Blacksburg Transit

2011-2017 Transit Development Plan

Journey into the Future

June 2011

Prepared by

Connetics Transportation Group

Under Sub-Contract to

ATKINS

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DRPT
Virginia Department of Rail and Public Transportation

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Chapter 1 Overview of Blacksburg Transit

Blacksburg Transit (BT), a department within the Town of Blacksburg, Virginia, provides fixed-route and paratransit bus service within Blacksburg and the nearby Town of Christiansburg. Blacksburg is located in Montgomery County, along US-460 and just north of I-81 in southwestern Virginia, and is the home of Virginia Polytechnic Institute and State University (VT), a public land-grant institution.

In 2000, the population of Blacksburg was 39,573 (including the VT student population) and the population of Christiansburg was 16,947. Population in 2010 is estimated to be 49,162 in Blacksburg and nearly 20,000 in Christiansburg. Blacksburg, Christiansburg, and portions of Montgomery County are part of the Blacksburg-Christiansburg-Montgomery Area Metropolitan Planning Organization, a federally-designated urbanized area since 2000.

This chapter details the history, governance, and current operations of BT, including organizational structure, services provided and resources utilized.

1.1 History

Public transit in Blacksburg and the surrounding area had been studied extensively through the 1970s, with a 1979 report, *New River Valley Transit Study*, summarizing and formalizing plans for fixed-route, demand response, and intercity transit services across the New River Valley.

In 1983, Blacksburg Transit was formed as a department of the Town of Blacksburg to operate the three local fixed routes originally proposed in the 1979 study. A transit management company was hired to start-up and manage the operation. Shortly after beginning service, the town assumed management responsibilities of BT internally. A Transit Advisory Committee (TAC) comprised of representatives of both the town and university advised on bus operations until 2001, when the TAC was disbanded.

BT's Blacksburg service hubs on Virginia Tech's main campus

The original three-route system (Hethwood/Windsor Hills, Toms Creek A/B, and North Main/South Main) were oriented to hub at Virginia Tech, which provided the local share for transit operations. Demand was strong from day one, and service was soon added to the Montgomery Regional Hospital area. Over the years, additional routes were added reaching other parts of town or campus, all terminating at VT's main campus. The eleven current routes in Blacksburg still closely resemble their original counterparts, with ridership on the system today growing to over three million annual riders.

Shortly after service began in 1983, complementary door-to-door demand response service (BT ACCESS) was added for qualified rides within the town. The first service outside of the Blacksburg town limits was introduced in 1991 in the form of the Two-Town Trolley, providing connecting fixed-route service between Blacksburg and Christiansburg.

1991 also saw the completion of BT's current administrative and maintenance facility at 2800 Commerce Street. Prior to this time, maintenance facilities were shared with the town's Department of Public Works. The new facility was initially built with 30 garage bays and three maintenance bays. A 2006 expansion added 20 garage bays and two more maintenance bays, along with a manager's suite and conference area to the administrative wing of the facility.

Christiansburg local service began in 2009

In November 2009, Christiansburg local service began operating on two fixed routes and one general public/ADA demand response route. Local funding for this service is provided by the Town of Christiansburg. Plans are currently underway to introduce subscriber express service between Christiansburg and Blacksburg for commuters in January 2011.

Fixed route service in Blacksburg has historically been operated with 35-foot and 40-foot diesel buses, but beginning in 2010, standard and 60-foot articulated diesel-electric hybrid buses have been added to the fleet. BT ACCESS and Christiansburg service operate mostly with body-on-chassis buses.

1.2 Governance

As a department of the Town of Blacksburg, BT is administrated within the town's Council-Manager form of government. The seven-member Blacksburg Town Council is led by a Mayor and elected to staggered four-year terms. It is the legislative body of the Blacksburg local government, adopting all ordinances and resolutions and establishing the general policies of the Town. The Council also sets the real estate tax rate and approves and adopts the annual operating budget.

The Council appoints a Town Manager to act as administrative head of the Town. The Town Manager serves at the pleasure of Council, carries out policies, directs business procedures, and has the power of appointment and removal of all Town employees except the Town Attorney and the Town Clerk, who are also appointed by the Council.

Duties and responsibilities of the Town Manager include preparation, submittal, and administration of the capital and operating budgets; advising the Council on the affairs of the Town; handling citizens' complaints; maintenance of all personnel records; enforcement of the Town Charter and laws of the Town; and direction and supervision of all departments, including Blacksburg Transit.

The following Council members and Town Manager currently govern BT's operations:

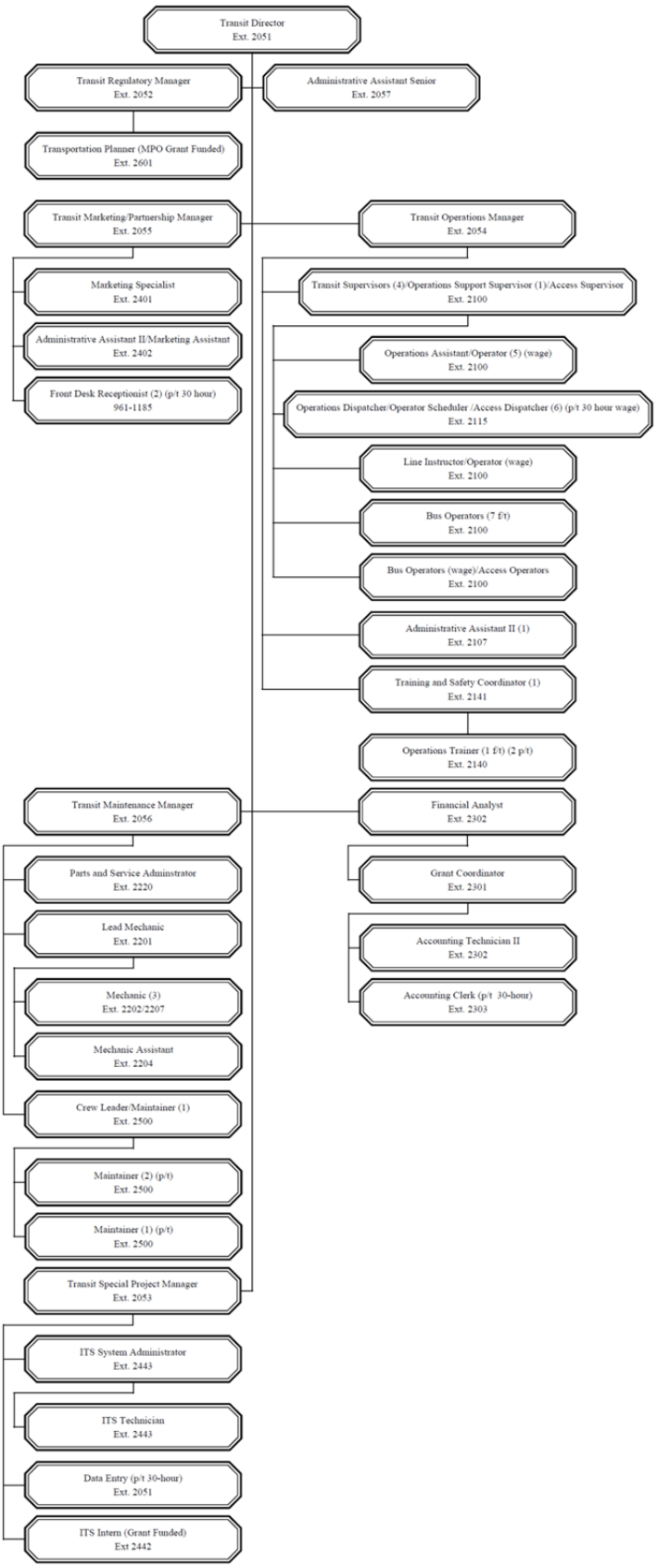
2010 Blacksburg Town Council

Mayor Ron Rordam
Vice Mayor Susan Anderson
Council Member John Bush
Council Member Krisha Chachra
Council Member Donald Langrehr
Council Member Cecile Newcomb
Council Member Leslie Hager-Smith
Town Manager Marc Verneil

1.3 Organizational Structure

BT is managed by a Transit Director and five Managers overseeing 29 full-time and 12 part-time employees, along with 7 full-time and 145 part-time bus operators. As shown in Figure 1-1, the organizational chart is organized into roughly six departments – Operations, Maintenance, Finance, Regulatory, ITS, and Marketing.

Figure 1-1. BT Organizational Chart



Key personnel currently heading BT's various departments are:

Rebecca Martin , Director
Debbie Swetnam, Regulatory Manager
Ken Tucker, Marketing Manager
Tim Witten, Special Projects Manager
Harland Brown, Operations Manager
Mike Price, Maintenance Manager
Wayde Kass, Financial Analyst

1.4 Transit Services Provided and Areas Served

BT provides fixed-route, demand response, and special events services within the Blacksburg-Christiansburg-Montgomery urbanized area. The department's service area is 28 square miles and as of 2000 had a population of 56,260.

Within Blacksburg, BT operates at two different service levels throughout the year, Enhanced Service and Regular Service, which roughly track Virginia Tech's academic calendar. In general, Enhanced Service operates from the end of August until mid-December, and again from mid-January until the beginning of May. Regular Service is operated during the summer and fall, winter, and spring breaks. Local funding for Blacksburg service is primarily paid for by Virginia Tech.

Christiansburg service is provided through an agreement with the Town of Christiansburg and is operated at the same level year-round, except for the November-December holiday season, where hours are extended on some days. Table 1-1 presents the daily hours of operation for each service. Note that BT runs no service on New Year's Day, Memorial Day, Independence Day, Thanksgiving, and Christmas.

Table 1-1. General Hours of Operation

Day of Week	Blacksburg		Christiansburg
	Enhanced Service	Regular Service	
Mon-Thu	7:00 am - 12:45 am	7:00 am - 10:15 pm	7:00 am - 6:00 pm
Friday	7:00 am - 2:45 am	7:00 am - 10:15 pm	7:00 am - 10:00 pm
Saturday	9:30 am - 2:45 am	9:30 am - 7:15 pm	8:00 am - 11:00 pm
Sunday	11:30 am - 11:30 pm	11:30 am - 7:15 pm	No Service

Blacksburg Enhanced Service is operated over eleven fixed routes on weekdays. All but the Two Town Trolley, which provides hourly service between Blacksburg and Christiansburg, operate every 10-20 minutes in the day. Eight routes continue in the weekday evenings, with frequencies dropping to every 30-60 minutes. Seven routes provide service on late night Friday and all day Saturday and Sunday. When Regular Service is in place, seven Blacksburg routes operate on weekdays and five continue on weekends. No late night Regular Service is offered.

In Christiansburg, the Explorer deviated fixed route operates Monday through Friday, the Shopper Express fixed route Friday and Saturday, and the Go Anywhere demand response route Monday through Saturday. Go Anywhere serves the entire Town of Christiansburg. Route frequencies and hours of operation during Enhanced Service (Table 1-2) and Regular Service (Table 1-3) are shown below. Figures 1-2 through 1-4 depict alignments for all fixed routes.

Table 1-2. Enhanced Service Hours and Frequency by Route

Route	Route Name	Weekday			Saturday			Sunday	
		Span of Service	Day	Evening	Span of Service	Day	Evening	Span of Service	All Day
Blacksburg									
TC	Tom's Creek	6:55 am - 12:30 am*	15	30	9:30 am - 2:30 am	30	30	11:30 am - 11:00 pm	30
UC	University City Blvd	7:00 am - 10:15 pm*	10	15/30	9:30 am - 2:30 am	30	30	11:30 am - 11:00 pm	30
PR	Progress Street	7:05 am - 6:35 pm	10	--	--	--	--	--	--
PH	Patrick Henry	7:00 am - 6:45 pm	15	--	--	--	--	--	--
UM	U-Mall Shuttle	9:00 am - 8:55 pm	15	15/--	--	--	--	--	--
HX	Hokie Express	7:00 am - 12:30 am*	15	30	10:30 am - 2:30 am	30/--	30	11:30 am - 11:00 pm	30
MS	Main Street	6:55 am - 12:15 am*	20	30/60	9:30 am - 2:30 am	60	30/60	11:30 am - 11:15 pm	60
HW	Hethwood	7:00 am - 12:30 am*	12	30/60	9:30 am - 2:30 am	60	60/30	11:30am - 10:50 pm	60
HD	Harding	7:00 am - 12:00 am*	15/30	60	9:50 am - 2:00 am	60	60	11:50 am - 11:00 pm	60
CR	CRC Shuttle	7:15 am - 9:45 pm	15	30	--	--	--	--	--
TT	Two Town Trolley	12:15 pm - 5:55 pm*	60	--	10:15 am - 12:45 am	60	60	12:15 pm - 5:55 pm	60
Christiansburg									
EX	Explorer	7:00 am - 5:00 pm	30	--	--	--	--	--	--
SH	Shopper	11:45 am - 6:15 pm (Fri)	30	--	11:45 am - 6:15 pm	30	--	--	--
GA	Go Anywhere	7:00 am - 6:00 pm*	on demand		8:00 am - 11:00 pm	on demand		--	--

* Friday service runs as late as Saturday service

Table 1-3. Regular Service Hours and Frequency by Route

Route	Route Name	Weekday			Saturday			Sunday	
		Span of Service	Day	Evening	Span of Service	Day	Evening	Span of Service	All Day
Blacksburg									
TC	Tom's Creek	7:00 am - 10:00 pm	30	30	9:30 am - 7:00 pm	30	--	11:30 am - 7:00 pm	30
UC	University City Blvd	7:00 am - 6:00 pm	30	--	--	--	--	--	--
MS	Main Street	7:00 am - 10:15 pm	30	30	9:30 am - 7:00 pm	60	--	11:30 am - 7:00 pm	60
HW	Hethwood	7:15 am - 9:50 pm	30	60	9:30 am - 6:50 pm	60	--	11:30 am - 6:50 pm	60
HD	Harding	7:00 am - 10:00 pm	30	60	9:50 am - 7:00 pm	60	--	11:50 am - 7:00 pm	60
CR	CRC/Hospital	7:10 am - 6:20 pm	60	--	--	--	--	--	--
TT	Two Town Trolley	12:15 pm - 5:55 pm	60	--	10:15 am - 5:45 pm	60	--	12:15 pm - 5:55 pm	60
Christiansburg									
EX	Explorer	7:00 am - 5:00 pm	30	--	--	--	--	--	--
SH	Shopper	11:45 am - 6:15 pm (Fri)	30	--	11:45 am - 6:15 pm	30	--	--	--
GA	Go Anywhere	7:00 am - 6:00 pm*	on demand		8:00 am - 11:00 pm	on demand		--	--

* Friday service runs as late as Saturday service

Figure 1-2. BT Blacksburg System Map

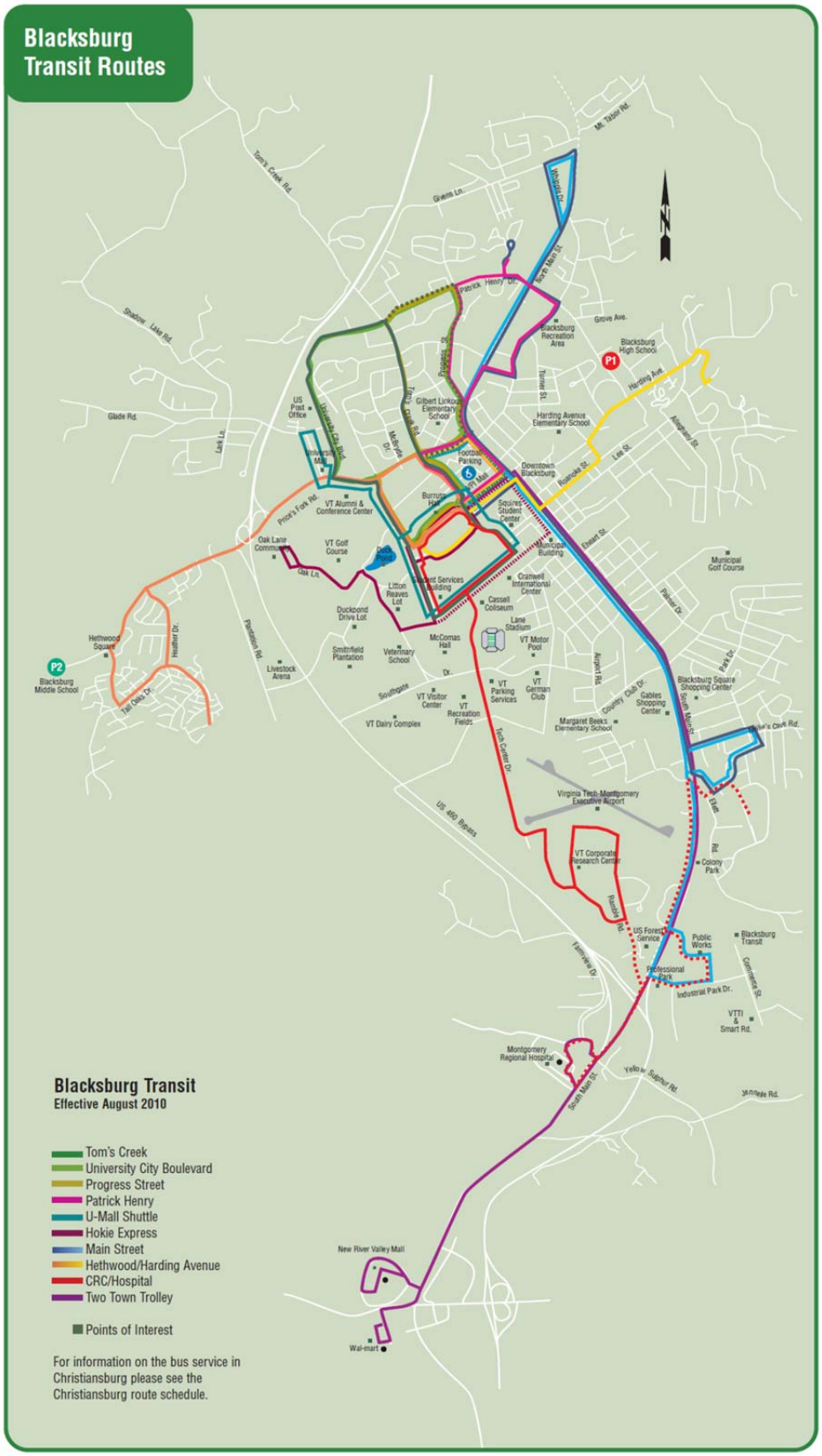


Figure 1-3. BT Christiansburg Explorer Route

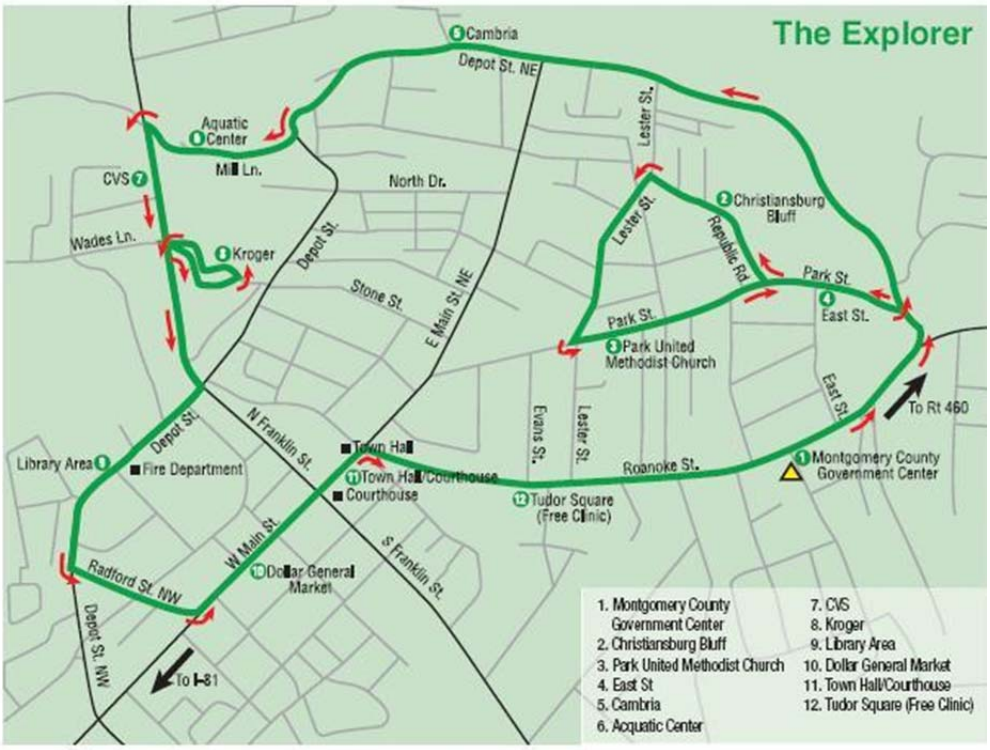
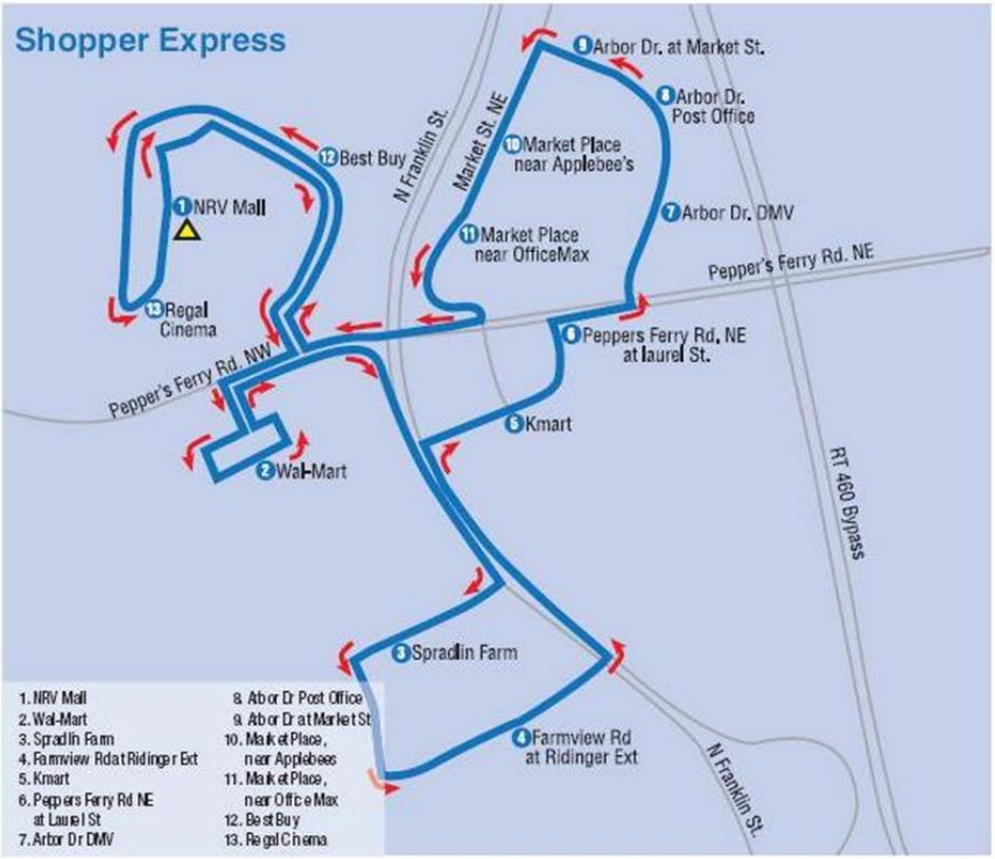


Figure 1-4. BT Christiansburg Shopper Express Route



During snow and ice accumulations, several routes are deviated to safer traffic patterns, necessitating the closure of some stops. These include: Main Street, Toms Creek, University City, Harding, and CRC/Hospital. Once Snow Routes have been initiated, notifications are immediately posted on the bus' destination sign, the BT website, and the Blacksburg Alert Service, an email alert service provided by the Town. Snow Routes continue to operate until all routes and major bus stops have been cleared and inspected.

Within the town limits of Blacksburg, fixed route service is complemented by ADA paratransit service, BT ACCESS, for qualified individuals who cannot complete their trip on the fixed route system. The service is available for persons with a temporary or permanent disability, as determined through an application process. Any person traveling to Blacksburg with a valid ADA Eligibility Card from another locality may also ride BT ACCESS. Within the town limits of Christiansburg, paratransit service is handled with the Go Anywhere demand response route.

BT also runs shuttle services for numerous Special Events throughout the year. These include:

- VT Orientation Shuttles
- VT Commencement Housing Shuttles
- VT Special Needs Graduation Shuttles
- Town of Blacksburg Independence Day Celebration Shuttles
- VT Football Game Day Service
- VT Basketball Game Shuttles

1.5 Fare Structure

BT accepts single-ride cash fares, prepaid monthly passes, and several forms of prepaid identification in order to ride fixed route services. Table 1-4 outlines the various fare classes.

Table 1-4. BT Fixed Route Fare Structure

Fare Class	Single Fare*	1 Month Pass	6 Month Pass
Adult	$0.50	$8.00	$37.50
Ages 3-17	$0.25^	$4.00	$18.75
Less than 3 years	Free	Free	Free
Ages 65 and over, persons with disabilities, & Medicare card holders	$0.25	$4.00	$18.75
Virginia Tech Students, Faculty, & Staff	Pre-paid	Pre-paid	Pre-paid
VCOM Students	Pre-paid	Pre-paid	Pre-paid
Town of Blacksburg employees	Pre-paid	Pre-paid	Pre-paid
Transfers (valid one hour)	Free	Free	Free

* Single fare is valid all day on the Explorer route
^ $0.50 for Christiansburg route service

On Virginia Tech Football Game Days, the regular fare structure is suspended on Blacksburg routes. No monthly passes are accepted on these days, only single ride fares and some prepaid fare classes. Table 1-5 outlines the fare structure on Football Game Days.

Table 1-5. BT Football Game Day Fare Structure

Time Period	Single Fare
Beginning of service until 3 hours prior to kickoff	$0.50
3 hours prior to kickoff until the beginning of halftime	$5.00
3 hour period beginning at halftime	Free
After the 3 hour period until the end of service	$0.50
Virginia Tech Students, Faculty, & Staff	Pre-paid*

*Does not include special game day shuttles

1.6 Fleet

BT owns and maintains a total vehicle fleet that includes 44 standard and articulated buses, 10 body-on-chassis ("cutaway") buses, and 16 support vehicles (these include pending delivery of 4 cutaways and 2 support vehicles). About 32 fixed route vehicles and 7 paratransit vehicles operate in maximum service. The vast majority of revenue vehicles are 40-foot diesel buses, however BT has begun in the last year to transition to diesel-electric hybrids, including the purchase of its first two articulated buses (Figure 1-5).

Figure 1-5. BT's Diesel-Electric Hybrid Articulated Bus

Useful service life for BT's buses is 12 years, and for cutaways, vans, and support vehicles is 4-5 years. As vehicles available for revenue service are aged from nine to zero years, fleet replacement will

continue over the length of the TDP. Tables 1-6 through 1-8 detail the breakdown of vehicles by type of service. Vehicles purchased in the current fiscal year and pending delivery are in italics.

Table 1-6. BT Fixed Route Vehicle Fleet

Year	Series	Make/Model	Type	Fuel Type	Number of Vehicles
2007	500	Chevy Supreme	Body-on-Chassis	Diesel	2
2002	4200	New Flyer	30' Standard Bus	Diesel	2
2001	3100	New Flyer	35' Standard Bus	Diesel	6
2002	5200	New Flyer	35' Standard Bus	Diesel	2
2007	2700	New Flyer	35' Standard Bus	Diesel	1
2002	5210	New Flyer	40' Standard Bus	Diesel	8
2007	2710	New Flyer	40' Standard Bus	Diesel	2
2009	1910/20	New Flyer	40' Standard Bus	Diesel	14
2010	6010	New Flyer	40' Standard Bus	Diesel-Electric	7
2010	6020	New Flyer	60' Articulated Bus	Diesel-Electric	2
TOTAL FIXED ROUTE FLEET					**46**

Table 1-7. BT Paratransit Vehicle Fleet

Year	Series	Make/Model	Type	Fuel Type	Number of Vehicles
2001	70	Dodge	Van	Gasoline	1
2006	50	Ford	Body-on-Chassis	Diesel	1
2009	50	Ford	Raised Roof Van	Diesel	1
2009	50	Ford	Body-on-Chassis	Diesel	2
2007	500	Chevy Supreme	Body-on-Chassis	Diesel	1
2010	*20*	*Ford Supreme*	*Body-on-Chassis*	*Diesel*	*4*
TOTAL PARATRANSIT FLEET					**10**

Table 1-8. BT Non-Revenue Vehicle Fleet

Year	Series	Make/Model	Type	Fuel Type	Number of Vehicles
2004	80	GMC Savannah	Van	Gasoline	1
2004	90	Ford Escape	SUV	Gasoline	1
2005	80	Ford Explorer	SUV	Gasoline	1
2006	80	Ford Explorer	SUV	Gasoline	1
2006	90	Ford Explorer	SUV	Gasoline	1
2008	60	Ford Explorer	SUV	Gasoline	3
2010	90	Ford Explorer	SUV	Gasoline	2
2008	80	Ford F450	Truck	Diesel	1
2009	80	Ford F350	Truck	Diesel	1
2011	*80*	*Ford*	*Truck*	*Diesel*	*2*
TOTAL NON-REVENUE FLEET					**14**

1.7 Existing Facilities

The whole of BT's administrative, operations, and maintenance functions are housed at a transit facility located at 2800 Commerce Street in the Blacksburg Industrial Park. The original 60,251 square-foot facility was built in 1991 and expanded to 94,655 square-feet in 2006. The updated facility contains:

- Administrative offices, including a reception area, manager's suite, and conference area;
- Daily operations areas, including dispatch center, operator's lounge and training facilities;
- Maintenance garage, including 5 maintenance bays, 3 above-ground bus lifts, 1 cutaway lift, 2 pits, and a wash bay; and
- Indoor storage garage with 50 vehicle bays for overnight parking.

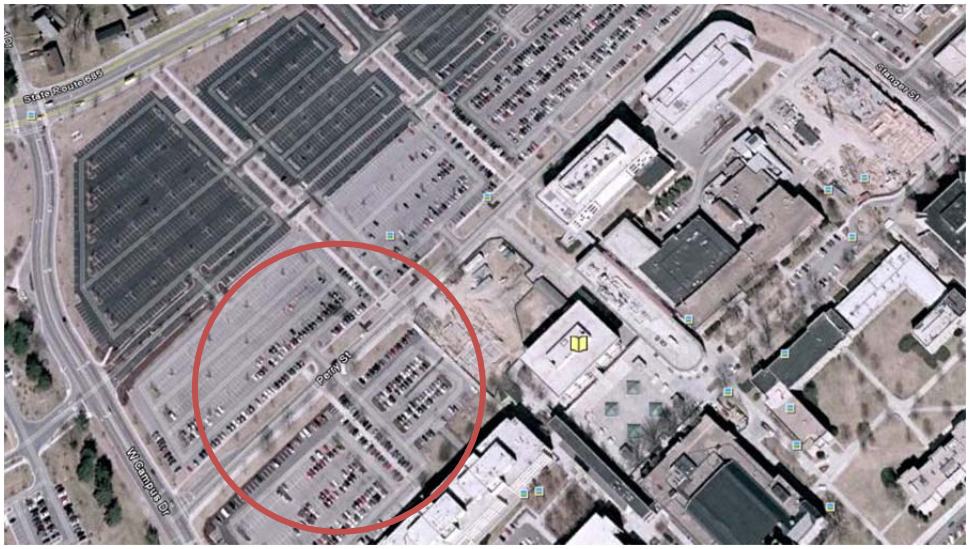
Diesel and gasoline fueling facilities are located on the property. Figure 1-6 provides an aerial view of the 2800 Commerce Street facility.

Figure 1-6. BT Administrative and Operations Facility

BT maintains a network of about 253 transit stops on its routes. All stops are identified with a small round BT sign. Bus shelters and benches are located at approximately 41 key stops through the system, with a handful of additional stops having benches only. About half of the shelters were installed and are maintained by private developers, mostly in the larger apartment complexes in Blacksburg. BT has developed a series of policies guiding bus stop and shelter placement and specifications.

Conceptual design is currently underway for a Multimodal Transfer Facility that would serve as the hub of BT's operations on the Virginia Tech campus. Initial plans for the facility call for a two-story facility with passenger services and 14-16 bus bays at ground level and multipurpose space on the second level. Figure 1-7 shows the proposed general location for this facility along Perry Street northeast of West Campus Drive.

Figure 1-7. Proposed Site for BT Multimodal Transfer Facility



1.8 Transit Security Program

A Facility Emergency Plan is in place which outlines staff procedures and responsibilities in the event of fire, bomb, accident, criminal behavior, or other suspicious or dangerous activity at the BT administrative and operations facility or on one of its vehicles. The plan includes evacuation and notification procedures and emergency contact information and protocols.

Incidents and activity on the road that threaten BT bus operators and riders are required to be radioed in to the dispatch center or a supervisor, who then can advise appropriate action. Depending on the vehicle's location, either Blacksburg Police, Virginia Tech Police, or Christiansburg Police will be called upon to assist.

Supplementing the Facility Emergency Plan is a Homeland Security Policy, which outlines department protocols to follow at each security threat level designated by the Department of Homeland Security Advisory System. These protocols are designed to be in place regardless of an actual incident or threat to BT.

1.9 Public Outreach

BT has instituted a wide range of programs and procedures in order to communicate with the public about the services offered and any potential changes to that service. The most formal of these, the BT Public Participation Policy, defines that a public hearing shall occur for any service change (increase or decrease) affecting more than 5 percent of a route's service hours, service miles, or stop locations.

Notices for such a hearing will be placed on all BT buses, the BT website, *Blacksburg Alert*, at the Town of Blacksburg Municipal Building, and through the Montgomery County Public Information Office. In addition, a notice will be published for two consecutive days in local newspapers of general circulation. Notification will also be directed to those parties who are deemed to be directly affected by the proposed action.

In addition to this formal policy, BT proactively engages the public throughout the year to promote existing and new services or initiatives. These activities include participation in several annual community events, including VT Freshman and Transfer Orientation, the VT Off-Campus Housing Fairs, Christiansburg community events, and Sustainability Week activities.

Unveiling of the new BT hybrid electric bus, Sep 23, 2010

Outreach also consists of providing content and notices for release in several publications and media outlets, such as VT football and basketball game day transit guides sent in all season ticket packages, newspaper and radio ads and press releases, newsletters at apartments, and social media networks like Facebook and Twitter.

Finally, BT enthusiastically reaches out to various community groups (such as senior and disabled groups, low income residents, and major employers) to understand their transportation needs and assess the viability of meeting those needs through public transit. These activities consist of informational meetings, focus groups, survey efforts, and more.

Chapter 2 Goals, Objectives, and Standards

Blacksburg Transit is guided by a wide range of goals and objectives both internal to BT and external to the various governmental authorities for whose constituents BT is providing service. While these guiding statements provide a firm basis for the expectations and ideals of BT, a review of these documents indicate that the quantitative benchmarks and detailed standards required to achieve these goals is at times deficient. This section aims to outline the various goals and standards that have been previously identified and supplement them with measures that can insure their implementation through the TDP process.

2.1 Blacksburg Transit Goals and Objectives

BT is guided by a mission statement that identifies the ultimate goal of the department:

> ***Blacksburg Transit provides safe, courteous, reliable, accessible, and affordable public transportation to the citizens of the Town of Blacksburg, Virginia Tech, Town of Christiansburg and the partnering communities within the New River Valley.***

This mission is further elaborated in BT's commitments and guiding principles:

BT's Mission Statement greets employees and visitors at the operations facility

Commitments

- We are committed to "Safety, Courtesy, Reliability and the Environment" – this is the foundation of our business.
- We are committed to seek innovative solutions to improve service to meet the needs of our region.
- We are committed to seek financially responsible and creative solutions to meet our funding challenges.

Guiding Principles

- All activities at BT will be directed by our mission statement, commitments, guiding principles, and annual goals.
- To be a more effective and efficient organization, all employees must maintain an open and receptive attitude in which change can be planned and implemented.
- Every team member is important and we should use every opportunity to remind each other of the valuable service we provide.
- We are a team and "together we can make a difference".

- We should always observe both professional and personal conduct standards when interacting with other co-workers

In order to create the environment in which this mission can be executed successfully, BT has committed to a series of core strategies and beliefs for their operations:

Strategies

- All employees must be empowered to accomplish the organization's goals and objectives.
- The courage to speak out, engage in constructive dialogue, and listen is the responsibility of all employees; this will make the organization stronger.
- Professionalism is expected of all employees and management will lead by example.
- Management will constantly seek opportunities to keep all employees highly motivated.

Beliefs

- "Inclusiveness vs. exclusiveness" in projects and day-to-day operations.
- Open lines of communication throughout the organization, irrespective of job titles, job functions, or job levels.
- Honest evaluation of projects based on analysis.
- Solutions are sought when situations or opportunities present themselves.
- Willingness and desire to look at issues with a 360-degree view.
- Maintaining a positive tone when dealing with others.

By establishing an open and inclusive environment with an empowered workforce, BT can more readily meet its overarching commitment of providing public transportation with a focus on safety, courtesy, reliability and the environment. In order to meet this mission, BT has identified the following objectives for the current fiscal year 2010-11:

FY 2010-11 Objectives

- Identify new and innovative funding sources.
- Explore cost-effective, environmentally friendly solutions to the public transportation needs in the region.
- Continue to increase ridership, potentially carrying up to 3.5 million passengers.
- Monitor and modify Christiansburg service as needed.
- Seek innovative partnership revenue sources.
- Continue High Performance Organization (HPO) training for staff.
- Seek funding for an updated Cost Allocation Plan, required by the state and FTA.
- Utilize state funds to conduct a Transportation Development Plan (TDP).
- Initiate service expansion in Blacksburg to help alleviate overcrowding and pass-bys on identified routes.
- Conduct a formal risk assessment of the facility and operations.
- Continue work on long range planning for the region, including the Blacksburg Downtown Trolley, the Warm Hearth Feasibility Study in Montgomery County, and expanded service in the New River Valley.

2.2 Other Governmental Goals and Objectives

As a department within the Town of Blacksburg, located within Montgomery County and the Blacksburg-Christiansburg-Montgomery MPO, BT coordinates input from a variety of governmental bodies as to the goals and objectives for the provision of public transportation in the local area. For the most part, these external aims are in tandem with BT's own commitments, often elaborating on the specifics of service offerings and operational strategies that BT should be pursuing. A review of some of these plans is below.

Blacksburg 2046 Comprehensive Plan

The Transportation Chapter of the Town's Comprehensive Plan provides the most detailed list of goals and objectives for BT, outlining the following objectives and action strategies related to public transit:

A. Encourage the use of public transportation as part of the Town's environmental management strategy.
   1. Comply with all federal and state environmental regulations and guidelines by using best available technologies and other innovative systems.
   2. Expand and improve Blacksburg Transit service in response to community growth, enhance transit accessibility and convenience; lower parking demand, energy use, and air pollution by reducing the traffic on local roads.
   3. Continue with Blacksburg Transit's investigation of alternative fuel vehicles and fuel, employing a cost and benefit perspective.
   4. Conduct a public awareness campaign to educate the community on the positive environmental impact from using mass transit.
   5. Research and implement new policies or infrastructure as needed in the Blacksburg Transit maintenance department (garage) to make the workplace environmentally friendly.
   6. Partner with and/or participate in Virginia Tech Technology Institute (VTTI) research program where the emissions from the Blacksburg Transit fleet will be tested to better understand the environmental impact of bus emissions.

B. Utilize public transportation to stimulate economic development in the community, including telecommunications.
   1. Use the availability of public transportation as a tool to attract new businesses and aid existing local businesses in employee retention.
   2. Maintain a visible presence in the community via Blacksburg Transit amenities.
   3. Review and amend the Town Code to ensure Town's Street Standards provide areas of access for Blacksburg Transit stops and shelters.
   4. Continue to work with area developers and community businesses to ensure public transportation accessibility is included in their plans.
   5. Continue to upgrade Blacksburg Transit services with the latest technology, including the completion of the Automatic Vehicle Locator project.
   6. Upgrade the Blacksburg Transit fleet to provide wireless internet access.
   7. Participate cooperatively with Virginia Tech in testing and implementing new technologies for vehicles, equipment, or communications.

C. Provide public transportation that is committed to safety, courtesy, and the schedule.
   1. Operate the Blacksburg Transit system in a manner that stresses safety, courtesy, on time performance, and well-maintained buses.
   2. Develop real-time dispatching to allow the exact location of each bus to be known to Blacksburg Transit and utilize it as a customer service tool.
   3. Provide service that is sensitive to the needs of a diverse community.
   4. Implement a system to maintain and upgrade facilities at all bus stops for accessibility and amenities.
   5. Continue training Blacksburg Transit operators in the Smith System of safe driving, as well as various other safety training courses.
   6. Coordinate the provision of transit service with area social service agencies.
D. Coordinate land use decisions with existing and planned alternative transportation services.
   1. Employ site planning and design criteria to make public and private development supportive of Blacksburg's alternative transportation system.
   2. Review and amend the Subdivision Ordinance to ensure that all new road construction standards meet the requirements for use by Blacksburg Transit buses.
   3. Expand Blacksburg Transit access to all high-density residential developments, mixed use developments, affordable housing developments, commercial centers, research parks, and industrial parks.
   4. Explore the provision of trolley service along Main Street through Downtown between the Patrick Henry Drive area and the South Main Street area.
E. Help to coordinate the provision of public transportation in the New River Valley.
   1. Improve the regional accessibility of Blacksburg and integrate bus, rail, and air modes of transportation into Town's alternative transportation system.
   2. Support the MPO's 2030 Transportation Plan to enhance options for intercity travel.
      a. Re-establish inter-city bus service.
      b. Support the implementation of the proposed TransDominion passenger rail service.
      c. Provide transit service from the Blacksburg/Christiansburg/Montgomery MPO area and adjacent jurisdictions to the Christiansburg train station to accommodate riders of the proposed TransDominion rail service.
      d. Expand Blacksburg Transit service into the Blacksburg/Christiansburg/Montgomery MPO area and adjacent jurisdictions with service along main arterial streets, making stops at large commercial areas, at local and county facilities, and at high-density residential areas.
      e. Investigate transit options between Blacksburg and Radford.
      f. Re-route Blacksburg Transit service around and to the Virginia Tech/Montgomery Executive Airport as the runway is expanded.
      g. Construct a Multi-Modal Transportation Center to include a parking garage and a bus transfer facility.
F. Provide an effective and efficient public transportation service to the community.
   1. Monitor Blacksburg Transit performance by completing self-evaluations of the services provided to identify needs and develop creative solutions.
   2. Complete a Blacksburg Transit Comprehensive Operational Analysis (COA) every five (5) years with annual updates to the Transportation Development Plan (TDP).

3. Utilize the most advanced technology to improve services and communication for citizens/customers on Blacksburg Transit.

G. Operate the transit system in a cost-effective, fiscally sound manner that is well supported by federal and state grants.
   1. Expand bus service when demand is demonstrated or projected, and when supported by an appropriate revenue source.
   2. Develop subscription service to target areas, including neighborhoods, where service can be financially supported.
   3. Coordinate local government vehicle maintenance services with other regional mass transit providers.
   4. Investigate alternative funding sources to expand the fleet of buses, the maintenance of assets such as state-of-the-art buses and quality parts, and mechanical expertise.
   5. Consider new ways to provide current and expanded service that is less expensive.
   6. Address future funding gaps in Blacksburg Transit operating costs.

H. Pursue public policies that support public transportation as an alternative source of mobility, and a primary solution to road congestion, parking demand, and air pollution.
   1. Educate potential park-and-ride participants and the general public as to the benefits and amenities of Blacksburg Transit and its services.
   2. Develop satellite park-and-ride facilities with bus service to reduce traffic congestion in the region.
   3. Support Rideshare/Park-And-Ride Improvements and marketing education campaigns with bus service to link these lots to Blacksburg's alternative transportation system.
   4. Conduct an Alternative Transportation Awareness campaign that includes Paratransit options.
   5. Create a new Alternative Transportation Map for Blacksburg that illustrates existing bike paths, sidewalks, greenways, and Blacksburg Transit Routes.
   6. Continue to expand the Blacksburg Transit and Virginia Tech Ridesharing program, a web-based service that matches car pool candidates sharing similar schedules.
   7. Encourage two-way commercial bus service between Town and other localities, such as New River Community College.
   8. Continue support and promotion of the bus service between Blacksburg and Roanoke.
   9. Research the opportunities to provide high-speed passenger connections between the New River Valley and Roanoke Valley that would be connected to Blacksburg's Alternative Transportation System.
   10. Conduct a public awareness campaign with Virginia Tech to promote Blacksburg's alternative transportation system.

Montgomery County 2025 Plan

The Montgomery County 2025 Plan strives for the region to "create a better mass transit system (rail, bus, trolley, carpool) that allows for mobility of all citizens" and lists the following goals for mass transit in the County, most of them similar to those established by BT and the Town:

TRN 3.1 Existing Service: To maintain and enhance the existing Blacksburg Transit (BT) transit service in order to maximize safety and efficiency while minimizing environmental degradation.

TRN 3.1.1 Efficient Transit: Encourage BT to provide more efficient and well-planned service routes, with "safe" bus stops and "safe" access to those bus stops, including: 1) well-planned service routes to decrease time spent waiting for the bus; 2) lit and well marked bus stops; and 3) and sidewalks or walkways/ bikeways to access bus stops safely rather than walking on the shoulder of a busy road.

TRN 3.1.2 Transit Service Extension: Request that the Metropolitan Planning Organization (MPO) evaluate mass transit extensions as part of the 2030 long-range transportation plan including the extension of the Two Town Trolley service between Blacksburg and Christiansburg to include Radford.

TRN 3.2 Future Service: Encourage the provision of a mass transit service in commercial areas and between jurisdictions (Blacksburg, Christiansburg, Radford) and between MSAs (Blacksburg and Roanoke) to alleviate congestion and decrease the number of personal car trips.

TRN 3.2.1 Micro-shuttle: Ask the Metropolitan Planning Organization (MPO) to evaluate micro-shuttle service to area businesses within the core shopping area. This study would evaluate cost, demand, efficiency, and transit route tie-ins. A shuttle service would simply be a small-localized loop within the core shopping area, whereas the transit relay would serve a larger area. Possible funding sources could be businesses that would have a shuttle stop in front of their store, the jurisdictions served by the commercial area, and Chamber of Commerce. Ideally, the micro-shuttle would be operated by BT and would tie into existing bus routes.

TRN 3.2.2 Valley Metro Service: Establish clear benchmarks to measure the success or failure of Valley Metro's demonstration project for express bus service between Blacksburg and downtown Roanoke.

TRN 3.2.3 Alternate Transit Transfer Site: Encourage Blacksburg Transit and Virginia Tech to evaluate an alternative to the existing transit transfer area on campus at Burruss Hall. While Burruss Hall serves the Virginia Tech populatio well, it does not purposefully serve other users of the BT transit system. The idea is to make mass transit more usable by all citizens; therefore finding an additional off-campus transit transfer site would be very beneficial.

TRN 3.3 Villages and Public Transportation: Evaluate the provision of public transportation between the six villages (Belview, Elliston-Lafayette, Plum Creek, Prices Fork, Riner, and Shawsville) and the urban centers (Blacksburg, Christiansburg, and Radford).

Blacksburg-Christiansburg-Montgomery MPO 2035 Long RangeTransportation Plan

At present, the MPO's 2035 LRTP is still in draft form, however, it has listed some specific goals for public transit in the MPO area that relate to BT's delivery of service. These include:

- Construct Multi-Modal Transportation Center on Perry Street on the Virginia Tech campus to accommodate transfers between multiple bus services, taxis, limousines, bicycles, and pedestrians, and connect to adjacent parking.
- Study expansion of transit services into the Blacksburg/Christiansburg/ Montgomery MPO area and adjacent jurisdictions with service along main arterial streets, making stops at large commercial areas, at local and county facilities, and central downtown locations.

- Provide transit service from the Blacksburg/Christiansburg/Montgomery MPO area and adjacent jurisdictions to the Christiansburg train station to accommodate riders of the proposed TransDominion rail service.
- Study the potential expansion of cost-effective paratransit service through contracting local taxi services.

Additional Local Plans

Other plans across the New River Valley which address goals and objectives for either BT or transit in general include:

- Town of Christiansburg Comprehensive Plan (2003) – establishes goals to "Promote and encourage the use of the Two Town Trolley between Blacksburg and Christiansburg"; "Support the expansion of bus services throughout and around the Town"; "Continue support of existing Blacksburg Transit services and explore the potential of expanded routes and schedules"; "Provide adequate and accessible bus shelters with benches"; and "Develop and support an effective park and ride program from commuting citizens of the Town."
- Virginia Tech Master Plan Update 2006-2016 and Virginia Tech Master Plan Amendment 2009 – address the need to "plan transportation and infrastructure goals to anticipate growth rather than react to demand". As such, the master plan specifies: "With roadway realignments it is recommended that the hub for Blacksburg transit be moved from the Drill Field at Burruss Hall to a transit center on Perry Street north of the academic core and that bus traffic be removed from the Drill Field as part of this initiative. Other minor route reconfigurations will be necessary in association with road realignments." Transit should also support goals for a walkable campus and the consolidation of parking into up to six parking structures located in perimeter areas.
- New River Valley PDC Human Service Mobility Plan (2008) and Employment Mobility Study (2009) – these plans identify and quantify public transportation needs across the New River Valley to access human services and employment, respectively. Both identify BT, among other providers, as a potential operator for some of these services.
- City of Radford Comprehensive Plan Update (2001), Radford 2020 Transportation Plan (2001), and Transit Service Plan for City of Radford/Radford University (2009) – all three plans describe an interest in intra-city transportation service in partnership with regional transportation providers, specifically an "interest in extending the Two Town Trolley now run by Blacksburg Transit between Blacksburg and Christiansburg to the City of Radford. This would tie Radford University with Virginia Tech and would provide a viable transportation alternative for those living in the Radford and Fairlawn communities." The transit service plan proposes such a route connecting Radford to Christiansburg and Blacksburg.

2.3 Performance Standards

BT does not currently utilize a comprehensive set of performance standards in order to address the efficiency and effectiveness of service or measure actual outcomes against the department's goals and objectives. Blacksburg service is reviewed quarterly with Virginia Tech in a report measuring historic systemwide ridership data and riders per revenue hour by time of day and day of week for each route.

Similarly, Christiansburg ridership data is reviewed monthly with the Town of Christiansburg. These reports, as well as the partner's goals for service, tend to drive any major changes in operation.

A wide-ranging set of service guidelines and performance standards was proposed as part of BT's last overall service evaluation, the *2006 Blacksburg Transit Comprehensive Operational Analysis*. While many of the guidelines for service are informally in place, these measures should form the initial development of a more complete and formal performance review than currently exists. Proposed BT Service Guidelines from the 2006 COA are:

Overall Fixed Route Design

The Blacksburg Transit fixed route system should have elements that are consistent throughout the route network. This consistency is important for the public to understand how the system can be used. The following are basic parameters for the design of the system:

- Routes should be separated into functional categories. The level of service on individual routes will vary by their function.
- Blacksburg Transit routes should be divided into two categories for the purpose of determining route design and performance standards: Fixed Routes and Community Circulator services.
- Routes should be predominantly bi-directional in nature. Large one-way loops, with over 30 minutes running time, should be avoided if possible.
- Travel times between major destinations should be minimized by providing some routes that operate on the fastest and most direct route, and by scheduling timed transfers between routes to minimize wait times.

Operating Environment

Fixed routes should operate primarily along major arterials but also on some residential collector streets that are suitable for operation of standard buses, and in some cases limited access highways. The use of smaller sized buses may be considered on certain routes that circulate through certain neighborhoods.

Service Area

Service coverage should be defined as the area within ¼-mile walking distance of the nearest bus stop. BT shall serve to the extent feasible, all major employers, hospitals, schools, and public housing within the Blacksburg urban area.

Passenger Stops

In order to provide a safe environment for passenger boarding and alighting, all bus stops will have signs indicating their location. Efforts should be made to include route and schedule information at bus stops. The spacing of bus stops will vary by location, but as a general rule, there should be bus stops no closer than every 0.2 miles.

Hours of Operation

The hours of operation should be based on demand and relate to the route's function. For Blacksburg routes during Enhanced Service, the maximum span of service should be from 7:00 a.m. to 12:45 a.m. from Monday to Thursday, 7:00 a.m. to 2:45 a.m. on Fridays, 9:30 a.m. to 2:45 a.m. on Saturdays, and

from 11:30 a.m. to 11:30 p.m. on Sundays. During Regular Service, the maximum span of service should be 7:00 a.m. to 10:15 p.m. on weekdays, 9:30 a.m. to 7:15 p.m. on Saturdays, and 11:30 a.m. to 7:15 p.m. on Sundays. Individual routes may operate more limited hours or days as demand warrants.

Community circulator and other non-campus oriented routes should be operated during consistent hours year-round and vary according to the need of the service and the community.

Service Levels

Service levels for each route should be based on demand. To foster a systematic approach, two levels of service are defined for different operating time periods. The service level should be consistent through each time period.

- Peak periods for Fixed Routes are defined as 9:00 a.m. to 4:00 p.m. on weekdays while school is in session.
- Peak service on Community Circulators is generally between the weekday hours of 6:00 a.m. and 9:00 a.m., and between 3:00 p.m. and 6:00 p.m.
- Off-peak service is provided at all other times with the exception of evening/night periods.
- Evening periods are from 6:00 p.m. to 9:00 p.m. and night periods are from 9:00 p.m. to 3:00 a.m.

Every effort should be made to provide coverage throughout most of the service area during the off-peak service periods. But since ridership is lower during these times, a reduced number of routes may be operated.

Frequency of Service

Each route's frequency should correspond to demand. Some routes may only operate during the weekday peak period while others may run at all times with relatively high frequencies. In addition, headways should conform to regularly recurring clock intervals. Maximum policy headways for Fixed Route and Community Circulator routes should be 30 minutes during peak hours and 60 minutes during offpeak hours.

With the exception of special services, these maximum headways should not be exceeded if the route is to be operated. Special services should be designed around specific times of the trip generator to be served, such as shift times at a major employer.

Transfers and Timed Transfers

Scheduled arrival and departure times for BT routes having common transfer points should be coordinated to the maximum extent feasible. Dwell time should be avoided on routes for mid-route transfer points. Routes should be designed to link in patterns that are consistent with consumer needs and desires, but also meet acceptable travel times.

Free transfers should be provided by Blacksburg Transit drivers upon request by passengers when boarding buses and accepted at other locations where routes intersect. The transfer ticket is only valid

on the next scheduled trip to which the passenger is transferring. Transfers cannot be used for return trips.

Layover

The amount allocated for layover time will be a minimum of 7 percent of the total cycle time. Additional layover time may be provided as necessary to achieve clock headways. Layover should be avoided at locations where through passengers are expected. This includes mid-route locations and along one-way loops.

Loading Standard

The loading standard should be a maximum average load factor of 1.2 (ratio of total passengers to seated passengers) during the weekday peak periods, and 1.0 at all other time periods. For individual trips, this should not be exceeded for time periods greater than 10 minutes. In addition, the maximum number of passengers on-board must not exceed 80 passengers for 40-foot buses, and 70 passengers for 35-foot buses at any time. An appropriate loading standard should be established any time BT adds a new vehicle size or type to the fleet.

Bus Shelters and Benches

Bus stops with more than 50 passengers boarding on a daily basis should have a bus shelter. Benches should be provided at bus stops with more than 25 passengers per day. In addition, passenger amenities should be provided at the major transfer locations on the Virginia Tech campus, large trip generators, and other key locations. In the case of route deviation services, amenities should be provided at primary time points. These bus stops should feature bus shelters or other means of weather protection for passengers and include a display for schedule information for all routes.

Public Timetable Availability

Route and schedule brochures should be available upon request from bus drivers and from Blacksburg Transit office clerks. They should also be displayed and made available at key locations including employment and activity centers throughout the service area as deemed appropriate by BT staff.

Bus Color and Logo

For easy identification of BT services, a distinct color scheme and logo should be designed and updated from time to time. This should be used consistently on all buses, letterheads, tickets, bus stop signs, and other printed materials or objects.

Vehicle Identification Sign

Identification signs should display the route the bus is traveling on at all times. When routes are interlined at a system hub, the signs will be changed before reaching the hub stop.

Vehicle Accessibility

All Blacksburg Transit vehicles and facilities should be accessible to disabled persons as required by the Americans with Disabilities Act (ADA).

The COA report also recommends a series of standards by which to measure existing routes and assess the viability of new routes. These benchmarks include:

Passenger Productivity

BT should regularly evaluate the performance of individual bus routes based upon the passengers per revenue hour and passengers per revenue mile. It will assure that each route performs at a rate equal to at least 50 percent of the system-wide average for that transit mode. Fixed route standards based on recent BT performance and community circulator standards based on industry experience are listed below. These should be refined periodically based on evolving ridership patterns.

FIXED ROUTES		
Category	**Passengers/ Rev-Hour**	**Passengers/ Rev-Mile**
Good	> 25	> 3.0
Satisfactory	20-25	2.0-3.0
Marginal	15-20	1.0-2.0
Unsatisfactory	< 15	< 1.0

COMMUNITY CIRCULATORS		
Category	**Passengers/ Rev-Hour**	**Passengers/ Rev-Mile**
Good	> 10	> 1.0
Satisfactory	7-10	0.6-1.0
Marginal	4-7	0.3-0.6
Unsatisfactory	< 4	< 0.3

Schedule Adherence

A critical success factor for BT routes will be providing reliable service. Therefore, on-time performance will be closely monitored. The routes with unsatisfactory performance will be candidates for corrective action.

Category	Percent Between 0 and 5 Minutes Late
Good	> 90%
Satisfactory	85-90%
Marginal	80-85%
Unsatisfactory	< 80%

Performance and productivity data should be collected on a monthly basis for each route using farebox-operating records. Comparisons with the previous month, the same month for the previous year, and with a two or three year running average should be included to identify trends. Routes consistently performing well above or well below average should be further screened for possible modifications to service. Newly established transit routes should be given a two-year window in which to begin performing at no less than 50 percent of the systemwide average in two of the three performance measures for its functional category.

Improvements to and expansion of the BT system should be based on services identified through a COA process occurring at least every five years. The combined population and employment density should be a key factor in determining whether an area will support transit. Different combined population and employment density levels should be used as a guide for identifying areas suitable for fixed route, route deviation, and demand response services. When designing new routes or service in a new service area, it is recommended that direct connections be provided to a major trip generator or transit center to provide as many “one seat” rides as possible and to avoid the necessity of two-transfer trips to major

destinations. The standards below should be used as guidelines and as an aide in the service planning process.

Service Type	Population and Employment Density
Fixed Route	2,500 p+e / square mile
Route Deviation	1,500 to 2,500 p+e / square mile
Dial-a-Ride	< 1,500 p+e / square mile

Other factors to consider in the creation of new services are the compatibility with land use and zoning plans and anticipated development or demographics that may support and be supported by public transit.

2.4 TDP Goals and Objectives

Based on the various goals, objectives, and standards identified previously and discussion with BT staff and stakeholders, a concise list of seven quantifiable outcomes for the TDP process was established. Meeting these objectives insures that BT's activities over the next six years are supporting the internal and external goals for the system. The TDP process should:

- Evaluate system and individual route performance and recommend service modifications within identified route service functions (campus circulators, off-campus circulators, and local/non-university services).
- Plan for the capital expenses and route modifications necessary to support a Multimodal Transfer Facility on the Virginia Tech campus.
- Define a local community route plan connecting neighborhoods directly to a core system, accounting for changes in land use and demographics and increasing potential for economic development.
- Define a regional and commuter service plan linking the BT service area to the rest of the New River Valley, accounting for changes in land use and demographics and increasing potential for economic development.
- Identify activity centers that could naturally support transit hubs and transfer points within the system, along with providing opportunities for mixed use, transit-oriented development.
- Identify a capital improvement plan that modernizes the BT fleet and utilizes technology to improve service efficiencies and customer accessibility.
- Develop a financial plan and cost allocation process that maximizes local investment and insures partner equity.
- Establish a comprehensive and quantitative process to regularly measure BT's performance to its core commitments – safety, courtesy, reliability, accessibility, affordability, and the environment – and provide accountability to current and new partners.

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Chapter 3 Service and System Evaluation

As described in Chapter 1, BT provides fixed route, demand response, and special events services within the Blacksburg-Christiansburg-Montgomery urbanized area. Blacksburg Enhanced Service (operating from late August to mid-December and mid-January to early May) operates over eleven fixed routes on weekdays, eight routes on weekday evenings, and seven routes for weekends and Friday/Saturday late night service. Blacksburg Regular Service operates over seven routes on weekdays and five routes on weekends with no late night service. Within the town limits of Blacksburg, fixed route service is complemented by ADA paratransit service, known as BT ACCESS, for qualified individuals who cannot complete their trip on the fixed route system.

Service in Christiansburg is provided by three routes: Explorer, a deviated fixed route operating Monday through Friday; Shopper Express, a fixed route operating on Friday and Saturday; and Go Anywhere!, a demand response route operating Monday through Saturday. Route maps for Blacksburg and Christiansburg service are presented in Chapter 1.

Altogether, BT annually provides around 3 million passenger trips over 70,000 revenue bus-hours on an operating budget of just over $4 million. This chapter evaluates that service using a variety of measurements – historical systemwide performance, a peer system review, an on-board rider survey, staff and stakeholder opinions, a route-level analysis, and in relation to land use and demographic projections. Additionally, a summary of BT's intelligent transportation systems, Title VI report, and Triennial Review are provided.

3.1 Historical Systemwide Performance

National Transit Database (NTD) information was collected for BT for the past five years (FY 2005 through FY 2009) to determine pertinent trends in service characteristics and performance measures. In general BT's systemwide fixed route performance has improved over the five-year period in terms of service effectiveness, providing more trips per hour or mile now than five years ago. However, service efficiency has declined in that time, mainly due to large increases in operating and maintenance expenses.

Basic Characteristics

Table 3-1 presents basic ridership, service, and operating statistics for fixed routes from FY 2005 through FY 2009. The number of fixed route passenger trips provided by BT steadily increased over the five-year period with an average annual increase of approximately five percent, while revenue hours and revenue miles each remained relatively flat, increasing by one percent or less per year on average. These significant increases in ridership with little change in service provided is a highly positive trend even in socioeconomic conditions that have been favorable to transit growth.

Table 3-1. Historical BT Fixed Route Service and Operating Statistics (FY 2005-FY 2009)

Year	Passenger Trips	Revenue Hours	Revenue Miles	Operating Budget	Farebox Recovery Ratio
2005	2,385,074	67,080	663,399	$2,706,395	22.9%
2006	2,482,523	74,019	740,150	$2,957,260	23.1%
2007	2,431,250	67,814	613,288	$3,358,400	20.3%
2008	2,615,954	71,846	710,852	$3,921,417	19.3%
2009	2,954,415	70,630	691,234	$4,390,143	18.2%
Change 2005-2009	23.9%	5.3%	4.2%	62.2%	-20.4%

On the downside, operating and maintenance costs for BT increased by 62 percent over the five-year period, a gain of more than twelve percent annually. With growth in operating expenses far outpacing growth in ridership, the systemwide farebox recovery ratio decreased significantly as well.

Service Effectiveness

Service effectiveness relates to how successful an agency is at moving passengers based on the amount of service they are providing. Measures used to evaluate service effectiveness include passengers per revenue hour (Figure 3-1), and passengers per revenue mile (Figure 3-2). Both measures increased nearly twenty percent over the five-year period, though passengers per revenue hour dipped slightly in FY 2006 and passengers per revenue mile dipped in FY 2006 and FY 2008. These years coincide with the highest numbers of revenue miles. FY 2009 produced the highest values for both measures of service effectiveness, topping 40 passengers per revenue hour and 4 passengers per revenue mile.

Figure 3-1. Passengers per Revenue Hour

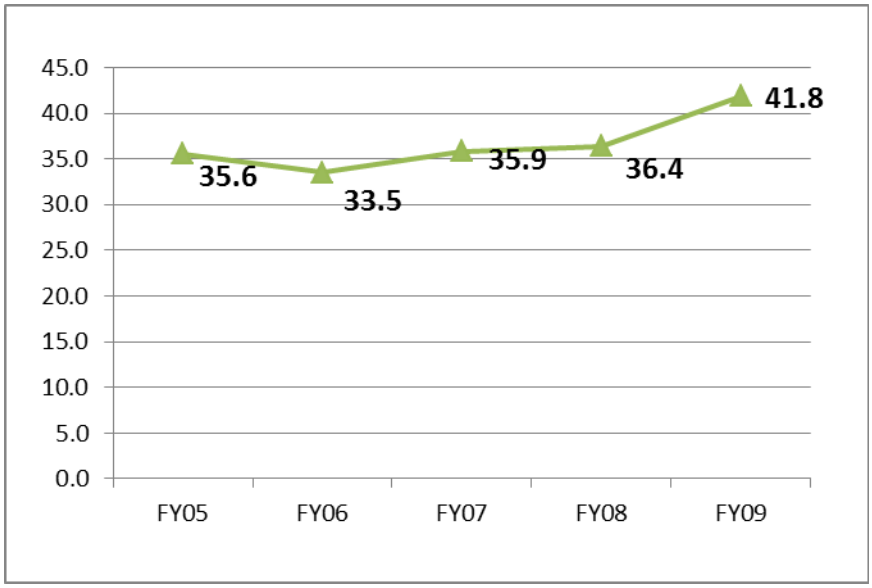
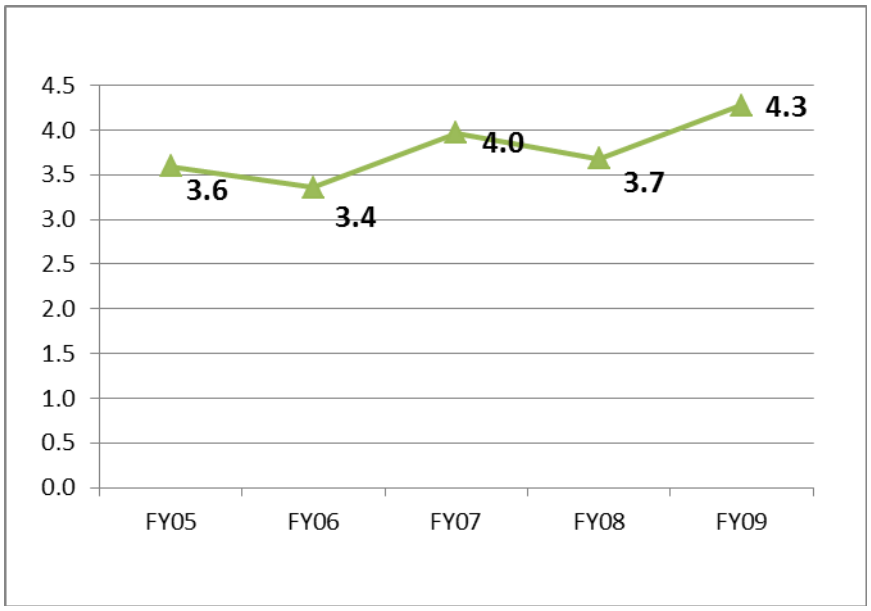


Figure 3-2. Passengers per Revenue Mile



Service Efficiency

Operating costs per revenue hour and per revenue mile provide measures of how cost efficiently an agency provides its service. Overall, BT's cost per revenue hour (Figure 3-3) and cost per revenue mile (Figure 3-4) both increased more than fifty percent between FY 2005 and FY 2009, from about $40 per revenue hour and $4 per revenue mile in FY 2005 to over $60 per hour and $6 per mile in FY 2009. The period between FY 2006 and FY 2007 saw the greatest increase in both operating cost per revenue hour and operating cost per revenue mile, generally due to increases in the cost of fuel and labor benefits.

Figure 3-3. Operating Cost per Revenue Hour

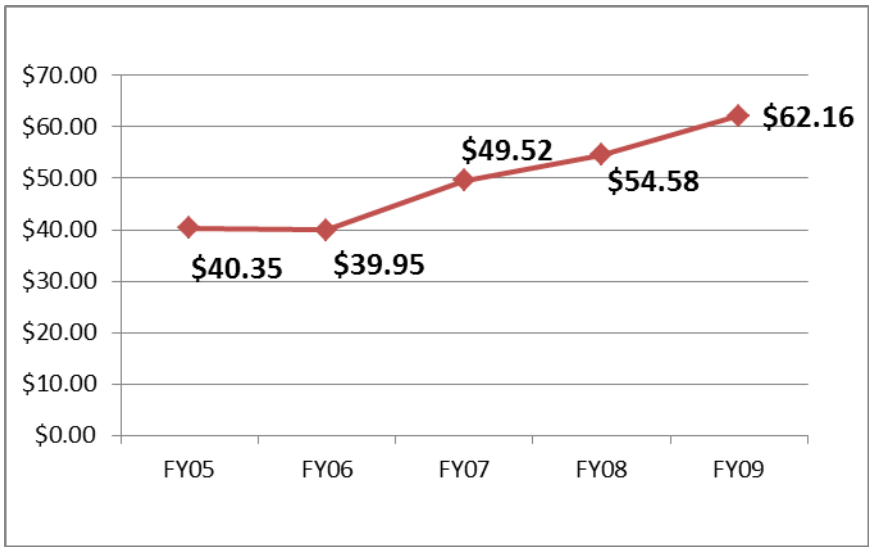


Figure 3-4. Operating Cost per Revenue Mile

The second highest increase in both measures occurred between FY 2008 and FY 2009 with both measures reaching their highest point in FY 2009. According to the Town of Blacksburg's *Recommended Operating Budget FY 2010-2011*, transit fund expenditures were higher in FY 2009 than in previous years due to increased expenditures on administration, operations, and maintenance. In general, higher costs of fuel and maintenance are largely to blame for the decrease in service efficiency over the past five years.

Cost Effectiveness

Cost effectiveness is an amalgamation of service effectiveness and service efficiency, measuring how effective an operator is at moving passengers based on the amount of money it costs to operate service. It is measured in terms of operating cost per passenger mile (Figure 3-5) and operating cost per passenger trip (Figure 3-6).

Figure 3-5. Operating Cost per Passenger Mile

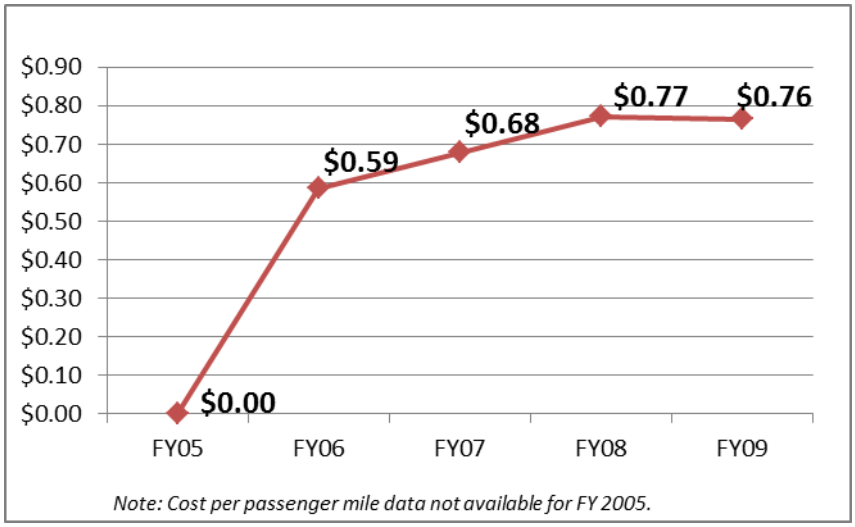
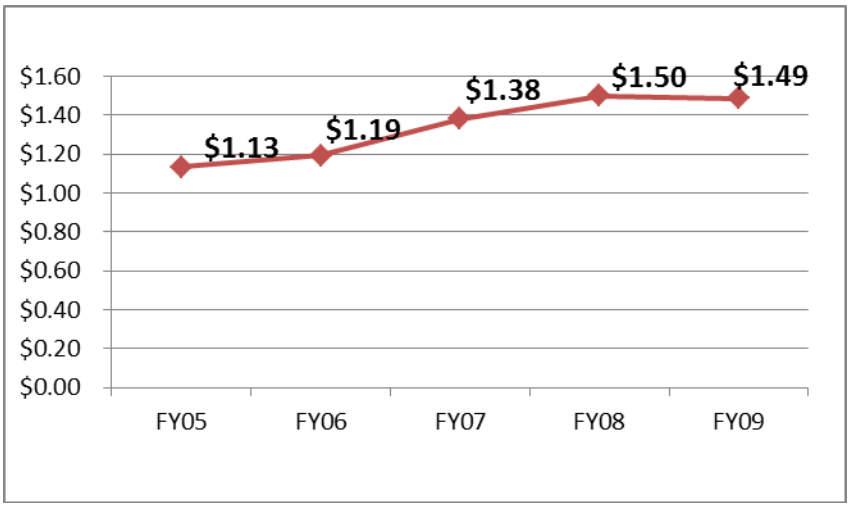


Figure 3-6. Operating Cost per Passenger Trip



The operating cost per passenger mile increased steadily between FY 2006 and FY 2008 and then leveled off between FY 2008 and FY 2009 due to a large increase in the number of passenger miles. The operating cost per passenger trip followed a similar trend.

Vehicle Fleet

Historical fleet characteristics are presented in Table 3-2. The active fleet grew very slightly, but was able to comfortably absorb a larger increase of twenty percent in the peak fleet (Figure 3-7). This led to a decrease in the spare ratio from 40 percent to a more manageable 27 percent. It is important to keep in mind that the number of peak vehicles may be calculated differently from year to year and there is often some variation in how agencies report this information. The average age of the BT fixed route fleet increased from 5.1 years in FY 2005 to 7.9 years in FY 2009 (Figure 3-8), however, the fleet age is still well within the vehicle useful life of 12 years.

Table 3-2. Historical Fleet Characteristics (FY 2005-FY 2009)

Year	Active Fleet	Peak Vehicles	Spare Ratio	Fleet Age
2005	35	25	40%	5.1
2006	35	25	40%	6.1
2007	35	24	46%	7.1
2008	39	24	63%	7.1
2009	38	30	27%	7.9

Figure 3-7. Peak and Active Fleet

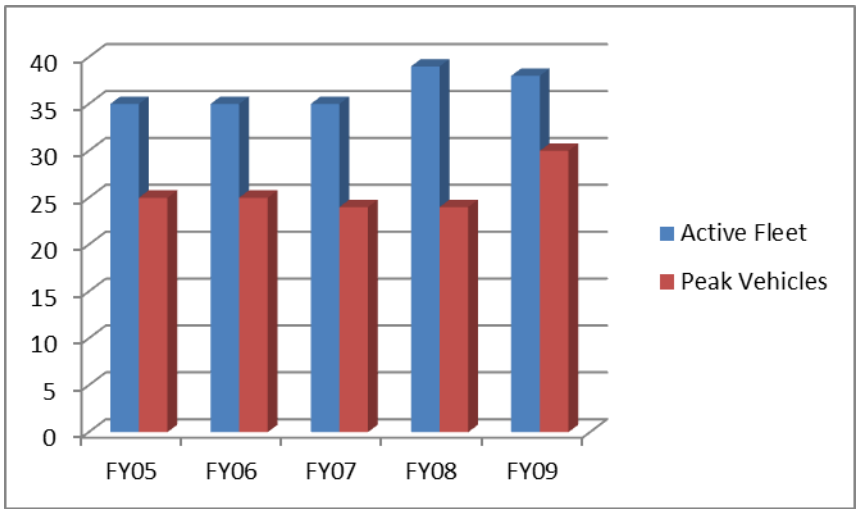
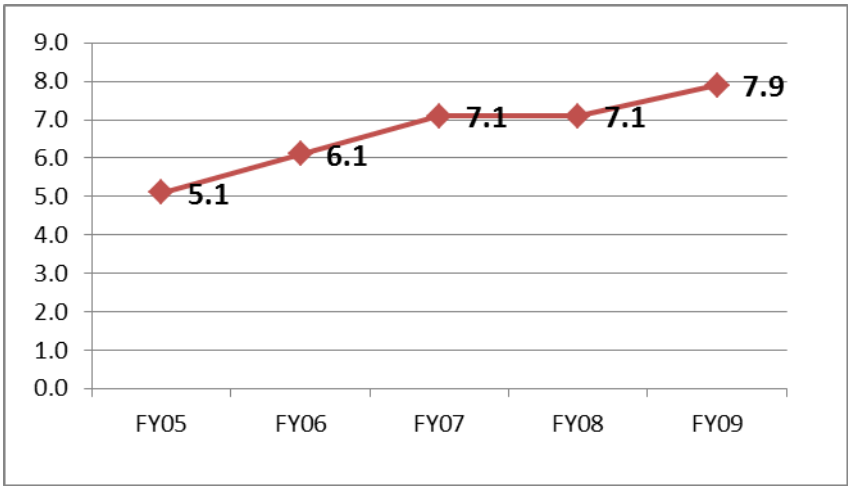


Figure 3-8. Average Fleet Age



Demand Response

Demand response service was evaluated as a function of fixed route service to determine how key demand response characteristics such as revenue hours, operating cost, and passenger trips changed in relationship to the same fixed route characteristics over the five year period (Table 3-3).

As shown in the table, in 2009 BT provided five demand response trips for every 1,000 fixed route trips while operating 111 demand response revenue hours for every 1,000 fixed route revenue hours operated, and spending $127 on demand response operating costs for every $1,000 spent for fixed route costs. In general, this represents much less demand response service as a function of fixed route service than compared to most agencies, but is in line with BT's primary function as a university service, which generates high fixed route passenger trips and often very few demand response passenger trips.

Table 3-3. Historical Comparison of Fixed Route to Demand Response Service Characteristics (FY 2005-FY 2009)

Year	Ratio of Demand Response to Fixed Route (per 1,000 units)		
	Revenue Hours	Operating Cost	Passenger Trips
2005	88	$132	5
2006	87	$139	6
2007	98	$145	6
2008	100	$132	5
2009	111	$127	5

Figures 3-9, 3-10, and 3-11 present the ratio of each of the measures over the five-year period. Over the five-year period, the ratio of demand response to fixed route revenue hours has increased while the ratio of passenger trips has generally remained constant. This means that the number of demand response trips taken annually has kept pace with the increase in fixed route ridership observed earlier. Since demand response revenue hours are a function of the number of trips provided, it makes sense that the number of demand response revenue hours had to increase to carry increased ridership, while fixed route revenue hours could remain constant. Operating costs for demand response service generally kept pace, and by FY 2009 decreased slightly, compared to fixed route costs.

