Bristol Virginia Transit

City of Bristol, Virginia

Transit Development Plan

2023-2028

March 2023

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1 OVERVIEW OF THE TRANSIT SYSTEM

HISTORY

The City of Bristol, Virginia, is located in the southwestern corner of the Commonwealth of Virginia. It is precisely at the border with Tennessee, across the state line from Bristol, Tennessee. Virtually, it is a single city split in two by the state line. Administratively, however, these are two separate cities from two different states that provide their own independent services. State Street, the main thoroughfare downtown, is the state line itself. The city is a historic community of the Appalachian Highlands recognized as "the Birthplace of County Music." Bristol, Virginia is an independent city surrounded on three sides by Washington County and bordered to the south by Sullivan County, Tennessee.

The city covers a surface area of 13 square miles and is home to a population of 17,219 (2020 Decennial Census), making up 0.2 percent of Virginia's total population. Washington County, which surrounds but excludes the City of Bristol, has 53,935 inhabitants. The City of Bristol, Tennessee, has a population of 27,147.

When compared to the 2010 Census, Bristol's population decreased slightly (3.5%), while the Commonwealth of Virginia experience a 7.9 percent increase in population. Neighboring Washington County also saw a smaller population decrease (1.7). The population of Bristol has declined by small increments in three of the past decades since the population peaked in 1980. Future forecasts from The Weldon Cooper Center for Public Services at the University of Virginia suggest the past modest declines is expected to continue into the future.

Bristol's current population is 85.7% non-Hispanic white, compared to 60.3% statewide. African Americans make up 6.1% of the population while only 2.6 percent of the total population is of Hispanic descent (compared to 10.5% statewide). The median household income for Bristol is $39,700 which is a little more than half Virginia's $76,400 (2020 American Community Survey). The poverty rate in Bristol is estimated at 13.7 percent (compared to 6.8% statewide). Households in Bristol with no vehicle available make up 10.1 percent of the total (compared to 6.1% statewide). In general, a higher share of Bristol's population may be economically disadvantaged and is thus more likely to need and use public transit.

The city provides public transportation services as Bristol Virginia Transit (BVT). Given the adjacent city of Bristol, Tennessee immediately to the south of the state line, the responsibility to provide public transportation is shared between the two states. As a result, BVT and Bristol Tennessee Transit (BTT) offer coordinated services that converge hourly at the Downtown

Transfer Center, located just south of State Street in Tennessee, next to the Farmers' Market, at 804 State Street. Public transit has been offered as a city service since the 1930s. Currently, both BVT and BTT offer three fixed-route services each.

GOVERNANCE

The city has a council/manager form of government. At the beginning of January 2023, the City Council had an organizational meeting to appoint the following officials:

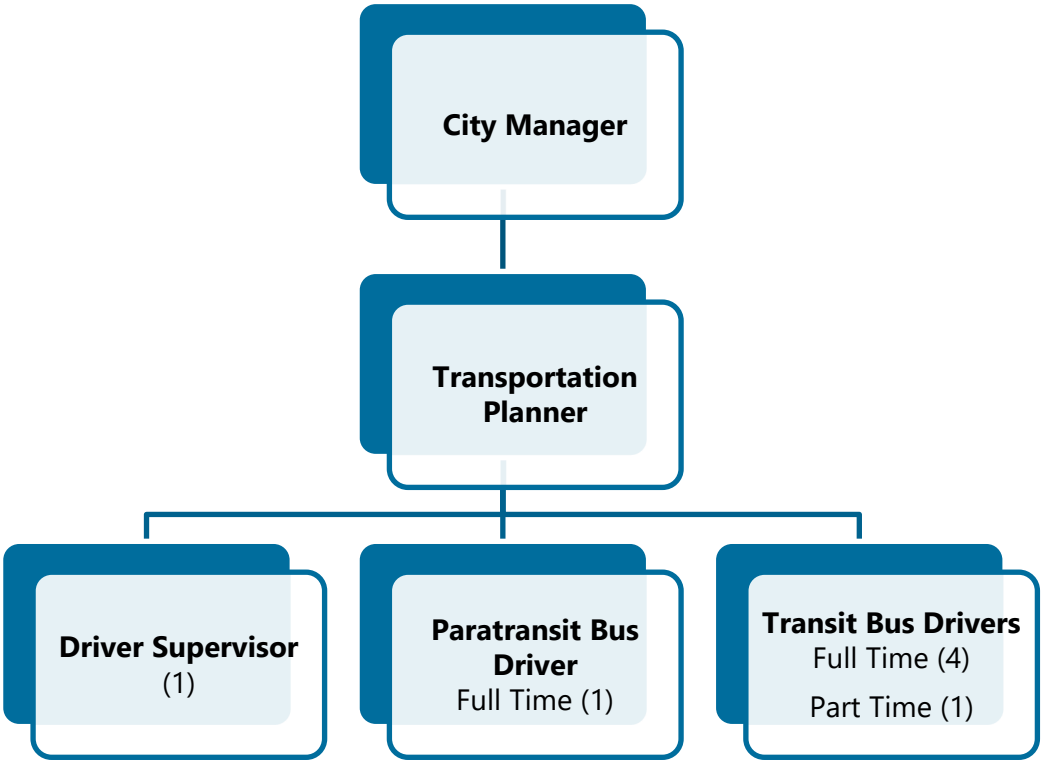
Title	Current Holder
Mayor	Neal Osborne
Vice Mayor	Becky Nave
City Manager	Randall Eads
City Attorney	Randall Eads
City Clerk	Joey Lamie

The City Council itself is made up of five people: the Mayor and Vice Mayor plus three (3) Council Members, who currently are: Anthony Farnum, Michael Pollard, and Jake Holmes. The council meets at 6:00 PM on the second and fourth Tuesday of each month.

ORGANIZATIONAL STRUCTURE

BVT is administered as a city governmental service, overseen by the city council and its five elected members. The city also employs a city manager, a transportation planner, a driver supervisor, and six (6) bus and paratransit drivers, as outlined in Figure 1. The driver supervisor handles day-to-day operations while the transportation planner handles administrative matters along with other staff from the Community Development & Planning Department.

Figure 1. Bristol Virginia Transit Organizational Chart



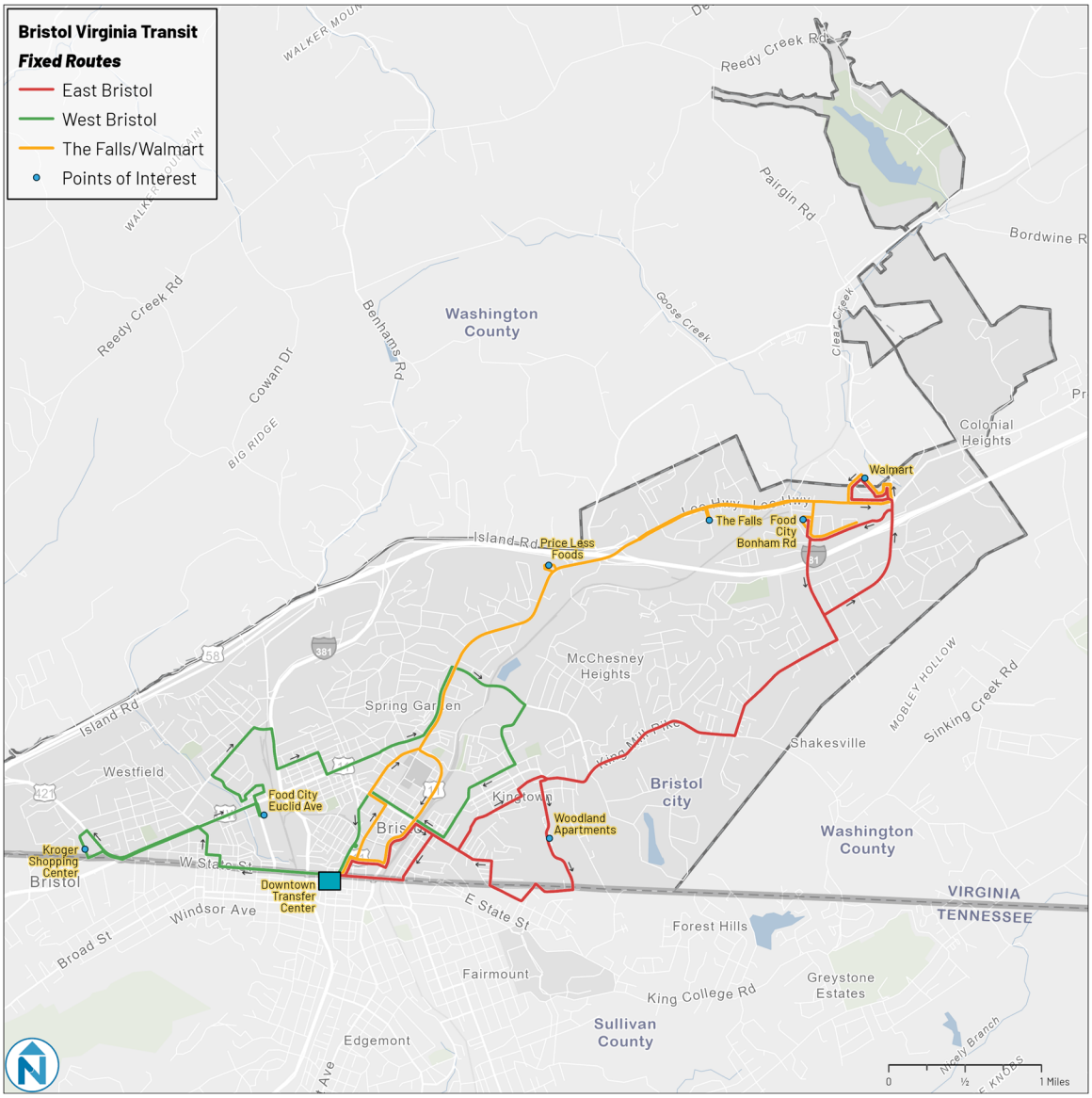
SERVICES PROVIDED AND AREAS SERVED

BVT currently offers two types of service: (a) fixed-route service with minor route deviations upon demand and (b) paratransit service in compliance with the Americans with Disabilities Act (ADA).

Fixed-Route Service

Fixed-route service is provided through three routes, as seen in Figure 2, which depart hourly from the Downtown Transfer Center (DTC) at 15 minutes past the hour between 7:00 AM and 6:00 PM (for a total of 11 daily trips). The exception is the East Bristol route, which starts a bit later in the day, at 10:00 AM (8 trips daily). The buses arrive back at DTC on the hour, before their next departure at 15 past the hour. These services are provided Monday through Friday only; no weekend service is available. Connections with BTT services are provided at DTC; these are timed transfers, which minimizes wait times for passengers. Drivers will respond to requests for minor deviations along the route in order to accommodate riders' needs.

Figure 2. Bristol Virginia Transit System Map



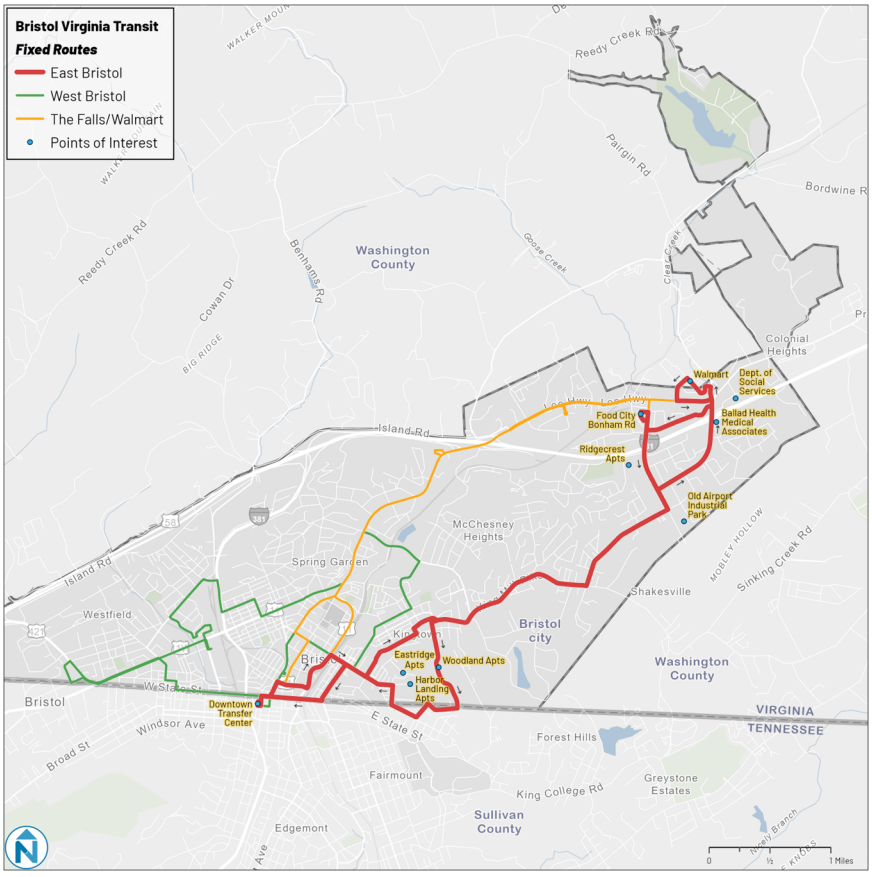
The peak vehicle requirement for each route is one bus. There are some designated bus stops but, typically, passengers flag down the buses for pick up and then tell the driver when and where they want to be dropped off. Buses pull up to the front of stores and businesses to pick up and drop off riders, since stop amenities are not widely available.

Together, these three routes carried 14,126 passenger trips in Fiscal Year 2021 (July 2020 through June 2021). This demand was met with a supply of 3,718 vehicle revenue hours, which yields an average of 3.80 passengers per revenue hour. Also, 43,536 vehicle revenue miles were provided, for an average of 0.32 passengers per mile.

East Bristol Route

This route serves areas as varied as Kingtown, Cheddar's, Walmart, the Department of Social Services, Linden Drive, Food City Bonham Road, and the Woodland Apartments. Upon request, deviated service is provided to Ballad Health Medical Associates (formerly Wellmont), Ridgecrest, Harbor Landing, and the Eastridge Apartments. This route used to run on peak periods only; now it runs all day but with a reduced span, starting later in the day at 10:00 AM, while the other two routes begin service at 7:00 AM. This route travels northeast from the DTC through downtown to Mary Street and then to Walmart via King Mill Pike and Old Airport Road, serving the Old Airport Industrial Park. On its way back from Walmart, this route serves Linden Drive and the Food City on Bonham Road. The return trip also deviates to serve the Woodland Apartments and other multi-family housing along 2nd Street and Eastridge Road, before finally returning to DTC via State Street. The total, round-trip length of the route is 13.7 miles. For more details, see Figure 3.

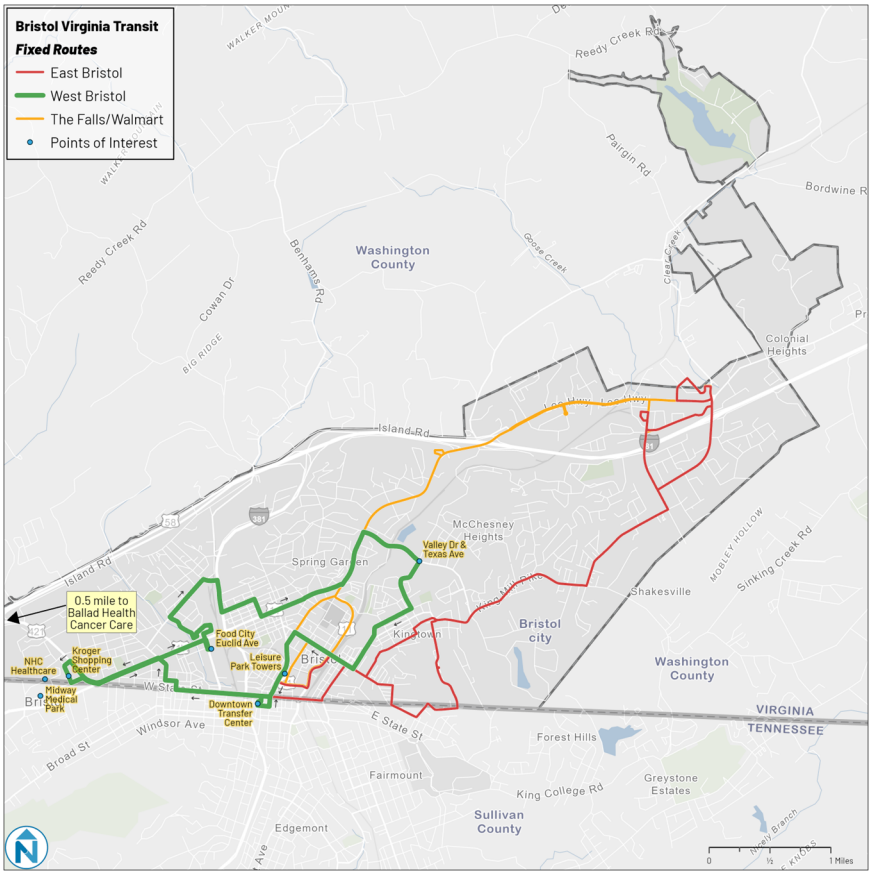
Figure 3. East Bristol Route Detail



West Bristol Route

This route serves the Bristol Casino area and serves Kroger Shopping Center, Food City Euclid Avenue, Valley Drive, and Leisure Park Towers. Upon request, deviated service is provided to Ballad Health Cancer Care on Island Road, NHC Healthcare, and the doctors' offices on Midway. (See Figure 4.) The total, round-trip length of the route is 10.0 miles. This route travels west on State Street and then on Euclid Avenue (U.S. Highway 11 West) to serve the Kroger Shopping Center on Gate City Highway and then return via Euclid Avenue to serve the Food City and the Euclid Avenue Shopping Center. Then, the route loops around Division Street, Randolph Street, and Commonwealth Avenue before returning to Euclid Avenue via Arlington Avenue and Park Street. From there, it takes Lee Highway to Valley Drive to then take Texas Avenue and Rhode Island Avenue to Mary Street. Finally, the route serves the Leisure Park Towers on Piedmont Avenue before returning to DTC.

