



Richmond Signal System - Retiming



City of Richmond, VA
Department of Public Works



-  Signalized Intersections
-  City Boundary



New Project Funding Application

Complete the application with as much detail as possible. Requests will be evaluated based on answers provided. The application can be edited after submission until the deadline of 11:59 PM on Friday, October 29, 2020.

If you need to save your application without finishing, click the save button. On the popup, click skip account creation and enter your email on the next page. A link to resume the application will be sent to you.

A confirmation email and link to edit your answers will be sent to you upon submission. For any questions or problems, contact Myles Busching (mbusching@planrva.org).

General

Project Sponsor	Richmond
Sponsor Point of Contact	Enrique Burgos
Point of Contact Email	enrique.burgos@rva.gov
Point of Contact Phone Number	(804) 646-6337

General

Project Title F Richmond Signal System Retiming Improvements

Project Description

This project will retime 400 signalized intersections. FHWA guidelines recommend traffic signal timing should be actively monitored, reviewed, and updated at least every 3 years and possibly sooner depending on growth and changes in traffic patterns. Growth, modern signal system infrastructure and technology (e.g. centralized transit signal priority and emergency vehicle preemption), roadway conversions, and street network changes contribute to changing travel patterns.

Project Type Project or Program

Location

Project Scale Jurisdiction-wide

Features

Select all improvements that apply to this project

- Active Transportation Improvements
- Bus Transit Improvements

Features

Describe the improvements to the bicycle and pedestrian network. If any bridge improvements are proposed, include the structure identification number.

The City has experienced significant change in the roadway network to become more multimodal due to the addition of new pedestrian hybrid beacons, traffic signals, bike lanes infrastructure, and increased pedestrians' activities.

The City of Richmond and the surrounding metropolitan area have grown rapidly over the last decade, leading to an increase in multimodal activity and changes in multimodal travel volumes and patterns, including no fare, high frequency transit service. Along with population growth, the City has fostered an abundance of new construction and redevelopment of residential, commercial, and employment center uses.

Features

Describe the improvements to bus service

In June 2018, the Greater Richmond Transit Company (GRTC) Pulse Bus Rapid Transit (BRT) system, the first BRT in Central Virginia, became operational together with a complete redesign of the GRTC transit network. The 7.6-mile GRTC Pulse BRT route introduced a new element to the City's signal operations, Transit Signal Priority (TSP).

A separate Smart Scale project will connect the Richmond Signal System to the GRTC Operations Center for centralized transit signal priority. In order to function, each controller located at 480+ intersections need to have new timings to effectively engage the TSP function. This project would provide those timings such that extended greens may assist a bus and make it more reliable and operate on schedule.

Features

Describe the improvements to shipping, trucking, freight rail, or other goods movement. If any bridge improvements are proposed, include the structure identification number.

By improving traffic signal timings, freight movements at the speed limit are fully supported. Each time a large truck has to stop, environmental air quality is lowered and wear and tear from stopping and starting shoves the pavement creating additional repair needs. In addition, our emergency responders need new timings to support the Emergency Vehicle Preemption being established by connecting the Richmond Signal System to the E-911 Dispatch Center.

Just in time delivery coupled with online shopping has continued to grow eliminating individual trips to commercial land uses. Traffic signal communication assists with supporting this shift in travel patterns by minimizing the stops and starts as well as keeping signals set for travel at or below the speed limit.

Features

Describe the improvements to roads including intersection and interchange improvements. If any bridge improvements are proposed, include the structure identification number.

Signal retiming is a cost effective tool to generate quantifiable traveler benefits as measured by

decreased multimodal delay, increased safety, lower emissions and reduced fuel consumption at a low cost. Qualitative benefits, such as decreased cut-through traffic on alternate routes, reduced user frustration, and reduced pedestrian delay can also be realized. A focused signal retiming program can provide with additional opportunities to examine intersection operations and corridor progression and identify related maintenance issues.

Updated traffic signal timings along 400 signalized intersections. This will include traffic counts, field inventory, development and implementation of at least four timing plans, synchronization\progression analysis and recommendation, before and after travel times comparison, clearance intervals calculation, transit signal priority timings, emergency vehicle preemption timings, and emission reduction calculation.