Figure 3-9. Demand Response Revenue Hours per 1,000 Fixed Route Revenue Hours

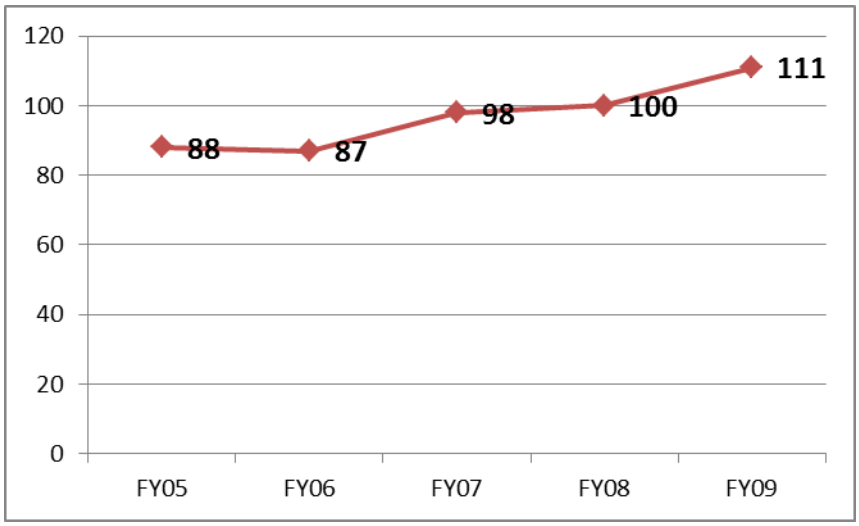


Figure 3-10. Demand Response Operating Cost per $1,000 Fixed Route Operating Cost

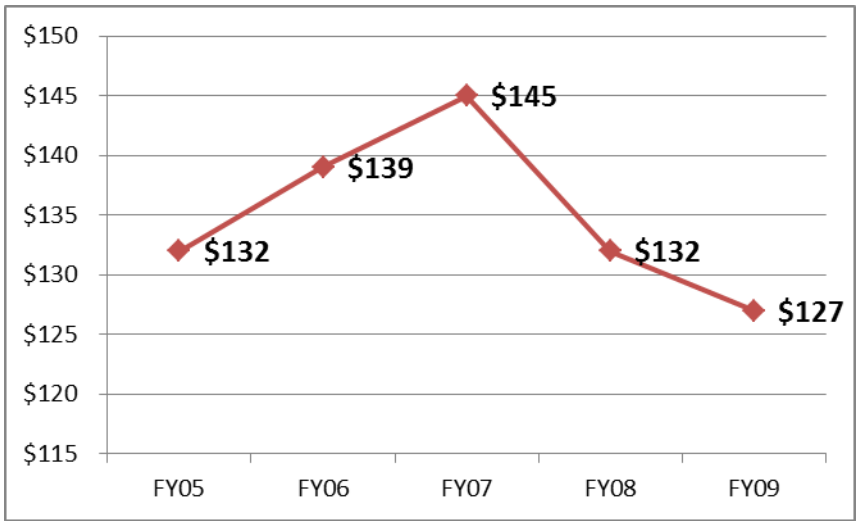
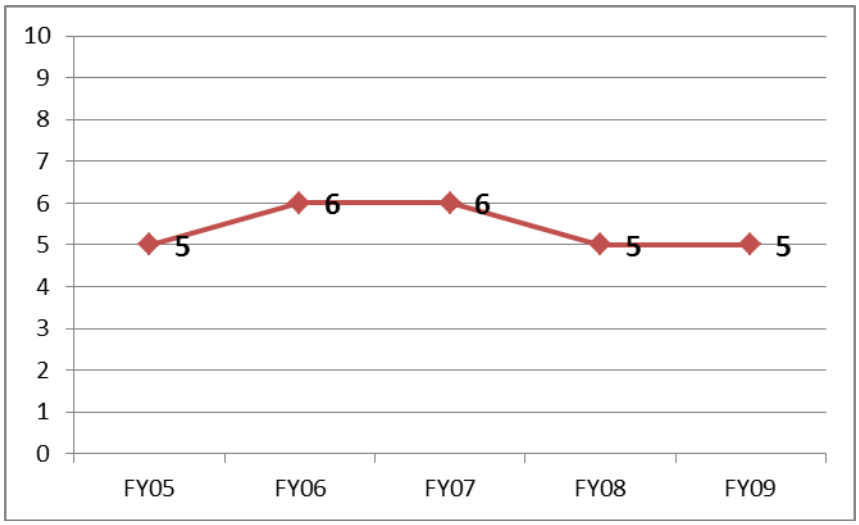


Figure 3-11. Demand Response Passenger Tips per 1,000 Fixed Route Passenger Trips



3.2 Peer Review

A peer system review analysis was conducted to determine how BT's service characteristics compare to peer agencies. The following peer agencies were selected based on service area population, service area size, enrollment at university in service area, fleet size, and fixed route ridership:

- Harrisonburg Department of Public Transportation (Harrisonburg, VA)
- Ames Transit Agency – CyRide (Ames, IA)
- Bloomington Public Transportation Corporation (Bloomington, IN)
- Chapel Hill Transit (Chapel Hill, NC)
- Mountain Line Transit (Morgantown, WV)
- Centre Area Transportation Authority – CATA (State College, PA)
- Athens Transit Service (Athens, GA)

Table 3-4 presents the general characteristics of the peer systems in comparison to BT, as well as the peer group averages. FY 2009 NTD data for fixed route bus service was used for the peer analysis. University enrollment for fall 2009 is also presented.

Table 3-4. Peer System Fixed Route Characteristics (FY 2009)

Transit System	Service Area Population	Service Area Size (sq. mi.)	Population Density	Fall 2009 University Enrollment	Annual Revenue Hours	Annual Revenue Miles	Peak Buses	Annual Passenger Trips	Annual Operating Expenses
Harrisonburg Dept. of Public Transportation (Harrisonburg, VA)	45,889	17	2,699	18,971	45,655	463,318	23	1,686,751	$2,674,871
Ames Transit Agency (CyRide) (Ames, IA)	50,276	15	3,352	27,945	103,770	1,091,085	52	4,977,881	$6,357,707
Bloomington Public Transportation Corp. (Bloomington, IN)	69,291	21	3,300	42,347	89,855	963,264	30	3,027,877	$5,100,241
Chapel Hill Transit (Chapel Hill, NC)	71,069	25	2,843	28,916	164,076	1,950,310	79	7,929,427	$12,488,309
Monongalia County Urban Transit (Mountain Line Transit) (Morgantown, WV)	73,278	201	365	31,952	63,982	1,031,121	22	1,155,417	$3,261,491
Centre Area Transportation Authority (CATA) (State College, PA)	83,444	133	627	44,832	111,708	1,417,487	51	7,001,149	$9,667,228
Athens Transit Service (Athens, GA)	101,000	44	2,295	34,885	73,879	855,766	22	1,839,022	$3,792,205
PEER AVERAGE	**70,607**	**65**	**2,186**	**32,835**	**93,275**	**1,110,336**	**40**	**3,945,361**	**$6,191,722**
Blacksburg Transit (BT) (Blacksburg, VA)	**56,260**	**28**	**2,009**	**28,687**	**70,630**	**691,234**	**30**	**2,954,415**	**$4,390,143**

In general, BT's overall level of service and vehicle utilization are lower than its peer systems. This can be attributed to an operating budget that is likewise lower than its peer average, and particularly to a lower level of local source funding (farebox revenue plus local assistance). Despite this, BT is more efficient than peers on a revenue-hour, revenue-mile, and cost basis. This indicates that on the whole BT has invested in transit services that are highly productive.

A summary of key characteristics of both the peer system average and BT is presented in Table A-5. Measures where BT was more than 125 percent of the peer average are in green, and measures where BT was less than 75 percent of the peer average are in red. Following this is a summary of the major findings from the peer analysis. Appendix A presents a technical memorandum with detailed findings from the peer analysis.

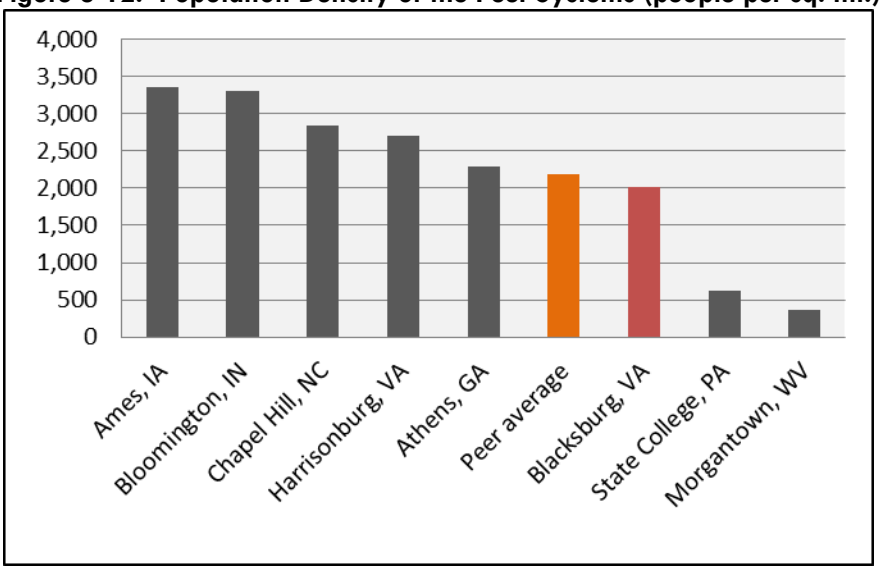
Table 3.5. BT and Peer-Average Key Fixed Route Characteristics

Characteristic	Peer Average	Blacksburg Transit
Service Area		
Population	70,607	56,260
Square Miles	65	28
People per Square Mile	2,186	2,009
Operating Data		
Weekday Peak Buses	40	30
Annual Revenue Miles	1,110,336	691,234
Annual Revenue Hours	93,275	70,630
Annual Passenger Trips	3,945,361	2,954,415
Financial Data		
Annual Operating Cost	$6,191,722	$4,390,143
Farebox Recovery	33%	16%
Local Assistance	23%	30%
Service Productivity		
Revenue Hours per Capita	1.37	1.26
Passengers per Revenue Hour	39	42
Cost per Revenue Hour	$63.08	$62.16
Cost per Passenger Trip	$1.77	$1.49
Vehicle Utilization		
Spare Ratio	27%	27%
Revenue Hours per Peak Bus	2,340	2,354

Service Area Characteristics

BT had the third lowest service area population and population density of all the peer systems and was below the peer average for both characteristics. Figure 3-12 compares the population densities of BT and the peer systems. The population density of BT's service area is 2,009 people per square mile, which is eight percent below the peer average of 2,186 people per square mile.

Figure 3-12. Population Density of the Peer Systems (people per sq. mi.)



Operating Characteristics

The size of BT's active fleet was 22 percent below the peer average. Figure 3-13 compares the active and peak fleet sizes of the peer systems. Out of the eight peer systems, BT ranked sixth in terms of annual revenue hours and seventh in terms of annual revenue miles (Figures 3-14 and 3-15). Despite this, BT ranked fifth in the number of annual passenger trips, as shown in Figure 3-16.

Figure 3-13. Peer Comparison – Fleet and Peak Buses

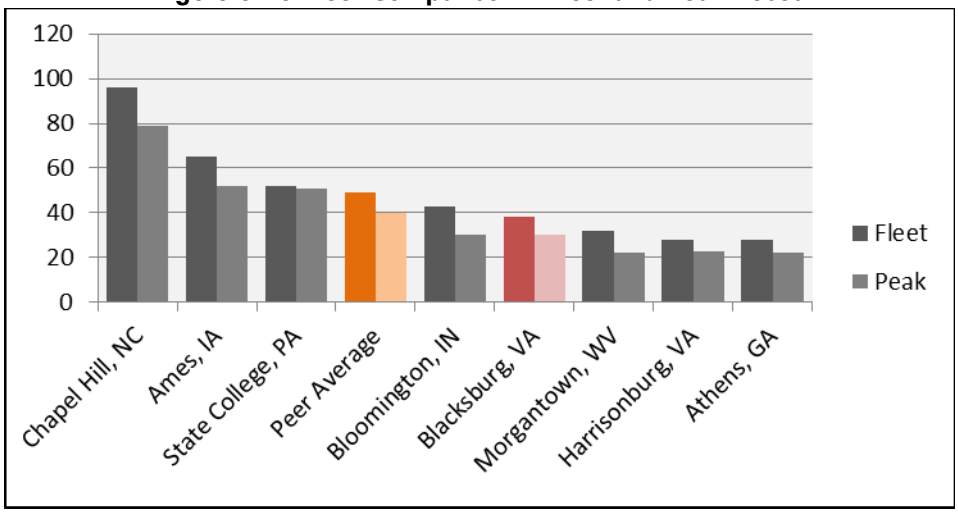


Figure 3-14. Peer Comparison – Annual Revenue Hours

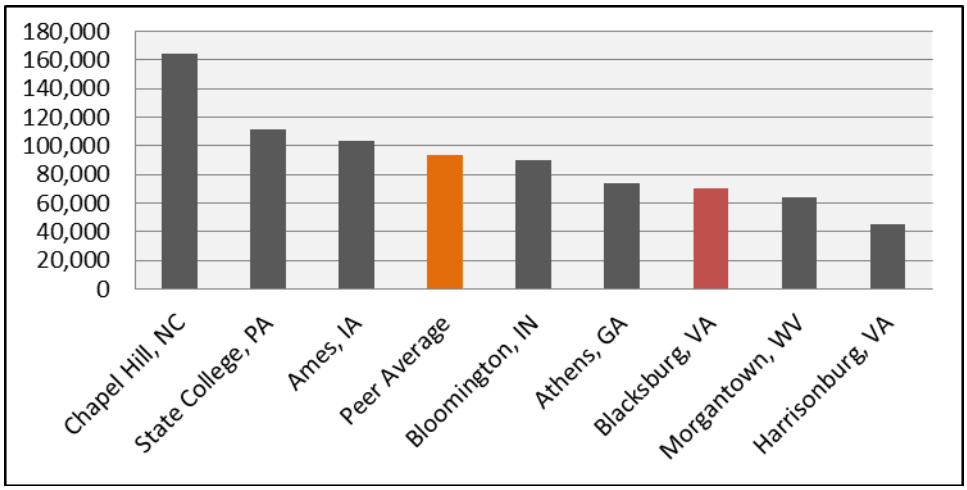


Figure 3-15. Peer Comparison – Annual Revenue Miles

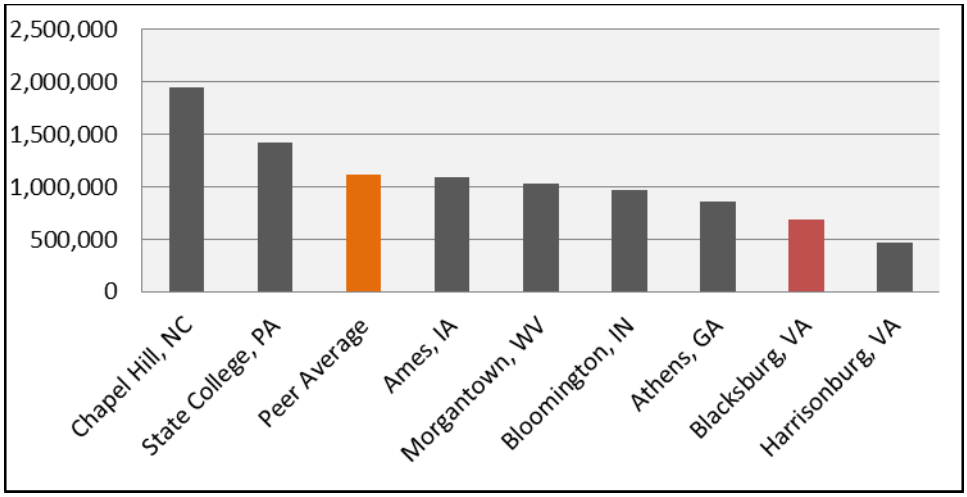
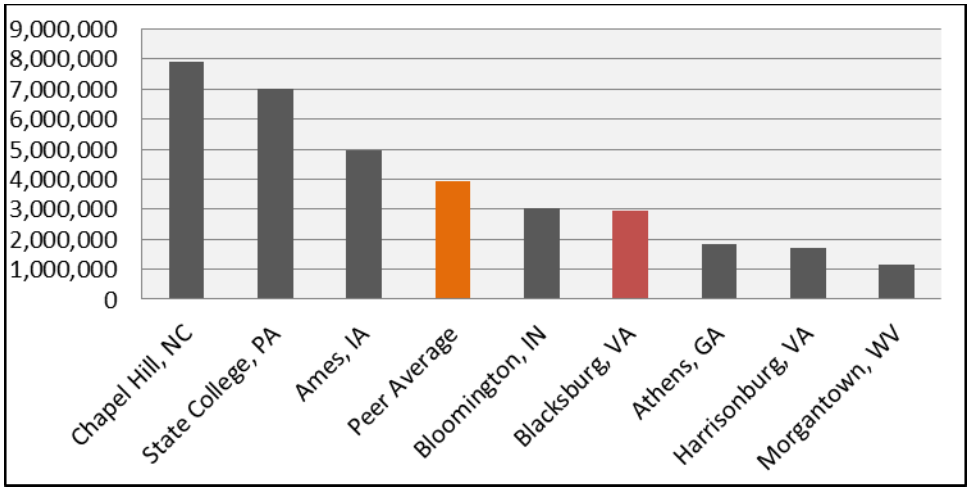


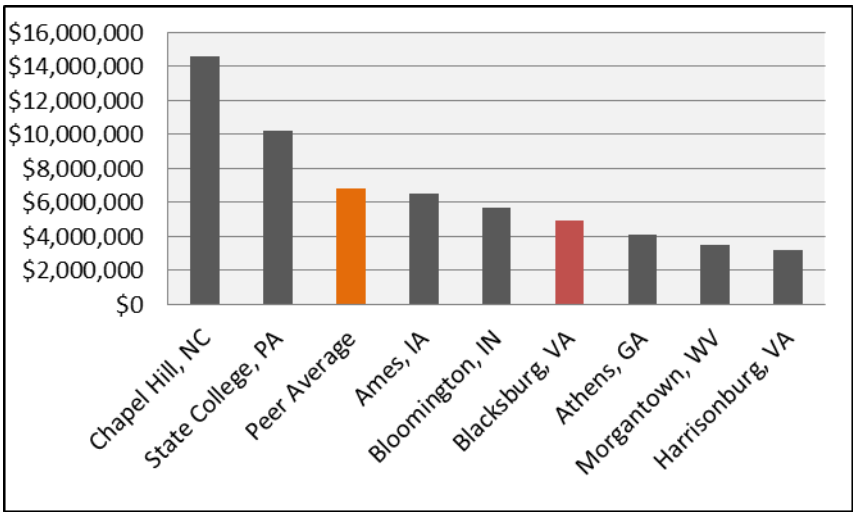
Figure 3-16. Peer Comparison – Annual Passenger Trips



Financial Characteristics

Annual operating expenses and sources of income were compared for all peers. As shown in Figure 3-17, BT's annual operating budget is 29 percent lower than the peer average, although BT is just below the median in operating expenses.

Figure 3-17. Peer Comparison – Operating Expenses



A breakdown of BT's 2009 operating budget is presented in Figure 3-18 and the average operating budget of the peer systems is presented in Figure 3-19 for comparison. The department reported higher percentages of operating funds from federal sources and fare revenue than the peer average, similar percentages from state funds and other funds, and a lower percentage from local funds. Combining local assistance with fare revenue, BT receives 16 percent less than the peer average to provide transit service (46 percent vs. 56 percent).

Figure 3-18: BT 2009 Operating Budget

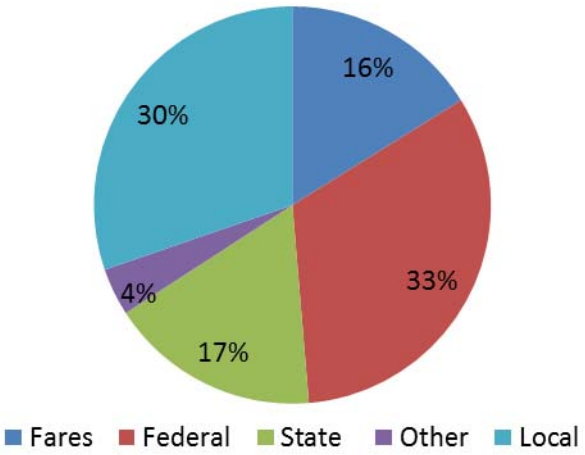
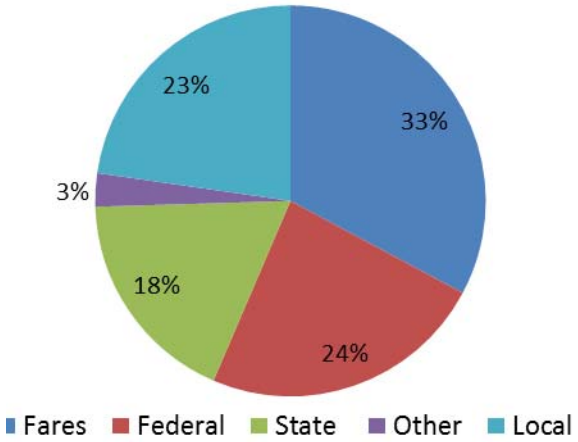


Figure 3-19: Peer Average 2009 Operating Budget



Level of Service

In comparison to its peers, BT operates 8 percent less annual revenue-hours and 25 percent less annual revenue-miles per capita than the peer averages (Figures 3-20 and 3-21). In addition, BT operates 24 percent less annual revenue-hours and 33 percent less annual revenue-miles per square mile than the peer average. However, as shown in Figure 3-22, BT is in the middle of the peer systems in terms of annual operating dollars spent per capita at $78 and slightly below the peer group average of just under $88.

Figure 3-20. Peer Comparison – Annual Revenue-Hours per Capita

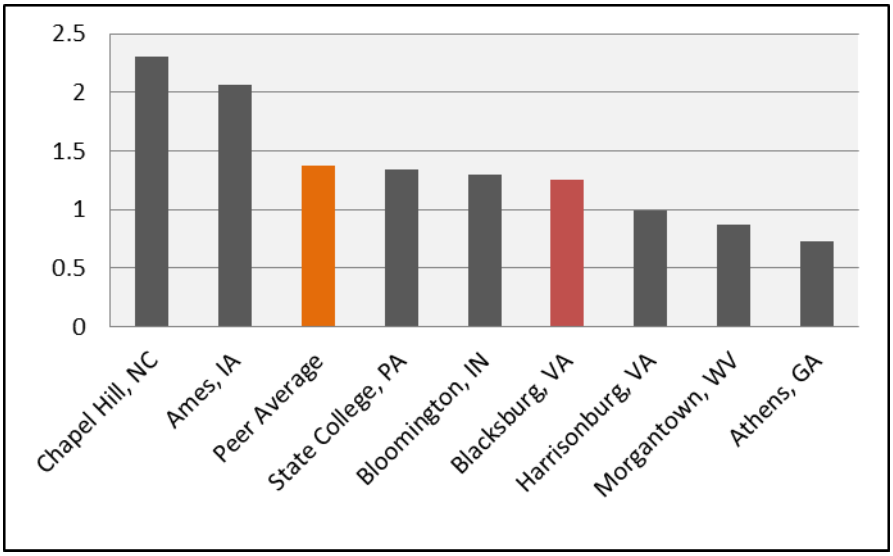


Figure 3-21. Peer Comparison – Annual Revenue-Miles per Capita

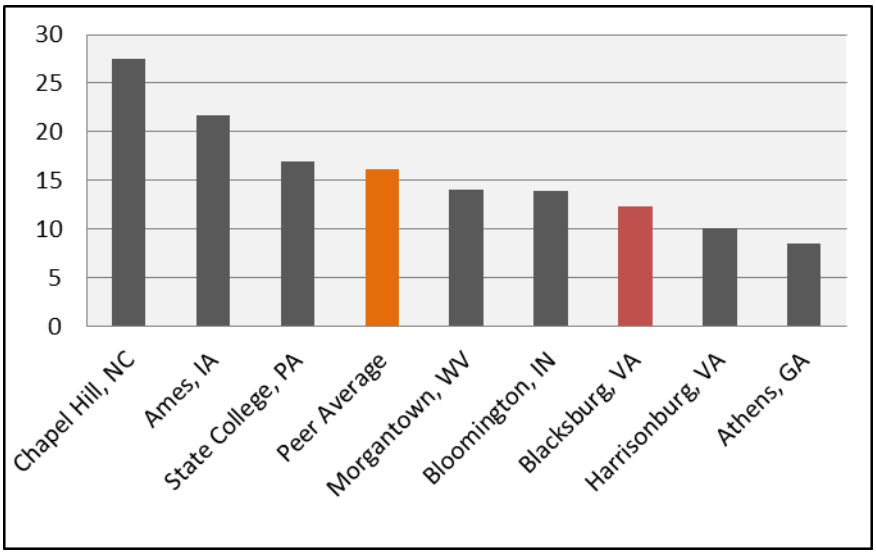
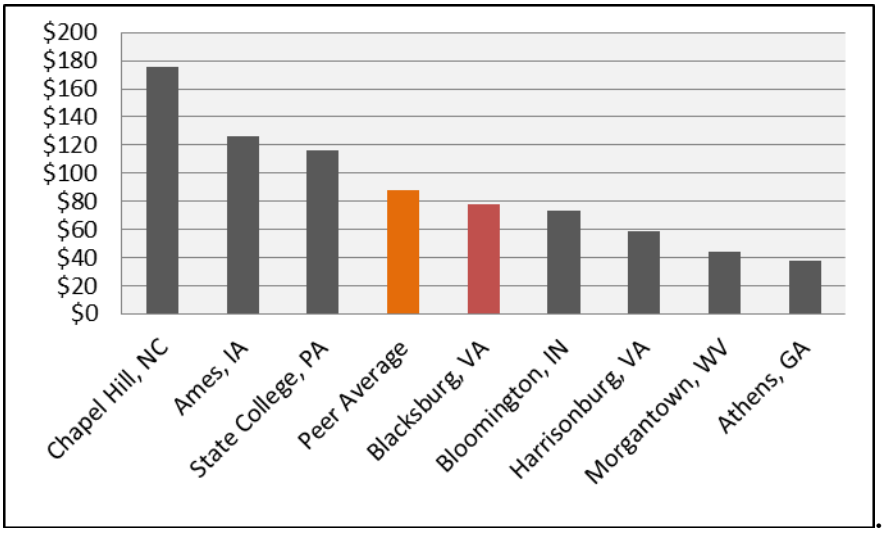


Figure 3-22. Peer Comparison – Annual Operating Cost per Capita



Service Effectiveness

Service effectiveness, which measures how effectively an operator is at moving passengers given the amount of service supplied, is a common guideline used to gauge a system's health. For 2009, BT was more productive in attracting ridership than most peer systems when compared on a revenue-hour, revenue-mile, and per capita basis, exceeding the average by 7 percent, 27 percent, and 10 percent, respectively. Figure 3-23 presents passenger trips per revenue-hour of bus service, where BT's productivity of 42 passengers compares favorably to the peer average of 39. As shown in Figure 3-24, BT serves 4.3 passengers per revenue-mile, which is likewise better than the peer average of 3.4.

Figure 3-23. Peer Comparison – Passenger Trips per Revenue-Hour

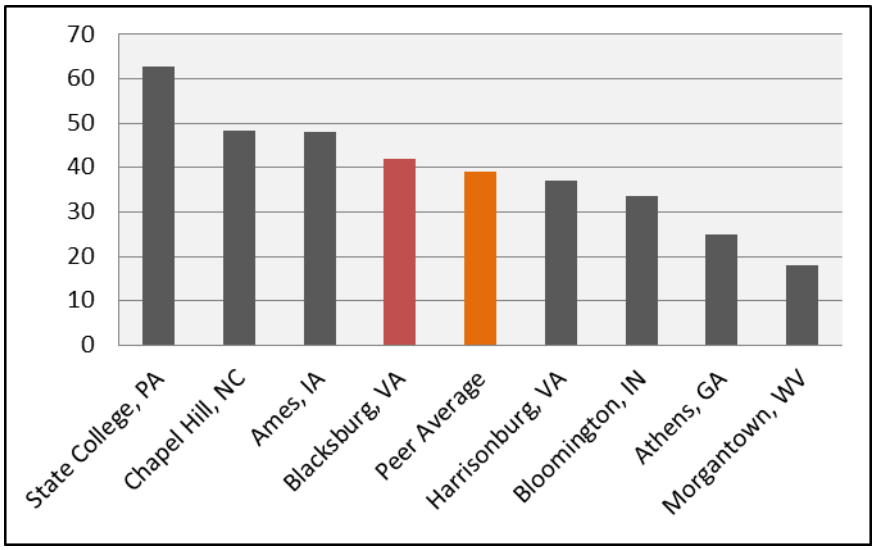
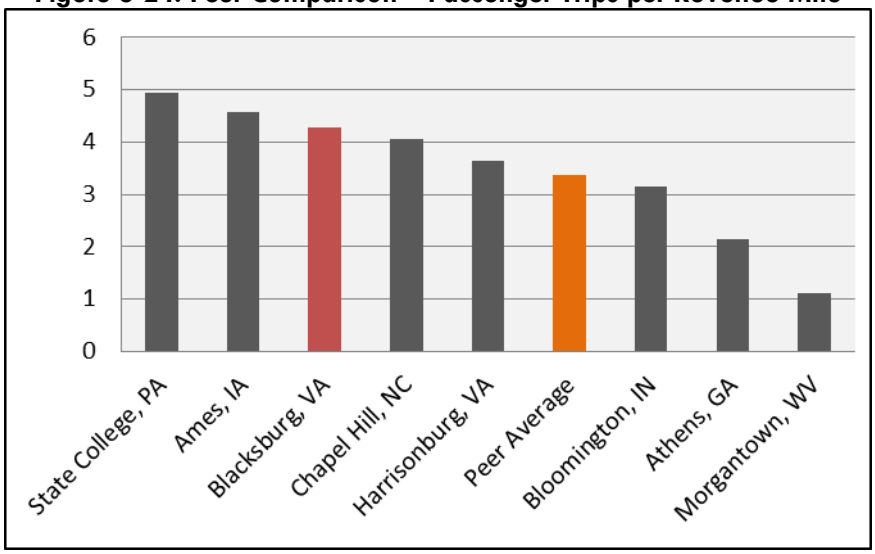


Figure 3-24. Peer Comparison – Passenger Trips per Revenue-Mile



Service Efficiency and Cost Effectiveness

Service efficiency, which tracks how much it costs an operator to provide a given amount of service, and cost effectiveness, which tracks how much it costs an operator to move a given amount of passengers, are related measures used to relate an agency's operational health to its financial health. BT's service efficiency was similar to its peers, with a cost per revenue hour comparable to the peer average and a cost per revenue mile somewhat higher than the average (Figures 3-25 and 3-26). However, as seen in Figure 3-27, BT was more cost effective than its peers, carrying passengers at a cost per trip ($1.49) that is 16 percent less than its peer average ($1.77).

Figure 3-25. Peer Comparison – Operating Cost per Revenue-Hour

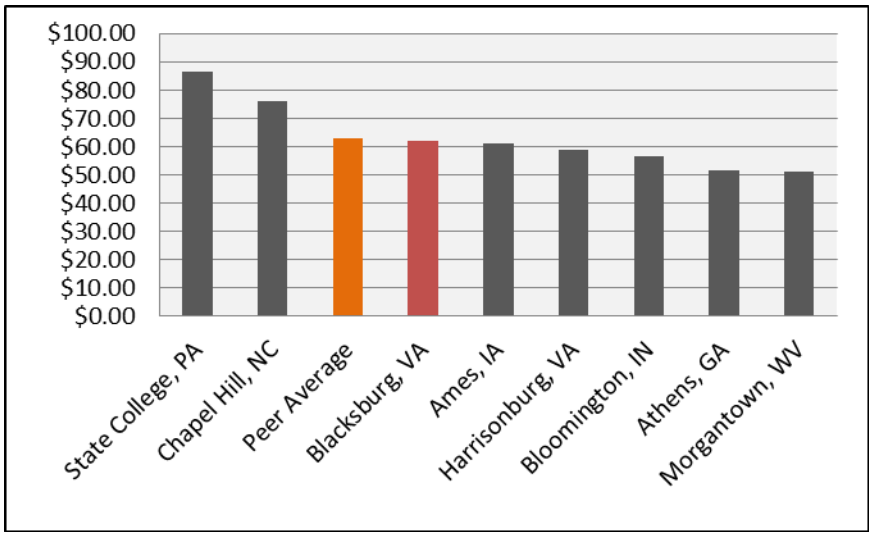


Figure 3-26. Peer Comparison – Operating Cost per Revenue-Mile

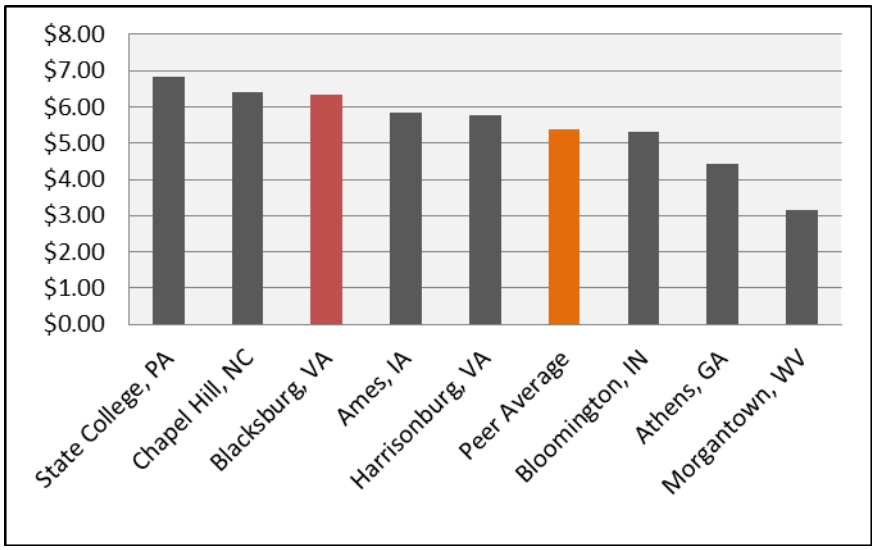
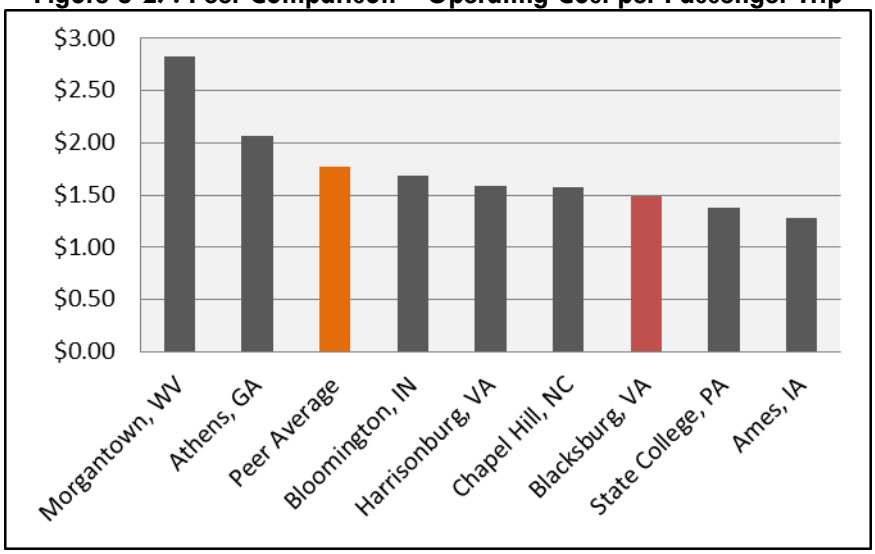


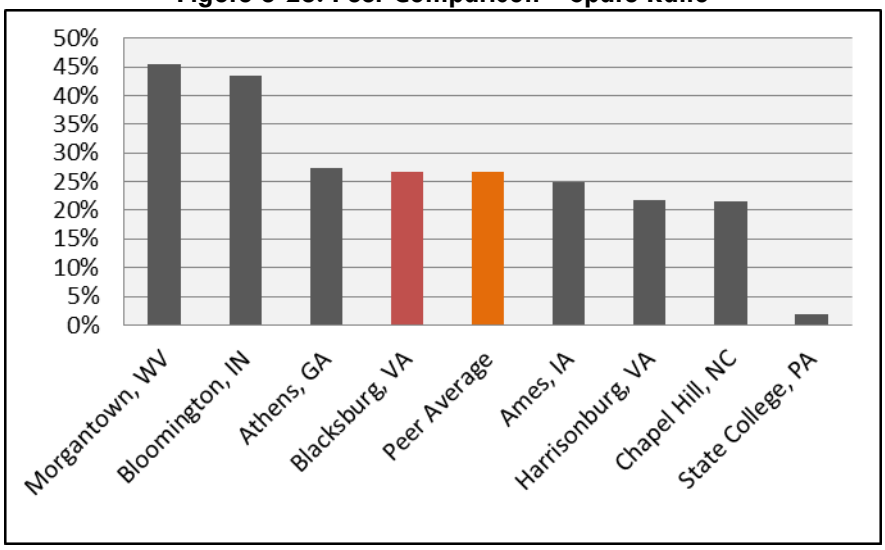
Figure 3-27. Peer Comparison – Operating Cost per Passenger Trip



Vehicle Utilization

Both the size of BT's bus fleet (38 buses) and vehicles operated in maximum service (30 buses) were smaller than the peer average (by 22 and 25 percent, respectively). BT's revenue-miles per peak bus were 17 percent below the peer average while BT's revenue-hours per peak bus were slightly above the peer average. All but one of the peers (State College, PA) exhibited spare ratios that exceed FTA guidelines of 20 percent spares. BT's spare ratio of 27 percent is equal to the peer average, as shown in Figure 3-28.

Figure 3-28. Peer Comparison – Spare Ratio



3.3 On-Board Rider Survey

An on-board survey was conducted on November 15-17, 2010. The survey was conducted to determine rider demographics, travel behavior, and perceptions regarding quality of existing transit services and possible service improvements. In all, just over 50% of all BT bus trips were surveyed, with an overall response rate of 24%. Systemwide, a total of 2,407 surveys were entered into the database, with the majority of them (2,380) collected on Blacksburg routes, and 27 on Christiansburg routes.

Due to the excellent overall response rate, the sampling error in the survey data is very low. For the overall system, error is lower than ±3% at a 95% confidence level. This is very good, as FTA standards for accuracy specify an error rate of ±10% at a 95% confidence level. Level of error is also good at the individual route levels, with almost all routes sampled at an error rate of ±10% at a 95% confidence level, and some exceeding an error rate of ±5% at a 95% confidence level. This means that survey data can be analyzed at a route level with good confidence in the accuracy of the results.

Note that while the sample size for Christiansburg routes far exceeds levels for statistical validity (47% response rate), the small overall rider population on the three routes – particularly on Shopper Express – means that reading these results for anything more than general trends could be misleading.

In analyzing the results, a survey expansion factor for each transit route was entered by dividing the average weekday ridership for the routes being surveyed by the number of completed survey forms for each of the specific routes. The October-November 2010 ridership data was utilized to develop the respective expansion factors for each BT route operating in the Blacksburg area. Due to the relatively low ridership in the Christiansburg area, expansion factors were not applied, as the results from the few samples available would not necessarily be the truest representation of the entire ridership base.

Detailed survey results are presented in Appendix B, including tables and graphs illustrating the cumulative responses to each question along with descriptive analysis of the results and their

significance. Key findings from the survey are summarized in the following sections. Responses were grouped according to service area (Blacksburg or Christiansburg) and in some cases stratified by route.

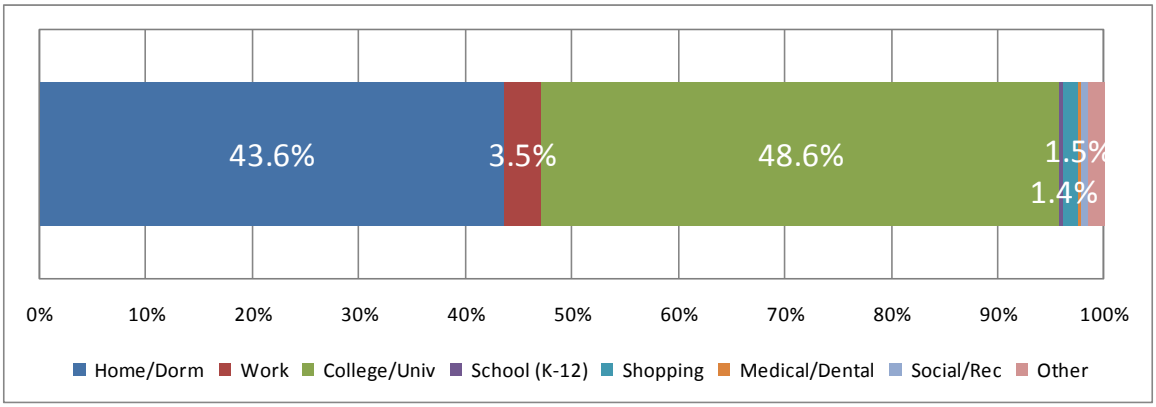
Rider Travel Behavior (Survey Questions 1-4)

Travel behavior questions assess where transit riders are coming from and going to, how they are choosing to get there, and the reason for making the trip. Questions in this section included:

- Where did your one-way trip start today?
- Where will your one-way trip end today?
- Does your one-way trip involve a transfer from one route to another?
- How did you pay for your bus fare today?

Overall, the vast majority of trips taken on BT are taken between the home or dorm and the Virginia Tech campus, with these two trip purposes accounting for 92 percent of all origins and destinations (Figure 3-29). Next highest was work (3.5%) and shopping (1.4%).

Figure 3-29. Combined Trip Origins and Destinations (Systemwide)



Further analysis was conducted to look at trip patterns between general trip origins and destinations. The majority of Blacksburg trips (68.5%) were taken between college/university and dorm/home (Table 3-5). Other discernable trip patterns were between home and work (3.5%), university and shopping (1.9%), home and shopping (1.8%), and university and work (1.6%).

Table 3-5. Cross Classification Matrix of Trip Origin and Destination (Blacksburg)

	Home /Dorm	Work	College /Univ	School (K-12)	Shopping	Medical /Dental	Social /Rec	Other
Home/Dorm	7.3%							
Work	3.5%	0.5%						
College/Univ	68.5%	1.6%	7.2%					
School (K-12)	0.6%	0.0%	0.1%	0.1%				
Shopping	1.8%	0.0%	1.9%	0.0%	0.1%			
Medical/Dental	0.4%	0.0%	0.3%	0.0%	0.0%	0.1%		
Social/Rec	0.8%	0.1%	0.5%	0.0%	0.0%	0.0%	0.0%	
Other	1.8%	0.2%	1.5%	0.0%	0.0%	0.0%	0.1%	0.1%

The percentages in the light gray cells along the diagonal indicate trips that began and ended at the same location type, such as from one campus building to another. These light gray cells likely also include responses from respondents that misinterpreted the origin and destination questions.

In Christiansburg, trips between home and work were the most popular (29.6%), followed by trips between home and college/university (11.1%) and trips between home and other origins/destinations (11.1%). Minor patterns included work-other, shopping-other, home-school, and home-shopping (Table 3-6).

Table 3-6. Cross Classification Matrix of Trip Origin and Destination (Christiansburg)

	Home /Dorm	Work	College /Univ	School (K-12)	Shopping	Medical /Dental	Social /Rec	Other
Home/Dorm	7.4%							
Work	29.6%	3.7%						
College/Univ	11.1%	3.7%	7.4%					
School (K-12)	3.7%	0.0%	0.0%	0.0%				
Shopping	3.7%	0.0%	0.0%	0.0%	0.0%			
Medical/Dental	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
Social/Rec	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Other	11.1%	7.4%	0.0%	0.0%	7.4%	0.0%	0.0%	3.7%

When looking at trip origins and destinations by route, logical patterns begin to form. Go Anywhere!, CRC Shuttle, Two Town Trolley, and Explorer were the most common routes taken for work trips. Two Town Trolley and University Mall Shuttle were the most likely choices to make a shopping trip, and Harding, University Mall, and Hokie Express were best options for a social/recreational trip.

The majority of BT trips do not require inter-route transfers - they are 'one-seat' rides, though Christiansburg riders are more likely to transfer (25.9% of respondents) compared to Blacksburg riders (4.4%). The routes most likely to require a transfer were Shopper Express, Go Anywhere!, CRC Shuttle, Hokie Express, and Two Town Trolley. VT/VCOM ID is the preferred form of fare payment used by the riders surveyed on Blacksburg routes (95.8%), while regular fare is most dominant in the Christiansburg market (80.8%).

Rider Demographics and Characteristics (Questions 5-14)

Demographic questions help a transit provider assess who it is riding on their system and personal characteristics that may influence their riding habits. Questions in this section included:

- What is your age and gender?
- What is your household's size, annual income, and vehicle availability?
- Do you have a driver's license?
- Are you affiliated with Virginia Tech/VCOM?
- How often and for how long have you been riding BT?

- How do you primarily access BT's schedule/route information?

While male/female ridership was evenly split, age classifications yielded notable results. As expected, Blacksburg service has a young college-age ridership base, with 80% of riders being 16-24 years old and nearly 15% being 25-34 years old (Figure 3-30). In Christiansburg, riders were generally spread more evenly across all adult age categories (Figure 3-31).

Figure 3-30. Age of Respondents (Blacksburg)

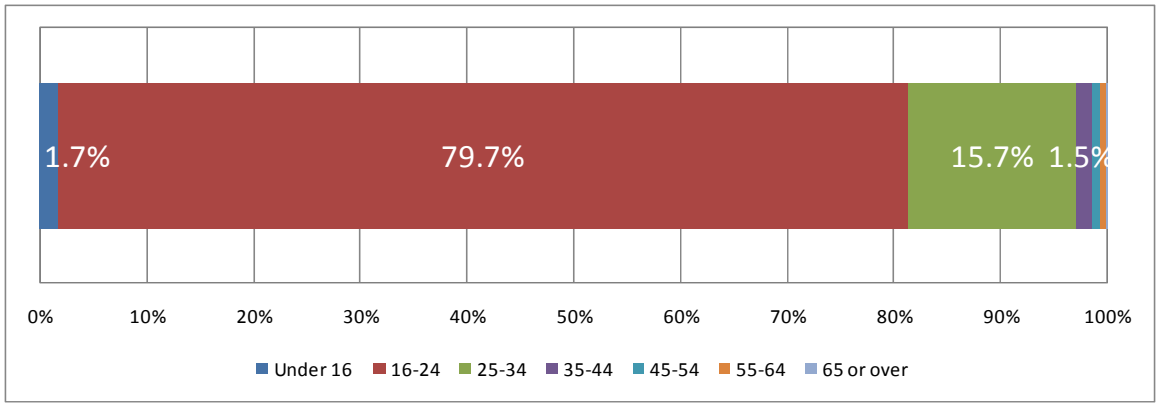
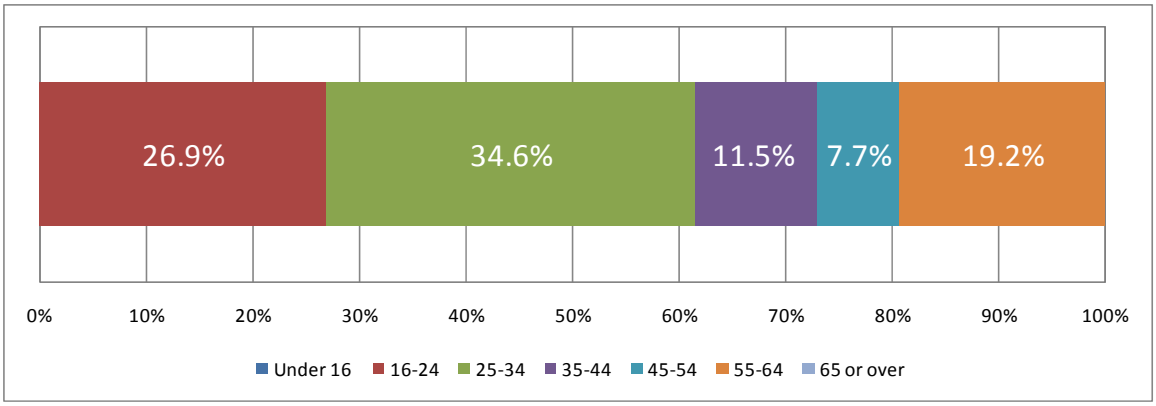


Figure 3-31. Age of Respondents (Christiansburg)



Questions about household size and income also yielded typical results. Most Blacksburg riders live in a one- or two-person household and earned less than $10,000 annually (college students living away from home were requested to identify as a one-person household). Of the Christiansburg respondents, most Christiansburg riders live in a two-person household (43.5%) with the rest living in a one-person household (21.7%) or three or more-person household (34.7%). Christiansburg riders also skewed toward low income, with 45.5% earning less than $10,000 annually and 68.2% of respondents earned less than $20,000 annually.

One in three Blacksburg riders have no vehicle available to them, with 40.9% having one vehicle in their household (Figure 3-32). Even so, over 90% of Blacksburg area riders have their driver's licenses (Figure 3-33). Having a driver's license and yet having no vehicle available is common for a college student

living away from home. Blacksburg riders without a vehicle were far more likely to ride Two Town Trolley and University Mall Shuttle than were riders who had a vehicle.

Figure 3-32. Number of Vehicles in Household (Blacksburg)

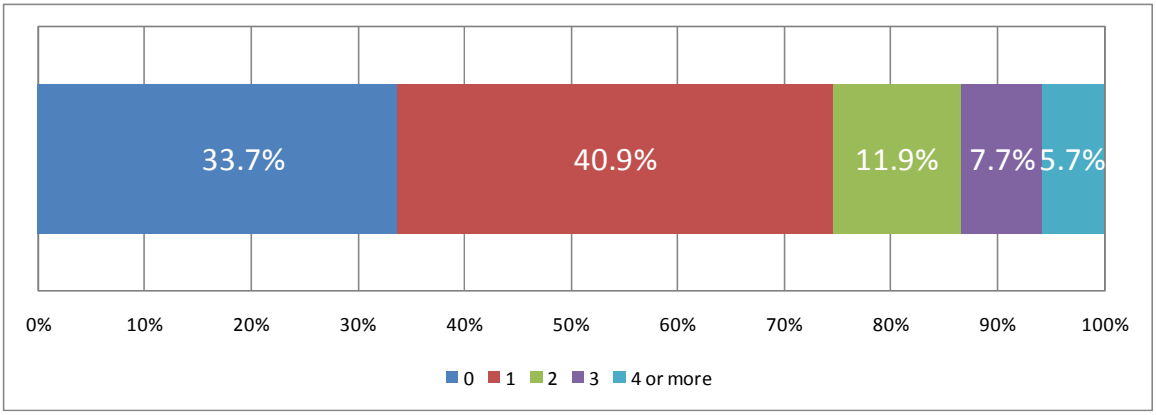
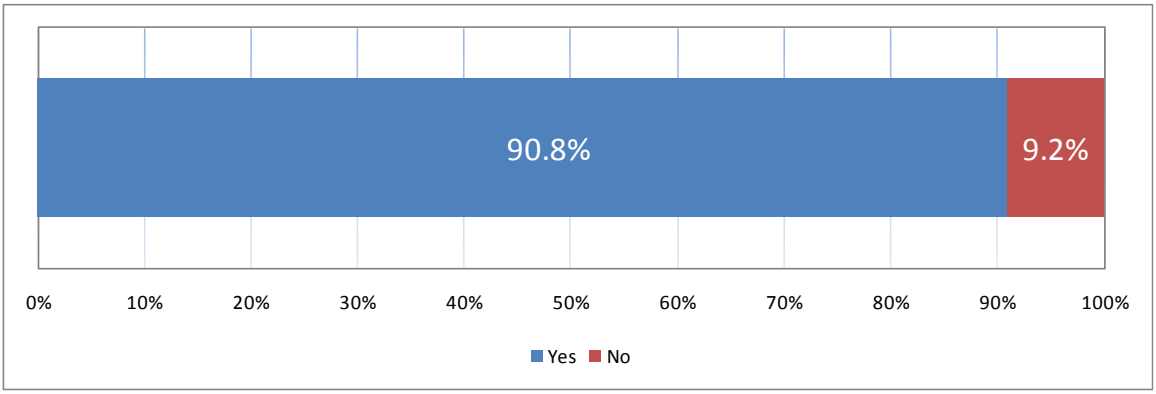


Figure 3-33. Valid Driver's License (Blacksburg)



For Christiansburg riders, driving to make a trip is much less of an option. Two in three respondents resided in zero-vehicle households, followed by 22.2% of respondents residing in one-vehicle households (Figure 3-34). Further, nearly three out of four riders do not have a driver's license (Figure 3-35). These results suggest a very large percentage of captive riders in this market.

Figure 3-34. Number of Vehicles in Household (Christiansburg)

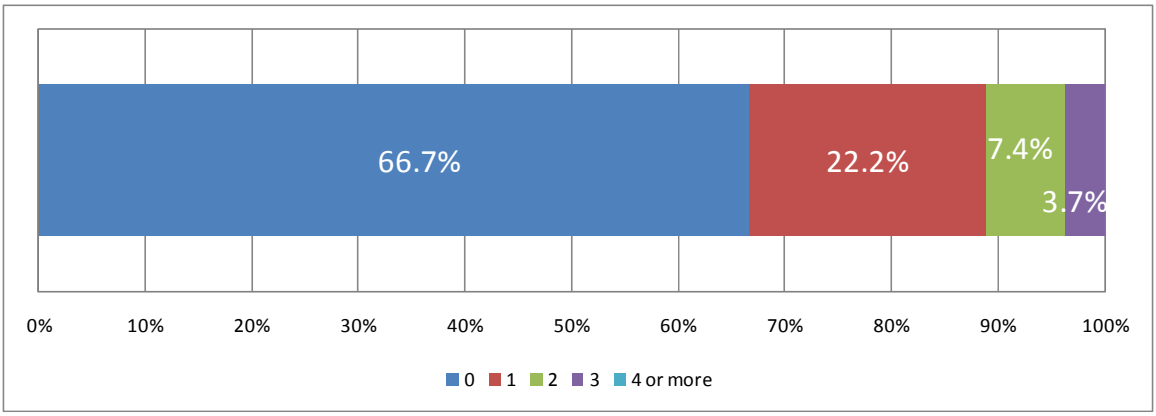
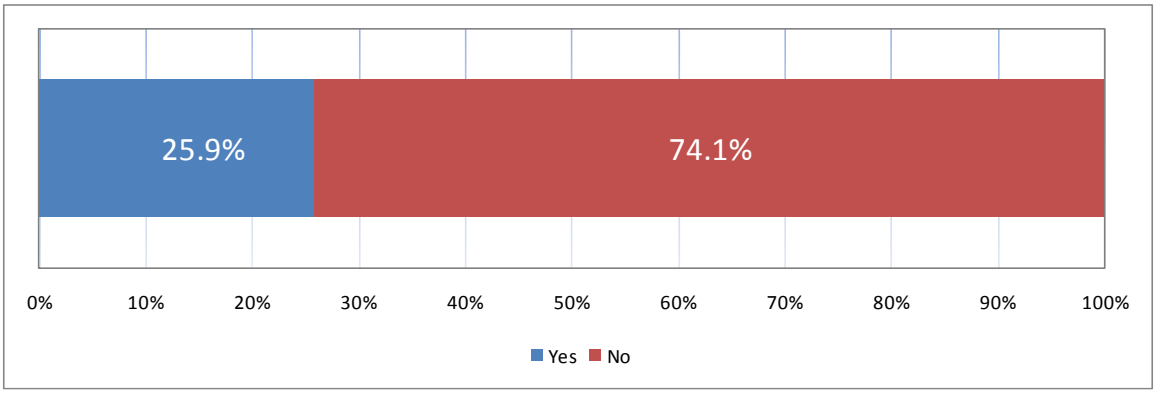
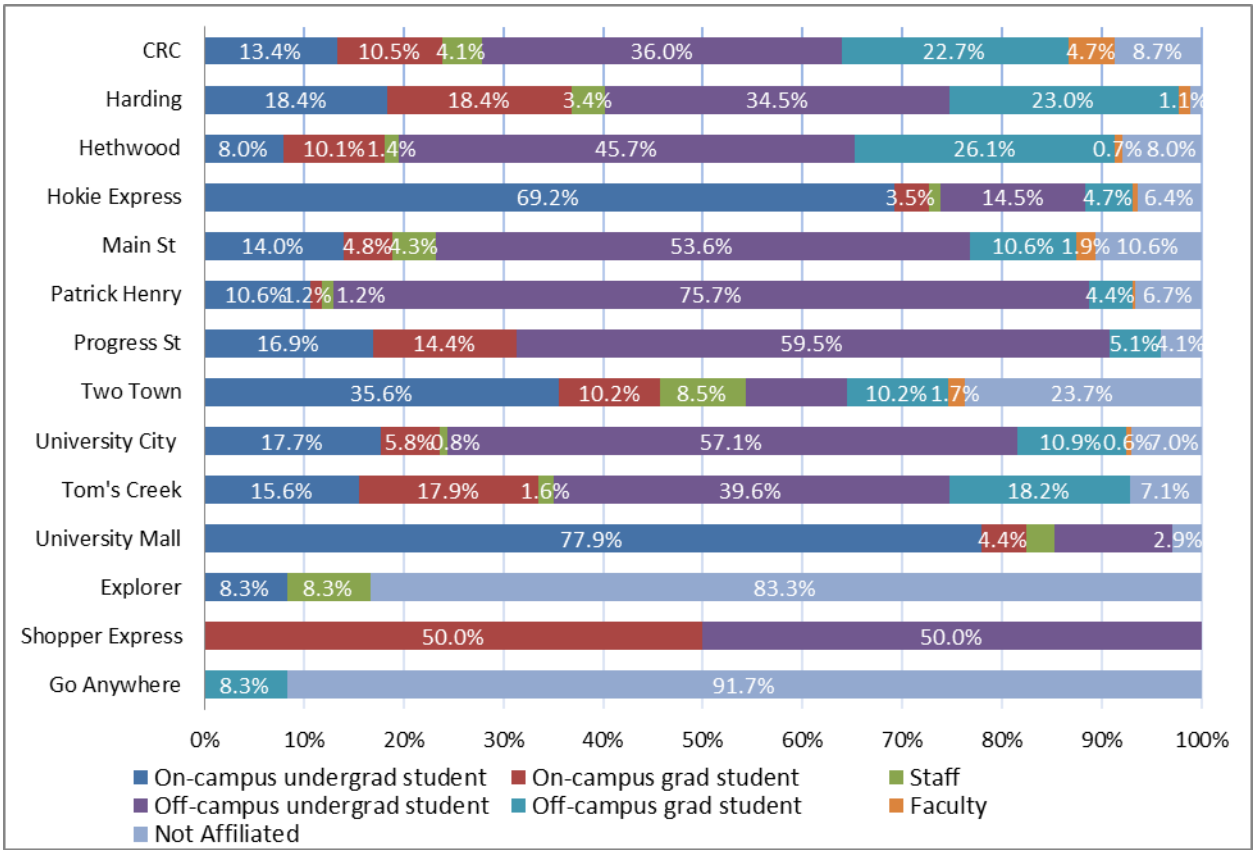


Figure 3-35. Valid Driver's License (Christiansburg)



Nearly 93% of the surveyed respondents on Blacksburg routes were affiliated with VT or VCOM. 70% were undergraduate students (50% off-campus, 20% on-campus), 20% were graduate students (12% off-campus, 8% on-campus), and 3% were staff or faculty. In stark contrast, 84% of Christiansburg respondents were not affiliated with Virginia Tech. Looking at VT/VCOM affiliation by route (Figure 3-36), on-campus undergrads dominate ridership on the U-Mall Shuttle and Hokie Express, and are the largest rider group on Two Town Trolley. The remaining Blacksburg routes skew more toward off-campus student use. Faculty are most likely to use the CRC Shuttle, and staff the Two Town Trolley.

Figure 3-36. VT/VCOM Affiliation by Route



The vast majority of BT patrons in both Blacksburg and Christiansburg are frequent riders, with over 70% of each riding four or more days per week, and over 95% riding at least two or three days per week. Due to the newness of Christiansburg service (implemented only in November 2009), these riders have been using BT for a shorter period of time on average than Blacksburg riders. Even so, riders in Blacksburg have on average not been using the system for longer than two years, indicative of a student ridership base that regenerates every four to five years.

In Blacksburg, BT's website is the primary means to access schedule/route information, used by half of riders. Printed maps are used by another 36.5% of the respondents, while Blacksburg Alert, VT Bus Tracker and Google Transit combined are primarily used by 10.8% of the respondents. In Christiansburg, the surveyed riders primarily access BT's route/scheduling information via other means (40.9%) such as the phone or through the word of mouth, followed by the agency's website (31.8%), printed maps (22.7%), and VT Bus Tracker (4.5%).

Rider Opinions (Questions 15-17)

Rider opinions can be used by a transit agency to understand a wide range of items about what their customers think, often focused on the quality of various existing service aspects or desires for new service. Questions in this section included:

- Rate a variety of characteristics of BT's on a scale of Very Good to Very Poor.
- Identify if service levels are meeting needs to a variety of destinations within the service area.
- Would you recommend BT to a friend or colleague, and why?

Survey respondents were asked to rate a series of service characteristics as well as provide an overall rating of BT's service on a scale of 1 (very poor) to 5 (very good). Table 3-7 shows the weighted average rating of all responses for each service characteristic, ranked in order from the most favorable opinions to the least favorable.

Table 3-7. Service Characteristic Ratings (Systemwide)

Service Characteristic	Rating
Cost of the fare	4.54
Availability of schedules and route info	4.27
BT website	4.23
OVERALL SERVICE	**4.19**
On-time performance	4.15
Areas served by BT	4.11
Directness of BT routes	4.09
Frequency of BT bus service	3.98
Hours of BT bus service	3.87
Bus stop amenities (shelters, benches, etc.)	3.73

As a whole, the data suggests that BT service is perceived to be good to very good, with most marks averaging above 4.0. Riders were particularly satisfied with the cost of service, availability of transit

information, and the BT website. Overall service was ranked as either good or very good by nearly 90% of all riders.

The results also suggest that there are a few service characteristics in need of improvement, including bus stop amenities, hours of service, and frequency of service. BT's efforts to create a bus stop database and amenities policy and improve bus stop information should allow BT to begin addressing the concerns leading to the lower ranking in this category.

Riders were asked to rate their ability to reach certain prime destinations across the service area. In general, surveyed riders perceived the existing transit connections to be adequate. However, some additional service needs would be welcomed by riders. In the Blacksburg market, downtown Christiansburg, New River Valley Mall and surrounding retail, and downtown Blacksburg topped the listed of destinations to which additional service is desired (Table 3-8).

Table 3-8. Transit Connections (Blacksburg)

Destination	Riders Desiring More Service
Downtown Christiansburg	18.9%
New River Valley Mall and surrounding retail	18.1%
Downtown Blacksburg	17.0%
First and Main/South Blacksburg	12.8%
New River Community College at NRV Mall	11.2%
Montgomery Hospital	9.3%
University Mall/Math Emporium	7.1%
Virginia Tech main campus	6.7%
Corporate Research Center	5.0%

Riders in the Christiansburg market expressed their top desires for more service as the Virginia Tech main campus, downtown Blacksburg, and the Corporate Research Center (Table 3-9).

Table 3-9. Transit Connections (Christiansburg)

Destination	Riders Desiring More Service
Virginia Tech main campus	27.8%
Downtown Blacksburg	21.1%
Corporate Research Center	18.8%
Montgomery Hospital	16.7%
University Mall/Math Emporium	16.7%
First and Main/South Blacksburg	16.7%
Downtown Christiansburg	10.5%
New River Valley Mall and surrounding retail	4.8%
New River Community College at NRV Mall	0.0%

BT ought to consider expanding existing and/or initiating new service between the two towns given the expressed demand for such service. Increased service between Christiansburg and the VT campus and between Blacksburg and the New River Valley Mall area could be provided by increasing the frequency of existing routes, or by introducing a new route connecting major points along the US-460 corridor.

Nearly all riders (98%) would recommend BT to their friends and colleagues, indicating a high level of satisfaction with BT's service. The write-in section unearthed a few caveats that would come along with those recommendations. While the riders praised BT for proving a very convenient, reliable, timely, and cheap or free transportation (that 'definitely beats parking fees at VT!' and is 'cheaper than driving'), some dissatisfaction seeped through in some of the notes: there are not enough bus shelters; weekend service is not as frequent and not late enough; transfers are not convenient and confusing (especially Progress Street – Toms Creek); and North Main route often experiences delays, especially on Friday.

3.4 Outreach

As part of the development of the Blacksburg Transit 2017 Transit Development Plan, a series of meetings were held with both BT staff and community stakeholders to garner a qualitative assessment and comprehensive viewpoints regarding BT's existing and future service and operations. A total of 22 meetings took place from October 12-14 and November 8-10, 2010.

Each meeting was framed by a few basic questions to stimulate discussion:

- **How would you assess existing route service?**
  (Service Coverage, Service Hours, Service Frequencies, Directness of Routing, Fares, etc.)
- **How would you assess existing equipment and facilities?**
  (Vehicles, Admin/Maintenance Facilities, Transit Facilities, Stop Amenities, ITS, etc.)
- **What are the new service and capital needs for the next six years?**
  (Within Blacksburg? Within Christiansburg? Across the region? How do needs change before and after the Multimodal Transfer Facility is in place?)
- **How can BT serve existing riders better and attract new riders?**
  (For on-campus students? Off-campus students? Faculty and staff? Non-VT riders? Seniors? Mobility-impaired riders?)

Most meetings were one-on-one or two individuals, while a few meetings – like the BT All Staff Meeting and TDP Task Force Meeting – were handled with large groups. Dialogue was typically informal and open-ended to allow each participant the flexibility to share a broad variety of opinions around these major topics. BT internal meetings also included a thorough interview regarding staff roles and responsibilities.

Feedback was provided by the following BT employees:

- Rebecca Martin, Director
- Debbie Swetnam, Regulatory Manager
- Harland Brown, Operations Manager
- Michael Price, Maintenance Manager

- Ken Tucker, Marketing Manager
- Tim Witten, Special Projects Manager
- Wayde Kass, Financial Analyst
- Erik Olsen, Transportation Planner
- Ron Parker, Supervisor
- Dianna Morris, Grant Coordinator
- BT Staff and Operators (30-40, various)

In addition, significant participation with community stakeholders was achieved, including:

- Town of Blacksburg
    - Marc Verneil, Town Manager *(TDP Task Force Member)*
    - Steve Ross, Deputy Town Manager
    - Karen Drake, Comprehensive Planner
- Town of Christiansburg
    - Barry Helms, Interim Town Manager *(TDP Task Force Member)*
    - Nichole Hair, Comprehensive Planner
- Virginia Tech Transportation and Campus Services Department
    - Steve Mouras, Director *(TDP Task Force Member)*
    - Debby Freed, Alternate Transportation Manager
- Montgomery County
    - Craig Meadows, County Administrator
    - Steve Sandy, Planning Director *(TDP Task Force Member)*
- Blacksburg- Christiansburg-Montgomery MPO
    - Dan Brugh, Executive Director *(TDP Task Force Member)*
- New River Valley Planning District Commission
    - Kevin Byrd, Executive Director *(TDP Task Force Member)*
- New River Community College
    - Jack Lewis, President
    - Pat Huber, Vice President for Instruction and Student Services
    - Linda Claussen, Director of Distance Education & Off-Campus Services
    - Fredrick (Fritz) Streff, Director of Institutional Effectiveness & Research
- Lewis-Gale Montgomery Regional Hospital
    - David Cashwell, Chief Operating Officer
- Warm Hearth Village
    - Fern Moschella, Chief Administrator
- Blacksburg Partnership
    - Diane Akers, President
- Virginia Tech Corporate Research Center
    - Joe Meredith, President

Several major themes echoed throughout the various meetings. These include:

- **The core service provided by BT – transporting students between residential areas in Blacksburg to Virginia Tech – is very good.** Both within and outside of BT, respondents felt that transit service to campus was well operated, well liked, and productive. Additional frequency would be nice on the heaviest routes (Hethwood and the Toms Creek patterns), as would increases in service hours and summer service, but all in all, BT is succeeding at moving students to VT. Virginia Tech feels they receive a good return on their investment. Many interviewees stressed that BT should not lose sight of this core business even as other services evolve.
- **More local "neighborhood" service is needed through the Blacksburg-Christiansburg-Montgomery service area.** For as good as service to VT is, many cited a need to provide more service in Blacksburg that was not campus-related and would be attractive to local residents, a "service for everyone." The Christiansburg model was used as an example for this, though most acknowledged that service delivery for the fledgling Christiansburg routes was still being refined. The Business 460 corridor connecting both downtowns, VT, NRV Mall, and the hospital, was often cited as the spine for local service. All recognized that providing neighborhood service meant some financial and political commitment from the Town of Blacksburg and Montgomery County, and a continued commitment from Christiansburg. It would also mean new challenges in BT's service planning, staffing needs, cost allocations, and marketing outreach.
- **There is a palpable and growing need for regional and commuter service connecting activity centers in the New River Valley.** Most respondents expressed that travel patterns between communities across the New River Valley were significant enough to warrant point-to-point and commuter services. Within BT's service area, Virginia Tech (for both employment and education) and NRV Mall (for both retail and employment) were cited as major attractions for the region, and were considered to be the best hubs for regional services. Areas suggested for connecting service include: Radford, Fairlawn, Pulaski, Giles, Floyd, and the villages of Montgomery County (Shawsville, Elliston & Lafayette, Prices Fork, Riner, Belview, and Plum Creek). Prices Fork was often cited as the area ripest for future growth. There were mixed feelings as to whether BT or some other operator should be the provider of regional services.
- **Passenger amenities, particular at stops, are in need of some upgrades.** Many interviewees felt that bus stops (which currently consist of a small round "BT" sign) could be improved by providing more stop and route information and in some cases benches or shelters. Implementing a bus stop standards policy guiding basic needs and amenity levels was suggested, as well as using IT-based solutions (such as BT4U and NextBus) to bring route information to riders at stops. Conversely, some felt that assets or stops currently unused or underused could be reallocated to areas of greater need.
- **BT is in need of adequate staffing and a focused vision to move forward from existing operations into the future.** Most staff members felt that due to economic conditions, current staffing levels were inadequate to meet current and future transit needs. Immediate needs included another mechanic and supervisor, but in a larger sense some felt the organization needed to rebalance to grow and develop mid- and lower-level employees. Finding the right mix of full- and part-time operators in relation to the addition of neighborhood or regional services was also a concern. Regarding a focused vision, many hoped the TDP document could provide a clear direction for BT to follow and a touch point for BT's engagement of the

community. Continuing the Task Force (or something similar) beyond the TDP timeframe as an ad-hoc Transit Advisory Committee was suggested as a way for BT to continue engaging the community regarding existing and future service needs.

Detailed summaries from each of the staff and stakeholder meetings are included in Appendix C.

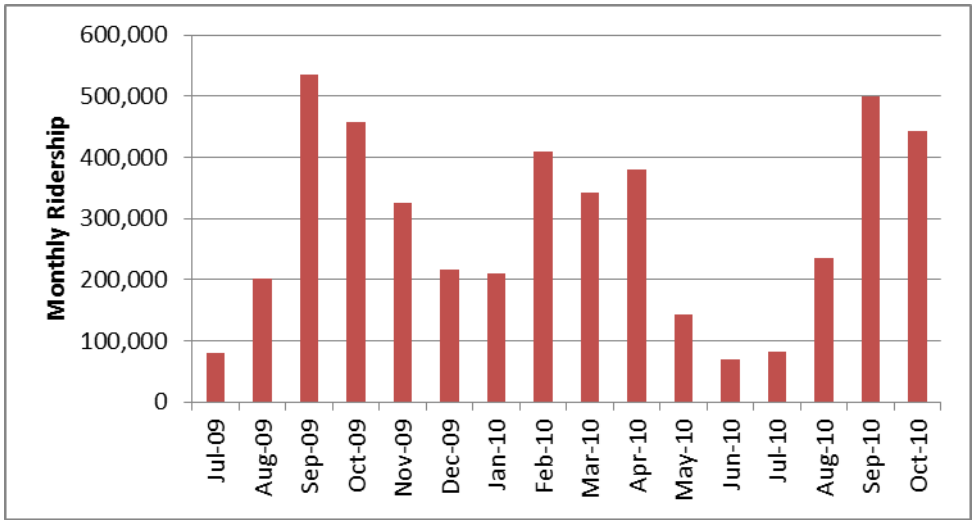
3.5 Existing Service Analysis

Daily ridership counts for BT routes are collected by a non-recording farebox that acts as an electronic counter. This information is used to generate annual reports for NTD and DRPT, quarterly reports for Virginia Tech, and monthly reports for the Town of Christiansburg. It is used in the following section to analyze ridership and route productivity for BT service.

Ridership by Service Area

Monthly ridership for Blacksburg and Christiansburg service was collected from July 2009 to October 2010 to understand how ridership changes seasonally and how each service has performed over the last 16 months. Ridership in Blacksburg is clearly influenced by the academic calendar with the highest ridership numbers corresponding to the fall (September through November) and spring (February through April) semesters (Figure 3-37). September had the highest Blacksburg ridership in both 2009 and 2010. Blacksburg service also operates at two different service levels through the year, Enhanced Service (during academic sessions) and Regular Service (during summer and breaks).

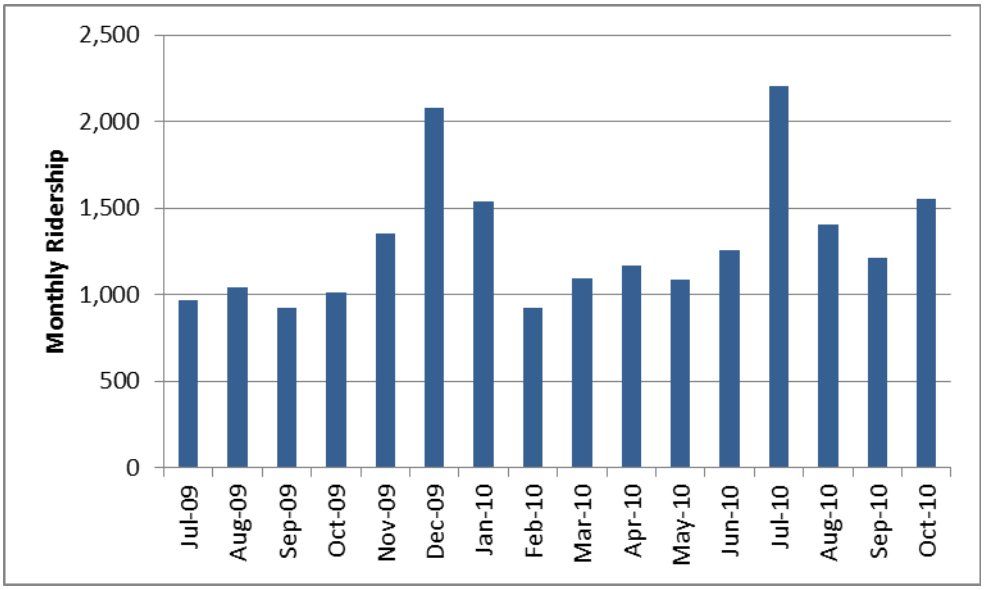
Figure 3-37: Blacksburg Ridership by Month



Ridership in Christiansburg was more consistent across the months while showing an overall increase in ridership over the 16-month period. December 2009 and July 2010 had the highest Christiansburg ridership (Figure 3-38). In month over month comparisons for July-October 2009 versus July-October 2010, Christiansburg ridership increased by at least 30 percent for all four months. Most notable was a 127 percent increase for July. The increase in Christiansburg ridership is likely due in part to the transition from only the Two Town Trolley to a three-route system in November 2009. Blacksburg

ridership increased in July and August (by 3% and 17%, respectively), but decreased slightly in September and October (by 7% and 3%, respectively).

Figure 3-38: Christiansburg Ridership by Month



Ridership by Route

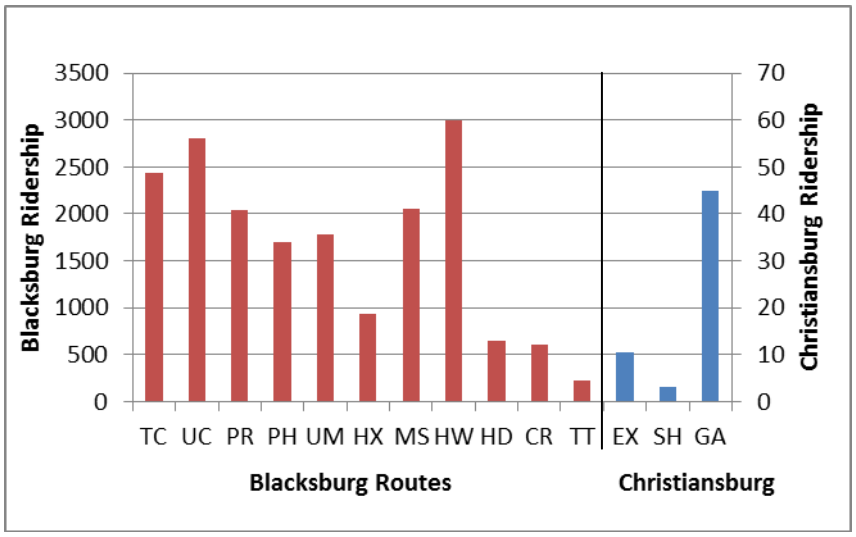
Farebox data was further broken down to the route level and analyzed during both Enhanced and Regular service. Average daily ridership data for July 2010 was used to represent Regular service, and data for October 18 through November 14, 2010 (to coincide with changes to Christiansburg service) was used to represent Enhanced service. Table 3-10 lists the route analyzed and the average daily ridership for each under both Enhanced and Regular service conditions. BT also offers trippers and routes for athletic events and other special events, but due to the variability in the operation of these routes, they are not included in the fixed route analysis.