Figure 4. West Bristol Route Detail

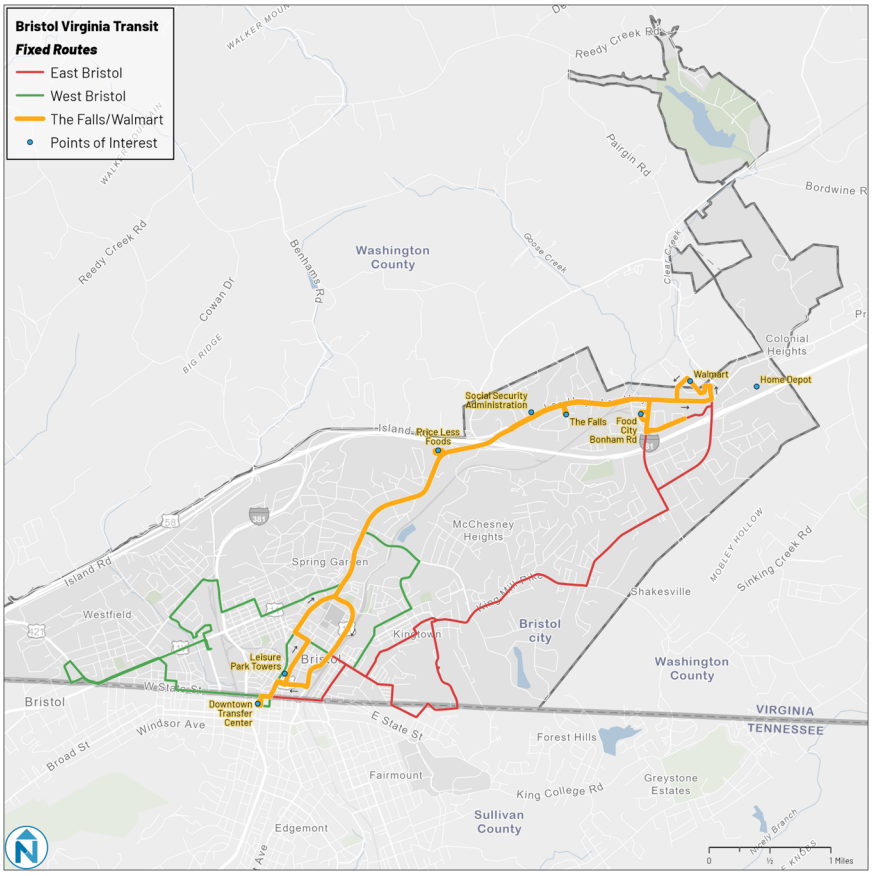


The Falls/Walmart Route

Service is provided to Rice Terrace, Johnson Court, The Falls (Merchant Trace), Walmart, Price Less Foods, and Leisure Park Towers. The total, round-trip length of the route is 11.3 miles, adding an extra 1.3 miles on the trips that deviate to serve Food City Bonham Road and Linden Drive. This route predominantly serves Lee Highway and businesses near it (like The Falls, the Social Security Administration, Price Less Foods/Bristol Plaza Shopping Center, and Food City Bonham Road) all the way out to Walmart. In downtown, the route meanders a little bit to serve the Leisure Park Towers from the Moore Street side on the outbound trip and then serve Martin Luther King, Jr. Boulevard, and the civic center on the inbound trip.

This route meets the East Bristol route at Food City Bonham Road in the mornings and at Walmart all day. The route does not go further east on Lee Highway because the city ends shortly after Walmart, with the Target on The Highlands Shopping Center being outside the city limits.

Figure 5. The Falls/Walmart Route Detail



Paratransit or Demand-Responsive Service

In accordance with the ADA law, complementary paratransit service is provided to persons unable to use the regular fixed-route bus service. BVT provides origin-to-destination service in accordance with regulations from the Federal Transit Administration (FTA). Paratransit riders must be certified as specified by ADA guidelines. Eligible individuals may apply before BVT staff to obtain ADA paratransit certification. The paratransit service carried 990 passenger trips in Fiscal Year 2021. This demand was met with a supply of 167 vehicle revenue hours, which yields an average of 5.93 passengers per revenue hour. Also, 3,227 vehicle revenue miles were provided, for an average of 0.31 passengers per mile.

Bicycle and Pedestrian Accommodations and Connectivity

Bicycle infrastructure is scarce in the City of Bristol. Pedestrian infrastructure, on the other hand, is abundant downtown, with plenty of sidewalks along State Street and the adjacent street network. However, some major thoroughfares served by BVT lack sidewalks, such as Lee Highway and King Mill Pike. This can make it challenging for riders to get to and from bus stops, making accessibility to the system more constrained.

FARE STRUCTURE, PAYMENTS, AND PURCHASING

Fare may be paid onboard the buses into a farebox, which may be cash or a prepaid 6-ride pass. Exact change is required on BVT fixed-route buses. Fares have remained unchanged since 2015. The regular fare is $1.00 and reduced fare is 50 cents. Reduced fare is available during off peak hours (10 A.M. to 2 P.M.) to senior citizens (60 or older), citizens with a disability, and Medicare cardholders. Children aged 5 or younger ride free with a fare-paying adult. Transfers among BVT services and between BVT and BTT routes cost 10 cents. The fare to ride ADA paratransit service is $2.00.

ASSET MANAGEMENT

The city operates half a dozen vehicles and maintains them in the Public Works garage. This section offers a breakdown of the vehicles and facilities run by the city to offer BVT service.

Fleet

The city owns and maintains a total of six (6) revenue vehicles that are used to provide BVT services. There are five light-duty buses for fixed-route service and one van for paratransit service. Each fixed route uses at least one bus with additional buses added as demand requires. These are all grant-funded, with 80 percent of the cost covered by Federal participation (Section 5307). The useful life for each of the vehicles is 4 years or 100,000 miles, whichever occurs first. The two 2012 vehicles are due for replacement in FY2022 (Bus #46) and FY2023 (Bus #48). Table 1 below provides a detailed breakdown of BVT's fleet.

Table 1. Bristol Virginia Transit Fleet Breakdown

Bus ID #	Vehicle Make	Year Manufactured	Mileage (Dec. 31, 2022)
46	Chevrolet Van (Bus)	2012	201,352
48	Chevrolet Van (Bus)	2012	200,480
50	Starcraft Transit Bus Handicap	2016	144,476
52	Starcraft Allstar Transit Bus	2017	113,342
54	Ford Transit Van	2018	49,031
56	Ford 19-Passenger Van (Bus)	2019	70,867

Facilities

Administrative tasks such as grant writing and service analyses are conducted by BVT in the City of Bristol's main offices at 300 Lee Street, a quarter mile north of State Street. The major passenger facility, for staging buses and enabling transfers, is the Downtown Transfer Center or DTC located at 804 State Street in the 800 block of Shelby Street. The center is in Tennessee and is a Bristol Tennessee Transit facility that is shared with BVT buses. The day-to-day operations along with storage, maintenance, and fueling of BVT and other City vehicles occurs in the Public Works garage located at 2515 Valley Drive.

TRANSIT SAFETY AND SECURITY PROGRAM

The low level of security-related incidents and potential threats does not warrant the additional expense of security investments. BVT trains drivers and supervisors on security issues and conducts background checks on new employees. BVT also updates security features on new

vehicle procurements. They also coordinate with local emergency management services and are integrated into the city's Disaster Preparedness and Hazard Mitigation Plan. The Valley Drive maintenance facility is well lit at all hours and is a shared facility frequented by police and other personnel. The proximity of the Bristol, TN Police Department just south of the DTC provides additional security to this passenger facility.

INTELLIGENT TRANSPORTATION SYSTEMS (ITS) PROGRAM

BVT has not made capital investments in ITS because the rural nature and small scale of the system has not yet warranted the additional expense. Computer aided dispatch and scheduling software are most useful on larger systems with more complicated routes and would not bring significant value to BVT's system. Automated vehicle locator (AVL) technology may provide additional safety support in case of an emergency, but the service area is small enough to make this benefit not worth the cost. Information displays with real-time arrival may contribute to a better rider experience, although the schedules are straightforward so the monetary cost may outweigh the benefits.

DATA COLLECTION AND RIDERSHIP/REPORTING METHODOLOGY

Each bus is currently equipped with electronic fareboxes to collect fares onboard which recently replaced traditional cash fareboxes. Passenger counting is currently completed manually by drivers and later entered into electronic spreadsheets for record keeping. BVT is currently integrating and training on new software to allow passenger counting based on electronic farebox data. When necessary, the data is then submitted through Virginia's Department of Rail and Public Transportation's (DRPT) online grant administration system (OLGA).

OTHER TRANSPORTATION SERVICE PROVIDERS

This section speaks about the other transportation service providers that serve the area of Bristol, Virginia.

Bristol Tennessee Transit (BTT)

This peer agency serves Bristol, Tennessee, the Tennessee counterpart of Bristol, Virginia. Both systems (BVT and BTT) meet at the Downtown Transfer Center (DTC) on the hour every hour between 7:00 AM and 6:00 PM. Like BVT, BTT also offers three routes:

- Hospital Route (West Bristol), which serves the Bristol Regional Medical Center and The Pinnacle Shopping Mall.
- Southside Route, which serves Walmart and Food City along Volunteer Parkway.
- Penn-Hickory Route (East Bristol), which serves King College and the Bristol Industrial Park.

Taxi and Private Transportation Companies

There are some traditional taxi service providers in the Bristol area but are mostly on the Tennessee side of the city. Transportation network companies or ride-hail service providers such as Uber and Lyft are, however, readily available in Bristol, Virginia.

There is also a private provider in the Bristol area of ride services for medical appointments as well as wheelchair services, ambulance, and stretcher van services called Ambulance Service of Bristol.

Although Tennessee-based, another provider of door-to-door, non-emergency medical transportation is NET Trans, which operates from 6:00 AM to 6:00 PM and requires reservations be made by 12:00 noon the day prior to the trip. Anyone is eligible to request a ride and vehicles are equipped with wheelchair lifts.

From their website:

"NET Trans is the Northeast Tennessee Regional Public Transit system. We offer door-to-door demand response transportation with flexible schedules designed to meet your needs. NET Trans RTS demand service provides you with a link to any location. We provide access from the rural areas to the major cities and are the link for the region with public transit."[1]

Human Service Transportation

Human service agencies provide a variety of services to people with disabilities (physical and mental), senior citizens, veterans, and low-income populations. One of the services offered may include transportation, which these agencies provide for their clients, residents, and patients as a supplemental service. According to the statewide 2019 Coordinated Human Service

[1] https://www.nettrans.org/about-us/who-we-are/

Mobility Plan prepared by the Virginia DRPT,[2] aside from public transit providers, there are six agency types that offer human service transportation.

- Community Services Boards (CSBs) and the Behavioral Health Authority (BHA), funded through the Virginia Department of Behavioral Health and Developmental Services, provide, or arrange services within each locality for people with mental health issues, developmental disabilities, or substance abuse disorders.
  - The Community Services Board for Bristol is the Highlands CSB located in Abingdon but with a Bristol campus.
- Employment Support Organizations (ESOs) provide employment services for people with disabilities (e.g., transportation to and from work sites).
  - United Way of Bristol is an organization that connects people in need with the services they need, including transportation.
- Area Agencies on Aging (AAAs), funded through the Virginia Department for Aging and Rehabilitative Services (DARS), offer a variety of community-based and in-home services to older adults, including senior centers, congregate meals, adult daycare services, home health services, and meals-on-wheels.
  - The AAA for the region of southwestern Virginia that includes Bristol is the District Three Governmental Cooperative, given that Bristol belongs to Planning Service Area number three. They provide senior services and public transportation in southwest Virginia, including the Mountain Lynx Transit service which serves areas outside of Bristol such as the cities of Abingdon, Galax, Marion, and Wytheville, and the counties of Bland, Carroll, Grayson, Smyth, Washington, and Wythe. The District Three Governmental Cooperative also offers senior medical trips.
- Disability Services Boards provide information and referrals to local governments regarding ADA and develop an assessment of local needs and priorities of people with physical and sensory disabilities.
  - For example, in Bristol and Washington County there is a provider of mental health, substance abuse, and developmental services called Highlands Community Services, which also happens to be the Community Services Board for the Bristol, Virginia area.
- Centers for Independent Living, also funded by DARS,[3] are organizations that serve as educational and resource centers for people with disabilities.
  - The Center for Independent Living that serves the Bristol, Virginia area is the Appalachian Independence Center located in Abingdon.

[2] https://www.drpt.virginia.gov/media/l4hfkzms/chsm-plan-2019-12-1.pdf

[3] https://www.vadars.org/cbs/cils.htm#3

- Other appropriate associations and organizations, such as Brain Injury Programs, Alzheimer's Chapters, the AARP, the Wounded Warrior Program, and the Virginia Association of Community Services Boards.

Additionally, other institutions and non-profit organizations offer supplemental transportation services to their visitors, residents, and patients:

- Adult Daycare Centers often provide transportation services for residents and visitors.
  - In the Bristol area, there is an adult daycare center on the Tennessee side called Gathering Place, which is along BTT's Hospital Route.
- Hospitals and Health Clinics sometimes provide transportation services to patients that require mobility assistance to and from appointments and between inpatient and outpatient care.
  - The biggest healthcare facility in the area is Ballad Health's Bristol Regional Medical Center, which offers a mobile clinic service but does not seem to offer transportation to and from the hospital itself.
- Community Center On-Demand Programs, offered by non-profit community centers and organizations, may include transportation services for the elderly and those with physical and mental disabilities.

Medicaid Transportation

Transportation is covered by Medicaid when patients have no other means to get to or from a doctor appointment or other Medicaid services. This transportation service is administered by Virginia Medicaid, the Department of Medical Assistance Services. This transportation service is available for Medicaid members who are part of a managed care health plan as well as members in the fee-for-service program. Fee-for-service transportation assistance is managed and operated by ModivCare. For those enrolled in a managed care health plan and eligible for transportation, patients must contact their plan for transportation arrangements.

Intercity Bus

Greyhound formerly served a bus station next to BVT/BTT's Downtown Transfer Center. The Virginia DRPT operates the Virginia Breeze Bus Lines which serve Bristol, Virginia, through its Highlands Rhythm Route. The route makes one round trip each day and serves a stop at the park-and-ride lot on Exit 5 along Interstate 81, at the intersection of Island Road and Lee Highway, and includes stops in seven other locations terminating in the north at Washington, DC Union Station. From there, customers can connect to national carriers for travel to other destinations.

Intercity Rail/Amtrak

Currently, Bristol is not served by Amtrak's intercity rail service or its Thruway Connecting Service. There have been conversations of extending Amtrak rail service from Roanoke down the Interstate 81 corridor to Bristol, but this has not yet come to fruition.

PUBLIC OUTREACH, ENGAGEMENT, AND INVOLVEMENT

Public hearings are only held when a reduction of service or an increase in fare is under consideration. In addition, public opinion of transit service may be voiced at designated times during city council meetings.

2 GOALS, OBJECTIVES, AND SERVICE DESIGN STANDARDS

This chapter of the TDP describes the specific goals, objectives, and service design standards necessary to meet the transit needs effectively and meaningfully of the Bristol community. This chapter also details the process for reviewing and updating the goals, objectives, and service design standards so they remain current and relevant as these needs change over time. To ensure that goals were in line with other plans within the community, the goals related to transit, and mobility has been reviewed, and are provided in this chapter. To the extent possible, the goals, objectives, and service design standards are based on SMART principles of being Specific, Measurable, Agreed, Realistic, and Time-bound.

CURRENT COMMUNITY PLANS

In 2017 the City of Bristol carried out an update to its Comprehensive Plan, setting the vision for the community and implementation steps necessary to make that vision a reality. One of the six components of the plan is the Transportation and Mobility Plan. An objective in this part of the plan is public transportation that provides for the safe and reliable fixed-route and demand responsive transit services that meets the transportation needs of Bristol, Virginia residents. Several specific objectives are listed to ensure this objective is met, several which refer to the prior update of the Transit Development Plan.

City of Bristol Comprehensive Plan

2A. Implement the recommendations within the City's Transit Development Plan.

2B. Ensure that transit stops are well-served by pedestrian infrastructure, including crosswalks, sidewalks, benches, and shelters, when warranted.

2C. Continue to update transit routes with significant alterations in land use and provide service to any major new developments or redevelopments.

2D. Provide transit service connections between residential areas and commercial areas with jobs, education, shopping, and medical services.

2E. Provide easily identifiable stop locations along routes and passenger shelters when warranted.

2F. Actively market transit services as a travel option within the City of Bristol, VA.

2G. Explore potential demand for coordinating service with neighboring jurisdictions.

2H. Maintain a systemwide fare box recovery ratio that meets or exceeds standards identified in the Transit Development Plan.

2I. Achieve systemwide fixed-route ridership levels that meet or exceed standards identified in the Transit Development Plan.

2J. Ensure that transit service operators maintain an accident rate of less than the standard identified in the Transit Development Plan.

2K. Ensure that an adequate fleet of vehicles is maintained for the fixed-route and demand-responsive services.

2L. Identify the need for replacement vehicles based on industry standards for defined useful life of vehicles.

2M. Provide transit services that are accessible to all population groups within the City of Bristol, Virginia.

Bristol Long-Range Transportation Plan 2045

The following goals have been taken from the Bristol Long-Range Transportation Plan 2045 developed by the Bristol TN/VA MPO.

Goal: System Efficiency and Asset Management Develop and maintain a transportation system to move people and goods at the most effective level of public and private cost.

Objectives:

- Maintain the efficiency and state of good repair of the existing transportation system.
- Maximize the cost-effectiveness of transportation investments.
- Select and program projects based on identified need and effectiveness.

Goal: Economic Development Provide transportation resources to support economic growth and strengthen the regional economy.

Objectives:

- Enhance the transportation access to commercial and industrial areas.
- Increase the accessibility options for freight movement.
- Proactively plan and accommodate for growth in the regional economy.

Goal: Healthy and Sustainable Communities Develop a transportation system to preserve and enhance the natural environment and improve quality of life.

Objectives:

- Minimize adverse environmental impacts of the urban transportation system.

- Reduce vehicle emissions and promote activities that reduce greenhouse gases.
- Coordinate the provision of transportation facilities with land use activities to promote active transportation and healthy multimodal lifestyles that minimize single-occupancy vehicle travel.

Goal: Mobility Options Develop a transportation system that provides an opportunity for a choice of mode for the movement of people and goods.

Objectives:

- Encourage the development of bicycle facilities, sidewalks, and greenways.
- Enhance the connectivity of the transportation system between modes.
- Maintain an efficient and cost-effective public transportation system.

Goal: User Safety and Security Develop a transportation system for the movement of people and goods, which is safe for all modes and provides security for users and transportation infrastructure.

Objectives:

- Reduce motorized crashes, injuries, and fatalities.
- Reduce non-motorized crashes, injuries, and fatalities.
- Coordinate with state and local agencies to improve transportation security for critical infrastructure.

RECOMMENDED GOALS AND OBJECTIVES

The goals and objectives established in the 2016 Bristol TDP were reviewed and updated with input from the City of Bristol staff along with recommendations from the consultant team. This section details the updated goals for Bristol Virginia Transit, each with a set of objectives. To elaborate on the objectives, specific strategies and measures are provided, thereby helping Bristol measure and ultimately reach the goals. The following goals are proposed for BVT:

1. Provide Different Types of Transit Service that Meets Community Needs
2. Develop Transit Services that Enhance the Economy of the Region
3. Market Transit Service to Residents and Visitors
4. Operate Services Reliably and Safely
5. Deliver Services in the Most Cost-Effective Manner Possible
6. Ensure Accessibility to All Users

Each of the six goals with associated objectives are as follows:

Goal 1: Provide Different Types of Transit Service that Meet Community Needs

Objective 1.1: Provide fixed-route, paratransit and demand responsive service based on needs of the community.

Strategy	Measure
Extend transit service to operate during weekends and evening hours on weekdays.	Number of hours of operation during weekends and evenings.
Coordinate with Bristol, TN transit staff for provision of transit service to all the major destinations.	Number of coordination meetings annually.
Collaborate periodically with the City Planning and Economic Development staff to assess new developments that might need transit service.	Number of coordination meetings annually.
Collaborate with other transit agencies to continue and improve regional coordination.	Number of joint marketing and operations ventures.

Goal 2: Develop Transit Services that Enhance the Economy of the Region

Objective 2.1: Promote economic development in the city through transit service.

Strategy	Measure
Promote Transit Oriented Development (TOD).	Value of development adjacent to transit routes.
Check transit coverage to the major commercial and industrial areas of the city.	Percentage of employment within ¼ mile of transit route.
Ensure transit network connects residential areas with major shopping places and education centers in the city.	Percentage of major retailers within ¼ mile of transit route.
Connect transit routes to local hotels and tourist attractions.	Number of hotels which share a route with casino & other major attractions.

