

**Roanoke-Clifton Forge
Enhanced Public
Transportation Study**

**VIRGINIA
DEPARTMENT OF
RAIL AND PUBLIC
TRANSPORTATION**

I. OVERVIEW

The 2020 General Assembly in the Biennial Budget directed the Department of Rail and Public Transportation (DRPT) to “evaluate enhanced public transportation services from the City of Roanoke to the Town of Clifton Forge for the purposes of enhanced connectivity to existing Amtrak service, including the potential ridership, cost, and feasibility of multimodal transportation options along the Interstate 81 and U.S. Route 220 corridors. The Department shall complete its investigation and report to the Chairs of the House Appropriations and Senate Finance and Appropriations Committee no later than June 30, 2021.” However, due to the COVID-19 pandemic, the General Assembly extended the study’s deadline to June 30, 2022.

As part of this study, DRPT analyzed existing and possible travel options between the City of Roanoke and the Town of Clifton Forge by evaluating trip time, trip distance, hours of availability, and ridership. Highway and non-highway modes were analyzed.

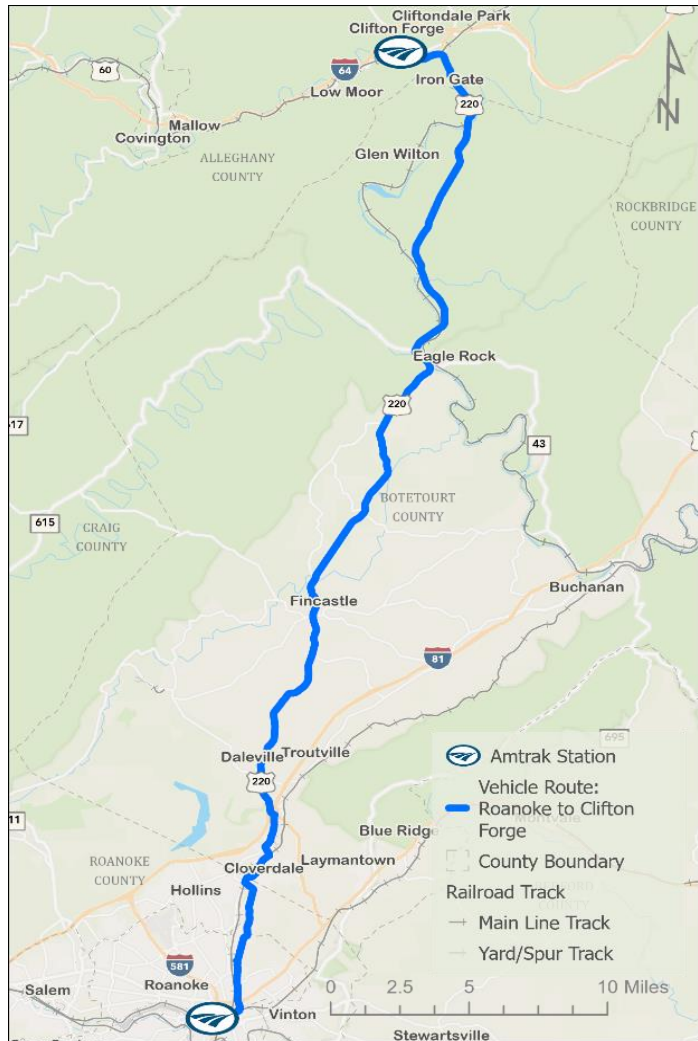


Figure 1: U.S. Route 220 between Roanoke and Clifton Forge

II. BACKGROUND

Amtrak’s Cardinal route serves the Town of Clifton Forge with long-distance passenger rail service to New York and Chicago three times per week. Amtrak also provides state-sponsored daily round-trip service between the City of Roanoke and Washington, D.C., with service to the Northeast Corridor.

Direct passenger rail or other public transportation does not currently exist between Roanoke and Clifton Forge, making highway-operated modes the most viable option for passenger travel between these two communities.

The main automobile route between Roanoke and Clifton Forge is Route 220. The trip takes between 60 to 75 minutes and has low congestion rates. Currently, there is no intercity or local bus service between the Town of Clifton Forge and the City of Roanoke. Paratransit is offered by the local transit agency, RADAR, in both Roanoke County and Clifton Forge; however, there is no connecting service between the areas. Figure 1 shows a vehicle route along U.S. Route 220 between Roanoke and Clifton Forge.

An Amtrak rail transfer is possible between Roanoke and Clifton Forge three days a week through Charlottesville. However, this trip takes between seven and ten hours to complete.

III. RIDERSHIP ESTIMATE

DRPT estimates that if a public transportation service were available between Roanoke and Clifton Forge, annual ridership would be approximately 100 to 500 individuals in the year 2030.