Table 3-10: Average Daily Ridership by Route

Route ID	Route Name	Enhanced Service			Regular Service	
		Weekday	Saturday	Sunday	Weekday	Saturday
Blacksburg						
TC	Toms Creek	2,437	1,550	895	663	254
UC	University City Blvd	2,811	1,243	630	422	n/a
PR	Progress Street	2,043	n/a	n/a	n/a	n/a
PH	Patrick Henry	1,697	n/a	n/a	n/a	n/a
UM	U-Mall Shuttle	1,778	n/a	n/a	n/a	n/a
HX	Hokie Express	935	107	70	n/a	n/a
MS	Main Street	2,049	1,045	276	616	178
HW	Hethwood	2,993	936	308	357	81
HD	Harding	645	151	77	357	81
CR	CRC Shuttle	614	n/a	n/a	162	n/a
TT	Two Town Trolley	221	567	228	97	192
Blacksburg Total		**18,222**	**5,598**	**2,485**	**2,673**	**787**
Christiansburg						
EX	Explorer	10	n/a	n/a	5	n/a
SH	Shopper	3	17	n/a	20	12
GA	Go Anywhere	45	60	n/a	31	16
Christiansburg Total		**59**	**77**	**0**	**56**	**28**
SYSTEM TOTAL		**18,281**	**5,675**	**2,485**	**2,729**	**816**

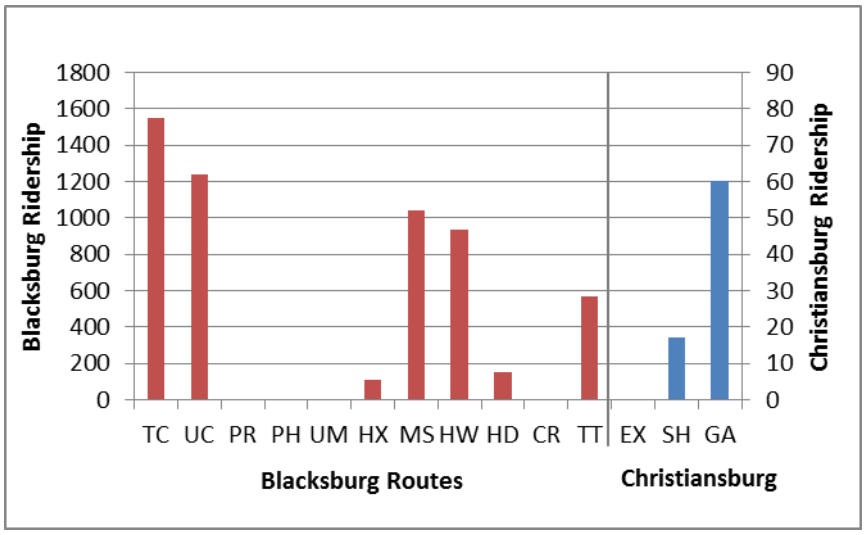
Figures 3-39, 3-40 and 3-41 illustrate ridership activity by route for weekdays, Saturdays, and Sundays for October/November 2010 (Enhanced Service). Note that routes with zero ridership in Figures 3-30 and 3-31 do not operate on Saturdays and/or Sundays. For weekday Enhanced service in Blacksburg, the Hethwood route had the most boardings at 2,993 per day, followed by the University City Boulevard route with 2,811 boardings per day, and the Toms Creek route with 2,437 boardings. In Christiansburg, the Go Anywhere route had the highest weekday boardings with 45 per day.

Figure 3-39: Average Weekday Ridership by Route (Enhanced Service)



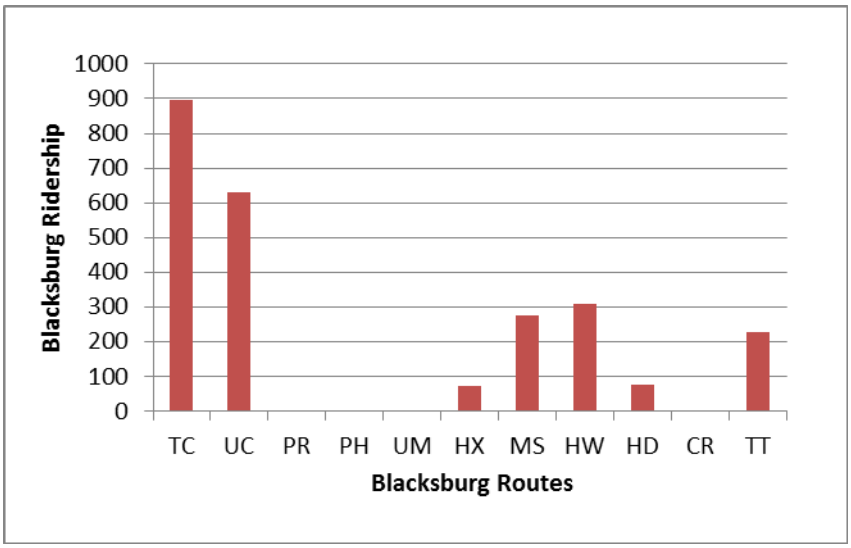
On Saturdays, the Toms Creek and University City Boulevard routes had the highest ridership in Blacksburg under Enhanced Service with 1,550 and 1,243 boardings, respectively. The Main Street and Hethwood routes are also popular on Saturdays. In Christiansburg, the Go Anywhere route had the highest ridership with 60 boardings, followed by the Shopper route with 17 boardings.

Figure 3-40: Average Saturday Ridership by Route (Enhanced Service)



On Sundays, the Toms Creek and University City Boulevard routes continued to have the most boardings in Blacksburg, but the Sunday ridership was nearly half of the Saturday ridership with 895 and 630 boardings, respectively. The Main Street, Hethwood, and Two Town Trolley routes each had over 200 boardings on Sundays under Enhanced Service. Christiansburg service does not operate on Sundays.

Figure 3-41: Average Sunday Ridership by Route (Enhanced Service)



Figures 3-42 and 3-43 illustrate ridership activity by route for weekdays and Saturdays for July 2010 (Regular Service). Note that routes with zero ridership in these figures did not operate during the period shown. The Toms Creek and Main Street routes carried the highest numbers of passengers under weekday Regular service in Blacksburg, with 663 and 616 weekday boardings, respectively. On Saturdays, Toms Creek had the highest number of passengers followed by the Two Town Trolley and Main Street. In Christiansburg, the Go Anywhere route had the highest boardings on both weekdays and Saturdays under Regular service, followed by the Shopper route. For both Blacksburg and Christiansburg routes, Saturday boardings were generally less than half of weekday boardings.

Ridership on Blacksburg routes under Regular service is significantly less than ridership under Enhanced service. Ridership on the Christiansburg routes remains more constant throughout the year, but Saturday ridership on the Go Anywhere route was significantly lower during Regular service. This is to be expected as this new service continues to be tweaked.

Figure 3-42: Average Weekday Ridership by Route (Regular Service)

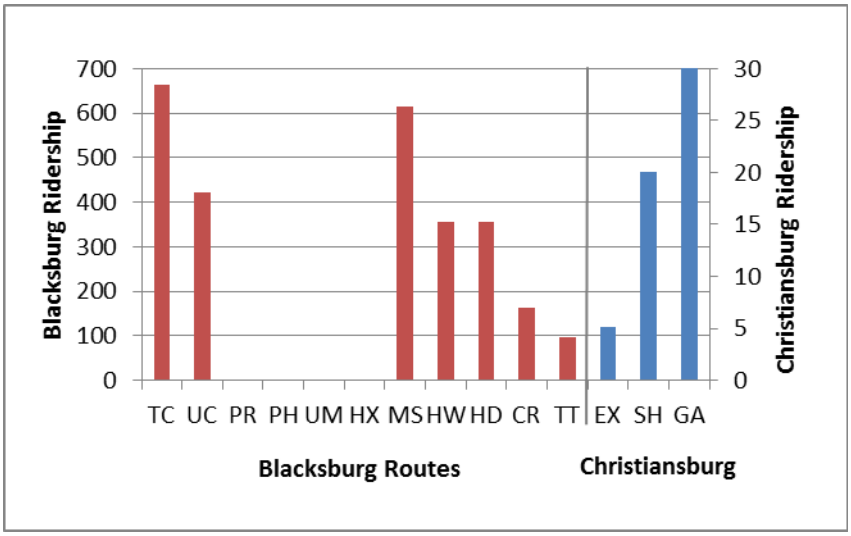
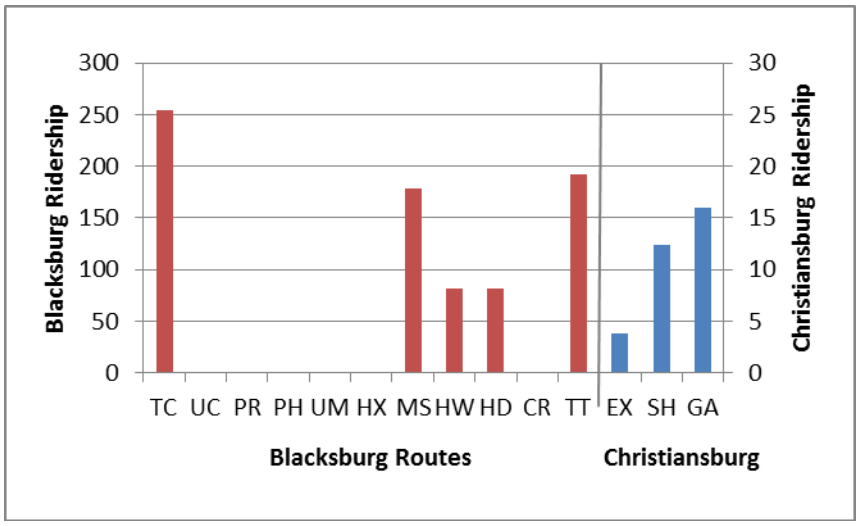


Figure 3-43: Average Saturday Ridership by Route (Regular Service)

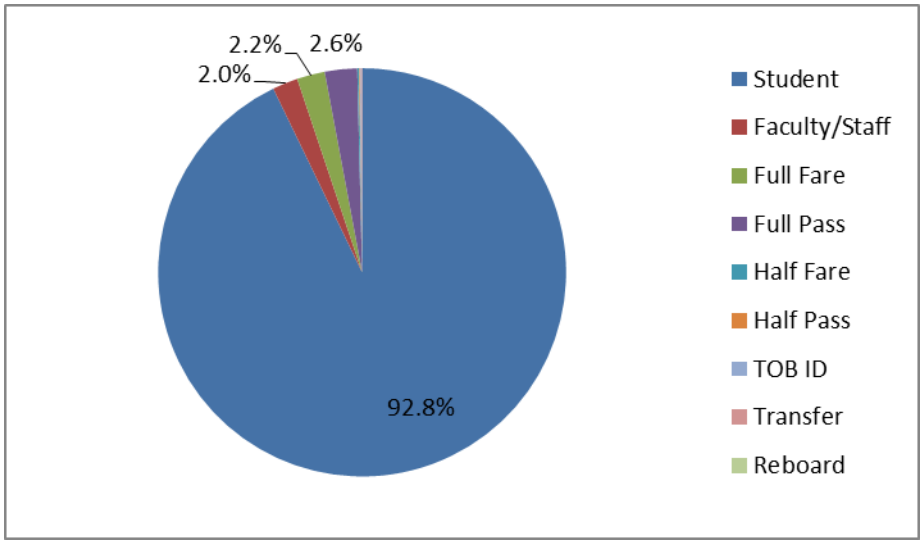


Ridership by Fare Class

Farebox data from July and October/November 2010 was reviewed to determine fare category and transfer characteristics by route. As described in Section 1.5, BT accepts single-ride cash fares, prepaid monthly passes, and several forms of prepaid identification in order to ride fixed route services. BT has two cash fare categories – full fare and half fare (youth/senior/disabled) and two categories of passes – full pass and half pass. Student and Faculty/Staff IDs from VT and VCOM are accepted as fare, as well as government IDs from the Towns of Blacksburg and Christiansburg. Children under 3 ride free.

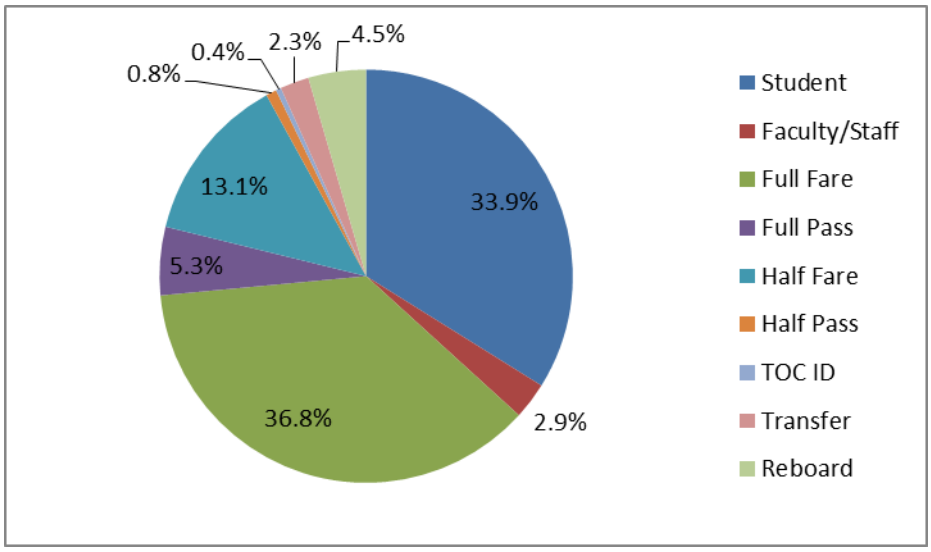
Ridership by fare category for Enhanced and Regular Service in Blacksburg and Christiansburg is presented in Figures 3-44 through 3-47. For Blacksburg Enhanced Service, student IDs account for an overwhelming 92.8 percent of ridership, followed by full pass at 2.6 percent, full fare at 2.2 percent, and faculty/staff ID at two percent. All other categories accounted for 0.1 percent of ridership or less.

Figure 3-44: Blacksburg Ridership by Fare Category (Enhanced Service)



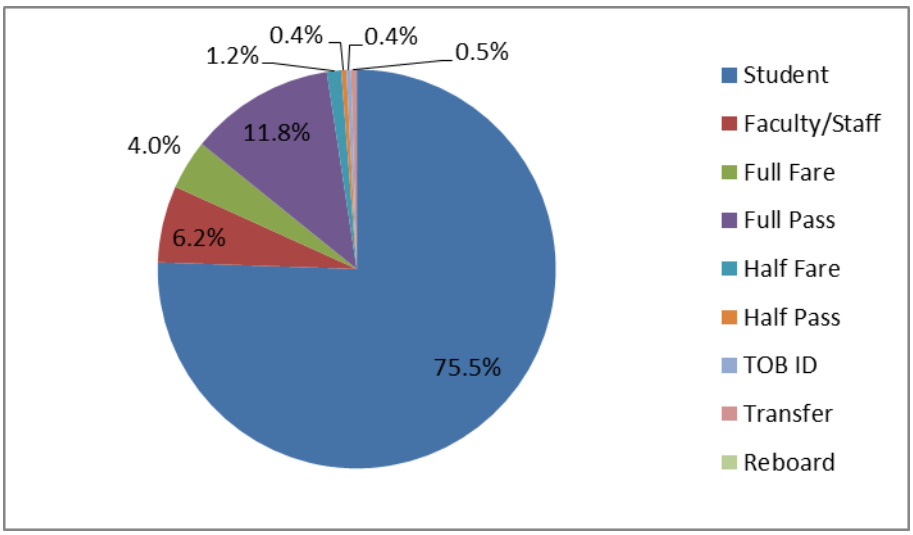
Christiansburg fares were more divided under Enhanced Service with full fares accounted for the most ridership at 36.8 percent, followed by student ID at 33.9 percent. Half fares accounted for 13.1 percent of Christiansburg Enhanced ridership and full passes accounted for 5.3 percent. All other categories accounted for less than five percent of Christiansburg ridership under Enhanced Service.

Figure 3-45: Christiansburg Ridership by Fare Category (Enhanced Service)



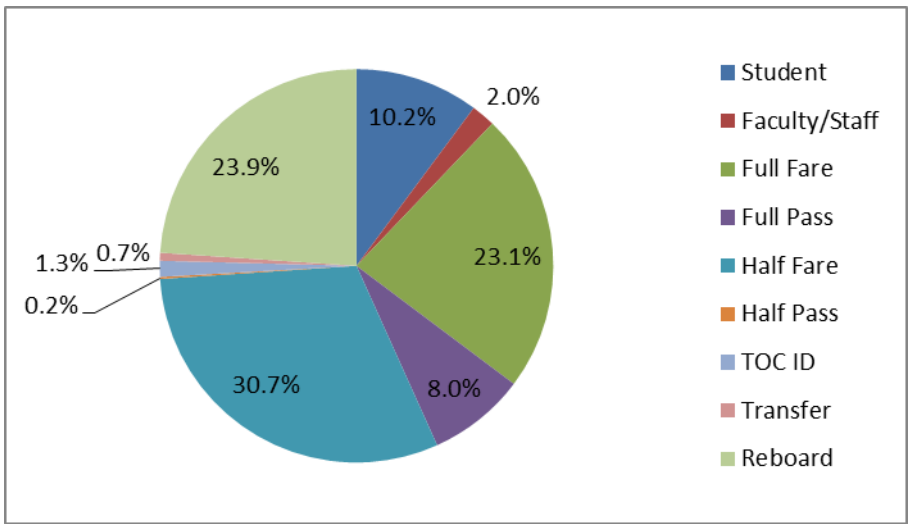
For Blacksburg Regular Service, student IDs account for over 75 percent of fares, followed by full passes at nearly 12 percent, faculty/staff IDs at 6.2 percent, full fares at four percent, and half fares at 1.2 percent. All other fare categories accounted for less than one percent of ridership. Compared to Enhanced Service in Blacksburg, the use of student ID's decreases proportionally under Regular Service and the percentages of full fares, full passes, and faculty/staff ID's increase.

Figure 3-46: Blacksburg Ridership by Fare Category (Regular Service)



For Christiansburg Regular Service, half fares, reboards, and full fares accounted for the majority of ridership at 30.7, 23.9 and 23.1 percent, respectively. Student IDs accounted for 10.2 percent of ridership, full passes accounted for eight percent, faculty/staff IDs accounted for two percent, and Town of Christiansburg government IDs accounted for 1.2 percent. All other fare categories accounted for less than one percent of Christiansburg ridership. Compared to Enhanced Service, the percentage of student ID's used as fare in Christiansburg also decreased while transfers and half fares increased.

Figure 3-47: Christiansburg Ridership by Fare Category (Regular Service)



Ridership by fare category was also identified by individual route for Enhanced and Regular Service, as shown in Figures 3-48 and 3-49. As expected, student IDs were the predominant fare for Blacksburg routes, especially under Enhanced Service when the student population is at its peak. Half fares and half passes make up a much higher percentage of Christiansburg fares compared to Blacksburg. Student IDs were used much more on the Christiansburg Shopper route under Enhanced Service compared to Regular Service where half fares and reboards were more popular.

Figure 3-48: Route Ridership by Fare Category (Enhanced Service)

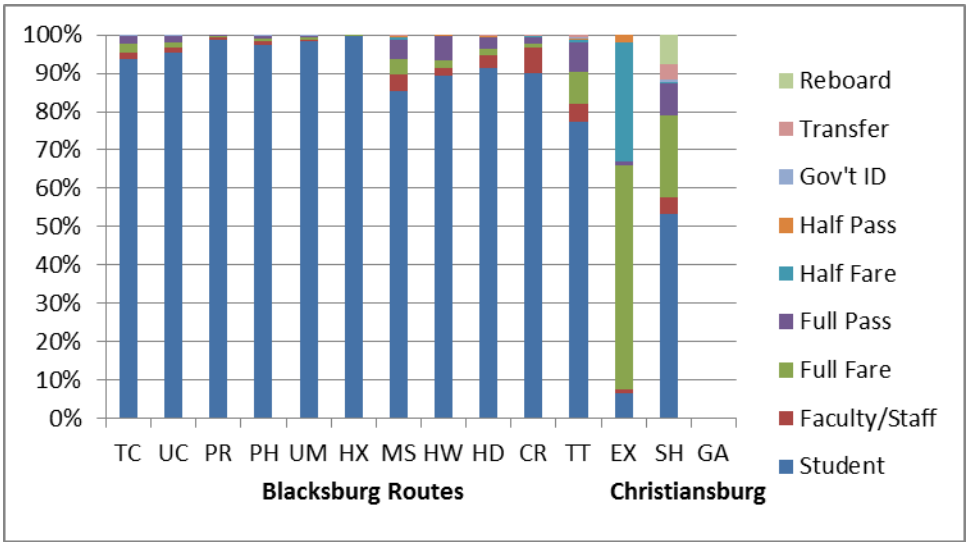
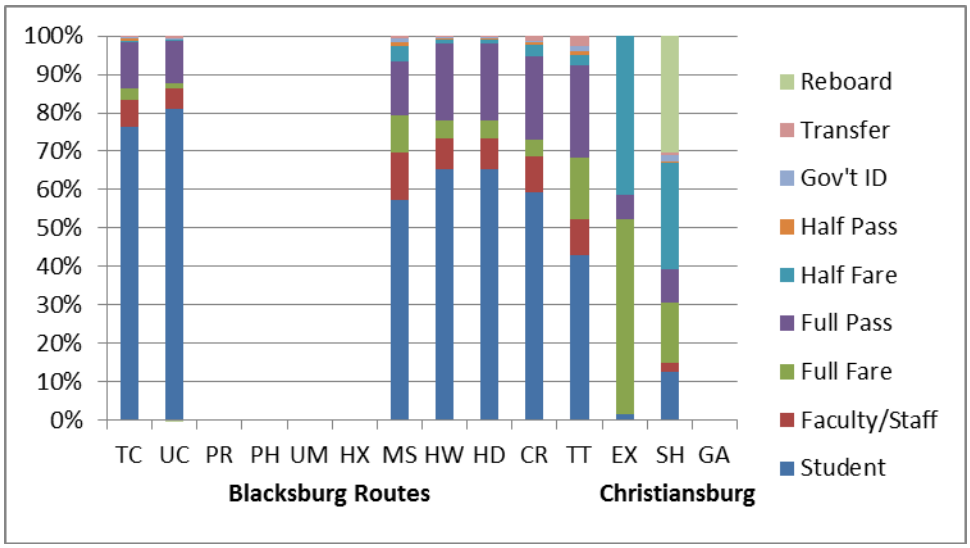


Figure 3-39: Route Ridership by Fare Category (Regular Service)



Ridership Productivity

As part of the systems-level analysis, ridership productivity was assessed. Three common measures used to evaluate performance are riders per trip, riders per revenue-hour and riders per revenue-mile. Tables 3-11, 3-12, and 3-13 present the existing route service performance rankings for BT's weekday, Saturday, and Sunday routes under Enhanced Service. Tables 3-14 and 3-15 present the rankings for BT's weekday and Saturday routes under Regular Service. These tables also identify routes that fall within the top quartile (numbers shown in green) and the bottom quartile (numbers shown in red) for each service productivity measure within each service area (Blacksburg and Christiansburg).

While route productivities are ranked against one another by service area, it is important to note that within each area routes are performing different roles that may be naturally more or less productive. For example, within Blacksburg, University City, Toms Creek, Progress Street, Patrick Henry, Hethwood, Harding, and Main Street all provide off-campus residential service; whereas Hokie Express, CRC Shuttle, and University Mall Shuttle all primarily act as campus circulation. Two Town Trolley serves a still different function as a more local community route. It is recommended that BT adopts a route classification system similar to the one described in Chapter Two of this TDP in which to group routes and periodically assess productivity.

Table 3-11: Weekday Route Productivity (Enhanced Service)

Rank	Route	Riders/ Trip
Blacksburg		
1	UM	41.35
2	TC	37.03
3	PH	36.49
4	UC	35.44
5	PR	30.27
6	MS	23.02
7	HW	22.71
8	TT	14.75
9	HX	8.09
10	HD	7.61
11	CR	5.90
Average		**21.63**
Christiansburg		
1	GA	1.15
2	EX	0.52
3	SH	0.25
Average		**0.81**
SYSTEM AVERAGE		**19.99**

Rank	Route	Riders/ Rev.-Hr.
Blacksburg		
1	UM	82.71
2	HW	76.36
3	TC	74.06
4	PH	72.20
5	UC	70.88
6	PR	60.54
7	MS	46.56
8	HX	32.35
9	HD	30.42
10	TT	29.49
11	CR	23.61
Average		**57.28**
Christiansburg		
1	GA	2.53
2	EX	1.04
3	SH	0.49
Average		**1.71**
SYSTEM AVERAGE		**51.88**

Rank	Route	Riders/ Rev.-Mi.
Blacksburg		
1	UM	11.66
2	PH	9.25
3	UC	9.16
4	PR	8.67
5	TC	8.42
6	HW	6.95
7	HX	4.22
8	MS	3.96
9	HD	3.28
10	TT	2.13
11	CR	1.85
Average		**6.13**
Christiansburg		
1	GA	0.22
2	EX	0.06
3	SH	0.04
Average		**0.13**
SYSTEM AVERAGE		**5.35**

Conclusions from the weekday Enhanced Service performance measure rankings are as follows:

- University Mall Shuttle, Toms Creek, and Patrick Henry routes in Blacksburg were in the top quartile for at least two of three productivity measures.
- Harding and CRC Shuttle routes were in the bottom quartile for all three measures.
- The ranking of the Christiansburg routes were the same for all three measures, with the Go Anywhere route ranking the highest for each.

Table 3-12: Saturday Route Productivity (Enhanced Service)

Rank	Route	Riders/ Trip
Blacksburg		
1	TC	44.92
2	UC	36.02
3	MS	22.71
4	HW	20.81
5	TT	18.89
6	HD	4.43
7	HX	2.09
Average		**20.36**
Christiansburg		
1	GA	2.62
2	SH	1.33
Average		**2.15**
SYSTEM AVERAGE		**18.25**

Rank	Route	Riders/ Rev.-Hr.
Blacksburg		
1	TC	89.84
2	HW	83.23
3	UC	72.04
4	MS	52.24
5	TT	37.78
6	HD	17.72
7	HX	8.37
Average		**54.88**
Christiansburg		
1	GA	4.24
2	SH	2.65
Average		**3.74**
SYSTEM AVERAGE		**46.25**

Rank	Route	Riders/ Rev.-Mi.
Blacksburg		
1	UC	9.75
2	TC	9.52
3	HW	6.35
4	MS	4.83
5	TT	2.91
6	HD	1.88
7	HX	0.97
Average		**5.39**
Christiansburg		
1	GA	0.50
2	SH	0.21
Average		**0.38**
SYSTEM AVERAGE		**4.56**

Conclusions from the Saturday Enhanced Service performance measure rankings are as follows:

- Toms Creek and University City routes in Blacksburg were in the top quartile for at least two of three productivity measures.
- The Harding and Hokie Express routes made up the bottom quartile all three measures.
- For Christiansburg, the Go Anywhere routes ranked highest for all three measures.

Table 3-13: Sunday Route Productivity (Enhanced Service)

Rank	Route	Riders/ Trip
Blacksburg		
1	TC	38.07
2	UC	26.82
3	TT	18.96
4	HW	13.41
5	MS	11.51
6	HD	3.21
7	HX	2.13
Average		**15.24**
SYSTEM AVERAGE		**15.24**

Rank	Route	Riders/ Rev.-Hr.
Blacksburg		
1	TC	76.15
2	UC	53.64
3	HW	53.63
4	TT	37.92
5	MS	23.02
6	HD	12.85
7	HX	8.52
Average		**40.40**
SYSTEM AVERAGE		**40.40**

Rank	Route	Riders/ Rev.-Mi.
Blacksburg		
1	TC	8.05
2	UC	7.26
3	HW	4.11
4	TT	2.92
5	MS	2.19
6	HD	1.39
7	HX	0.99
Average		**4.11**
SYSTEM AVERAGE		**4.11**

Conclusions from the Sunday Enhanced Service performance measure rankings are as follows:

- The Toms Creek and University City Boulevard routes in Blacksburg made up the top quartile for all three productivity measures.
- The Harding and Hokie Express routes made up the bottom quartile all three measures.

Table 3-14: Weekday Route Productivity (Regular Service)

Rank	Route	Riders/ Trip
Blacksburg		
1	TC	21.72
2	UC	18.74
3	MS	11.73
4	TT	8.10
5	CR	6.88
6	HW	6.87
6	HD	6.87
Average		**10.91**
Christiansburg		
1	GA	1.29
2	SH	0.77
3	EX	0.26
Average		**0.80**
SYSTEM AVERAGE		**8.66**

Rank	Route	Riders/ Rev.-Hr.
Blacksburg		
1	TC	43.44
2	UC	37.48
3	HW	27.46
3	HD	27.46
5	MS	23.24
6	TT	16.20
7	CR	14.05
Average		**27.70**
Christiansburg		
1	GA	2.35
2	SH	1.54
3	EX	0.52
Average		**1.55**
SYSTEM AVERAGE		**20.57**

Rank	Route	Riders/ Rev.-Mi.
Blacksburg		
1	UC	4.81
2	TC	4.60
3	HD	2.96
4	MS	2.22
5	HW	2.13
6	TT	1.13
7	CR	1.08
Average		**2.59**
Christiansburg		
1	GA	0.27
2	SH	0.12
3	EX	0.03
Average		**0.13**
SYSTEM AVERAGE		**1.85**

Conclusions from the weekday Regular Service performance measure rankings are as follows:

- Toms Creek and University City Boulevard routes in Blacksburg made up the top quartile for all three productivity measures.
- The Two Town Trolley and CRC Shuttle routes were in the bottom quartile for two of the three measures.
- The ranking of the Christiansburg routes were the same for all three measures, with the Go Anywhere routes ranking the highest for each.

Table 3-15: Saturday Route Productivity (Regular Service)

Rank	Route	Riders/ Trip
Blacksburg		
1	TC	13.03
2	TT	12.01
3	MS	9.15
4	HW	4.28
5	HD	4.07
Average		**8.38**
Christiansburg		
1	GA	1.33
2	SH	0.95
Average		**1.14**
SYSTEM AVERAGE		**6.86**

Rank	Route	Riders/ Rev.-Hr.
Blacksburg		
1	TC	26.05
2	TT	24.03
3	MS	18.30
4	HW	17.14
5	HD	16.28
Average		**21.14**
Christiansburg		
1	SH	1.91
2	GA	1.74
Average		**1.81**
SYSTEM AVERAGE		**15.40**

Rank	Route	Riders/ Rev.-Mi.
Blacksburg		
1	TC	2.75
2	TT	1.85
3	HD	1.78
4	MS	1.74
5	HW	1.30
Average		**1.93**
Christiansburg		
1	GA	0.27
2	SH	0.15
Average		**0.20**
SYSTEM AVERAGE		**1.49**

Conclusions from the Saturday Regular Service performance measure rankings are as follows:

- The Toms Creek route in Blacksburg made up the top quartile for all three productivity measures.
- The Harding route was in the bottom quartile for two of the three measures.
- For Christiansburg, the Go Anywhere routes ranked highest for two of the three measures.

Ridership by Stop

Stop level ridership (boardings) was recorded for each route between March 14 and April 10, 2010 and aggregated to develop a systems level assessment of ridership activity by stop. The average daily ridership was calculated for weekdays, Saturdays, and Sundays. Boardings were counted at 214 individual stops, 23 of which are located in Christiansburg.

A total of 16,766 boardings occurred on an average weekday in the BT system for the March/April 2010 period, with less than one percent occurring at Christiansburg stops and the remainder occurring at Blacksburg stops. On Saturdays, average boardings totaled 3,271, with approximately seven percent occurring at Christiansburg stops. On Sundays, average boardings totaled 2,080, with approximately two percent occurring at Christiansburg stops.

Table 3-16 and Table 3-17 present average daily boardings for weekdays, Saturday, and Sunday at the top 25 Blacksburg stops and all 23 Christiansburg stops, respectively. In Blacksburg, the highest number of boardings occurred at Burruss Hall. Boardings at Burruss Hall account for 15 percent of total weekday boardings in Blacksburg, 14 percent of Saturday boardings, and 17 percent of Sunday boardings. Torgerson Hall had the second highest number of boardings in Blacksburg. Together, Burruss Hall and Torgerson Hall accounted for nearly 27 percent of average weekday boardings in Blacksburg. Eleven of the top 25 Blacksburg stops are located on the Virginia Tech campus.

In Christiansburg, the New River Valley Mall and Walmart stops had the highest boardings. The New River Valley Mall stop accounted for nearly 55 percent of weekday boardings, 54 percent of Saturday boardings, and 55 percent of Sunday boardings. The Walmart stop accounted for 30 percent of weekday boardings, 36 percent of Saturday boardings, and 43 percent of Sunday boardings. Note that Christiansburg data only includes fixed route stops. Stops made to pick up demand response passengers that are not at a fixed stop are not part of the data presented.

Table 3-16: Average Ridership Activity at Blacksburg Stop Locations

Stop Name	Weekday	Saturday	Sunday
Burruss Hall	2,553	435	347
Torgerson Hall	1,885	412	148
Squires Ebnd	698	267	100
University Mall Main Entrance	662	0	0
Old Security Bldg	552	34	23
Progress/Hunt Club Sbnd	538	85	71
Patrick Henry/Toms Creek Ebnd	503	47	59
Newman Library	447	58	14
Squires Wbnd	439	217	105
Davidson Hall	391	38	23
Patrick Henry/Seneca Wbnd	359	27	36
Heather/Tall Oaks	334	41	40
The Village on Patrick Henry Ebnd	325	34	26
University City/Toms Creek Wbnd	317	68	55
University Mall Sbnd	315	90	158
Oak Lane South	291	25	7
Tall Oaks/Copper Croft	258	29	33
Tall Oaks/Foxridge	242	15	19
Pheasant Run	240	65	55
West Campus/Perry Nbnd	203	16	9
Main/Patrick Henry Sbnd	172	28	29
McBryde Hall	171	0	0
Hutcheson Hall	158	0	0
Litton Reaves Hall	156	10	11
Main/Red Maple	156	35	21

Table 3-17: Average Ridership Activity at Christiansburg Stop Locations

Stop Name	Weekday	Saturday	Sunday
New River Valley Mall	50.8	121.5	27.0
Wal Mart	27.9	80.8	21.3
NRV Theatre	2.9	5.5	0.3
Republic/Salem	2.1	2.8	0.0
Kroger	1.7	2.8	0.0
Montgomery County Govt Center	1.7	1.0	0.0
W Main/Dunkley	1.5	3.8	0.0
DMV on Arbor	1.0	0.3	0.0
Spradlin Farm	1.0	3.5	0.0
Laurel/Sycamore	0.7	0.5	0.0
Arbor/Market	0.5	0.3	0.0
Depot/Cambria	0.5	0.8	0.0
Depot/New	0.4	0.0	0.0
Park/Hagan	0.3	0.3	0.0
Farmview/Ridinger	0.2	0.0	0.0
Shoppers Way	0.2	0.0	0.0
Park/East	0.2	0.0	0.0
Town Hall and Courthouse	0.2	0.0	0.0
Market Place South	0.1	0.0	0.0
Laurel/Peppers Ferry	0.0	0.0	0.0
Post Office on Arbor	0.0	0.0	0.0
Market Place North	0.0	0.0	0.0
Franklin/Sara	0.0	0.0	0.0

Figures 3-50, 3-51, and 3-52 display the average daily ridership by stop in Blacksburg and Christiansburg for weekdays, Saturday, and Sunday. Gray dots on the figures indicated stops where no data was available, either because the stop did not exist at the time the data was collected or no data was collected for that particular stop. The small blue dots on the figures indicated stops where no riders were recorded between March 14 and April 10, 2010. There were two stops in Blacksburg and four in Christiansburg with no recorded weekday ridership.

In Christiansburg, the New River Valley Mall and Wal-Mart stops maintained more than 20 average daily riders on weekdays, Saturdays, and Sundays, as shown by the red dots in the figures. In Blacksburg, there were seven stops with average weekday ridership over 500 (shown with red dots on Figure 3-40), but no stops that exceeded 500 average daily riders on Saturdays or Sundays.

Figure 3-50: Weekday Ridership Activity by Stop Location

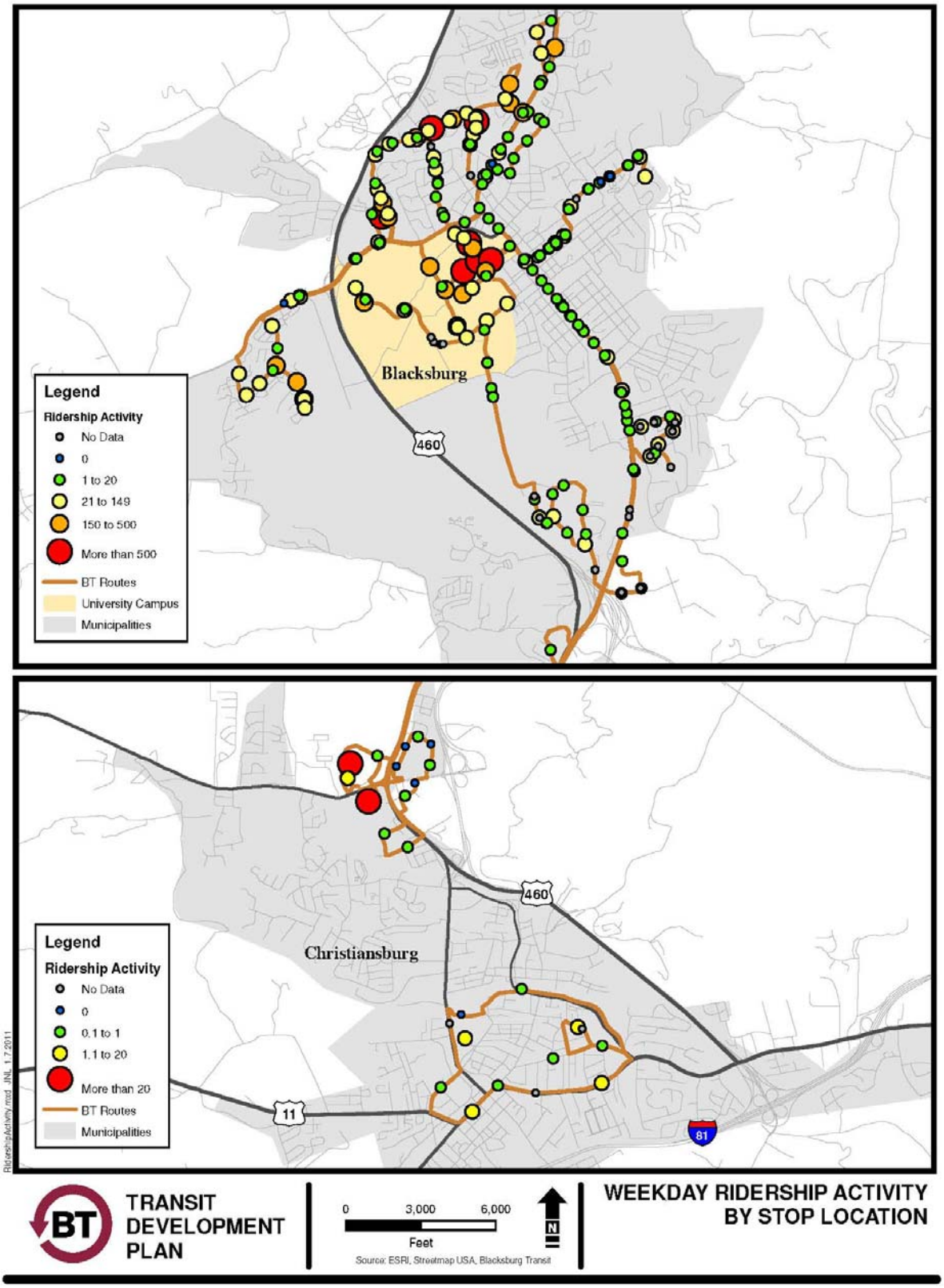


Figure 3-51: Saturday Ridership Activity by Stop Location

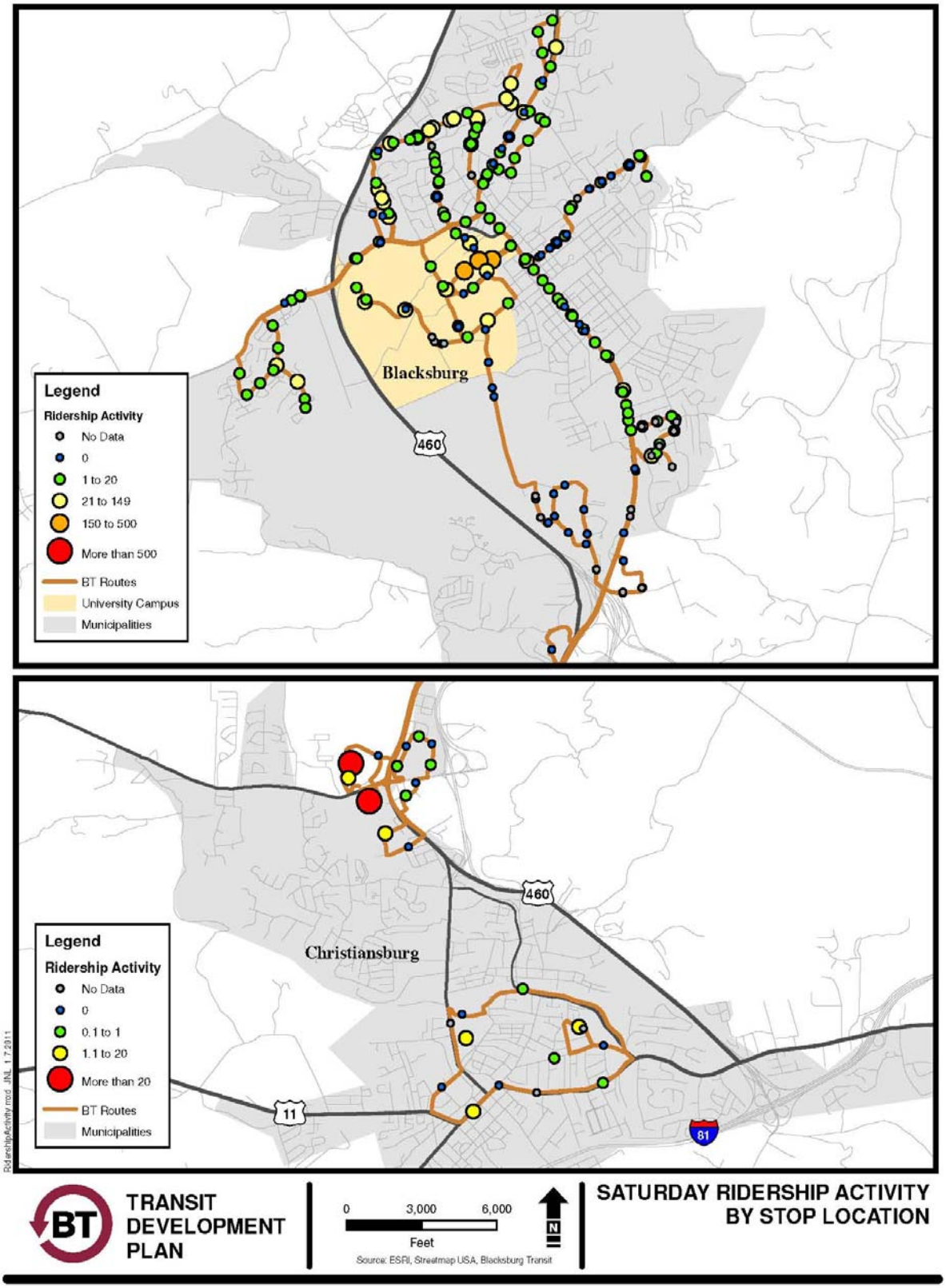
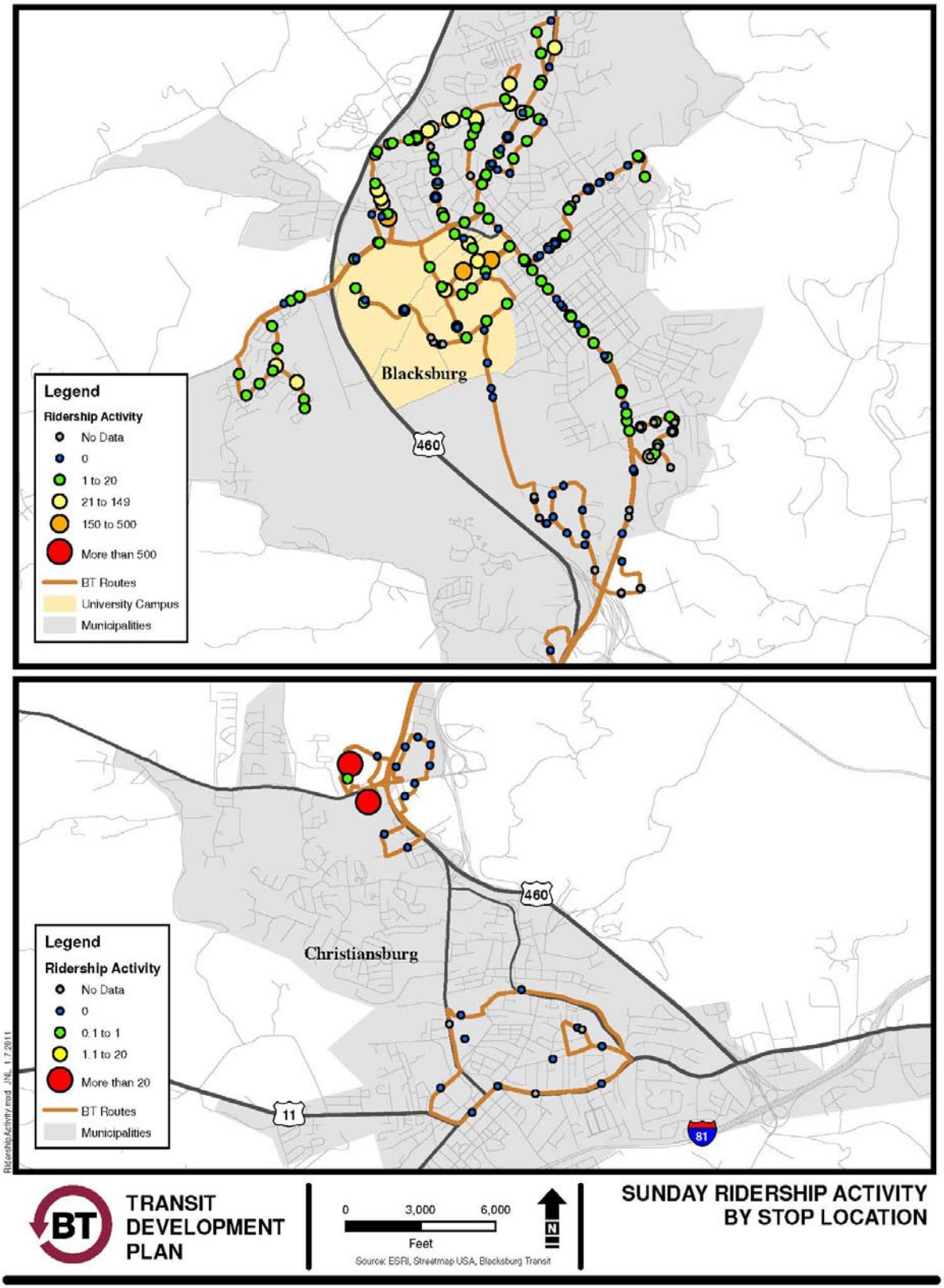


Figure 3-52: Sunday Ridership Activity by Stop Location



3.6 Land Use Summary

The Blacksburg Comprehensive Plan (*Blacksburg 2046*) serves as the Town of Blacksburg's official planning document for guiding growth over the next 35 years. Several of the action strategies in the plan involve improving access to transit. For example, the bicycle section includes a strategy to "develop bicycle lanes as part of an intermodal transportation system by providing easy access to transit stops and connections to the greenway system." Also, the greenway section has a strategy to "improve pedestrian crossings, sidewalks, and bicycle lanes leading up to and at major roads such as Harding Avenue, North Main Street, Prices Fork Road, Patrick Henry Drive, and University City Boulevard." Improving pedestrian access to these major corridors will also improve access to transit stops along the corridors.

Figure 3-53 shows existing land uses within the Town of Blacksburg as well as existing BT routes. As shown on the figure, BT's existing routes appear to serve the land use types and development densities that typically have the highest demand for transit (commercial, office, institutional, and multi-family).

Figure 3-54 presents future land use designations for the Town of Blacksburg. Based on the future land use map, new research/light industrial use is designated for the VT property on the west side of US-460. In addition, medium and high-density residential uses are designated south of existing multi-family residential development on Tall Oaks Road in southwest Blacksburg. If these uses develop as designated, BT may want to consider extending existing routes south of Prices Fork Road to serve the new development. In addition, according to information provided by the Blacksburg Planning Department, a project to extend Progress Street to Givens Lane is awaiting funding. Once the Progress Street extension is constructed, BT should consider extending the Progress Street or Patrick Henry routes along Progress Street to Givens Lane and along Givens Lane to Whipple Drive or North Main Street. This would add access for the Blacksburg Estates mobile home park located on the south side of Givens Lane.

Figure 3-55 shows existing land use for the Town of Christiansburg, based on current zoning districts. As shown on the figure, existing BT routes in Christiansburg generally serve the commercial area around New River Valley Mall in northern Christiansburg and the commercial and multi-family residential areas around downtown Christiansburg. The Franklin Street corridor between US-460 and downtown Christiansburg is not currently served by BT fixed routes, nor is the Roanoke Street corridor east of Highway 460 where additional commercial development is located.

Figure 3-56 presents the future land use map for the Town of Christiansburg. New mixed use development is designated along Peppers Ferry Road west of the mall. As this development occurs, BT may want to consider extending service west along Peppers Ferry Road. Also notable on the future land use map are the commercial and mixed uses designated along Roanoke Street between US-460 and I-81 and east of I-81. This is another area where transit service should be considered in the future.

Figure 3-53: Town of Blacksburg Existing Land Use

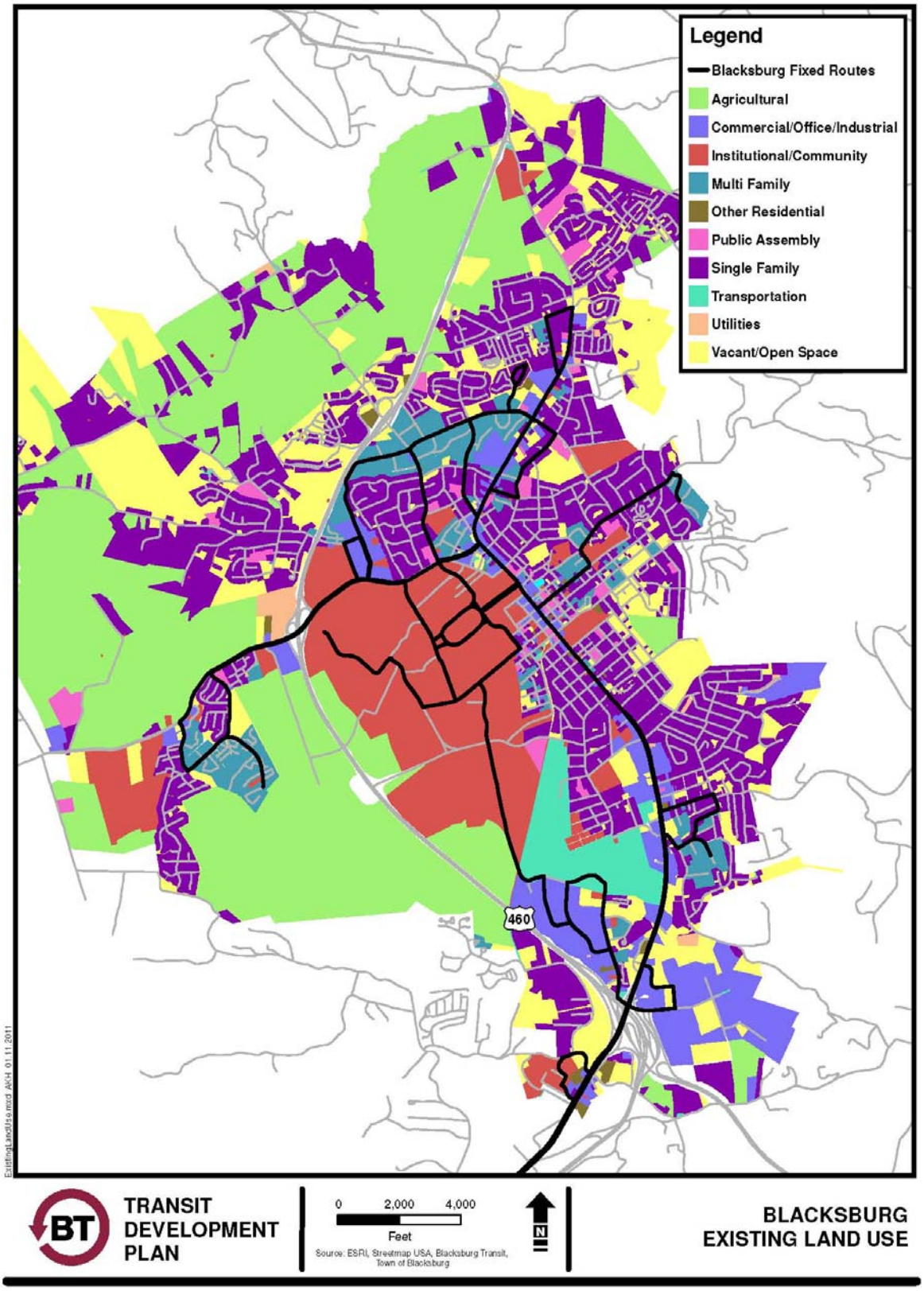


Figure 3-54: Town of Blacksburg Future Land Use

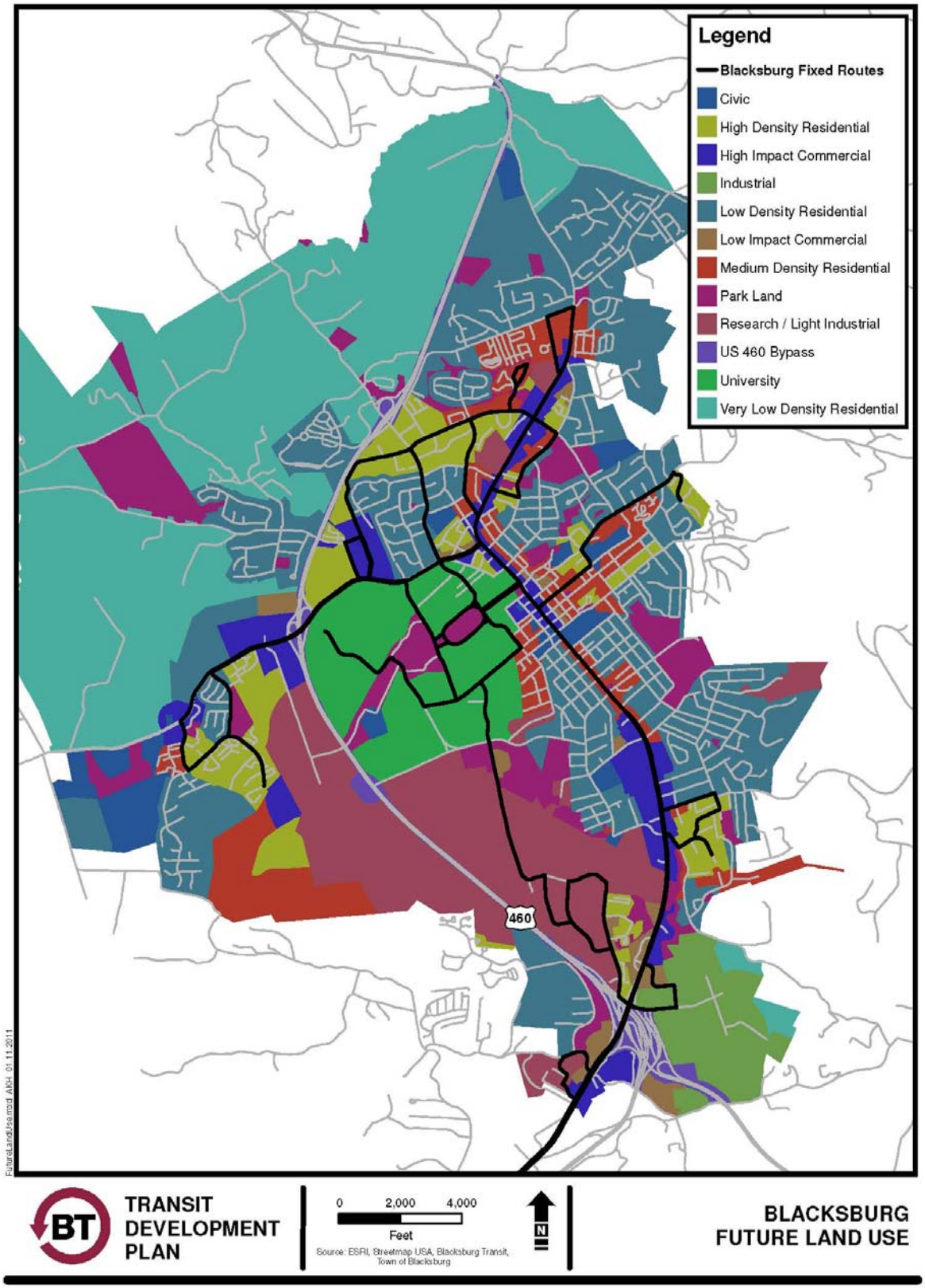


Figure 3-55: Town of Christiansburg Existing Land Use

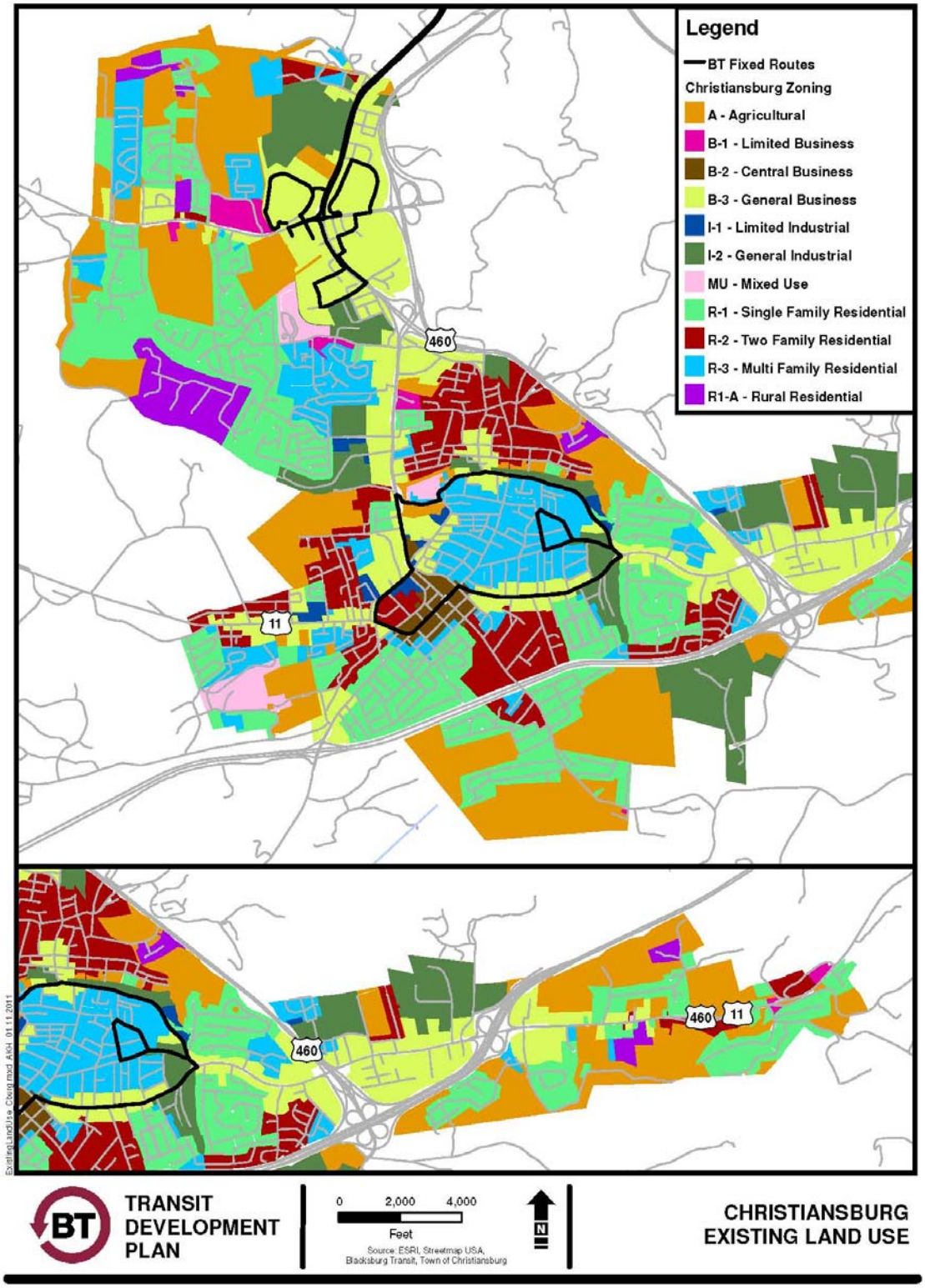
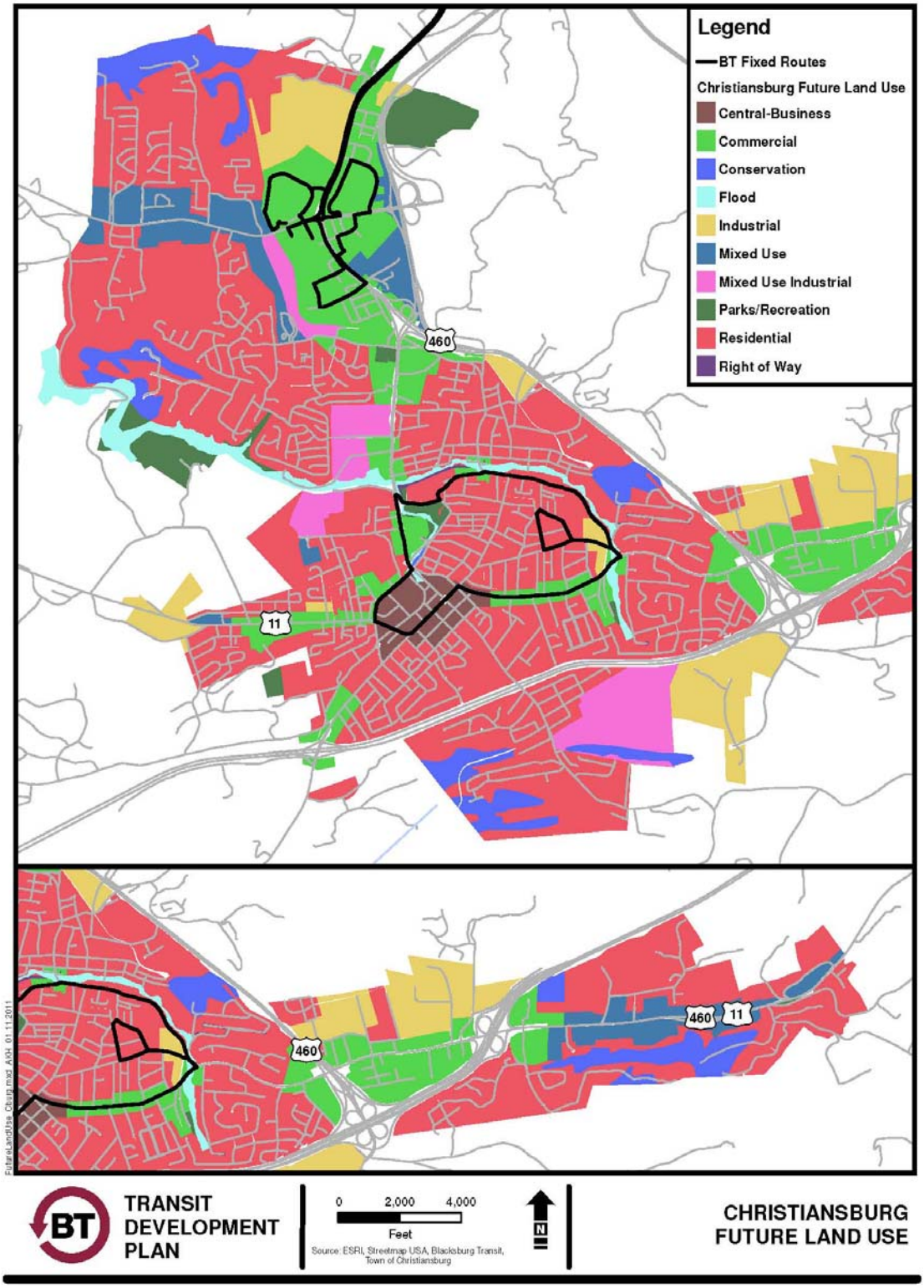


Figure 3-56: Town of Christiansburg Future Land Use



3.7 Population and Employment Trends

Population and employment data at the TAZ level were provided by the Blacksburg-Christiansburg-Montgomery Area MPO for 2008 as well as projections for 2035. Figure 3-57 shows the population density by TAZ for 2008 and Figure 3-58 shows the projected population density for 2035. While there are no drastic changes in population density projected between 2008 and 2035, there are several TAZs along the Highway 460 corridor between Blacksburg and Christiansburg, and in areas north and west of downtown Christiansburg, where population density is projected to increase from less than two persons per acre to between two and five persons per acre. Increases in population density are also projected in Blacksburg in the general area between Patrick Henry Drive and Turner Street, north of Harding Avenue and in the area between Toms Creek Road and University City Boulevard.

Figure 3-59 shows employment density by TAZ for 2008 and Figure 3-60 shows the projected employment density for 2035. In general, all areas with an existing (2008) employment density of greater than four employees per acre are served by BT fixed routes, with the exception of two isolated TAZs in eastern Christiansburg. Areas where employment density is projected to increase by 2035 include the Franklin Street corridor from the New River Valley Mall area to downtown Christiansburg, the Roanoke Street corridor west of US-460 in eastern Christiansburg, the area around Industrial Park Drive in southern Blacksburg, the area around South Main Street and Country Club Drive in southwest Blacksburg, and the area between the VT campus and US-460. Most of the areas in Blacksburg where employment density is expected to increase are served by existing BT routes. However, the areas in Christiansburg where employment density is expected to increase, including the Franklin Street corridor from the New River Valley Mall area to downtown Christiansburg and especially the Roanoke Street corridor west of US-460, are not currently served by BT routes. These are areas where routes should be considered in the future.

Figure 3-57: 2008 Population Density by TAZ

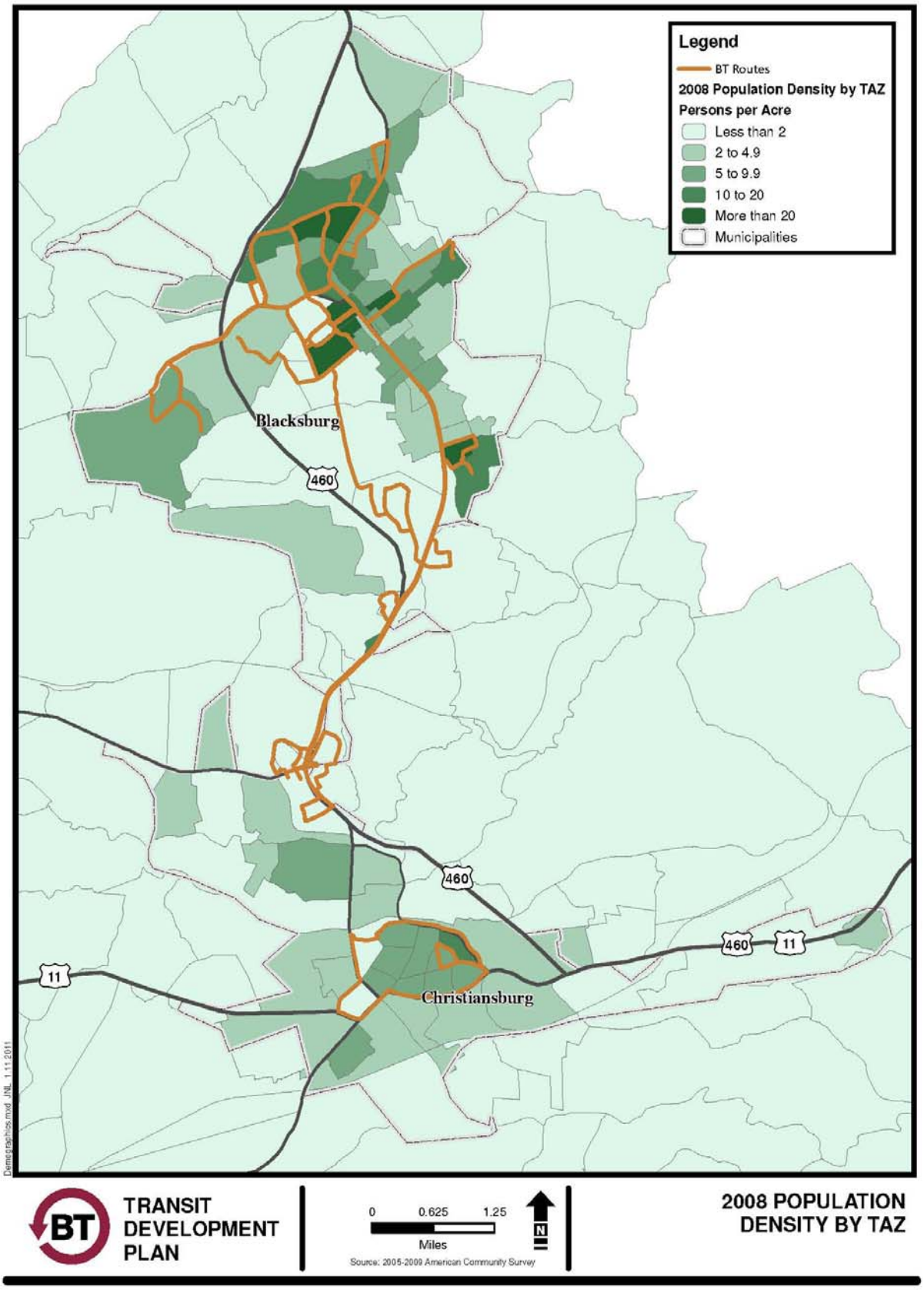


Figure 3-58: 2035 Population Density by TAZ

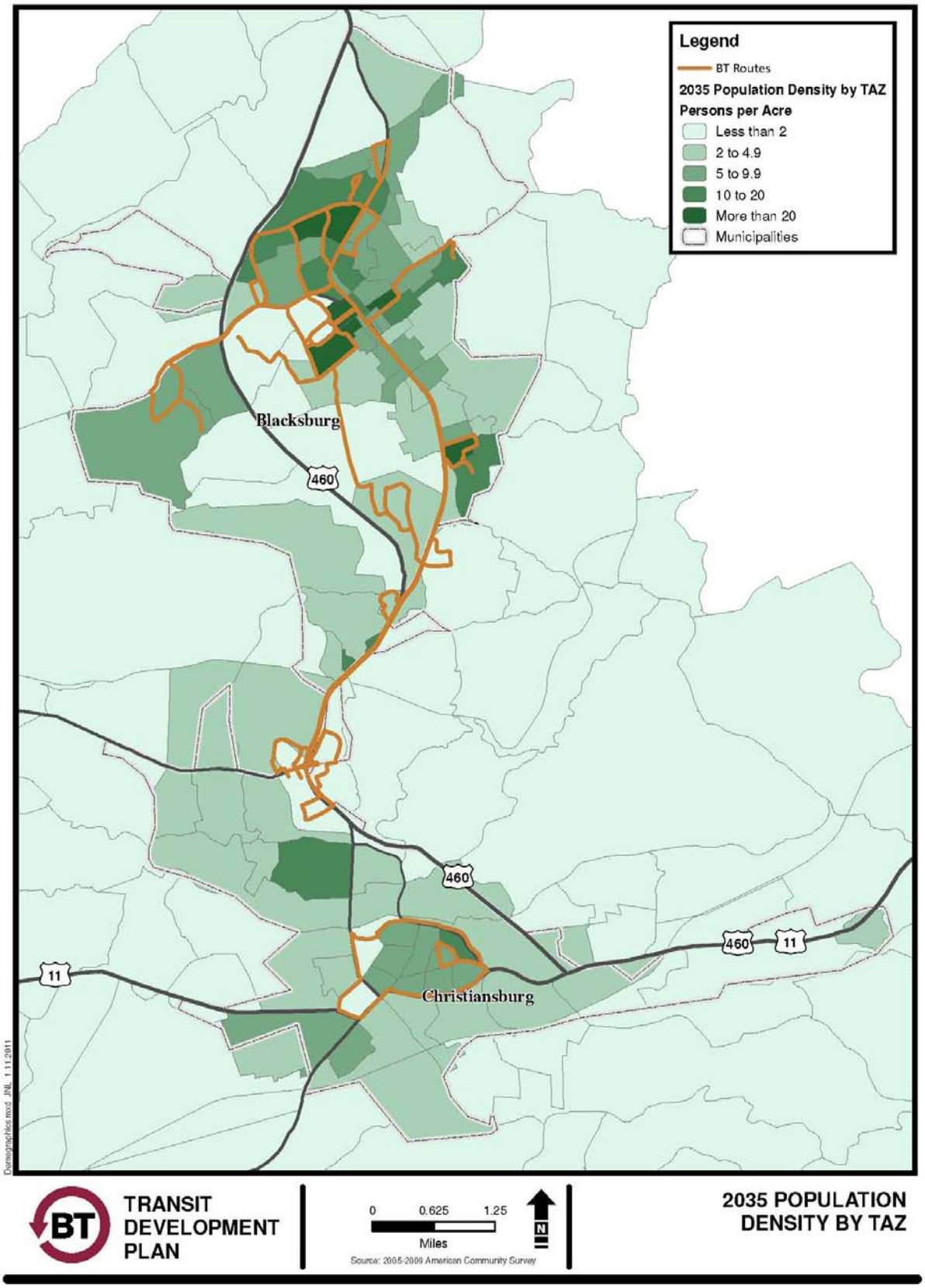


Figure 3-59: 2008 Employment Density by TAZ

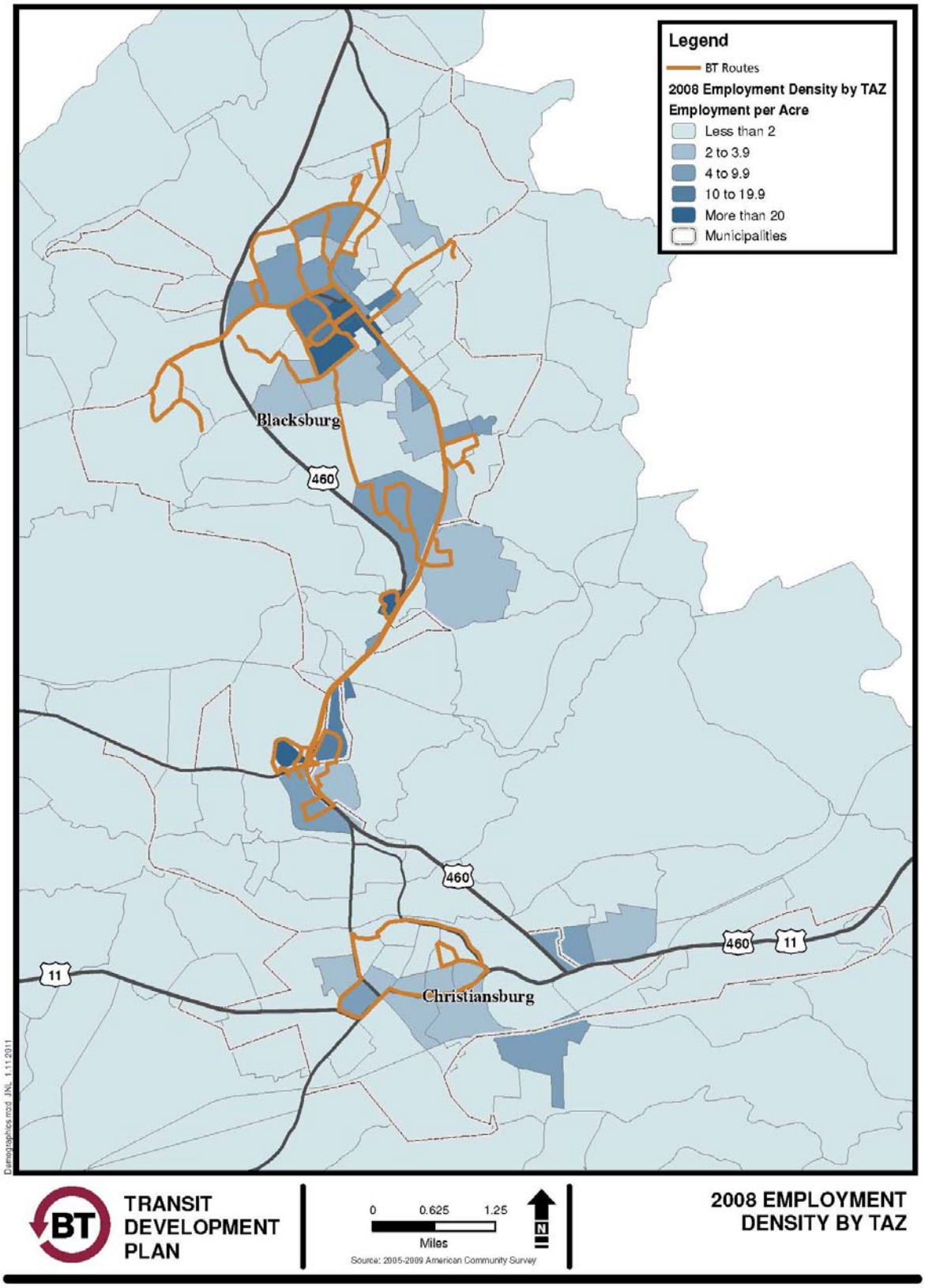
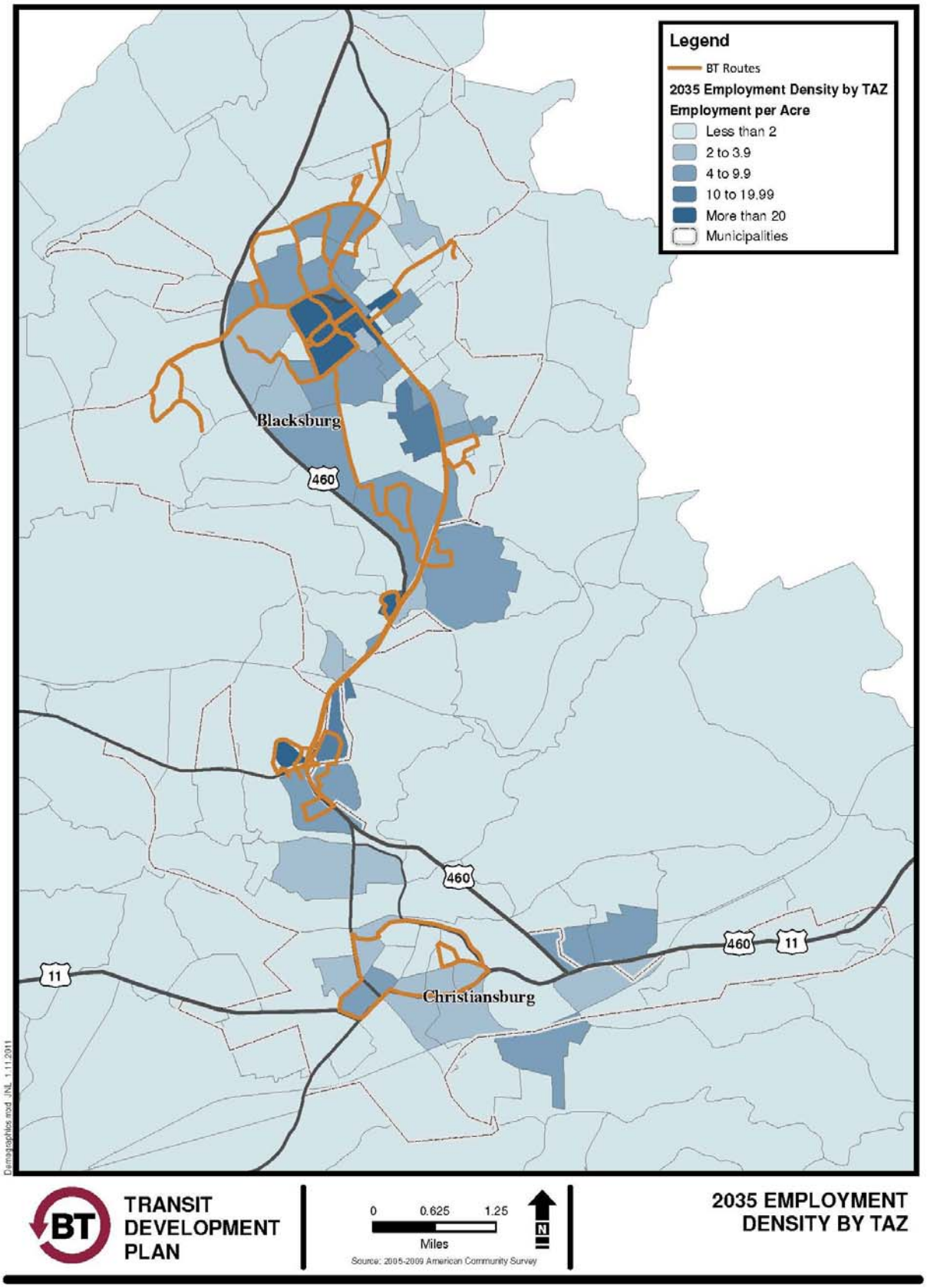


Figure 3-60: 2035 Employment Density by TAZ



3.8 Intelligent Transportation Systems Summary

Intelligent Transportation Systems (ITS) are techniques and methods for providing traveler information, relieving congestion, improving road and transit safety, and increasing economic productivity. During the last few decades, there have been rapid advances in information and communications technology. Many transit agencies have employed a number of different ITS technologies to enhance the transportation services they offer to the public. The following sections provide a brief summary of BT's current and projected ITS applications.

