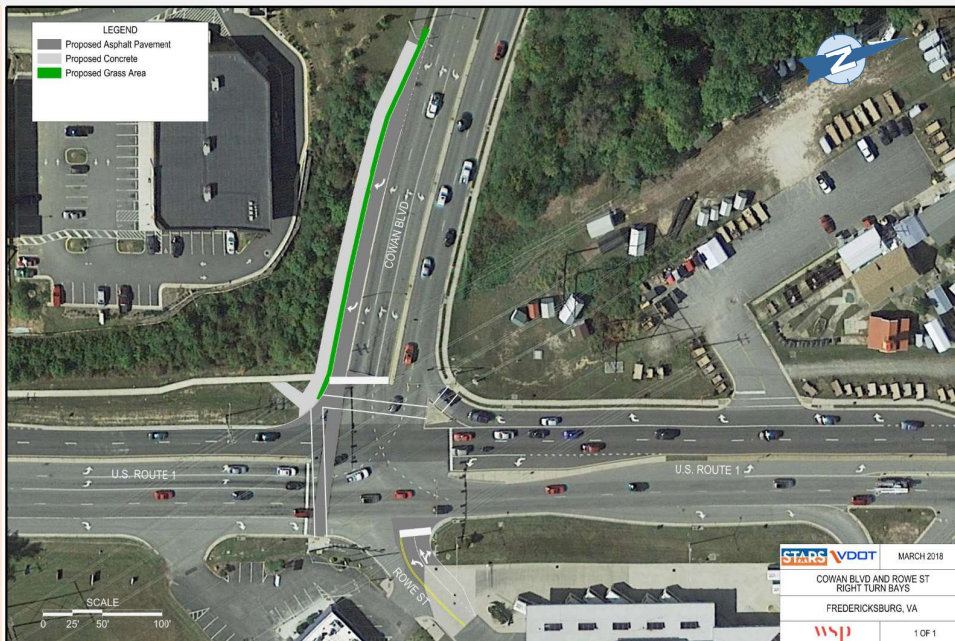
Crash Reduction

2030 No-Build Crashes*	12.62
2030 Build Crashes*	9.43
Δ Crashes (% Change)	-3.19 (-25%)
20-Year Crash Reduction Savings	\$612,867

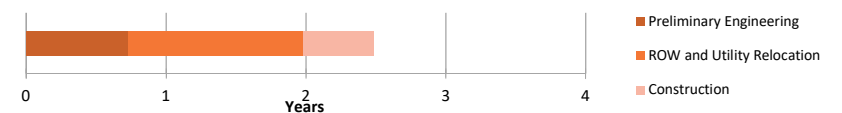
*Projected Crashes in the influence area of the intersection

- Provides additional lane capacity for eastbound right turn movement.
- Provides additional lane capacity for westbound approach.
- Reduces intersection delay.
- Reduces crashes at intersection.
- Improves safety for pedestrians.

Conceptual Layout: Year 2030 Preferred Alternative (Cowan Blvd/Rowe Street)



Project Schedule



ROUTE 1 CORRIDOR STUDY

IMPROVEMENT CONCEPT: COWAN CROSSING/SPOTSYLVANIA AVENUE INTERSECTION (2030 PREFERRED ALTERNATIVE)

Existing Conditions

- 4-leg signalized intersection
- No posted speed limit along Cowan Crossing/Spotsylvania Ave

Proposed Improvements

- Convert free-flow westbound Route 3 off-ramp to signalized triple rights
- Signalize northbound Route 1 approach at off-ramp
- Add auxiliary through lane northbound to become left turn lane at Cowan Blvd
- Add northbound right turn lane at Spotsylvania Avenue

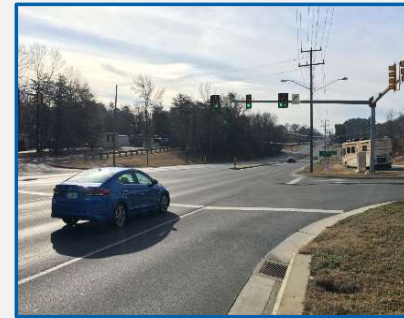
Planning Level Cost Estimate

Total Cost Range = **\$3,250,000 - \$4,520,000**

Note: The cost range shown for this concept is planning-level estimation, only. As a project is developed, further features and greater details will become known and a true project budget will be created. This estimate is inflated to the 2024 construction year.



Eastbound Approach (Cowan Crossing)



Southbound Approach (Route 1)

Project Benefits

Intersection Traffic Operations Measures

2030 No-Build Delay*	53.2 hours
2030 Build Delay*	43.6 hours
Δ Delay (% Change)	-9.6 (-18.0%)
20-Year Operations Savings	\$1,293,515

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

Crash Reduction

2030 No-Build Crashes*	5.34
2030 Build Crashes*	3.16
Δ Crashes (% Change)	-2.18 (-41%)
20-Year Crash Reduction Savings	\$6,787,862

*Projected Crashes in the influence area of the intersection

- Eliminates the weave between Route 3 off-ramp and traffic signal at Cowan Crossing
- Provides additional capacity for northbound throughs at Cowan Crossing and additional storage for northbound lefts at Cowan Blvd.
- Provides additional lane capacity for northbound right turn movement.
- Reduces intersection delay.
- Reduces crashes at intersection.

Conceptual Layout: Year 2030 Preferred Alternative (Cowan Crossing/Spotsylvania Avenue)



Project Schedule