Goal 3: Market Transit Service to Residents and Visitors

Objective 3.1: Promote utilization of transit through effective marketing.

Strategy	Measure
Distribute BVT/BTT informational brochures at frequently visited locations by community residents.	Number of locations with transit marketing materials.
Update city's website with transit information.	Frequency of updates/number of updates annually.
Promote public transportation at community events and festivals.	Number of community events/festivities participated by the transit agency.
Utilize social media to spread awareness about the transit service.	Number of social media platforms utilized to disseminate information.
Provide transit service information to organizations and social agencies that could serve as markets with high ridership potential.	Number of organizations/social agencies being reached out by the transit agency.

Goal 4: Operate Services Reliably and Safely

Objective 4.1: Provide transit service that is reliable.

Strategy	Measure
Regular monitoring of on-time performance reports of the transit service.	Percentage of routes adhering to scheduled arrivals and departures.

Objective 4.2: Deliver transit service that ensures safety of the population.

Strategy	Measure
Provide safety training to all new employees.	Percentage of workforce that completed safety training module.
Check compliance of the fleet with safety standards.	Percentage of fleet that adhere to safety standards.
Reduce number of accidents or near accidents.	Number of preventable accidents.
Make bus stops safe for passengers to board/alight transit service.	Percentage of stops with passenger amenities.

Increase the number of bus stop pull-outs where feasible.	Number of added bus stop pull-offs.
Monitor condition of sidewalks at the stops with high ridership activity.	Periodic inspections to assess condition of sidewalks.

Goal 5: Deliver Services in the Most Cost-Effective Manner Possible

Objective 5.1: Operate transit service in a cost-efficient manner.

Strategy	Measure
Record and monitor monthly ridership reports for fixed-route and demand-responsive service.	Total ridership and passengers per revenue hour.
Keep track of transit operation expenses and farebox revenues.	Farebox revenue and farebox recovery ratio.
Adopt corrective measures to route alignment and service frequency to address declining ridership if needed.	Year-over-year transit ridership gain (loss) by route.
Optimize transit maintenance cost.	Maintenance costs per revenue mile.

Objective 5.2: Diversify revenue resources.

Strategy	Measure
Increase revenue through advertisements.	Percentage of fleet being utilized for generating advertisement revenue.
Target grants from the state and federal agencies for more financial support.	Total discretionary grant dollars committed.

Goal 6: Ensure Accessibility to All Users

Objective 6.1: Make transit service accessible to all the population groups.

Strategy	Measure
Maximize coverage of public transit within the city.	Population living within ¼ mile buffer of the transit service.
Improve accessibility of existing bus stops.	Percentage of stops with connectivity to sidewalks.

Ensure compliance with ADA requirements and serve ADA population with paratransit service.	Number of denials for paratransit services.

SERVICE STANDARDS

Category	Metric	Standard
Service Effectiveness	Passenger trips per vehicle revenue hour	Review and consider modification to routes that fall 20% below system average and/or prior year metric
Cost Efficiency	Operating cost per revenue hour	Metric should increase by no more than 5% per year (or annual PPI if greater)
Cost Effectiveness	Operating cost per passenger	Metric should increase by no more than 5% per year
Reliability	Timepoint departures less than five minutes late of schedule	80% of service matches the criterion
Safety	Collisions per 100,000 revenue miles	Reportable collisions per 100,000 revenue miles should be less than or equal to 1
Vehicle Maintenance	Major mechanical failures per 100,000 vehicle miles	Metric should not increase from prior year by more than 5%

PROCESS FOR REVIEWING AND UPDATING

The goals, objectives, and service design standards outlined in this section are meant to aid Bristol Virginia Transit in maintaining a healthy and successful transit system for now and into the future. They have been developed as part of the TDP major update process through discussions with Bristol staff, review of other relevant planning documents, and a continuation of some of the 2016 TDP goals. Intended as a guide for Bristol to measure and assess the system, these goals, objectives, and service design standards will need to be reviewed critically and amended as necessary over time. It is recommended that Bristol staff not only analyze and assess the performance of the system on an annual basis, but also assess the goals, objectives, and service design standard metrics as well. Giving critical attention to these areas will help ensure that BVT stays current with the needs of the community.

3 SERVICE AND SYSTEM EVALUATION

This chapter of the TDP discusses the socio-economic fabric of the city of Bristol and evaluation of the BVT system. The chapter is divided into five sections. Section 3.1 presents the demographics of the city of Bristol and compares the same with the Kingsport-Bristol, TN-VA Metropolitan Area, and State of Virginia. Section 3.2 evaluates the current transit service of Bristol, based on the ridership data available from the agency. For assessing the performance of BVT system qualitatively, multiple stakeholder interviews were conducted. Findings of stakeholder interviews is presented in section 3.3. Quantitative assessment was done by reviewing multiple peer agencies of comparable size (section 3.4) and analyzing on-board passenger survey data (section 3.5).

DEMOGRAPHICS

The city of Bristol, VA has a population of 17,219. Table 2 presents the distribution of the city's population and population of Kingsport-Bristol, TN-VA Metropolitan Area and state of Virginia based on age. The table depicts numbers and percentages in each category for the city of Bristol and only percentages for the rest two for comparison.

Table 2. Distribution of Population Based on Age Group

Age	Bristol, VA		Kingsport-Bristol. TN-VA Metro Area	Virginia
under 18	3,556	20.8%	19.2%	22.0%
18-29	2,410	14.1%	13.5%	16.5%
30-39	2,285	13.4%	10.8%	13.7%
40-49	1,792	10.5%	12.7%	12.8%
50-64	3,340	19.5%	21.9%	19.7%
65 or older	3,676	21.7%	22.0%	15.4%

The percentage of youth is comparable for all the three: city of Bristol, Kingsport-Bristol Metro Area, and state of Virginia. The percentage of seniors is comparable for the city of Bristol and the metropolitan area, but higher than the state average. There are 3,884 (23%) persons with disability in the city of Bristol which is comparable to the metropolitan area (21.4%) and much higher than the state of Virginia (11.8%).

Table 3 presents the distribution of the city's households based on annual income. Bristol has more percentage of households with annual income less than $10,000 and $10,000 to $19,999 than the metropolitan area or state.

Table 3. Distribution of Households Based on Income

Annual Household Income	Bristol, VA		Kingsport-Bristol. TN-VA Metro Area	Virginia
Less than $10,000	660	8.8%	7.2%	4.8%
$10,000 to $19,999	1,012	13.5%	12.0%	6.6%
$20,000 to $34,999	1,471	19.7%	18.1%	10.8%
$35,000 to $49,999	1,210	16.2%	15.4%	10.8%
$50,000 to $74,999	1,318	17.6%	18.3%	16.3%
$75,000 to $99,999	466	6.2%	11.5%	12.9%
$100,000 or more	1,345	18%	17.30%	37.90%
Median Income	$36,679		$46,685	$76,398

There are 1,418 (19%) households in the city that receive food stamps (SNAP). The percentage of the households receiving food stamps in the city are higher than the metropolitan area (13.7%) and state of Virginia (7.9%).

Table 4 presents the distribution of the city's household based on number of vehicles. Bristol has a higher percentage of households with no vehicles than either the state or metro area.

Table 4. Distribution of Households Based on Number of Vehicles

Number of Vehicles	Bristol, VA		Kingsport-Bristol. TN-VA Metro Area	Virginia
0	755	10.1%	5.9%	6.1%
1	3,000	40.1%	30.0%	30.0%
2	2,478	33.1%	36.4%	37.8%
3 or more	1,249	16.7%	27.7%	26.1%

Table 5 presents the distribution of the city's housing units based on the units in structure. The percentage of single-family units is comparable for the city of Bristol and the metropolitan area and higher than the state of Virginia.

Table 5. Distribution of Housing Units Based on Units in Structure

Units in Structure	Bristol, VA		Kingsport-Bristol. TN-VA Metro Area	Virginia
1, detached	5,926	68.0%	69.9%	61.7%
1, attached	497	5.7%	2.4%	11.1%
2-4 apartments	453	5.2%	5.1%	4.4%
5 to 9 apartments	915	10.5%	4.1%	4.6%
10 or more apartments	776	8.9%	4.0%	13.3%
Mobile home or other type of housing	131	1.5%	14.4%	4.9%

Table 6 presents the distribution of the city's occupied housing units by tenure (own vs. rent). Bristol has lesser percentage of owner-occupied units than the rest two. Renter-occupied housing units and units at higher densities (more units per structure) both are highly correlative of transit usage.

Table 6. Distribution of Housing Units Based on Tenure

Housing Tenure	Bristol, VA		Kingsport-Bristol. TN-VA Metro Area	Virginia
Owner-occupied	4,601	61.5%	73.5%	66.7%
Renter-occupied	2,881	38.5%	26.5%	33.3%

PERFORMANCE EVALUATION

As mentioned in Chapter 1, fixed-route service is provided through three routes: East Bristol, West Bristol, and Falls/Walmart. The buses run from 7:00 AM to 6:00 PM except for the East Bristol route which starts at 10:00 AM. All the three routes start from Downtown Transfer Center (DTC). The service is available only during weekdays.

Figure 6 depicts annual ridership based on the fiscal years from 2018 through 2022. Annual ridership shows a declining trend from 2018 to 2021. A part of this decline can be attributed to the COVID-19 pandemic which is evident in the fiscal years of 2020 and 2021. Ridership has recovered to some extent in the FY 2022 but still not at par with the pre-pandemic levels.

Figure 6. Annual Ridership

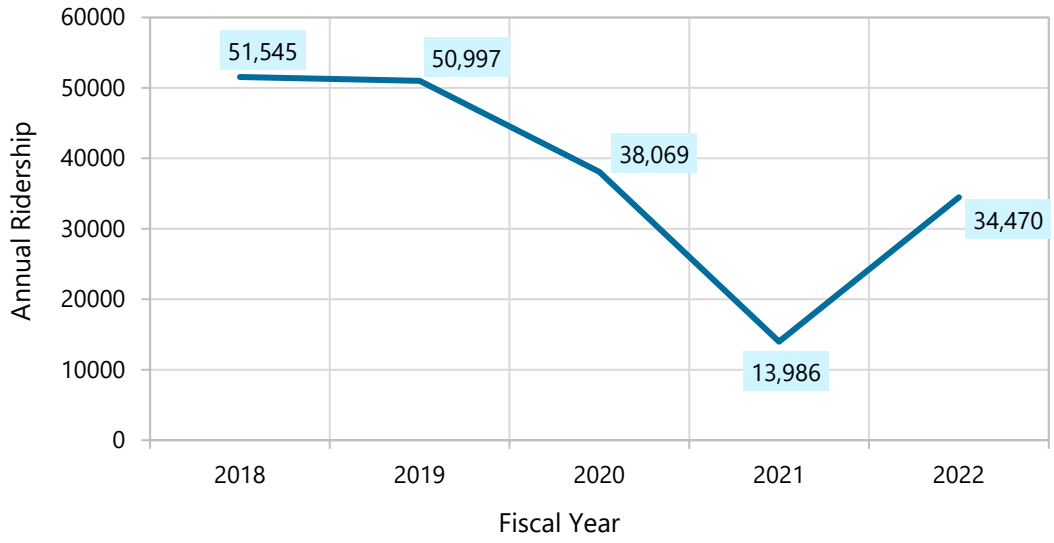


Figure 7 depicts variation in ridership based on the months for all the fiscal years from 2019 through 2022. No consistent pattern is evident from the figure to conclude which month is the most productive based on the ridership levels. The steep decline in the month of April for the FY 2020 is because of COVID-19 pandemic.

Figure 7. Annual Ridership

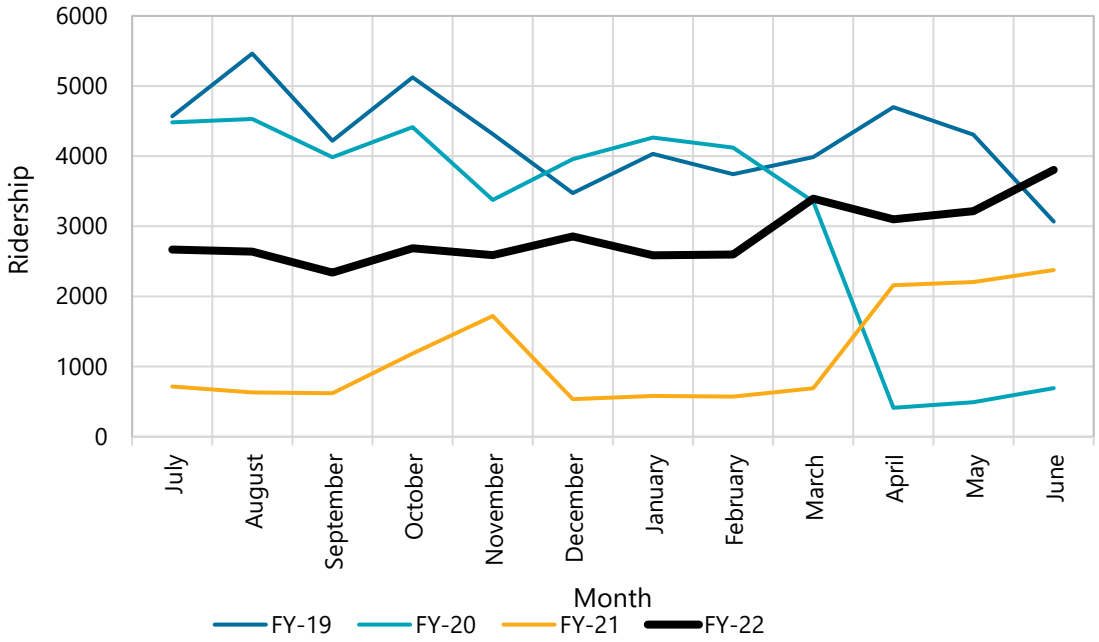
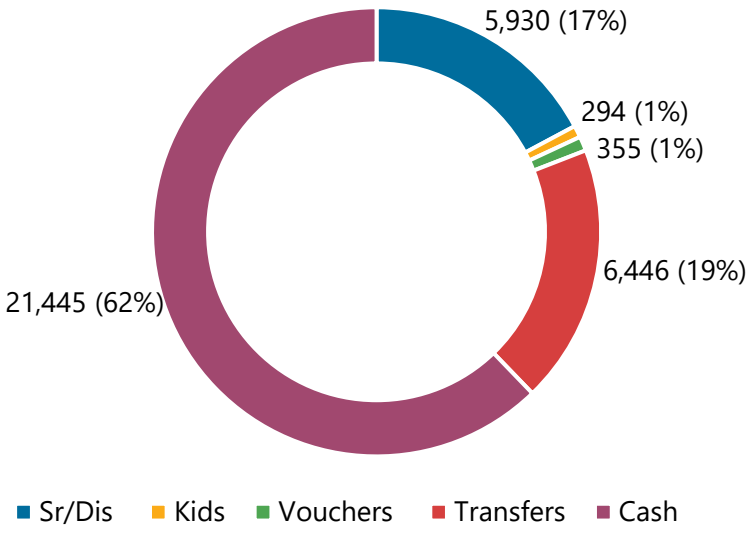


Figure 8 depicts distribution of fare type for the FY of 2022. Most of the passengers (62%) prefer to pay by cash. 19% of the passengers are transfers either within BVT or from Bristol Tennessee Transit. 17% of the passengers get senior citizen or disability discount.

Figure 8. Fare Type



STAKEHOLDER PARTICIPATION

This section provides an overview of the stakeholder interviews and summarizes the major findings. In total, 11 stakeholder interviews were conducted wherein interview participants were asked to share their experiences and perceptions for the BVT system. The selected participants include the City Manager of Bristol, VA, representatives from Bristol Tennessee Transit, and representatives from nonprofit groups, civic organizations, local businesses and institutions, and other key members from the local communities working in different capacities in the city of Bristol, VA. Following are the major findings from the stakeholder interviews:

1. While many of the stakeholders who represented social services were familiar with the services provided due to work on behalf of clients, those in the business, government, or larger civic community were not as familiar.
2. Related to the first finding, participants widely agreed more efforts are needed to disseminate the information regarding the service routes and schedules. While this can be a challenge given limited resources, participants suggested opportunities to collaborate with hotels and the casino for disseminating the information about the services through flyers at the front desk. Developing a stronger brand was also mentioned by some participants.
3. The most common service improvement mentioned over the course of the discussions was the addition of more service hours. There was somewhat more interest in later hours on weekdays, but also a large number who wanted to see weekend service in order for service hours to accommodate work schedules for retail and service jobs. Many of the low-income residents have job timings that are not conventional, and thus they don't get buses while returning home.
4. More frequent bus service was also mentioned as a service improvement desired to reduce the time of travel, but this was a secondary priority based on the feedback of most participants.
5. In general, most participants who knew the bus system well thought it connected with most key locations in the city. Access to the DMV in Abingdon was a notable mobility challenge, but participants understood the jurisdictional issues in providing service to this location. Other locations mentioned for extended service were recreational, such as Sugar Hollow Park.
6. Many stakeholders desired better coordination of service between BVT and BTT to provide seamless movement of passengers from one city to another. Some participants had a more general desire that the two cities work better together, with transit being one component.
7. Stakeholders mentioned that most of the citizens perceive transit as a safe, accessible and affordable mode of transportation. It serves people that don't own a vehicle and helps them getting to their workplaces on routine basis.

8. Stakeholders agreed with the fact that transit adds 'value' to the city. Serving community members without the means to own a car was seen as the biggest benefit of transit in the city.
9. The attitude of the bus drivers is greatly appreciated by the passengers.

PEER REVIEW ANALYSIS

In this section, multiple peer agencies of comparable size were analyzed to measure the effectiveness of BVT's services. Peers were selected based on the five parameters: Urban area population, Service area, Service population, Vehicles Operated in Maximum Service (VOMS) and Vehicle Revenue Hours (VRH) available from National Transit Database (NTD) for the Fiscal Year (FY) of 2019. The following peer transit systems were used in this analysis:

1. Bristol Tennessee Transit (BTT), Bristol, Tennessee
2. Electric City Transit (ECT), Anderson, South Carolina
3. Henderson Area Rapid Transit (HART), Henderson, Kentucky
4. Kingsport Area Transit Service (KATS), Kingsport, Tennessee
5. Winchester Transit (WinTran), Winchester, Virginia

Table 7 depicts summary of all the parameters for BVT and peers. Among peers, Henderson, KY has the highest population of 229,351 and the city of Winchester the lowest population of 69,449. Bristol (spanning both Tennessee and Virginia) has an urban population of 69,501 which is lower than the peer average. KATS has the greatest service area of 54 square miles and WinTran has the lowest service area of 9 square miles. BVT has a service area of 13 square miles, lower than the peer average. KATS has the greatest service area population of 53,374 and BVT has the lowest service area population of 17,835 as evident from the Table 6. The average service area population of the peers is 32,757. BVT requires three buses (one per route) for operating its maximum service. Out of all the peers, KATS requires the highest number of buses while the lowest requirement of buses is for BTT and HART. For the FY of 2019, KATS reported the highest VRH while BTT reported the lowest VRH among the peers. Annual VRH are comparable for both BVT and BTT.