Automatic Passenger Counting

Transit agencies use Automatic Passenger Counting (APC) systems to automatically record passenger boarding and alighting information by time and location. These systems typically consist of infrared sensors positioned at every door of a bus that communicate with a central APC unit located on the vehicle. The central APC unit is equipped with GPS technology that allows it to stamp the boarding and alighting information with the particular place and time of occurrence. The APC unit stores the data collected for every stop and every trip. The benefits of APC systems are a reduced cost to collect ridership information and increased quality of the information collected.

Approximately 85 percent of BT's buses have APC units. About half of the units are overhead and the other half are door units. The overhead units have 95 percent accuracy compared to 65 percent for the door units. BT's cutaway buses do not have APC units, so there is no automatic passenger counting for the Christiansburg routes.

Computer Aided Dispatch/Automatic Vehicle Location

Automatic Vehicle Location (AVL) is a computer-based vehicle tracking system that monitors the position of a transit vehicle and relays the information to a central system. Positioning information can be transmitted in near real-time using wireless communications infrastructure to provide a tracking capability for buses. GPS-backed tracking is a proven mechanism for accurately tracking vehicle location in the field. Computer aided dispatch (CAD) and AVL systems facilitate the management of transit operations, providing up-to-date information on vehicle locations to assist transit dispatchers as well as inform travelers of bus status. Knowing the positions of all vehicles at any given time helps management respond to incidents more quickly as well as identify trends in schedule adherence that can be used to improve on-time performance.

BT has used AVL with GPS since 1994 to track its buses. BT is currently implementing a rider information program (BT4U.org) where the public can send a text message requesting the next bus service based on stop number and will be connected with real-time AVL information. In the beginning, the program will be available for 75 to 85 of BT's 239 stops.

Based on a survey conducted in 2009 by DRPT, BT plans to develop an interactive voice response (IVR) system, real-time traveler information on the web, and wayside equipment displaying the next bus arrival over the next one to two years. IVR provides traveler information through a touch-tone telephone or voice recognition software and provide information on updated schedules and on-time

performance. Real-time information on the web would provide customers real-time information on bus locations, schedule adherence, event data, and predicted stop arrivals. Finally, next bus arrival displays would provide real-time information to the public at transit shelters and terminals.

Google Transit

Google Transit is a public transportation planning tool that combines BT's fixed route schedule data with the graphic interface of Google Maps. The website integrates transit stop, route, and schedule information to make trip planning easy and readily accessible to anyone with an internet connection. A Google Transit box on the main BT webpage allows user to enter their desired start address, destination address, and the day and time they would like to travel. Google Maps then displays directions to the nearest transit stop, the route number, and schedule information.

On-Board Security Cameras

BT has cameras deployed on its BT Access and Christiansburg body-on-chassis buses. There are no cameras on Blacksburg fixed route buses, but BT plans to have them installed on any future bus purchases. The existing cameras are focused on the interior of the vehicles for passenger/operator conflicts and are used to review incidents when they are reported to operations. The system has a hard drive that saves the recordings for a minimum of 48 hours, but the system generally stores two to three weeks of recordings since the vehicles do not run all the time.

3.9 Title VI Report and Triennial Review

As a condition of receiving federal financial assistance from the Department of Transportation, BT must comply with Title VI of the Civil Rights Act of 1964. BT is required to submit Title VI assurance annually as part of its Certification and Assurance submission to the FTA. BT's most recent Title VI Report was submitted to the FTA on July 23, 2009 and expires in 2012. BT has no outstanding compliance issues. A copy of the complete Title VI Report is included in Appendix D.

The FTA is required to perform reviews and evaluations of Urbanized Area Formula Grant activities at least every three years, specifically with regard to compliance with statutory and administrative requirements. The Triennial Review includes a review of the grantee's compliance in 23 different areas. BT's most recent Triennial Review was submitted in August 2008. No deficiencies were found with the FTA requirements in 18 of 23 areas. Deficiencies were found in the other five areas: Maintenance, Procurement, Title VI, Half Fare, and Equal Employment Opportunity. During the site visit for the review, the Town closed the finding in the Equal Employment Opportunity area. Explanations of the deficiencies found in the other four areas are provided below.

A review of the preventative maintenance records for both fixed-route buses and paratransit vehicles found that the Town had not been maintaining these vehicles according to the schedules included in its vehicle maintenance plan. Staff indicated the problem was due to lack of personnel in the maintenance area. In addition, the Town's facility maintenance plan did not include any checklists for maintenance activities to the facility and there were no records of maintenance activities on the facility. The Town was required to submit a remediation plan to FTA to ensure it is maintaining FTA-funded vehicles

according to the Town's preventative maintenance schedules. The Town was also required to submit a revised maintenance plan that includes checklists for maintenance activities.

During the Triennial Review, deficiencies were found with the FTA requirements for procurement. In June 2007, the Town entered into a sole source procurement for the replacement and repair of its existing shelters. However, the project file did not contain a sole source justification with a cost analysis. The Town was required to submit to FTA a written assurance that it understands the requirements for noncompetitive procurements and will follow them in the future.

Deficiencies were also found with the FTA requirements for Title VI. The Town had not completed an assessment or addressed the ability of persons with limited English proficiency (LEP) to use transit services. In addition, the Town did not notify its customers of their rights under Title VI either on its website of on other materials available to the public. The Town was required to submit to FTA an assessment of whether it has a significant LEP population as well as an LEP implementation plan if an LEP population does exist. In addition the Town was required to submit documentation on how it notifies its customers of their rights under Title VI.

Deficiencies were also found with the FTA requirements for half fare. BT's website and printed schedules describe the availability of the half fare program to the elderly, persons with disabilities, and persons with a Medicare card. However, the fare information on its buses did not describe the availability of the half fare program to the disabled or persons with a Medicare card. The Town was required to submit to FTA documentation that it had revised its description of the half fare program on its buses. BT has since revised the sticker on its fareboxes to include the required description of the half fare program.

A copy of the FY 2008 Triennial Review in included in Appendix D.

Chapter 4 Transit Service and Facility Needs Assessment

Data gathered in the course of evaluating existing BT service and operations led to the identification of transit needs existing now and anticipated in the future for the BT service area and across the New River Valley. These needs were identified through the staff and stakeholder outreach process, demographic and land use analysis, evaluation of operating data and survey results, and a review of prior studies for the region. Studies and reports that were instrumental in defining these needs include:

- Blacksburg-Christiansburg-Montgomery 2030 Long Range Transportation Plan (BCM-MPO, 2005)
- BT Route Service Concept Notes (BT, various)
- BT/VT Multimodal Transfer Facility Study (Wendel, 2011)
- Downtown Trolley Feasibility Study (BT, 2009)
- Merrimac Area Potential Stops map (Montgomery County, 2010)
- Montgomery County-Warm Hearth Senior Transportation Program Grant request (BT, 2011)
- NRV PDC Coordinated Human Service Plans (NRVPDC, 2008)
- NRV PDC Employment Mobility Study (NRVPDC, 2009)
- Pulaski Area Transit 2017 Transit Development Plan (CTG/PBS&J, 2011)
- Radford Transit Service Plan (KFH, 2009)
- Town of Blacksburg 2046 Comprehensive Plan (TOB, 2006)
- Town of Christiansburg Comprehensive Plan (TOC, 2003)
- Virginia Tech Campus Master Plan Update and Amendment (VT, 2006/2009)

A transit service needs workshop was conducted with BT operations staff to distill the various concepts gathered into definable projects to meet those needs. Key findings from prior chapters that guided this process include:

- While BT's ridership has grown considerably over the past five years, operating costs have grown at an even faster rate, reflecting national trends in the price to provide transit service. Compared to peers, BT's cost and service efficiencies were average to above average, indicating that despite economic realities BT is maintaining a competitive and productive service.
- Rider ratings of service characteristics were all good to very good, the highest marks possible. Customers in both Blacksburg and Christiansburg are happy with the service they receive and how it is delivered. Their greatest desires are for more stop amenities, greater frequency, and longer service hours.
- BT's core Blacksburg service – moving students between Virginia Tech, off-campus housing areas, and local destinations – is extremely productive and severely overloaded in many route segments throughout the enhanced weekday period. Operator reports of pass-bys and heavy use of trippers to manage loads are not uncommon.
- Current service connecting Blacksburg to Christiansburg is well utilized by all rider types. Riders and stakeholders both demonstrated a strong desire for more service between the towns.

- Local service provided in Christiansburg has shown marked increases in ridership over its first full year of operations. These routes are serving mostly transit-dependent riders and may be a viable model for providing similar services elsewhere in the MPO area, where an unmet demand and desire for local "neighborhood" service is present.
- There is a growing need for regional and commuter service connecting activity centers across the New River Valley. Several stakeholders and reports described the interconnectivity of the various counties, towns, and cities in the NRV. Many citizens have daily trips between home, work, school, shopping, medical, and other destinations that span across the entire region.
- With the community's transportation needs growing, BT has been undergoing a transition from a provider of only high-capacity, short-haul campus trips and complementary paratransit to additionally operating lower-capacity demand responsive and flexible local and intercity routes. Updates to organizational vision and structure, staffing levels, and local funding scenarios will be necessary to move into the future.

This chapter quantifies the community's transit needs into clear projects to be considered for future implementation. It is important to note that these are *potential* projects to address transportation needs without regard to funding capacity or jurisdiction. While the majority of improvements described could be reasonably operated by BT within the next six years, some of these would not realistically develop until 10 to 20 years into the future, while others may be more timely but not suitable candidates for operation by BT.

4.1 Service and Operating Needs

A total of fourteen distinct service-related transit projects were identified through the evaluation process. These are categorized into those affecting existing route services, new local services, and new regional services. Project numbers have been assigned for identification purposes and do not reflect priority.

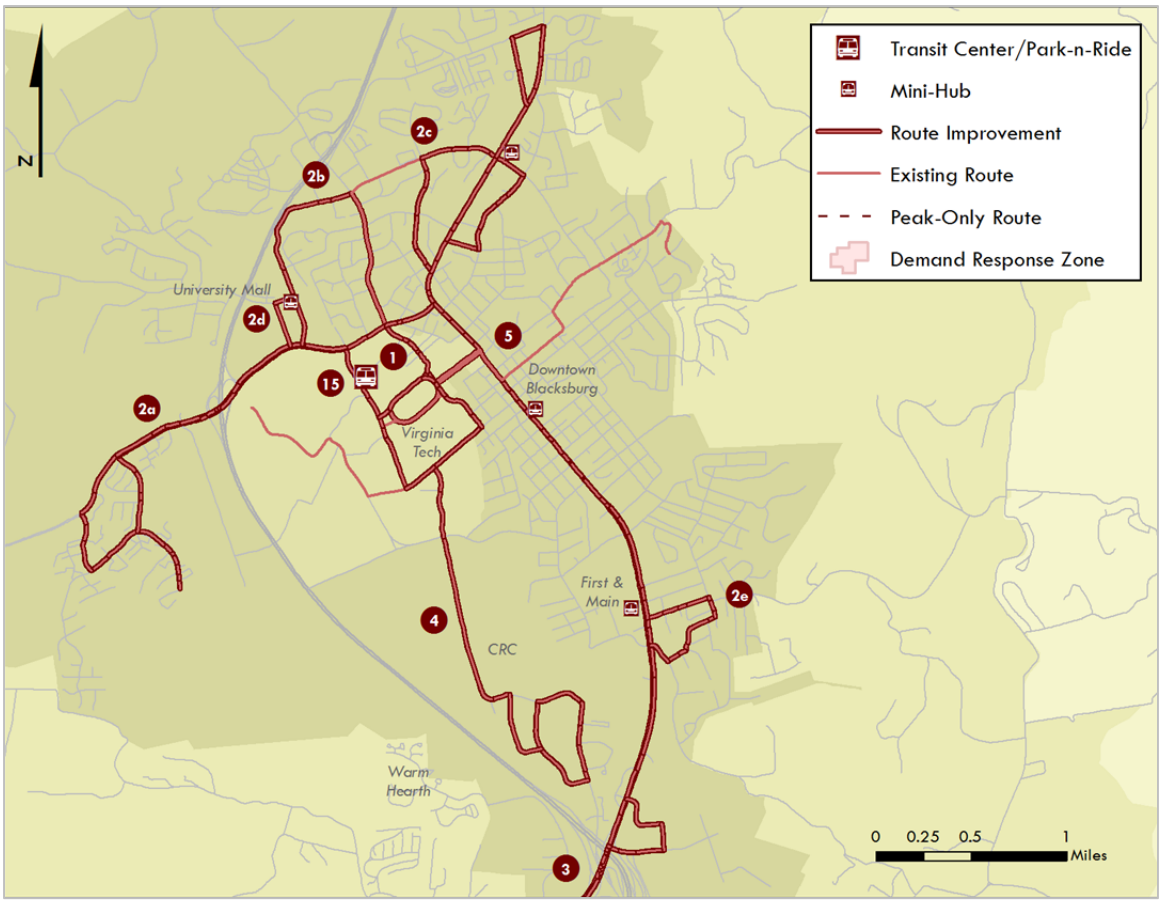
Existing Service

These projects would seek to improve aspects of existing routes in the BT system. Figure 4-1 depicts the existing services that would be improved with the implementation of these projects.

- **PROJECT NO. 1: Restructure Core Route Network.** Since initiating operations in 1983, BT's core route structure in Blacksburg has remained relatively unchanged, with various routes beginning somewhere off-campus and then circulating Virginia Tech's core campus, typically dropping riders off at various points around the Drillfield. As the campus and bus ridership have simultaneously grown, this means of passenger delivery has outgrown its usefulness. With each bus dropping off upwards of 80 riders at a time at key stops and hundreds more pedestrians likewise mingling with bicycles, automobiles, and buses, it is both a safety liability and travel time detriment to continue circulating all trips around campus. Restructuring the system to hub large buses at a central transit facility and providing opportunities from that location to walk or ride campus circulator shuttles to final destinations can solve both of these issues.

Ideally, this project should be implemented concurrently with the opening of the BT/VT Multimodal Transfer Facility (MMTF) that is currently being studied (Project No. 15) to ease rider transitions. It also ideally occurs as the outcome of a Comprehensive Operational Analysis of the BT system, so that any route modifications can be based on a wide swath of data and integrated into other adjustments that may need to occur. For example, VT master plans suggest that campus growth and the construction of a satellite parking network would require an expansion of circulator service. As a result of a core route restructuring, service levels could remain the same, decrease, or increase, depending on the goals and results of the evaluation.

Figure 4-1. Existing Service Potential Projects



- **PROJECT NO. 2a-e: Improve Frequencies of Core Routes during Enhanced Service.** Many routes are frequently overcrowded during Weekday Enhanced Service, meaning the elaborate use of tripper buses and frequent pass-bys of riders waiting at stops. As the system is over capacity in several places, improving the frequencies of core routes to a new baseline standard of 15-minute service on all Weekday Enhanced Service local routes and 10-minute service on the highest volume of these routes is a key priority. Below a handful of routes are identified to each receive another bus in order to enhance frequencies; however, the exact placement of additional core service would no doubt change following the implementation of Project No. 1.

  2a. Hethwood: Increase weekday enhanced frequency from 12-minutes to 10-minutes.

2b. Tom's Creek: Increase weekday enhanced frequency from 15-minutes to 10-minutes.
2c. Patrick Henry: Increase weekday enhanced frequency from 15-minutes to 10-minutes.
2d. U-Mall Shuttle: Increase weekday enhanced frequency from 15-minutes to 10-minutes.
2e. Main Street: Increase weekday enhanced frequency from 20-minutes to 15-minutes.

- **PROJECT NO. 3: Expand Service Hours of Two Town Trolley during Enhanced Service.** Rider surveys indicated a strong desire for greater connectivity between Blacksburg and Christiansburg. A strong step in achieving this goal would be to expand the hours of service on the Two Town Trolley, which already demonstrates good productivity connecting the Virginia Tech campus in Blacksburg to the New River Valley Mall area in Christiansburg via Main Street/Bus-460. This route currently operates at 60-minute headways from noon to 6pm Sunday through Thursday, with longer hours provided on Saturday and Sunday. This project would roughly double the hours of service by running the Two Town Trolley from 9am to 9pm every day. Service would continue to run till midnight on Enhanced Fridays and Saturdays, as it currently operates.

- **PROJECT NO. 4: Improve Frequency of CRC Route during Regular Service.** Current service to the VT Corporate Research Center scales with the academic year, with 15-minute frequencies during Enhanced Service dropping to 60-minute frequencies during Regular Service. While many of those employed in the CRC do need a route tailored to VT's academic calendar, the majority work year-round and perceive the fluctuation in service levels as an impediment to riding regularly. With the CRC poised to expand starting this year, and the cost per parking space growing higher, raising the Regular Service frequency to 15-minutes to match the Enhanced frequency could help to increase usage of this route when it will be needed most.

- **PROJECT NO. 5: Improve Frequencies of Late Night Friday and Saturday routes during Enhanced Service.** Ridership during late night Friday and Saturday Enhanced Service remains strong as students wisely are making the choice to not drive and instead use BT for safe rides out and home again. Service levels at these times however are currently limited to 30- and 60-minute frequencies, leading to overcrowding conditions on many trips. This project would seek to increase service hours from 9:30pm to 2:30am by 50% in order for BT to selectively improve frequencies or add tripper service as needed to alleviate overcrowding conditions.

New Local Service

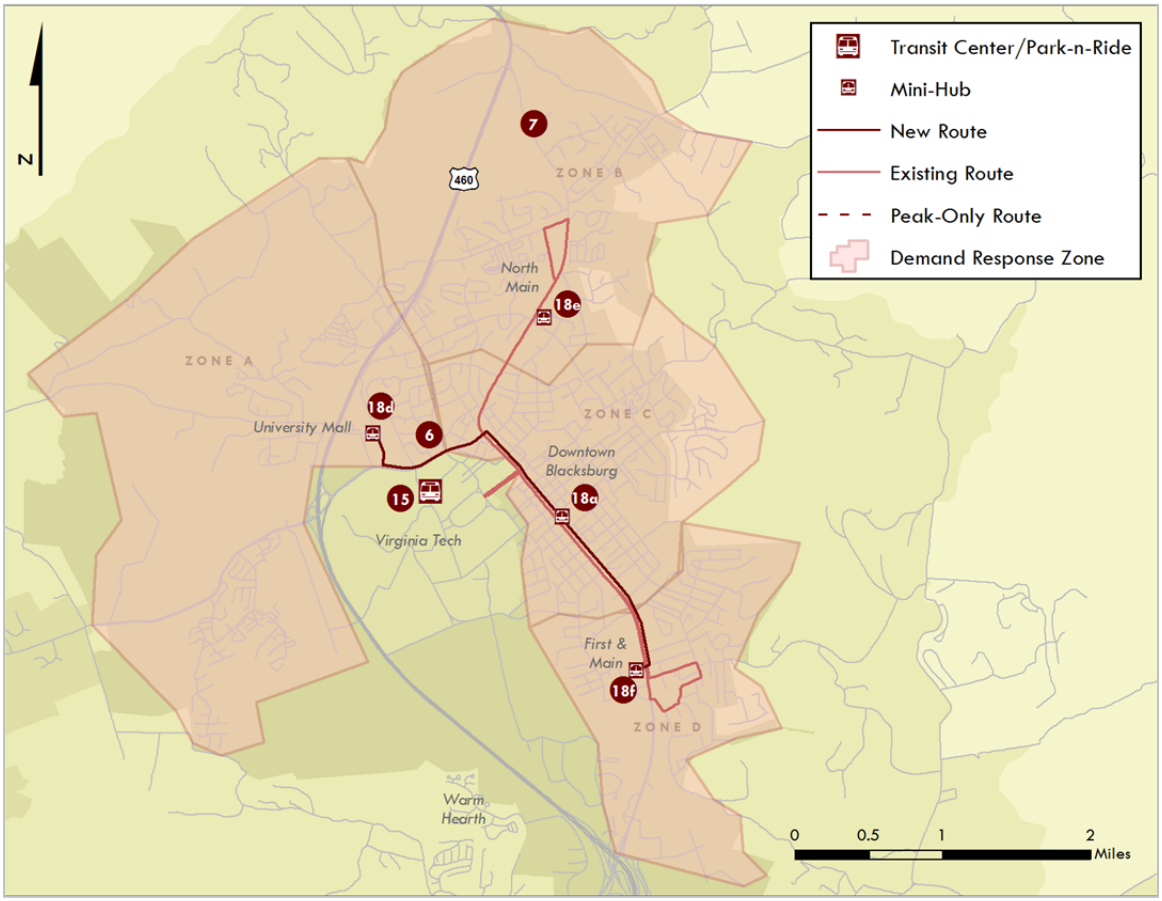
These projects would seek to bring new local services not currently offered within the current BT service area. Coordination with both existing and new public and private funding partners would be necessary to implement many of these.

- **PROJECT NO. 6: Blacksburg Local Service (Downtown Trolley).** Need exists for routes that serve the "local" Blacksburg population and are not tied to reaching Virginia Tech, in order to benefit the general mobility of the town. The downtown Blacksburg Trolley has long been identified as one such project that could help address that need. Operating from the University Mall area, the route would travel along University Boulevard, Prices Fork Road, and Main Street, through

downtown and terminating at the First & Main retail complex along South Main. The route would serve to connect most major retail and commercial destinations within the town.

The Downtown Trolley would run every 20 minutes from 9am to 9pm on weekdays and Saturdays during both Enhanced and Regular service. To maximize capacity and ease passenger comfort, the trolley would likely be a standard size heavy duty bus branded and fitted as a rubber-tire trolley service. It would ideally be timed to implement around the same time Blacksburg neighborhood circulators (Project No. 7) and mini-hub transfer stations (Project No. 18) were completed. The mini-hub stations, which could be as simple as well-appointed off-street bus pullouts or as elaborate as small transit centers, would be located in the vicinity of University Mall, Downtown Blacksburg, and First & Main, allowing riders safe and convenient opportunities to move from the trolley to the neighborhood circulators or other routes in the system. Figure 4-2 describes potential new local services in the Blacksburg area.

Figure 4-2. New Local Service (Blacksburg) Potential Projects



- **PROJECT NO. 7: Blacksburg Local Service (Neighborhood Circulators).** Complementing the Blacksburg Downtown Trolley (Project No. 6) would be a series of 4 circulator routes designed to penetrate the neighborhood communities of Blacksburg and transport riders to a designated mini-hub area from which they could transfer to a frequent direct route that could carry them across town or even the region. Due to the non-student population densities in Blacksburg,

these circulators would likely be flexible in nature, offering either route- or point-deviation service (a la the Christiansburg Explorer route), or acting purely as demand-responsive service (like the Christiansburg Go Anywhere! route). They would be operated with medium-duty body-on-chassis type vehicles.

Blacksburg neighborhood routes would operate from 9am to 9pm on weekdays and Saturdays in order to coordinate with the service span of the Downtown Trolley. Each of the four circulators would operate within a particular zone designed to connect every hour to a mini-hub transfer station for a timed-transfer to a fixed route. The 4 zones and corresponding hub locations would be:

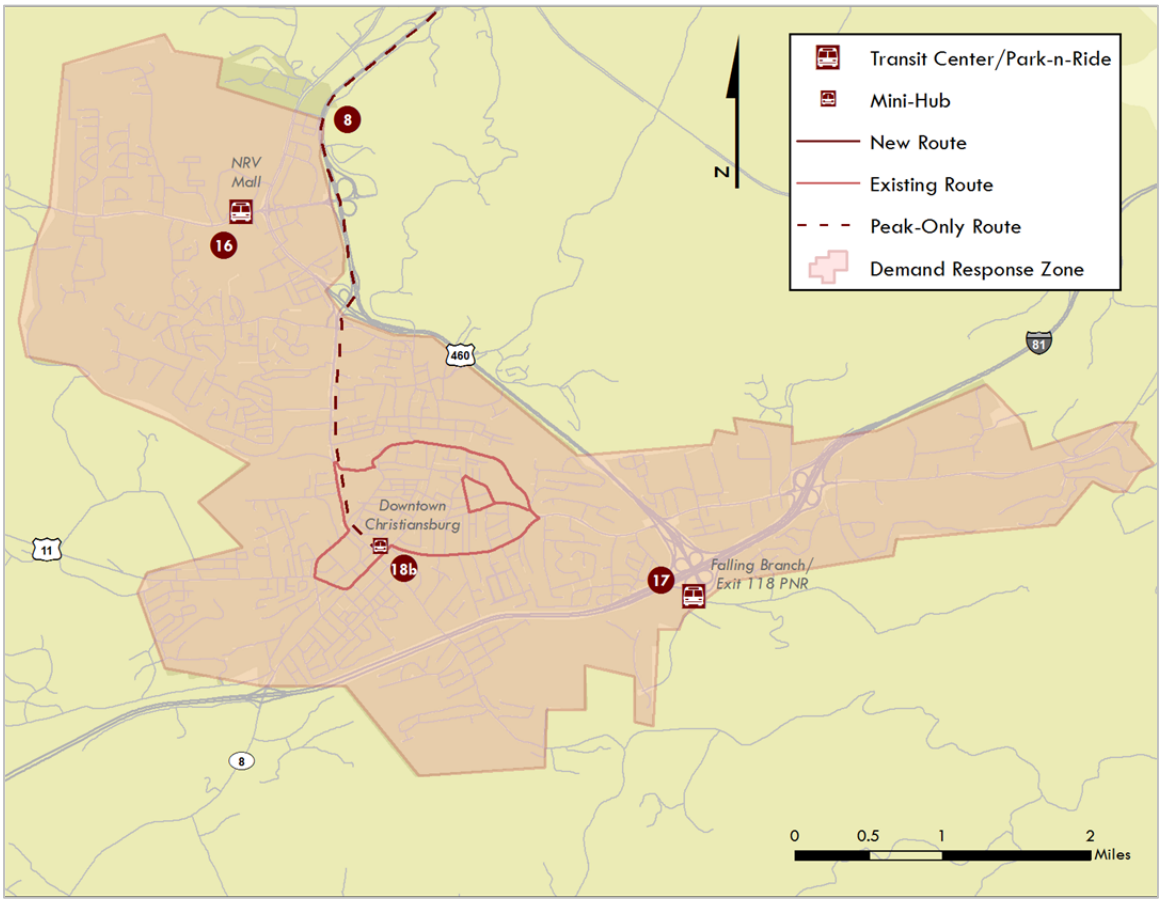
Zone A: Blacksburg West, hub at University Mall
Zone B: Blacksburg North, hub at North Main & Patrick Henry
Zone C: Blacksburg Central, hub in downtown Blacksburg
Zone D: Blacksburg South, hub at First & Main

For this reason, this project would ideally be implemented alongside the mini-hub project (Project No. 18) described below.

- **PROJECT NO. 8: Christiansburg Commuter Service.** Meetings and surveys conducted by BT at Virginia Tech and within Christiansburg indicated good potential demand for a commuter route designed to carry passengers from Christiansburg to Virginia Tech in the mornings, and back home in the evenings. This was confirmed by respondents in the TDP on-board survey, who showed a desire for more service connecting Christiansburg to the Virginia Tech campus. This service would fill that need by providing two inbound morning trips and two outbound evening trips on weekdays. Service would be provided with medium-duty body-on-chassis type vehicles and do limited circulation within Christiansburg neighborhoods before reaching the Northgate Village Shopping Center, from where it would take US-460 north to VT and circulate the main campus. Following the completion of the MMTF, this route would terminate there instead of circulating campus.

  As of March 2011, one trip of this service was already running, with the second planned to be implemented by Fall 2011 at the latest. Figure 4-3 presents new local services in Christiansburg.

Figure 4-3. New Local Service (Christiansburg) Potential Projects

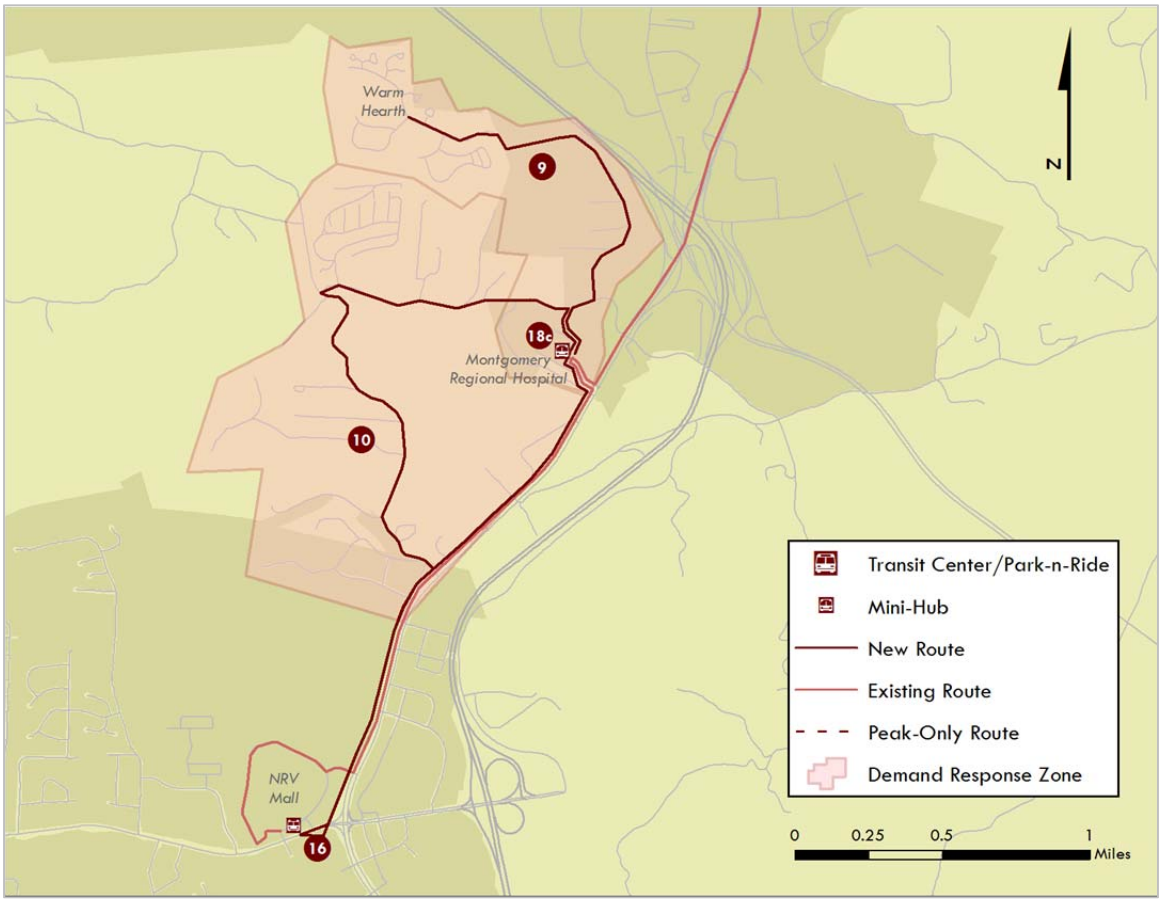


- **PROJECT NO. 9: Warm Hearth-Hospital Connector.** Meetings and surveys conducted by BT with the Warm Hearth Village retirement community identified a need for public transport for the community's residents beyond what the village could privately provide, both within the community and to Montgomery Regional Hospital. This project, set to implement in Fall 2011, would provide a starter service connecting the Warm Hearth Village to the hospital. It would operate one day a week from around 9am to 5pm at 30-minute frequencies and about 20 evenings per year from 6pm to 11pm.The route would circulate both within Warm Hearth and around the medical offices surrounding Montgomery Regional Hospital. By reaching the hospital, this route also allows riders to transfer to the existing BT route network, and vice versa. Figure 4-4 depicts potential new local services in the Montgomery County MPO area.

- **PROJECT NO. 10: Merrimac/Hightop Neighborhood Service.** While BT currently operates services both with Blacksburg and Christiansburg, part of its service area between the two towns includes the Merrimac/Hightop area of Montgomery County that receives no service. Both existing and future demographics, along with stakeholder outreach with the County, indicate that income levels and population densities support the establishment of route service in the area. This service would likely be flexible or demand-responsive in nature and operated with medium-duty body-on-chassis type vehicles.

Service would operate hourly from 9am to 9pm on weekdays and Saturdays. Due to its proximity to Montgomery Regional Hospital and Warm Hearth Village, it is envisioned that one vehicle could serve both the Merrimac/Hightop area and Warm Hearth Village, connecting to the rest of the BT network at the hospital and the NRV Mall area every hour. The route would generally follow Warm Hearth Drive and Mabry Lane/Farmview Road to the hospital, circulate via Hospital Drive and Davis Street, the continue along Hightop Road and Merrimac Road before reaching Franklin Street to reach the NRV Mall area. Ideally, this route would be timed to begin with the completion of the NRV Mall Transit Center and Montgomery Regional Hospital mini-hub (Project Nos. 16 and 18).

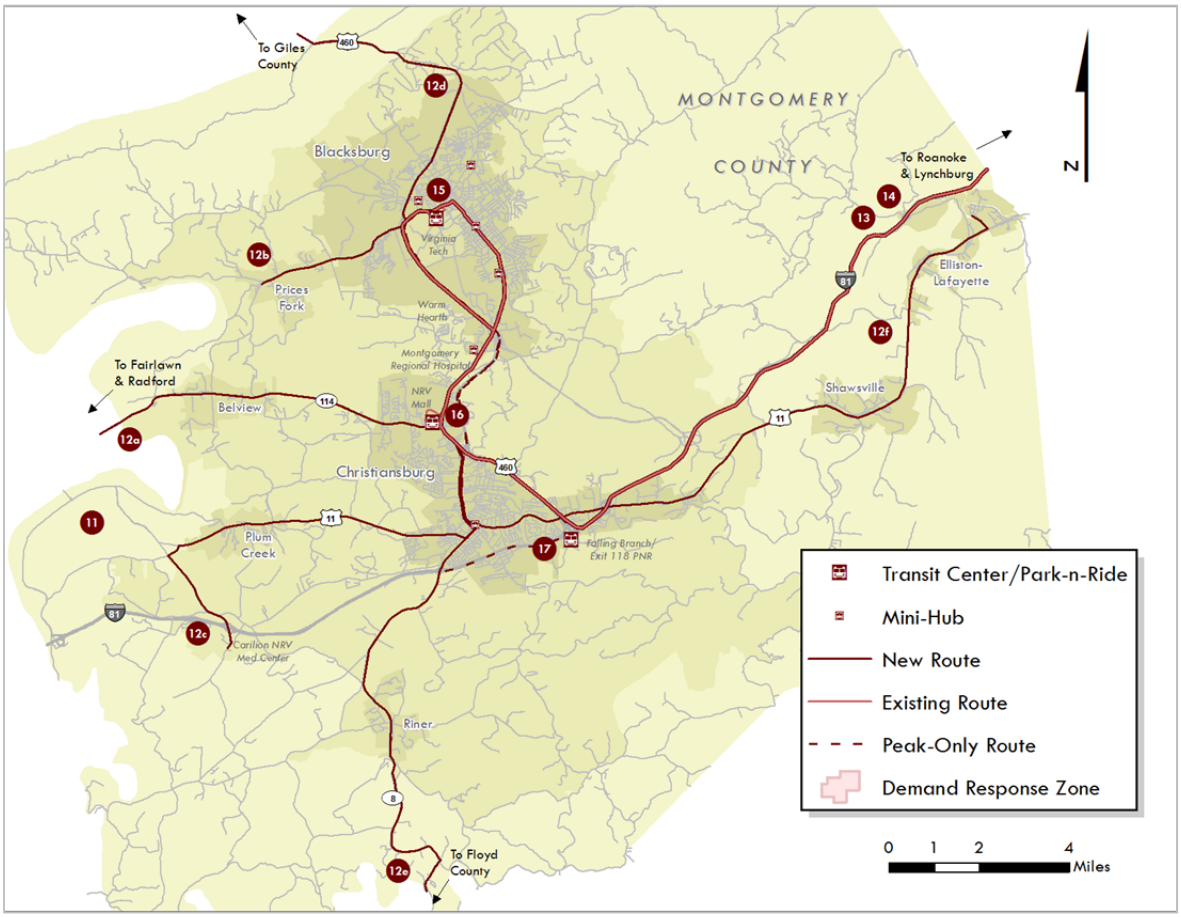
Figure 4-4. New Local Service (Montgomery MPO Area) Potential Projects



Regional Service

These projects would seek to implement regional services that connect the BT service area to points across the region that are outside the current BT service area. As with many regional services, they would involve operations over multiple jurisdictions; therefore, while BT might be the operator of some of these they would not necessarily be the operator of all of these. Or in many cases, regional services could operate as a partnership between multiple providers. Regardless, these projects (Figure 4-5) would address the transportation need that currently exists.

Figure 4-5. New Regional Service Potential Projects



- **PROJECT NO. 11: Radford Local Service.** A need for local bus service in Radford has been identified for some time across various studies, with a route plan proposed most recently in KFH's 2009 study. This plan proposed a system of 5 local routes serving Radford University (RU), 2 local routes serving the City of Radford, and 1 regional route connecting to Blacksburg and Christiansburg. It would replace RU's current Tartan Transit service.

  While not currently within the BT service area, Radford service would be well-suited to operation by BT given its proximity and similar operating environments. Additionally, BT has worked extensively with Radford officials over the years to develop the proposed system. As of March 2011, the City of Radford has released a Request for Proposal to interested parties to operate Radford local service beginning in Fall 2011.

- **PROJECT NO. 12a-f: New River Valley Intercity Service.** Intercity route service across the New River Valley is another project that has been proposed in various regional studies over the years, most recently and succinctly in the PDC's 2009 NRV Employment Mobility Study. Need for intercity service across the NRV is growing quickly, as residents increasingly live in one community, work in another, take classes in yet another, and shop or attend medical appointments in others. As the home of Virginia Tech, the New River Valley Mall retail complex, and many other employment, retail, and medical destinations, the BT service area sees an influx

of several thousand commuters every day from across the NRV, many of whom would benefit from the mobility provided by public transport.

This project seeks to meet the needs of both commuters coming into the BT service area as well as residents moving out on a daily basis with a series of regional routes anchored to the MMTF at Virginia Tech (Project No. 15), the NRV Mall Transit Center (Project No. 16), or both. It seeks to connect the six villages of Montgomery County, the City of Radford, Pulaski County, Giles County, and Floyd County into the Blacksburg-Christiansburg-Montgomery MPO area. Unless otherwise indicated, service would be provided with medium-duty body-on-chassis type vehicles.

12a. Radford/Fairlawn/Belview: Connects City of Radford/RU, Fairlawn, and Belview Village to NRV Mall and Virginia Tech. From Radford, follows US-11 into Fairlawn, where it makes a timed-transfer to Pulaski Area Transit's Fairlawn Connector route at the Walmart.* The route then heads east along Peppers Ferry Road, stopping in Belview before heading to the NRV Mall Transit Center. Peak period trips would continue from here via US-460 to the MMTF. During Enhanced Service, additional late night Friday and Saturday service would be offered to NRV Mall and connecting to the Two Town Trolley.

- Weekdays (to MMTF) – 1 morning, 1 midday, and 1 afternoon round trip
- Weekdays (to NRV Mall) – 60-minute service from noon to 9pm (12am on Enh. Fridays)
- Saturdays (to NRV Mall) – 60-minute service from noon to 6:30pm (12am on Enh. Saturdays)

**While the service above is proposed to be operated by BT with a timed-transfer to PAT at the Fairlawn Walmart, this route could be operated in a number of ways to give Montgomery and Pulaski County residents their best transportation options. This could include PAT running service all the way into Montgomery County, BT running service all the way into Pulaski County, alternating trips between the operators, or some other arrangement.*

12b. Prices Fork: Connects the Prices Fork Village to Virginia Tech. From McCoy & Prices Fork, travels Prices Fork Road to West Campus Drive and the MMTF.

- Weekdays – 2 morning and afternoon trips at 60-minutes; 4 midday trips at 120-minutes
- Saturdays – 4 midday trips at 120-minutes

12c. Carilion/Plum Creek: Connects the Carilion NRV Medical Center and Plum Creek Village to NRV Mall. From the medical center, follows Tyler Road north over I-81 to Rock Road and US-11, stopping in Plum Creek before continuing into Christiansburg. From here, follows Main Street and Franklin Street to the NRV Mall Transit Center.

- Weekdays – 1 morning, 1 midday, and 1 afternoon round trip

12d. Giles County: Connects points across Giles County to Virginia Tech. From the Glen Lyn/Rich Creek area, travels US-460 to the MMTF, with stops in Narrows, Pearisburg, and Pembroke. Given the distance of this route, an over-the-road coach would be the likely vehicle type to operate.

- Weekdays – 1 morning and 1 afternoon trip; 2 midday trips at 240-minutes

12e. Floyd/Riner: Connects Floyd and Riner to NRV Mall and Virginia Tech. From Floyd, travels north on SR-8 with a stop in Riner. In the peak periods, follows I-81 north to the Exit 118/Falling Branch Park-n-Ride, then takes US-460 to the MMTF. In the midday, stays on SR-8 into Christiansburg, then uses Franklin Street to reach NRV Mall Transit Center. Given the distance of the full route to VT, an over-the-road coach would be the likely vehicle type to operate.

- Weekdays (to MMTF) – 1 morning and 1 afternoon round trip
- Weekdays (to NRV Mall) – 2 midday trips at 240-minutes

12f. Elliston-Lafayette/Shawsville: Connects the villages of Elliston-Lafayette and Shawsville to NRV Mall. From Elliston-Lafayette, travels along US-11, stopping in Shawsville before continuing into downtown Christiansburg. From here, follows Franklin Street to the NRV Mall Transit Center.

- Weekdays – 1 morning, 1 midday, and 1 afternoon round trip

- **PROJECT NO. 13: Improve Frequency of SmartWay connection to Salem/Roanoke.** This service, operated by Valley Metro out of Roanoke, connects the Roanoke Valley to Blacksburg and Christiansburg. It has proven highly popular and is reaching capacity on some trips. SmartWay currently averages 45-minute peak/90-minute offpeak service on weekdays and Sautrdays. Increasing frequencies to 30-minute peak/60-minute offpeak would address the growing demand for this service.

- **PROJECT NO. 14: Intercity Connection to Amtrak Lynchburg.** Newly introduced Amtrak service between Lynchburg and Washington, D.C., has seen greater demand than any predictions indicated. Plans are now underway to connect the Roanoke and New River Valleys into Lynchburg to access this service. Given the success of the SmartWay service, Valley Metro would be the likely candidate to offer pilot service from Blacksburg, Christiansburg, and Roanoke to Lynchburg with 1 morning trip and 1 afternoon trip on weekdays timed to meet Amtrak.

4.2 Facility and Equipment Needs

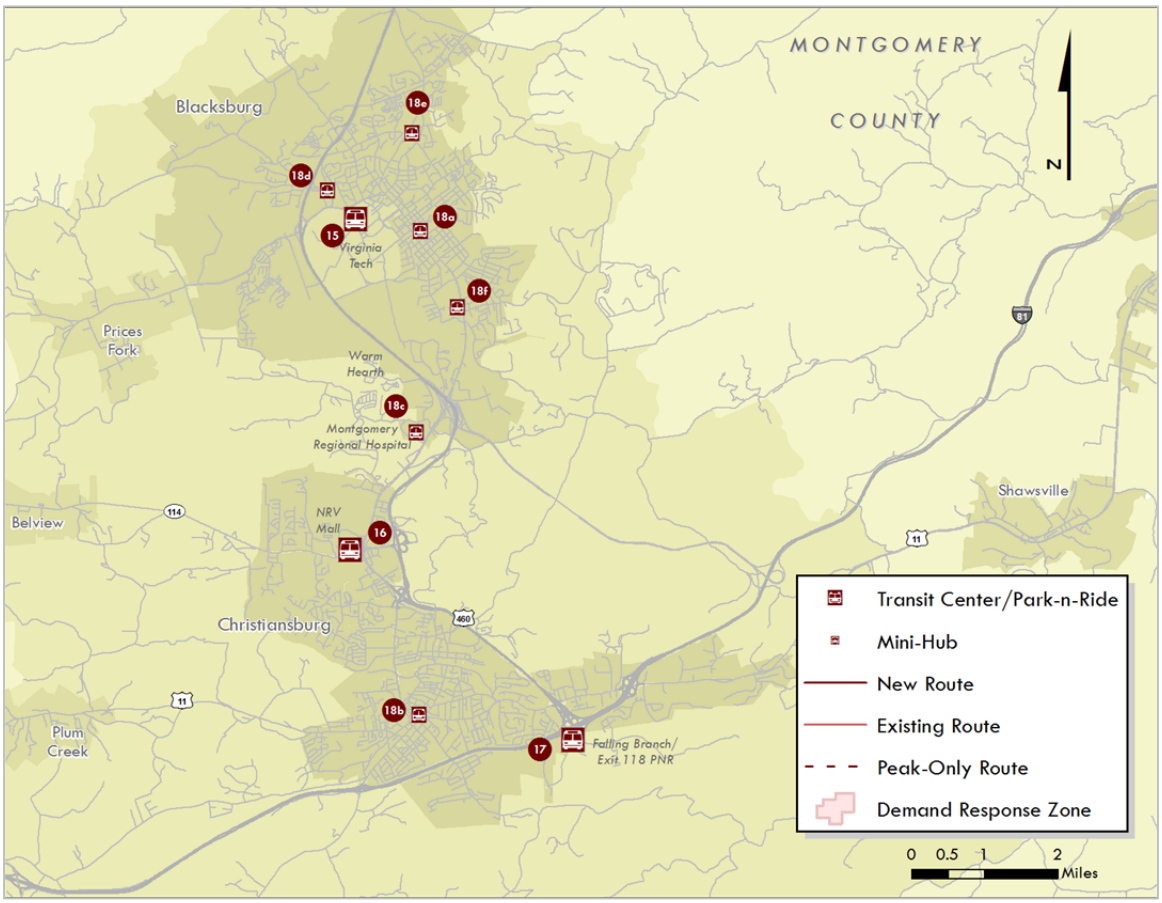
Significant capital investments in facilities and vehicles are required to support BT's existing service provisions as well as those designed for the future. Figure 4-6 locates the passenger facility needs across the BT service area.

- **PROJECT NO. 15: BT/VT Multimodal Transfer Facility.** Chief among facility needs for BT is the establishment of a multimodal transfer facility (MMTF) on the Virginia Tech campus. BT currently has no passenger facilities to handle the upwards of 5,000 daily riders boarding or alighting from three key stops on the VT main campus. Without a transfer facility in place, all Blacksburg routes must circulate campus. This is primarily a safety risk, as 40- and now 60-foot buses must navigate a heavily congested area mixing pedestrian crossings with bicycles, auto

traffic, and on-street parking. The mixed-mode environment also significantly increases travel times for BT routes, and makes transfers difficult.

A transit center could solve all these issues, by creating a centralized hub where off-campus and regional route services safely unload passengers, who could then walk, bike, or utilize smaller campus circulator shuttles to reach their final destinations. This center would ideally provide up to 16 BT bus bays and 4 other provider bays complete with an indoor queuing area, information kiosks, restrooms, bike and kiss-n-ride capabilities, and other passenger amenities suitable for the extreme flows coming through the facility. As of March 2011, conceptual design and siting had been completed for the MMTF, to be located on the southeast corner of West Campus & Perry.

Figure 4-6. Passenger Facility Potential Projects



- **PROJECT NO. 16: NRV Mall Transit Center.** A future passenger facility need is developing in conjunction with the regional and intercity service demand of the community. This facility would be located somewhere at the intersection of Franklin & Peppers Ferry in Christiansburg, either on the property of NRV Mall or one of the many retail developments in this area. This facility would consist of 6-10 bus bays and some passenger amenities, such as a restroom, indoor waiting area, and information kiosks. Park-n-ride, kiss-n-ride, and bike facilities should also be included. In addition to being a gateway to pedestrian and circulator service to the NRV

Mall, New River Community College, and surrounding retail area, this center would serve as a hub connecting intercity routes between Blacksburg, Christiansburg, Montgomery County, and the New River Valley.

- **PROJECT NO. 17: VDOT Park-n-Ride (I-81 Exit 118) Improvements.** The VDOT park-n-ride located at Exit 118 on I-81 is currently nothing more than a simple paved lot. Demand has grown quickly recently with the introduction of SmartWay and now Megabus services, and this property must grow in response. Passenger amenities like indoor waiting areas, restrooms, and information kiosks; road improvements to separate auto, bus, and pedestrian traffic; and parking lot improvements such as paving, signage, lighting, and security are all needed to complete this facility.

- **PROJECT NO. 18a-f: Mini-Hub Transfer Stations.** Mini-hub transfer stations are gathering points for transit service. They can be as simple as well-appointed off-street bus pullouts and shelters or as elaborate as small transit centers, complete with bus bays, passenger amenities, and transit-oriented development. They represent points in the system where bus transfers can occur safely and comfortably, so that the system can maximize productivity without sacrificing passenger experience. Mini-hubs are ideally located near destinations that naturally draw riders, such as downtowns, retail centers, hospitals, educational or cultural institutions, or government or community centers. Six mini-hubs would ideally form a network of connection points through the backbone of the BT service area. Over time, the need for additional or different mini-hubs will undoubtedly materialize.

  18a. Downtown Blacksburg: the largest of the proposed mini-hubs, this station would provide a curb-cut or off-street bus bays for 3-4 vehicles at a time along Main Street. It would include an information kiosk and significant design elements, with indoor or outdoor passenger waiting. As the vibrant heart of Blacksburg, the downtown station is ideally suited as part of a larger transit-oriented development that could include retail, employment, and residential. As the centralized Main & College environs are quite developed, this station would likely be positioned as part of redevelopment effort, such as that currently occurring on the old Blacksburg Middle School site.

  18b. Downtown Christiansburg: curb-cut or off-street bus bays for 2-3 vehicles at a time in the vicinity of Main & Franklin. As in downtown Blacksburg, it could include an information kiosk and significant design elements as part of a larger transit-oriented development.

  18c. Montgomery Regional Hospital: curb-cut or off-street bus bays for 2-3 vehicles along Hospital Drive.

  18d. University Mall: curb-cut or off-street bus bays for 2-3 vehicles along University Boulevard between Glade and Prices Fork. Could be incorporated into transit-oriented development.

  18e. North Main: curb-cut or off-street bus bays for 2-3 vehicles in the vicinity of North Main & Patrick Henry. Could be incorporated into transit-oriented development.

18f. First & Main: curb-cut or off-street bus bays for 2-3 vehicles near South Main & Ardmore or within the First & Main retail complex. Could be incorporated into transit-oriented development.

- **PROJECT NO. 19: Bus Stop Improvement Program.** Currently, most BT stops consist of a simple post and sign. This multi-year program would update BT's 250 bus stops to an entirely new bus stop sign design (including "BT4U" signage), replace existing shelters and benches, and implement tiered ridership activity standards to identify stops that warrant electronic signage (such as NextBus), bus shelters, benches, and other amenities. These stops would include the proposed mini-hub stations and highest usage stops as indicated in Tables 3-16 and 3-17.

- **PROJECT NO. 20: Revenue and Support Vehicle Replacement Program.** This multi-year program would ensure that BT's existing vehicle fleet, including heavy-duty standard buses, medium-duty body-on-chassis buses, and various support vehicles are retired and replaced on a federally-approved replacement schedule.

4.3 Funding Requirements

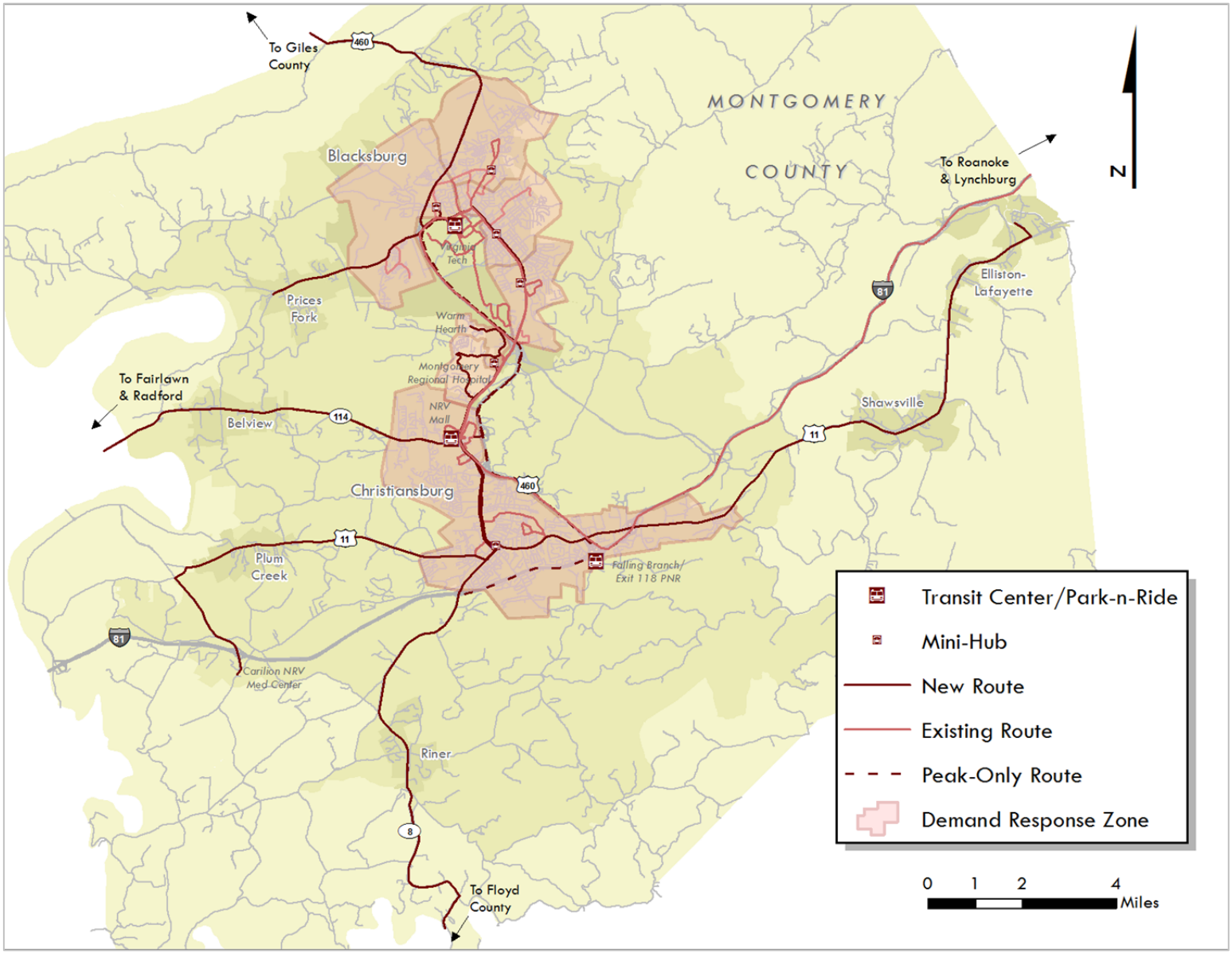
Potential costs to implement the various service needs or construct or purchase the capital needs identified above were calculated. For each service need, a calibrated operating statistics model was used to estimate revenue hour, revenue mile, and vehicle requirements. A generalized cost per hour of $40 based on current BT marginal rates was applied to approximate annual operating expenses. Vehicle expenses were estimated according to current pricing afforded to BT. Facility expenses were forecast based on local estimates where available, and national averages where not. All costs are in FY2012 dollars, and all service statistics assume projects operate independent of each other (Table 4-1).

Following the table, a summary map (Figure 4-7) depicts existing services alongside potential projects developed for the BT 2017 TDP to get a full view of the unconstrained transit vision for the BT service area.

Table 4-1. BT 2017 TDP Potential Project Requirements and Costs

Proj No	Service Need	Additional Service Requirements	Additional Cost Estimate
Operating			
1	Restructure Core Route Network	Unknown. Hours, miles, and vehicles for service redesign will vary based on desired outcomes	Unknown. Operating and capital costs for service redesign will vary based on desired outcomes
2a-e	Improve Frequencies of Core Routes during Enhanced Service	1,500 to 1,800 annual revenue-hours, 10,000 to 21,000 annual revenue-miles, and 1 peak vehicle PER ROUTE IMPROVEMENT	$59,000 to $71,000/year in operating costs and $400,000 to $650,000 in capital costs PER ROUTE IMPROVEMENT
3	Expand Service Hours of Two Town Trolley during Enhanced Service	1,400 annual revenue-hours, 20,000 annual revenue-miles, and 0 peak vehicles	$55,000/year in operating costs and no additional capital costs
4	Improve Frequency of CRC Route during Regular Service	1,100 annual revenue-hours, 16,000 annual revenue-miles, and 0 peak vehicles	$45,000/year in operating costs and no capital costs
5	Improve Frequency of Late Night Friday/Saturday routes during Enhanced Service	1,100 annual revenue-hours, 11,000 annual revenue-miles, and 0 peak vehicles	$42,000/year in operating costs and no capital costs
6	Blacksburg Local Service (Downtown Trolley)	8,800 annual revenue-hours, 65,000 annual revenue-miles, and 2 peak vehicles	$350,000/year in operating costs and $1.2 to $1.9 million in capital costs
7	Blacksburg Local Service (Neighborhood Circulators)	17,800 annual revenue-hours, 94,000 annual revenue-miles, and 4 peak vehicles	$714,000/year in operating costs and $320,000 in capital costs
8	Christiansburg Commuter Service	1,300 annual revenue-hours, 28,000 annual revenue-miles, and 2 peak vehicles	$51,000/year in operating costs and $260,000 in capital costs
9	Warm Hearth to Hospital Connection	500 annual revenue-hours, 3,500 annual revenue-miles, and 1 peak vehicle	$20,000/year in operating costs and $80,000 in capital costs
10	Merrimac/Hightop Neighborhood Service	5,500 annual revenue-hours, 35,000 annual revenue-miles, and 1 peak vehicle	$221,000/year in operating costs and $80,000 in capital costs
11	Radford Local Service	20,000 to 30,000 annual revenue-hours, 200,000 to 300,000 annual revenue-miles, and 8 peak vehicles	$700,000 to $1.5 million/year in operating costs and $1 to $1.5 million in capital costs
12a-f	New River Valley Intercity Service	17,300 annual revenue-hours, 341,000 annual revenue-miles, and 6 peak vehicles	$692,000/year in operating costs and $2 million in capital costs
13	Improve Frequency of SmartWay connection to Salem/Roanoke	8,100 annual revenue-hours, 204,400 annual revenue-miles, and 2 peak vehicles	$264,000/year in operating costs and $1.1 million in capital costs
14	Intercity Connection to Amtrak Lynchburg	4,000 annual revenue-hours, 116,000 annual revenue-miles, and 1 peak vehicle	$150,000/year in operating costs and $550,000 in capital costs
Capital			
15	VT Multimodal Transfer Facility	N/A	$20 million in capital costs; facility operating costs to be determined following further study
16	NRV Mall Transit Center	N/A	$5 million in capital costs; facility operating costs to be determined following further study
17	VDOT Park-n-Ride at I-81 Exit 118 Improvements	N/A	$1 million to $2 million in capital costs; facility operating costs to be determined following further study
18a-f	Mini-Hub Transfer Stations	N/A	$1 million in capital costs PER STATION; facility operating costs to be determined following further study
19	Bus Stop Improvement Program	N/A	$600,000 to $1 million in capital costs; stop maintenance costs to be determined following further study
20	Revenue and Support Vehicle Replacement Program	N/A	$16 million in capital costs; vehicle maintenance costs are additional

Figure 4-7. BT 2017 TDP Existing and Potential New Service



4.4 Ancillary Needs

While not directly service, facility, or equipment needs, several other necessities were identified in order for BT to sustain existing operations and implement service expansion over the course of the TDP. It is important for an agency to identify these so as not to lose track of the critical support steps that ensure the continuation and improvement of service.

- **Comprehensive Operational Analysis (COA).** BT's last COA was conducted in 2006, before the advent of Christiansburg service or the prospect of the MMTF and regional services. In preparation for the completion of the MMTF, it is time for BT to once again do a thorough evaluation of its services to understand stop-level and route segment performance before attempting to overhaul its route structure in support of the MMTF.
- **Organizational Audit.** With transit costs spiraling higher every year, transit providers are being pressed to deliver the most efficient services possible. While a COA provides a thorough assessment of the route structure, BT likewise needs a systematic review of its organizational structure to understand how the department could most efficiently be organized in order to provide not only fixed route short-haul services, but also general public flex and demand responsive services and intercity routes. This analysis should include an evaluation of the ideal mix of part-time and full-time operators BT needs in order to deliver its service offerings.
- **Regional Cost Model Update.** BT's current regional cost model represents a large improvement over its predecessors, but it still lacks the precision required to accurately cost out the myriad different service types the operator is providing. Shifting the model to become multi-variable would allow BT to allocate costs by many factors (e.g., revenue hours, miles, vehicles, facilities, etc) instead of just one. It would allow for the model to separately track costs related to vehicle type (heavy-duty vs. medium-duty bus) or by operation type (fixed route vs. flex route vs. demand responsive). This is imperative for the department to not only control costs, but also provide the transparent and equitable tools needed to serve multiple partners and jurisdictions.
- **Additional mechanics.** For years, BT has been operating with fewer mechanics per vehicle than nearly all of its peers. As a result, preventive maintenance has suffered, existing staff is compromised, and many maintenance functions have to be contracted out. Adding two more mechanics would still leave BT at the outer end of its peers but represent a marked improvement, adding 3 or 4 would bring the department in line with its peers. In addition, the pay rate for new (and existing) mechanics is substantially lower than nearby agencies. For example, Valley Metro in Roanoke, Virginia, pays new mechanics $15.00 per hour. The Town of Blacksburg offers new mechanics starting rates ranging from $10.41 to $11.45 per hour. This relatively low rate makes it difficult to attract and retain maintenance personnel, particularly for those that are required to work as night mechanics.

Chapter 5 Operations Plan

Service expansion projects identified in the previous chapter were considered for inclusion in the six-year timeframe of the TDP from FY2012 to FY2017. They were assigned for implementation by year based on:

- The project's contribution to the overall needs of the community and goals of the TDP;
- The reasonableness of the project to be provided by BT rather than another operator;
- A reasonable expectation of local funding and community support from public and private partners within the jurisdiction(s) it would serve;
- A reasonable expectation of federal and state funding for the project; and
- The logical progression of service implementation (e.g., MMTF Route Restructuring would not precede completion of the MMTF)

Of the twenty service, facility, and vehicle projects identified in Chapter 4, twelve have been assumed for full implementation by BT within the TDP timeframe, and another three have been assumed to be partially implemented by 2017. Four other projects are expected to be implemented by other providers and have not been included in the TDP operations plan.

All service expansion projects were reviewed with stakeholders representing the jurisdictions to be served, who directly assessed the viability of each project and its likelihood to be funded locally within the TDP timeframe. As such, this plan is an exciting and challenging vision for future growth that represents the community's best estimates to implementation available at this time. These plans will be updated annually per the TDP monitoring program (Chapter 8) to reflect the evolving economic and political landscape.

In total from 2012 to 2017, the TDP plan forecasts a 31 percent increase in revenue hours, a 39 percent increase in revenue miles, and a 27 percent increase in the total revenue vehicle fleet. It includes a redesign and expansion of BT's core Virginia Tech service to reflect evolving demand and travel patterns. It reflects the introduction of new local services in Blacksburg and Montgomery County, the continuation of local services in Christiansburg, and the first phase of regional and commuter point-to-point services between the BT service area and the New River Valley. For all these, it projects the capital facility and vehicle infrastructure needed to support service. Much of the growth in new services are scheduled for FY2016 and 2017 to reflect the reality that it will take time to develop the political consensus and funding arrangements necessary to bring new partners into the system.

This chapter outlines a year-by-year implementation plan of service additions and modifications during the TDP timeframe along with the operating requirements by type of service.

5.1 Annual Operating Plans

Operating plans by year are presented below. Unless otherwise indicated, existing services from the previous year continue into the next year. Project numbers for service expansion projects correspond to those established in the previous chapter. The Bus Stop Improvement Program and Vehicle Replacement Program (Project Nos. 19 & 20) are planned to recur annually as needed.

Key local, state, and federal funding sources assumed to implement each project have been identified. Local sources are meant to represent the jurisdiction from which funds – both public and private – would be reasonably expected, and are not an indication of solely local government support. Funding codes and their definitions:

Federal/State Programs:

- 5307 Urbanized Area Operating Grants
- 5309 Bus and Bus Facilities Capital Grants
- 5311 Rural and Small Urban Areas Operating Grants
- JARC Job Access and Reverse Commute Program
- NF New Freedoms Program
- STF State Senior Transportation Fund

Localities:

- VT Virginia Tech
- TOB Town of Blacksburg
- TOC Town of Christiansburg
- MC Montgomery County
- RAD City of Radford/RU
- GC Giles County
- FC Floyd County

FY2012

The first year of the plan initiates the expansion of Virginia Tech core route service to address overcrowding during Enhanced weekday peak service, starting with an additional bus added to the Hethwood route, which currently is experiencing the worst overcrowding on the system. Commuter service from Christiansburg to Virginia Tech (initiated January 2011) and starter service from Warm Hearth Village to Montgomery Regional Hospital (Fall 2011) are also scheduled to begin this year. These two projects have undergone the planning, market analysis, outreach, and local funding arrangements needed before introducing new service, and are ready for implementation (Table 5-1).

Table 5-1. FY2012 New Service Projects

Proj No	Project Name	Service Area	Description	Key Funding
FY2012				
2a	Hethwood Weekday Peak Bus	Virginia Tech/Blacksburg	Add 1 bus to Hethwood Route to increase weekday peak frequency from 12 to 10 minutes	5307/VT
8	Christiansburg Commuter	Christiansburg/Virginia Tech	Initiate 2 trips of weekday peak commuter service to VT with 2 BoCs; eliminate Shopper Express route to preserve resources	JARC/VT/TOC
9	Warm Hearth-Hospital Connector	Montgomery County	Initiate 30-minute service from 9am-5pm (1 day/wk) between Warm Hearth and Montgomery Regional Hospital and 20 evenings/wk with 1 BoC	STF/MC (Warm Hearth and Hospital)

In order to fully implement the Christiansburg Commuter service, it is necessary to cancel the under-performing Shopper Express service, which is the case as of March 26, 2011. This route may make sense to reintroduce once significant regional services are terminating in the NRV Mall area, but for now there is not enough need for a retail circulator to warrant continuation. It is expected that final design for the MMTF is completed in FY2012, along with a detailed route restructuring plan.

FY2013

The second year of the TDP sees a continuation of the expansion of core VT service, this time with an additional bus placed on the Tom's Creek route, another route subject to extreme peak period loads. Construction is anticipated to be underway on the MMTF, and enhancements to the I-81 Park-n-Ride lot at Exit 118 are expected to be completed at this time.

Starter service from Radford, Fairlawn, and Belview to Christiansburg would also start in this year. Preliminary discussions with New River Community College and Pulaski Area Transit indicated a strong desire to launch this service soon. It is expected that FY2012 would be used to refine service levels, resolve any jurisdictional issues, and secure local funding commitments so that a pilot service could be implemented in FY2013. This would also give Radford local service a year to be operational before introducing an intercity route to that area. FY2013 pilot service would consist of weekday and Saturday trips at 120-minute frequencies; the full implementation of this project would not occur until FY2016 so that demand and local funding sources have an opportunity to develop (Table 5-2).

Table 5-2. FY2013 New Service Projects

Proj No	Project Name	Service Area	Description	Key Funding
FY2013				
2b	Tom's Creek Weekday Peak Bus	Virginia Tech/Blacksburg	Add 1 bus to Tom's Creek route to increase weekday peak frequency from 15 to 10 minutes	5307/VT
12a	Radford/Fairlawn/Belview (Phase 1)	Radford/Montgomery Cty/ Christiansburg	Initiate 120-minute service from noon-9pm weekdays and noon-6:30pm Saturdays from Radford/Fairlawn to NRV Mall via Pepper's Ferry with 1 BoC	JARC/RAD/MC/TOC
17	VDOT Park-n-Ride Lot (I-81 exit 118)	Christiansburg/ Montgomery County	Complete enhancements to parking lot and addition of passenger amenities	(VDOT)

FY2014

In FY2014, all service modifications are geared around the completion of the MMTF on the Virginia Tech campus. Route modifications associated with the opening of the MMTF would be put in place at this time. These likely include a new system of passenger delivery whereby off-campus and regional routes bring riders to the MMTF, from where they can walk, bike, or rider small shuttle circulators to this final destination. Since the overall VT route system is already being adapted, FY2014 represents a logical point in which to modify the CRC Shuttle to run more frequently during Regular Service and to expand service hours on the Two Town Trolley (Table 5-3).

Table 5-3. FY2014 New Service Projects

Proj No	Project Name	Service Area	Description	Key Funding
FY2014				
1	MMTF Route Restructuring	Virginia Tech/Blacksburg	Restructuring of BT core routes to serve MMTF and redesign campus service delivery	5307/VT
3	Two Town Trolley Expanded Hours	Virginia Tech/Blacksburg/ Christiansburg	Expand weekday and Saturday hours from noon-6pm to 9am-9pm	5307/VT
4	CRC Regular Service Improvement	Virginia Tech	Modify CRC Regular Service to match alignment and headway of CRC Enhanced Service	5307/VT
15	Multimodal Transfer Facility	Virginia Tech	Complete construction of primary transit center in vicinity of Perry & West Campus	5309/VT

FY2015

Year 4 of the TDP sees the return of the multi-year core VT service improvement plan (Table 5-4). At this time, the Patrick Henry route has been identified as the next candidate for which a peak bus would be added; however, the specific placement of extra service as part of this project would possibly change as a result of the MMTF restructuring. Planning and design for a transit center in the vicinity of NRV Mall and the first three mini-hubs is expected to be underway at this time.

Table 5-4. FY2015 New Service Projects

Proj No	Project Name	Service Area	Description	Key Funding
FY2015				
2c	Patrick Henry Weekday Peak Bus	Virginia Tech/Blacksburg	Add 1 bus to Patrick Henry route to increase weekday peak frequency from 15 to 10 minutes	5307/VT

FY2016

The fifth year of the plan sees the acceleration of the BT regional network with the expansion of the Radford/Fairlawn/Belview regional route to include commuter trips direct to MMTF in Blacksburg and a doubling of base headways to 60-minutes, and the initiation of a second regional route from Prices Fork Village to MMTF. Construction is expected to be completed for the first three mini-hubs, and planning underway on the next three. Construction of the NRV Mall Transit Center is also forecast to be underway. U-Mall Shuttle (or its equivalent following MMTF restructuring) would receive an extra bus as part of the core service improvement program (Table 5-5).

Table 5-5. FY2016 New Service Projects

Proj No	Project Name	Service Area	Description	Key Funding
FY2016				
2d	U-Mall Shuttle Weekday Peak Bus	Virginia Tech	Add 1 bus to U-Mall route to increase weekday peak frequency from 15 to 10 minutes	5307/VT
12a	Radford/Fairlawn/Belview (Phase 2)	Radford/Montgomery Cty/ Christiansburg/Virginia Tech	Initiate 3 trips of weekday commuter service from Radford/Fairlawn to VT via Pepper's Ferry and US-460 with 1 BoC; Increase base service to NRV Mall from 120-minutes to 60-minutes	JARC/RAD/MC
12b	Prices Fork	Montgomery/Virginia Tech	Initiate 8 weekday and 4 Saturday trips from Price's Fork & McCoy to VT via Price's Fork with 1 BoC	JARC/MC
18a	Downtown Blacksburg Mini-Hub	Blacksburg	Complete construction of mini-hub transit station in vicinity of Downtown Blacksburg	5309/TOB
18b	Downtown Christiansburg Mini-Hub	Christiansburg	Complete construction of mini-hub transit station in vicinity of Downtown Christiansburg	5309/TOC
18c	Montgomery Regional Hospital Mini-Hub	Montgomery County	Complete construction of mini-hub transit station in vicinity of Montgomery Hospital	5309/MC

FY2017

In the last year of the TDP, regional service would expand by one route with the addition of Carilion/Plum Creek service, and VT service would see its final improvement with the addition of a bus on the Main Street route. At this point, the VT route network would be capable of offering no longer than 15-minute headways on all local routes, and no longer than 10-minute service on its high volume routes.

Local service in Blacksburg and the Montgomery portion of the MPO would initiate with the introduction of the Blacksburg Downtown Trolley and neighborhood circulators, and the Merrimac/Hightop/Warm Hearth flex route. The latter would replace the once-weekly Warm Hearth-Hospital connector, which by now will have been outgrown by its ridership base. Blacksburg local service would initially run only from noon to 6pm on weekdays and Saturdays while demand was established. In out years past the TDP timeframe, the full project as described in Chapter 4 would be implemented.

To complement the expansion of the regional and local networks, FY2017 foresees the opening of the entire 6-station mini-hub network and the NRV Mall Transit Center. Now, riders would finally have the ability to start navigating their communities and the surrounding areas with safe, convenient, and efficient public transportation (Table 5-6).

Table 5-6. FY2017 New Service Projects

Proj No	Project Name	Service Area	Description	Key Funding
FY2017				
2e	Main Street Weekday Peak Bus	Virginia Tech/Blacksburg	Add 1 bus to Main Street route to increase weekday peak frequency from 20 to 15 minutes	5307/VT
6	Blacksburg Downtown Trolley	Blacksburg	Initiate weekday and Saturday midday and afternoon 20-minute service from University Mall to First & Main via Price's Fork and Main with 2 trolley buses	5307/TOB
7	Blacksburg Neighborhood Service	Blacksburg	Initiate weekday and Saturday midday and afternoon flex or demand responsive service in four quadrants of Blacksburg with 2 BoCs	5307/TOB
10	Merrimac/Hightop/Warm Hearth	Montgomery County	Replace Warm Hearth-Hospital Connector with weekday and Saturday midday and afternoon flex or demand responsive service across Warm Hearth/Merrimac/ Hightop to NRV Mall with 1 BoC	JARC/MC
12c	Carilion/Plum Creek	Montgomery County/Christiansburg	Initiate 3 weekday trips from Carilion Hospital to NRV Mall via SR-177 and US-11 with 1 BoC	NF/MC/TOC
16	NRV Mall Transit Center	Christiansburg/ Montgomery County	Complete construction of secondary transit center in vicinity of Franklin & Pepper's Ferry	5309/TOC/MC
18d	University Mall Mini-Hub	Blacksburg	Complete construction of mini-hub transit station in vicinity of University Mall	5309/TOB
18e	North Main Mini-Hub	Blacksburg	Complete construction of mini-hub transit station in vicinity of North Main & Patrick Henry	5309/TOB
18f	First & Main Mini-Hub	Blacksburg	Complete construction of mini-hub transit station in vicinity of First & Main	5309/TOB

Other Projects

Some projects were identified in the previous chapter addressing the community's service needs, but do not appear in BT's six-year TDP for various reasons.

- Core route restructuring requirements (Project No. 1) may include service expansion beyond current resources, such as additional needs in order to provide a campus circulator service. These should be addressed through future planning activities between BT and Virginia Tech.
- Late night service improvements to the VT core system (Project No. 5) were not included based on funding priorities established by Virginia Tech.
- Blacksburg local service (Project Nos. 6 & 7) is only partially implemented by FY2017 to allow service to phase in naturally. It is anticipated to be fully implemented beyond 2017.
- Radford local service (Project No. 11) is expected to come online in FY2012. As of March 2011, operation of the service is the subject of a request for proposal from the City of Radford, so no provider can be identified at this time.

- NRV intercity services to Giles County, Floyd/Riner, and Elliston-Lafayette/Shawsville (Project Nos. 12d-f) are not anticipated to occur within the time frame of the TDP due to a current lack of local funding. Should the economics change for these communities, service could be shifted into the TDP.
- Increased frequencies on SmartWay to Roanoke (Project No. 13) and intercity service to Lynchburg Amtrak (Project No. 14) are assumed to be operated by Valley Metro and therefore do not appear in this plan.
- Additional mini-hub opportunities (Project No. 18) may present themselves that will require inclusion in this plan. For example, candidate locations on the Virginia Tech campus along Alumni Mall and at Washington Street & West Campus Drive could be elevated to project status following further discussions with the university.

5.2 Annual Service Levels

Annual revenue hours, revenue miles, vehicles, and passenger facilities required for the TDP plan are summarized below (Table 5-7). Over the six years of the plan, revenue hours are projected to grow by 30,766 (31 percent). About 42 percent of this growth is attributable to Fixed Route Heavy-Duty services, which is the core VT route system, with 57 percent of the growth attributable to Fixed Route and Demand Responsive Medium Duty services, which is essentially the local and regional route networks. The percent of overall revenue hours attributable to heavy duty bus services drops from 80 percent in FY2012 to 71 percent in FY2017.