To estimate the ridership, DRPT reviewed the following previous studies:

- Clifton Forge 2020 Transportation Plan, prepared by the Virginia Department of Transportation in cooperation with the Federal Highway Administration (2020);
- Final Report of the RVARC Rural Transit Feasibility Study, prepared by the Roanoke Valley Transportation Planning Organization in cooperation with the Virginia Department of Transportation and the Federal Transit Administration (2019);
- Final Report of the Roanoke Agency Dial a Ride (RADAR) Transit Development Plan FY2018-FY2027, prepared by KFH Group, Inc. for RADAR (2018);
- Final Report of the Valley Metro Transit Development Plan FY2019-FY2028, prepared by KFH Group, Inc. for Valley Metro (2018);
- Roanoke Valley Transit Vision Plan, prepared by Foursquare Integrated Planning & Michael Baker International for the Roanoke Valley Transportation Planning Organization (2016).

DRPT also considered the rail boardings and alightings at the Clifton Forge Amtrak station. As of 2019, there were 2,190 Amtrak passengers boarding or alighting at the station. There is no publicly available information noting the home location of these passengers. It is possible that some of these individuals were traveling from Roanoke to board the train in Clifton Forge and might in the future choose to use transit for this first leg of the trip. However, the following factors limit the Roanoke to Clifton Forge travel market.

- Of the 2,190 annual passengers using the Clifton Forge Amtrak station, about half (52 percent) are traveling to or from stations which are already served by the existing Amtrak Northeast Regional / Virginia service from Roanoke. This means that people who live in Roanoke and want to travel to these destinations are

better served boarding the daily direct service from Roanoke, rather than traveling to Clifton Forge for the thrice-weekly Cardinal service.

- The remaining 1,051 passengers per year translates to fewer than three people per day, some of whom would be originating from locations other than Roanoke, providing a very limited market for transit service.

IV. ROANOKE-CLIFTON FORGE TRAVEL OPTIONS

Despite low ridership projections, DRPT did complete an analysis to provide cost estimates for possible public transportation service from Roanoke to Clifton Forge. This section summarizes the agency's findings.

PASSENGER RAIL

DRPT developed a conceptual passenger rail route between the stations in Roanoke and Clifton Forge for cost estimation purposes. This route would require utilizing existing freight routes and construction of approximately 19 miles of new track along the Route 220 corridor as shown in Figure 2. Travel time would be approximately one hour.

However, after analyzing the associated costs, DRPT does not recommend this alternative. Capital costs would be approximately \$4.9 billion in 2030 dollars. The operating and maintenance costs associated with this alternative were not quantified in this study, given the high capital costs.

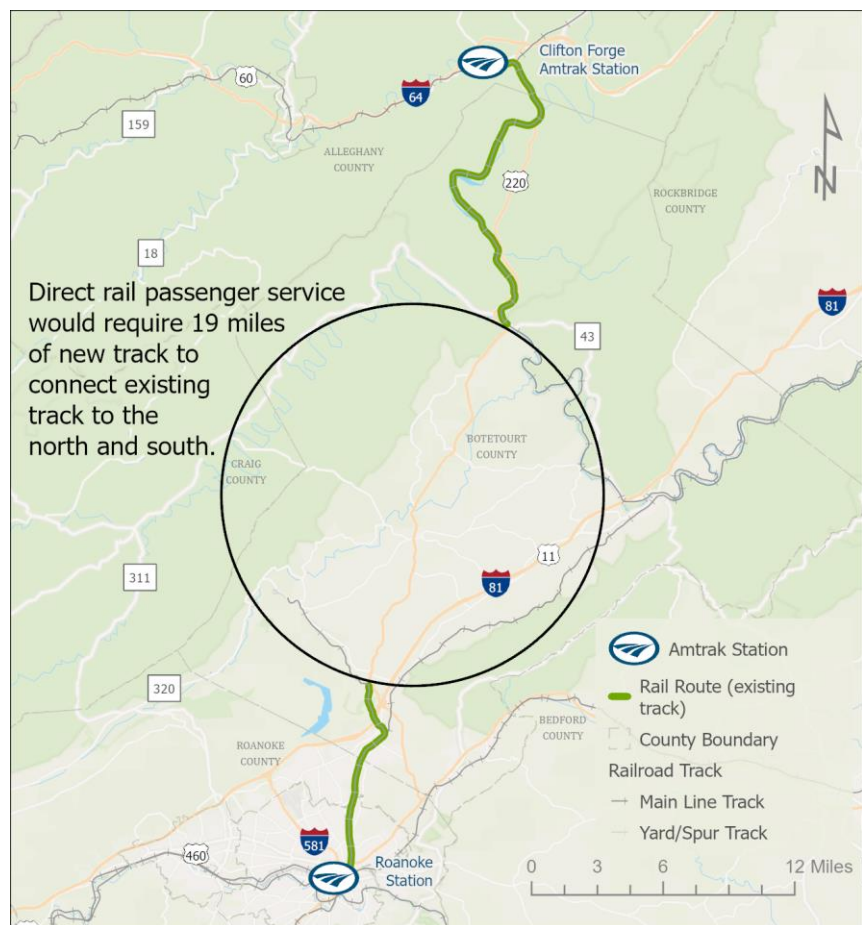


Figure 2: Conceptual Rail Alternative between Roanoke and Clifton Forge

FIXED-ROUTE BUS SERVICE

DRPT also examined the possibility of a fixed-route, scheduled bus service to connect Clifton Forge and Roanoke. Similar to passenger rail, DRPT found this is not an efficient option to increase connectivity between Roanoke and Clifton Forge due to the high operations and maintenance cost per passenger.