Further, BVT and its peers were compared based on the performance metrics for ridership and operating cost as available from the NTD for the FY of 2019 in the following sub-sections. For ridership, annual unlinked passenger trips, annual unlinked passenger trips per capita, annual unlinked passenger trips per VRH and annual unlinked passenger trips per vehicle revenue mile (VRM) are used as metrics. For operating cost, operating cost per passenger trip, operating cost per VRH and operating cost per VRM are used as metrics.

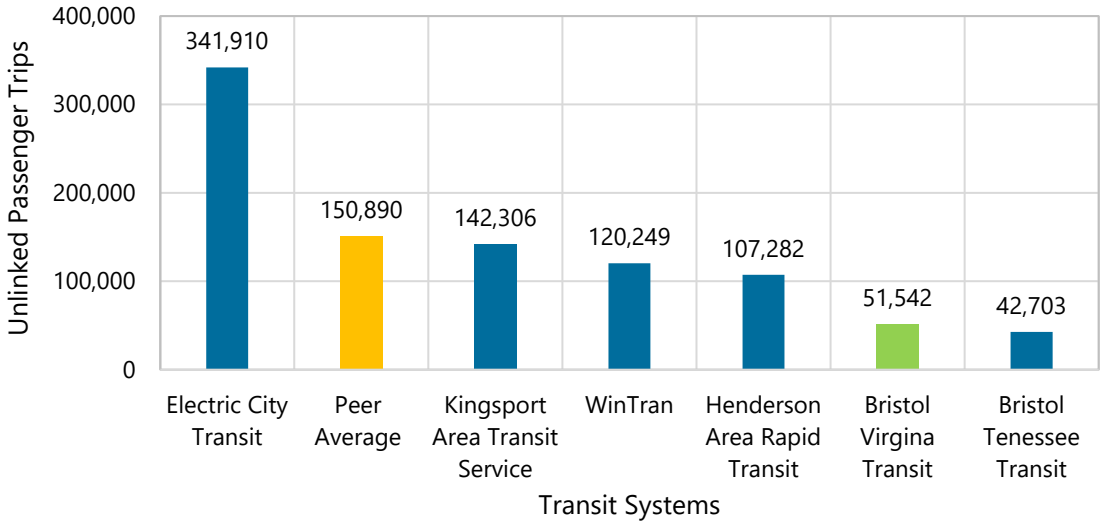
Table 7. Summary of Parameters for BVT and Selected Peers

Agency Name	Transit System	City	Parameters				
			Urban area population	Service area (Sq. Miles)	Service area population	VOMS (Bus)	VRH
City of Bristol Virginia	Bristol Virginia Transit	Bristol, Virginia	69,501	13	17,835	3	7,168
City of Bristol Tennessee	Bristol Tennessee Transit	Bristol, Tennessee	69,501	33	26,702	3	7,250
City of Anderson	Electric City Transit	Anderson, South Carolina	75,702	15	27,293	6	15,375
City of Henderson	Henderson Area Rapid Transit	Henderson, Kentucky	229,351	16	28,900	3	10,608
City of Kingsport	Kingsport Area Transit Service	Kingsport, Tennessee	106,571	54	53,374	7	16,253
City of Winchester	WinTran	Winchester, Virginia	69,449	9	27,516	4	12,870
Peer Average			110,115	25	32,757	5	12,471

Ridership

Figure 9 depicts annual unlinked passenger trip for BVT and peer transit systems for the fiscal year of 2019. Out of all the peers, Electric City Transit has the highest and Bristol Tennessee Transit has the lowest number of annual unlinked passenger trips. BVT has lower annual unlinked passenger trips than peer average.

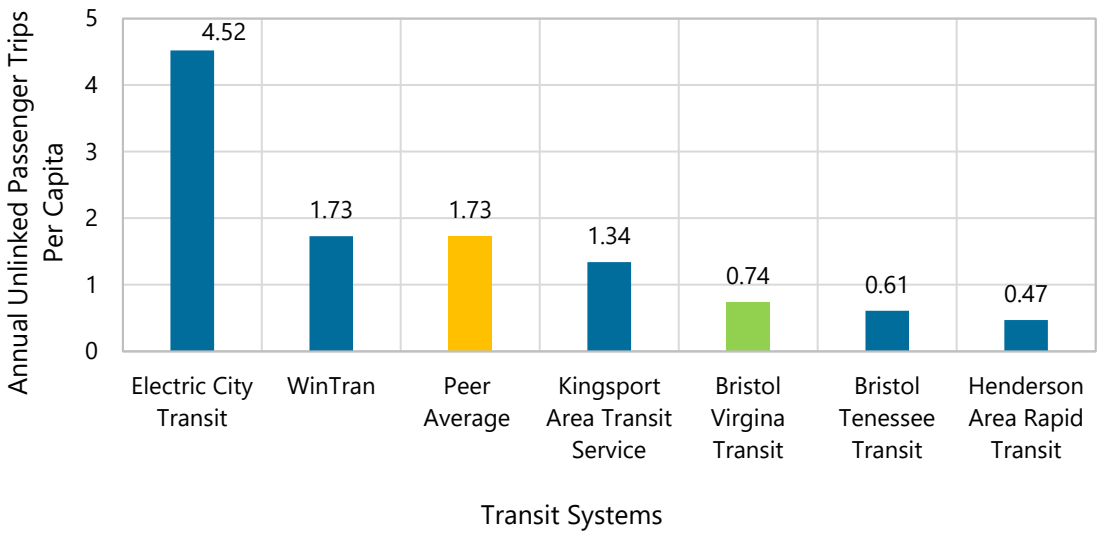
Figure 9. Annual Unlinked Passenger Trips for BVT and Peer Systems



However, as City of Bristol of Virginia has the lowest urban area population (Table 6), direct comparison based on annual unlinked passenger trips is not justified. Thus, normalizing the annual unlinked passenger trips with urban area population, VRH and VRM was deemed appropriate for comparison. Figures 10-12 depict results that were obtained by normalizing the annual unlinked passenger trips with the urban population, VRH and VRM respectively.

Figure 10 shows annual unlinked passenger trips per capita for BVT and the peers. ECT has the highest and HART has the lowest trips per capita. BVT compares with the peers favorably on normalizing the trips with the urban area population but still has a metric value of 0.74 which is lower value than the peer average. The lower value of the metric for BVT shows that people in Bristol, Virginia are less likely to make trip with transit as compared to the peers (except for BTT and HART).

Figure 10. Annual Unlinked Passenger Trips per Capita for BVT and Peer Systems



In order to assess, productivity (ridership) per unit supply, annual unlinked passenger trips were normalized by VRH and VRM for the analysis. Figure 11 shows annual unlinked passenger trips per VRH for Bristol and the peers. ECT has the highest and BTT has the lowest annual unlinked passenger trips per VRH. The metric value for BVT is 7.19 which is lower than the peer average.

Figure 11. Annual Unlinked Passenger Trips per VRH for BVT and Peer Systems

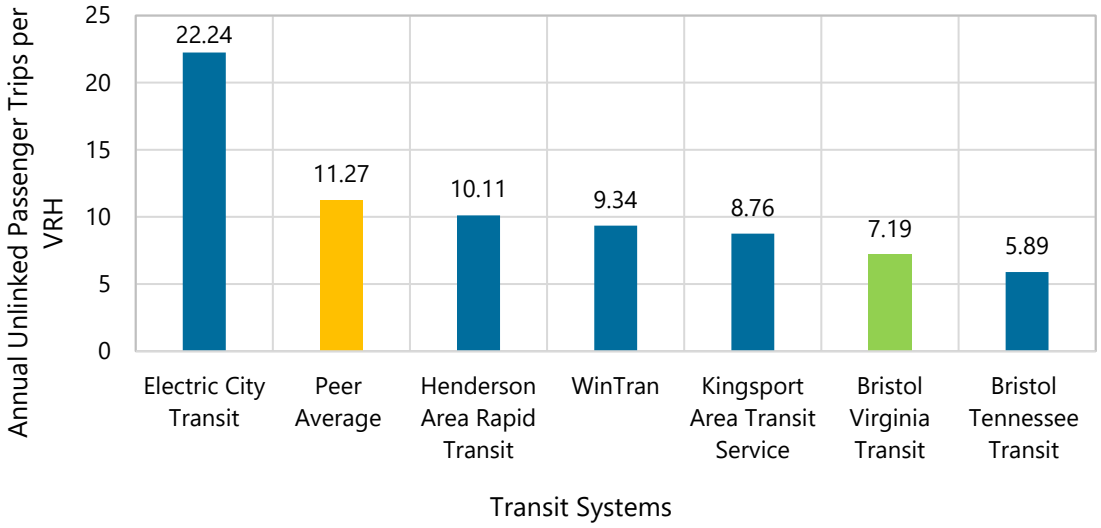
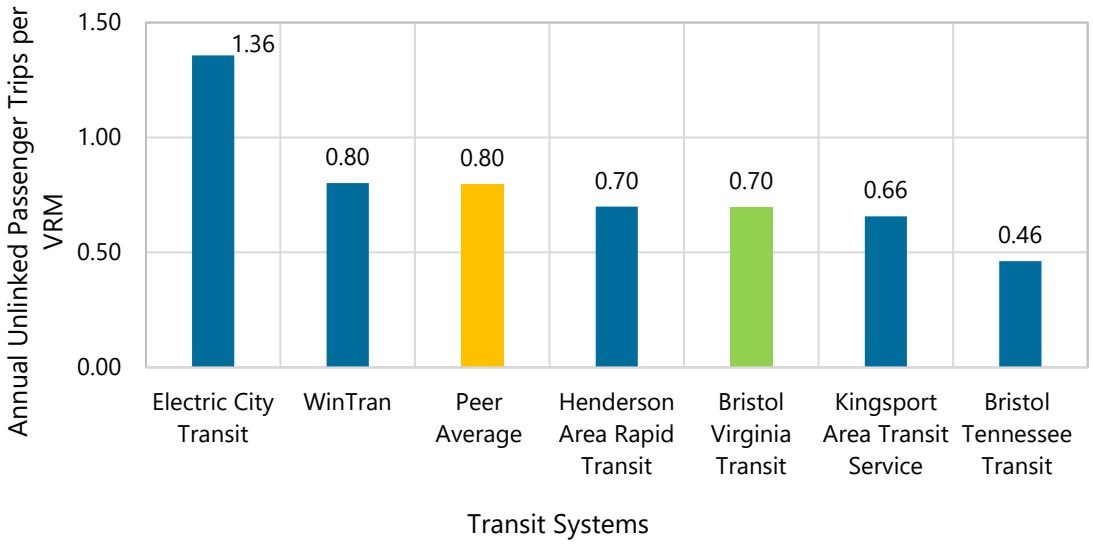


Figure 12 shows annual unlinked passenger trips per VRM for Bristol and the peers. ECT has the highest and BTT has the lowest annual unlinked passenger trips per VRM. The metric value for BVT is 0.70 which is lower than the peer average.

Figure 12. Annual Unlinked Passenger Trips per VRM for BVT and Peer Systems



From Figures 10-12, it can be concluded that despite normalizing annual unlinked trips by urban area population, VRH and VRM, BVT has a lower productivity as compared to the peer average.

Cost Efficiency

Cost efficiency for BVT and peers was compared based on three metrics: operating cost per VRH, operating cost per VRM and operating cost per passenger trip. Operating cost per VRH and operating cost per VRM are metrics to measure operating cost per unit supply. Figure 13 depicts operating expense per VRH for BVT and its peers. HART has the highest and ECT has the lowest operating cost per VRH. BVT has a lower operating cost per VRH than the peer average.

Figure 13. Operating Cost Per VRH for BVT and Peer Systems

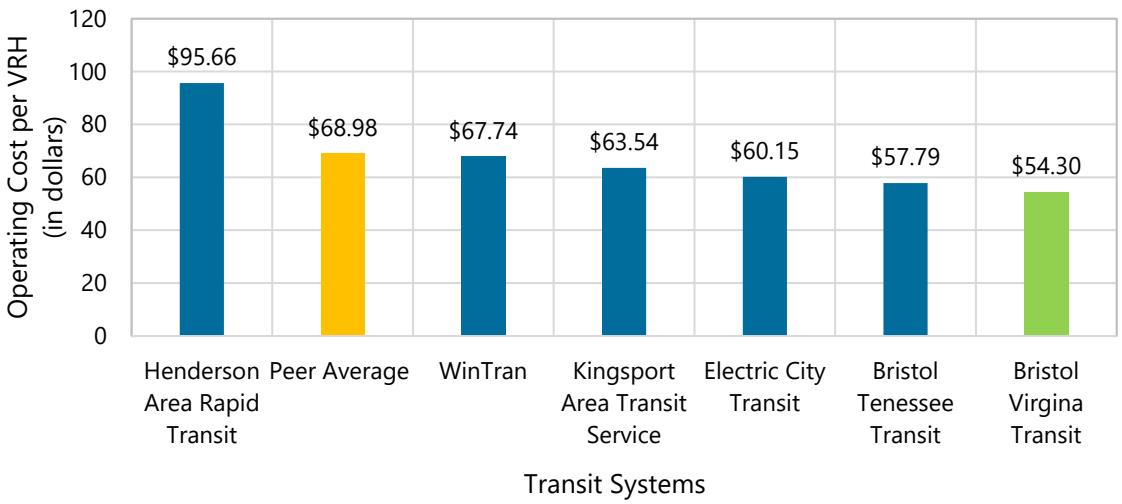


Figure 14 depicts operating cost per VRM for BVT and peers. HART has the highest and ECT has the lowest operating cost per VRM. Bristol has the operating cost per VRM greater than the peer average.

Figure 14. Operating Cost Per VRM for BVT and Peer Systems

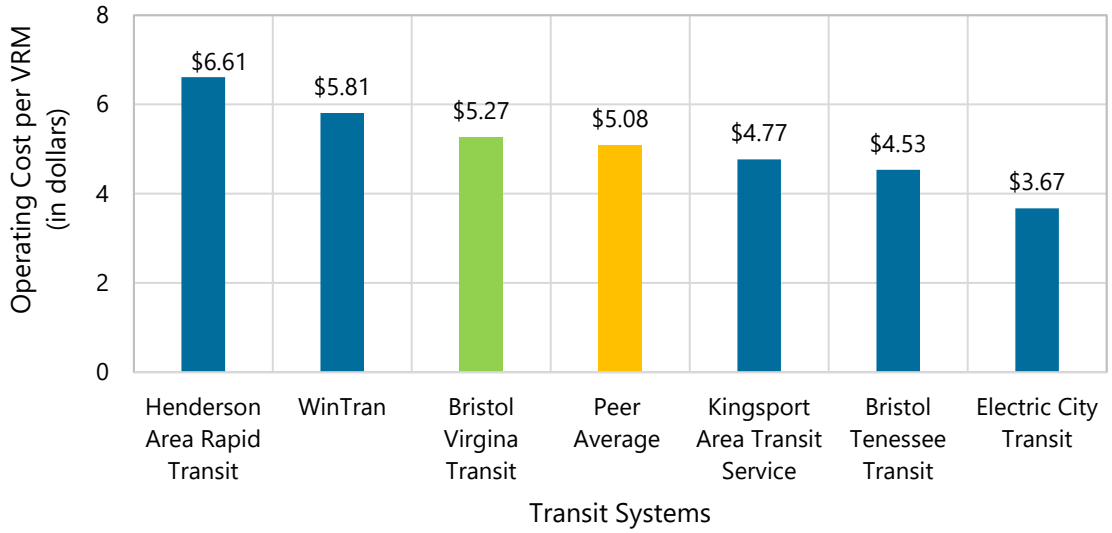
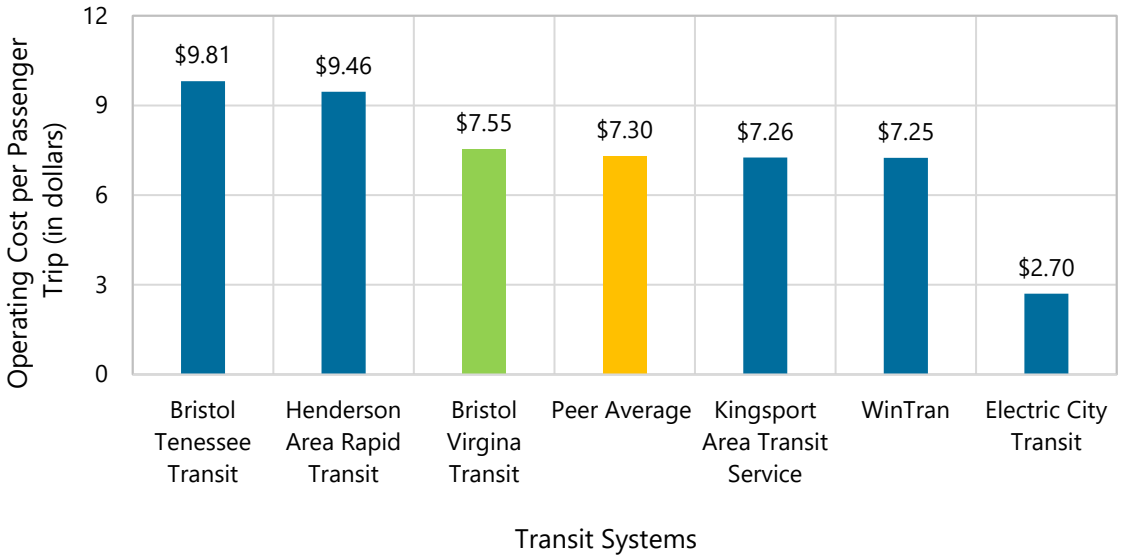


Figure 15 depicts operating expense per passenger trip for BVT and peers. Operating cost per passenger trip is a metric for assessing cost bore by the agency per unit trip made by a passenger. BTT has the highest and ECT has the lowest operating cost per passenger trip. BVT has higher operating cost per passenger trip than the peer average.

Figure 15. Operating Cost Per Passenger Trip for BVT and Peer System



ON BOARD SURVEY FINDINGS

In addition to the stakeholder interviews, on-board passenger surveys were conducted on all the three operational routes. The surveys were conducted on 22 and 23 September 2022. Overall, 45 passengers were surveyed through a questionnaire. Considering small size of the BVT system, sample size of 45 was deemed appropriate to draw conclusions regarding the transit usage in the city. The questions in the survey were targeted to assess demographics and travel characteristics of the transit users. The summary of the responses is discussed next.

Demographics

Transit service users were asked about their gender, age, ethnic background, education level and annual household income. Table 8 shows numbers (and percentage) of the respondents based on the afore mentioned demographic attributes. 'No response' category in the table refers to the percentage of responses that were not completed by the passengers. 49% of the transit service users are female. Male and female transit users are comparable. 27% of the respondents are of age 60 or older. This shows that transit is quite a preferrable mode of travel among the senior citizens of the city. 32% of the users are White and 13% of the users are African American. 13% of the users didn't respond to the ethnicity question. 22% of the users have some college degree. 29% of the users didn't respond the question asking about educational qualification. 40% of the users have annual household income under $10,000. 16% of the respondents didn't prefer to disclose their annual household income and another 16% didn't respond to the question asking household income.