Table 5-7. Annual TDP Service Requirements

OPERATING PARAMETER	FISCAL YEAR						Overall Growth
	2012	2013	2014	2015	2016	2017	2012-2017
Revenue-Hours							
Fixed Route (Hvy Duty Bus)	79,848	81,631	84,140	85,922	87,395	92,790	16%
Fixed Route (Med Duty Bus)	500	1,691	1,691	1,691	6,294	6,153	1131%
Demand Responsive (Med Duty Bus)	10,595	10,595	10,595	10,595	10,595	22,361	111%
ADA Paratransit	9,038	9,240	9,524	9,726	9,893	9,453	5%
Total	99,981	103,156	105,949	107,933	114,176	130,757	31%
Annual Percentage Change	n/a	3%	3%	2%	6%	15%	
Revenue-Miles							
Fixed Route (Hvy Duty Bus)	744,191	759,164	795,043	808,947	819,254	873,161	17%
Fixed Route (Med Duty Bus)	3,454	37,169	37,169	37,169	131,318	148,095	4188%
Demand Responsive (Med Duty Bus)	104,680	104,680	104,680	104,680	104,680	187,042	79%
ADA Paratransit	64,290	65,725	67,745	69,181	70,366	67,239	5%
Total	916,616	966,739	1,004,638	1,019,977	1,125,618	1,275,538	39%
Annual Percentage Change	n/a	5%	4%	2%	10%	13%	
Revenue Fleet Vehicles							
Heavy-Duty Buses (30'-40')	42	43	43	44	45	49	7
Heavy-Duty Buses (60')	2	2	3	3	3	3	1
Medium-Duty Buses (<30')	12	12	12	12	14	19	7
Total	56	57	58	59	62	71	15
Annual Change	n/a	1	1	1	3	9	
Passenger Facilities							
Primary Transit Center	0	0	1	1	1	1	1
Secondary Transit Center	0	0	0	0	0	1	1
Mini-Hub	0	0	0	0	3	6	6
Park-n-Ride Lot	1	1	1	1	1	1	0
Total	1	1	2	2	5	9	8
Annual Change	n/a	0	1	0	3	4	

Similar growth occurs in revenue miles and fleet vehicles, which see increases of 39 percent and 27 percent, respectively. Increases in revenue miles are more driven by new regional services than other service types, given the longer trip distances of these routes. Increases in fleet vehicles are more evenly split between expansion of the heavy-duty bus fleet and the medium-duty body-on-chassis fleet.

Passenger facilities represent an area of significant investment by BT over the course of the TDP, as the system moves from one facility in the service area not even operated by BT (the VDOT Park-n-Ride at I-81), to a total of 9 by FY2017. This figure includes the MMTF primary transit center currently in design as well as a secondary transit center in the vicinity of NRV Mall and 6 mini-hub transfer stations located across the service area. Vehicles and facilities are described in greater detail in the following chapter.

Chapter 6 Capital Improvement Program

BT's Capital Improvement Plan figures to be fairly active over the six year timeframe of the TDP. Heavy-duty replacement buses are in the middle of a replacement cycle that will last into the first three years of the plan, and steady expansion is forecast for that fleet through 2017. Due to their shorter life cycles, medium-duty buses will be in a continuous replacement loop over the six years. Other capital purchases, such as the bus stop amenities program, vehicle maintenance schedule, and IT program, also maintain steady annual levels of investment.

Most distinctive about BT's CIP through 2017 is the Facility Improvement Program being put into place. Until now, BT has managed transport of over 3 million annual riders without the benefit of any passenger facilities. Plans are underway for that to change with the construction of a signature transit center on the VT campus by the middle of the TDP. Following the completion of this major project, BT can turn to installing necessary facilities in other parts of the system. In all, a total of 8 new passenger facilities of varying sizes are projected to be built by 2017.

This chapter of the TDP describes all the capital programs required to carry out the operations and services presented in the previous chapter.

6.1 Vehicle Replacement and Expansion Program

As described in Chapter 1, BT's current vehicle fleet includes 44 standard and articulated buses, 12 body-on-chassis ("cutaway") buses, and 14 support vehicles. The useful life is 12 years for BT's heavy-duty buses and five years for body-on-chassis buses, vans, and most support vehicles. The vehicles available for revenue service are aged from zero to nine years, so fleet replacement will continue throughout the TDP planning period.

For heavy-duty buses, 18 will need to be purchased during the TDP period to maintain the existing fleet and eight buses are programmed to be purchased for service expansion. Replacement vehicles are scheduled between FY2012 and FY2014, at which point the oldest bus will be seven years old and the heavy-duty replacement schedule can be relaxed for the remainder of the TDP. Expansion heavy-duty buses would continue through FY2017 in support of the core VT service improvements and Blacksburg Downtown Trolley projects described in the previous chapters. A continued investment in diesel-electric hybrid buses is planned for the heavy-duty fleet.

Modern trolley buses are increasingly standard buses "fitted" with a trolley-look in order to increase passenger comfort and capacity

For medium-duty ("cutaway" or body-on-chassis) buses and paratransit vans, 18 replacement vehicles and 10 expansion vehicles are programmed for the TDP period. Medium-duty vehicles will include a mix of

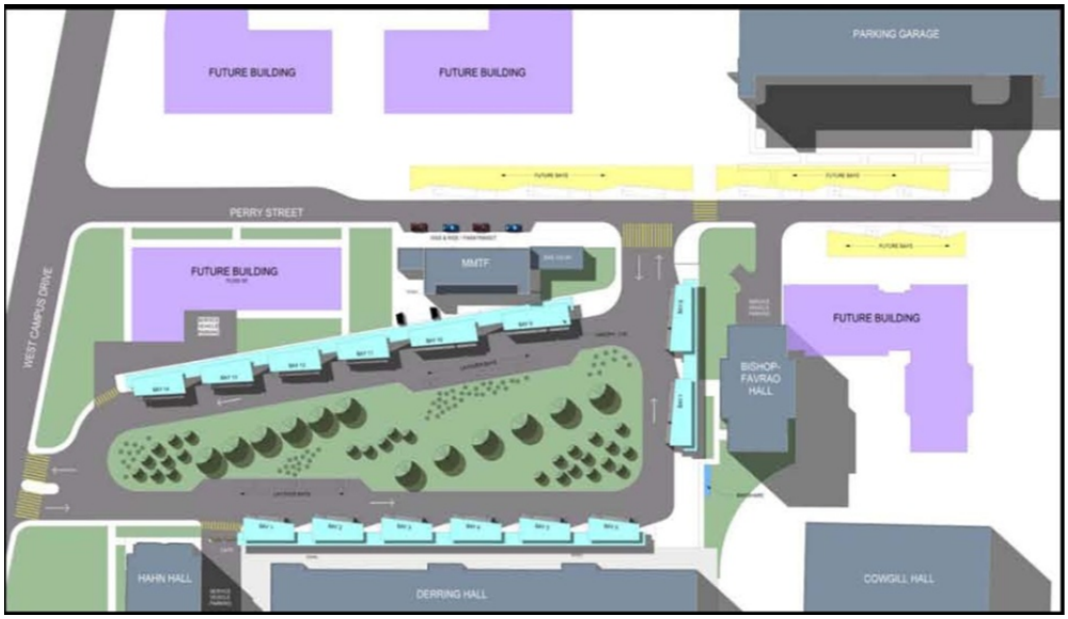
standard-length BoCs, extra-long 30-foot BoCs, and raised roof vans. While vehicles are designated to specific services and partners, these vehicle types as a whole will be used in a variety of ways, ranging from complementary ADA services (BT Access) to general public demand-responsive services (Christiansburg and new local services) to fixed route services (new regional services).

For support vehicles, 17 replacement vehicles and one expansion vehicle are programmed for the TDP period. The complete vehicle replacement and expansion schedule is presented in Table 6-1 at the end of this chapter.

6.2 Facility Improvement Program

As noted in preceding chapters of this TDP, several facility needs for BT have been identified over the next six years. The largest of these is the BT/VT Multi-Modal Transfer Facility (MMTF), which is proposed to be located on Perry Street east of West Campus Drive, behind Derring Hall on the VT campus (Figure 6-1).

Figure 6-1. Proposed Site Plan for the BT/VT Multi-Modal Transfer Facility

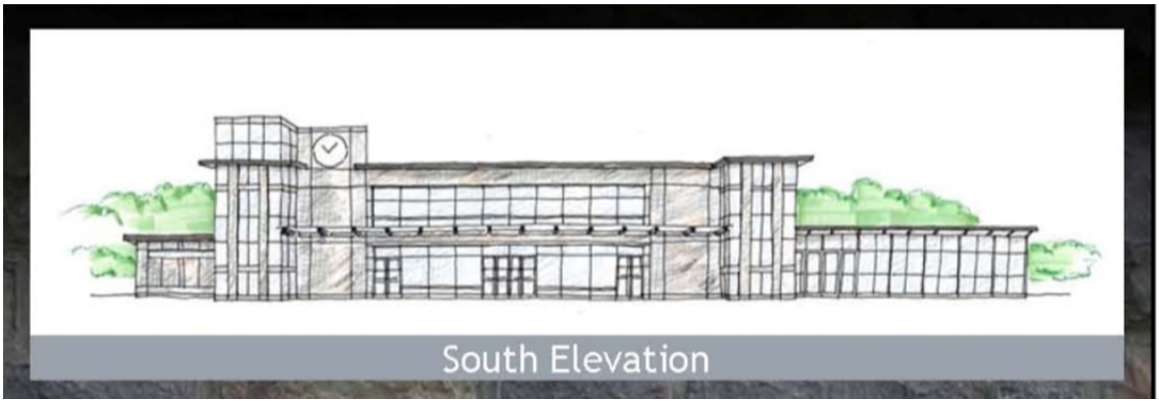


Preliminary architectural and engineering (A&E) design for this project have already begun. The facility would initially include 12 BT bus bays (8 standard 40' and 4 articulated 60') and two regional (45') bays, with future plans to add 8 bays for a total of 22 bays. A 12,000 square foot, 2-story building is proposed to include offices, driver support functions, and a waiting area with amenities for passengers (Figure 6-2). Other accommodations would include a paratransit drop-off/pick-up, kiss-and-ride drop-off, bike racks and bike lockers. Additional funding for A&E is programmed for FY2012 with construction programmed in FY2013 and FY2014. The design life of the facility is 50 years.

Completion of this facility will alleviate a myriad of safety, operational, and environmental concerns of the current campus circulation by creating a centralized hub where off-campus and regional route

services can safely load and unload the upwards of 5,000 daily riders to the VT campus, who could then walk, bike, or utilize smaller campus circulator shuttles to reach their final destinations.

Figure 6-2. Proposed Elevation for Multi-Modal Transfer Facility



Further facility improvements in the TDP period include a secondary transit center at the New River Valley Mall, construction of six mini-hubs throughout the BT service area, and improvements to a VDOT park-and-ride facility at Exit 118 on I-81 in Christiansburg. The New River Valley Mall Transit Center would be located somewhere at the intersection of Franklin & Peppers Ferry in Christiansburg, either on the property of NRV Mall or one of the many retail developments in this area. This facility would consist of 6-10 bus bays and some passenger amenities, such as restrooms, indoor waiting area, and information kiosks. Park-n-ride, kiss-n-ride, and bike facilities would also be included.

Malls and retail centers are natural locations for transit centers due to employment and commercial densities

In addition to being a gateway to pedestrian and circulator service of the NRV Mall, New River Community College, and surrounding retail area, this center would serve as a major hub connecting regional and intercity routes between Blacksburg, Christiansburg, Montgomery County, and the New River Valley. Due to the potential ridership demand such a center could attract, it would be well-suited to act as an economic generator for the area. The NRV Mall Transit Center is programmed for A&E in FY2015 with construction in FY2016 and FY2017, timed with the ramp up of regional services.

Six mini-hub transfer stations are programmed for design and construction across the service area in FY2016 and FY2017. These stations would provide transfer opportunities, passenger amenities, and destination travel at a smaller scale than the larger transit centers proposed above. They can be as simple as well-appointed off-street bus pullouts and shelters or as elaborate as small transit centers, complete with bus bays, passenger amenities, and transit-oriented development. They represent points in the system where bus transfers can occur safely and comfortably, so that the system can maximize productivity without sacrificing passenger experience.

The mini-hubs planned for the BT service area would be located in areas that that naturally draw riders, such as downtowns, retail centers, hospitals, educational or cultural institutions, or government or community centers. Three of these stations would come online in FY2016 (Downtown Blacksburg, Downtown Christiansburg, and Montgomery Regional Hospital) with the other three following in FY2017 (University Mall, North Main, and First & Main). Preliminary concepts for each include:

- *Downtown Blacksburg*: the largest of the proposed mini-hubs, this station would provide a curb-cut or off-street bus bays for 3-4 vehicles at a time along Main Street. It would include an information kiosk and significant design elements, with indoor or outdoor passenger waiting. At the vibrant heart of Blacksburg, the downtown station is ideally suited as part of a larger transit-oriented development that could include retail, employment, and residential. As the centralized Main & College environs are quite developed, this station would likely be positioned as part of redevelopment effort, such as that currently occurring on the old Blacksburg Middle School site.
- *Downtown Christiansburg*: curb-cut or off-street bus bays for 2-3 vehicles at a time in the vicinity of Main & Franklin. As in downtown Blacksburg, it could include an information kiosk and significant design elements as part of a larger transit-oriented development.
- *Montgomery Regional Hospital*: curb-cut or off-street bus bays for 2-3 vehicles along Hospital Drive.
- *University Mall*: curb-cut or off-street bus bays for 2-3 vehicles along University Boulevard between Glade and Prices Fork. Could be incorporated into transit-oriented development.
- *North Main*: curb-cut or off-street bus bays for 2-3 vehicles in the vicinity of North Main & Patrick Henry. Could be incorporated into transit-oriented development.

Mini-hubs come in many shapes and sizes. Examples above include a station with passenger facilities and heavy TOD, a station with moderate passenger facilities only, and a station with simple shelter and bus access

- *First & Main*: curb-cut or off-street bus bays for 2-3 vehicles near South Main & Ardmore or within the First & Main retail complex. Could be incorporated into transit-oriented development.

Finally, there is an existing VDOT park-and-ride lot in the southwest corner of the I-81 interchange at Exit 118 (Parkway Drive) in Christiansburg, adjacent to Falling Branch Elementary School. The existing paved lot has 53 parking spaces, including two handicapped spaces. Demand has grown here recently with the introduction of SmartWay and now Megabus services, and this property must grow in response. It is proposed that this lot be improved to provide additional parking and amenities, including lighting, signage, road improvements to separate auto, bus, and pedestrian traffic, an information kiosk, and possibly restrooms and an indoor waiting area. The costs for these improvements could total anywhere from $100,000 to $1,000,000 depending on the number of additional spaces and level of amenities provided. This would be a VDOT facility shared by multiple service providers; therefore, no costs to BT are included in the TDP period.

This PNR separates auto, bus, and pedestrian traffic, and provides comfort, security, and convenience to passengers

6.3 Other Capital Investments

The BT capital improvement program forecasts needs beyond vehicles and facilities over the next six years. These include costs related to passenger amenities, vehicle parts, tools, software, hardware, radios, AVL equipment, and other miscellaneous needs. Passenger amenities include shelters, benches, signage, and other features, with costs including new amenities as well as maintenance of existing amenities. Software and hardware costs are highest in FY2013 and FY2014 due to the purchase of AVL software updates and BT4U computer hardware, though most of these programs have annual schedules by which to keep the major investments of vehicles and facilities functional and optimized.

Table 6-2 details the entire Capital Improvement Program for FY2012 through FY2017, along with projected federal, state, and local funding levels to support the program. This CIP represents an updated vision from that presented in BT's 2011 CIP submittal to VDRPT and in the Town of Blacksburg's CIP for 2011/12-2015/16. Those plans should be updated to match the BT 2017 TDP at the earliest possibility.

Table 6-1. BT Vehicle Replacement and Expansion Schedule (FY2012 – FY2017)

Vehicle Replacement/Expansion Schedule	FY12	FY13	FY14	FY15	FY16	FY17	FY12-17 Total
Heavy-Duty Hybrid Buses (Model - Length - Life)							
Blacksburg Replacement Vehicles (35'/40')							
2002 New Flyer (30' - 12yr)		2					2
2001 New Flyer (35' - 12yr)	2	4					6
2002 New Flyer (35' - 12yr)			2				2
2007 New Flyer (35' - 12yr)							0
2002 New Flyer (40' - 12yr)			7				7
2007 New Flyer (40' - 12yr)							0
2009 New Flyer (40' - 12yr)							0
2010 New Flyer (40' - 12yr)							0
2010 New Flyer (60' articulated - 12yr)							0
Blacksburg Replacement Vehicles (60' Articulated)							
2002 New Flyer (40' - 12yr)			1				1
Blacksburg Expansion Vehicles (12yr)							
35'/40' Standard Bus		1	1	1	1	1	5
60' Articulated Bus							0
35'/40' Trolley Bus						3	3
Total Heavy-Duty Hybrid Buses	**2**	**7**	**11**	**1**	**1**	**4**	**26**
Medium Duty "Cut-A-Way" Buses (Model - Life)							
Blacksburg/BT Access Replacement Vehicles							
2006 Ford (BoC - 5yr)	1						1
2009 Ford (BoC - 5yr)			2				2
2007 Chevy Supreme (30' BoC - 5yr)			1				1
2001 Dodge (Van - 5yr)		1					1
2009 Ford (Raised Roof Van - 5yr)						1	1
Blacksburg/BT Access Expansion Vehicles							
Body-on-Chassis						3	3
Raised Roof Van					1		1
Christiansburg Replacement Vehicles							
2010 Ford Supreme (BoC - 5yr)				4			4
2011 Series? (BoC - 5yr)					1	4	5
2007 Chevy Supreme (30' BoC - 5yr)			2				2
Christiansburg Expansion Vehicles							
Body-on-Chassis		1	1				2
Regional Replacement Vehicles						1	1
Regional Expansion Vehicles	1			1	1	1	4
Total Medium Duty Buses	**2**	**2**	**6**	**5**	**3**	**10**	**28**

Table 6-1 (cont'd). BT Vehicle Replacement and Expansion Schedule (FY2012 – FY2017)

Vehicle Replacement/Expansion Schedule	FY12	FY13	FY14	FY15	FY16	FY17	FY12-17 Total
Support Vehicles (Year - Life)							
Replacement Vehicles							
Maintenance Truck					1		1
Maintenance Floor Sweeper					1		1
Pickup 2008 (5yr)		1					1
Pickup 2009 (5yr)				1			1
Pickup 2011 (5yr)					2		2
SUV 2004 (5 Yr)		1			1		2
SUV 2005 (5 Yr)		1			1		2
SUV 2006 (5 Yr)		1					1
SUV 2008 (5 Yr)			3				3
SUV 2010 (5 Yr)				1	1		2
Van 2004 (5 Yr)		1					1
Expansion Vehicles							
SUV		1					1
Total Support Vehicles	**0**	**6**	**3**	**2**	**7**	**0**	**18**
Vehicle Cost Assumptions (Inflation Rate = 3.0%							
Heavy Duty Hybrid Bus - 35'/40'	$675,781	$696,054	$716,936	$738,444	$760,597	$783,415	
Heavy Duty Hybrid Bus - 60' Articulated	$1,034,843	$1,066,849	$1,099,844	$1,132,839	$1,166,824	$1,201,829	
Heavy Duty Hybrid Trolley Bus - 35'/40'	$661,037	$681,482	$702,558	$724,287	$746,016	$768,396	
Medium Duty BOC Bus	$102,460	$105,534	$108,700	$111,961	$115,320	$118,779	
Medium Duty BOC Bus - Access	$93,035	$95,826	$98,701	$101,662	$104,712	$107,853	
Medium Duty BOC Bus - 30'	$151,631	$156,320	$161,155	$165,990	$170,969	$176,098	
Medium Duty Raised Roof Van	$69,052	$71,188	$73,324	$75,523	$77,789	$80,123	
Over-the-Road Coaches	$750,000	$772,500	$795,675	$819,545	$844,132	$869,456	
Pickup/SUV/Van	$31,611	$32,589	$33,243	$33,908	$34,250	$35,278	
Maintenance Truck	$53,118	$54,760	$56,454	$58,200	$60,000	$61,800	
Maintenance Floor Sweeper	$19,122	$19,714	$20,323	$20,952	$21,600	$22,248	

Table 6-2. BT Capital Improvement Program for FY2012 – FY2017 (Year of Expenditure Dollars)

	FY12 Budget	FY13 Forecast	FY14 Forecast	FY15 Forecast	FY16 Forecast	FY17 Forecast	FY12-17 Total
Expenses							
Vehicle Parts and Associated Capital	$ 45,640	$ 72,000	$ 428,000	$ 8,000			$ 553,640
Shop Equipment	$ 100,000	$ 102,000	$ 104,040	$ 106,120	$ 108,245	$ 75,000	$ 595,405
Heavy-Duty Hybrid Buses (35'/40')	$ 1,351,562	$ 4,872,381	$ 7,169,361	$ 738,444	$ 760,597	$ 3,088,604	$ 17,980,949
Heavy Duty Diesel Buses (60' Articulated)	$ -	$ -	$ 1,099,844	$ -	$ -	$ -	$ 1,099,844
Medium-Duty Buses (BoC and Vans)	$ 195,495	$ 176,722	$ 789,566	$ 559,804	$ 308,428	$ 1,116,357	$ 3,146,373
Over-the-Road Coaches	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Support Vehicles	$ -	$ 195,534	$ 99,729	$ 67,816	$ 252,850	$ -	$ 615,929
Bike Racks and Related Equipment	$ -	$ -		$ 8,109	$ 1,834	$ 1,864	$ 11,807
ADP Hardware/Software	$ 25,970	$ 164,606	$ 160,376	$ 52,288	$ 27,720	$ 42,240	$ 473,200
Security/Radio/Communications	$ 45,497	$ 6,870	$ 14,740	$ 25,942	$ 18,005	$ 1,024	$ 112,078
A&E Services	$ 1,615,000			$ 350,000	$ 50,000	$ -	$ 2,015,000
Shelters and Amenities (Blacksburg)	$ 55,097	$ 48,168	$ 32,756	$ 16,246	$ 16,528	$ 16,815	$ 185,610
Shelters and Amenities (Christiansburg)	$ 38,000	$ 38,000	$ 15,000	$ 15,000	$ 15,000		$ 121,000
Multimodal Transfer Facility		$ 10,000,000	$ 10,000,000	$ -	$ -	$ -	$ 20,000,000
NRV Mall Transit Center					$ 2,500,000	$ 2,500,000	$ 5,000,000
Mini-hubs					$ 2,000,000	$ 1,000,000	$ 3,000,000
Total Expenses	**$ 3,472,261**	**$ 15,676,281**	**$ 19,913,412**	**$ 1,947,769**	**$ 6,059,208**	**$ 7,841,904**	**$ 54,910,835**
Funding							
Federal	$ 2,777,809	$ 12,541,025	$ 15,930,730	$ 1,558,215	$ 4,847,366	$ 6,273,523	$ 43,928,668
State	$ 478,902	$ 1,567,628	$ 1,991,341	$ 194,777	$ 605,921	$ 784,190	$ 5,622,759
Local	$ 215,550	$ 1,567,628	$ 1,991,341	$ 194,777	$ 605,921	$ 784,190	$ 5,359,408
Total Funding	**$ 3,472,261**	**$ 15,676,281**	**$ 19,913,412**	**$ 1,947,769**	**$ 6,059,208**	**$ 7,841,904**	**$ 54,910,835**
Federal Percentage	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%
State Percentage	13.8%	10.0%	10.0%	10.0%	10.0%	10.0%	10.2%
Local Percentage	6.2%	10.0%	10.0%	10.0%	10.0%	10.0%	9.8%
Balance	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

Chapter 7 Financial Plan

The financial plan is the culmination of the TDP process, whereby the resource needs identified to meet the region's transportation demand are balanced against the funding realities of federal, state, and local sources. This chapter describes the sources of funds anticipated to be available on an annual basis over the six-year TDP period and the programmed uses of those funds. As with any plan, the projections within are intended to be used as a guide to future operations. Funding and expenses for transit are subjective to local, state, and national political and economic conditions. As those realities change, so to will this financial plan need to evolve.

Local funding assumptions were reviewed and amended by each contributing jurisdiction as part of the TDP development. *They are intended to represent a reasonable estimation of revenue that could be provided and are not an explicit commitment to a particular funding level.* Note that in the graphs and tables below, local investment is assigned to a particular jurisdiction (e.g., "Christiansburg") through which funds would be contributed. In many cases, that investment represents the combined equity of multiple partners within that jurisdiction, including the local governmental body.

Examples of current and potential non-governmental partners include educational institutions (e.g., Virginia Tech, New River Community College), medical centers (e.g., Lewis-Gale Montgomery Regional Hospital, NRV Carilion Medical Center), retail outlets (e.g., New River Valley Mall, Walmart), business associations (e.g., Blacksburg Downtown Merchants, Blacksburg Partnership), residential communities (e.g., Warm Hearth Village), and more. Due to the size of its contribution, Virginia Tech is broken out separately. Its contribution includes estimates from all related streams, such as student fees, parking fees, VT Athletics, VT Corporate Research Center, Via College of Osteopathic Medicine, and others.

In total, BT is expected to require a total of $40 million in operating funds over the next six years (in year-of-expenditure dollars) to operate fixed-route, demand responsive, and paratransit services, an average of almost $7 million annually. These costs are expected to grow at a 9 percent annual growth rate from $5.4 million in FY2012 to $8.4 million in FY2017, due to both inflationary increases and the addition of new services. For the same period, capital expenditures for vehicles, facilities, and other needs are projected to total $55 million, or over $9 million annually. Operating and capital would be funded by a combination of federal and state grant monies, fare revenue and other operating revenue, and local funding from public and private entities within Blacksburg, Christiansburg, Montgomery County, and other jurisdictions, with primary local investment provided by Virginia Tech.

The following sections describe the specific sources and uses of funds in this plan, which are detailed in Table 7-3 at the end of this chapter. In the development of these projections, general inflation is assumed to grow at 2.51 percent annually, which is the 10-year average annual growth rate of the Consumer Price Index for a Southern midsize urban environment from 2000-2010. It is expected that some line items (such as fuel) will grow faster than this rate while others would not. Vehicle purchases are expected to grow at 3% annually per DRPT guidelines. Population is assumed to grow 1.01 percent annually, which is the rate projected for the urbanized area from 2008-2035 by the Blacksburg-Christiansburg-Montgomery MPO.

7.1 Operating and Maintenance Costs and Funding Sources

The operating and maintenance budget is expected to steadily escalate at an average growth rate of 9 percent from $5.4 million in FY2012 to $8.4 million in FY2016. This growth reflects both the enhancement of existing services and the initiation of new services, along with the cost of inflation. Table 7-1 summarizes BT's projected annual operating budgets through FY2017.

Table 7-1. BT Operating Budget Summary, 2012-2017 (Year-of-Expenditure Dollars)

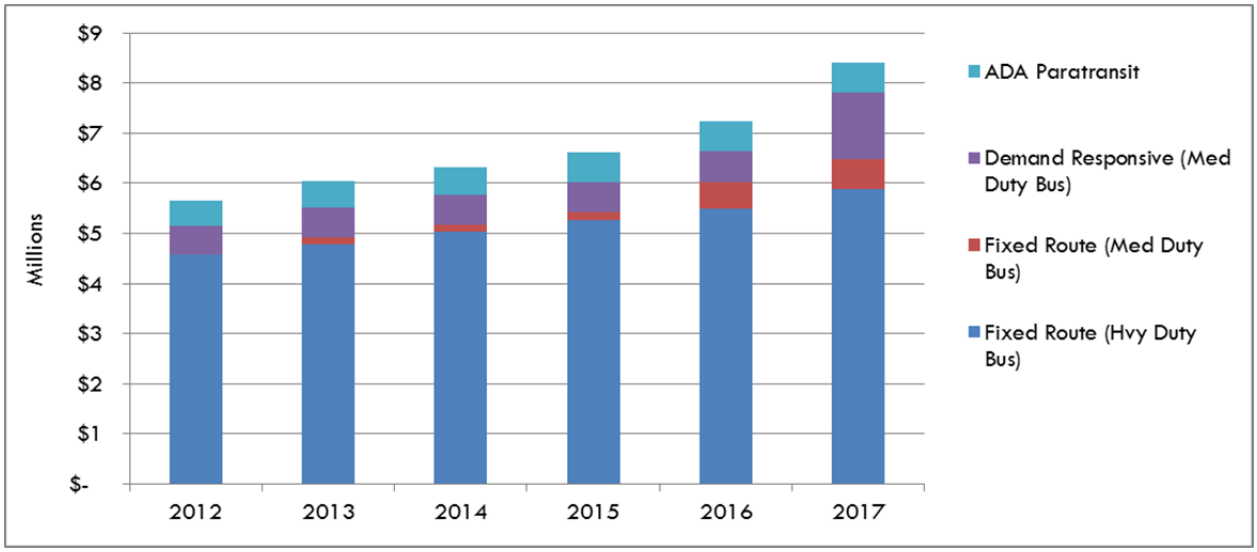
OPERATING BUDGET	TOTAL 2012-2017	FISCAL YEAR - INFLATED DOLLARS 2012	2013	2014	2015	2016	2017
Funding and Revenue							
Federal Grants	$ 12,319,087	$ 1,805,645	$ 1,931,860	$ 1,984,674	$ 2,039,071	$ 2,220,312	$ 2,337,523
State Grants	$ 5,399,196	$ 706,407	$ 833,035	$ 889,442	$ 931,807	$ 972,560	$ 1,065,944
Virginia Tech & Athletics	$ 18,853,733	$ 2,515,722	$ 2,737,966	$ 2,980,107	$ 3,243,933	$ 3,531,393	$ 3,844,612
Blacksburg	$ 283,862	$ -	$ -	$ -	$ -	$ -	$ 283,862
Christiansburg	$ 1,435,599	$ 199,757	$ 212,189	$ 224,394	$ 237,079	$ 271,471	$ 290,709
Montgomery County	$ 279,355	$ 500	$ 5,126	$ 5,404	$ 5,693	$ 69,571	$ 193,062
Other Partners	$ 121,630	$ -	$ 11,533	$ 12,196	$ 12,885	$ 41,194	$ 43,823
Fare Revenue	$ 714,321	$ 69,700	$ 83,654	$ 86,725	$ 131,702	$ 163,765	$ 178,775
Other Operating Revenue	$ 900,490	$ 142,085	$ 145,178	$ 148,349	$ 151,599	$ 154,931	$ 158,347
Subtotal	$40,307,273	$5,439,816	$5,960,541	$6,331,291	$6,753,770	$7,425,197	$8,396,658
Expenses							
Fixed Route (Hvy Duty Bus)	$ 31,058,216	$ 4,570,474	$ 4,791,092	$ 5,035,984	$ 5,271,956	$ 5,501,847	$ 5,886,863
Fixed Route (Med Duty Bus)	$ 1,539,268	$ 10,000	$ 137,518	$ 140,976	$ 144,521	$ 512,030	$ 594,225
Demand Responsive (Med Duty Bus)	$ 4,315,369	$ 568,710	$ 583,011	$ 597,671	$ 612,700	$ 628,107	$ 1,325,170
ADA Paratransit	$ 3,369,226	$ 510,024	$ 530,784	$ 555,580	$ 577,890	$ 599,483	$ 595,465
Subtotal	$ 40,282,080	$ 5,659,208	$ 6,042,404	$ 6,330,211	$ 6,607,066	$ 7,241,467	$ 8,401,722

On average, 77 percent of operating expenses go toward the provision of heavy-duty fixed route transit, which is essentially BT's core Virginia Tech network. Over the life of the plan, this mode decreases from 81 percent to 70 percent as new medium-duty vehicle operations increase. Medium-duty fixed route services (primarily the new regional network grows to become 7 percent of operating expenses by 2017. Medium-duty demand responsive expenses (local neighborhood services) rise from 10 to 16 percent of the total budget. ADA Paratransit (BT Access) holds steady at around 8 percent of expenses. Figure 7-1 visualizes the relative contributions to costs of the various service modes.

Modal operating expenses are calculated from a four-variable resource allocation model (revenue-hours, revenue-miles, peak vehicles, and garages) modified from BT's current single-variable allocation model based on revenue hours only. This model was calibrated to FY2012 operating data, with costs allocated to appropriate drivers (e.g., fuel costs are driven by revenue-miles) based on industry norms.

While moving to a multi-variable model allowed for more accurate costing of the various service modes than a single variable model, it should only be considered an interim step in the development of a more robust multi-variable model. For example, the interim model cannot distinguish differences in maintenance costs between heavy-duty and medium-duty vehicles. Given the marked differences in service modes BT operates and the need for partner equity, it is imperative that BT's cost allocation model address these differences.

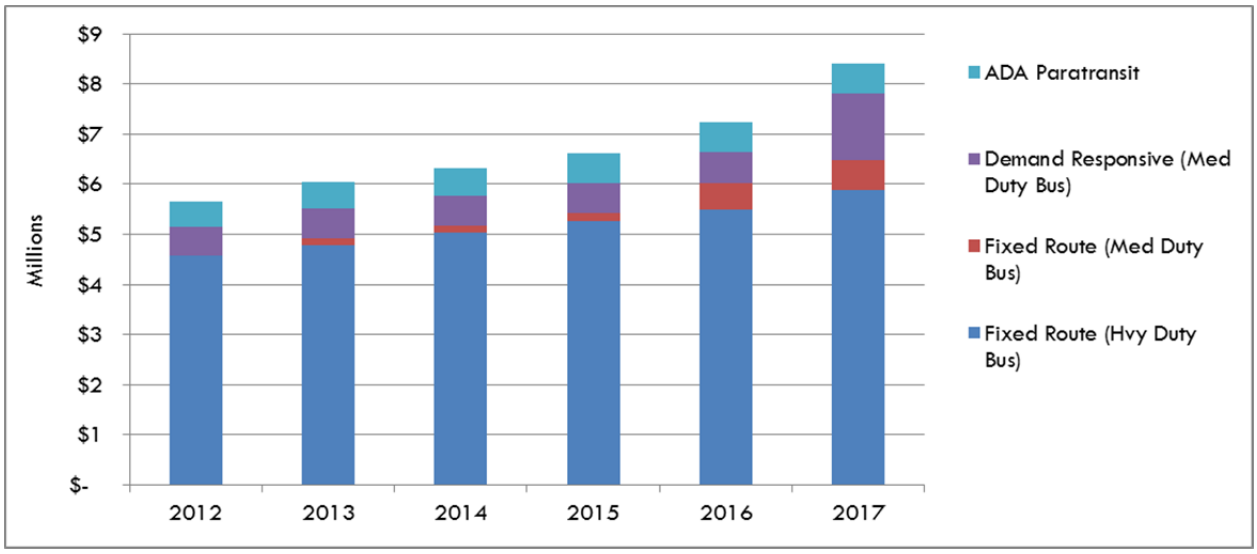
Figure 7-1. Annual Operating Expenses by Mode, 2012-2017 (Year-of-Expenditure Dollars)



On the funding side, an average of 30 percent of operating dollars are expected from federal sources; however, this percentage is projected to decline from a high of 33 percent in 2012 to a low of 28 percent in 2017, reflecting the historical trend of diminishing federal operating support for transit providers. State aid is projected to remain steady at 14 percent. Local funding, the bulk of which is provided by Virginia Tech, would increase proportionally from 50 percent to 55 percent over the course of the TDP to offset declining federal funding. Note that Virginia Tech funding includes a mixture of local investment and prepaid fare revenue. Direct farebox revenue and other operating revenue combined account for 4 percent of total revenue.

Figure 7-2 presents the anticipated growth in funding by source. Following that is a detailed description of the funding assumptions by category.

Figure 7-2. Annual Operating Revenue by Source, 2012-2017 (Year-of-Expenditure Dollars)



Federal and State Grants and Allocations

- *FTA Section 5307 Urbanized Area Formula Fund* – BT's primary source of federal operating aid is expected to continue, with increases attributed to population and population density increases. Assumed to grow at half the rate of inflation. Proposed FTA changes in federal funding streams could change future distribution of formula operating funding.
- *FTA Section 5316 Job Access Reverse Commute Program* – provides around 50 percent of operating support to transit services that connect low-income individuals to jobs. Christiansburg local service is currently funded through this program. In the future, this program is assumed to provide funding for local and commuter routes in Christiansburg and Montgomery County, and regional services from Radford/Fairlawn and Prices Fork.
- *FTA Section 5317 New Freedoms Program* – provides operating support to transit services for persons with disabilities that go beyond ADA requirements. No BT services are currently funded through this program. In the future, this program could possibly provide funding for local services between Warm Hearth, Montgomery Regional Hospital, and NRV Mall, and regional services to NRV Carilion.
- *State Formula Assistance Grants* – assumed to continue at FY2011 allocation level of 14.72% of previous year's operating expenses, with inflationary growth. This rate provides about half of the full state assistance formula, calculated as 95% of non-surplus FTM and Administrative expenses.
- *State Senior Transportation Program* – this program supports new projects and programs that improve mobility for senior citizens. It is anticipated to provide first-year funding to support the Warm Hearth-Hospital Connector planned to start in FY2012.

Local Funds

- *Virginia Tech* – programmed to grow at 9 percent annually to support enhancements to existing VT fixed-routes to meet demand, BT Access, and overcome inflationary cost increases and lack of growth in federal and state formula funding. Virginia Tech funding covers both local investment share plus pre-paid fares charged at average fare rate for VT student, faculty, and staff ridership.
- *Town of Blacksburg/Town of Christiansburg/Montgomery County/Regional Partners* – product of the marginal rate for transit service and annual revenue-hours of designated service, adjusted by local share percentage needed to balance budget and maintain partner equity.

Revenue from Operations

- *Fare Revenue* – product of average fare and projected annual ridership (as a function of service hours, route accessibility, and population). Includes fares from VT Athletics services. New regional services are assumed initially at $1 base fare. In FY2015, a fare increase is programmed across the system, raising base local fare to $0.75 and base regional fare to $1.25. As noted above, VT pre-paid fares appear under the Virginia Tech line item.

- *Other Operating Revenue* – includes revenue generated from advertising and smaller partnerships, along with MPO and investment revenue. Most other sources assumed to grow with inflation.

7.2 Capital Costs and Funding Sources

The capital budget oscillates from year to year during the TDP period, with a high of $19.9 million in 2014 and a low of $1.9 million in 2015. As described in the preceding chapter, capital costs are tied to annual programming for vehicle replacements, expansion vehicle needs for new services, and the construction of significant passenger facilities, most notably the BT/VT Multimodal Transfer Facility (MMTF) estimated for completion in 2014. Table 7-2 summarizes BT's projected annual capital budgets through 2017.

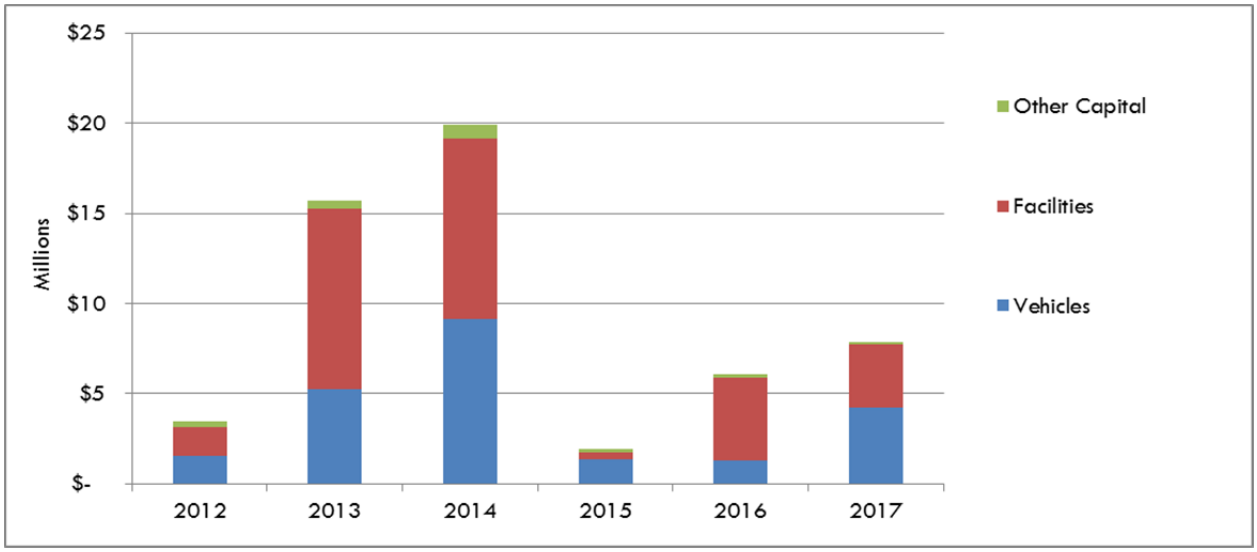
Table 7-2. BT Capital Budget Summary, 2012-2017 (Year-of-Expenditure Dollars)

CAPITAL BUDGET	TOTAL 2012-2017	FISCAL YEAR - INFLATED DOLLARS 2012	2013	2014	2015	2016	2017
Funding and Revenue							
Federal Grants	$ 43,928,668	$ 2,777,809	$ 12,541,025	$ 15,930,730	$ 1,558,215	$ 4,847,366	$ 6,273,523
State Grants	$ 5,622,759	$ 478,902	$ 1,567,628	$ 1,991,341	$ 194,777	$ 605,921	$ 784,190
Virginia Tech	$ 4,074,753	$ 201,504	$ 1,553,275	$ 1,946,740	$ 107,297	$ 118,378	$ 147,560
Blacksburg	$ 506,275	$ -	$ -	$ -	$ 5,000	$ 138,400	$ 362,875
Christiansburg	$ 414,218	$ 3,800	$ 14,353	$ 44,601	$ 58,784	$ 167,679	$ 125,000
Montgomery County	$ 352,630	$ 10,246	$ -	$ -	$ 23,696	$ 169,932	$ 148,756
Other Partners	$ 11,532	$ -	$ -	$ -	$ -	$ 11,532	$ -
Subtotal	$ 54,910,835	$3,472,261	$15,676,281	$19,913,412	$1,947,769	$6,059,208	$7,841,904
Expenses							
Vehicles	$ 22,843,095	$ 1,547,057	$ 5,244,637	$ 9,158,500	$ 1,366,064	$ 1,321,876	$ 4,204,961
Facilities	$ 30,015,000	$ 1,615,000	$ 10,000,000	$ 10,000,000	$ 350,000	$ 4,550,000	$ 3,500,000
Other Capital	$ 2,052,740	$ 310,204	$ 431,644	$ 754,912	$ 231,705	$ 187,332	$ 136,943
Subtotal	$ 54,910,835	$ 3,472,261	$ 15,676,281	$ 19,913,412	$ 1,947,769	$ 6,059,208	$ 7,841,904

On average, 41 percent of capital expenses go toward the replacement and expansion of the vehicle fleet, almost $4 million annually. The high in vehicle purchases occurs in 2014 ($9.2 million), the last year in a heavy-duty vehicle replacement cycle. Lows occur the next two years, at $1.3 million. Passenger facility costs account for a sizable 55 percent of the total capital costs over the course of the plan, averaging $5 million annually. The construction of the MMTF, anticipated in 2013 and 2014, represents the highest facility costs in the TDP ($10 million each year). Other capital expenses make up just 4 percent of the overall capital budget ($340,000 annually). Figure 7-3 presents annual capital expenses by type.

Unit costs for vehicles were taken from actual manufacturer price estimates supplied by BT for a range of vehicle types including 35'/40' hybrid bus, 60' articulated hybrid bus, 22' body-on-chassis buses, 30' body-on-chassis buses, raised roof vans, and support vans, trucks, and SUVs. Design and construction costs for the MMTF were taken from results of the MMTF Conceptual Study, while costs for other facilities were estimated based on national averages. Other capital costs were provided by BT from their current CIP submittal.

Figure 7-3. Annual Capital Expenses by Type, 2012-2017 (Year-of-Expenditure Dollars)

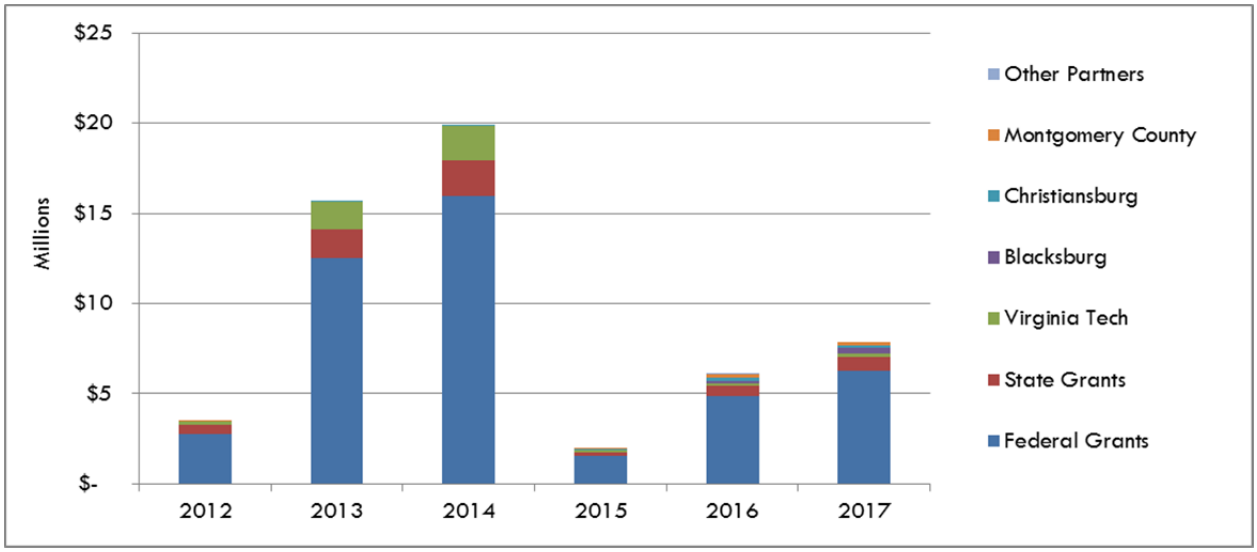


Capital funding is assumed to continue established relationships that provide for 80 percent of capital expenses from the FTA 5309 Bus and Bus Facilities Fund and 10 percent from state MTF Capital Funds and Bonds, with the remaining 10 percent to be provided by local sources. Local capital funding was assigned to the jurisdiction for which vehicles or facilities would be provided; therefore:

- Virginia Tech assumes local match for the MMTF and vehicle needs for core VT routes and BT Access;
- Town of Blacksburg and its partners assumes local match for 4 mini-hubs (Downtown Blacksburg, University Mall, North Main, First & Main) and its local service vehicle needs;
- Town of Christiansburg and its partners assumes local match for half of the NRV Mall Transit Center, the Downtown Christiansburg mini-hub, and its local, commuter, and regional service vehicle needs;
- Montgomery County and its partners assumes local match for half of the NRV Mall Transit Center, the Montgomery Regional Hospital mini-hub, and its local and regional service vehicle needs; and
- Other partners assume local match for commuter and regional service vehicle needs, as appropriate.

Figure 7-4 presents the anticipated growth in funding by source.

Figure 7-4. Annual Capital Revenue by Source, 2012-2017 (Year-of-Expenditure Dollars)



Detail of the TDP operating and capital financial projections summarized above is provided in Table 7-3. Cash flow over the life of the TDP is projected to run small annual surpluses and deficits from year to year. The plan maintains the reserve equity held in BT's Transit Enterprise Fund, which opens at $2.8 million beginning of FY2012 and closes at $2.9 million ending of FY2017. Low point of the Fund occurs end of FY2013 at $2.5 million.

For a 5-year retrospective view of BT's revenue and expenditures, see Appendix E.

Table 7-3. BT Financial Plan Detail, 2012-2017 (Year-of-Expenditure Dollars)

SOURCE OF FUNDS	TOTAL 2012-2017	FISCAL YEAR - INFLATED DOLLARS 2012	2013	2014	2015	2016	2017
Revenues from Operations							
Farebox	$ 714,321	$ 69,700	$ 83,654	$ 86,725	$ 131,702	$ 163,765	$ 178,775
Football Revenues	$ 191,702	$ 30,000	$ 30,754	$ 31,528	$ 32,321	$ 33,133	$ 33,966
Transit Partnerships	$ 178,922	$ 28,000	$ 28,704	$ 29,426	$ 30,166	$ 30,924	$ 31,702
Advertising	$ 415,355	$ 65,000	$ 66,635	$ 68,310	$ 70,028	$ 71,789	$ 73,594
MPO Revenue from State	$ 114,510	$ 19,085	$ 19,085	$ 19,085	$ 19,085	$ 19,085	$ 19,085
Subtotal	$ 1,614,811	$211,785	$228,832	$235,073	$283,302	$318,697	$337,122
Federal and State Grants/Allocations							
FTA 5307 Urbanized Area	$ 9,822,497	$ 1,526,651	$ 1,569,033	$ 1,612,724	$ 1,657,768	$ 1,704,213	$ 1,752,108
FTA 5309 Bus and Bus Facilities	$ 43,928,668	$ 2,777,809	$ 12,541,025	$ 15,930,730	$ 1,558,215	$ 4,847,366	$ 6,273,523
FTA 5316 Job Access and Reverse Commute (JARC)	$ 2,398,525	$ 278,994	$ 357,701	$ 366,696	$ 375,917	$ 510,577	$ 508,639
FTA 5317 New Freedoms	$ 98,065	$ -	$ 5,126	$ 5,255	$ 5,387	$ 5,522	$ 76,776
State Formula Assistance Grants	$ 5,389,696	$ 696,907	$ 833,035	$ 889,442	$ 931,807	$ 972,560	$ 1,065,944
State Capital Assistance Grants	$ 5,622,759	$ 478,902	$ 1,567,628	$ 1,991,341	$ 194,777	$ 605,921	$ 784,190
State Senior Transportation Program	$ 9,500	$ 9,500	$ -	$ -	$ -	$ -	$ -
Subtotal	$ 67,269,709	$ 5,768,763	$ 16,873,549	$ 20,796,187	$ 4,723,871	$ 8,646,159	$ 10,461,181
Local Funds							
Virginia Tech - Operating	$ 18,442,753	$ 2,451,407	$ 2,672,033	$ 2,912,516	$ 3,174,643	$ 3,460,361	$ 3,771,793
Virginia Tech - Capital	$ 4,074,753	$ 201,504	$ 1,553,275	$ 1,946,740	$ 107,297	$ 118,378	$ 147,560
Virginia Tech Athletics	$ 410,980	$ 64,315	$ 65,933	$ 67,590	$ 69,290	$ 71,033	$ 72,819
Blacksburg - Operating	$ 283,862	$ -	$ -	$ -	$ -	$ -	$ 283,862
Blacksburg - Capital	$ 506,275	$ -	$ -	$ -	$ 5,000	$ 138,400	$ 362,875
Christiansburg - Operating	$ 1,435,599	$ 199,757	$ 212,189	$ 224,394	$ 237,079	$ 271,471	$ 290,709
Christiansburg - Capital	$ 414,218	$ 3,800	$ 14,353	$ 44,601	$ 58,784	$ 167,679	$ 125,000
Montgomery County - Operating	$ 279,355	$ 500	$ 5,126	$ 5,404	$ 5,693	$ 69,571	$ 193,062
Montgomery County - Capital	$ 352,630	$ 10,246	$ -	$ -	$ 23,696	$ 169,932	$ 148,756
Radford - Operating	$ 121,630	$ -	$ 11,533	$ 12,196	$ 12,885	$ 41,194	$ 43,823
Radford - Capital	$ 11,532	$ -	$ -	$ -	$ -	$ 11,532	$ -
Subtotal	$ 26,333,588	$ 2,931,529	$ 4,534,441	$ 5,213,442	$ 3,694,367	$ 4,519,550	$ 5,440,259
TOTAL SOURCES OF FUNDS	$ 95,218,108	$ 8,912,077	$ 21,636,822	$ 26,244,703	$ 8,701,539	$ 13,484,405	$ 16,238,562

USE OF FUNDS	TOTAL 2012-2017	FISCAL YEAR - INFLATED DOLLARS 2012	2013	2014	2015	2016	2017
Operating & Maintenance							
Fixed Route (Hvy Duty Bus)	$ 31,058,216	$ 4,570,474	$ 4,791,092	$ 5,035,984	$ 5,271,956	$ 5,501,847	$ 5,886,863
Fixed Route (Med Duty Bus)	$ 1,539,268	$ 10,000	$ 137,518	$ 140,976	$ 144,521	$ 512,030	$ 594,225
Demand Responsive (Med Duty Bus)	$ 4,315,369	$ 568,710	$ 583,011	$ 597,671	$ 612,700	$ 628,107	$ 1,325,170
ADA Paratransit	$ 3,369,226	$ 510,024	$ 530,784	$ 555,580	$ 577,890	$ 599,483	$ 595,465
Subtotal	$ 40,282,080	$ 5,659,208	$ 6,042,404	$ 6,330,211	$ 6,607,066	$ 7,241,467	$ 8,401,722
Capital Projects							
Heavy-Duty Buses	$ 19,080,793	$ 1,351,562	$ 4,872,381	$ 8,269,205	$ 738,444	$ 760,597	$ 3,088,604
Medium-Duty Buses	$ 3,146,373	$ 195,495	$ 176,722	$ 789,566	$ 559,804	$ 308,428	$ 1,116,357
Support Vehicles	$ 615,929	$ -	$ 195,534	$ 99,729	$ 67,816	$ 252,850	$ -
Transit Centers & Park-n-Rides	$ 30,015,000	$ 1,615,000	$ 10,000,000	$ 10,000,000	$ 350,000	$ 4,550,000	$ 3,500,000
Passenger Stop Amenities (Shelters, Benches, etc)	$ 306,610	$ 93,097	$ 86,168	$ 47,756	$ 31,246	$ 31,528	$ 16,815
Other Capital (Tools, Equipment, Parts)	$ 1,746,130	$ 217,107	$ 345,476	$ 707,156	$ 200,459	$ 155,804	$ 120,128
Subtotal	$ 54,910,835	$ 3,472,261	$ 15,676,281	$ 19,913,412	$ 1,947,769	$ 6,059,208	$ 7,841,904
TOTAL USES OF FUNDS	$ 95,192,915	$ 9,131,469	$ 21,718,685	$ 26,243,623	$ 8,554,836	$ 13,300,675	$ 16,243,626

BEGINNING BALANCE		$ 2,762,016	$ 2,557,624	$ 2,488,139	$ 2,501,665	$ 2,661,610	$ 2,859,567
ANNUAL SURPLUS(SHORTFALL)		$ (219,392)	$ (81,863)	$ 1,079	$ 146,704	$ 183,730	$ (5,064)
INVESTMENT INCOME		$ 15,000	$ 12,379	$ 12,446	$ 13,242	$ 14,227	$ 14,273
ENDING BALANCE		$ 2,557,624	$ 2,488,139	$ 2,501,665	$ 2,661,610	$ 2,859,567	$ 2,868,775

Chapter 8 TDP Monitoring and Evaluation

The BT 2017 TDP has presented a comprehensive evaluation of Blacksburg Transit's existing operating characteristics along with an assessment of the community's transit needs and a financially-constrained short-range plan designed to meet those needs. Key elements that have been addressed in this TDP include:

- An overview of BT's history, governance, organizational structure, services, fleet, and facilities;
- A compilation of goals, objectives, and standards that guide operations and service delivery;
- A historical analysis and peer agency review of BT service and financial characteristics;
- An on-board passenger survey detailing rider demographics, travel behavior, and opinions;
- Extensive staff and stakeholder outreach regarding current and future transit service;
- A detailed evaluation of existing service characteristics, with identification of system strengths and weaknesses;
- A summary of existing and future land use, population, and employment for the service area;
- An assessment of unconstrained service and facility projects to meet community transportation needs; and
- A fiscally-constrained six-year operating, capital, and financial plan that enhances the existing network and initiates new local, regional, and commuter services;

This TDP provides a framework and roadmap by which BT can make future improvements to its services and operations. It is the community's plan, reflecting the input and guidance of BT staff along with representatives from Virginia Tech, Town of Blacksburg, Town of Christiansburg, Montgomery County, the Blacksburg-Christiansburg-Montgomery MPO, the New River Valley PDC, and most importantly – BT riders themselves. It is designed to be a living plan that is used to place day-to-day decisions in an overarching context, and can be updated as needed to reflect the evolving nature of BT and the community.

This chapter details the measures and controls that ensure the TDP can be effectively executed and maintained by aligning with local, regional, and state goals and providing for periodic monitoring of the TDP program.

8.1 Coordination with Other Plans and Programs

For the TDP to be an effective tool for BT, it must be synched with other transportation and land use planning efforts within the service area and across the New River Valley. Goals, standards, needs, and plans identified here should be integrated into other pertinent efforts, such as:

- Blacksburg-Christiansburg-Montgomery MPO 2035 Long Range Transportation Plan
- Blacksburg-Christiansburg-Montgomery MPO 2012-2015 Transportation Improvement Plan

- Montgomery County Transportation Plan
- Montgomery County UDA Plan
- NRV PDC Sustainable Communities Plan
- Old Blacksburg Middle School Master Plan
- Town of Blacksburg 2046 Comprehensive Plan
- Town of Blacksburg Annual Budget, 2012-2017
- Town of Blacksburg Capital Improvement Plan, 2012-2016
- Town of Christiansburg Comprehensive Plan
- Virginia Tech Campus Master Plan

Additionally, the TDP suggests a vision for BT to initiate new local and regional services that would draw the department into partnerships with several new public and private entities, such as other cities, towns, and counties; hospitals and educational institutions; and local retailers and non-profits. To be successful, these relationships entail open and frequent communication not just with BT but between partners so that sensitive issues of service coordination, financial equity, and organizational effectiveness can be addressed. BT should develop a forum, such as that established with the TDP Task Force, by which existing and potential partners can come together periodically to dialogue and review progress toward goals defined in the TDP.

8.2 Service Performance Monitoring

This TDP has suggested several programs, policies, and analyses for BT to perform in order to monitor and/or apply corrective action to service productivity, organizational effectiveness, system equity, or other areas of interest. These include:

Route Functional Classes and Service Standards Guidelines

This policy would develop service standards for route design, ridership, productivity, etc. delineated by route functional classes (e.g., campus circulator, off-campus route, intercity route). Potential standards appear in Chapter 2, summarized from the *2006 Blacksburg Transit Comprehensive Operational Analysis*. Corrective measures could be taken if these service performance falls below the prescribed standard (e.g., through route alignment adjustments, headway and/or span of service adjustments). This program could stand alone or be incorporated into the overall performance monitoring program described below.

- Routes reviewed quarterly or three times annually (Fall, Spring, Summer)
- Standards reviewed and updated annually

Overall Performance Monitoring

This program would develop overall performance metrics for BT as an organization. Standards would tie back to the BT mission statement and include not only ridership measures but also indicators for other goals (e.g., accidents per mile, complaints per rider, on-time performance). Corrective actions would kick in when certain negative thresholds were reached, and organizational incentives provided when certain positive thresholds were met.

- Reports quarterly or three times annually (Fall, Spring, Summer)
- Metrics reviewed and updated annually

Bus Stop Design Standards and Improvement Program

This program would develop standards for bus stop amenities (signage, benches, trash cans, shelters, etc.) and guidelines by which to upgrade them based on stop usage, amenity condition, customer requests, or other factors. It could also define criteria for stops to be upgraded to mini-hub transfer stations or full transit centers (e.g., ridership activity levels, transfer activity levels, regional juristdiction, proximity to another hub location, etc.) and standards for these key facilities in the BT network.

- Stops and stations reviewed on an on-going basis
- Standards reviewed and updated annually

Comprehensive Operational Analysis

Transit operators should typically perform a comprehensive operational analysis (COA) of their systems every five years or when major changes to service delivery are occurring. In BT's case, both situations apply, as the last COA was performed in 2006 and the system is poised to undergo a major restructuring following the construction of the MMTF. This analysis should include at minimum a ride check of all stops in the system, on-time performance analysis, route segment analysis, and route recommendations. Rider and non-rider surveying and outreach, latent demand analysis, and transfer analysis could also be considered.

- Conducted at least every five years

Organizational Audit

Much like a COA analyzes transit service in order to identify strengths and weaknesses and recommend updates, an organizational audit can do the same for the transit department itself. BT's organizational structure is the outgrowth of a system that traditionally provided only high ridership heavy-duty fixed route service, primarily to VT students. Now BT is in the midst of a transition to being not only a university provider, but also a local service provider and potentially a regional service provider to low-density rural and semi-rural communities. Those services may require a different type of organization to run effectively, such as more full time bus operators or additional demand-responsive dispatching support. It is time to look at the organization from top to bottom to identify gaps, overlaps, or incongruities that inhibit the most effective service delivery to riders.

- Conducted about every 10-20 years

Regional Cost Model Update

As identified in Chapter 7, the BT Regional Cost Model (RCM) is a single-variable model that, while detailed, is not flexible enough to handle the variety of service modes which BT runs or is considering to run. Through the TDP effort an interim multi-variable model was developed, but the RCM requires a complete upgrade of allocation methods and functionality in order to accurately and transparently cost everything from fixed route services with heavy-duty hybrid buses to general public flex routing with medium-duty body-on-chassis buses, to complementary paratransit service.

- Major updates and recalibration about every five years
- Minor updates and validation annually

8.3 Annual TDP Monitoring

The VDRPT will require submittal of an annual letter that provides updates to the contents of this TDP. Recommended contents of this "TDP Update" letter include:

- A summary of ridership trends for the past 12 months and other performance measures identified above
- A description of TDP goals and objectives that have been advanced over the past 12 months
- A list of improvements (service and facility) that have been implemented in the past 12 months, including identification of those that were noted in this TDP
- An update to the TDP's list of recommended service and facility improvements (e.g., identify service improvements that are being shifted to a new year, being eliminated, and/or being added). This update of recommended improvements should be extended one more fiscal year to maintain a six-year planning period
- A summary of current year costs and funding sources
- Updates to the financial plan table presented in Chapter 7 of this TDP. This table should be extended one more fiscal year to maintain a six-year planning period

APPENDIX A

Blacksburg Transit Peer System Review
Technical Memorandum

1. Overview of Peer Analysis Process

A peer analysis provides the means to compare various performance characteristics of a transit agency to transit systems of similar size. Transit agencies report such information to the Federal Transit Administration (FTA), which records the information annually in the National Transit Database (NTD). Agencies have strict requirements regarding the manner in which cost and service characteristics are reported to the NTD. Thus, the NTD provides a consistent set of measurable data that can be used in a peer systems analysis.

The National Transit Database is the only comprehensive source of validated operating and financial information reported by transit systems nationwide. This database is updated annually by submissions from each transit system. The FTA reviews and confirms the accuracy of the information received and publishes a final report after all reporting transit systems successfully respond to comments and inquiries. The NTD is used by the FTA and other federal, state, and local agencies as a resource to help guide public investment decisions, shape public policy, and develop planning initiatives. The NTD reports various standard measures of performance that allow decision makers and other stakeholders to determine the efficiency and effectiveness of transit services on a local, regional and national basis. It is important to note that smaller systems (i.e., operating with fewer than ten peak vehicles) have the option of taking an exemption from NTD reporting.

While a peer analysis based on NTD data provides operational and financial information, it is important to keep in mind other aspects of service quality that are not reported in the NTD, such as passenger satisfaction, vehicle cleanliness and comfort, schedule adherence and route connectivity. It is also worth noting that there may be unique operating and financial characteristics associated with a particular transit agency that should be considered when making comparisons among the agencies.

Sections 2 through 5 of this technical memorandum present a peer review of transit systems that are similar in service area size, population, and operation to the BT system:

- Section 2 describes the process used to select the BT's peer transit systems.
- Section 3 provides an overview of the peer systems' basic service area and operational characteristics compared with BT.
- Section 4 contains a detailed comparison of specific service productivity measures. These productivity measures focus on level of service, service effectiveness, service efficiency, cost efficiency, and fleet considerations.
- Section 5 summarizes the key findings of the peer system analysis.

2. Peer Selection Process

Select criteria were used to determine transit systems that have similar service area characteristics. As shown in Table A-1, primary criteria included service area population, service area population density, and proximity to a university. Secondary criteria included service area population, service area size, university enrollment, and the number of peak vehicles in operation on a typical weekday.

Table A-1: Criteria for Selecting Peer Transit Systems

Criteria	Importance
Service Area Population	Primary
Service Area Population Density	Primary
Proximity to University	Primary
Service Area Size	Secondary
University Enrollment	Secondary
Number of Peak Buses	Secondary

The following seven transit systems were identified as peers based on the application of the selection criteria and regional preference:

- Harrisonburg Department of Public Transportation (Harrisonburg, VA)
- Ames Transit Agency – CyRide (Ames, IA)
- Bloomington Public Transportation Corporation (Bloomington, IN)
- Chapel Hill Transit (Chapel Hill, NC)
- Monongalia County Urban Transit – Mountain Line Transit (Morgantown, WV)
- Centre Area Transportation Authority - CATA (State College, PA)
- Athens Transit Service (Athens, GA)

Table A-2 displays service area and operating characteristics for the peer systems as reported in the 2009 NTD (the most recent NTD information that is available). University enrollment for Fall 2009 is also presented. In general, BT has slightly less population than its peers and roughly the same population density. All peers serve universities, with enrollment in the average peer city being slightly greater than that of Virginia Tech. On average, peer systems run more fixed route service than BT and generate more fixed route ridership.

Table A-2: Peer Transit Agency Fixed Route Comparisons (FY 2009)

Transit System	Service Area Population	Service Area Size (sq. mi.)	Population Density	Fall 2009 University Enrollment	Annual Revenue Hours	Annual Revenue Miles	Peak Buses	Annual Passenger Trips	Annual Operating Expenses
Harrisonburg Dept. of Public Transportation (Harrisonburg, VA)	45,889	17	2,699	18,971	45,655	463,318	23	1,686,751	$2,674,871
Ames Transit Agency (CyRide) (Ames, IA)	50,276	15	3,352	27,945	103,770	1,091,085	52	4,977,881	$6,357,707
Bloomington Public Transportation Corp. (Bloomington, IN)	69,291	21	3,300	42,347	89,855	963,264	30	3,027,877	$5,100,241
Chapel Hill Transit (Chapel Hill, NC)	71,069	25	2,843	28,916	164,076	1,950,310	79	7,929,427	$12,488,309
Monongalia County Urban Transit (Mountain Line Transit) (Morgantown, WV)	73,278	201	365	31,952	63,982	1,031,121	22	1,155,417	$3,261,491
Centre Area Transportation Authority (CATA) (State College, PA)	83,444	133	627	44,832	111,708	1,417,487	51	7,001,149	$9,667,228
Athens Transit Service (Athens, GA)	101,000	44	2,295	34,885	73,879	855,766	22	1,839,022	$3,792,205
PEER AVERAGE	**70,607**	**65**	**2,186**	**32,835**	**93,275**	**1,110,336**	**40**	**3,945,361**	**$6,191,722**
Blacksburg Transit (BT) (Blacksburg, VA)	**56,260**	**28**	**2,009**	**28,687**	**70,630**	**691,234**	**30**	**2,954,415**	**$4,390,143**

3. Peer System Overview

A general overview of peer systems' operating and capital expenses, ridership, and service area and passenger fare characteristics was completed prior to conducting a detailed assessment of specific financial, ridership, and service characteristics. The following descriptions of the services provided by the peer systems were collected from their respective websites:

Harrisonburg Dept. of Public Transportation (Harrisonburg, VA):

HDPT offers similar transit services to BT. HDPT has 39 numeric fixed routes that run Monday through Saturday starting at approximately 6:00 a.m. and ending at approximately 7:00 p.m. depending upon the route. Four of these routes provide late evening service (10:00 p.m. to 2:15 a.m) on Friday and Saturday nights. HDPT also has two Shopper (weekday and weekend) fixed routes beginning at about 9:00 a.m and ending at about 7:00 p.m. Monday through Saturday. In addition, HDPT offers two inner campus shuttles that run Monday through Friday from about 7:40 a.m. to about 7:00 p.m. One night campus shuttle operates Monday through Friday from about 7:00 p.m. to about 10:00 p.m.

There are two Sunday shuttles that operate only when JMU is in session. These shuttles run a fixed route with stops every few minutes starting at 11:00 a.m. and ending at approximately midnight.

The Bridgewater/Dayton Shuttle is a fixed route, on-demand service, offered Tuesdays and Thursdays starting at 8:30 a.m. and ending at 4:30 p.m.

Sunday morning church shuttle provides service to any house of worship in Harrisonburg. This service has two departing locations with three morning departure times each (approximately 8:35, 9:35, and 10:25). The riders are to inform the driver of their pick up time. The Church Shuttle operates only when JMU is in session and stops at 1:00 p.m.

HDPT also offers paratransit services Monday through Friday from 6:38 a.m. to 7:00 p.m. and 8:38 a.m. to 6:00 p.m. on Saturdays. When JMU is in session, this service is extended to 2:15 a.m. Monday through Saturday and from 11:00 a.m. to 12:00 a.m. on Sundays.

Ames Transit Agency - CyRide (Ames, IA):

CyRide also offers similar transit services as BT. CyRide offers 16 fixed routes generally covering the hours of 6:00 a.m. to 12:30 a.m. daily. CyRide's Moonlight Express offers a free ride when regular fixed route service ends on Friday and Saturday nights from 10:30 pm to 3:00 am. It consists of shuttle bus routes running to campus, downtown, west Ames, and southeast Ames, and door-to-door buses operating in the areas of the city not covered by the shuttle routes.

CyRide also provides a door-to-door service (Dial-A-Ride) providing on-demand service for the City of Ames during all hours the fixed routes run. Rides may be scheduled up to two weeks in

advance and must be scheduled by 6:00 pm of the night before travel to be ensured of a ride. Same day calls will be accepted if there is time and space available.

Bloomington Public Transportation (Bloomington, IN):

Bloomington Public Transportation offers several routes generally covering the hours of 6:30 a.m. to 11:30 p.m. Monday through Saturday, 8:00 a.m. to 9:00 p.m. Saturday, and 10:30 a.m. to 9:00 p.m. Sunday. Bloomington also offers a Safe Ride that runs 11:00 p.m. to 2:30 a.m. Thursday, Friday and Saturday, and 8:30 p.m. to 10:30 p.m. on Sunday.

Chapel Hill Transit (Chapel Hill, NC):

CHT offers several routes generally covering the hours of 5:45 a.m. to 8:00 p.m. Monday through Friday. Express bus service from Park and Ride lots to UNC-Chapel Hill and downtown Chapel Hill is provided during UNC home football and basketball games. Service begins 1.5 to 3 hours before the scheduled start of an event.

Monongalia County Urban Transit – Mountain Line Transit (Morgantown, WV):

Mountain Line Transit offers several routes generally covering the hours of 6:00 a.m. to 6:00 p.m. Monday through Friday with limited service on Saturdays. Mountain Line Transit also offers a downtown/mall shuttle that operates from 6:00 p.m. to midnight Monday through Saturday and a Campus Shuttle that operates 6:00 p.m. to 2:50 a.m. Thursday, Friday, and Saturday.

Centre Area Transportation Authority – CATA (State College, PA):

CATA offers three transit services: CATABUS, CATACOMMUTE, and CATARIDE. CATABUS consists of 17 different community fixed routes which provide service starting at approximately 5:00 a.m. and ending at approximately 3:00 a.m., depending upon the route, Monday through Saturday and 8:00 a.m. to 1:00 a.m. Sunday.

CATACOMMUTE is a group of CATA services that includes RideShare, Vanpool, and Guaranteed Ride Home programs. These programs are designed to assist long distance commuters in finding a shared ride with someone who travels at the same time and to a relatively similar destination. The Guaranteed Ride Home program provides an emergency ride home for those in rideshare arrangements when the need arises, taking the fear out of being stranded.

CATARIDE provides curb-to-curb transportation for senior citizens and people whose disabilities prevent their use of CATABUS buses. CATARIDE currently operates from 4:45 a.m. until 1:00 a.m., Monday through Friday (until 2:15 a.m. Thursday and Friday during Penn State fall and spring semesters), from 7:45 a.m. until 1:00 a.m. Saturday (until 2:15 a.m. during Penn State fall and spring semesters), and from 7:45 a.m. until 1:00 a.m. Sunday.

Athens Transit Service (Athens, GA):

ATS operates 15 bus routes during the morning hours, and 17 bus routes during the afternoon. Routes travel through major shopping locations and neighborhoods; into the University of Georgia and the downtown district; and extend into the far eastern corners of the county on Lexington Road, to the western portions near Georgia Square Mall, and to the northern areas including Athens Area Technical Institute. Times vary according to the route and day; however, approximate hours of operation are Monday through Saturday, 6:00 a.m. - 11:00 p.m.

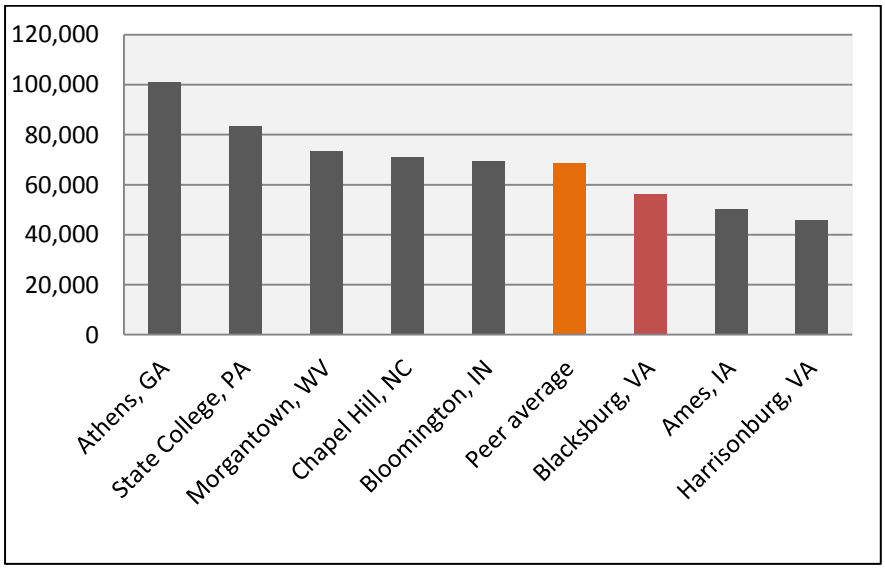
ATS offers a curb-to-curb service, called The Lift, to anywhere within one mile of an ATS fixed bus route. The Lift's service hours are 6:00 a.m. to 10:45 p.m. Monday through Friday and 7:00 a.m. to 10:45 p.m. Saturday.

ATS also offers a UGA football shuttle service from the Athens-Clarke County Ben Epps Airport to The Arch at the University of Georgia when the UGA football team plays in Athens. Tickets are $5.00 (round trip-only) and are available at the main counter inside the airport.

3.1 Service Area Characteristics

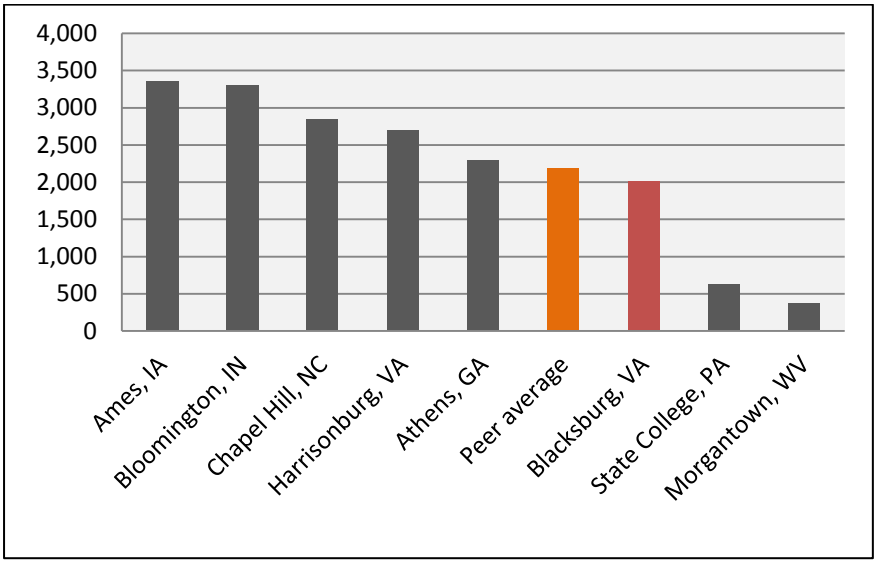
Figure A-1 compares the service area populations for BT and the peer systems as reported in the 2009 NTD. As shown in the figure, BT's service area population (56,260) is the third smallest among the peer systems and 80 percent of the peer group average (70,607).

Figure A-1: Peer Systems' Service Area Populations



As shown in Table A-2, the peer bus systems reported service areas that ranged in size from 15 to 201 square miles, with an average of 65. At 28 square miles, BT's service area is the fourth largest of all the peer systems and is 43 percent of the peer average. Figure A-2 compares the population densities of BT and the peer systems. The population density of BT's service area is 2,009 people per square mile, which is eight percent below the peer average of 2,186 people per square mile.

Figure A-2: Population Density of the Peer Systems (people per sq. mi.)



The fall 2009 enrollment at Virginia Tech University (28,687) in the BT service area is the third lowest of the peer systems and below the peer average of 32,835. Penn State University in the CATA service area had the highest enrollment (44,832) of the peer systems and James Madison University in Harrisonburg, VA had the lowest (18,971).

3.2 Operating Characteristics

- **Vehicles Available**: As shown in Figure A-3, the peer systems' active bus fleets ranged from 28 (Harrisonburg, VA and Athens, GA) to 96 (Chapel Hill, NC). At 38, BT's 2009 bus fleet was 22 percent smaller than the peer average of 49.
- **Peak Vehicles**: The number of vehicles operated in maximum service is also shown Figure A-3. Peer systems operated between 22 (Morgantown, WV and Athens, GA) and 79 (Chapel Hill, NC) buses during peak periods. With a 30-vehicle peak requirement, BT operates in the middle of the range of vehicles in maximum service and is operating 75 percent of the peer average of 40.
- **Revenue Hours**: As shown in Figure A-4, BT's annual revenue hours (70,630) were the third lowest of the peer systems and below the peer average of 93,275. Five of the eight peer systems, including BT, had annual revenue hours under 100,000.
- **Revenue Miles**: Figure A-5 shows the annual revenue miles for the peer systems, which range from 463,318 (Harrisonburg, VA) to 1,950,310 (Chapel Hill Transit). BT had the second lowest number of annual revenue miles at 691,234.
- **Annual Ridership**: A passenger trip is recorded every time a person boards a transit vehicle, including multiple transfers that may occur between the trip origin and the final destination. As shown in Figure A-6, BT's ridership (2,954,415) was the fifth largest of the individual peer systems, which ranged between 1,155,417 and 7,929,427, and approximately 75 percent of the peer average (3,945,361). The closest peer ridership to BT was Bloomington, IN (3,027,877).