The estimated annual operating and maintenance costs total approximately \$270,980 in 2030 dollars, which equates between \$590 and \$2,200 per passenger in 2030 dollars.

DRPT reviewed the following data sources to better understand the cost dynamics in bus services with the Commonwealth and the United States:

- Virginia Breeze operating cost data between 2019 and 2021 for a trend analysis of operating costs;
- 2019 National Transit Database (NTD) commuter bus cost data for benchmarking purposes.

DRPT manages the Virginia Breeze intercity bus service using a percentage of federal funds from the Federal Transit Administration. It consists of four routes: the Valley Flyer, Piedmont Express, Capital Connector, and Highlands Rhythm. The Valley Flyer is the only service that began operation prior to the pandemic. It operates once a day between Blacksburg and Washington, D.C., with stops in Christiansburg, Lexington, Staunton, Harrisonburg, Front Royal, Dulles Airport, and Falls Church.

DRPT also analyzed NTD data for agencies with commuter bus services and selected agencies with similar operating patterns while acknowledging that service parameters and region-specific characteristics may limit comparability to service between Roanoke and Clifton Forge.

AMTRAK CONNECTOR BUS SERVICE

DRPT analyzed Amtrak's Thruway bus as an option to provide service between Roanoke and Clifton Forge. The proposed Thruway bus route between Lynchburg and Bedford, Virginia, served as a recent and relevant point of comparison.

DRPT estimated an operating cost between \$300,000 and \$400,000 per year for one round trip a day between Lynchburg and Bedford. Assuming similar operating costs for a thruway bus between Roanoke and Clifton Forge, and considering the estimated ridership of between 100 and 500 individuals per year, the cost per passenger is estimated to be between \$650 and \$3,250. These results are consistent with previous analyses suggesting that scheduled bus services are not financially efficient options due to the high cost per passenger.

ON-DEMAND TRANSIT SERVICE

Another option that DRPT examined is on-demand transit service between the two communities. Currently, DRPT collaborates with Bay Transit in the Middle Peninsula

and Mountain Empire Older Citizens in Southwest Virginia on the Virginia Rural Microtransit Deployment Initiative, a demonstration project that is testing the feasibility of microtransit and a service delivery model for rural on-demand transit service. This project is funded in part through the Federal Transit Administration's Integrated Mobility Innovation Grant and the Commonwealth's Innovation Technology Transportation Fund. Microtransit technology allows customers to book trips on demand or in advance via an app or call-in number. The technology allows efficient real-time routing, trip sharing, mobile payment, and flexible scheduling within a defined service zone. The demonstration projects, Bay Transit Express and METGO, went live on June 28, 2021, and will run for a total of 18 months.

Based on the Albemarle County Transit Expansion Study developed by the Thomas Jefferson Planning District Commission, Albemarle County and Charlottesville Area Transit (CAT) will implement microtransit services in the Route 29 North and Pantops service area as part of a 12-month demonstration project. The microtransit services would remove an estimated total of 100 single-occupancy vehicle trips per day between the two service areas. CAT will be the transit operator for the microtransit services, procuring four 20-passenger transit vehicles and using current transit operators to implement the microtransit pilot. In year one, this service would cost over \$1.9 million. By year two, the cost would be a little under \$1.9 million annually.

DRPT reviewed publicly available microtransit vehicle costs and found that to serve the forecasted ridership, cost estimates ranged from \$23,700 for a six-passenger van in 2018 dollars to \$111,800 for an eight-passenger minibus in 2019 dollars. Vehicle costs varied based on the number of passengers per vehicle and the vehicle features required for the service.

It is important to note that all of these examples of on-demand transit service run in a smaller geographic region than a connection between Roanoke and Clifton Forge. Based on the cost analysis, the low predicted ridership, and size of service area, DRPT finds that the cost of on-demand transit service for this corridor outweighs the benefits.

V. CONCLUSION

Forecasts project very low ridership for the transit corridor between Roanoke and Clifton Forge. The ridership projected does not justify the very high capital costs for rail and makes rail transit prohibitively expensive. Commuter bus services present far lower capital costs; however, they do have high O&M costs. The low projected ridership suggests that scheduled bus trips would operate with mostly empty vehicles.

Micro-transit or demand response service may enhance connectivity in an efficient and sustainable way, meaning the service only operates when there is passenger demand. Capital operational costs for micro-transit are significantly lower than other options; however, costs would still be high for the limited number of riders.