Table 8. Percentage Distribution of Respondents Based on Demographics

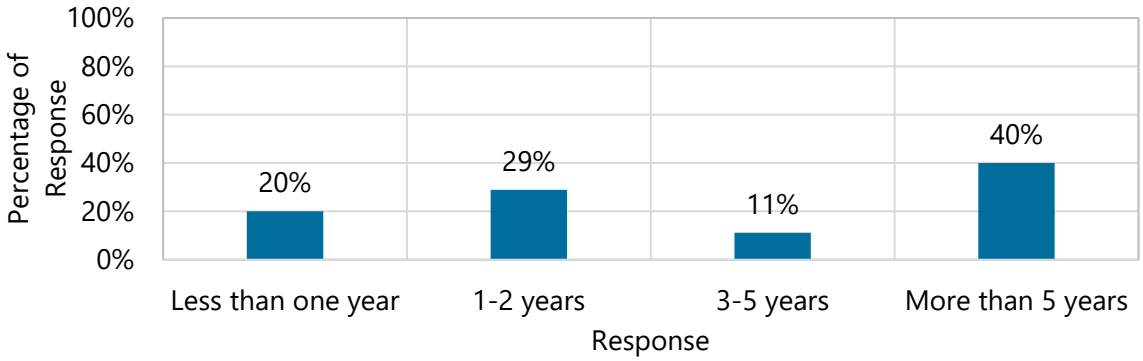
Demographic Attribute	Numbers (Percentage)
Gender	
Male	19

choosing public transit. Respondents were also asked if they would be making a transfer to Bristol, Tennessee route during their trip. Summary of the response to each of the questions is discussed next.

Length of Usage

Figure 16 shows the percentage distribution of the passengers based on the length of the usage of transit. 40% of the passengers have been using transit for more than 5 years.

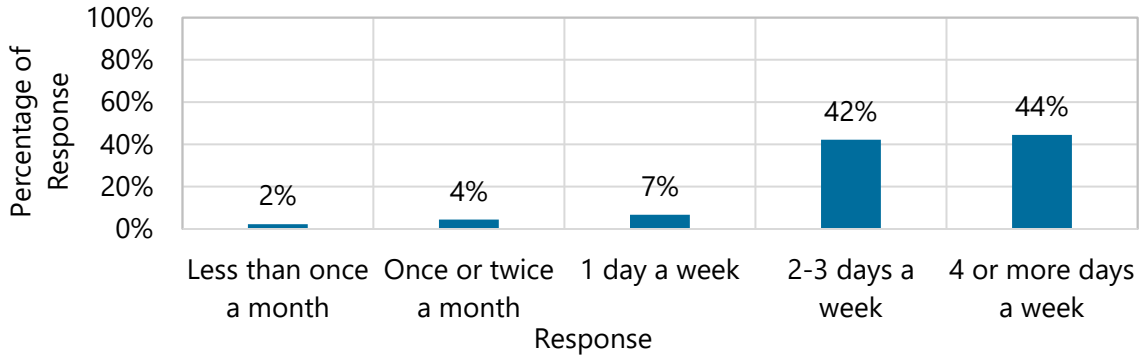
Figure 16. Length of Usage



Frequency of Usage

Percentage distribution of the respondents based on the frequency of the usage of transit is depicted in Figure 17. Most of the respondents are frequent transit users. 44% of the passengers use transit for 4 or more days a week. 42% the users use transit for 2-3 days a week.

Figure 17. Frequency of Usage

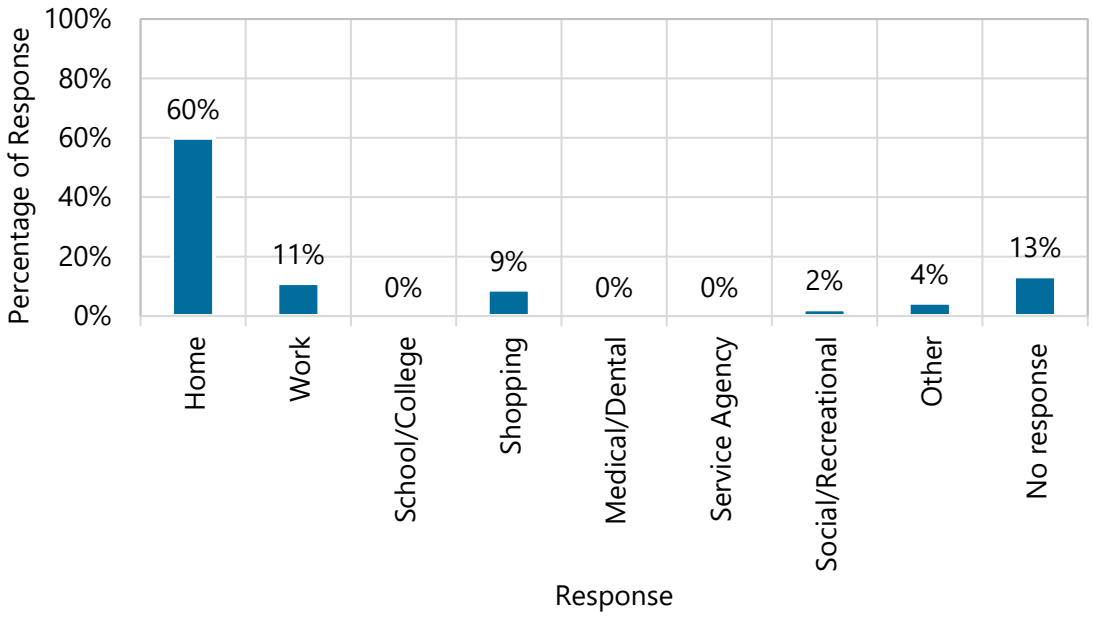


Trip Origin

Figure 18 depicts the percentage distribution based on origin of the trip of the survey respondents. 60% of the transit trips originated from home followed by 11% and 9% from

workplaces and shopping areas respectively. About 13% of the respondents didn't respond to the question.

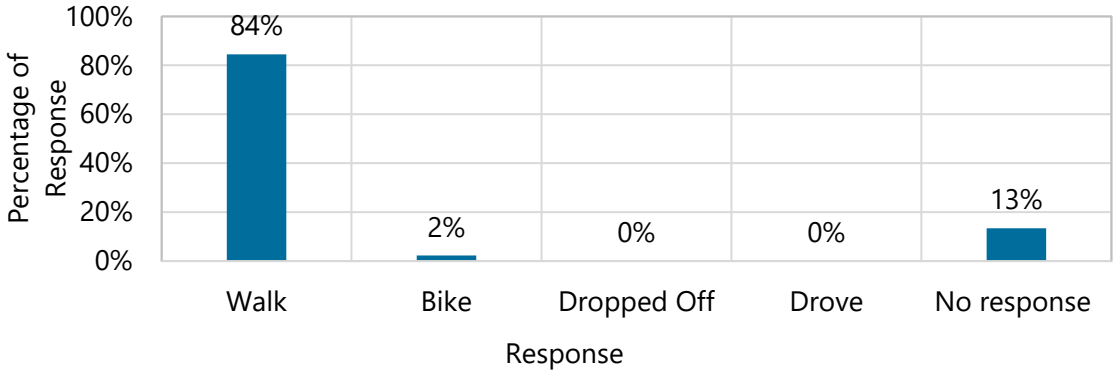
Figure 18. Trip Origins



Transit Access Mode

Figure 19 presents the percentage distribution of the trips based on the transit mode of access. 84% of the respondents reported that they have accessed transit by walking to the stops. None of them accessed transit by driving or were dropped off. 13% of the respondents didn't complete the response.

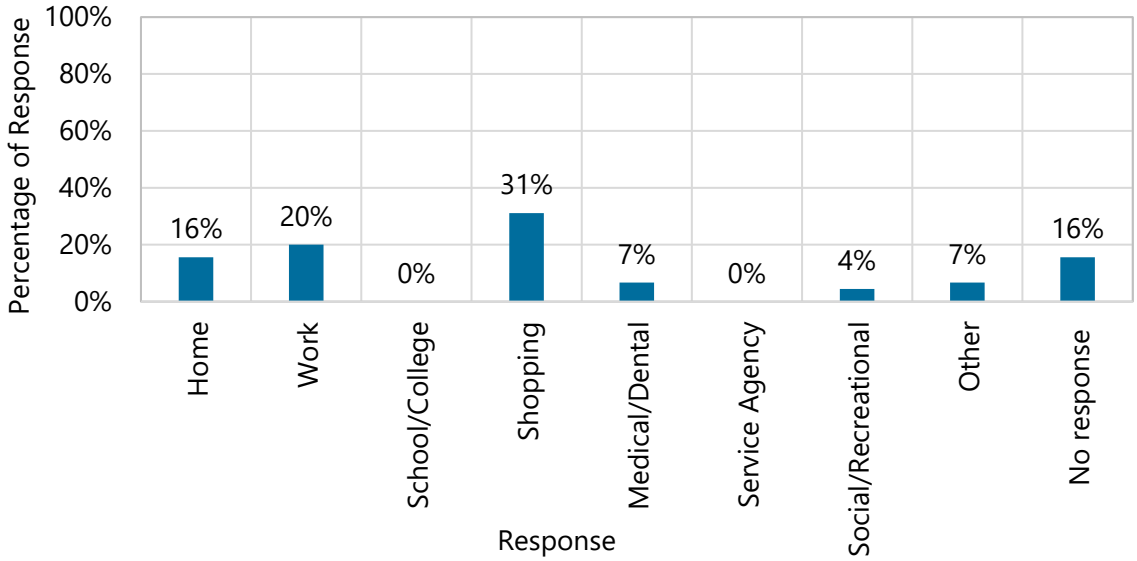
Figure 19. Transit Access Mode of the Respondents



Trip Destination

Figure 20 depicts the percentage distribution of the trips based on the trip destination. 31% of the respondents reported shopping place as their destination followed by 20% and 16% who reported workplace and home as their destination.

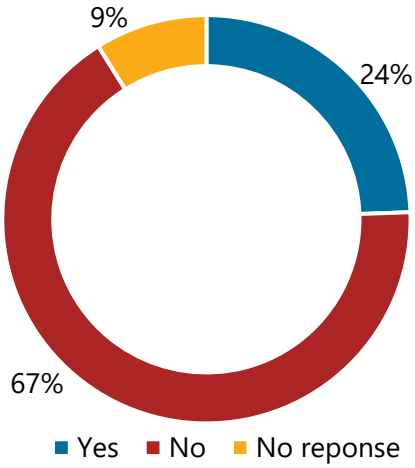
Figure 20. Trip Destinations



Inclusion of Bristol, TN route

Survey respondents were asked to mention if their trip included Bristol, Tennessee routes as well. 67% of the respondents reported that their trip did not include Bristol, Tennessee transit route. 9% of the respondents didn't provide response to the question.

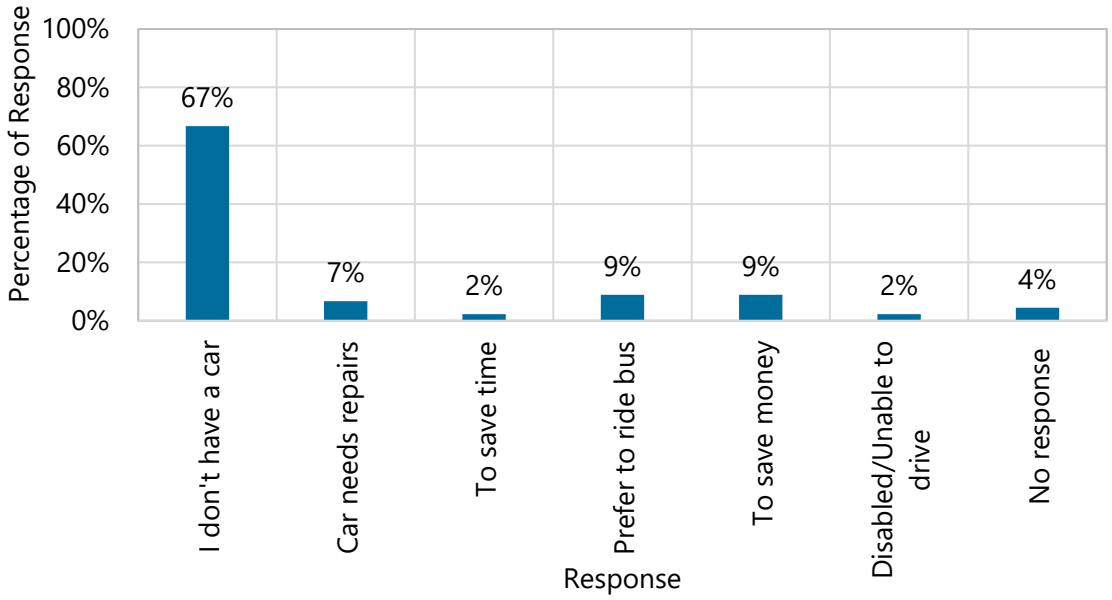
Figure 21. Inclusion of Bristol, TN route



Reason for Choosing Transit

Figure 22 summarizes the responses based on the reason for choosing transit. 67% of the respondents reported that they don't have a car as the reason for choosing transit. 9% of the respondents chose transit to save money. Another 9% reported that they prefer to ride transit.

Figure 22. Reason for Choosing Transit



User's Perception on Existing Service

Survey respondents were asked to provide ratings (from very good to very poor) to the existing transit service based on transit characteristics (column 1 of table 9). Respondents also had an option to choose 'Not Sure' if they are not certain about the rating with respect to any of the mentioned transit characteristics. Last column of the table includes percentage of the responses that were not completed by the respondents. 58% of the respondents have provided 'very good' rating to the overall transit service. For specific transit characteristics:

- 64% of respondents rated the coverage area of bus routes as 'very good'.
- 64% of respondents provided very good rating to the on-time performance of the buses.
- 44% of the respondents rated duration of the service as 'very good'.
- 53% of the respondents rated availability of the schedules and route information as 'very good'.
- 62% of the respondents rated the bus fare as 'very good'.
- 58% of the respondents rated sense of security on buses and transit station as 'very good'.

- 62% of the respondents rated cleanliness of buses and transit station as 'very good'.
- 76% of the respondents rated courtesy and friendliness of bus drivers as 'very good'.

Table 9. User's Perception on Existing Service

Transit Characteristic	Very Good	Good	Okay	Poor	Very Poor	Not Sure	No Response
Areas that are served by bus routes	64%	24%	7%	2%	0%	2%	0%
Bus on time performance	64%	24%	7%	0%	0%	2%	2%
Hours of bus service	44%	31%	11%	4%	2%	2%	4%
Availability of schedules and route information	53%	18%	7%	2%	0%	2%	18%
Cost of bus fare	62%	18%	11%	0%	0%	2%	7%
Sense of security on buses and at transit station	58%	16%	4%	4%	0%	2%	16%
Cleanliness of buses and transit station	62%	22%	11%	0%	0%	0%	4%
Courtesy and friendliness of bus drivers	76%	13%	2%	2%	0%	2%	4%
Overall Service	58%	20%	11%	0%	0%	2%	9%

User's Perception on Service Improvement

Survey respondents were asked to provide ratings (from very important to not important) for potential service improvement measures. The ratings obtained are summarized in the table 10. It is evident from table that, most of the transit users would like to have more frequent bus service, service during late evening hours and on Saturdays.

Table 10. User's Perception on Service Improvement

Improvement Measure	Very Important	Somewhat Important	Not Important	Not Sure	No Response
More frequent bus service	69%	11%	9%	0%	11%
Late evening bus service	62%	20%	7%	0%	11%
Better identification of bus stop locations	56%	20%	7%	0%	18%
Saturday service	82%	7%	4%	0%	7%
Service expanded outside of the city	49%	24%	11%	0%	16%
Improved security on buses and at the transit station	38%	18%	20%	2%	22%

4 SERVICE AND CAPITAL IMPROVEMENT PLAN

Based on the insights from peer review analysis, stakeholder interviews and on-board passenger surveys, this chapter suggests avenues of improvements in the service provided by Bristol Virginia Transit (BVT). This chapter is divided into two sections. The first section, 'Service Improvements and Needs Identification' presents improvement measures and strategies that are recommended to address the unmet expectations of the BVT. The second section, 'Service and Needs Prioritization', assigns time frames and level of priority to the suggested improvement measures based on the prospects of implementation. Associated operation, maintenance and capital costs are also presented. It is useful to acknowledge that the time frames and the statistics assigned to the suggested improvement measures are liable to change over time.

SERVICE IMPROVEMENTS AND NEEDS IDENTIFICATION

This section suggests improvement measures to address the needs of the city's transit system. The improvement measures are suggested keeping in mind the feedbacks from the stakeholders and analysis of the on-board passenger survey data. The suggested measures aim to improve the system in the most cost-effective manner as the system-wide ridership has declined in the years 2020 and 2021 as compared to the years 2018 and 2019. Each suggested measure is 'described' in detail and critically 'assessed' with respect to its potential to serve the needs of the transit system.

Changes in the Existing Route Structure

Based on system performance and the feedback received from both customers and stakeholders, some changes are recommended for the existing route structure. The suggested modifications would serve additional areas within East Bristol, while streamlining service in West Bristol to improve travel times for customers on this route. The changes would be made within existing schedule timeframes, resulting in no additional revenue hours or operational costs.

East Bristol Route

Figure 23 depicts the alignment of the proposed East Bristol Route. The proposed alignment will serve locations as varied as Downtown Transfer Station, Woodlands at Bristol, Springdale Village Apartments, American Merchant, Trinity Baptist Church, Department of Social Services, Walmart Supercenter, Courtyard by Marriott, Food City Bonham Road, Suncrest Drive, Old

Abingdon Highway, and Bristol City Hall. Deviations to Eastridge & Harbor Landing and Ballad Health shall be made based on the user's request. The route will operate from 10:00 AM to 6:00 PM. The total, round-trip length of the route will be 14.3 miles.

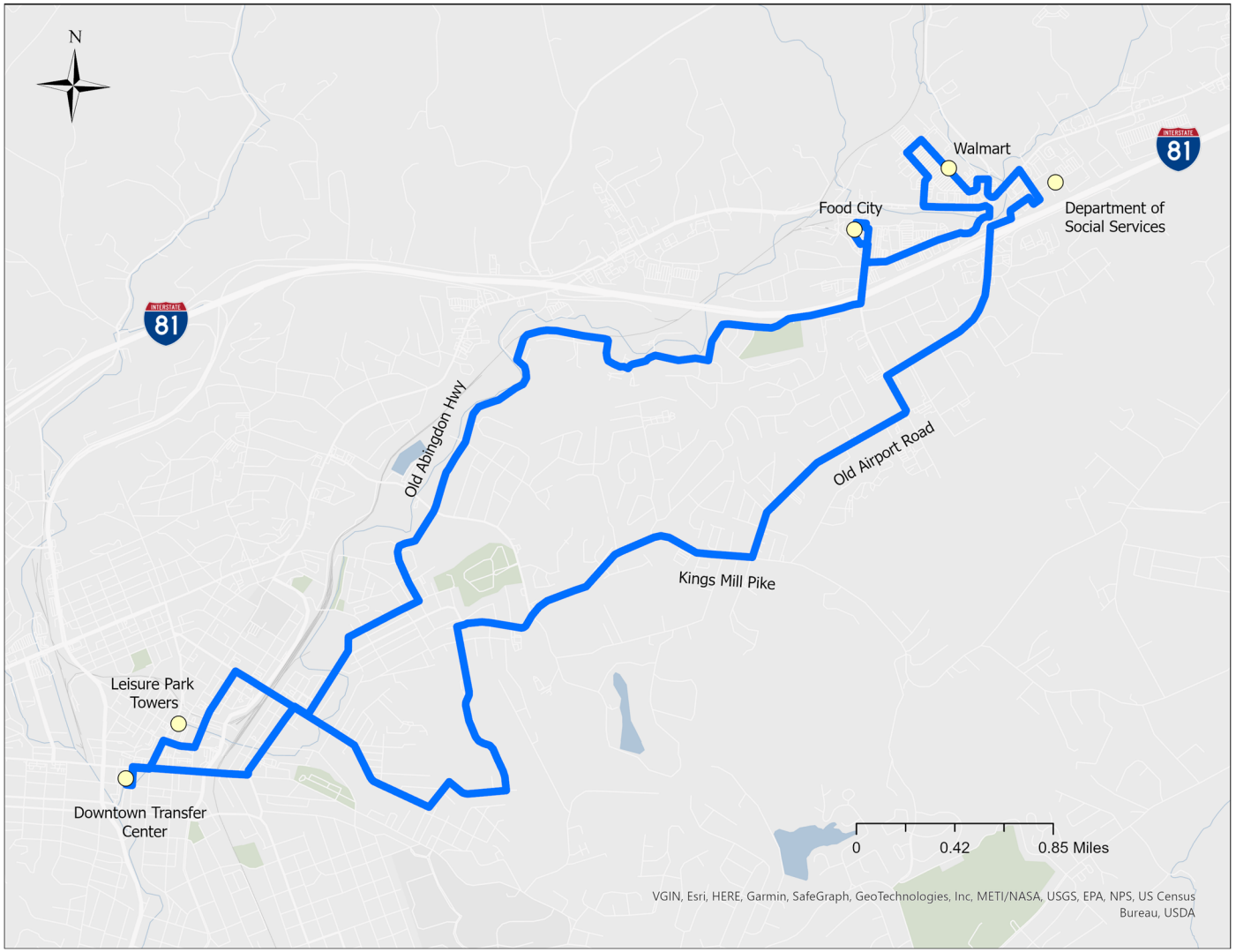
The operating statistics for the existing and proposed alignments of the East Bristol route is shown in the Table 11. The proposed East Bristol route is longer in stretch than the current route. However, it is expected that the entire route stretch can still be served in 45 minutes and operators can have relief of 15 minutes after every trip. Thus, the headway and number of trips per day remain the same. The annual operation and maintenance cost for the proposed route is estimated to be $126,585.