Figure A-3: Peer Comparison – Fleet and Peak Buses

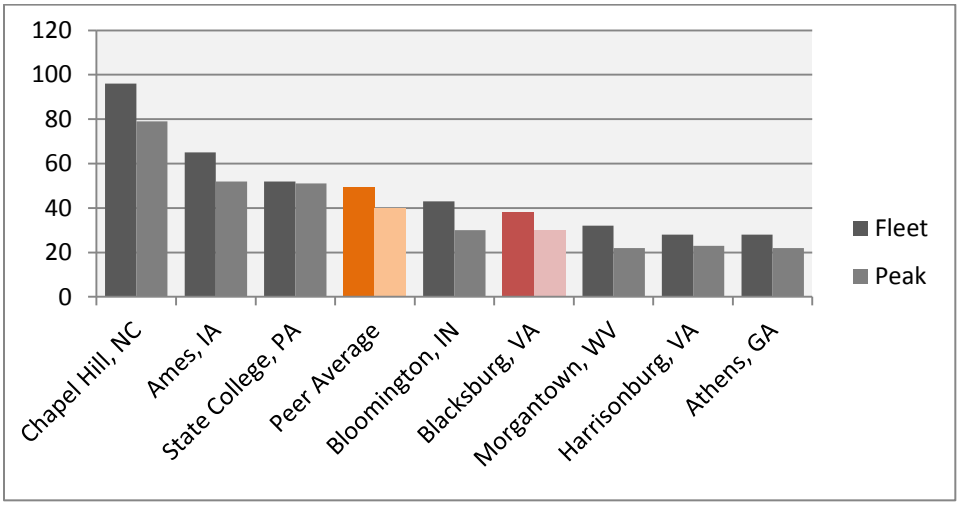


Figure A-4: Peer Comparison – Annual Revenue Hours

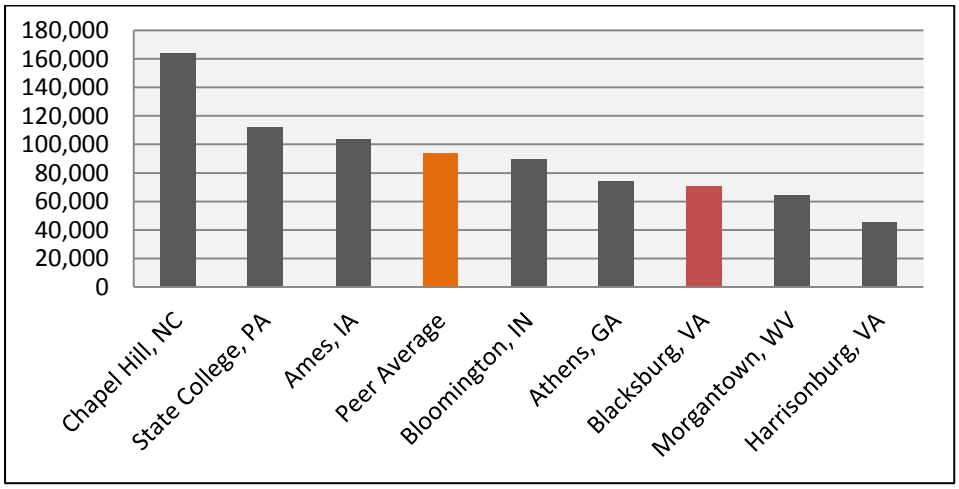


Figure A-5: Peer Comparison – Annual Revenue Miles

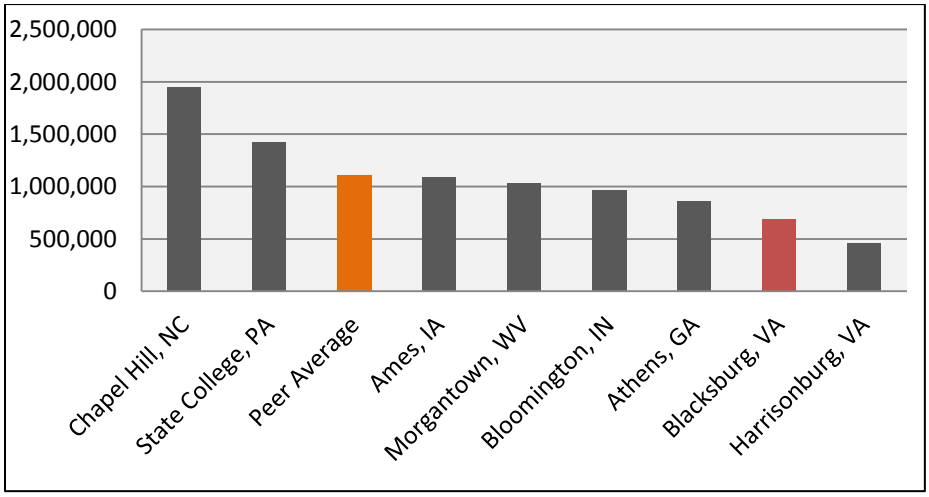
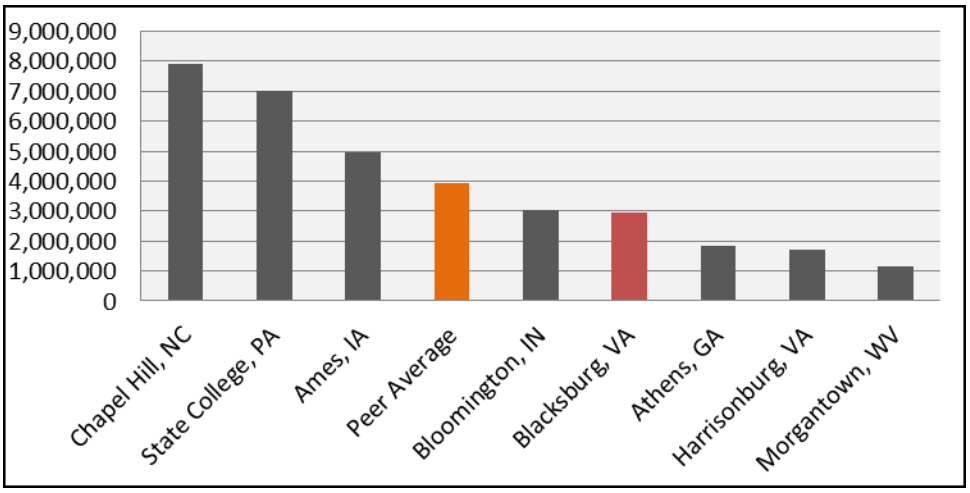


Figure A-6: Peer Comparison – Annual Unlinked Passenger Trips



3.3 Financial Characteristics

Table A-3 summarizes the annual operating expenses for the peer systems for FY 2009 (the most recent NTD information that is available). A breakdown of the level of funding by source is also provided. Note that Table A-3 combines costs for operating fixed-route and demand-response service for the agencies that provide both modes. This is the only format in which the online NTD provides funding sources. Pie charts of BT's sources of operating funds and the peer averages are presented in Figures A-7 and A-8.

Key characteristics are as follows:

- BT's FY 2009 operating budget of $4,948,432 represents approximately 72 percent of the peer average ($6.8 million). Of the seven peer systems, Athens and Bloomington were most similar to BT with respect to the size of the annual operating budget, as shown in Figure A-9.
- Compared to the peer average, BT derives more of its operating revenue from local support (30% vs. 23%) and less from fares (16% vs. 33%), as shown in Figures A-10 and A-11. Taken together, BT is one of only two that receives less than half of revenue from local assistance plus fare revenue (these sources are analyzed together since many university transit providers cross-classify university investment as either local assistance or fare revenue).
- State operating assistance for BT (18 percent) was consistent with the peer average of 17 percent.
- BT ranks second highest in the peer group in terms of federal operating assistance at 33 percent. The peer group average was 24 percent.

Table A-3: Comparison of 2009 Operating Budgets

	Harrisonburg VA	Ames IA	Bloomington IN	Chapel Hill NC	Morgantown WV	State College PA	Athens GA	*Peer Average*	Blacksburg VA
Total Operating Budget	**$3,224,749**	**$6,517,046**	**$5,705,061**	**$14,609,426**	**$3,507,777**	**$10,248,225**	**$4,129,593**	**$6,848,840**	**$4,948,432**
Fares	42%	4%	12%	52%	33%	47%	39%	33%	16%
Local Assistance	13%	52%	24%	6%	23%	4%	36%	23%	30%
State Assistance	19%	14%	36%	23%	0%	34%	0%	18%	17%
Federal Assistance	25%	23%	26%	18%	36%	14%	24%	24%	33%
Other Funds	<1%	7%	2%	1%	8%	<1%	0%	3%	4%

Source: 2009 National Transit Database
Note: Based on agency totals for all modes of service provided.

Figure A-7: BT 2009 Operating Budget

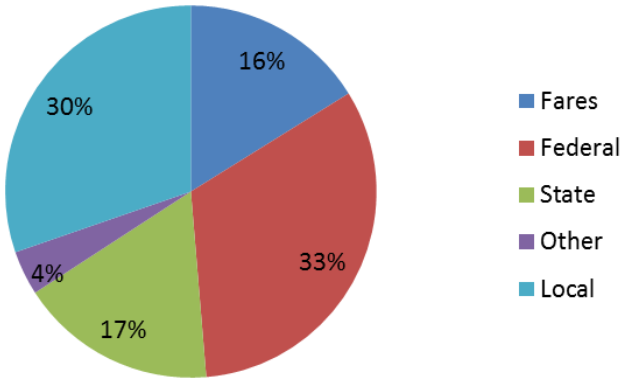


Figure A-8: Peer Average 2009 Operating Budget

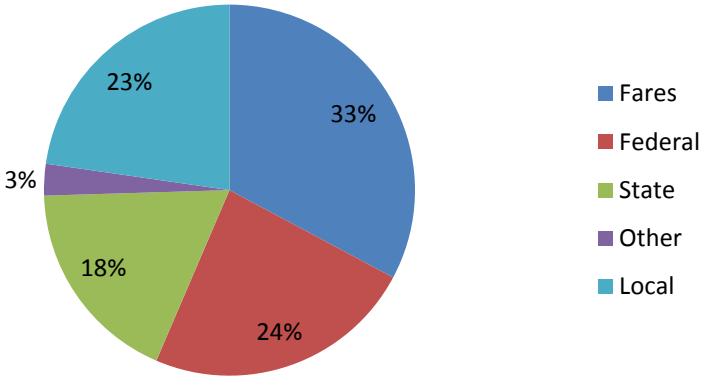


Figure A-9: Peer Comparison – Operating Expenses

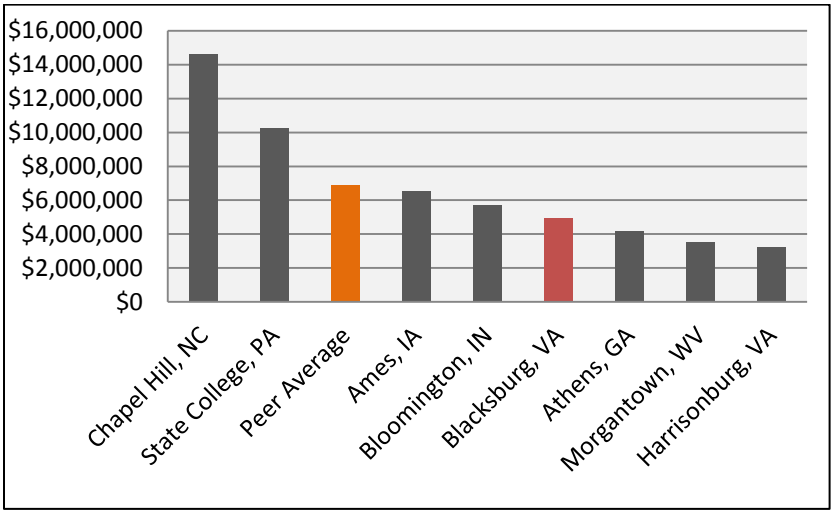


Figure A-10: Peer Comparison – Local Subsidy

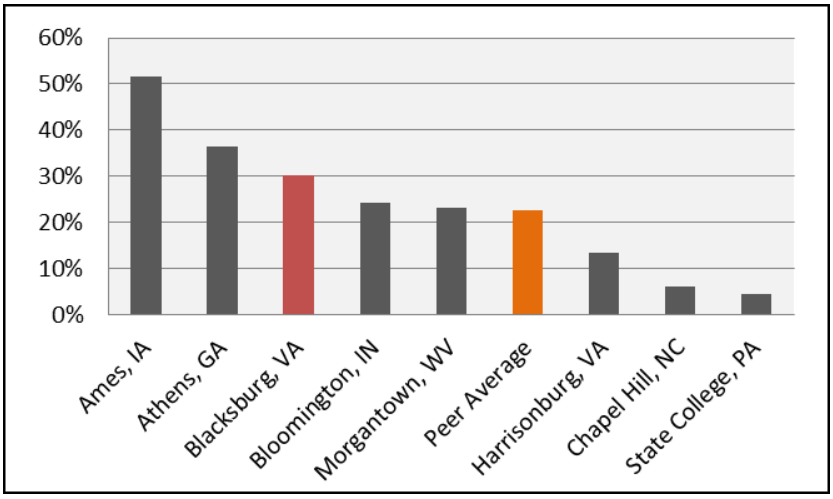
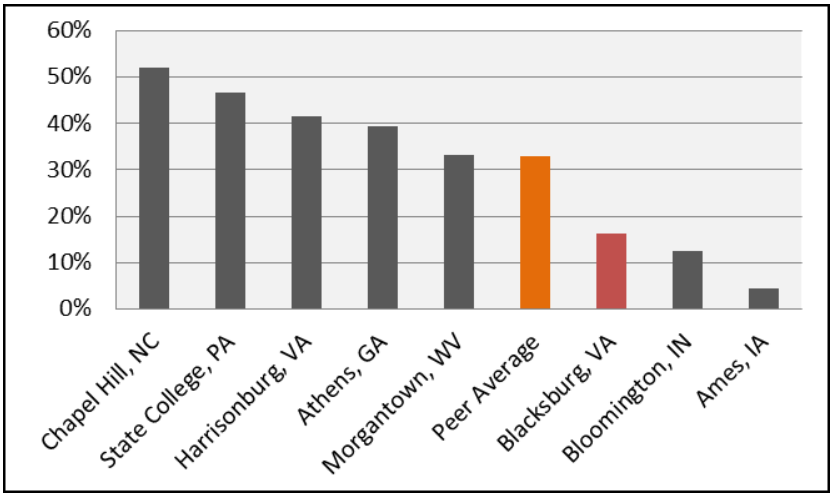


Figure A-11: Peer Comparison – Operating Revenue from Fares



Fare structures were compared for the peer transit agencies based on a review of their respective websites, as presented in Table A-4. Restrictions and variations apply to some fares and children under age 5 generally ride free on all systems. Aside from Chapel Hill Transit, which offers free fares on all local regular routes and complementary paratransit service, BT has the lowest base fare of its peers, at just over half the peer average for fixed route service and less than a third of the average for ADA service. All agencies provide discounted elderly/disabled fares and free (or prepaid) fares with a college ID.

Table A-4: Comparison of Fare Structure

City	Fixed Route	Senior Citizen / Disabled	K-12 Student	College Student / Staff ID	Within System Transfer	Demand Response
Harrisonburg, VA	$1.00	$0.50	Free	Free	Free	$2.00
Ames, IA	$1.00	$0.50	$0.50	Free	Free	$2.00
Bloomington, IN	$1.00	$0.50	$0.50	Free	Free	$2.00
Chapel Hill, NC	Free	Free	Free	Free	Free	Free
Monongalia, WV	$0.75	Free	Free	Free	$0.75	$1.25
State College, PA	$1.50	Free	$1.50	Free	Free	$2.00/$3.00
Athens, GA	$1.50	$0.75	$1.25	Free	Free	$3.00
PEER AVERAGE	***$0.91***	***$0.31***	***$0.50***	***Free***	***$0.09***	***$1.66***
Blacksburg, VA	**$0.50**	**$0.25**	**$0.25**	**Prepaid**	**Free**	**$0.50**

4. Service Productivity Comparisons

This section presents a detailed comparison of specific service productivity measures. These productivity measures focus on level of service, service effectiveness, service efficiency, cost effectiveness, and vehicle utilization. Unless stated otherwise, the data were obtained from the 2009 NTD.

4.1 Level of Service

Level of service compares the hours and miles of operation provided to the peers' service area populations as well as the geographic extent of service provision to assess how much service an operator is providing in relationship to the size of the service area.

- **Transit Service per Capita**: This analysis looks at two measures of the amount of bus service provided to the service area population – annual revenue-hours and annual revenue-miles per capita. Figure A-12 shows that BT's annual revenue-hours per capita (1.26) are in the mid-range of the peer systems, which range between 0.73 (Athens, GA) and 2.31 (Chapel Hill, NC). The number of annual revenue-hours per capita that BT provides is just below the peer average (1.37).

Figure A-12: Peer Comparison – Annual Revenue-Hours per Capita

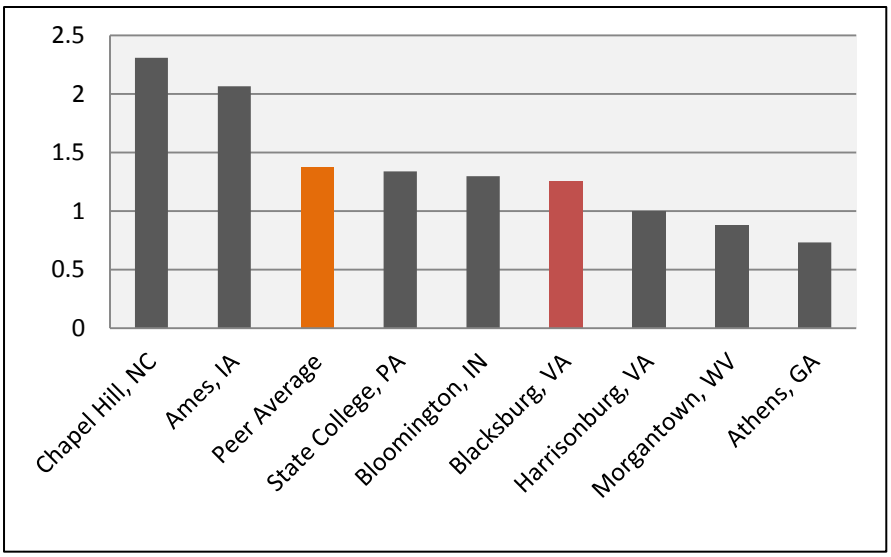
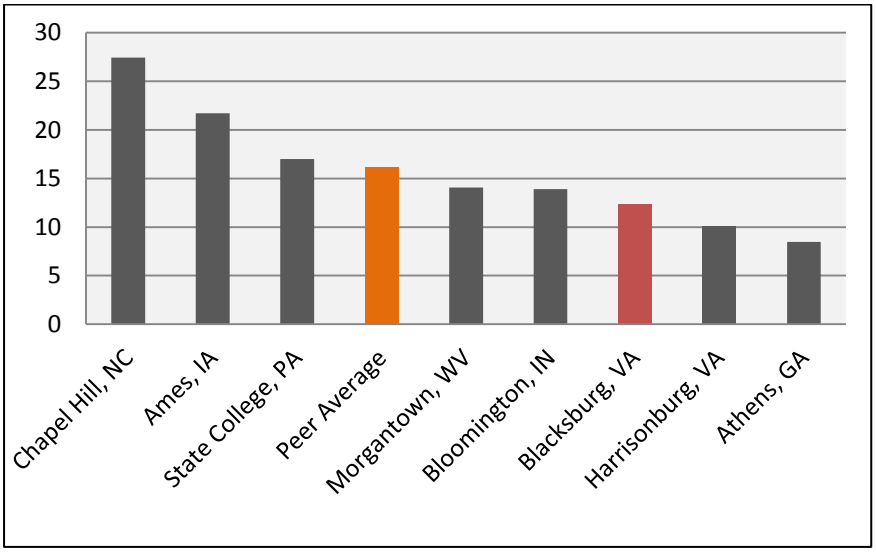


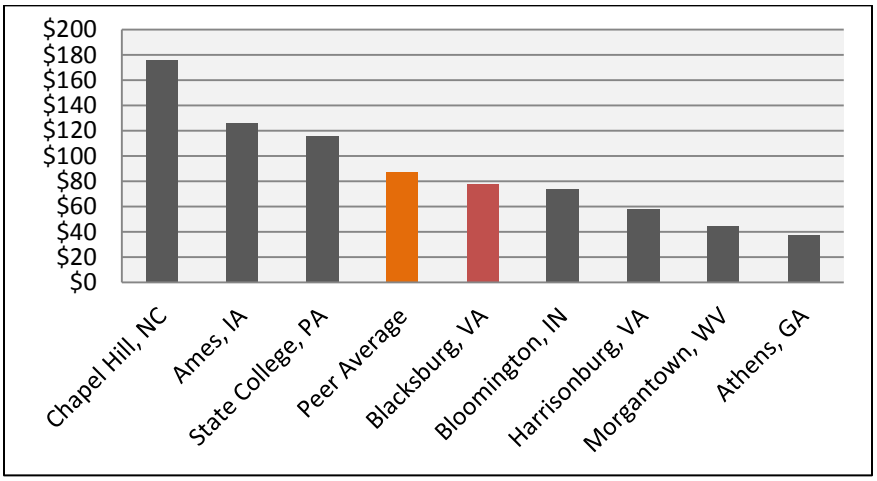
Figure A-13 shows that BT operates the third least annual revenue-miles per capita (12) of the peer systems, which range between 8 (Athens, GA) and 27 (Chapel Hill, NC). BT's annual revenue-miles per capita are 25 percent lower than the peer average (16).

Figure A-13: Peer Comparison – Annual Revenue-Miles per Capita



As shown in Figure A-14, BT is in the middle of the peer systems in terms of annual operating cost per capita at $78 and slightly below the peer group average of just under $88. Chapel Hill Transit has by far the highest annual operating cost per passenger capita at over $175 while Athens Transit has the lowest at approximately $37.50.

Figure A-14: Peer Comparison – Annual Operating Cost per Capita



- **Service Area**: In Figure A-15, the peer systems operated between 318 (Morgantown, WV) and 6,918 (Ames, IA) annual revenue-hours per square mile. At 2,523 annual revenue-hours per square mile, BT supplies about 76 percent of the peer average (3,326).

Figure A-15: Peer Comparison – Annual Revenue-Hours per Square Mile of Service Area

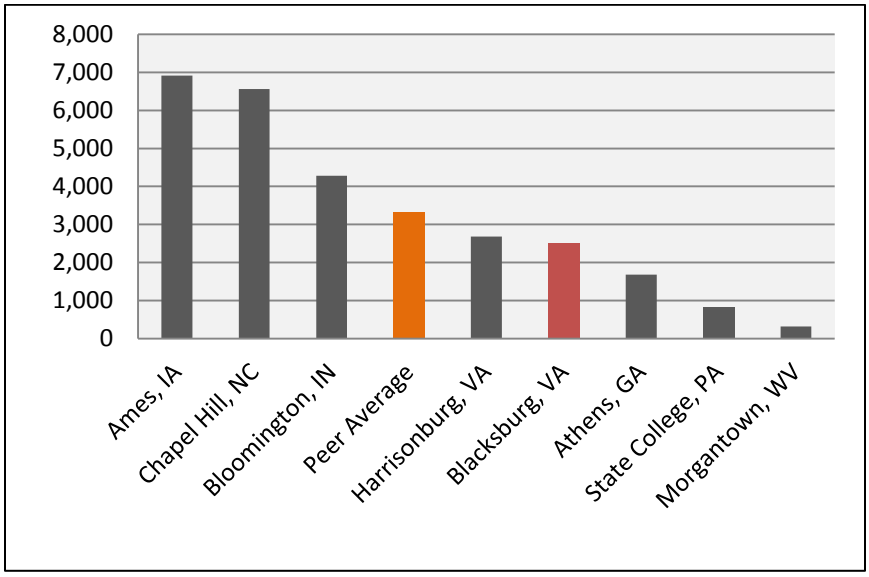
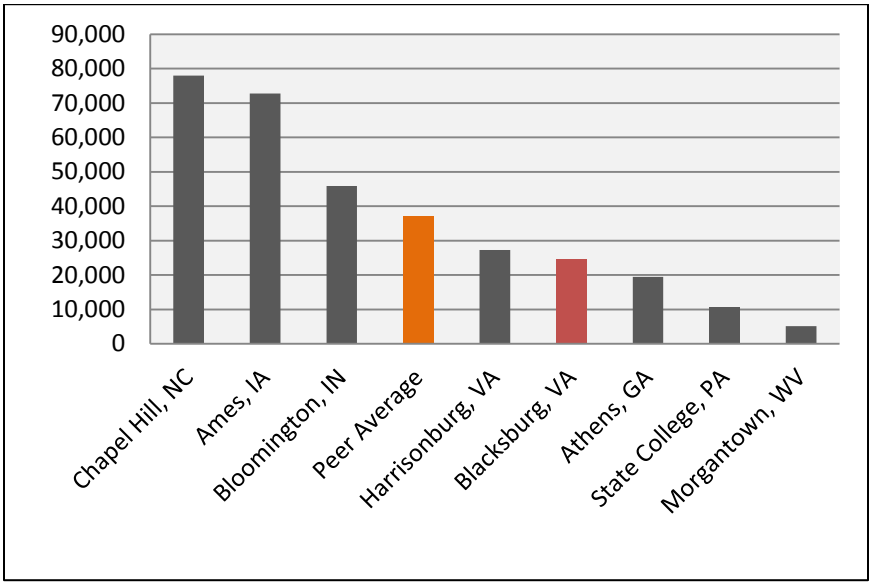


Figure A-16 shows that BT operated 24,687 annual revenue-miles of service per square mile, which is about 67 percent of the peer average (37,016). The peer systems that supplied the lowest and highest annual revenue-miles of service per square mile were Morgantown, WV (5,130) and Chapel Hill, NC (78,012).

Figure A-16: Peer Comparison – Annual Revenue-Miles per Square Mile of Service Area

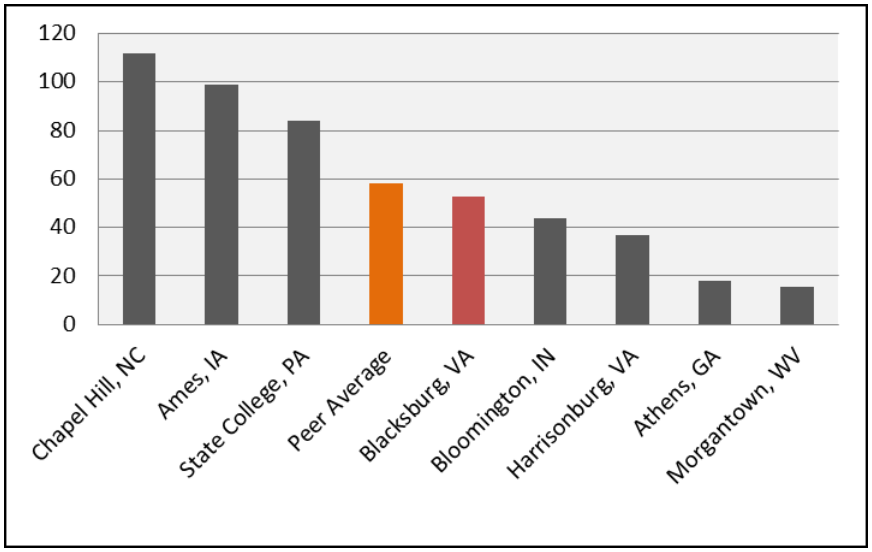


4.2 Service Effectiveness (Ridership Productivity)

Service effectiveness, or ridership productivity, provides a way to evaluate how well a transit agency is able to attract passengers relative to the level of service operated. Three measures that reveal productivity are passenger trips per capita, per revenue-hour, and per revenue-mile.

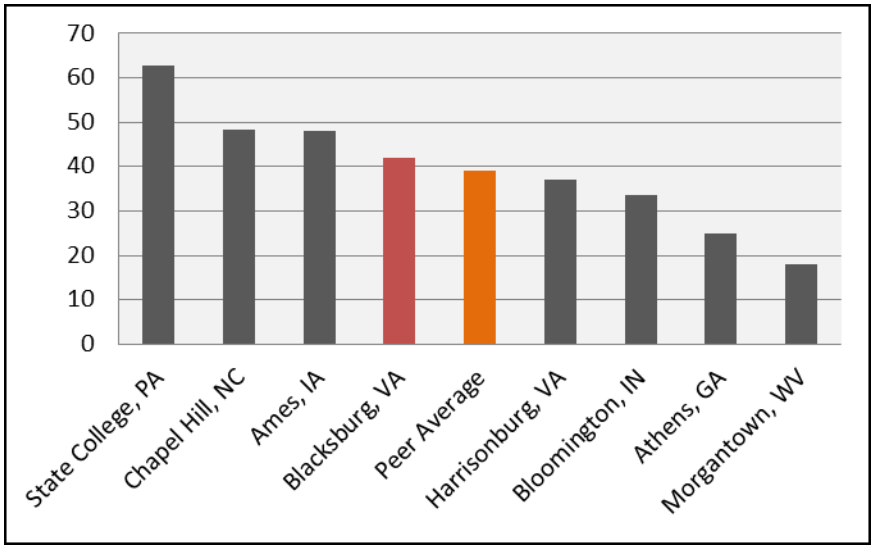
- **Passenger Trips per Capita**: As shown in Figure A-17, BT recorded the fourth highest annual passenger trips per capita of the peer systems (52.5). BT's productivity on this measure is about 10 percent lower than the peer average (58.4).

Figure A-17: Peer Comparison – Annual Passenger Trips per Capita



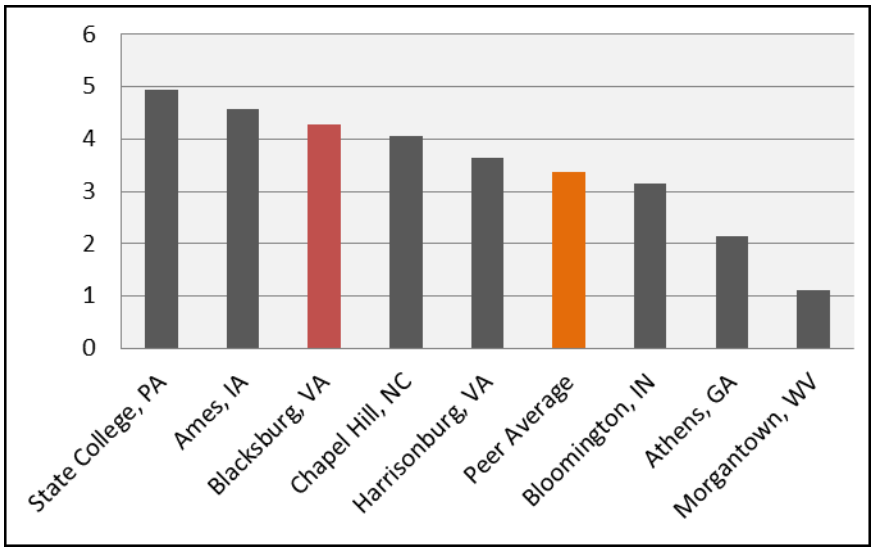
- **Passenger Trips per Revenue-Hour**: Figure A-18 shows that the peer systems generate between 18 (Morgantown, WV) and 63 (State College, PA) passenger trips for every revenue-hour of bus service. BT's productivity of 42 passengers per revenue-hour is about 7 percent higher than the peer average of 39.

Figure A-18: Peer Comparison – Passenger Trips per Revenue-Hour



- **Passenger Trips per Revenue-Mile:** Figure A-19 shows that peer systems generate between 1.1 (Morgantown, WV) and 4.9 (State College, PA) passenger trips per revenue-mile of service. BT serves 4.3 passengers per revenue-mile, which is 27 percent higher than the peer average of 3.4.

Figure A-19: Peer Comparison – Passenger Trips per Revenue-Mile

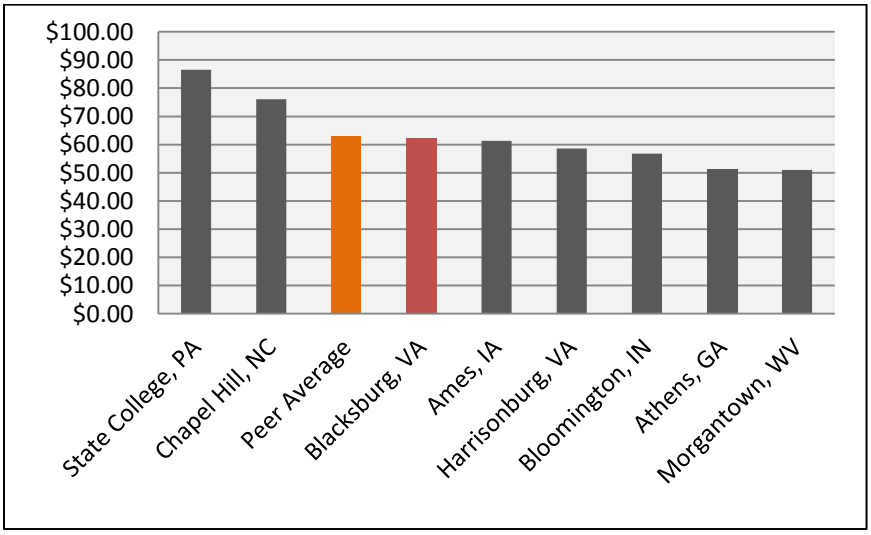


4.3 Service Efficiency

Transit systems typically must balance the level of service they provide with the budget required to do so. Service efficiency performance is often measured as the operating cost per revenue-hour or revenue-mile service.

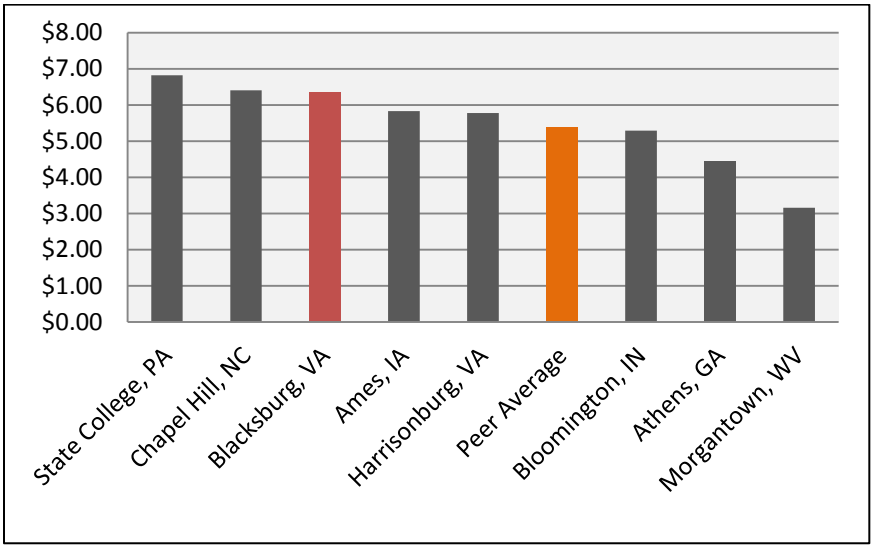
- **Operating Cost per Revenue-Hour**: Figure A-20 shows the peer systems' operating cost per revenue-hour range from $50.98 (Morgantown, WV) to $86.54 (State College, PA), with a peer average of $63.08. On this performance measure BT is slightly more efficient than the peers. BT's operations cost of $62.16 per revenue-hour is 1.5 percent lower than the peer average.

Figure A-20: Peer Comparison – Operating Cost per Revenue-Hour



- **Operating Cost per Revenue-Mile**: Figure A-21 shows that on this measure of efficiency, the peers range between $3.16 (Morgantown, WV) and $6.82 (State College, PA) with an average cost per revenue-mile of $5.39. BT is less efficient than the peer average by spending $6.35 for each revenue-mile of service. This is 18 percent above the peer average.

Figure A-21: Peer Comparison – Operating Cost per Revenue-Mile

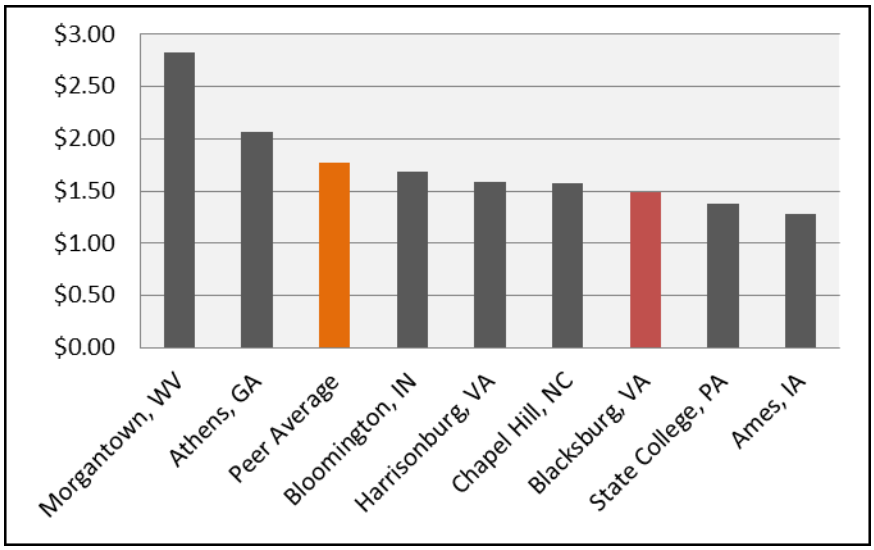


4.4 Cost Effectiveness

Cost effectiveness measures how effective an operator is at moving passengers based on the amount of money it costs to operate service. It is frequently measured in terms of operating cost per passenger trip.

- **Operating Cost per Passenger Trip**: This performance measure provides an indication of how efficient a system is at balancing the cost of providing service with the number of patrons it serves. As shown in Figure A-22, peer system costs per passenger trip range from $1.28 (Ames, IA) to $2.82 (Morgantown, WV) with an average of $1.77. BT's operating cost per passenger trip ($1.49) is 16 percent less than the peer group average.

Figure A-22: Peer Comparison – Operating Cost per Passenger Trip

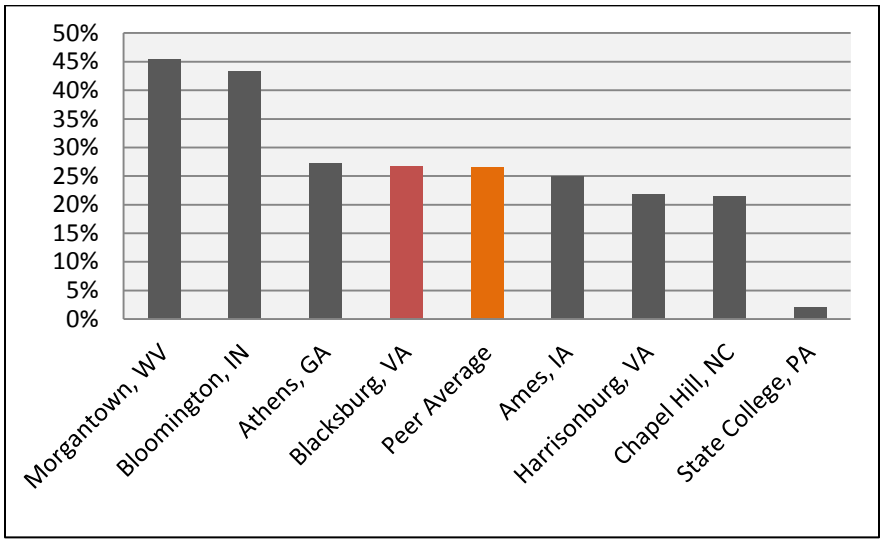


4.5 Vehicle Utilization

The peer systems were compared on several indicators of vehicle utilization including size of the bus fleet available for revenue service, maximum number of buses in simultaneous scheduled service, and hours and miles of revenue service per peak bus.

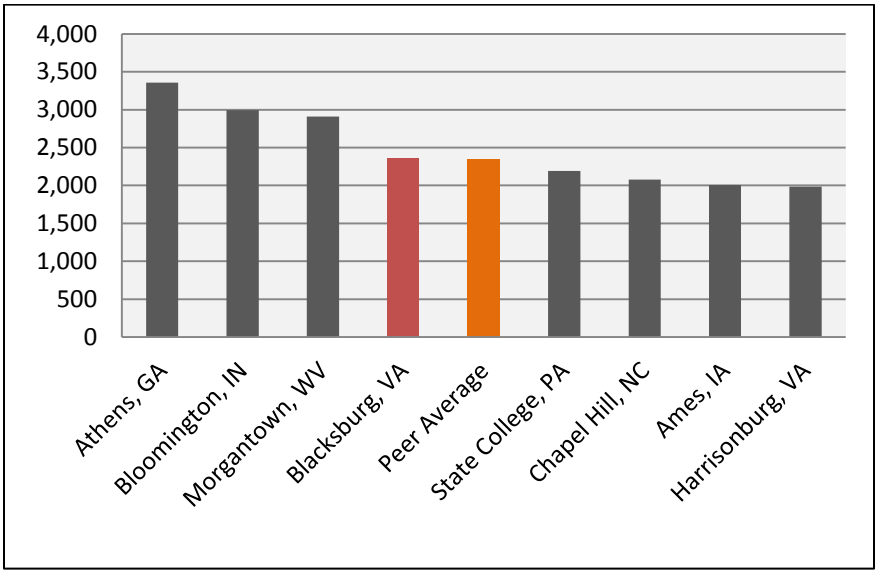
- **Spare Ratio**: Spare ratio is an indication of how a transit agency meets its need to balance the provision of sufficient vehicles to operate scheduled revenue service with the requirements of vehicle maintenance and overhaul programs. FTA's formula to calculate a spare ratio is: (Total Active Fleet – Peak Vehicle Requirement) / Peak Vehicle Requirement. Accordingly, peer spare ratios range from 2 percent (State College, PA) to 45 percent (Morgantown, WV). At 27 percent, BT's spare ratio is equivalent to the peer average, as shown in Figure A-23. Spare ratios typically run higher during times of vehicle replacement or prior to the implementation of large service initiatives. Generally, FTA prefers spare ratios near 20 percent.

Figure A-23: Peer Comparison – Spare Ratio



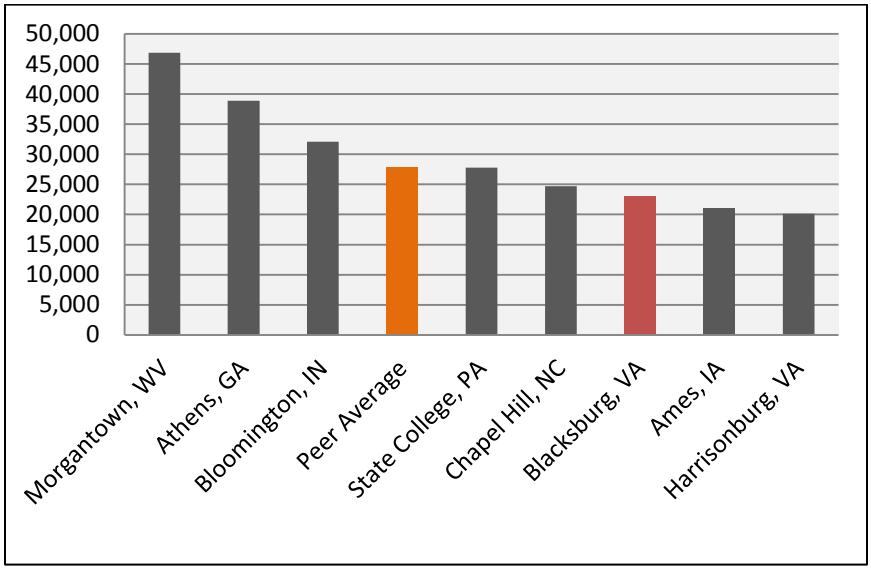
- **Revenue-Hours per Peak Bus**: Figure A-24 shows that the peer systems operated between 1,985 (Harrisonburg, VA) and 3,358 (Athens, GA) annual revenue-hours per peak bus. At 2,354, BT operated in the mid-range of annual hours of service per peak vehicle and nearly equal to the peer average of 2,340.

Figure A-24: Peer Comparison – Annual Revenue-Hours per Peak Bus



- **Revenue-Miles per Peak Bus**: Figure A-25 shows that the peer systems operated between 20,144 (Harrisonburg, VA) and 46,869 (Morgantown, WV) annual revenue-miles per peak bus. At 23,041, BT operated the third lowest annual miles of service per peak vehicle and 17 percent less than the peer average of 27,858.

Figure A-25: Peer Comparison – Annual Revenue-Miles per Peak Bus



5. Key Findings of Primary Peer Review

This review has compared the Blacksburg Transit (BT) bus system to seven peer transit systems with respect to operational and financial characteristics and performance. The Federal Transit Administration's NTD was the primary source of data for these systems, with the most recently available data (2009) used in the analysis. The transit systems selected as peers to BT were:

- Harrisonburg Department of Public Transportation (Harrisonburg, VA)
- Ames Transit Agency – CyRide (Ames, IA)
- Bloomington Public Transportation Corporation (Bloomington, IN)
- Chapel Hill Transit (Chapel Hill, NC)
- Monongalia County Urban Transit – Mountain Line Transit (Morgantown, WV)
- Centre Area Transportation Authority - CATA (State College, PA)
- Athens Transit Service (Athens, GA)

A summary of peer system average and BT key criteria is presented in Table A-5. Measures where BT was more than 125 percent of the peer average are in green, and measures where BT was less than 75 percent of the peer average are in red.

Table A-5: BT and Peer-Average Key Characteristics

Characteristic	Peer Average	Blacksburg Transit
Service Area		
Population	70,607	56,260
Square Miles	65	28
People per Square Mile	2,186	2,009
Operating Data		
Weekday Peak Buses	40	30
Annual Revenue Miles	1,110,336	691,234
Annual Revenue Hours	93,275	70,630
Annual Passenger Trips	3,945,361	2,954,415
Financial Data		
Annual Operating Cost	$6,191,722	$4,390,143
Farebox Recovery	33%	16%
Local Assistance	23%	30%
Service Productivity		
Revenue Hours per Capita	1.37	1.26
Passengers per Revenue Hour	39	42
Cost per Revenue Hour	$63.08	$62.16
Cost per Passenger Trip	$1.77	$1.49
Vehicle Utilization		
Spare Ratio	27%	27%
Revenue Hours per Peak Bus	2,340	2,354

Key findings were as follows:

- **Service Area Characteristics**: BT had the third lowest service area population and population density of all the peer systems and was below the peer average for both characteristics.
- **Operating Characteristics**: The size of BT's active fleet was 22 percent below the peer average. Out of the eight peer systems, BT ranked sixth in terms of annual revenue hours and seventh in terms of annual revenue miles. Despite this, BT ranked fifth in the number of annual passenger trips.
- **Financial Characteristics:** BT's annual operating budget is 29 percent lower than the peer average. The department reported higher percentages of operating funds from federal sources and local assistance than the peer average, similar percentages from state funds and other funds, and a lower percentage from fare revenue. University transit investment is often classified as either local assistance or fare revenue – combining these sources, BT receives 16 percent less than the peer average to provide transit service.
- **Level of Service:** In comparison to its peers, BT operates 8 percent less revenue-hours and 25 percent less revenue-miles per capita than the peer averages. In addition, BT operates 24 percent less revenue-hours and 33 percent less revenue-miles per square mile than the peer average.
- **Service Effectiveness (Ridership Productivity):** BT was more productive in attracting ridership than the peer system average when compared on a revenue-hour, revenue-mile, and per capita basis by 7 percent, 27 percent, and 10 percent, respectively.
- **Service Efficiency and Cost Effectiveness:** BT's service efficiency was similar to its peers, with a cost per revenue hour comparable to the peer average and a cost per revenue mile somewhat higher than the average. However, BT was more cost effective than its peers, carrying passengers at a cost per trip that is 16 percent less than its peers.
- **Vehicle Utilization:** Both the size of BT's bus fleet (38 buses) and vehicles operated in maximum service (30 buses) were smaller than the peer average (by 22 and 25 percent, respectively). BT's revenue-miles per peak bus were 17 percent below the peer average while BT's revenue-hours per peak bus were slightly above the peer average. All but one of the peers (State College, PA) exhibited spare ratios that exceed FTA guidelines of 20 percent spares.

To conclude, this peer review analysis has determined that BT's overall level of service and vehicle utilization are lower than its peer systems. This can be attributed to an operating budget that is likewise lower than its peer average, and particularly to a lower level of local source investment (local assistance and fare revenue). Despite this, BT is more efficient than peers on a revenue-hour, revenue-mile, and cost basis. This indicates that on the whole BT has invested in transit services that are highly productive.

APPENDIX B

Blacksburg Transit On-Board Rider Survey Results
Technical Memorandum

1. Introduction and Methodology

One of the key elements of Blacksburg Transit's Transit Development Plan (TDP) is the on-board transit rider survey that was conducted in November 2010. This Technical Memorandum presents the results of the on-board survey. The survey was conducted to determine rider demographics, travel behavior, and perceptions regarding quality of existing transit services and possible future service improvements.

Individual transit rider survey forms (Figure B-1) were handed out to existing riders on-board BT transit vehicles on all its fixed-route and general public demand response services in both Blacksburg and Christiansburg. The survey instrument was also available in Spanish. Survey questions and design of survey instrument were reviewed by BT staff prior to administration. The actual survey administration and collection took place from Monday, November 15 through Friday, November 19, 2010, with one survey shift scheduled for Friday, November 19 being made up on Friday, December 3. The on-board survey staff was available to assist riders with filling out the survey form and to answer any questions they might have had regarding the survey process, TDP, or BT services.

In all, just over 50% of all BT bus trips were surveyed, with an overall response rate of 24%. Systemwide, a total of 2,407 surveys were entered into the database, with the majority of them, 2,380 collected on the Blacksburg routes, and 27 on the Christiansburg routes. Due to the excellent overall response rate, the sampling error in the survey data is very low. For the overall system, error is lower than ±3% at a 95% confidence level. This is very good, as FTA standards for accuracy specify an error rate of ±10% at a 95% confidence level.

Level of error is also good at the individual route levels, with almost all routes sampled at an error rate of ±10% at a 95% confidence level, and some exceeding an error rate of ±5% at a 95% confidence level. This means that survey data can be analyzed at a route level with good confidence in the accuracy of the results. Note that while the sample size for Christiansburg routes far exceeds levels for statistical validity (47% response rate), the small overall rider population on the three routes – particularly on Shopper Express – means that reading these results for anything more than general trends could be misleading.

For the purpose of this analysis, the BT fixed-routes serving Blacksburg were identified as follows:

- CRC Hospital/CRC Shuttle (CRC)
- Hethwood
- Harding
- Hokie Express
- Main Street
- Patrick Henry
- Progress Street
- Tom's Creek
- U-Mall Shuttle
- University City Blvd
- Two Town Trolley (serving both Blacksburg *and* Christiansburg)

Figure B-1. BT On-Board Survey Instrument

Blacksburg TRANSIT SURVEY

Esta encuesta está disponible en Español a su pedido.

Blacksburg Transit (BT) is conducting a survey to determine typical travel patterns and needs of its riders for future planning purposes. Your participation is vital.

Please take a few moments to answer the questions below based on the one-way trip in which you received this survey. Thank you!

Please tell us about your CURRENT one-way trip:

1a. Where did your one-way trip START today?

☐ Home/Dorm ☐ Work ☐ College/University (student) ☐ School (K-12)
☐ Shopping ☐ Medical/Dental ☐ Social/Recreational ☐ Other _____

1b. What is the location of where your trip started (be as specific as possible)?

_____
Street Address, Intersection, Building Name (examples 123 N. Main St, Progress & N. Main, McBryde Hall)

2a. Where will your one-way trip END today?

☐ Home/Dorm ☐ Work ☐ College/University (student) ☐ School (K-12)
☐ Shopping ☐ Medical/Dental ☐ Social/Recreational ☐ Other _____

2b. What is the location of where your trip will end (be as specific as possible)?

_____
Street Address, Intersection, Building Name (examples 123 N. Main St, Progress & N. Main, McBryde Hall)

3. Does your one-way trip involve a transfer from one route to another?

☐ No ☐ Yes: _____
(please list all routes or services you will use for this one-way trip)

4. How did you pay for your bus fare today?

☐ VT/VCOM ID (Free) ☐ Regular fare ($0.50) ☐ Senior/disabled fare ($0.25)
☐ Monthly pass ☐ Other _____

Staff Use Only

Route # _____ Time _____ am/pm Serial # _____

Please tell us about yourself:

5. I am: ☐ Male ☐ Female

6. My age is:

☐ Under 16 ☐ 16-24 ☐ 25-34 ☐ 35-44 ☐ 45-54 ☐ 55-64 ☐ 65 or over

7. How many people live in your household (if you are a student living away from home, answer for yourself only)?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 or more

8. How many vehicles are in your household (if you are a student living away from home, answer for yourself only)?

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 or more

9. Do you have a valid driver's license? ☐ Yes ☐ No

10. My household income is (if you are a student living away from home, answer for yourself only):

☐ Less than $10,000 ☐ $10,000-$19,999 ☐ $20,000-$34,999
☐ $35,000-$49,999 ☐ $50,000-$74,999 ☐ More than $75,000

11. Are you affiliated with Virginia Tech/VCOM? ☐ No

Yes: ☐ On-campus undergrad student ☐ On-campus grad student ☐ Staff
☐ Off-campus undergrad student ☐ Off-campus grad student ☐ Faculty

12. How often do you typically ride with BT?

☐ 4 or more days a week ☐ 2 or 3 days a week ☐ 1 day a week
☐ Once or twice a month ☐ Less than once a month

13. How long have you been using BT's service?

☐ Less than 6 months ☐ 6-12 months ☐ 1-2 years
☐ 3-5 years ☐ More than 5 years

14. How do you primarily access BT's schedule/route information?

☐ Printed maps ☐ Website ☐ Blacksburg Alert
☐ Google Transit ☐ VT Bus Tracker ☐ Other _____

15. Please rate the following service characteristics:

	Very Good	Good	Okay	Poor	Very Poor	N/A
a. On-time performance	☐	☐	☐	☐	☐	☐
b. Hours of BT bus service	☐	☐	☐	☐	☐	☐
c. Frequency of BT bus service	☐	☐	☐	☐	☐	☐
d. Areas served by BT	☐	☐	☐	☐	☐	☐
e. Directness of BT routes	☐	☐	☐	☐	☐	☐
f. Bus stop amenities (shelters, benches, etc)	☐	☐	☐	☐	☐	☐
g. Availability of schedules & route info	☐	☐	☐	☐	☐	☐
h. BT website	☐	☐	☐	☐	☐	☐
i. Cost of the fare	☐	☐	☐	☐	☐	☐
j. OVERALL	☐	☐	☐	☐	☐	☐

16. Please rate BT's ability to connect you to the following locations:

	Currently meets my needs	Desire more service	N/A
a. Virginia Tech main campus	☐	☐	☐
b. Corporate Research Center (CRC)	☐	☐	☐
c. Downtown Blacksburg	☐	☐	☐
d. University Mall/Math Emporium	☐	☐	☐
e. First and Main/South Blacksburg	☐	☐	☐
f. Montgomery Hospital	☐	☐	☐
g. New River Valley Mall & surrounding retail	☐	☐	☐
h. New River Community College at NRV Mall	☐	☐	☐
i. Downtown Christiansburg	☐	☐	☐
j. Other _____	☐	☐	☐

17a. Would you recommend BT to a friend or colleague? ☐ Yes ☐ No

17b. Why or why not?

_____

_____

The routes serving Christiansburg were identified as follows:

- Shopper Express
- Explorer (deviated fixed-route service)
- Go Anywhere! (demand response service)

The graphs in the following section illustrate unfactored response rates for each question for both Blacksburg area routes and Christiansburg area routes. For Blacksburg routes, results have also been expanded by route to represent the characteristics of the entire ridership base. A survey expansion factor for each transit route was derived by dividing the average weekday ridership for October-November 2010 for the routes being surveyed by the number of completed survey forms for each of the specific routes, as shown in Table B-1.

Due to relatively low ridership in the Christiansburg area as described above, expansion factors were not applied, as the results from the few samples available would not necessarily be the truest representation of the entire ridership base.

Table B-1. BT Survey Expansion Factors

Route		Average Weekday Ridership Oct-Nov 2010	Surveys Received	Expansion Factor
Blacksburg area routes				
TC	Tom's Creek	2,436.7	312	7.81
UC	University City	2,810.5	514	5.47
PR	Progress Street	2,043.3	196	10.43
PH	Patrick Henry	1,696.8	438	3.87
UM	University Mall	1,778.2	70	25.40
HX	Hokie Express	934.8	174	5.37
MS	Main Street	2,048.6	211	9.71
HW	Hethwood	2,993.4	141	21.23
HD	Harding	645.0	87	7.41
CR	CRC	613.8	177	3.47
TT	Two Town Trolley	221.2	60	3.69
Christiansburg area routes				
EX	The Explorer	10.4	12	n/a
SH	Shopper Express	3.2	2	n/a
GA	Go Anywhere!	45.0	13	n/a
	BT Totals	**18,280.8**	**2,407**	**n/a**

The following section presents tabulated responses for each of the survey instrument's questions:

- Unfactored *and* factored for the Blacksburg transit market area
- Unfactored for the Christiansburg transit market area
- Unfactored results systemwide

2. On-Board Survey Results for Blacksburg and Christiansburg

The on-board survey database were processed and summarized by each individual question. For each question, separate graphs and tables show results for the Blacksburg subset of the BT transit system (both unfactored and factored) and Christiansburg subset. Individual transit rider survey forms were processed, compiled, and summarized to calculate the number of responses and the consequent percentage of total responses for each question. This section includes tables and graphs illustrating the cumulative responses to each question. The number of respondents and percentages shown are for valid responses only. The analysis of the responses, focusing on describing the results for the Blacksburg routes (factored and unfactored) and Christiansburg routes (unfactored) follows these grouped question sections from the survey instrument:

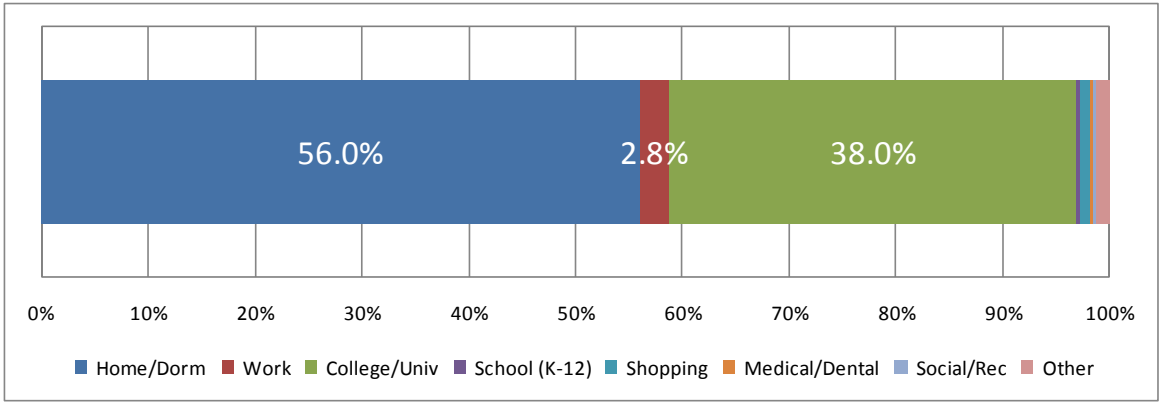
- **Rider Travel Behavior**: Questions 1 through 4
- **Rider Demographics and Characteristics**: Questions 5 through 14
- **Rider Transit Service Perceptions**: Questions 15 through 17

2.1 Rider Travel Behavior

Please tell us about your CURRENT one-way trip:

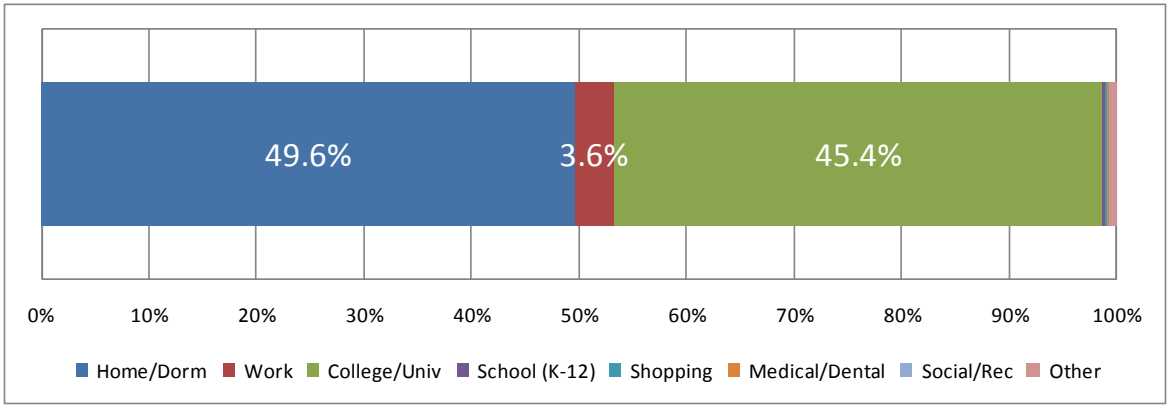
Question 1a: Where did your one-way trip START today?

Blacksburg (unfactored):



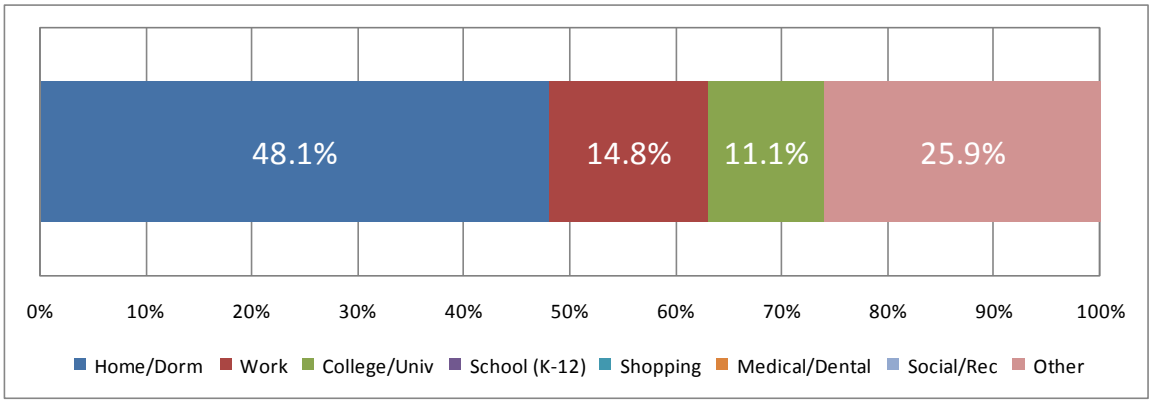
	Percentage	Responses
Home/Dorm	56.0%	1,326
Work	2.8%	67
College/Univ.	38.0%	900
School (K-12)	0.5%	12
Shopping	0.8%	20
Medical/Dental	0.3%	8
Social/Rec.	0.3%	8
Other	1.1%	27
Total	100.0%	2,368

Blacksburg (factored):



	Percentage	Responses
Home/Dorm	49.6%	9,913
Work	3.6%	723
College/Univ.	45.4%	9,069
School (K-12)	0.3%	62
Shopping	0.1%	25
Medical/Dental	0.2%	33
Social/Rec.	0.2%	33
Other	0.6%	117
Total	100.0%	19,975

Christiansburg:



	Percentage	Responses
Home/Dorm	48.1%	13
Work	14.8%	4
College/Univ.	11.1%	3
School (K-12)	0.0%	0
Shopping	0.0%	0
Medical/Dental	0.0%	0
Social/Rec.	0.0%	0
Other	25.9%	7
Total	100.0%	27

Results

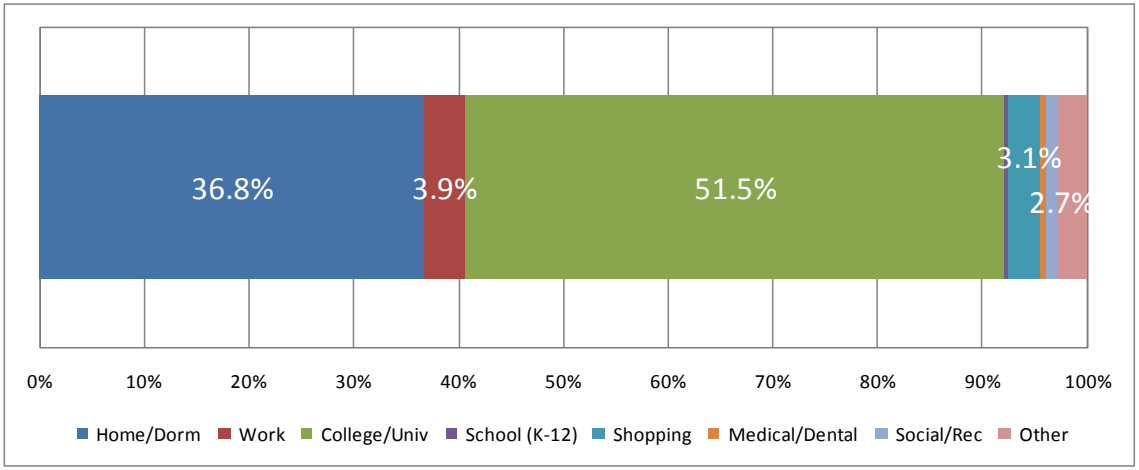
More than half (56%) of Blacksburg respondents' transit trips originated at home or dorm, with 38% of trips originating at college/university. Nearly 3% of the respondents were taking transit from work. Nearly half (48%) of Christiansburg's trips originated at home/dorm as well, but a substantial percentage of trips originated at work (15%), college/university (11%), and other locations (26%).

Significance

The fact that that majority of trips in Blacksburg were Virginia Polytechnic Institute and State University-related (VT) - either from VT or from home/dorm presumably going to VT – and that, at the same time, only 3% of BT riders were work-related, points out the magnitude of influence VT has had on BT's ridership. In Christiansburg, the influence of the university was still pronounced, but not to such a great extent, and 15% of the respondents were actually taking transit from work. Most of the existing BT riders can be considered regular riders when it comes to transit trip origins – for them, BT fulfills critical mobility need.

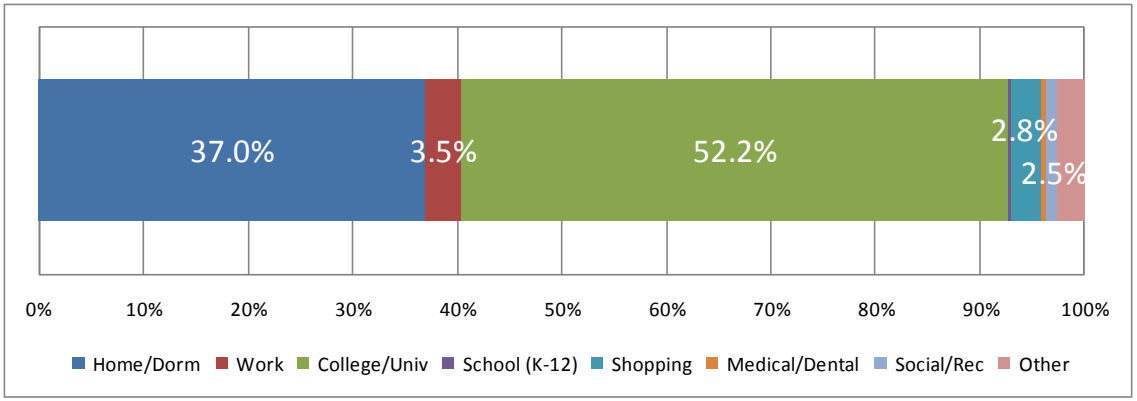
Question 2a: Where will your one-way trip END today?

Blacksburg (unfactored):



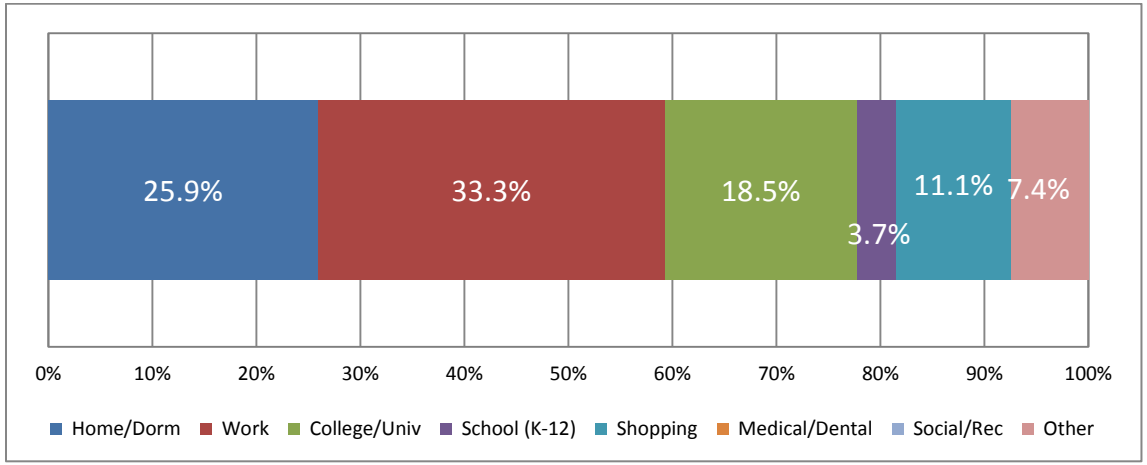
	Percentage	Responses
Home/Dorm	36.8%	866
Work	3.9%	91
College/Univ.	51.5%	1,212
School (K-12)	0.4%	10
Shopping	3.1%	72
Medical/Dental	0.5%	12
Social/Rec.	1.2%	28
Other	2.7%	64
Total	100.0%	2,355

Blacksburg (factored):



	Percentage	Responses
Home/Dorm	37.0%	6,653
Work	3.5%	623
College/Univ.	52.2%	9,386
School (K-12)	0.4%	71
Shopping	2.8%	512
Medical/Dental	0.4%	75
Social/Rec.	1.2%	210
Other	2.5%	457
Total	100.0%	17,988

Christiansburg:



	Percentage	Responses
Home/Dorm	25.9%	7
Work	33.3%	9
College/Univ.	18.5%	5
School (K-12)	3.7%	1
Shopping	11.1%	3
Medical/Dental	0.0%	0
Social/Rec.	0.0%	0
Other	7.4%	2
Total	100.0%	27

Results

In terms of the riders' trip destinations, more than half (51.5%) of Blacksburg respondents were traveling to college/university, and nearly 37% were going home or to their dorms. Nearly 4% of the respondents were taking transit to work, and close to 3% were going shopping. Most Christiansburg survey respondents indicated their transit trip was to work (33.3%) or home/dorm (25.9%). Other popular destinations for Christiansburg respondents were college/university (18.5%) and shopping (11.1%).

Significance

Similar to trips origins, transit trip destinations in Blacksburg were dominated by VT-related trips, while Christiansburg riders were taking transit for to get to work and home. Table B-2 and Table B-3 present cross classifications of trips origins and destinations in Blacksburg and Christiansburg, respectively, as a percentage of total responses. The percentages in the light gray cells along the diagonal indicate trips that began and ended at the same location type, such as from one campus building to another. These light gray cells likely also include responses from respondents that misinterpreted the origin and destination questions.

Table B-2 shows that the majority of Blacksburg trips (68.5%) were between college/university and dorm/home. In Christiansburg, trips between work and home/dorm were the most popular (29.6%), followed by trips between college/university and home/dorm (11.1%) and trips between other origins/destinations and home/work. Cross-tabulations of origins and destinations by route are presented in Section 2.5.

Table B-2. Cross Classification Matrix of Trip Origin and Destination (Blacksburg)

	Home /Dorm	Work	College/ Univ	School (K-12)	Shopping	Medical/ Dental	Social/ Rec	Other
Home/Dorm	7.3%							
Work	3.5%	0.5%						
College/Univ	68.5%	1.6%	7.2%					
School (K-12)	0.6%	0.0%	0.1%	0.1%				
Shopping	1.8%	0.0%	1.9%	0.0%	0.1%			
Medical/Dental	0.4%	0.0%	0.3%	0.0%	0.0%	0.1%		
Social/Rec	0.8%	0.1%	0.5%	0.0%	0.0%	0.0%	0.0%	
Other	1.8%	0.2%	1.5%	0.0%	0.0%	0.0%	0.1%	0.1%

Table B-3. Cross Classification Matrix of Trip Origin and Destination (Christiansburg)

	Home /Dorm	Work	College/ Univ	School (K-12)	Shopping	Medical/ Dental	Social/ Rec	Other
Home/Dorm	7.4%							
Work	29.6%	3.7%						
College/Univ	11.1%	3.7%	7.4%					
School (K-12)	3.7%	0.0%	0.0%	0.0%				
Shopping	3.7%	0.0%	0.0%	0.0%	0.0%			
Medical/Dental	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
Social/Rec	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Other	11.1%	7.4%	0.0%	0.0%	7.4%	0.0%	0.0%	3.7%

Question 1b and 2b: Trip Origin and Destination Locations

Results

The surveyed riders were asked to identify specific locations/addresses of their transit trip origins and trip destinations in Questions 1b and 2b (the write-in segments of Questions 1 and 2). The trip origins and destinations (Os/Ds) identified by the surveyed riders in Questions 1b and 2b were geocoded using GIS mapping software and data from ESRI, Streetmap USA, and BT. Figures B-1 and B-2 show geocoded transit trip Os and Ds, respectively.

As shown in Figures below, the largest concentration of Os and Ds in the BT service area was in the VT university area with and the surrounding neighborhoods with a large concentration of student housing. Other notable Os/Ds locations include: Foxridge Apartments, Patrick Henry Centre Shopping Center, Terrace Road Apartments, Tom's Creek Road, and apartment complexes located around it, Chasewood Downs Apartments, University City Boulevard commercial corridor, CRC, and apartment complexes around Southeast Park.

Significance

Not surprisingly, based on the results, VT main campus was the most active trip origin and destination. A variety of clustered residential apartment complexes and commercial corridors were next in popularity. Overall, trip origins and destinations fell on or within ¼ mile of BT's fixed route alignments. This highlights the fact that the existing BT system meets the needs of the area's residents quite well. While some of the transit routes' alignments could probably be modified to facilitate easier transfers (as desired by the surveyed riders – see Question 16), overall BT allows riders to travel to/from their desired destination points.

Figure B-1. BT Systemwide Trip Origins

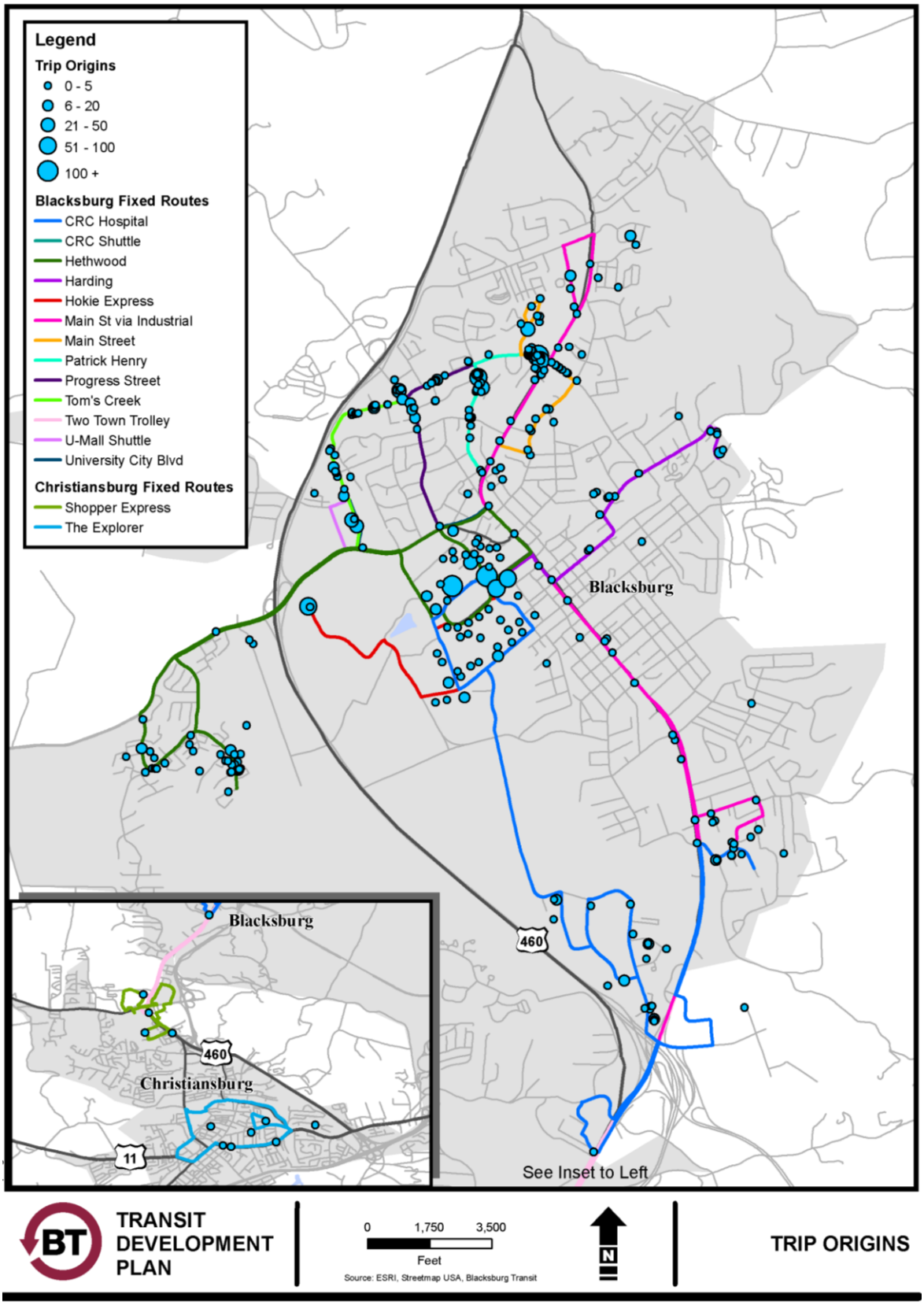
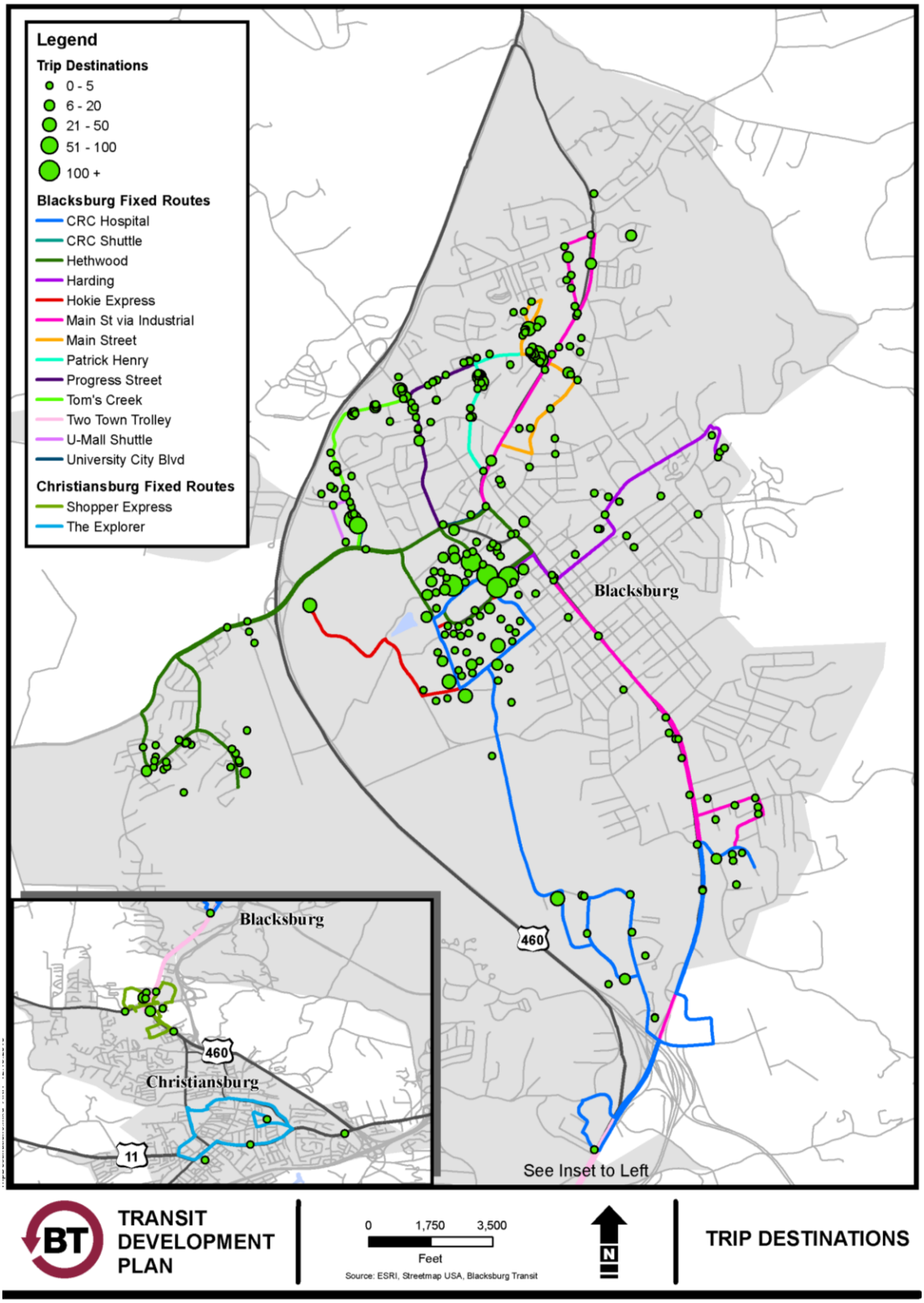
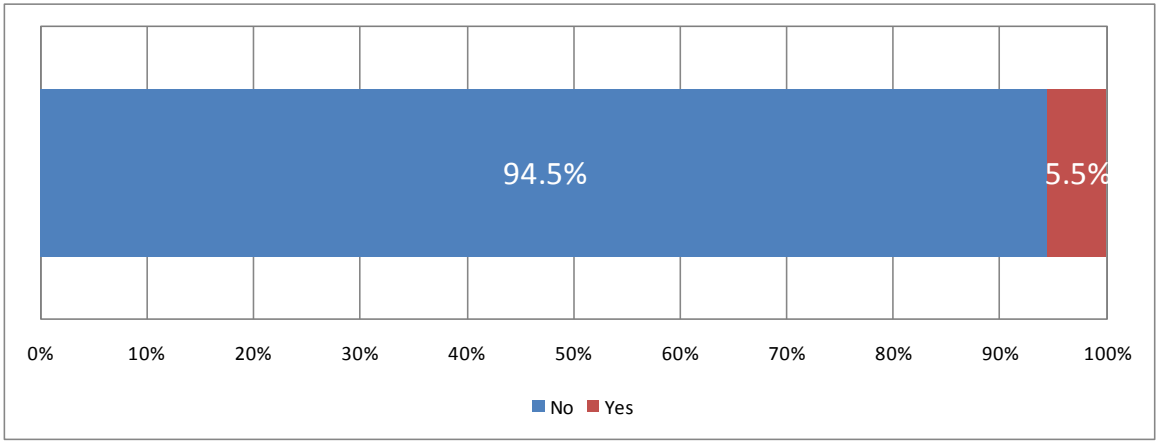


Figure B-2. BT Systemwide Trip Destinations



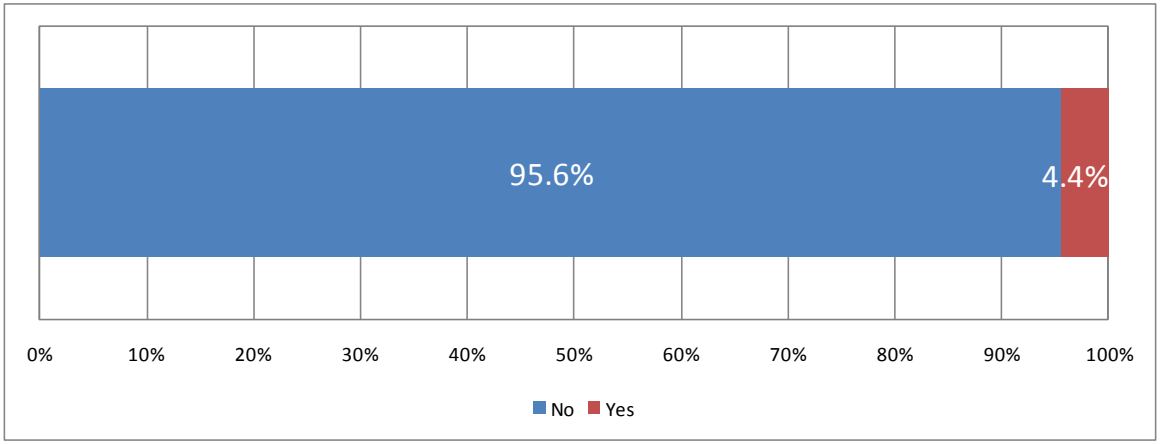
Question 3: Does your one-way trip involve transfer from one route to another?