Features

Features

Project Delivery

Who is expected to administer this project?

Locality/Agency

Is this project in the local Comprehensive Plan?

Yes

Is this project in the local Capital Improvement Plan?

Yes

Describe any public outreach related to this project including the level of public participation

Public outreach includes outreach to Richmond 300 participants under Equitable Transportation Working Group as well as the CIP Budget process for the Richmond Signal System. The Department also works with the media using press releases for new retiming projects funded by CMAQ as well as the general public through its 311 system.

The following questions are based on the regional long-range transportation plan, [ConnectRVA 2045](#). See the following links for more information:

- [Regional Significance](#)
- [Goals and Objectives](#)

Is this project regionally significant based on the project inclusion guidelines?

No

How does this project address Goal A: Safety?

Updated traffic signal timings will allow the multimodal transportation system to be more reliable and intuitive. Retiming is not just for car traffic, the non-car network also improves by allowing signal system engineers to build in a multimodal approach where all users are served with each cycle of the light. It is expected there will be a 13% reduction of overall crashes and 36-40% reduction in serious injuries and deaths per the Crash Modification Factor clearinghouse, since travel time and signal timing is more predictable and reduces the opportunity for aggressive driving. By increasing traffic density into tighter platoons, the speeds are better managed by forcing aggressive drivers to wait for the vehicle ahead or wait at the next traffic signal.

How does this project address Goal B: Environment and Land Use?

Signal synchronization between intersections will be more reliable, then we will expect the reduction of

number of times one has to stop and start at the signal, reducing then the amount of gas and GHG vehicle emissions. This will result in the improvement of air quality. Retiming also supports transit signal priority and transit oriented development. Dense land uses increase and support high frequency transit use and dedicated transit only lanes. This is all possible with retiming the signal network.

How does this project address Goal C: Equity and Accessibility?

Our traffic signal communication network is mostly located in the lowest quintile of the Health Opportunity Index (HOI) developed by the Virginia Department of Health. In addition, transportation disadvantaged populations (low income, elderly, disabled) as defined by the RRTPO reside near our signalized intersections. This project provides the opportunity for all modes to cross at the intersection to access high frequency transit, for people who walk and bike to access dense mixed land uses for mixed incomes.

How does this project address Goal D: Economic Development?

Retiming allows our users with nearly 5,000,000 turning movements per day and supporting the second densest area in the Commonwealth for jobs and housing, just behind Arlington County. The City is still adding population, jobs, and it is best to focus that development where the infrastructure exists in lieu of green field development practices with longer trips for services.

How does this project address Goal E: Mobility?

The new term for measuring mobility is access. While this project improves mobility, we are also concerned about our traffic control signals providing access using a multimodal approach. Our communication network coordinates signalized intersections to limit speeds to the posted speed limit based upon the land use context and provides opportunities for people who walk, bike, and ride transit to safely cross the street at a slower speed to support all ages and abilities. Accessibility is the new mobility.

Project Delivery

Preliminary Engineering (PE) Start Wednesday, August 31, 2022

Project Delivery

Preliminary Engineering (PE) Cost \$1,713,425

Total Cost \$1,713,425.00

Project Delivery

Is this a request for funds to leverage to obtain other funding sources such as Smart Scale?

No

The following questions are based on the adopted definitions for "committed" and "reasonably expected" funds. For more information, see [Appendix II: Outside Funding](#) of the project selection framework.

Does this project have any other committed funding?

No

Does this project have any other reasonably expected funding?

No

Total Funding Request

\$1,713,425.00

Funding Program

CMAQ

Supplemental Material

Project Sketch



richmond signal system retiming sketch.pdf

Detailed Estimate



rss retiming estimate cost.pdf

Supporting Studies



trafficflow_improvement_tool brook.pdf



trafficflow_improvement_tool commerce rd.pdf



trafficflow_improvement_tool commerce rd_2...



trafficflow_improvement_tool midlothian.pdf



trafficflow_improvement_tool monument.pdf

Comprehensive Plan Excerpt



Richmond 300 Comprehensive Plan.pdf

Capital Improvement Plan Excerpt



Adopted City of Richmond Capital Improve...

Project Presentation