Table 11. Operating Statistics for Proposed East Bristol Route

Alignment	Stretch in Miles	Daily Trips	Revenue Hours Per Day	Revenue Miles Per Day	Annual Revenue Hours	Annual Revenue Miles	Annual O & M Cost (FY 2023 $)
Proposed	14.4	8	7.8	115.2	1,945.3	28,915.2	$126,585
Existing	13.7	8	7.8	109.6	1,945.3	27,509.6	$126,585
Difference	0.7	0	0.0	5.6	0.0	1,405.6	$0

The current East Bristol route has the least ridership of all the fixed routes operating in the city. Thus, for the more cost-effective operation, it will be profitable to replace this route with the mobility-on-demand type microtransit service in the medium term of three years which is discussed later in the next sub-section 4.1.2.

Figure 23. Proposed East Bristol Route



West Bristol Route

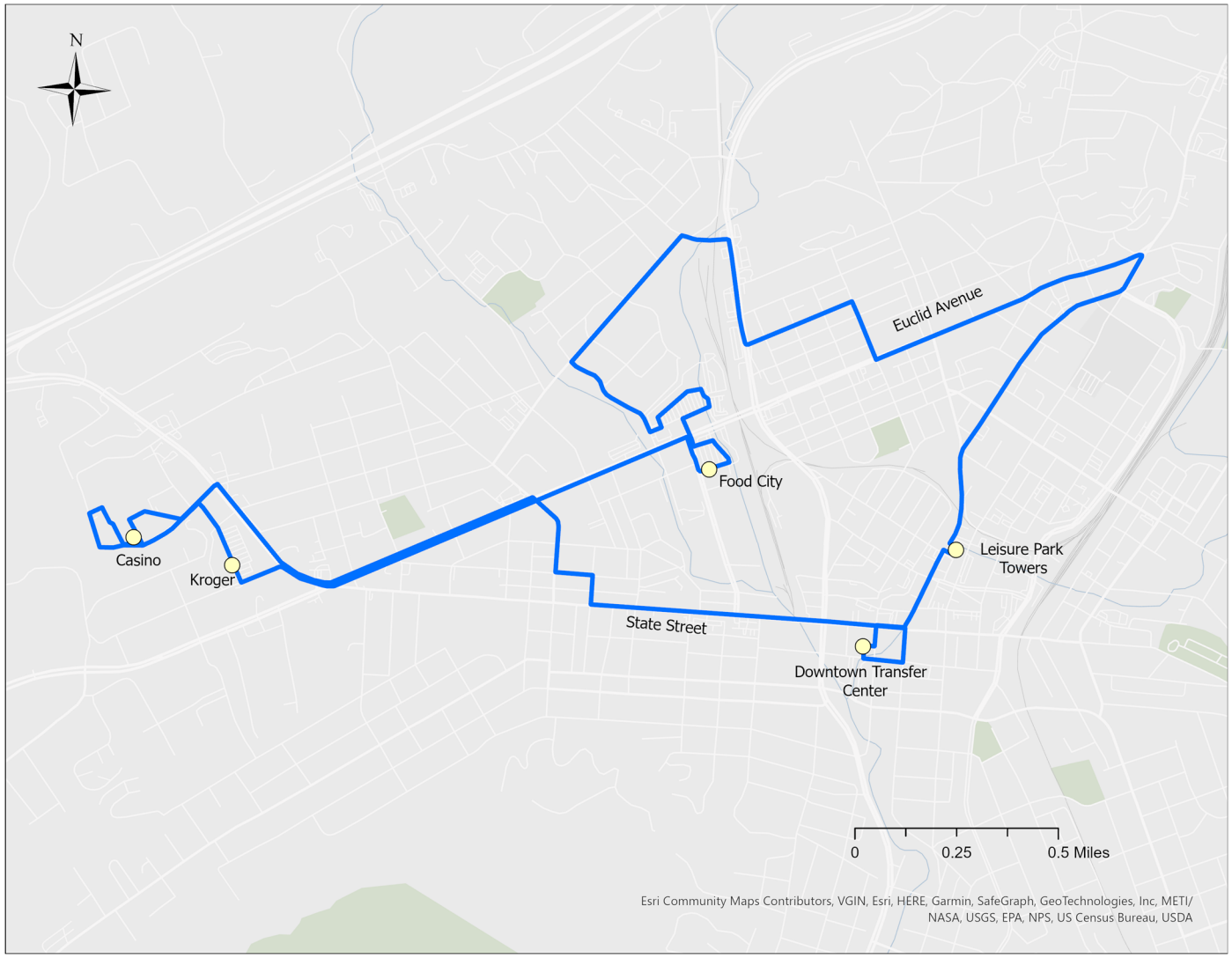
Figure 24 depicts the alignment of the proposed West Bristol Route. The proposed alignment will serve Downtown Transfer Station, Leisure Park Towers, Cumberland Square Park, Food City at Euclid Avenue, Bristol Casino, and Kroger Shopping Center at Gate City Highway. The route will operate from 7:00 AM to 6:00 PM. The total, round-trip length of the route is 8.75 miles.

The operating statistics for the existing and proposed alignments of the West Bristol route is shown in the Table 12. The proposed West Bristol route is shorter in stretch than the current route. The headway and number of trips per day remain the same. The annual operation and maintenance cost for the proposed route is estimated to be $175,585.

Table 12. Operating Statistics for Proposed West Bristol Route

Alignment	Stretch in Miles	Daily Trips	Revenue Hours Per Day	Revenue Miles Per Day	Annual Revenue Hours	Annual Revenue Miles	Annual O & M Cost
Proposed	8.8	11	10.8	96.3	2,698.3	24,158.8	$175,585
Existing	10.0	11	10.8	110.0	2,698.3	27,610.0	$175,585
Difference	1.3	0	0	13.8	0	3,451.3	$0

Figure 24. Proposed West Bristol Route



It is useful to note that the productivity of the Falls/Walmart route was evaluated, performs as well as other routes, and offers direct service for customers. Thus, no changes in the route alignment or operational attributes are proposed for the Falls/Walmart route. The route will continue to serve as per the current supply schedule. Table 13 provides its operating statistics for reference.

Table 13. Operating Statistics for Existing Falls/Walmart Route

Alignment	Stretch in Miles	Daily Trips	Revenue Hours Per Day	Revenue Miles Per Day	Annual Revenue Hours	Annual Revenue Miles	Annual O & M Cost
Existing	11.3	11	10.8	124.3	2,698.3	31,199.3	$175,585

Service Expansion

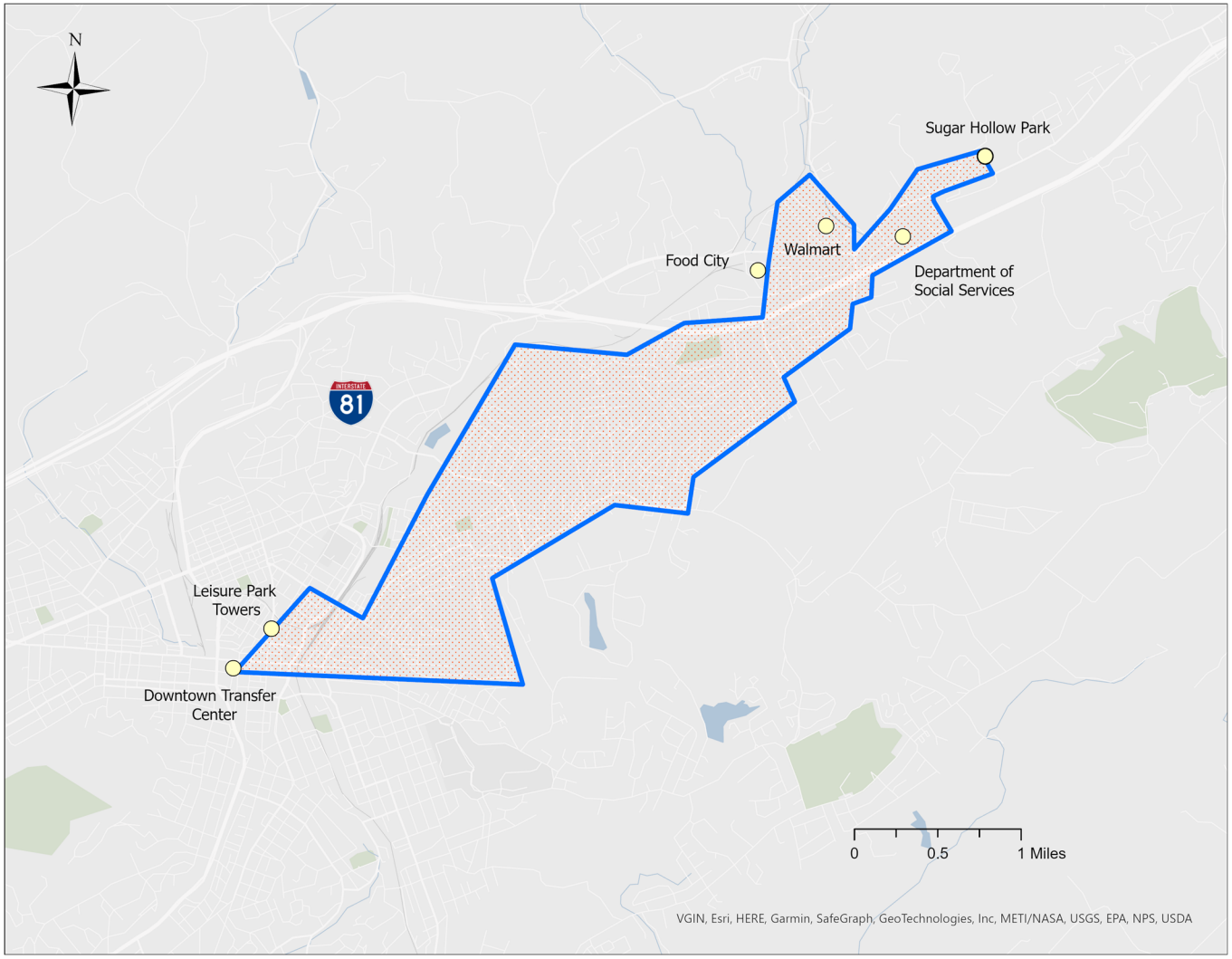
Microtransit Service

Considering the size of the population and low demand for the public transportation in the city of Bristol, VA, microtransit deems to be a promising measure to expand the existing transit network in the most cost-effective manner. Microtransit is a small-scale, on-demand, shared public transit service that offers fixed as well as flexible routing options. Effective implementation of microtransit service can provide first-mile last-mile connections to the passengers as well as complement traditional transit routes in the city. As a first step, BVT should apply for a Technical Assistance (TA) grant from DRPT this cycle which will allow a study of microtransit to begin in 2023. Such a study will be beneficial for further refinement of the recommendations here along with estimating likely costs for such a service.

Replace East Bristol Route with Microtransit

As already discussed, that the East Bristol route has the lowest ridership of all the operational routes in the city of Bristol, VA. Thus, replacing the same with the microtransit service in future will help BVT achieve more cost-effectiveness in the operation. Figure 25 shows the proposed zone that would be served by the microtransit service as a replacement of the current East Bristol route. It is useful to note that the proposed zone is serving Sugar Hollow Park and The Highlands Shopping Center in addition to all the major locations that will be served by the proposed East Bristol Route (Figure 23).

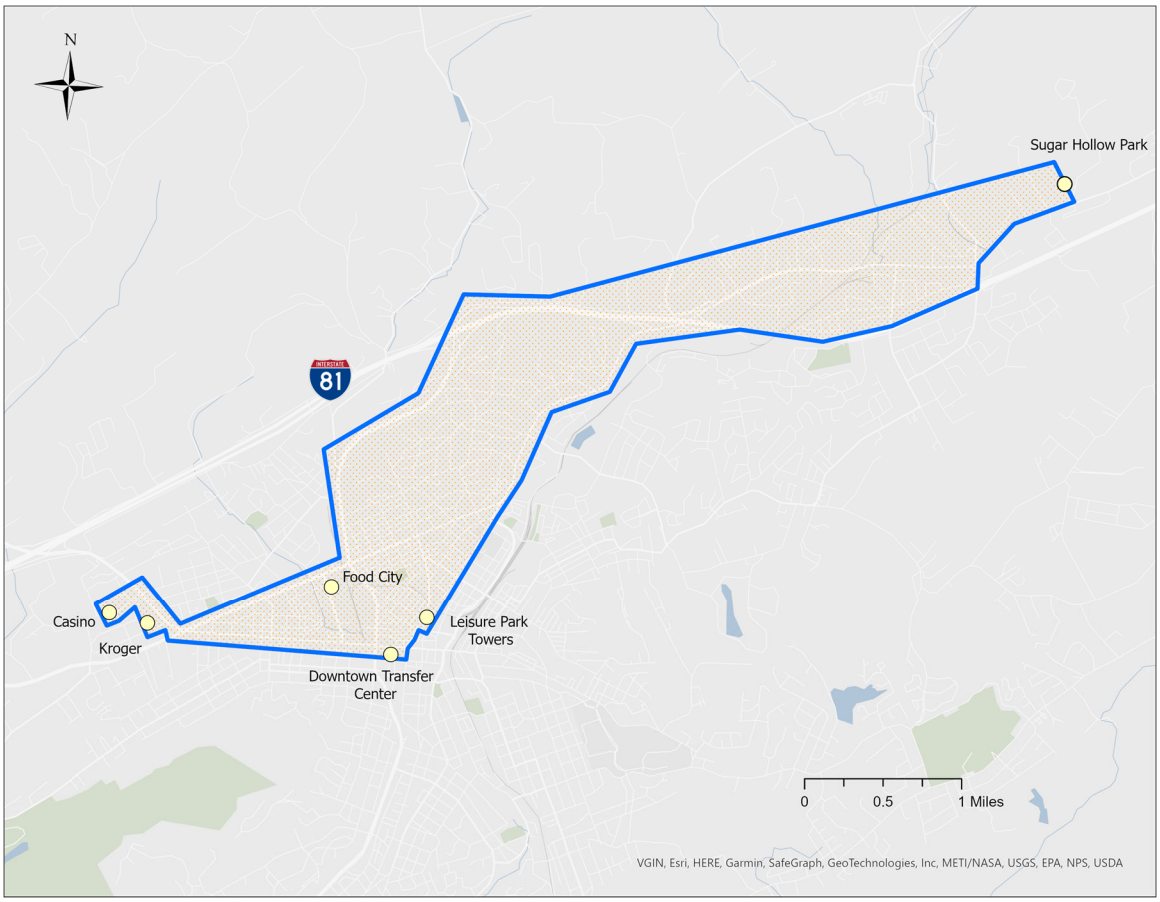
Figure 25. Proposed Microtransit Service Zone for East Bristol Route



Extend Service Hours to Nights & Saturdays

In order to enhance connectivity of downtown Bristol with major attractions nearby, while not dramatically increasing operating costs, a pilot microtransit zone is proposed as an extension to the existing transit network in the city of Bristol, VA. Implementing later service using microtransit options maximizes flexibility for customers within the service zone presented in the Figure 26. The proposed service will serve major locations like downtown Bristol, Leisure Park Towers, Food City at Euclid Avenue, Bristol Casino, and Kroger Shopping Center at Gate City Highway that have maximum in-flow out-flow of the passengers. The route will operate initially from 6:00 PM to 10:00 PM on weekdays with Saturday service from 8:00 AM to 10:00 PM to be the second step of implementation.

Figure 26. Proposed Microtransit Zone for the Late & Weekend Pilot



Once the service starts to witness and maintain enough ridership, BVT can switch to fixed-route type service with the alignment of the proposed circulator as shown in the Figure 27. The total, round-trip length of the route is 5.14 miles. The route is proposed to operate from 6:00 PM to 10:00 PM on weekdays and 8:00 AM to 10:00 PM on Saturdays. The operating statistics for the proposed Circulator service is shown in the Table 14. There would be no capital required, due to the ability to use existing weekday vehicles to serve this route.