Blacksburg (unfactored):



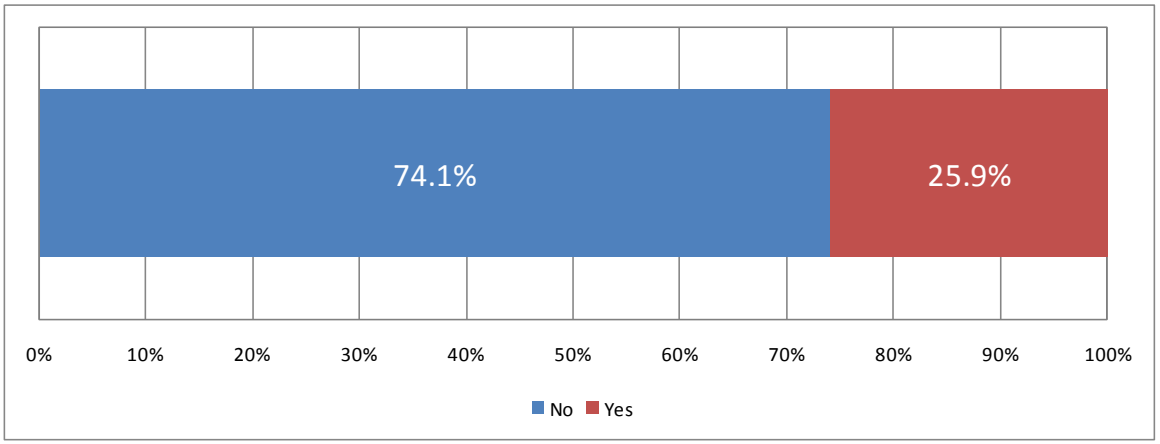
	Percentage	Responses
No	94.5%	2,227
Yes	5.5%	129
Total	100.0%	2,356

Blacksburg (factored):



	Percentage	Responses
No	95.6%	17,269
Yes	4.4%	795
Total	100.0%	18,064

Christiansburg:



	Percentage	Responses
No	74.1%	20
Yes	25.9%	7
Total	100.0%	27

Results

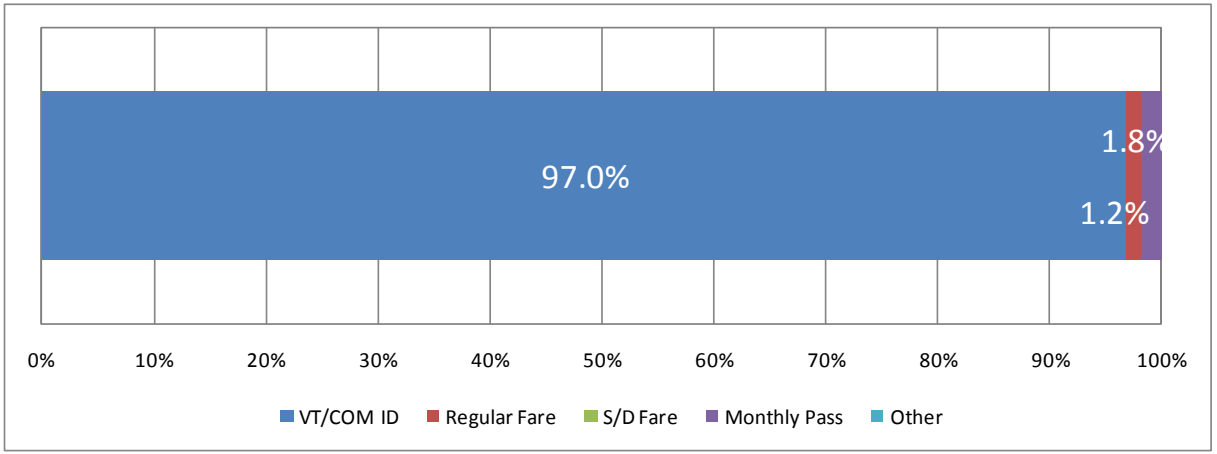
The overwhelming majority of the surveyed transit trips on both Blacksburg and Christiansburg routes were "one-seat" rides not requiring transfers. Only 5.5% of respondents on Blacksburg routes indicated their trip would require transfers. This percentage was higher on Christiansburg's routes – 25.9%. The respondents were asked to write-in other transit routes they intended to use as part of their trip. The following routes had the most responses (in other words, were identified as the routes riders would transfer to in order continue their trips): Tom's Creek, Patrick Henry, CRC, Hokie Express, and Hethwood.

Significance

The fact that most trips were one-seat rides requiring no transfers suggest that the number, routing, and frequency of the existing BT routes are adequate. BT seemingly covers the existing service area quite well and its patrons are able to get to and from their desired Os and Ds conveniently and efficiently without the need for trip chaining. High transfer rates to/from specific routes might warrant a planning study aimed at determining the feasibility of establishing formal transfer points ('satellite transfer points') at the transfer locations that are most active.

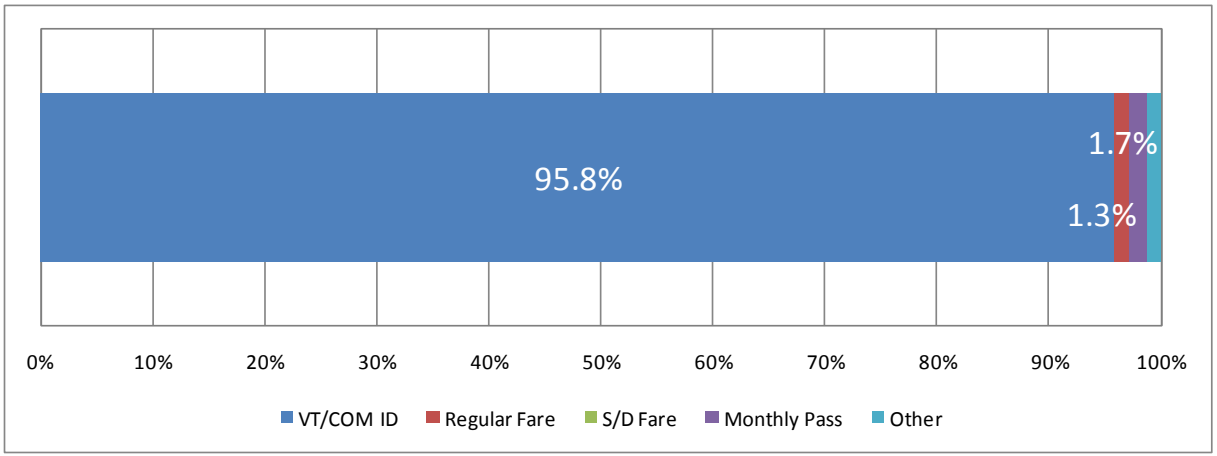
Question 4: How did you pay for your bus fare today?

Blacksburg (unfactored):



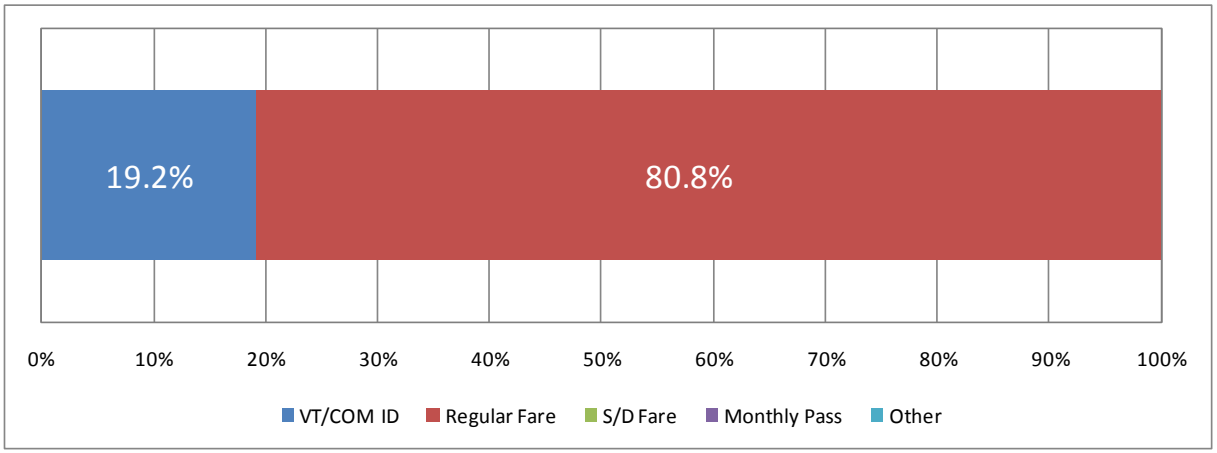
	Percentage	Responses
VT/VCOM ID	97.0%	2,261
Regular Fare	1.2%	29
S/D Fare	0.0%	1
Monthly Pass	1.8%	41
Other	0.0%	0
Total	100.0%	2,332

Blacksburg (factored):



	Percentage	Responses
VT/VCOM ID	95.8%	17,325
Regular Fare	1.3%	236
S/D Fare	0.0%	4
Monthly Pass	1.7%	300
Other	1.2%	214
Total	100.0%	18,079

Christiansburg:



	Percentage	Responses
VT/VCOM ID	19.2%	5
Regular Fare	80.8%	21
S/D Fare	0.0%	0
Monthly Pass	0.0%	0
Other	0.0%	0
Total	100.0%	26

Results

The majority (97%) of Blacksburg riders used their VT/VCOM ID to use BT services. The remaining 3% of the riders paid regular fare or used BT's monthly pass. Four in five of the surveyed Christiansburg's riders paid regular fare to use transit services, and one in five of the respondents used the VT/VCOM ID.

Significance

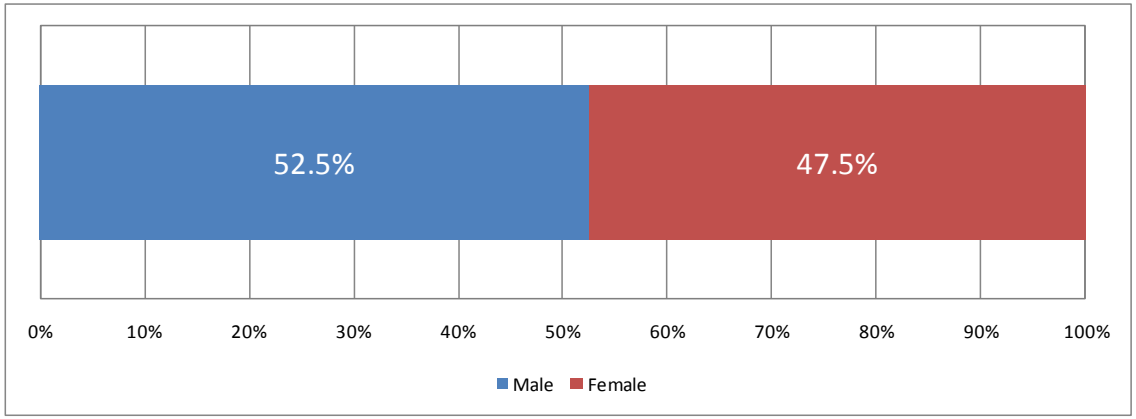
The fact that Blacksburg is a major college town and that VT students and faculty are able to use their college/faculty ID as fare for BT services is reflected in the type of answers received to the fare question, particularly in the Blacksburg market area.

2.2 *Rider Demographics and Characteristics*

Please tell us about yourself:

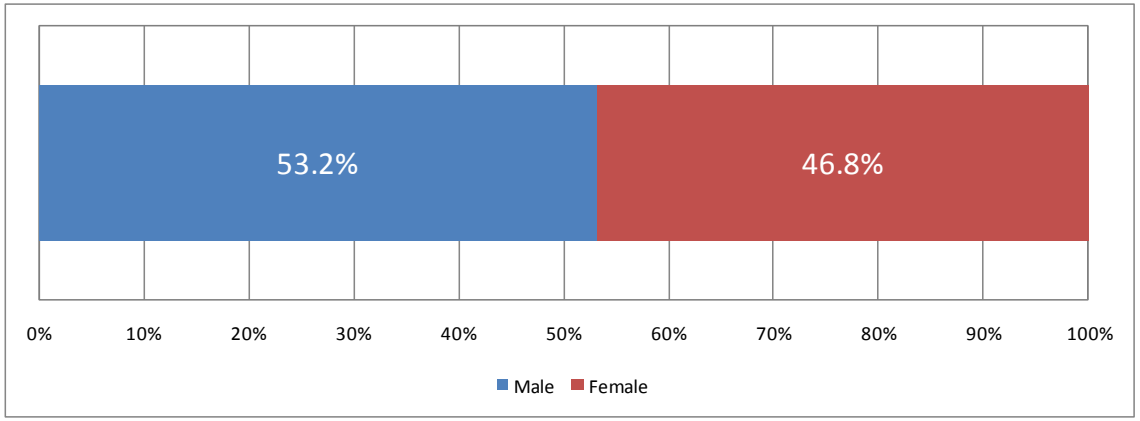
Question 5: Gender

Blacksburg (unfactored):



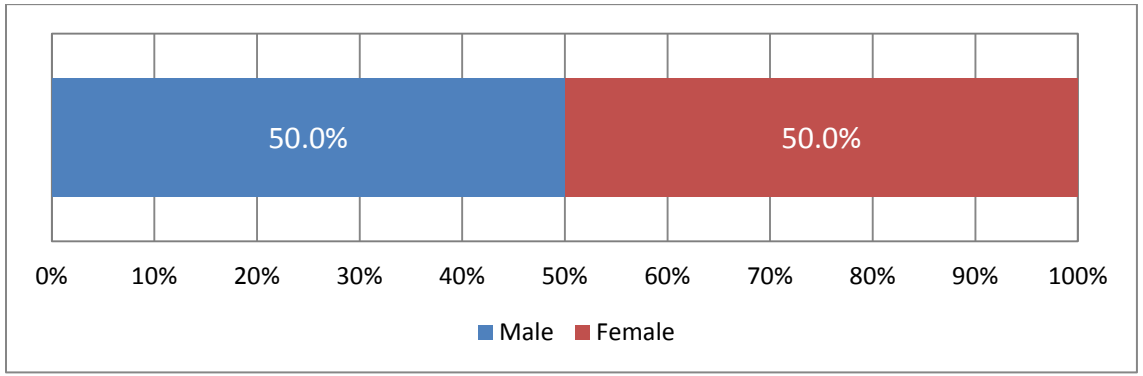
	Percentage	Responses
Male	52.5%	1,247
Female	47.5%	1,126
Total	100.0%	2,373

Blacksburg (factored):



	Percentage	Responses
Male	53.2%	9,660
Female	46.8%	8,501
Total	100.0%	18,161

Christiansburg:



	Percentage	Responses
Male	50.0%	13
Female	50.0%	13
Total	100.0%	26

Results

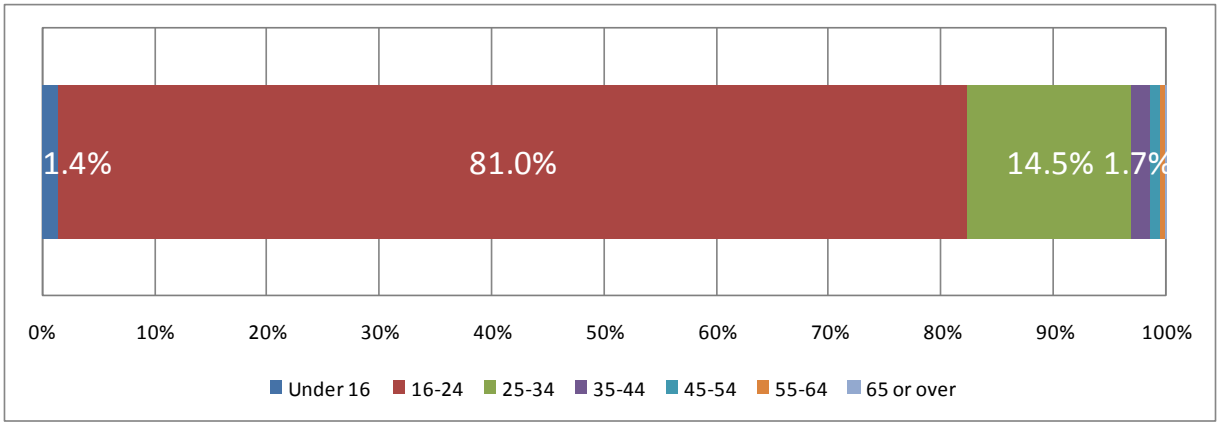
In both Blacksburg and Christiansburg markets, the split between male and female riders was about equal, with slightly more men than female respondents in Blacksburg (52.5% vs. 47.5%).

Significance

There was no significant gender gap in BT ridership. Although about 59% of VT students are male, and BT is overwhelmingly used by VT students, that ratio itself was not enough to result in gender imbalance when it comes to the resulting BT transit ridership.

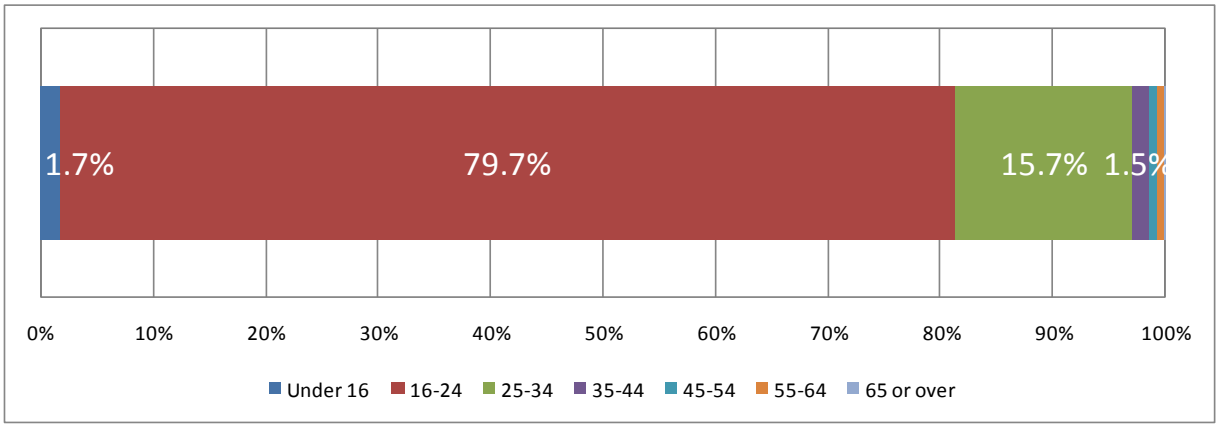
Question 6: Age (My age is…)

Blacksburg (unfactored):



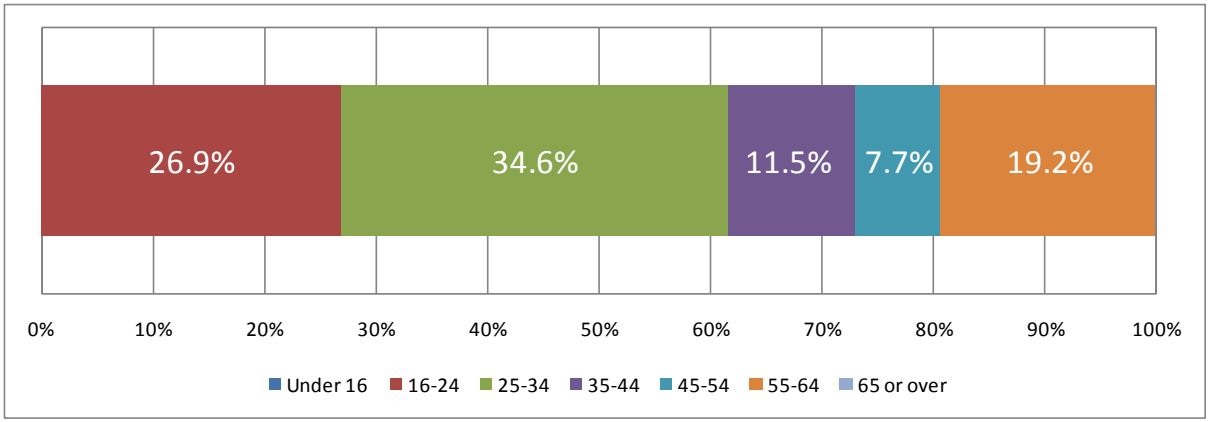
	Percentage	Responses
Under 16	1.4%	34
16-24	81.0%	1,922
25-34	14.5%	343
35-44	1.7%	41
45-54	0.8%	20
55-64	0.4%	9
65 or over	0.1%	3
Total	100.0%	2,372

Blacksburg (factored):



	Percentage	Responses
Under 16	1.7%	302
16-24	79.7%	14,471
25-34	15.7%	2,858
35-44	1.5%	277
45-54	0.7%	134
55-64	0.5%	92
65 or over	0.1%	23
Total	100.0%	18,157

Christiansburg:



	Percentage	Responses
Under 16	0.0%	0
16-24	26.9%	7
25-34	34.6%	9
35-44	11.5%	3
45-54	7.7%	2
55-64	19.2%	5
65 or over	0.0%	0
Total	100.0%	26

Results

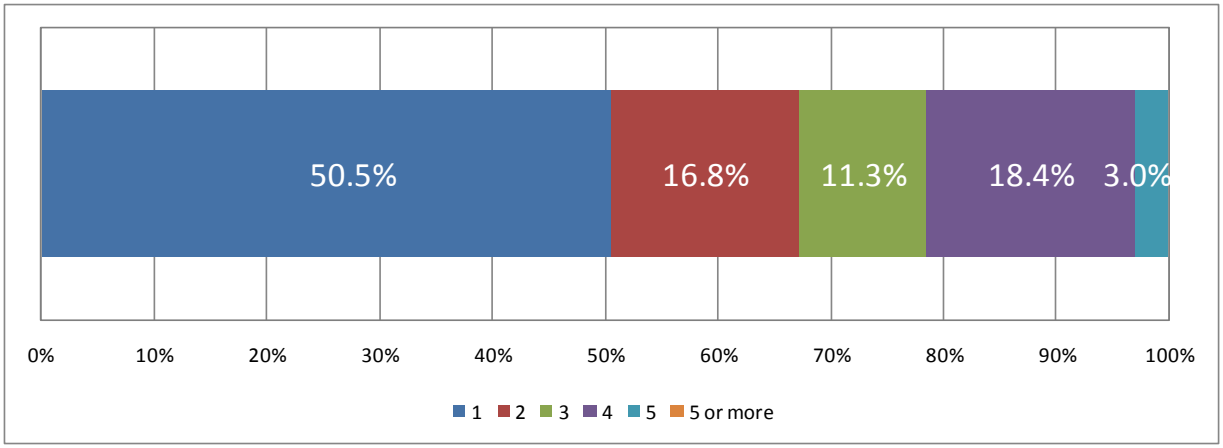
Blacksburg is a major college town and the results identifying the respondents' age definitely reflected the town's nature. Four in five of the respondents in Blacksburg were roughly the age of undergraduate college students (16 to 24 years old age range), and 14.5% in the age range that would probably include most graduate students and young faculty members (25 to 34 years old age range). The remaining 4.5% of respondents includes riders under 16 years old and over 34 years old. Surprisingly, only 0.1% of all riders in Blacksburg (three persons total) were seniors. In Christiansburg, roughly one in three riders were in the 25 to 34 age bracket, and about one in four respondents were children or young adults (under 16 years old). Notably, 38.4% of respondents were 35 years and older, in stark contrast to a mere 3.1% in Blacksburg. Although there were no senior riders surveyed in Christiansburg this fact could probably be due to a small surveyed transit market sample in that service area.

Significance

College students dominate BT, particularly in Blacksburg. The low percentage of the 'working age adults' utilizing BT service in Blacksburg is in contrast to a more age-balanced transit user base in Christiansburg. Overall, the results point out the importance of BT catering to the needs of students in the area.

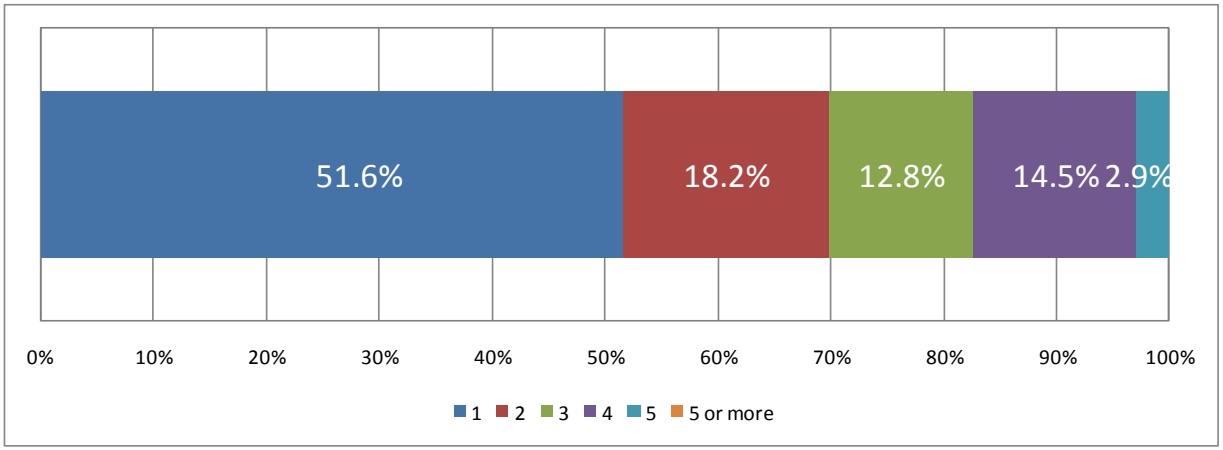
Question 7: Household size - How many people live in your household (if you are a student living away from home, answer for yourself only)?

Blacksburg (unfactored):



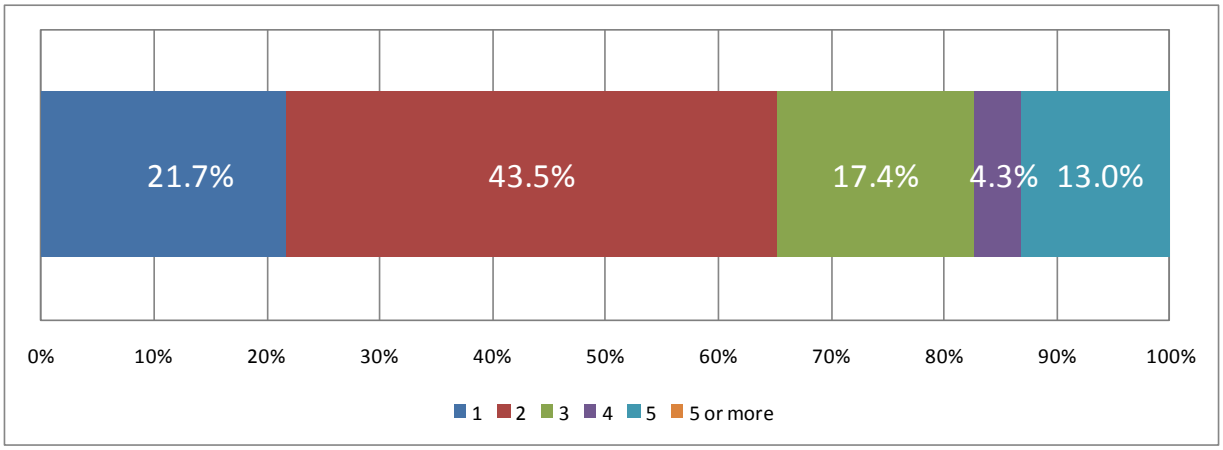
	Percentage	Responses
1	50.5%	1,192
2	16.8%	396
3	11.3%	266
4	18.4%	435
5	3.0%	72
5 or more	0.0%	0
Total	100.0%	2,361

Blacksburg (factored):



	Percentage	Responses
1	51.6%	9,331
2	18.2%	3,294
3	12.8%	2,304
4	14.5%	2,623
5	2.9%	516
5 or more	0.0%	0
Total	100.0%	18,068

Christiansburg:



	Percentage	Responses
1	21.7%	5
2	43.5%	10
3	17.4%	4
4	4.3%	1
5	13.0%	3
5 or more	0.0%	0
Total	100.0%	23

Results

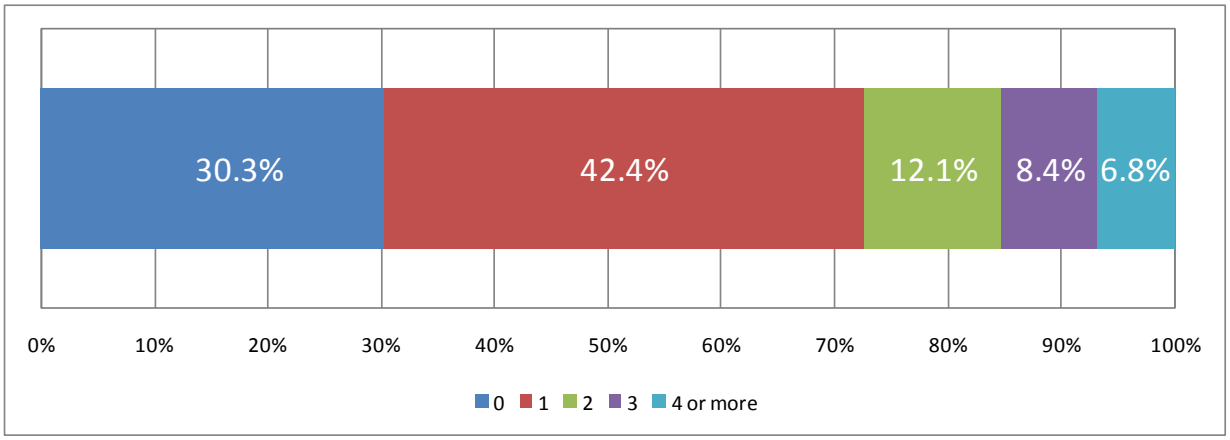
About half of the respondents in Blacksburg live alone and nearly 17% live with one other person. The remaining 32.7% of the respondents reside in typical family-size households consisting of three persons and more. In Christiansburg, 43.5% of the surveyed riders live in two-person households, while 21.7% reside in one-person households. The remaining 34.7% of the respondents reside in typical family-size households consisting of three persons and more.

Significance

Given the large number of university students in the area, it is not surprising that a large percentage of the surveyed respondents live in one-person households, especially since this qualifier includes college students living away from home in dorms. In general, the household size in Christiansburg is larger, and two-person households are much more prevalent there than in Blacksburg. The situation is reversed when it comes to one-person households, which are much more dominant in Blacksburg.

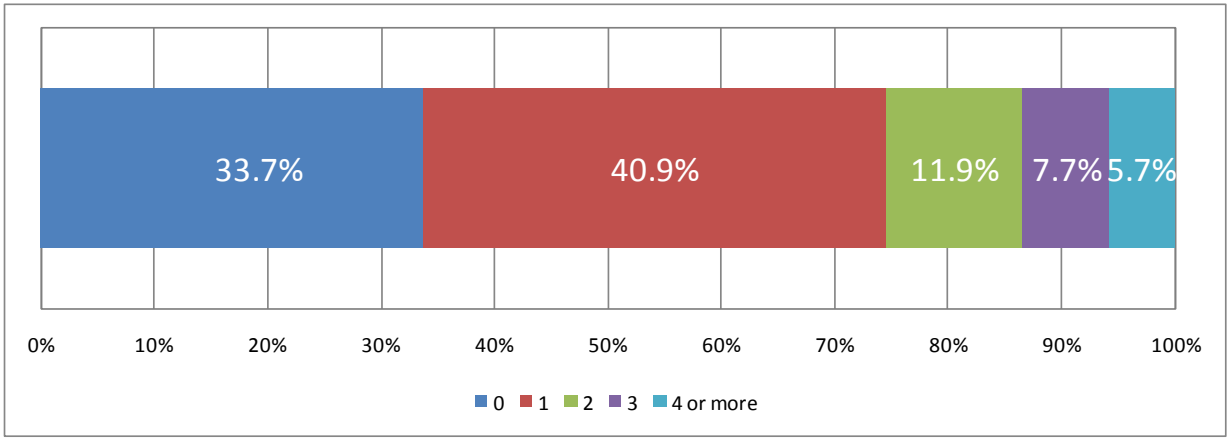
Question 8: Number of Vehicles in Household - How many vehicles are in your household (if you are a student living away from home, answer for yourself only)?

Blacksburg (unfactored):



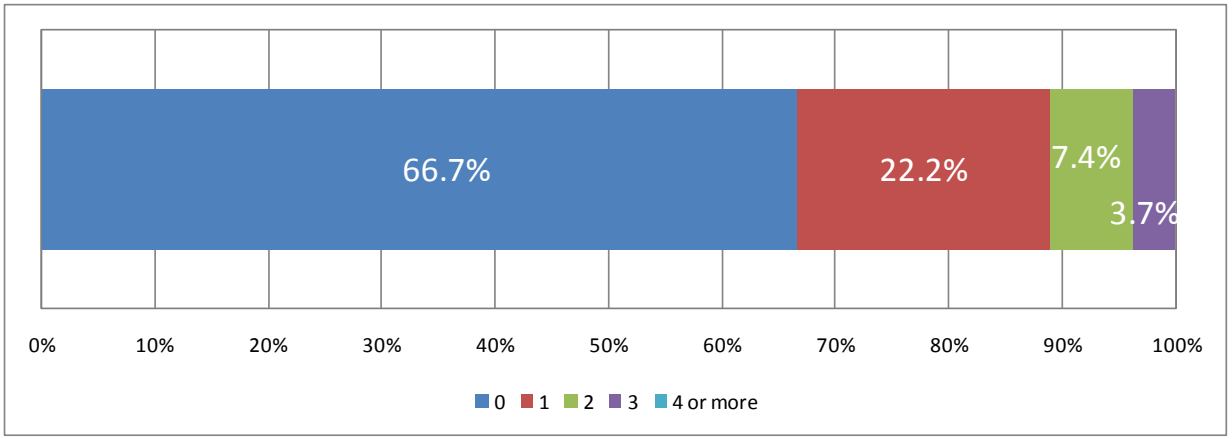
	Percentage	Responses
0	30.3%	714
1	42.4%	1,001
2	12.1%	285
3	8.4%	199
4 or more	6.8%	161
Total	100.0%	2,360

Blacksburg (factored):



	Percentage	Responses
0	33.7%	6,085
1	40.9%	7,377
2	11.9%	2,152
3	7.7%	1,398
4 or more	5.7%	1,035
Total	100.0%	18,047

Christiansburg:



	Percentage	Responses
0	66.7%	18
1	22.2%	6
2	7.4%	2
3	3.7%	1
4 or more	0.0%	0
Total	100.0%	27

Results

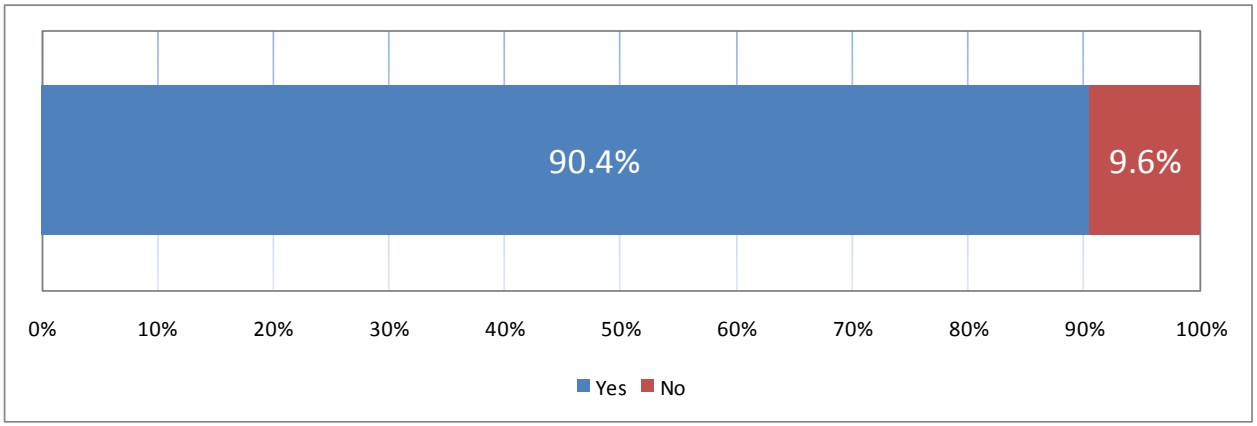
Nearly one in three Blacksburg respondents lived in households with no motor vehicles, followed by 42.4% of one-vehicle households. In Christiansburg, two in three respondents resided in zero-vehicle households, followed by 22.2% of respondents residing in one-vehicle households.

Significance

Given the large number of university students in the area, it is not surprising that a large percentage of the surveyed respondents resided in zero one-vehicle households, especially since this qualifier includes college students living away from home in dorms. Households with no access to vehicles are typically more likely to use transit services, although in college towns such as Blacksburg many students residing in dorms do not need to necessarily use transit services (or at least not often) to get to and around college (because they might live on-campus or in nearby neighborhoods within walking distance of campus). The large percentage of respondents using BT in Christiansburg who indicated they lived in zero-vehicle households is alarming; although the actual transit market response sample rate was small when it comes to Christiansburg's portion of BT services, the large number of carless respondents who might be perceived as "captive" transit riders is a cause for concern.

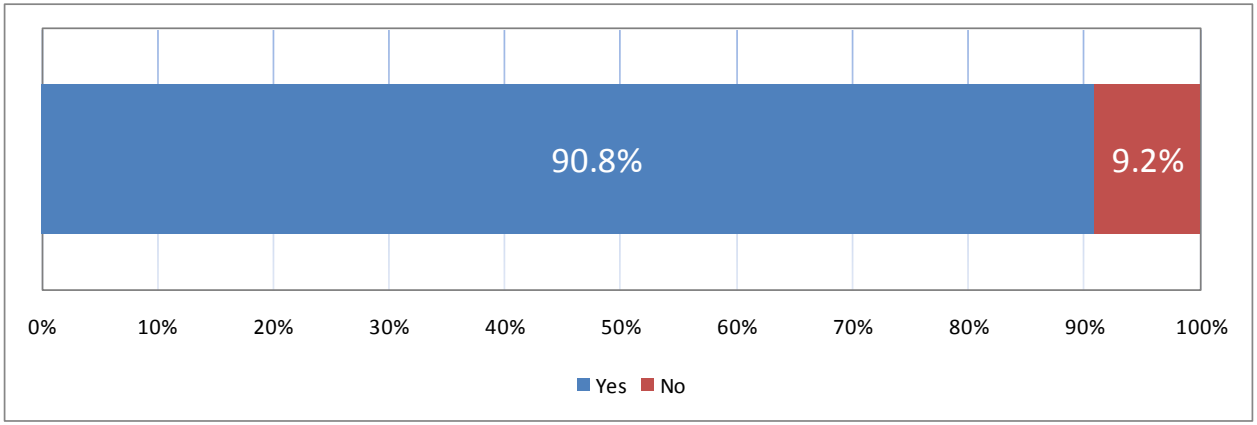
Question 9: Do you have a valid driver's license?

Blacksburg (unfactored):



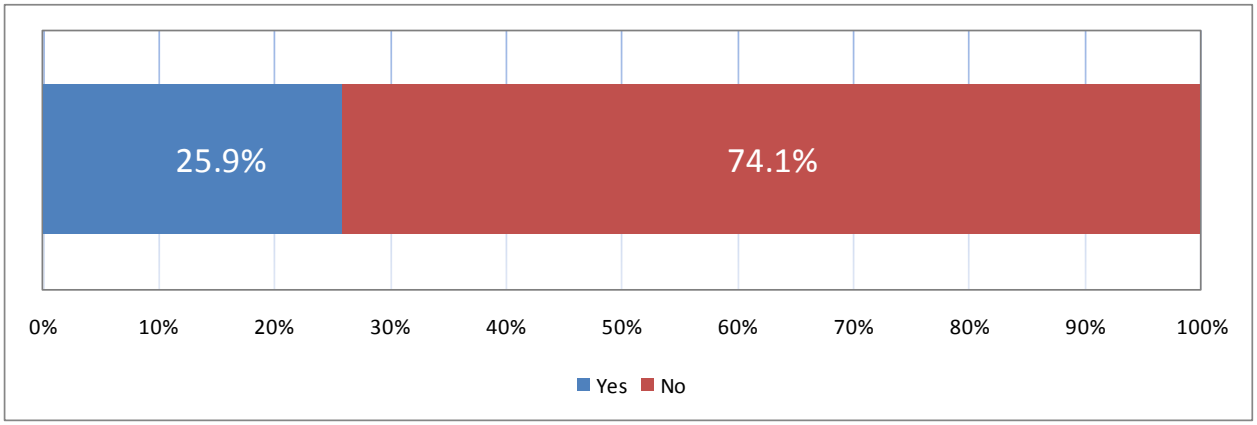
	Percentage	Responses
Yes	90.4%	2,090
No	9.6%	222
Total	100.0%	2,312

Blacksburg (factored):



	Percentage	Responses
Yes	90.8%	15,959
No	9.2%	1,611
Total	100.0%	17,570

Christiansburg:



	Percentage	Responses
Yes	25.9%	7
No	74.1%	20
Total	100.0%	27

Results

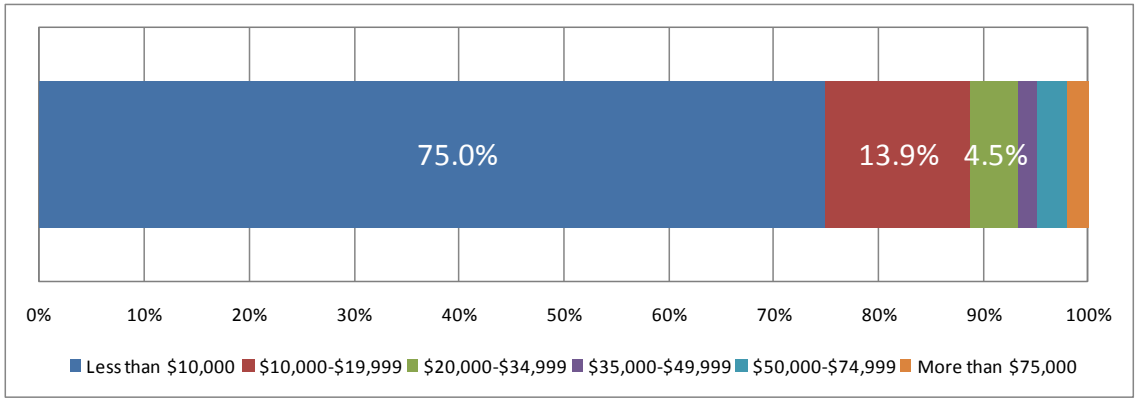
The majority of respondents (90.4%) in Blacksburg carried a valid driver's license; on the surveyed Christiansburg's routes, nearly three in four of the respondents had no valid driver's license.

Significance

VT students largely dominate the demographics landscape in the Blacksburg area. While they might hold valid driver's licenses, they are less likely to drive and own a vehicle while attending college, especially if they live on-campus. Christiansburg's results confirm results from Question 8; the large number of zero-vehicle households did go hand-in-hand with lack of driver's licenses. The findings reinforce the notion that a sizeable portion of transit users in Christiansburg is comprised of captive users.

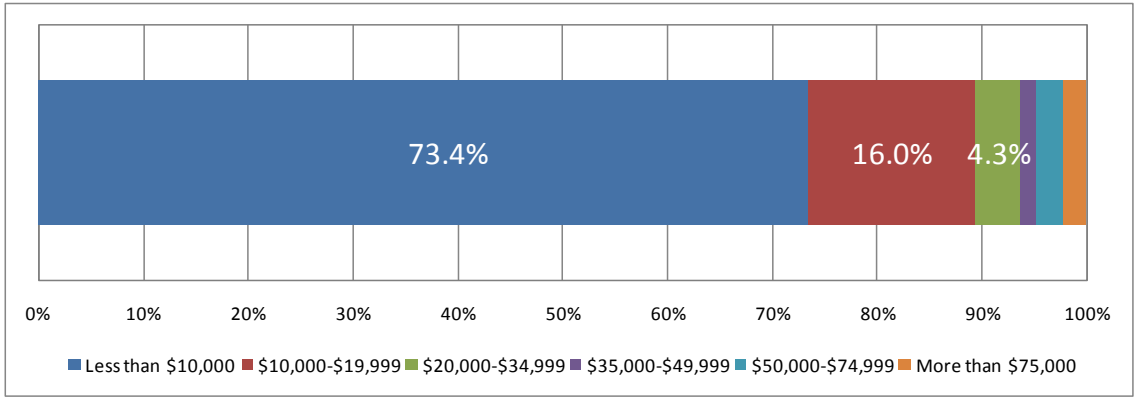
Question 10: Household Income - My household income is: (if you are a student living away from home, answer for yourself only)

Blacksburg (unfactored):



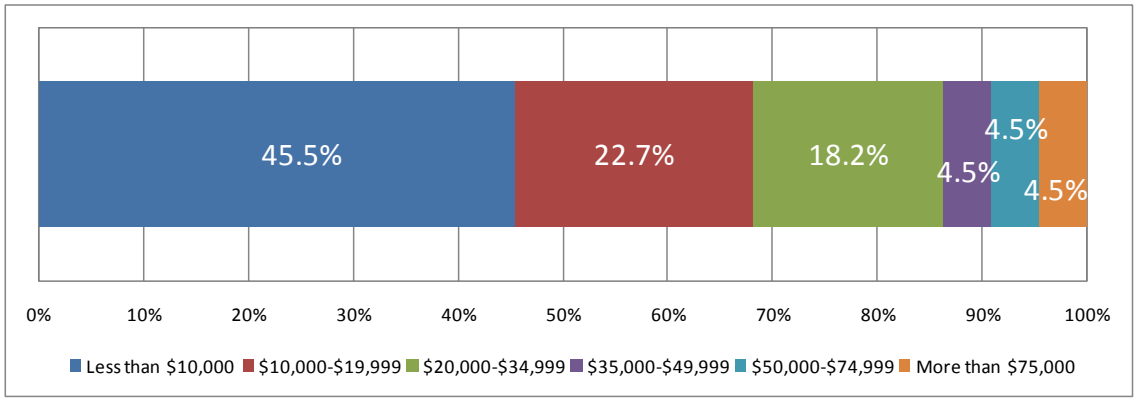
	Percentage	Responses
Less than $10,000	75.0%	1,713
$10,000-$19,999	13.9%	317
$20,000-$34,999	4.5%	102
$35,000-$49,999	1.9%	44
$50,000-$74,999	2.7%	62
More than $75,000	2.1%	47
Total	100.0%	2,285

Blacksburg (factored):



	Percentage	Responses
Less than $10,000	73.4%	12,870
$10,000-$19,999	16.0%	2,798
$20,000-$34,999	4.3%	748
$35,000-$49,999	1.5%	267
$50,000-$74,999	2.6%	460
More than $75,000	2.2%	387
Total	100.0%	17,530

Christiansburg:



	Percentage	Responses
Less than $10,000	45.5%	10
$10,000-$19,999	22.7%	5
$20,000-$34,999	18.2%	4
$35,000-$49,999	4.5%	1
$50,000-$74,999	4.5%	1
More than $75,000	4.5%	1
Total	100.0%	22

Results

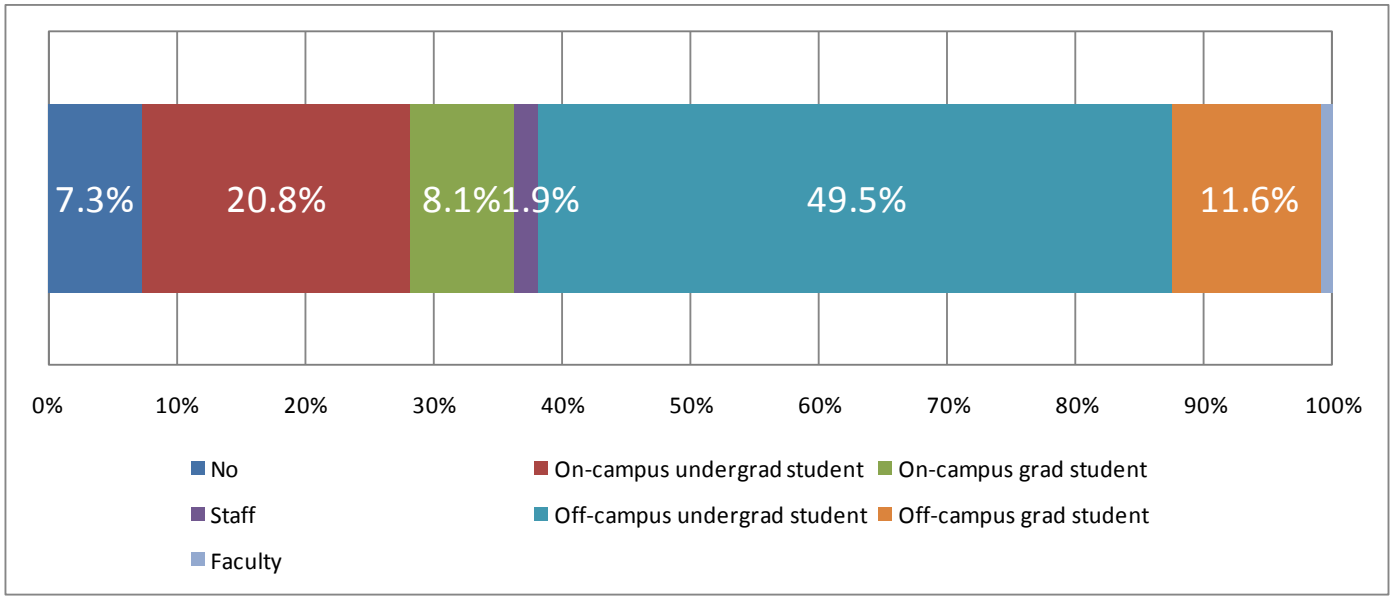
Three in four (75%) of the surveyed respondents indicated that their households in the Blacksburg service area earned less than $10,000 annually and nearly 89% of them earned less than $20,000 annually. On the surveyed Christiansburg's routes, 45.5% earned less than $10,000 annually and 68.2% of respondents earned less than $20,000 annually.

Significance

VT students are the most dominant transit users in the Blacksburg area. They are exceptionally likely to have minimal or no income at all when attending college; if they do work, they can probably only work part-time while attending school. A few respondents in Christiansburg transit market area indicated their income was above $35,000 annually, but those results can be perceived as inconclusive given the relatively small number of collected surveys on the Christiansburg's routes. Overall, low-income individuals are more likely to use transit services – and, as captive transit users, they are also more likely to rely on transit to meet their everyday mobility needs.

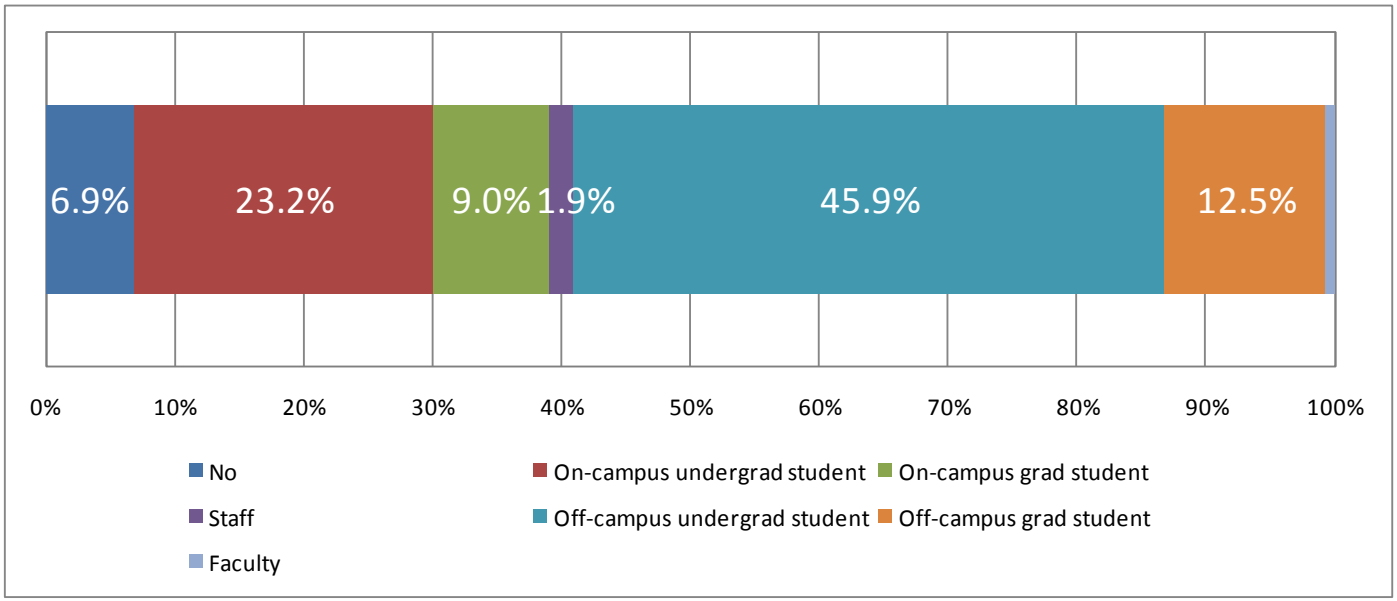
Question 11: Are you affiliated with Virginia Tech / VCOM?

Blacksburg (unfactored):



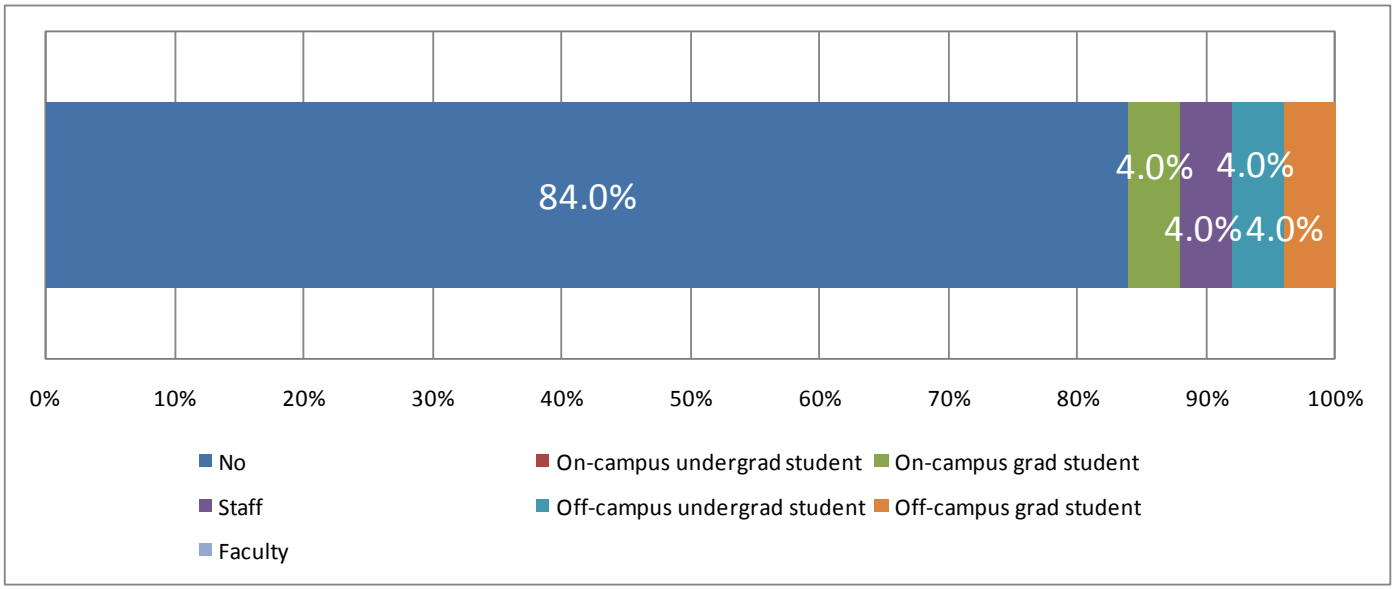
	Percentage	Responses
No	7.3%	171
On-campus undergrad student	20.8%	490
On-campus grad student	8.1%	191
Staff	1.9%	44
Off-campus undergrad student	49.5%	1,163
Off-campus grad student	11.6%	272
Faculty	0.9%	20
Total	100.0%	2,351

Blacksburg (factored):



	Percentage	Responses
No	6.9%	1,232
On-campus undergrad student	23.2%	4,171
On-campus grad student	9.0%	1,611
Staff	1.9%	337
Off-campus undergrad student	45.9%	8,243
Off-campus grad student	12.5%	2,248
Faculty	0.7%	125
Total	100.0%	17,967

Christiansburg:



	Percentage	Responses
No	84.0%	21
On-campus undergrad student	0.0%	0
On-campus grad student	4.0%	1
Staff	4.0%	1
Off-campus undergrad student	4.0%	1
Off-campus grad student	4.0%	1
Faculty	0.0%	0
Total	100.0%	25

Results

Nearly 93% of surveyed respondents on the Blacksburg BT routes were affiliated with VT or VCOM:

- 70.3% were undergraduate students
    - 49.5% resided off-campus
    - 20.8% resided on-campus
- 19.7% were graduate students
    - 11.6% resided off-campus
    - 8.1% resided on-campus
- 2.8% were staff/faculty

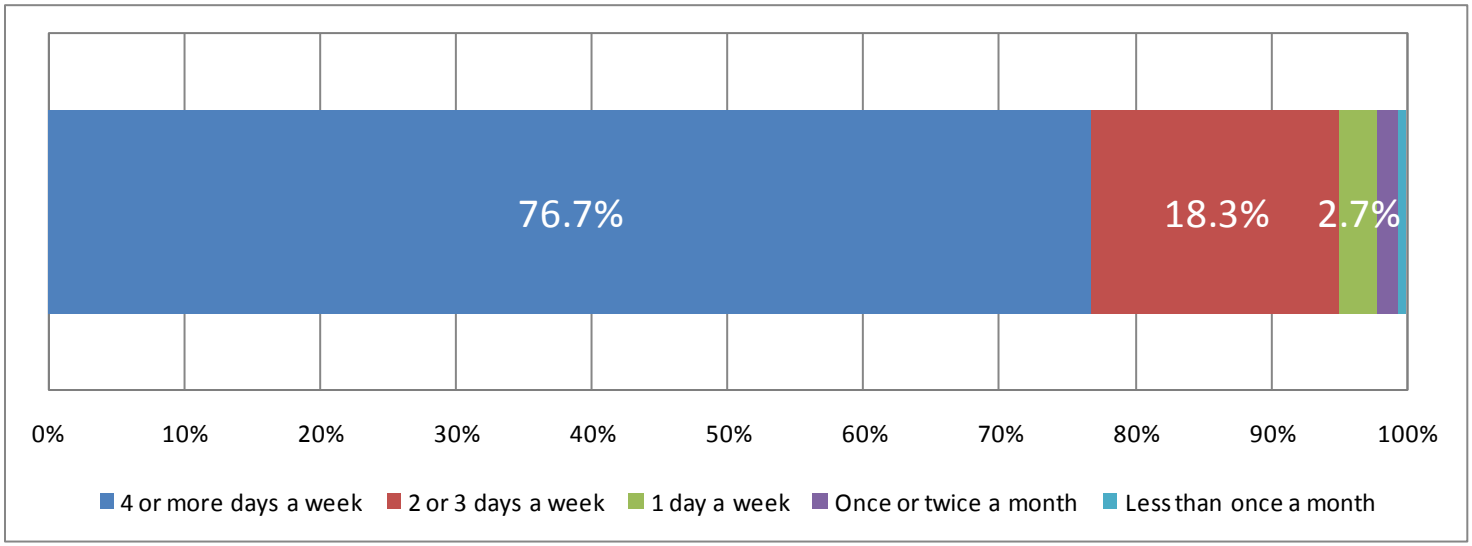
In stark contrast, in the surveyed Christiansburg transit market, 84% of respondents were not affiliated with local colleges.

Significance

Since such a large percentage of the surveyed riders are affiliated with VT/VCOM, it is probably safe to assume that they would make extensive use of transit services if those are made available to them. The results confirm that assumption, since the analysis shows that nine in 10 surveyed riders in Blacksburg self-identified as college students. It is crucial that BT caters their services to satisfy the needs of their primary customer base consisting of VT/VCOM-affiliated riders, but recognizes that the so-called "general public" is just as important, both in Christiansburg (where it is seemingly more predominant) and Blacksburg (where the primary user transit base consisting of college students is augmented with non-college affiliated general public).

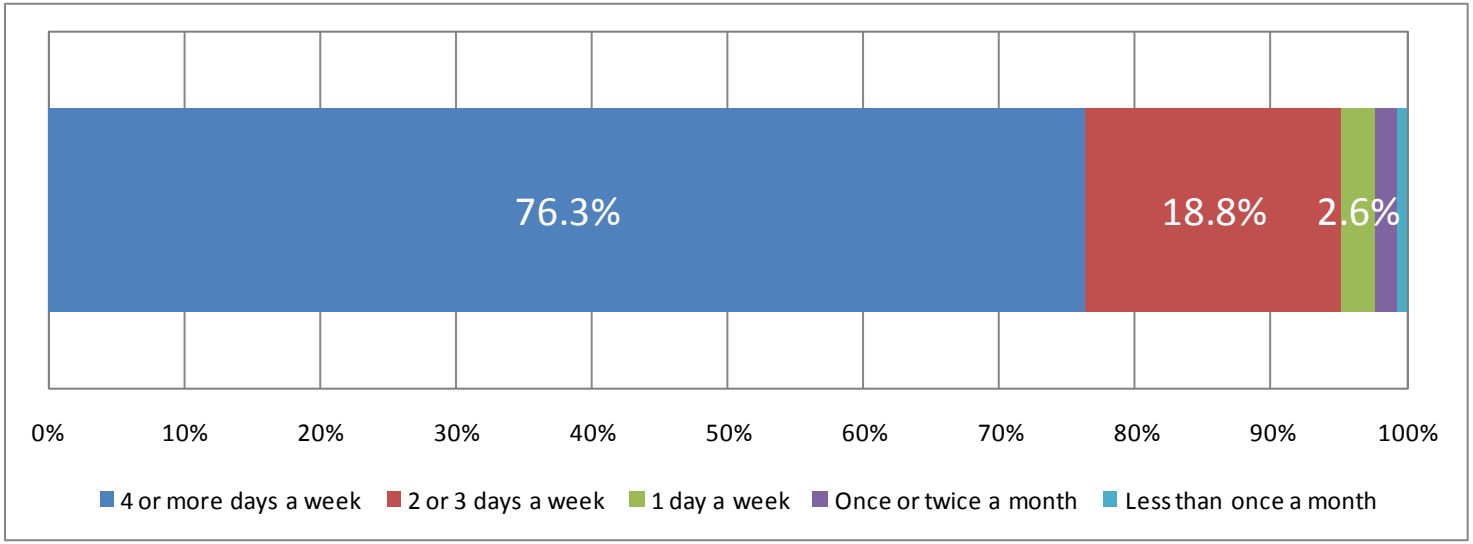
Question 12: How often do you typically ride with BT?

Blacksburg (unfactored):



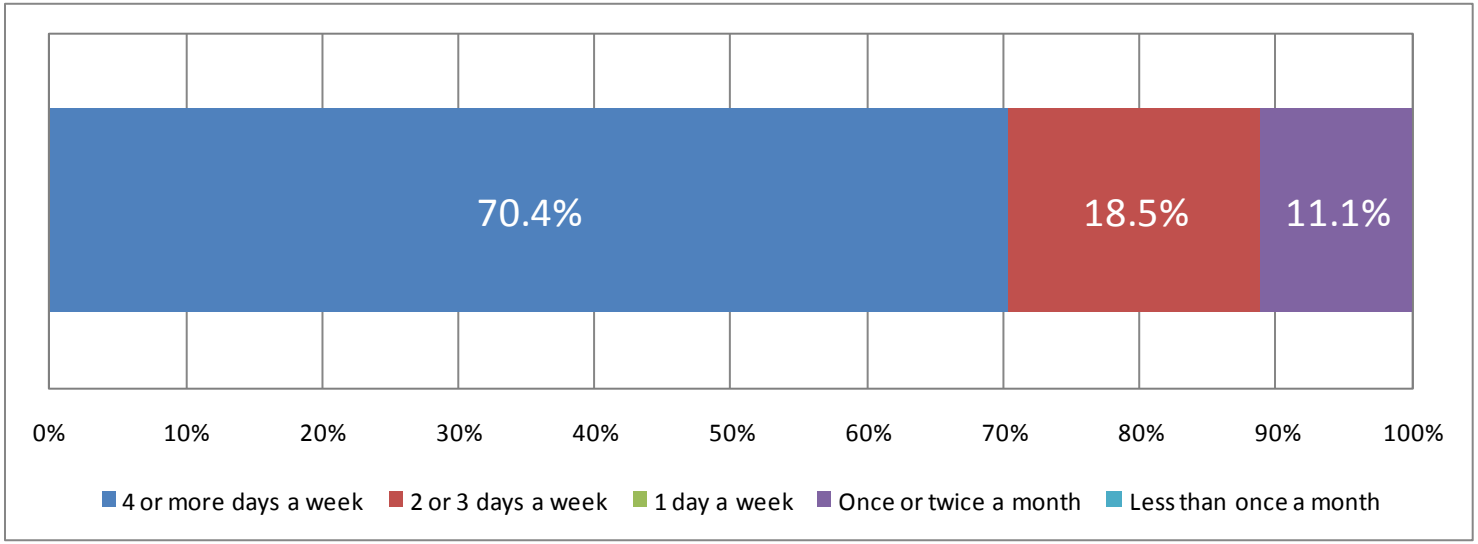
	Percentage	Responses
4 or more days a week	76.7%	1,807
2 or 3 days a week	18.3%	432
1 day a week	2.7%	64
Once or twice a month	1.6%	37
Less than once a month	0.7%	16
Total	100.0%	2,356

Blacksburg (factored):



	Percentage	Responses
4 or more days a week	76.3%	13,757
2 or 3 days a week	18.8%	3,390
1 day a week	2.6%	462
Once or twice a month	1.7%	299
Less than once a month	0.7%	125
Total	100.0%	18,033

Christiansburg:



	Percentage	Responses
4 or more days a week	70.4%	19
2 or 3 days a week	18.5%	5
1 day a week	0.0%	0
Once or twice a month	11.1%	3
Less than once a month	0.0%	0
Total	100.0%	27

Results

If we separate the results into three distinct categories: frequent riders (those who use BT 2 or 3 days per week or more); occasional riders (who ride it once a week /once or twice per month) and non-riders (who ride it less than once per month / or never take BT), we can conclude that:

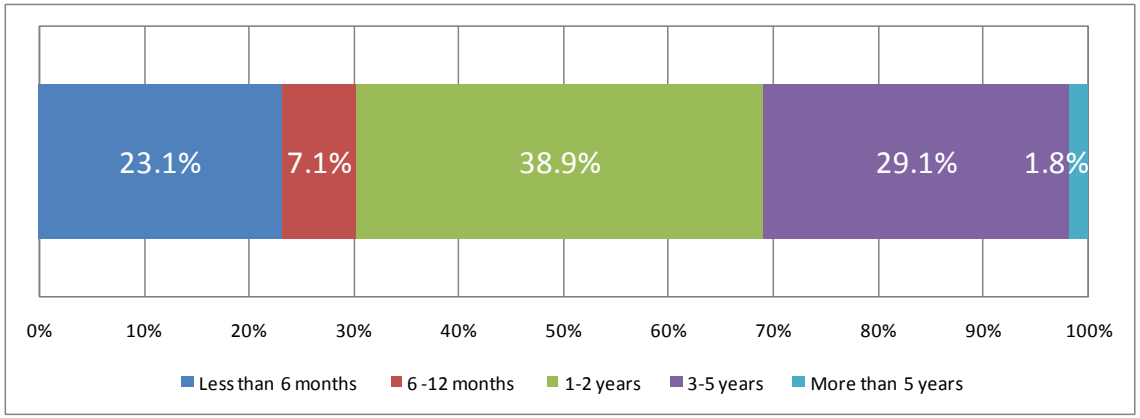
- Frequent riders tend to regularly patronize BT routes in both Blacksburg and Christiansburg transit markets, with 95% and 88.9% percent of the respondents utilizing transit services on a regular basis in those respective markets.
- Occasional riders comprise 4.3% of the surveyed riders in Blacksburg and 11.1% in Christiansburg.
- Only 0.7% of the respondents in Blacksburg (and none in Christiansburg) claimed to never (or almost never) use BT services.

Significance

The data suggests that most surveyed respondents are frequent transit riders who depend on BT to get around on a daily basis. The fairly high percentage of the respondents who use BT services occasionally suggests there exists an opportunity to target these groups and provide transit services tailored to suit their needs that would entice them to use transit more frequently, and possibly become regular riders.

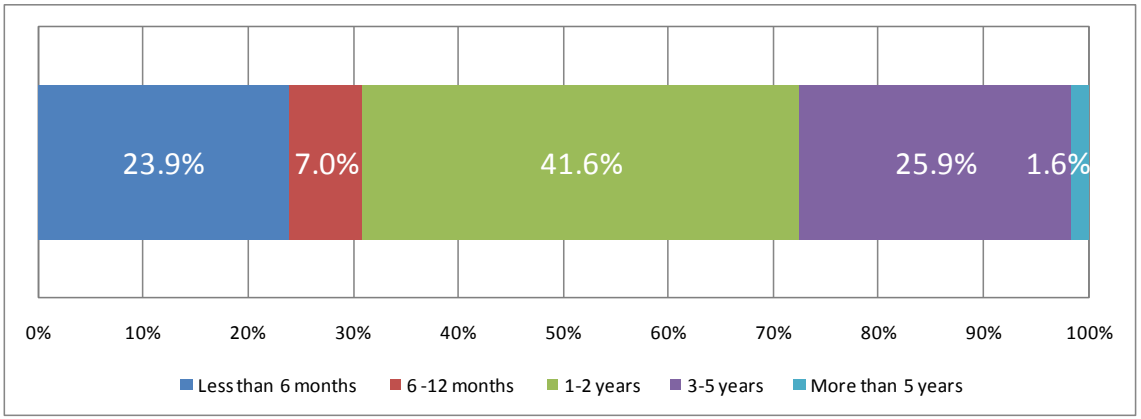
Question 13: How long have you been using BT's service?

Blacksburg (unfactored):



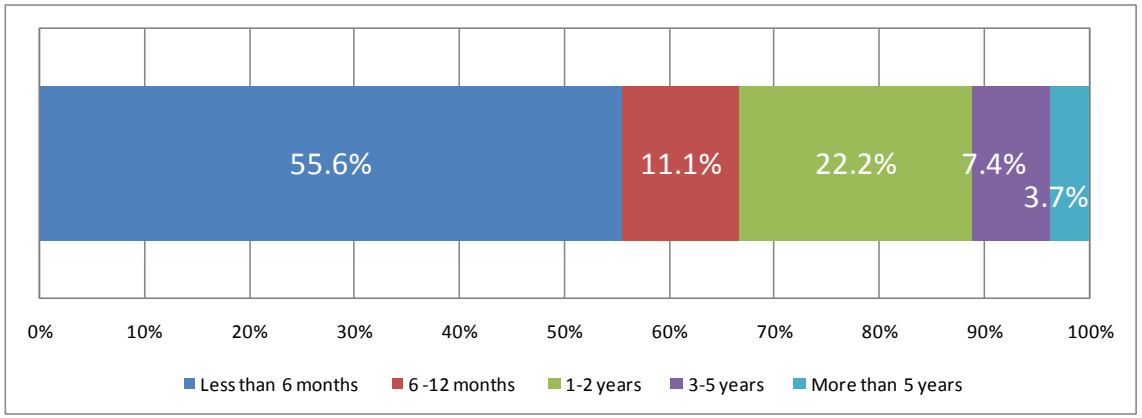
	Percentage	Responses
Less than 6 months	23.1%	544
6 -12 months	7.1%	167
1-2 years	38.9%	916
3-5 years	29.1%	684
More than 5 years	1.8%	43
Total	100.0%	2,354

Blacksburg (factored):



	Percentage	Responses
Less than 6 months	23.9%	4,302
6 -12 months	7.0%	1,259
1-2 years	41.6%	7,478
3-5 years	25.9%	4,654
More than 5 years	1.6%	285
Total	100.0%	17,978

Christiansburg:



	Percentage	Responses
Less than 6 months	55.6%	15
6 -12 months	11.1%	3
1-2 years	22.2%	6
3-5 years	7.4%	2
More than 5 years	3.7%	1
Total	100.0%	27

Results

About one in three of the surveyed riders in Blacksburg are fairly new to the bus system since they have been riding it for less than 1 year. In Christiansburg market, the ratio increases to two out of three respondents. Nearly 39% of the riders have used BT's services in Blacksburg for 1 to 3 years and close to 31% have used it for more than 3 years. Over 22% of the riders have used BT's services in Christiansburg for 1 to 3 years and over 11% have used it for more than 3 years.

Overall, about 70% of the surveyed riders have been using BT's services for more than 1 year on routes surveyed in Blacksburg (33% in Christiansburg).