Figure 27. Proposed Fixed Route for the Evening/Saturday Downtown Circulator

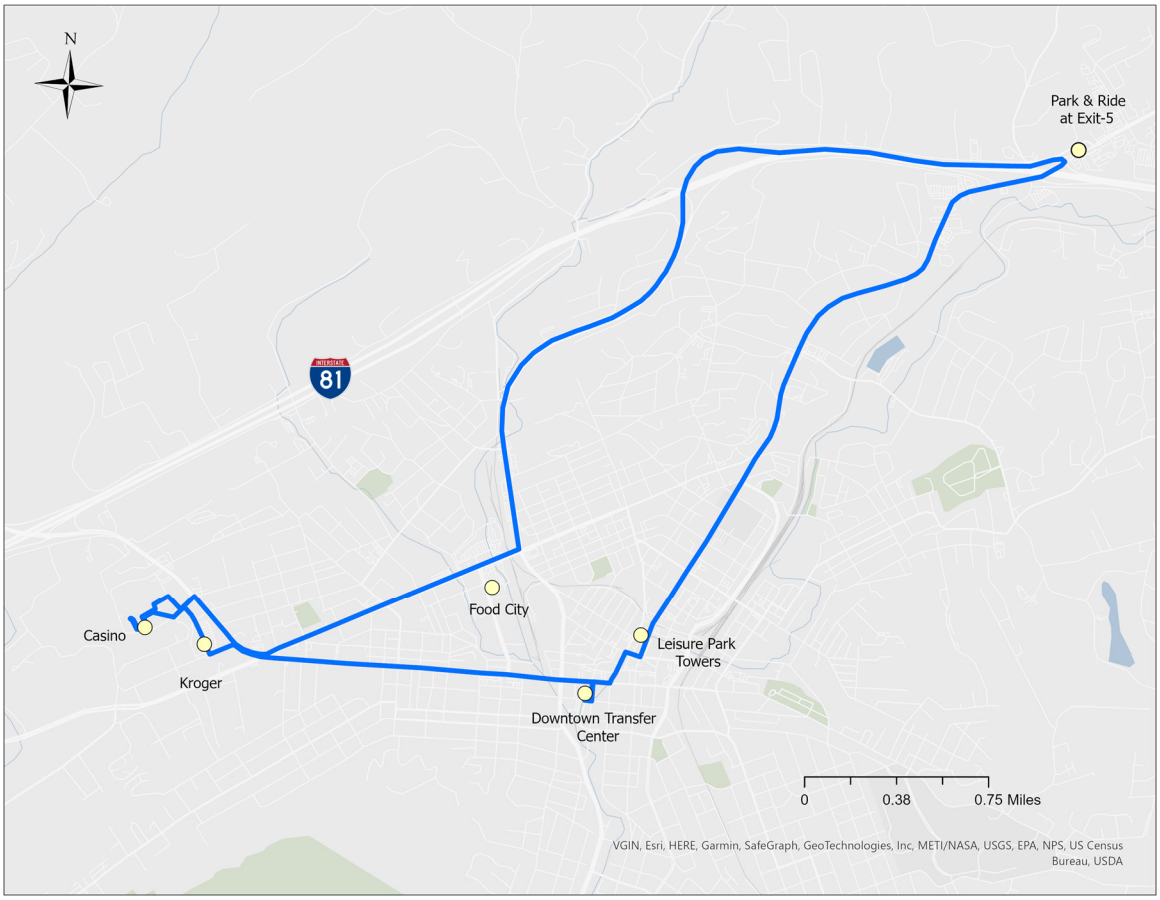


Table 14. Operating Statistics for the Proposed Circulator Service

Days	Stretch In Miles	Daily Trips	Revenue Hours Per Day	Revenue Miles Per Day	Annual Revenue Hours	Annual Revenue Miles	Annual O & M Cost	Capital Cost
Weekdays	5.1	4	3.8	43.6	941.2	10,943.6	$107,775	$0
Saturdays	5.1	14	13.8	152.6	715.0	7,782.6		

Marketing and Outreach

Effective marketing and outreach strategies are an integral component of transit planning. Without effective marketing and outreach, even the best planned transit systems won't attract enough riders. Primary goal of any public transit agency must always include a customer-centric approach that aims to inform users about the transit services and benefits that are available to them. In order to ensure that users of the transit system are well aware of the services and service changes, transit agency must have a robust marketing strategy. Marketing needs constant efforts as it is critical to keep attracting new customers and expand the existing transit ridership.

Many stakeholders indicated that BVT is not sufficiently marketing its services. Thus, in order to address that the concern of the stakeholders, this section presents marketing and outreach strategies that will support BVT in attracting more and more riders. Figure 6 depicts five strategies that are proposed to ensure sufficient ridership from the citizens of the Bristol, VA. It is useful to acknowledge that the proposed strategies below are also in line with the findings from stakeholder interviews and on-board passenger surveys.

1. Branding: BVT should maximize the visibility of the transit system (fleet vehicles, bus stops, passenger amenities) and give it a unique identity. It is through branding citizens get the sense of the service and its presence in the city. This can be achieved by choosing a specific color/design for the fleet buses, stop signage and amenities at the bus stops and the downtown transfer center. Branding is specifically helpful in attracting new customers and tourists who are the first-time users.
2. Media Advertisement: BVT should utilize print and electronic media for publicity of the transit system. It is advisable for any transit agency to be friends with local media and involve it for public outreach campaigns and meetings.
3. Stakeholders: BVT should develop and maintain a stakeholder contact list that includes people who are closely associated with the transit users. Representative from the local communities, minority groups, educational institutes, and medical centers can serve as the stakeholders. Periodic meetings should be organized with the stakeholders in order to solicit their feedbacks time to time for betterment of the transit system.
4. Dissemination of Information: Information regarding available routes and schedules should be displayed at the prominent transit stops in the city. Additionally, brochures with route schedules should be made available at all the tourist places like casino and hotels in the downtown.
5. Customer Feedback: BVT should periodically conduct survey (on-board or off-board) to gather customer's feedback. In order to ensure enough participation, agency can provide incentives or gift cards to the participating citizens.

Figure 28. Marketing and Outreach Strategies

Capital Improvements

Bus Stops

Bus stops are critical component of any transit system as passengers interact with the transit network through the bus stops. Safe and well-maintained bus stops promote passengers to use public transit system more and more. It is suggested that BVT should consider enhancing and improving passenger amenities at all the major bus stops in the city. BVT shall target 8-10 bus stops per year and provide passenger seats and information signages.

Bus Pull-Outs

Bus pull-outs are mechanisms to help bus operations and safety by allowing buses to complete passenger stops without potentially impeding traffic. Remaining in traffic can both increase the risk of a rear-end accident or operators completing stops hastily in order to get out of the way of traffic, both safety concerns. It is also of note that the larger number of both curves and hills in Bristol reduces sight lines on some roads and increases the risk for safety incidents where unexpected stops are concerned. Bus pull-outs, while important, are also both expensive

and require modification or expansions of roadways which may be limited by right-of-way constraints.

To best utilize resources, some corridors were identified as good candidates for consideration of bus pull-outs. These were evaluated by focusing on corridors where passenger loads are strongest for on-street stops, where vehicular traffic flows are continuous, where right of way appears to exist or could be added based on prevalent setbacks, and where sidewalk infrastructure exists. The corridors identified are:

- U.S. 11 north of Clover Lane to Interstate 81 ramps (both directions)
- State Street from 12th Street to Peters Street (north side of the street)
- Euclid Avenue from Gate City Highway to Peters Street (both directions)

Bus Fleet

It is essential for any transit agency to abide by the standards of 'Preventative Maintenance' (PM). A PM aims to identify and subsequently repair or replace the defective vehicle components before the operational safety gets compromised. PM can be accomplished through a systematic approach and considering periodic inspections, lubrications, and vehicle servicing.

Bristol Virginia Transit's current fleet consists of 6 vehicles (5 buses and 1 van). All the transit vehicles are fully accessible for patrons in wheelchairs. Given that many transit vehicles are at or exceeding their service life, vehicle replacements are an important component of the capital program for BVT. BVT should consider replacing bus fleet in based on the life span of the vehicle model. Further, BVT should consider maintaining bus fleet on periodic basis as needed. Table 15 presents bus fleet inventory and timeline for the fleet replacement. The suggested year for replacement is based on the mileage run of the assets.

Table 15. Bus Inventory and Replacement Suggestion

Bus #	Asset Name	Date of Acquisition	Condition Status	Mileage as on July 1, 2022	Suggested Year for Replacement
48	2012 CHEVROLET VAN (BUS)	20 Dec 2012	Fair	193,924	FY-23
46	2012 CHEVROLET VAN (BUS)	20 Dec 2012	Fair	193,976	FY-24
52	2017 STARCRAFT ALLSTAR TRANSIT BUS	28 Jun 2017	Good	102,657	FY-28

50	2016 STARCRAFT TRANSIT BUS HANDICAP	22 Aug 2016	Good	135,200	FY-26
54	FORD TRANSIT VAN	27 Jul 2018	Excellent	44,292	_
56	2019 FORD 19 PASSENGER VAN (BUS)	5 Nov 2019	Excellent	58,934	_

In the long term, BVT should also consider transitioning to electric buses. This transition of the existing fleet to the electric buses has potential to attract discretionary riders who are concerned with ecofootprints. Further adoption of electric fleet will help reducing the exhaust and noise that would additionally help in brand building of the transit system in the local community.

SERVICE AND NEEDS PRIORITIZATION

Recommendations suggested in the service improvements section aim to address the unmet transit needs of the city of Bristol, VA. The Service and Needs Prioritization section builds on that work by prioritizing the recommendations and placing them into different timeframes as shown in the Table 16. The 'Short-term' includes the remainder of FY-23, FY-24, and FY-25, and is allocated to the improvement measures that can be implemented relatively quickly. 'Medium-term' includes FY-26, FY-27, FY-28, and FY-29 and is allocated to the ambitious improvement measures that would need additional O&M and capital funding. 'Long-term' includes FY-30, FY-31, and FY-32 and is allocated to the measures that are part of the vision of BVT.

Table 16. Prioritization of the Suggested Service Improvement Measures

Suggested Service Improvement Measures		Timeframe
Changes in the existing route structure	East Bristol Route	Short
	West Bristol Route	Short
Service expansion	Weeknight Microtransit Service	Short
	Replace East Bristol route with microtransit	Medium
	Saturday Microtransit	Medium
	Downtown Circulator (Fixed route)	Long
Marketing and outreach	Branding	Medium
	Media Advertisement	Medium

	Stakeholders	Short
	Dissemination of Information	Short
	Customer Feedback	Medium
Capital improvements	Bus Stops	Short
	Bus Fleet (Replacement)	Short/Medium
	Bus Fleet (Electrification)	Long

5 IMPLEMENTATION PLAN

This chapter presents cost estimates for BVT to maintain the existing services and effectively incorporate improvement measures suggested in the previous chapter. During the next ten years (FY 2023 to FY 2032), BVT should replace and upgrade existing fleet of the service vehicles, passenger amenities at the major bus stops and effectively conduct marketing and public outreach efforts. Unless otherwise noted, all costs included in this chapter have been inflated and are therefore in year of expenditure dollars (YOE$).

The chapter has been divided into four sub-sections. Section 5.1 presents service changes that would impact capital cost. This includes suggestions that aim to expand the existing transit services in the city of Bristol, Virginia. Section 5.2 outlines the cost associated with the fleet replacement and/or upgradation during the span of this TDP. Section 5.3 presents the summary (quantity and cost) of the passenger amenities that BVT is recommended to install at the major transit stops of the city during the span of this TDP. Finally, in section 5.4, expenses associated with the marketing and public outreach efforts are presented.

SERVICE CHANGES IMPACTING CAPITAL COSTS

Existing service revenue hours will remain unchanged throughout the span of this TDP. However, the operating cost of the existing services are expected to increase at 8% inflation rate for FY 2023, 5% for FY 2024, 4% for FY 2025 and 3% for each year from FY 2026 to FY 2032. Further, based on the service changes suggested in the previous chapter, there will be additional 1,656 revenue hours by FY 2032 as services are expanded first to nights then to weekends. Thus, the cost of operation of the services by BVT are expected to increase in the span of next 10 years. Table 17 presents details of the revenue hours of the existing service, added service and associated cost of operations throughout the lifespan of the TDP.

While microtransit operation is calculated using assumed revenue hours as part of Table 17, Table 18 depicts additional expenses related to a microtransit study, acquisition of mobile application and on-going service costs of the application needed for implementation of the microtransit program in the city of Bristol.

Table 17. Operations and Maintenance Revenue Service Addition Summary

	FY-23	FY-24	FY-25	FY-26	FY-27	FY-28	FY-29	FY-30	FY-31	FY-32
Existing System										
Revenue Hours (FRT)	7,367	7,367	7,367	7,367	7,367	7,367	7,367	7,367	7,367	7,367
Operating Cost (FRT)	$479,399	$503,369	$523,504	$539,209	$555,385	$572,047	$589,208	$606,884	$625,091	$643,844
Operating Cost (Paratransit)	$63,755	$66,942	$69,620	$71,709	$73,860	$76,076	$78,358	$80,709	$83,130	$85,624
Service Additions										
Annual Revenue Hours			941				715			
Annual Operating Cost			$31,074				$26,574			
Cumulative Revenue Hours			941	941	941	941	1,656	1,656	1,656	1,656
Cumulative Operating Cost			$31,074	$32,006	$32,966	$33,955	$60,529	$62,345	$64,216	$66,142
Summation										
Revenue Hours	7,367	7,367	8,308	8,308	8,308	8,308	9,023	9,023	9,023	9,023
Operating Cost (FRT + Paratransit)	***$543,154***	***$570,311***	***$624,198***	***$642,923***	***$662,211***	***$682,077***	***$728,095***	***$749,938***	***$772,436***	***$795,609***

Table 18. Additional Costs for Microtransit Program

	FY-23	FY-24	FY-25	FY-26	FY-27	FY-28	FY-29	FY-30	FY-31	FY-32
Microtransit Study		$50,000								
App Creation		$30,000								
App Service Costs			$35,000	$36,050	$37,132	$38,245	$39,393	$40,575	$41,792	$43,046
Total	***$0***	***$80,000***	***$35,000***	***$36,050***	***$37,132***	***$38,245***	***$39,393***	***$40,575***	***$41,792***	***$43,046***

1. Revenue hours for the existing services remain unchanged throughout the span of the TDP.
2. Annual inflation rates are 8% for FY-23, 5% for FY-24, 4% for FY-25 and 3% for the rest.
3. Service additions are from Chapter 4 of TDP.
4. All costs are in year of expenditure dollars.

ROLLING STOCK UTILIZATION

BVT owns 6 vehicles (5 buses and 1 van). Peak hour vehicle requirement is three; one for each of the fixed routes. As some of the vehicles in the fleet are at or exceeding the service life, BVT would incur cost on behalf of the vehicle replacement. The suggested year of the replacement for the existing rolling stock is based on the assumption of service life which is assumed to be 7 years for bus and 5 years for van. However, some adjustments were made for a couple of items. First, the existing status of vehicles and likely turnaround for new orders does require existing fleet to continue service beyond the useful life cycle. Second, for replacements that would happen in FY 2030 to FY 2032, these were consolidated to allow fleet electrification in Fiscal Year 2032. This would need to coincide with larger efforts by the City of Bristol fleet services to ensure sufficient infrastructure.

For demand responsive microtransit service, the plan recommends two vans (one operational and one spare) to provide that service. These would then become part of the van replacement schedule. Paratransit currently has one van and that has a replacement schedule of FY 2025 and again in FY 2032 with electrification.

Table 19. Rolling Stock Capital Needs (YOE$)

	FY-23	FY-24	FY-25	FY-26	FY-27	FY-28	FY-29	FY-30	FY-31	FY-32
Unit Cost										
Passenger Bus	$138,717	$145,653	$151,479	$156,023	$160,704	$165,525	$170,491	$175,606	$180,874	$186,300
Passenger Van	$86,256	$90,569	$94,192	$97,017	$99,928	$102,926	$106,013	$109,194	$112,470	$115,844
Electric (Upgrade)	$15,000	$15,750	$16,380	$16,871	$17,378	$17,899	$18,436	$18,989	$19,559	$20,145
Quantity										
Replacement Bus	1	1	1	1						3
Replacement Van			1				2			1
Expansion Van (Microtransit)		2								
Electric (Upgrade)										4
Total Cost										
Replacement Bus	$138,717	$145,653	$151,479	$156,023	$0	$0	$0	$0	$0	$558,900
Replacement Van	$0	$0	$94,192	$0	$0	$0	$212,027	$0	$0	$115,844
Expansion Van (Microtransit)	$0	$181,138	$0	$0	$0	$0	$0	$0	$0	$0
Electric (Upgrade)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$80,581
Total	***$138,717***	***$326,790***	***$245,671***	***$156,023***	***$0***	***$0***	***$212,027***	***$0***	***$0***	***$755,325***

1. Costs are adopted from the vehicle inventory report provided by BVT.
2. Annual inflation rates are 8% for FY-23, 5% for FY-24, 4% for FY-25 and 3% for the rest.
3. Suggested replacement year might vary based on the operating condition.
4. All costs are in year of expenditure dollars.

IMPROVEMENTS AT THE BUS STOPS

The plan recommends BVT make some capital improvements to enhance and improve passenger amenities at the major transit stops in the city in the short and medium term. Table 20 presents numbers and cost estimates for the passenger amenities like bus stop shelters and benches to be installed at the transit stops throughout the lifespan of the TDP. The plan includes installation of 2 bus stop shelters each year from FY 2024 through FY 2026 and6 bus stop benches each year from FY 202 to FY 2027. It is useful to note that the service life of the suggested passenger amenities is assumed to be six years. Thus, the amenities that are installed in the FY-24 are likely to be re-installed in the FY-31 and so on.

For the safe service operation, BVT should incorporate bus pull outs where appropriate and a budget for up to three pull outs are included in the plan, with locations selected from areas suggested in the previous chapter. For illustrative purposes, the pull outs are included for Fiscal Years 2024, 2027, and 2030, based on what is likely reasonable over the course of the TDP implementation.

Table 20. Passenger Amenities Capital Needs (YOE$)

	FY-23	FY-24	FY-25	FY-26	FY-27	FY-28	FY-29	FY-30	FY-31	FY-32
Unit Cost										
Bus stop shelter	$10,800	$11,340	$11,794	$12,147	$12,512	$12,887	$13,274	$13,672	$14,082	$14,505
Bus stop bench	$899	$943	$981	$1,011	$1,041	$1,072	$1,104	$1,138	$1,172	$1,207
Bus pull-outs	$77,760	$81,648	$84,914	$87,461	$90,085	$92,788	$95,571	$98,439	$101,392	$104,433
Quantity										
Bus stop shelter		2	2	2				2	2	2
Bus stop bench	12		6	6			6	6	6	6
Bus pull-outs		1			1			1		
Total Cost										
Bus stop shelter	$0	$22,680	$23,587	$24,295	$0	$0	$0	$27,344	$28,164	$29,009
Bus stop bench	$10,783	$0	$5,887	$6,064	$0	$0	$6,626	$6,825	$7,030	$7,241
Bus pull-outs	$0	$81,648	$0	$0	$90,085	$0	$0	$98,439	$0	$0
Total	***$10,783***	***$104,328***	***$29,475***	***$30,359***	***$90,085***	***$0***	***$6,626***	***$132,608***	***$35,194***	***$36,250***

1. Adopted costs are industry estimates and are liable to change based on market conditions.
2. Annual inflation rates are 8% for FY-23, 5% for FY-24, 4% for FY-25 and 3% for the rest.

MARKETING

An important suggestion from the stakeholder interviews and bus passenger surveys for BVT was to enhance its marketing efforts. This can be addressed by setting aside funding for branding, brochure designing/printing, establishing information kiosks, media advertisements and customer feedback. Table 21 presents expenses that BVT would have to incur for marketing initiatives along the lifespan of this TDP, based on recommendations from Chapter 4.

Table 21. Marketing Capital Needs (YOE$)

	FY-23	FY-24	FY-25	FY-26	FY-27	FY-28	FY-29	FY-30	FY-31	FY-32
Unit Cost										
Branding					$15,000	$15,450	$15,914	$16,391	$16,883	$17,389
Brochure Design		$2,500	$2,600	$2,678	$2,758	$2,841	$2,926	$3,014	$3,105	$3,198
Brochure Printing		$0.30	$0.31	$0.32	$0.33	$0.34	$0.35	$0.36	$0.37	$0.38
Information Kiosk		$100	$104	$107	$110	$114	$117	$121	$124	$128
Media Advertisement						$12,000	$12,360	$12,731	$13,113	$13,506
Customer Feedback				$10,000	$10,300	$10,609	$10,927	$11,255	$11,593	$11,941
Quantity										
Branding					1					
Brochure Design		1								
Brochure Printing		1000	1000	1000	1000	1000	1000	1000	1000	1000
Information Kiosk		20		20		20		20		20
Media Advertisement						1	1	1	1	1
Customer Feedback				1			1			1
Total Cost										
Branding	$0	$0	$0	$0	$15,000	$0	$0	$0	$0	$0
Brochure Design	$0	$2,500	$0	$0	$0	$0	$0	$0	$0	$0
Brochure Printing	$0	$300	$312	$321	$331	$341	$351	$362	$373	$384
Information Kiosk	$0	$2,000	$0	$2,142	$0	$2,273	$0	$2,411	$0	$2,558
Media Advertisement	$0	$0	$0	$0	$0	$12,000	$12,360	$12,731	$13,113	$13,506
Customer Feedback	$0	$0	$0	$10,000	$0	$0	$10,927	$0	$0	$11,941
Total	***$0***	***$4,800***	***$312***	***$12,464***	***$15,331***	***$14,614***	***$23,638***	***$15,504***	***$13,485***	***$28,388***

1. Adopted costs are industry estimates and are liable to change based on market conditions.
2. Annual inflation rates are 8% for FY-23, 5% for FY-24, 4% for FY-25 and 3% for the rest.

6 FINANCIAL PLAN

The financial plan chapter of the TDP projects the anticipated expenses for the service and capital requirements presented in the previous chapters over the life span of the transit development plan. This chapter is organized into two sections: 'Operating and Maintenance Costs and Funding Sources', and 'Capital Costs and Funding Sources'.

The operating and maintenance section presents details about the funds that are anticipated per year for making up the expenses associated with the existing services and recommended service additions through different funding sources. Four funding sources are identified: farebox, federal, state, and local. This section also details out the assumptions that are used for the calculation of funding via each of these four sources.

The capital costs and funding sources section presents details about the funds that are anticipated per year for making up the expenses associated with the capital improvements through different funding sources. Capital improvements are classified into four categories: microtransit, rolling stock, improvements at bus stops and marketing.

A snapshot of previous funding revenues is presented in Table 22**.**

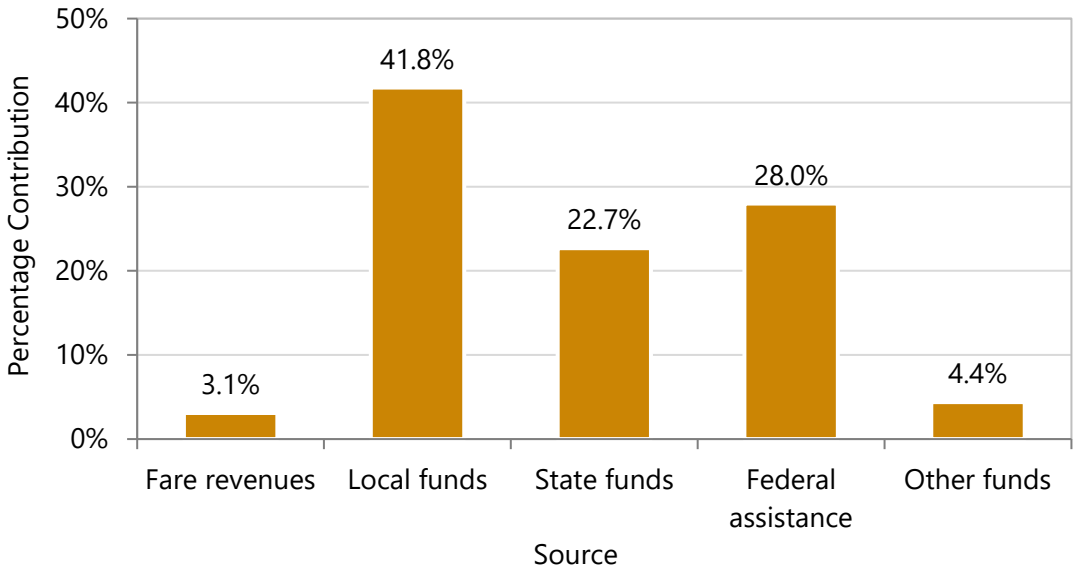
Table 22. Six-Year Retrospective of Operating Revenues

Sources of Funds	2021	2020	2019	2018	2017	2016
Fare revenues	$12,694	$34,035	$43,384	$42,044	$45,127	$57,253
Local funds	$171,939	$149,270	$110,706	$120,924	$116,831	$124,846
State funds	$93,147	$102,399	$90,117	$75,696	$103,682	$96,634
Federal assistance	$115,193	$148,141	$166,794	$174,774	$174,488	$161,538
Other funds	$18,000	$21,640	$26,315	$14,725	$0	$0

OPERATING AND MAINTENANCE COSTS AND FUNDING SOURCES

This section presents details on the expenditures and revenues dedicated to operating and maintaining the transit services in the city of Bristol, VA over the next ten years. To gain a better understanding of the future finances, Figure 29 summarizes revenues from FY 2021, the most recent and complete annual dataset available. Expenditures for operating and maintenance in FY 2021 totaled $410,793. It is evident from the figure that, largest portion of the expenses were met through local funds (41.8%), followed by federal assistance (28%), state funds (22.7%), fare revenues (3.1%) and other funds (4.4%).

Figure 29. FY-22 Operating and Maintenance Funding Sources



The remainder of this section focuses on projections of expenditures and revenues over the course of the TDP (FY 2023 to FY 2032). Funding amount from each of the revenue sources is projected based on certain assumptions, that are discussed next. After the assumptions are discussed, two service scenarios: 'No Service Changes Scenario' and 'Service Changes Scenario', are presented. For each of these scenarios, revenues and expenditures are liable to change over the due course of time.

Assumptions

Based on the '2021 Annual Agency Profile Report' of BVT, fare revenues were $12,694. **Fare revenues** are assumed to be constant throughout the life span of the TDP, with the only

additions being from added microtransit service hours. The current fare per revenue hour of service is forecast for this new service. **Federal funding** is assumed to be 28% of the total operation and maintenance cost in the first fiscal year of the TDP and then grow at the same rate of inflation as costs. **State funding** contributed 22.7% towards the operation and maintenance cost of BVT in FY 2021. The contribution from the state funds is assumed to increase at the rate of 1% per year throughout the life span of the TDP, consistent with statewide projections. As inflation is anticipated to be quicker than this rate, the percent of state share would somewhat diminish over the 10-year period. **Local funds** are assumed to cover any remaining costs after the utilization of the previous three funding sources (fares, federal, and state).

No Service Changes Scenario

The 'no service changes scenario' assumes that BVT will not make any of the recommended service changes over the next ten years, thus, resulting in no additional revenue hours. However, BVT would still incur cost (expenses) on behalf of the continuation of the existing services. The operating costs, anticipated revenues by source, and assumptions for this scenario are shown in **Table 23**.

Total operating and maintenance costs are expected to increase from $543,154 in FY 2023 to $729,467 in FY 2032. The net increase of $186,314 in the expenses is because of inflation alone. As BVT doesn't anticipate increasing the service fare, fare revenues are expected to be constant over the entire timeframe of the TDP. The federal, state, and local revenues, however, are expected to increase over time based on various assumptions. Federal funds are expected to increase from $152,083 in FY 2023 to $204,251 in FY 2032 (though the percentage contribution remains the same). State funds increase from $123,296 in FY 2023 to $134,847 in FY 2032. Local funds increase from $255,081 in FY 2023 to $377,676 in FY 2032.

Service Changes Scenario

The 'service changes scenario' assumes that BVT will make all of the recommended service changes over the next ten years, thus, resulting in additional revenue hours and operation cost. The operating and maintenance costs, anticipated revenues by source, and assumptions for this scenario are shown in **Table 24**. This includes both costs for operation and maintenance as well as on-going marketing costs.

As there are no service additions in FY 2023 and FY 2024, the only difference for operating and maintenance costs for the 'Recommended Service Changes' scenario as compared to 'No Service Changes' scenario is some marketing expenses in FY 2024. BVT will start to incur expenses from FY 2025 to FY 2032 as a result of service additions.

Total operating and maintenance costs are expected to increase from $543,154 in FY 2023 to $823,998 in FY 2032. The net increase of $280,844 in the expenses is because of inflation as well as service additions. As BVT doesn't anticipate increasing the service fare, fare revenues are expected to be similar over the entire timeframe of the TDP with the only addition due to microtransit fares. The federal, state, and local revenues, however, are expected to increase over time because of the increase in operating cost. Federal funds are expected to increase from $152,083 in FY 2023 to $204,251 in FY 2032 (increasing at the rate of inflation). State funds will increase more slowly from $123,296 in FY 2023 to $134,847 in FY 2032, which assumes Bristol's share of total state funds stays constant. Local funds increase from $255,081 in FY 2023 to $469,353 in FY 2032. **Table 25** shows amount difference in each funding category for 'no service changes' and 'service changes' scenario for all the fiscal years.

Table 23. No Service Changes Scenario Operations Funding Plan Summary

	FY-23	FY-24	FY-25	FY-26	FY-27	FY-28	FY-29	FY-30	FY-31	FY-32
Revenue Hours Operating	7,367	7,367	7,367	7,367	7,367	7,367	7,367	7,367	7,367	7,367

Table 25. Amount Difference in each Funding Category for 'No Service Changes' and 'Service Changes' Scenario

	FY-23	FY-24	FY-25	FY-26	FY-27	FY-28	FY-29	FY-30	FY-31	FY-32
Fare	$0	$0	$1,621	$1,621	$1,621	$1,621	$2,853	$2,853	$2,853	$2,853
Federal	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
State	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Local	$0	$4,800	$29,764	$42,848	$46,676	$46,947	$81,315	$74,996	$74,848	$91,677

CAPITAL COSTS AND FUNDING SOURCES

Capital costs presented in this section are driven by the implementation plan presented in Chapter 5, which assume service changes are implemented. Capital costs are grouped into categories of service changes, rolling stock utilization, and improvements at bus stops. Additional information on each of the three categories can be found in the previous chapter.

The remainder of this section focuses on projections of expenditures and revenues over the course of the TDP (FY 2023 to FY 2032). Funding amount from each of the revenue sources is projected based on certain assumptions, that are discussed next. After the assumptions are discussed, two service scenarios: 'No Capital Improvements scenario and 'Recommended Capital Improvements' scenario, are presented. For each of these scenarios, revenues and expenditures are liable to change over the due course of time.

Assumptions

Funding for capital projects is anticipated to come from three different sources: federal, state, and local. The funding amounts expected from each of the sources are calculated based on the following percentages:

- Federal: 80%
- State: 16%
- Local: 4%

For most items, it is assumed that these percentages will remain same throughout the lifespan of the TDP. For microtransit planning and technology costs, these costs are assumed to be state funded through the first two years of operation and then become a local expense.

Funding Plan

No Capital Improvements Scenario

Table 26 shows a summary of all capital costs for 'no capital improvement scenario' over the ten-year TDP timeframe. Capital costs are grouped into three categories: microtransit, rolling stock, and improvements at bus stops. The "No Capital Improvement" scenario is based on the assumption that BVT will not make any of the recommended improvements in the previous chapter except for vehicle replacement which is mandatory considering the safety of the passengers and bus operators. Funding sources and the percentage break ups are already indicated in the assumptions. Evident from the Table 26, are the FY for which BVT would need funding as a result of vehicle fleet replacement. It is also useful to note that BVT would not

incur any expenses for FY 2027 through FY 2029, as the fleet would all be within their useful life during these years.

Recommended Capital Improvements Scenario

Table 27 shows a summary of all capital costs for 'capital improvement scenario' over the ten-year TDP timeframe. Categorization of the capital costs remain same as the no capital improvement scenario. Capital improvement scenario is based on the assumption that BVT will make all of the recommended improvements mentioned in the previous chapter. The most immediate capital funds are needed for the categories: microtransit, rolling stock and improvements at bus stops in FY 2023. Amongst all the categories, 'rolling stock' needs more capital throughout the span of TDP.

Total capital costs are expected to increase from $149,400 in FY 2023 to $791,575 in FY 2032. The reason for the high costs in FY 2032 is that is the year fleet electrification is included, with multiple vehicle replacements scheduled to occur at this time. The federal, state, and local revenues are expected to increase over time because of the increase in the capital expenses. Federal funds are expected to increase from $119,600 in FY 2023 to $633,260 in FY 2032. State funds increase from $23,920 in FY 2023 to $126,652 in FY 2032. Local funds increase from $5,980 in FY 2023 to $74,709 in FY 2032.

Table 28 shows amount difference in each funding category for 'no capital improvements' and 'capital improvements' scenario for all the fiscal years.

Table 29 shows the capital costs necessary for the microtransit program only. It is useful to note that the microtransit program will be supported initially by state funds with local funds absorbing costs once the program has been operational for two years.

Tables 30 through 32 show more details on capital cost categories and marketing costs over the next ten years.

Table 26. No Capital Improvements Scenario Funding Plan Summary

	FY-23	FY-24	FY-25	FY-26	FY-27	FY-28	FY-29	FY-30	FY-31	FY-32
Costs										
Microtransit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Rolling Stock	$138,717	$145,653	$245,671	$156,023	$0	$0	$0	$284,799	$180,874	$186,300
Improvements at Bus Stops	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$138,717**	**$145,653**	**$245,671**	**$156,023**	**$0**	**$0**	**$0**	**$284,799**	**$180,874**	**$186,300**
Anticipated Funding Sources										
Federal	$110,974	$116,522	$196,536	$124,819	$0	$0	$0	$227,840	$144,699	$149,040
State	$22,195	$23,304	$39,307	$24,964	$0	$0	$0	$45,568	$28,940	$29,808
Local	$5,549	$5,826	$9,827	$6,241	$0	$0	$0	$11,392	$7,235	$7,452

Table 27. Recommended Capital Improvements Scenario Funding Plan Summary

	FY-23	FY-24	FY-25	FY-26	FY-27	FY-28	FY-29	FY-30	FY-31	FY-32
Costs										
Microtransit	$0	$80,000	$35,000	$36,050	$37,132	$38,245	$39,393	$40,575	$41,792	$43,046
Rolling Stock	$138,717	$326,790	$245,671	$156,023	$0	$0	$212,027	$0	$0	$755,325
Improvements at Bus Stops	$10,783	$104,328	$29,475	$30,359	$90,085	$0	$6,626	$132,608	$35,194	$36,250
Total	**$149,500**	**$431,118**	**$275,146**	**$186,382**	**$90,085**	**$0**	**$218,653**	**$132,608**	**$35,194**	**$791,575**
Anticipated Funding Sources										
Federal	$119,600	$344,895	$220,116	$149,106	$72,068	$0	$174,922	$106,086	$28,155	$633,260
State	$23,920	$148,979	$79,023	$65,871	$14,414	$0	$34,984	$21,217	$5,631	$126,652
Local	$5,980	$17,245	$11,006	$7,455	$40,735	$38,245	$48,139	$45,879	$43,200	$74,709

Table 28. Amount Difference in each Funding Category for 'No Capital Improvements' and 'Capital Improvements' Scenario

	FY-23	FY-24	FY-25	FY-26	FY-27	FY-28	FY-29	FY-30	FY-31	FY-32
Federal	$8,626	$228,372	$23,580	$24,287	$72,068	$0	$174,922	($121,753)	($116,544)	$484,220
State	$1,725	$125,674	$39,716	$40,907	$14,414	$0	$34,984	($24,351)	($23,309)	$96,844
Local	$431	$11,419	$1,179	$1,214	$40,735	$38,245	$48,139	$34,487	$35,965	$67,257

Table 29. Microtransit Funding Plan Summary

	FY-23	FY-24	FY-25	FY-26	FY-27	FY-28	FY-29	FY-30	FY-31	FY-32
Costs										
Pilot Study		$50,000								
Microtransit App		$30,000								
App Maintenance			$35,000	$36,050	$37,132	$38,245	$39,393	$40,575	$41,792	$43,046
Total		$80,000	$35,000	$36,050	$37,132	$38,245	$39,393	$40,575	$41,792	$43,046
Anticipated Funding Sources										
Federal	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
State	$0	$80,000	$35,000	$36,050	$0	$0	$0	$0	$0	$0
Local	$0	$0	$0	$0	$37,132	$38,245	$39,393	$40,575	$41,792	$43,046

Table 30. Rolling Stock Funding Plan Summary

	FY-23	FY-24	FY-25	FY-26	FY-27	FY-28	FY-29	FY-30	FY-31	FY-32
Costs										
Existing Passenger Bus (replacement)	$172,512	$181,138	$188,383	$194,035	$0	$0	$0	$0	$0	$695,062
Existing Passenger Van (replacement)	$0	$0	$94,192	$0	$0	$0	$212,027	$0	$0	$115,844
New Microtransit Vans	$0	$181,138	$0	$0	$0	$0	$0	$0	$0	$0
Electric (Upgrade Costs)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$80,581
Total	**$172,512**	**$362,275**	**$282,575**	**$194,035**	**$0**	**$0**	**$212,027**	**$0**	**$0**	**$891,487**
Anticipated Funding Sources										
Federal	$138,010	$289,820	$226,060	$155,228	$0	$0	$169,621	$0	$0	$713,190
State	$27,602	$57,964	$45,212	$31,046	$0	$0	$33,924	$0	$0	$142,638
Local	$6,900	$14,491	$11,303	$7,761	$0	$0	$8,481	$0	$0	$35,659

Table 31. Improvements at Bus Stops Funding Plan Summary

	FY-23	FY-24	FY-25	FY-26	FY-27	FY-28	FY-29	FY-30	FY-31	FY-32
Costs										
Bus Stop Shelter	$0	$22,680	$23,587	$24,295	$0	$0	$0	$27,344	$28,164	$29,009
Bus Stop Bench	$10,783	$0	$5,887	$6,064	$0	$0	$6,626	$6,825	$7,030	$7,241
Bus pull outs	$0	$81,648	$0	$0	$90,085	$0	$0	$98,439	$0	$0
Total	**$10,783**	**$104,328**	**$29,475**	**$30,359**	**$90,085**	**$0**	**$6,626**	**$132,608**	**$35,194**	**$36,250**
Anticipated Funding Sources										
Federal	$8,626	$83,462	$23,580	$24,287	$72,068	$0	$5,301	$106,086	$28,155	$29,000
State	$1,725	$16,692	$4,716	$4,857	$14,414	$0	$1,060	$21,217	$5,631	$5,800
Local	$431	$4,173	$1,179	$1,214	$3,603	$0	$265	$5,304	$1,408	$1,450

Table 32. Marketing Funding Plan Summary (Included in Operations Costs)

	FY-23	FY-24	FY-25	FY-26	FY-27	FY-28	FY-29	FY-30	FY-31	FY-32
Costs										
Branding	$0	$0	$0	$0	$15,000	$0	$0	$0	$0	$0
Brochure Design	$0	$2,500	$0	$0	$0	$0	$0	$0	$0	$0
Brochure Printing	$0	$300	$312	$321	$331	$341	$351	$362	$373	$384
Information Kiosk	$0	$2,000	$0	$2,142	$0	$2,273	$0	$2,411	$0	$2,558
Media Advertisement	$0	$0	$0	$0	$0	$12,000	$12,360	$12,731	$13,113	$13,506
Customer Feedback	$0	$0	$0	$10,000	$0	$0	$10,927	$0	$0	$11,941
Total	**$0**	**$4,800**	**$312**	**$12,464**	**$15,331**	**$14,614**	**$23,638**	**$15,504**	**$13,485**	**$28,388**
Anticipated Funding Sources										
Federal	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
State	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Local	$0	$4,800	$312	$12,464	$15,331	$14,614	$23,638	$15,504	$13,485	$28,388