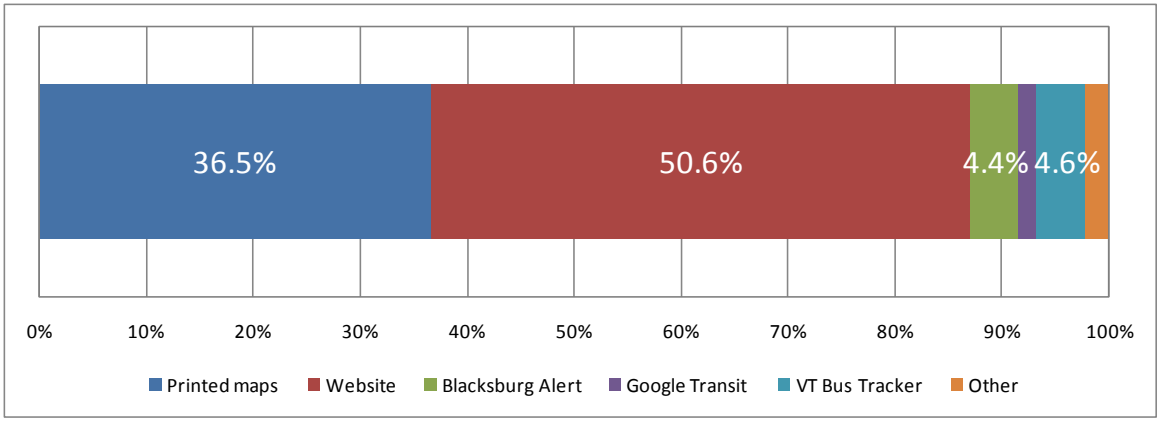
Significance

BT's riders are mostly established riders who have been utilizing the service for a few years. The BT services play an important role in their daily lives – they depend on it to meet their daily mobility needs and expect the service to continue to meet those needs. It also suggests the high quality of service provided by BT since the riders' retention rate is very high.

As important is the fact that one in every three of the surveyed riders in Blacksburg (and two in every three in Christiansburg) is fairly new to BT and the services the agency provides – these riders are quite likely to be retained and become return riders if the provides service continues to be high quality and continuously improving and they perceive it be a viable alternative to other modes of transportation. Lastly, the "college student factor" can be noticed in the analyzed data – in Blacksburg, 69.1% of the surveyed rides have used BT for less than two years, and 98.2% have used it for less than five years; considering the fact that students comprise the majority of transit riders in Blacksburg, the results are in line with the number of years typical college students reside where their college is located.

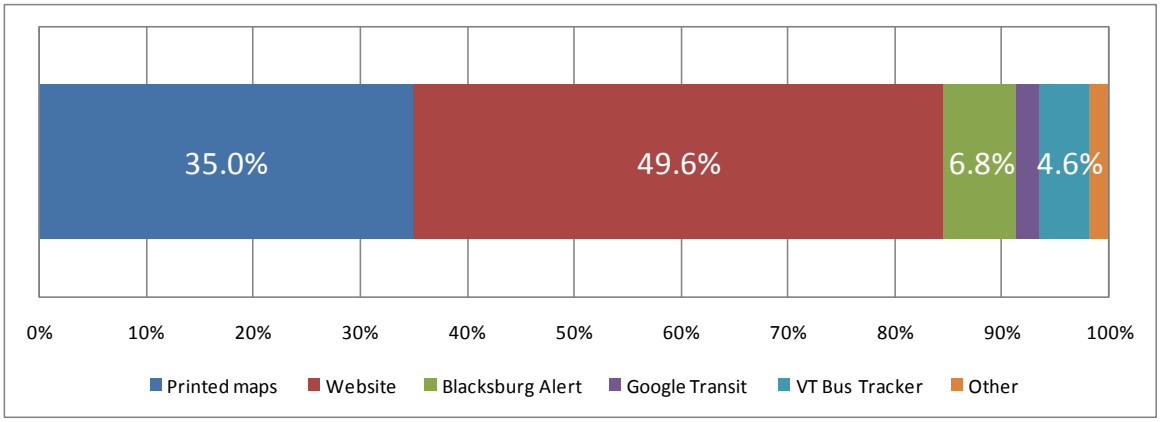
Question 14: How do you primarily access BT's schedule/route information?

Blacksburg (unfactored):



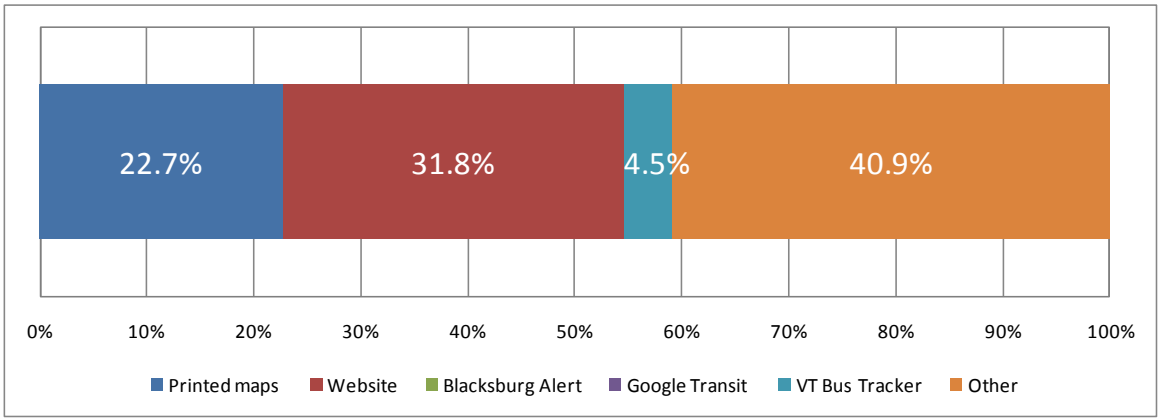
	Percentage	Responses
Printed maps	36.5%	851
Website	50.6%	1,178
Blacksburg Alert	4.4%	102
Google Transit	1.8%	41
VT Bus Tracker	4.6%	108
Other	2.1%	49
Total	100.0%	2,329

Blacksburg (factored):



	Percentage	Responses
Printed maps	35.0%	6,235
Website	49.6%	8,849
Blacksburg Alert	6.8%	1,210
Google Transit	2.1%	376
VT Bus Tracker	4.6%	829
Other	1.8%	329
Total	100.0%	17,829

Christiansburg:



	Percentage	Responses
Printed maps	22.7%	5
Website	31.8%	7
Blacksburg Alert	0.0%	0
Google Transit	0.0%	0
VT Bus Tracker	4.5%	1
Other	40.9%	9
Total	100.0%	22

Results

About half of the respondents in the Blacksburg transit market primarily use BT's website to access schedule/route information. Printed maps are used by 36.5% of the respondents, while Blacksburg Alert, VT Bus Tracker and Google Transit combined are primarily used by 10.8% of the respondents. In Christiansburg, the surveyed riders primarily access BT's route/scheduling information via other means (40.9%) such as the phone or through the word of mouth, followed by the agency's website (31.8%), printed maps (22.7%), and VT Bus Tracker (4.5%).

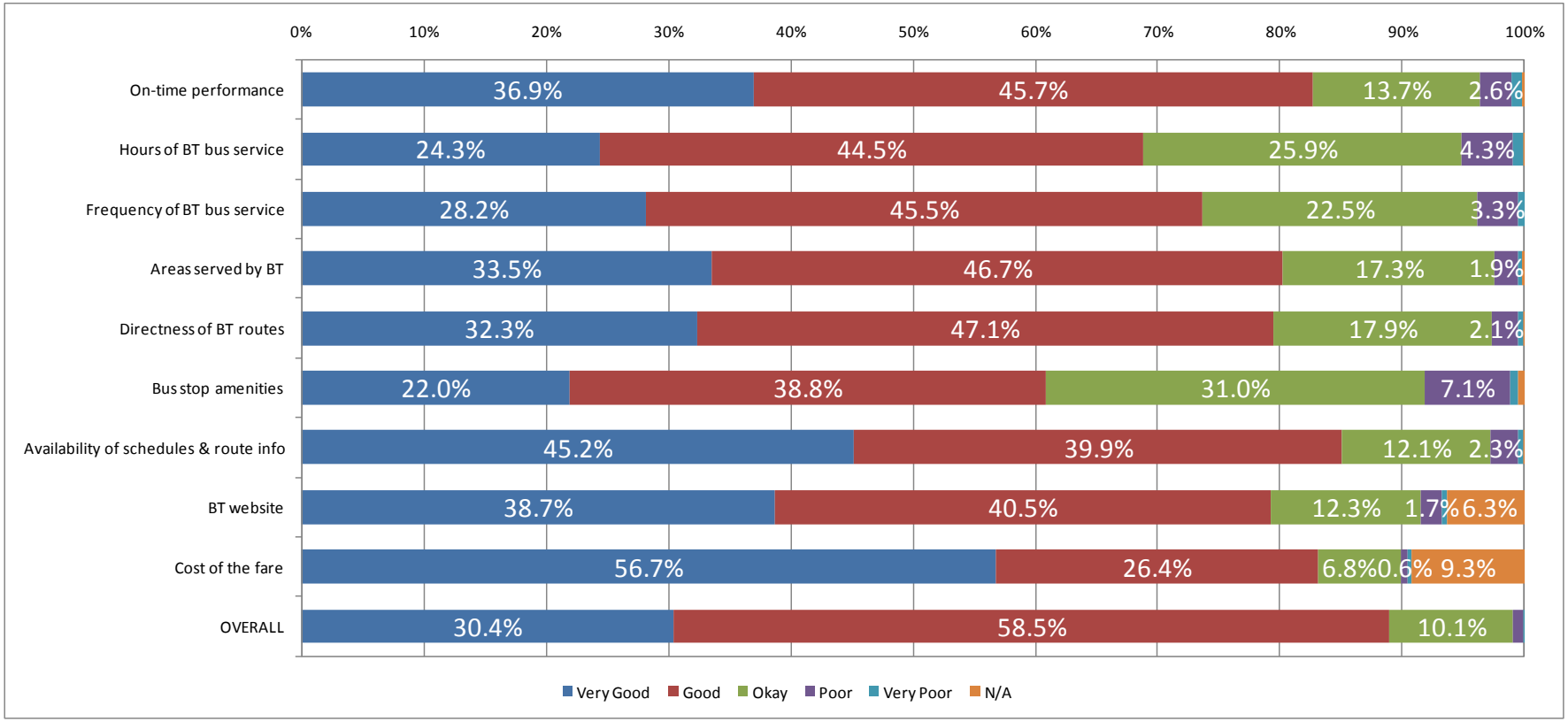
Significance

BT's riders primarily rely on the agency's website and printed maps to primarily access BT's schedule and route information. In Christiansburg, many of the surveyed access transit information via phone. More recently introduced means of getting transit information such as Blacksburg Alert, VT Bus Tracker, and Google Transit are quite popular with riders, but not as popular as BT's main website or printed maps. Perhaps better marketing of available resources to the existing and potential BT customers could result in increased usage of those resources. Since most riders rely on the website and printed maps for transit information, it is important to ensure both provide up-to-date accurate information.

2.3 *Rider Transit Service Perceptions*

Question 15: Please rate the following service characteristics:

Blacksburg (unfactored):



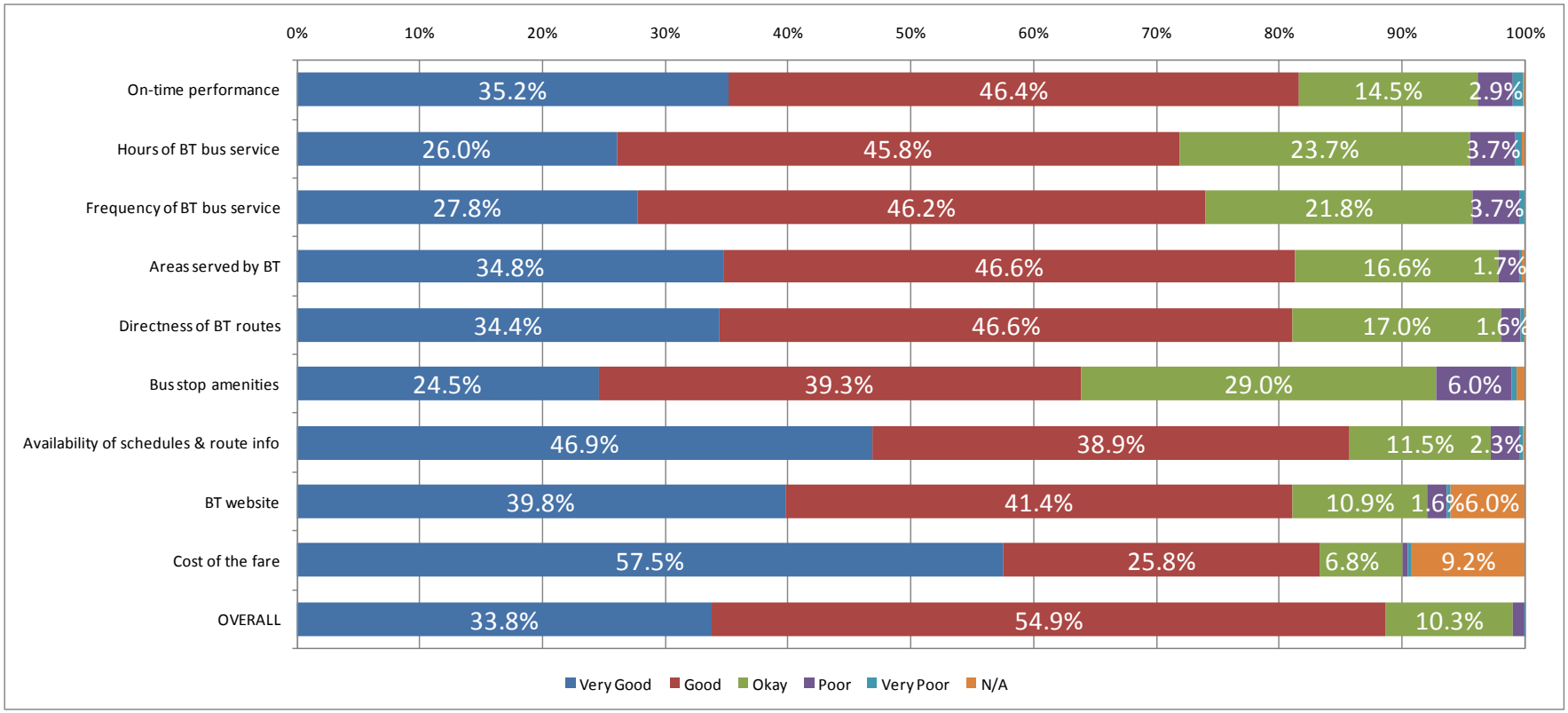
Blacksburg: Number of Respondents (unfactored):

	Very good	Good	Okay	Poor	Very poor	N/A
On-time performance	859	1,064	318	60	21	4
Hours of BT bus service	567	1,037	604	99	19	3
Frequency of BT bus service	654	1,056	522	77	13	0
Areas served by BT	777	1,082	400	45	7	5
Directness of BT routes	747	1,090	413	49	12	1
Bus stop amenities	509	900	718	164	14	12
Availability of schedules & route info	1,046	923	280	53	9	3
BT website	897	939	286	40	10	146
Cost of the fare	1,317	612	158	13	6	215
OVERALL	696	1,338	232	20	1	0

Blacksburg: Percentage of Responses (unfactored):

	Very good	Good	Okay	Poor	Very poor	N/A
On-time performance	36.9%	45.7%	13.7%	2.6%	0.9%	0.2%
Hours of BT bus service	24.3%	44.5%	25.9%	4.3%	0.8%	0.1%
Frequency of BT bus service	28.2%	45.5%	22.5%	3.3%	0.6%	0.0%
Areas served by BT	33.5%	46.7%	17.3%	1.9%	0.3%	0.2%
Directness of BT routes	32.3%	47.1%	17.9%	2.1%	0.5%	0.0%
Bus stop amenities	22.0%	38.8%	31.0%	7.1%	0.6%	0.5%
Availability of schedules & route info	45.2%	39.9%	12.1%	2.3%	0.4%	0.1%
BT website	38.7%	40.5%	12.3%	1.7%	0.4%	6.3%
Cost of the fare	56.7%	26.4%	6.8%	0.6%	0.3%	9.3%
OVERALL	30.4%	58.5%	10.1%	0.9%	0.0%	0.0%

Blacksburg (factored):



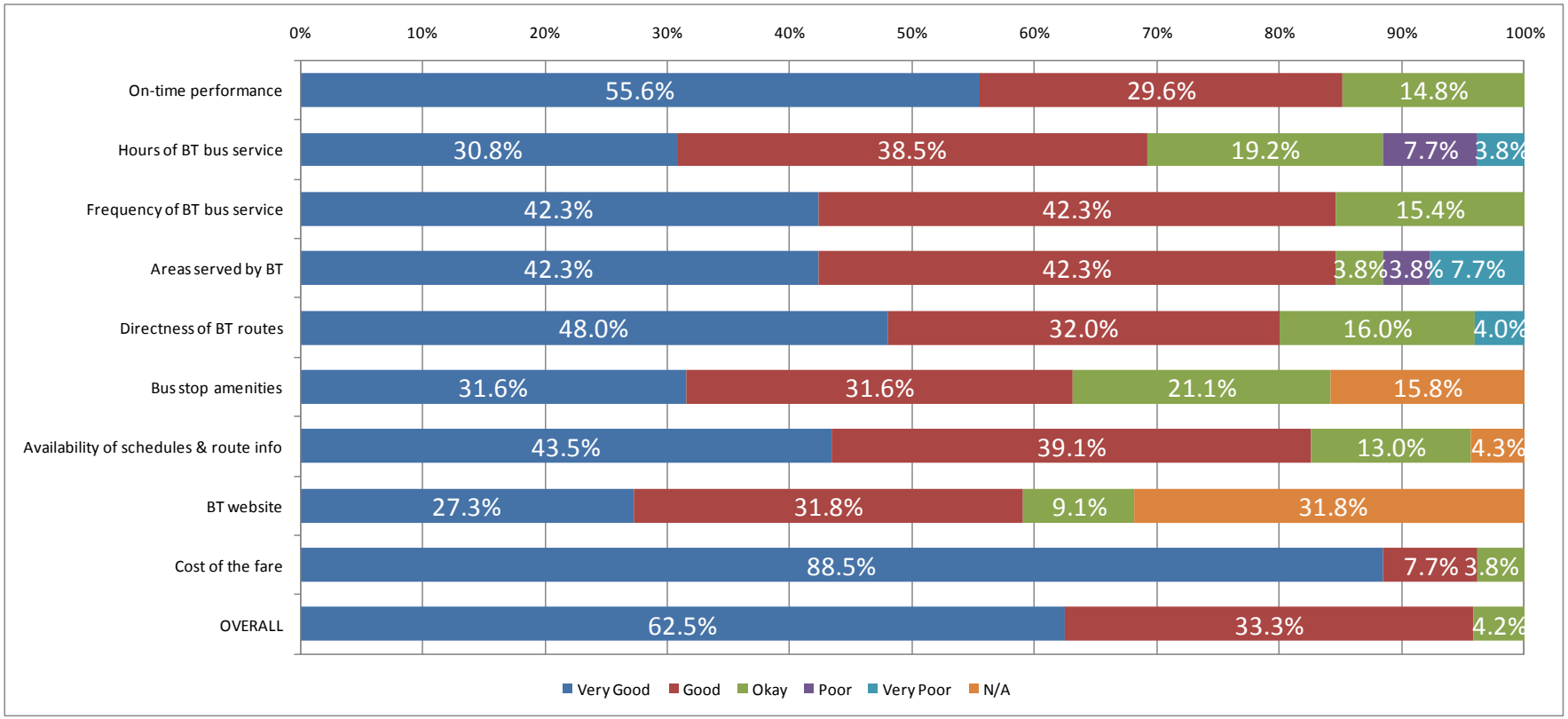
Blacksburg: Number of Respondents (factored):

	Very good	Good	Okay	Poor	Very poor	N/A
On-time performance	6,245	8,243	2,582	507	146	25
Hours of BT bus service	4,625	8,144	4,207	649	101	38
Frequency of BT bus service	4,911	8,166	3,856	662	80	0
Areas served by BT	6,130	8,209	2,926	299	40	30
Directness of BT routes	6,061	8,208	2,991	274	57	3
Bus stop amenities	4,327	6,930	5,123	1,065	86	107
Availability of schedules & route info	8,266	6,850	2,019	408	66	17
BT website	7,011	7,300	1,923	285	63	1,055
Cost of the fare	10,108	4,534	1,186	76	40	1,622
OVERALL	5,544	9,001	1,687	156	4	0

Blacksburg: Percentage of Respondents (factored):

	Very good	Good	Okay	Poor	Very poor	N/A
On-time performance	35.2%	46.4%	14.5%	2.9%	0.8%	0.1%
Hours of BT bus service	26.0%	45.8%	23.7%	3.7%	0.6%	0.2%
Frequency of BT bus service	27.8%	46.2%	21.8%	3.7%	0.5%	0.0%
Areas served by BT	34.8%	46.6%	16.6%	1.7%	0.2%	0.2%
Directness of BT routes	34.4%	46.6%	17.0%	1.6%	0.3%	0.0%
Bus stop amenities	24.5%	39.3%	29.0%	6.0%	0.5%	0.6%
Availability of schedules & route info	46.9%	38.9%	11.5%	2.3%	0.4%	0.1%
BT website	39.8%	41.4%	10.9%	1.6%	0.4%	6.0%
Cost of the fare	57.5%	25.8%	6.8%	0.4%	0.2%	9.2%
OVERALL	33.8%	54.9%	10.3%	1.0%	0.0%	0.0%

Christiansburg:



Christiansburg: Number of Respondents:

	Very good	Good	Okay	Poor	Very poor	N/A
On-time performance	15	8	4	0	0	0
Hours of BT bus service	8	10	5	2	1	0
Frequency of BT bus service	11	11	4	0	0	0
Areas served by BT	11	11	1	1	2	0
Directness of BT routes	12	8	4	0	1	0
Bus stop amenities	6	6	4	0	0	3
Availability of schedules & route info	10	9	3	0	0	1
BT website	6	7	2	0	0	7
Cost of the fare	23	2	1	0	0	0
OVERALL	15	8	1	0	0	0

Christiansburg: Percentage of Responses:

	Very good	Good	Okay	Poor	Very poor	N/A
On-time performance	55.6%	29.6%	14.8%	0.0%	0.0%	0.0%
Hours of BT bus service	30.8%	38.5%	19.2%	7.7%	3.8%	0.0%
Frequency of BT bus service	42.3%	42.3%	15.4%	0.0%	0.0%	0.0%
Areas served by BT	42.3%	42.3%	3.8%	3.8%	7.7%	0.0%
Directness of BT routes	48.0%	32.0%	16.0%	0.0%	4.0%	0.0%
Bus stop amenities	31.6%	31.6%	21.1%	0.0%	0.0%	15.8%
Availability of schedules & route info	43.5%	39.1%	13.0%	0.0%	0.0%	4.3%
BT website	27.3%	31.8%	9.1%	0.0%	0.0%	31.8%
Cost of the fare	88.5%	7.7%	3.8%	0.0%	0.0%	0.0%
OVERALL	62.5%	33.3%	4.2%	0.0%	0.0%	0.0%

Results

Overall, the surveyed riders were satisfied with BT's service characteristics: 88.9% of the respondents rated BT's service characteristics as 'better than average' ('good or very good') in the Blacksburg market and 95.8% in the Christiansburg market. Three service characteristics received 80 percent plus 'better than average' rating in the Blacksburg market: cost of the fare, on-time performance, and availability of schedules and route information. In the Christiansburg market, in addition to the qualities just mentioned, the riders were also very pleased with the frequency of BT service and areas served by BT.

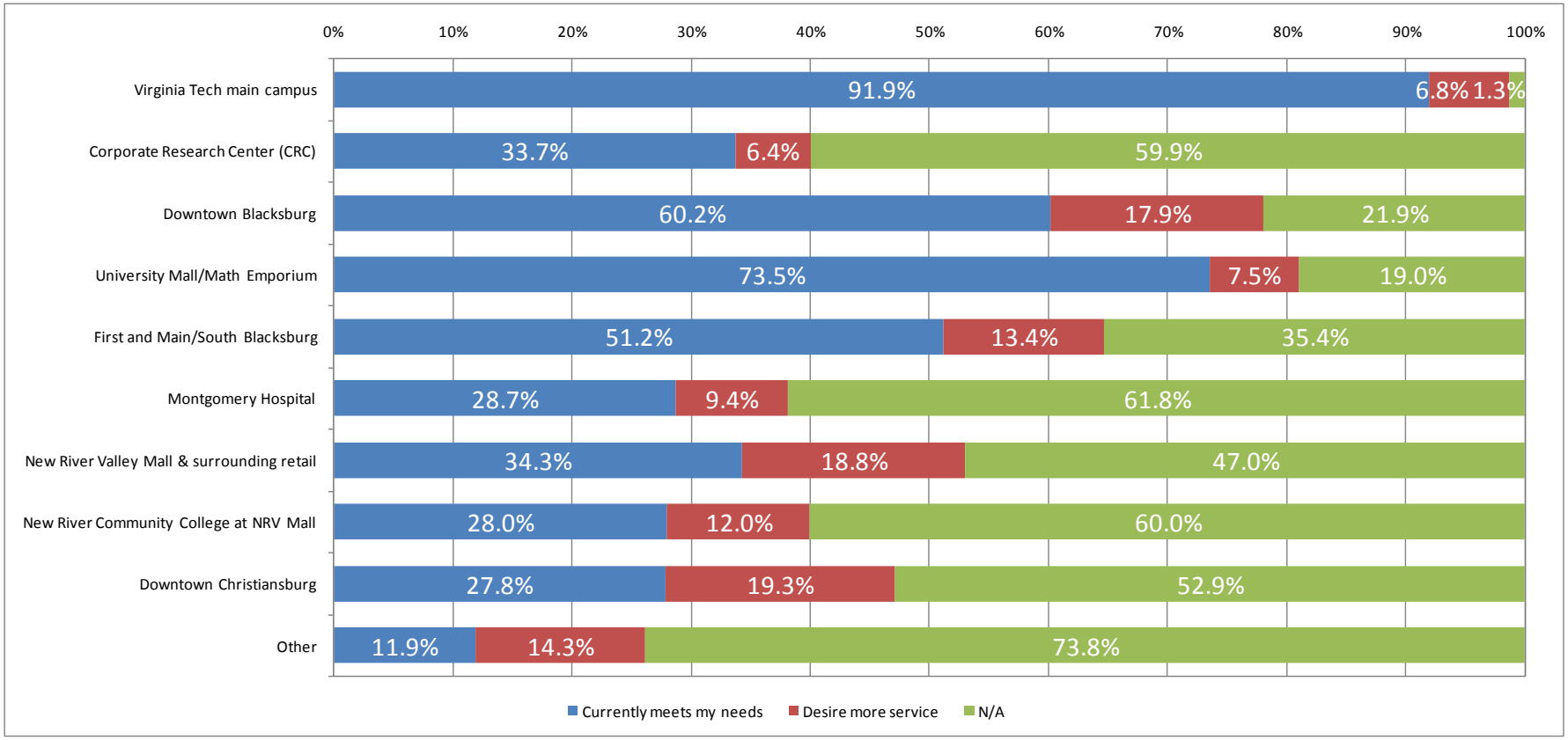
In terms of the areas for improvement, the riders noted that bus stop amenities, hours of service, and frequency of service were mostly lacking in both the Blacksburg and Christiansburg transit markets (rating of 'okay' or worse). More than 39% of riders in the Blacksburg market assigned an 'okay' or worse rating (including 'poor' and 'very poor') to the existing BT bus stop amenities, followed by over 31% in terms of hours of service, and more than 26% frequency of service-wise. Overall, the one service characteristic riders were the most displeased with were the bus stop amenities, with nearly 8% assigning it ratings of 'poor' and 'very poor.'

Significance

The overall data suggests that BT service is perceived to be very good. The riders were particularly satisfied with the cost of service, on-time performance, and availability of transit information. However, the results also suggest that there are a few service characteristics in need of improvement: capital needs such as the bus stop amenities, and operational/service needs, including the hours of service and frequency of service. BT should consider creating an infrastructure plan and database (maybe a result of a planning study) compiling and rating its existing bus top amenities and identifying the specific bus stops where waiting amenities are necessary. The agency might also want to consider extending the existing hours of service and frequency of service, particularly on its busiest routes.

Question 16: Please rate BT's ability to connect you to the following locations:

Blacksburg (unfactored):



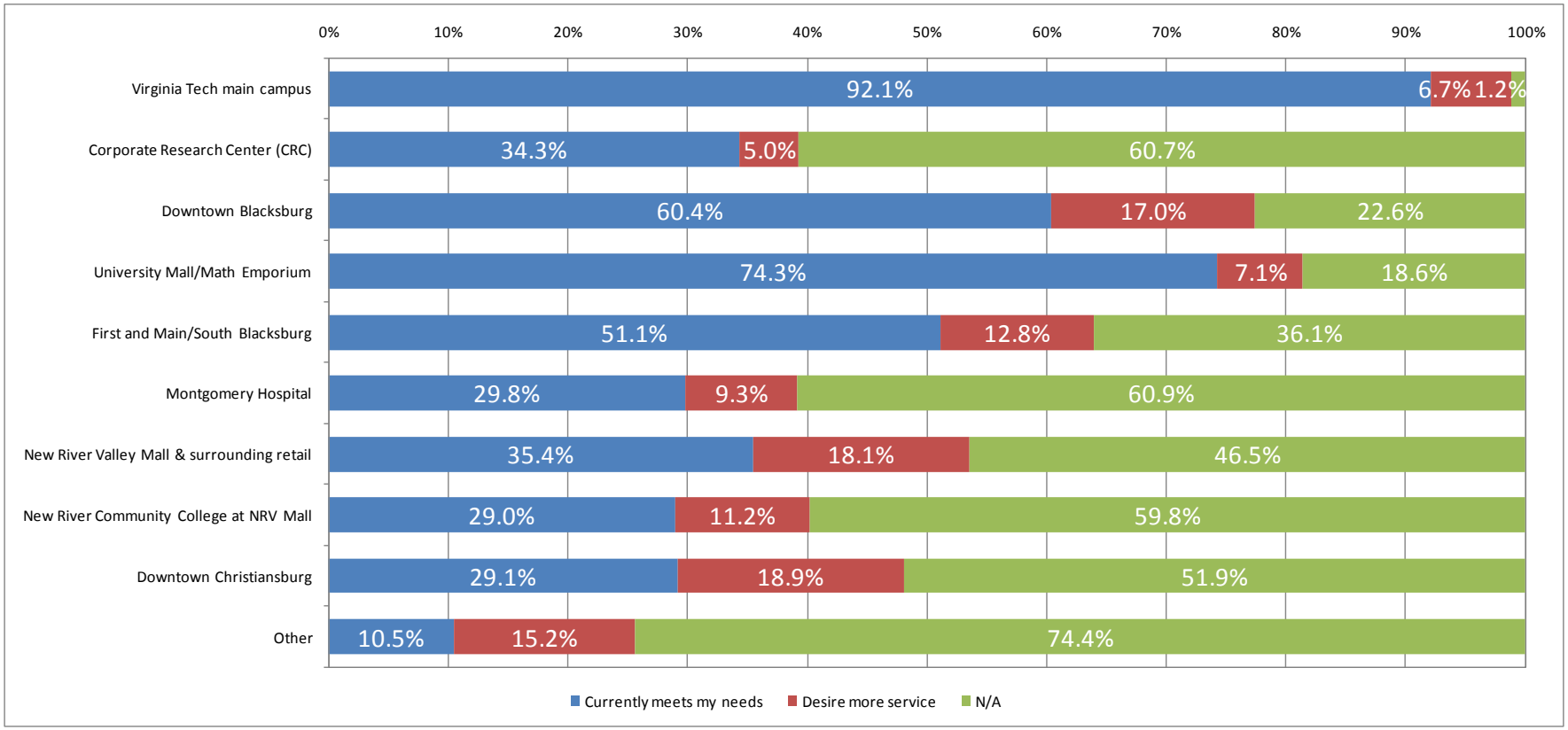
Blacksburg: Number of Respondents (unfactored):

	Currently meets my needs	Desire more service	N/A
Virginia Tech main campus	2,100	155	30
Corporate Research Center (CRC)	758	143	1,348
Downtown Blacksburg	1,360	404	496
University Mall/Math Emporium	1,663	169	430
First and Main/South Blacksburg	1,148	301	793
Montgomery Hospital	642	211	1,381
New River Valley Mall & surrounding retail	770	422	1,055
New River Community College at NRV Mall	626	268	1,341
Downtown Christiansburg	624	432	1,187
Other	56	67	347

Blacksburg: Percentage of Respondents (unfactored):

	Currently meets my needs	Desire more service	N/A
Virginia Tech main campus	91.9%	6.8%	1.3%
Corporate Research Center (CRC)	33.7%	6.4%	59.9%
Downtown Blacksburg	60.2%	17.9%	21.9%
University Mall/Math Emporium	73.5%	7.5%	19.0%
First and Main/South Blacksburg	51.2%	13.4%	35.4%
Montgomery Hospital	28.7%	9.4%	61.8%
New River Valley Mall & surrounding retail	34.3%	18.8%	47.0%
New River Community College at NRV Mall	28.0%	12.0%	60.0%
Downtown Christiansburg	27.8%	19.3%	52.9%
Other	11.9%	14.3%	73.8%

Blacksburg (factored):



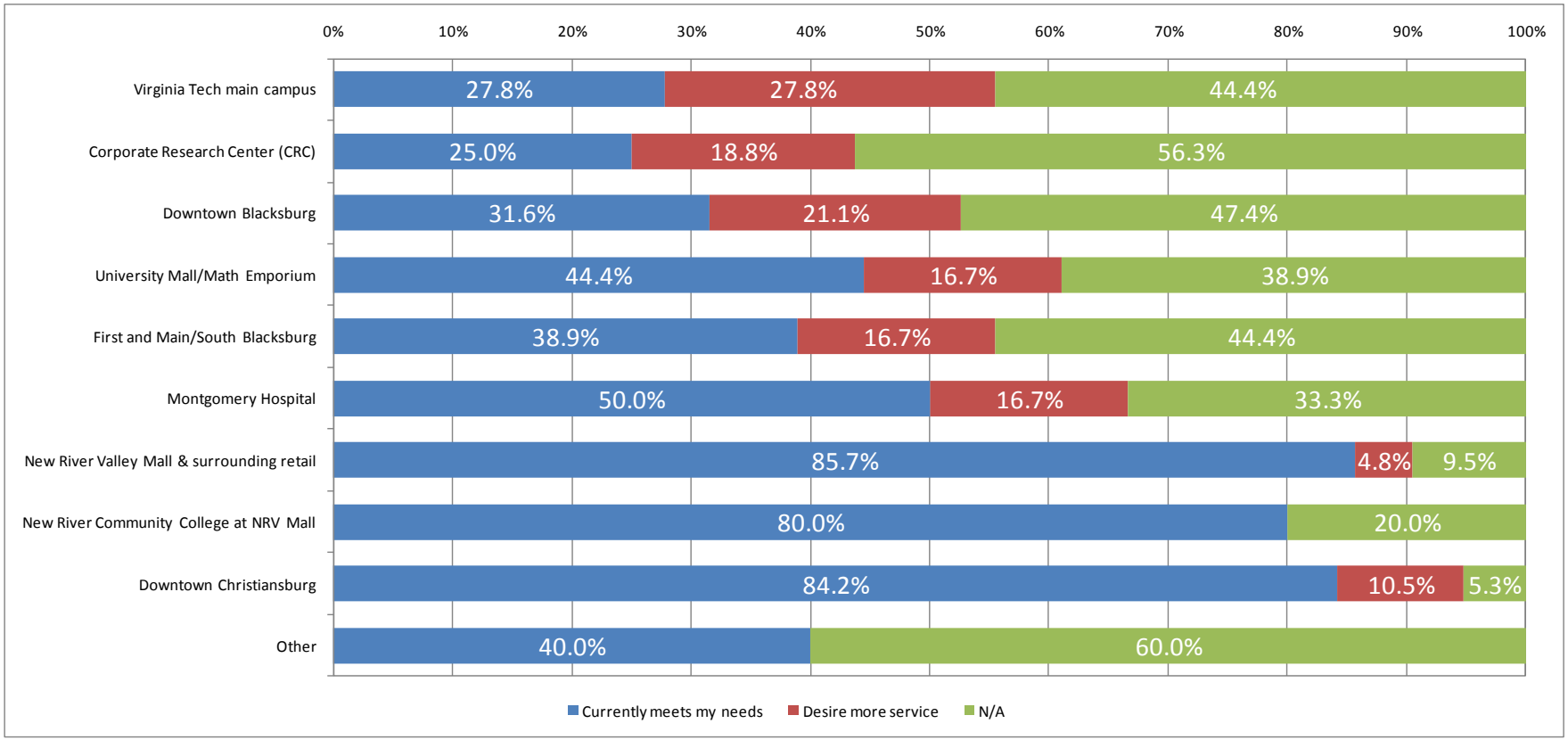
Blacksburg: Number of Respondents (factored):

	Currently meets my needs	Desire more service	N/A
Virginia Tech main campus	16,034	1,160	208
Corporate Research Center (CRC)	5,848	850	10,340
Downtown Blacksburg	10,360	2,915	3,875
University Mall/Math Emporium	12,768	1,222	3,196
First and Main/South Blacksburg	8,667	2,170	6,118
Montgomery Hospital	5,048	1,578	10,299
New River Valley Mall & surrounding retail	6,025	3,081	7,900
New River Community College at NRV Mall	4,901	1,903	10,117
Downtown Christiansburg	4,948	3,213	8,823
Other	353	513	2,512

Blacksburg: Percentage of Respondents (factored):

	Currently meets my needs	Desire more service	N/A
Virginia Tech main campus	92.1%	6.7%	1.2%
Corporate Research Center (CRC)	34.3%	5.0%	60.7%
Downtown Blacksburg	60.4%	17.0%	22.6%
University Mall/Math Emporium	74.3%	7.1%	18.6%
First and Main/South Blacksburg	51.1%	12.8%	36.1%
Montgomery Hospital	29.8%	9.3%	60.9%
New River Valley Mall & surrounding retail	35.4%	18.1%	46.5%
New River Community College at NRV Mall	29.0%	11.2%	59.8%
Downtown Christiansburg	29.1%	18.9%	51.9%
Other	10.5%	15.2%	74.4%

Christiansburg:



Christiansburg: Number of Respondents:

	Currently meets my needs	Desire more service	N/A
Virginia Tech main campus	5	5	8
Corporate Research Center (CRC)	4	3	9
Downtown Blacksburg	6	4	9
University Mall/Math Emporium	8	3	7
First and Main/South Blacksburg	7	3	8
Montgomery Hospital	9	3	6
New River Valley Mall & surrounding retail	18	1	2
New River Community College at NRV Mall	16	0	4
Downtown Christiansburg	16	2	1
Other	2	0	3

Christiansburg: Percentage of Respondents:

	Currently meets my needs	Desire more service	N/A
Virginia Tech main campus	27.8%	27.8%	44.4%
Corporate Research Center (CRC)	25.0%	18.8%	56.3%
Downtown Blacksburg	31.6%	21.1%	47.4%
University Mall/Math Emporium	44.4%	16.7%	38.9%
First and Main/South Blacksburg	38.9%	16.7%	44.4%
Montgomery Hospital	50.0%	16.7%	33.3%
New River Valley Mall & surrounding retail	85.7%	4.8%	9.5%
New River Community College at NRV Mall	80.0%	0.0%	20.0%
Downtown Christiansburg	84.2%	10.5%	5.3%
Other	40.0%	0.0%	60.0%

Results

The ease of access to major destinations in a given service area typically presents a dilemma for transit agencies. How much transit service is 'enough'? Is the existing demand being met or would increasing capacity make sense? Is transit coverage and provided transit options in the service area adequate?

In BT's service area, the riders believe that the agency has provided adequate connections to places that 'matter the most' in Blacksburg and Christiansburg. In the Blacksburg service market, BT's existing connections to/from VT campus were perceived to currently meet the riders' needs - 92% of the respondents indicated so. The connections to/from University Mall/Math Emporium and downtown Blacksburg seemed to be adequate based on their opinion as well. The riders in the Blacksburg market area desired more transit connections to/from downtown Christiansburg and New River Valley Mall in particular. In the Christiansburg transit market area, the riders perceived the existing transit connections to/from New River Valley Mall, New River Community College, and downtown Christiansburg to be adequate. On the other end of the spectrum were the VT main campus, downtown Blacksburg, and Corporate Research Center (CRC), points of interest riders desired more connections to/from.

The riders also were offered a chance to write-in any additional locations they thought were in need of more transit service in the BT service area. The most common locations listed were the following: Foxridge Apartment Homes; Hethwood Square Shopping Center; more weekend service; longer service hours, particularly on the weekends; Patrick Henry Centre shopping Center; Tom's Creek; Litton-Reaves; Duck Pond (parking lot and the engineering school).

Interestingly, many riders (about 60% of the respondents) in the Blacksburg transit market were *not* very concerned with transit connections to/from Montgomery Hospital, New River Community College, and CRC. In the Christiansburg market, the same could be stated in regards to CRC (56% 'N/A' response rate).

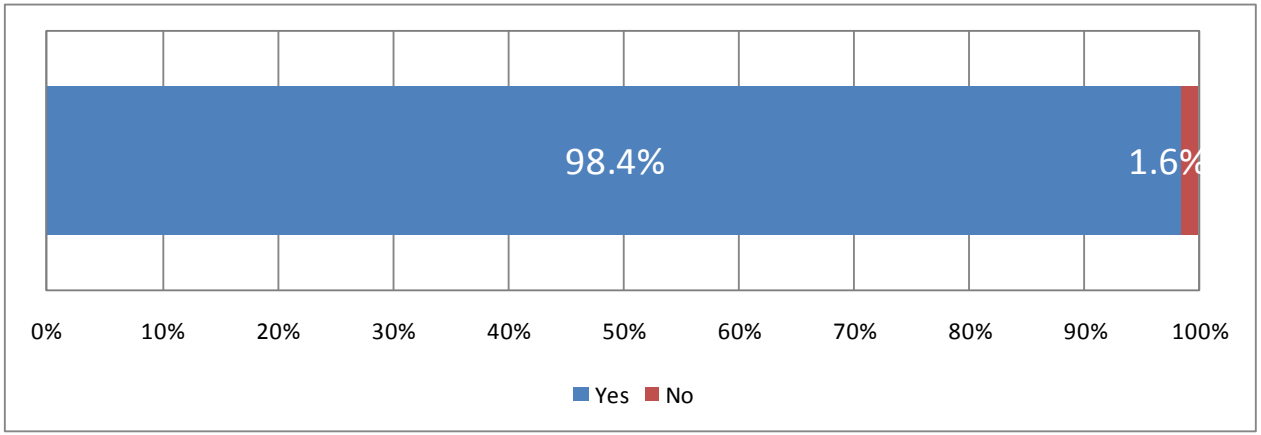
Significance

The analyzed data suggests that service connections to the specific locations noted on the survey instrument were perceived to be adequate. However, both the riders in the Blacksburg and Christiansburg transit market area indicated that they desire more connecting service between downtown Blacksburg and downtown Christiansburg. BT ought to consider expanding and/or initiating new type of service to/from the two downtowns given the high interest and demand for such service. Blacksburg area riders also desired more service to the New River Valley Mall, while Christiansburg area riders desired more connectivity to the CRC; however, these two requests can probably be served by the existing BT services as long as the transit location accessibility is adequate, including facilitating the ease of transfers to/from different routes (if needed) reaching those destinations for riders from both Blacksburg and Christiansburg.

Question 17a: Would you recommend BT to a friend or colleague?

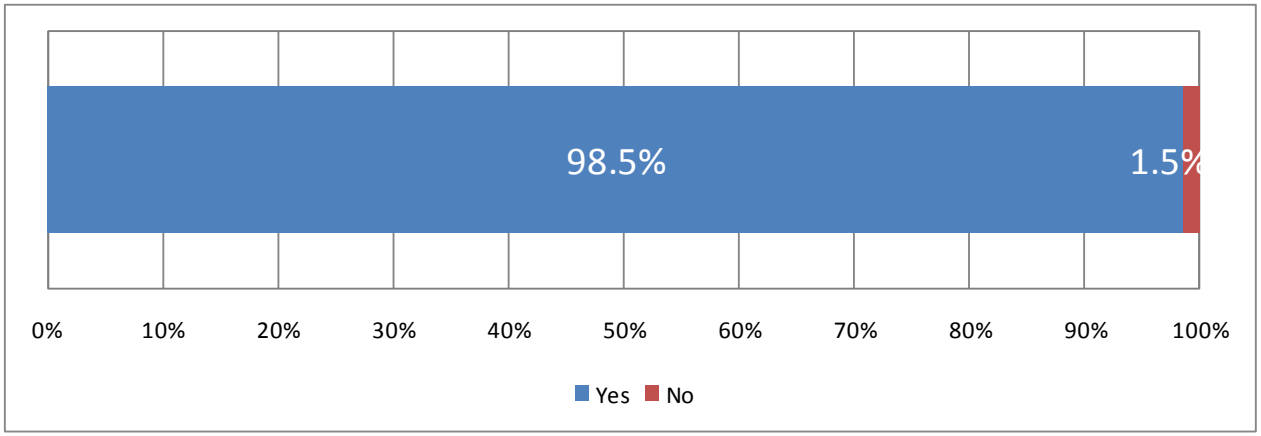
17b: Why or why not?

Blacksburg (unfactored):



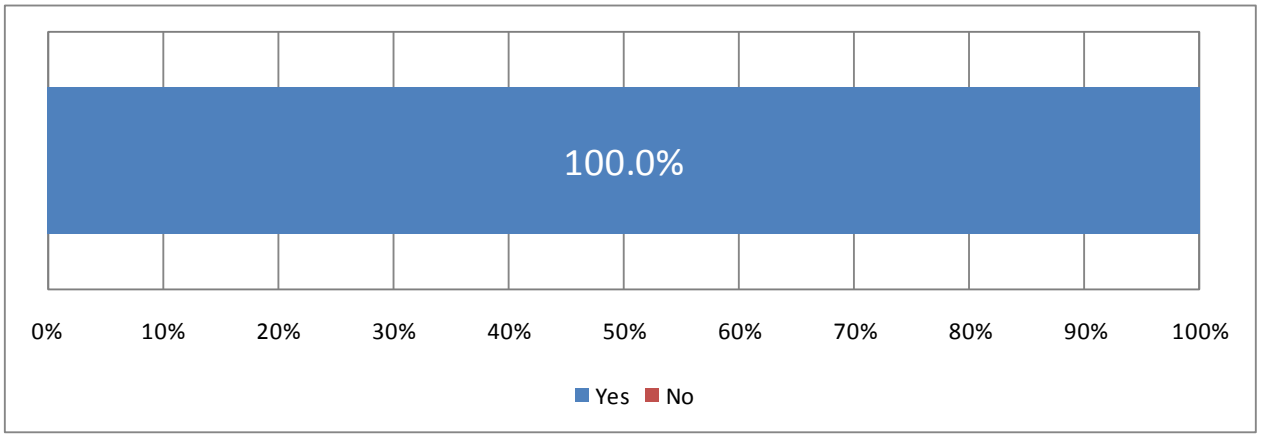
	Percentage	Responses
Yes	98.4%	2,242
No	1.6%	36
Total	100.0%	2,278

Blacksburg (factored):



	Percentage	Responses
Yes	98.5%	17,090
No	1.5%	252
Total	100.0%	17,342

Christiansburg:



	Percentage	Responses
Yes	100.0%	23
No	0.0%	0
Total	100.0%	23

Results

The last question on the survey instrument asked the existing BT's riders whether they would recommend BT services to prospective riders, including their friends or colleagues. The respondents claimed they would do so nearly in unison, but the write-in section unearthed a few caveats that would come along with those recommendations. While the riders praised BT for proving a very convenient, reliable, timely, and cheap or free transportation (that 'definitely beats parking fees at VT!' and is 'cheaper than driving'), some dissatisfaction seeped through in some of the notes: there are not enough bus shelters; weekend service is not as frequent and not late enough; transfers are not convenient and confusing (especially Progress Street – Tom's Creek); North Main route often experiences delays, especially on Friday.

Significance

The answers could make BT proud of the service they have provided to the area's residents, students, and visitors. Almost every surveyed rider would recommend BT services to their friends or colleagues – that is nearly 2,300 riders willing to vouch for BT's services based on their personal direct experiences!

However, any type of business or service, including transit service, always has a few disgruntled customers; the major themes brought up by unsatisfied BT's customers mostly dealt with service characteristics that were already mentioned in previous answers in the survey instrument as being in need of improvements – i.e. the need for more bus stop amenities; extended service hours, particularly on the weekends; or the need for better ease of intra-route transfers. It is imperative that BT takes these 'recommendations' under consideration.

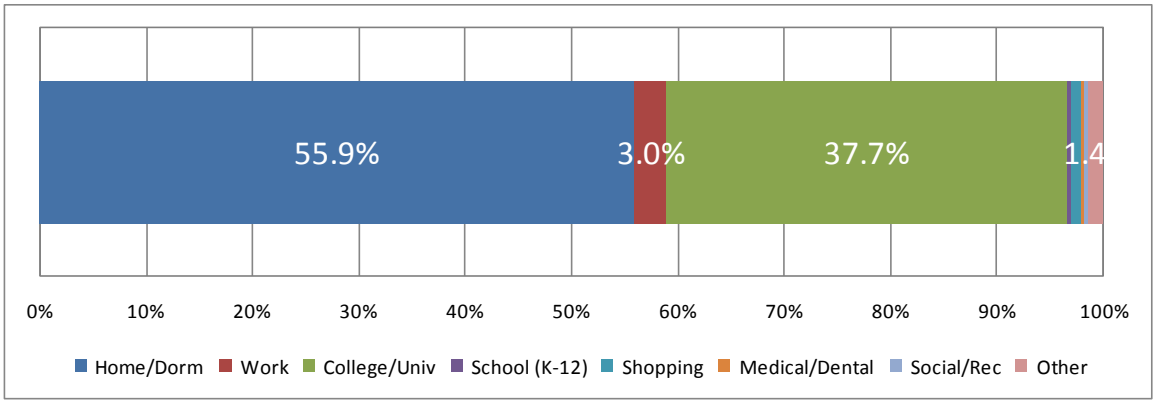
3. Systemwide Results

The above sections described answers to the survey instrument separately for the Blacksburg and Christiansburg routes. Since the Blacksburg routes constitute the majority of services provided by BT, and because the sample obtained from the riders utilizing the routes in Christiansburg was fairly small, it is safe to assume that systemwide BT results (combining the responses from riders on Blacksburg and Christiansburg routes) would mirror the analyzed results of the surveys collected on-board Blacksburg routes. Indeed, the similarities are striking. For illustrative purposes, this section presents graphs and tables showing the unfactored systemwide analyzed survey results. For descriptive analysis of the results, the analysis above dealing with the Blacksburg transit market area would paint a similar picture – while there might be slight differences in the percentages cited, the overall findings would be very similar.

3.1 Rider Travel Behavior

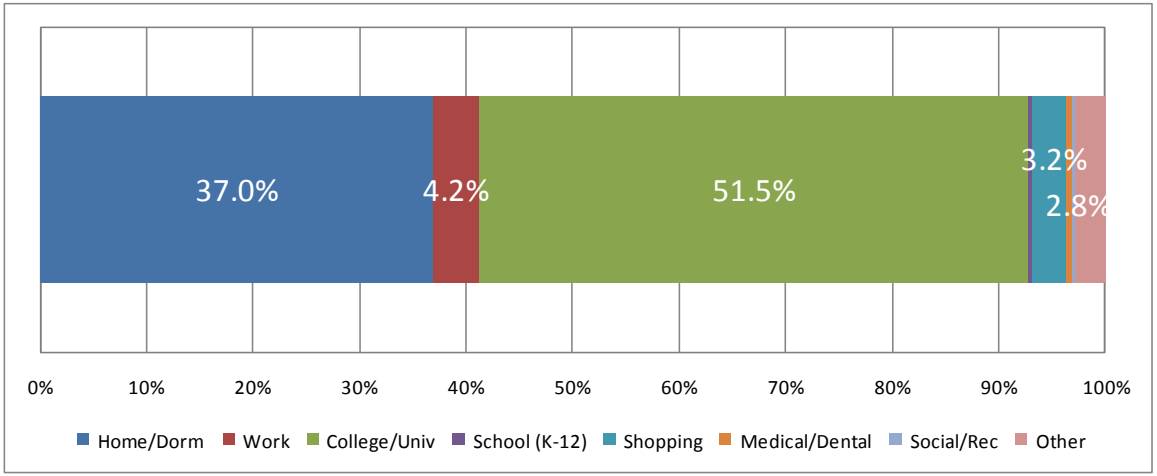
Please tell us about your CURRENT one-way trip:

Question 1a: Where did your one-way trip START today?



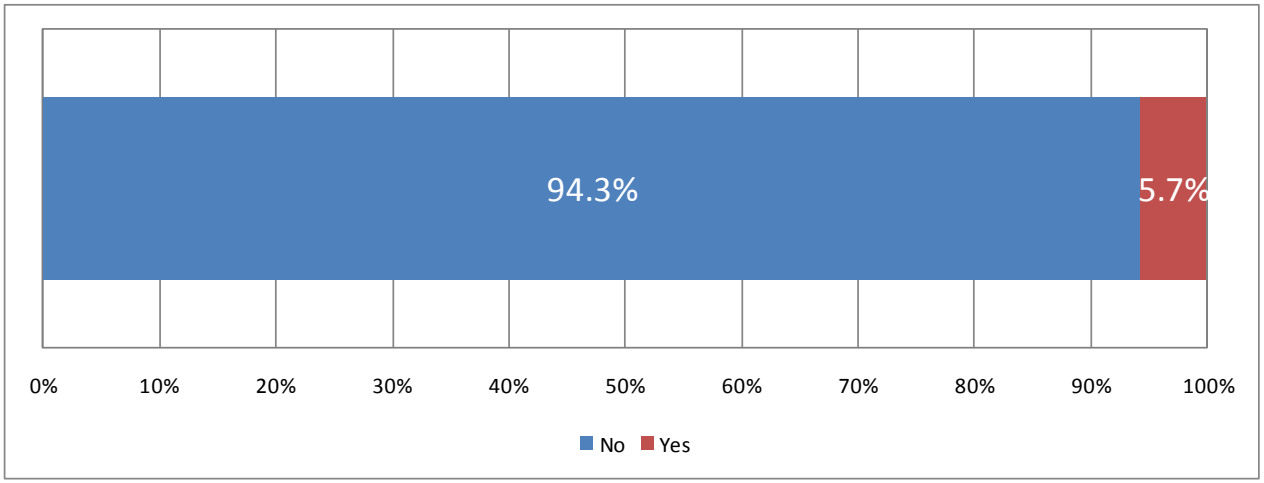
	Percentage	Responses
Home/Dorm	55.9%	1,339
Work	3.0%	71
College/Univ.	37.7%	903
School (K-12)	0.5%	12
Shopping	0.8%	20
Medical/Dental	0.3%	8
Social/Rec.	0.3%	8
Other	1.4%	34
Total	100.0%	2,395

Question 2a: Where did your one-way trip END today?



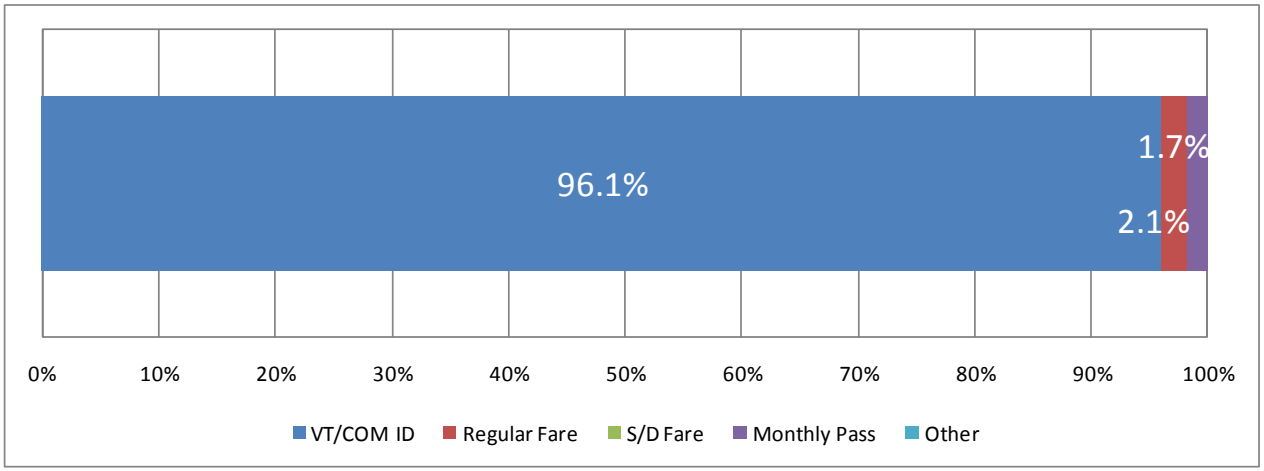
	Percentage	Responses
Home/Dorm	37.0%	873
Work	4.2%	100
College/Univ.	51.5%	1,217
School (K-12)	0.5%	11
Shopping	3.2%	75
Medical/Dental	0.5%	12
Social/Rec.	0.3%	7
Other	2.8%	66
Total	100.0%	2,361

Question 3: Does your one-way trip involve transfer from one route to another?



	Percentage	Responses
No	94.3%	2,247
Yes	5.7%	136
Total	100.0%	2,383

Question 4: How did you pay for your bus fare today?

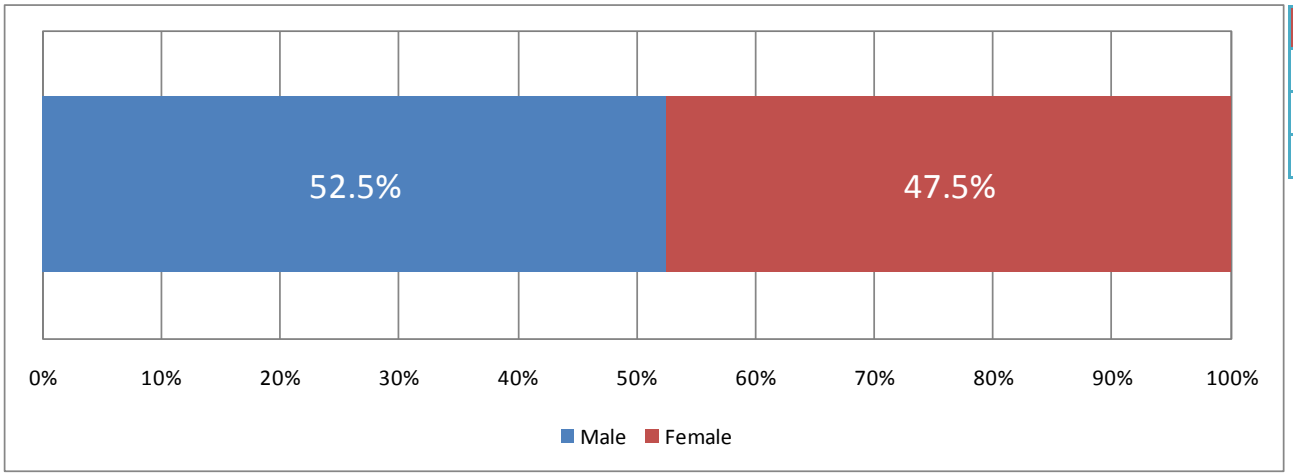


	Percentage	Responses
VT/COM ID	96.1%	2,266
Regular Fare	2.1%	50
S/D Fare	0.0%	1
Monthly Pass	1.7%	41
Other	0.0%	0
Total	100.0%	2,358

3.2 *Rider Demographics and Characteristics*

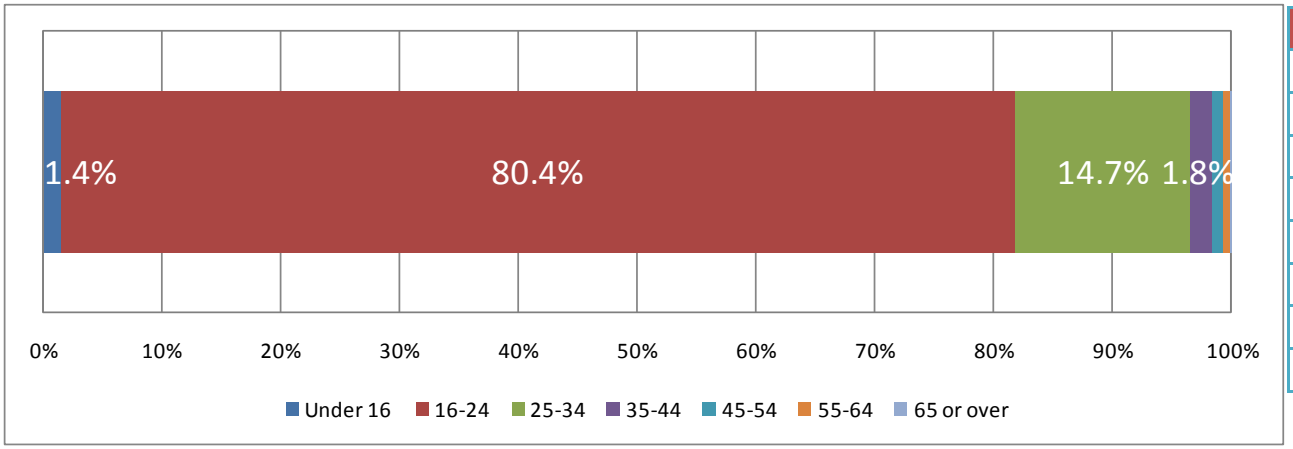
Please tell us about yourself:

Question 5: Gender



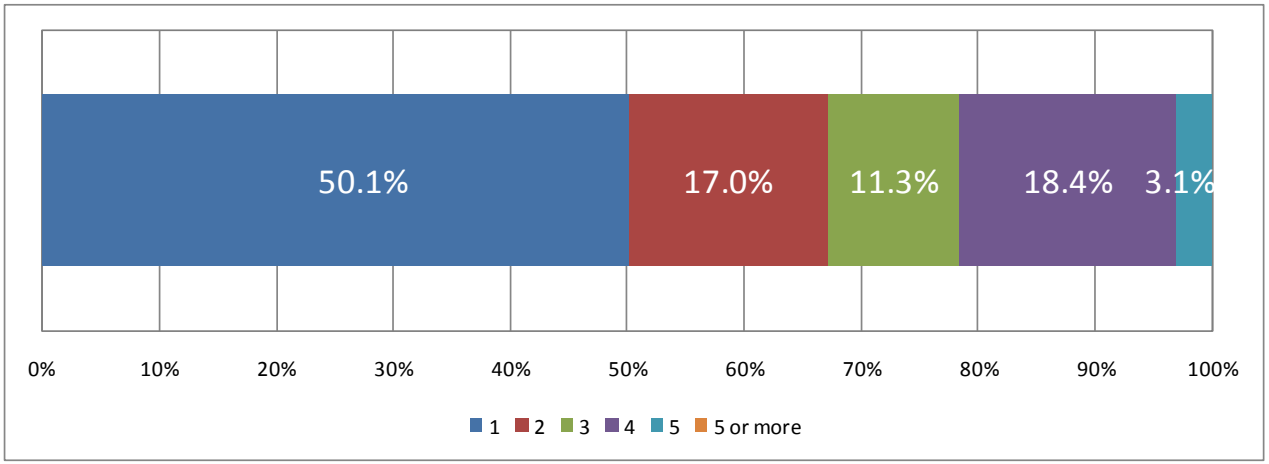
	Percentage	Responses
Male	52.5%	1,260
Female	47.5%	1,139
Total	100.0%	2,399

Question 6: Age (My age is:)



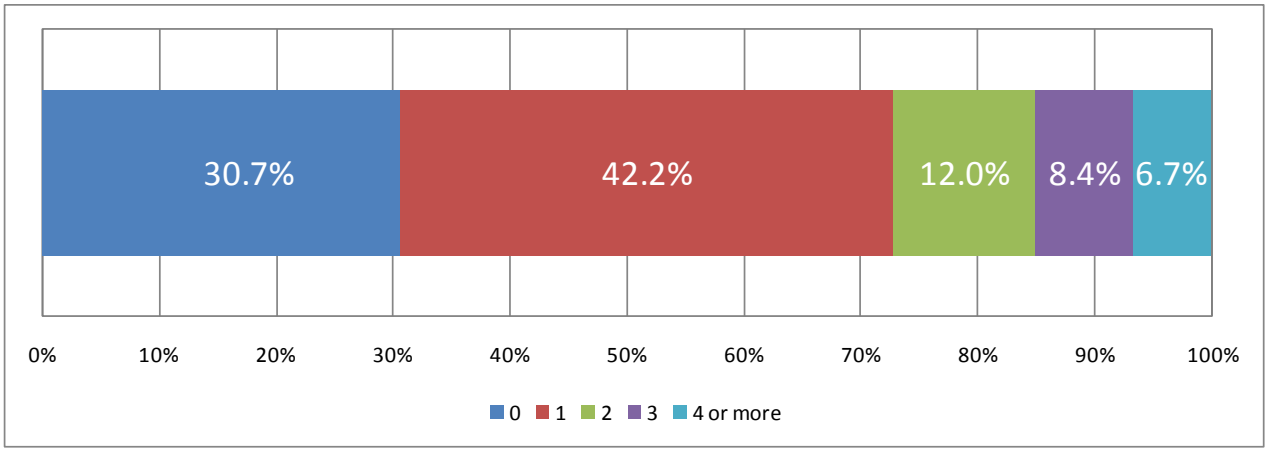
	Percentage	Responses
Under 16	1.4%	34
16-24	80.4%	1,929
25-34	14.7%	352
35-44	1.8%	44
45-54	0.9%	22
55-64	0.6%	14
65 or over	0.1%	3
Total	100.0%	2,398

Question 7: Household size (How many people live in your household (if you are a student living away from home, answer for yourself only)



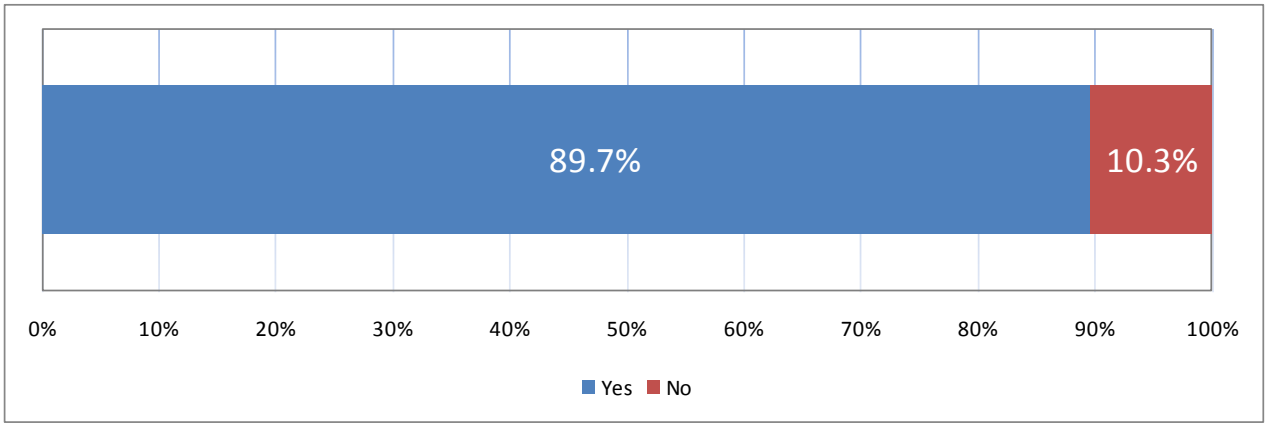
	Percentage	Responses
1	50.1%	1,197
2	17.0%	406
3	11.3%	270
4	18.4%	440
5	3.1%	75
5 or more	0.0%	0
Total	100.0%	2,388

Question 8: Number of Vehicles in Household - How many vehicles are in your household (if you are a student living away from home, answer for yourself only)



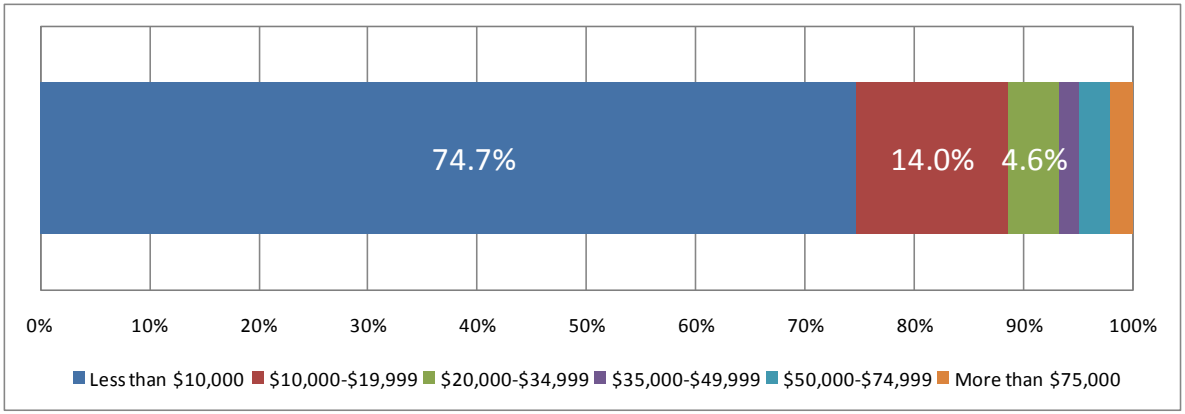
	Percentage	Responses
0	30.7%	732
1	42.2%	1,007
2	12.0%	287
3	8.4%	200
4 or more	6.7%	161
Total	100.0%	2,387

Question 9: Do you have a valid driver's license?



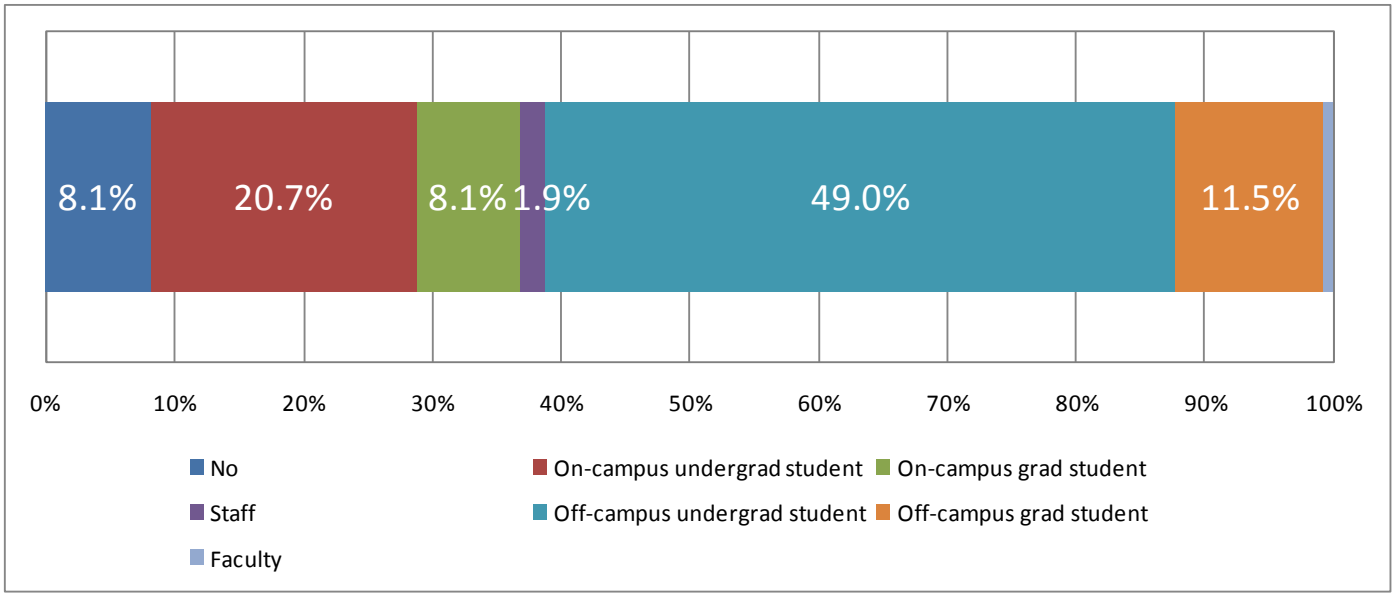
	Percentage	Responses
Yes	89.7%	2,097
No	10.3%	242
Total	100.0%	2,339

Question 10: Household Income - My household income is: (if you are a student living away from home, answer for yourself only)



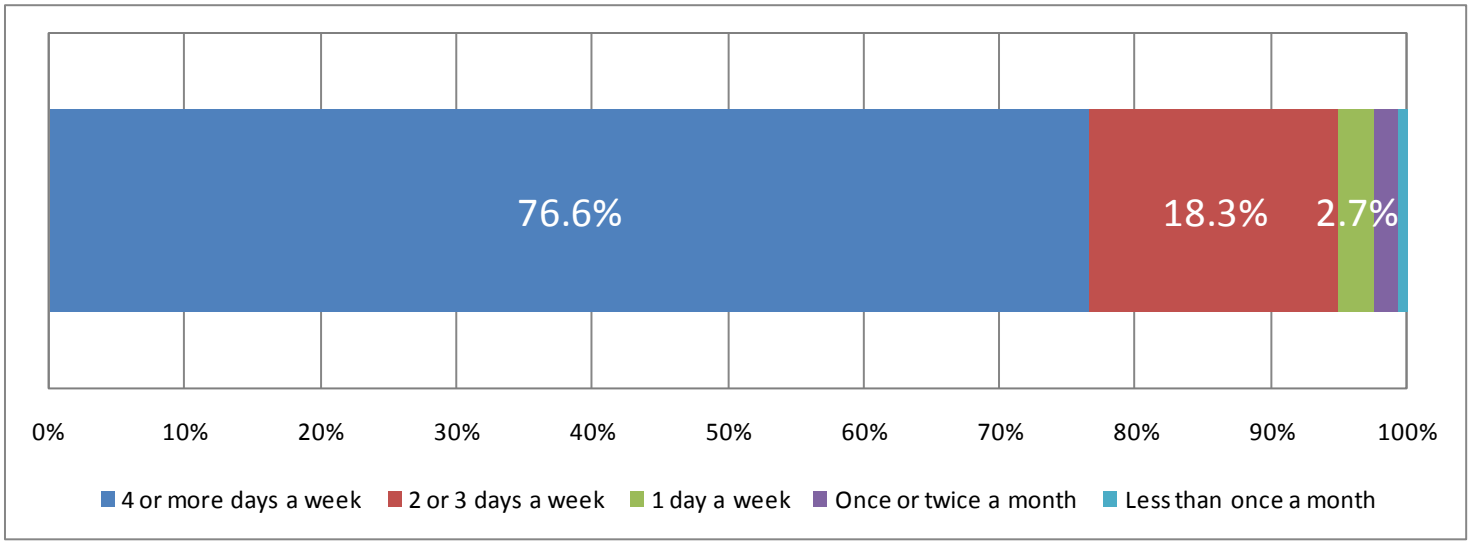
	Percentage	Responses
Less than $10,000	74.7%	1,723
$10,000-$19,999	14.0%	322
$20,000-$34,999	4.6%	106
$35,000-$49,999	2.0%	45
$50,000-$74,999	2.7%	63
More than $75,000	2.1%	48
Total	100.0%	2,307

Question 11: Are you affiliated with Virginia Tech / VCOM?



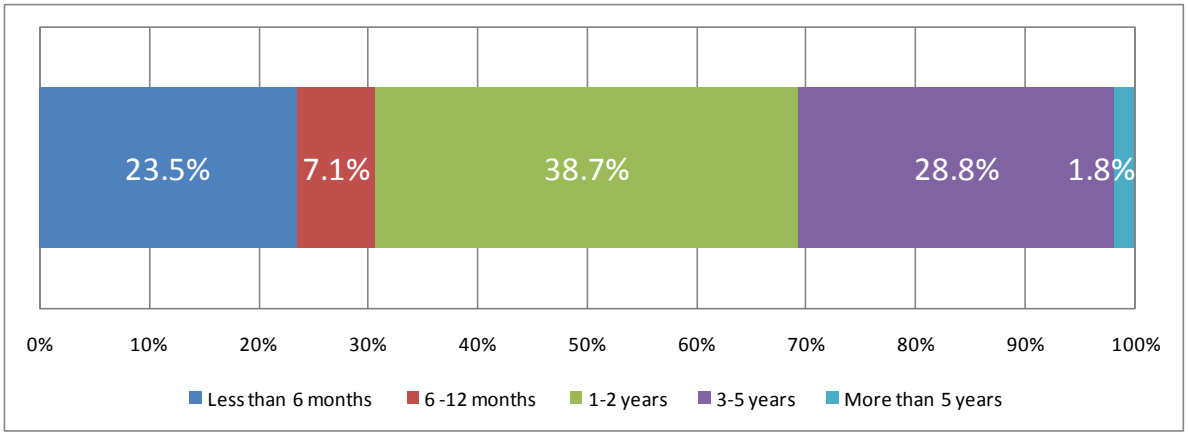
	Percentage	Responses
No	8.1%	192
On-campus undergrad student	20.7%	491
On-campus grad student	8.1%	192
Staff	1.9%	45
Off-campus undergrad student	49.0%	1,164
Off-campus grad student	11.5%	273
Faculty	0.8%	20
Total	100.0%	2,377

Question 12: How often do you typically ride with BT?



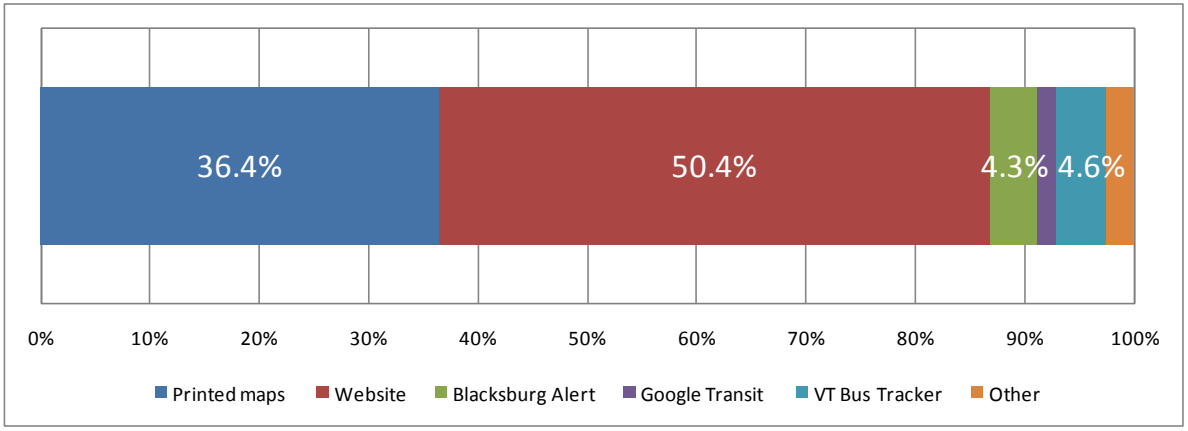
	Percentage	Responses
4 or more days a week	76.6%	1,826
2 or 3 days a week	18.3%	437
1 day a week	2.7%	64
Once or twice a month	1.7%	40
Less than once a month	0.7%	16
Total	100.0%	2,383

Question 13: How long have you been using BT's service?



	Percentage	Responses
Less than 6 months	23.5%	559
6 -12 months	7.1%	170
1-2 years	38.7%	922
3-5 years	28.8%	686
More than 5 years	1.8%	44
Total	100.0%	2,381

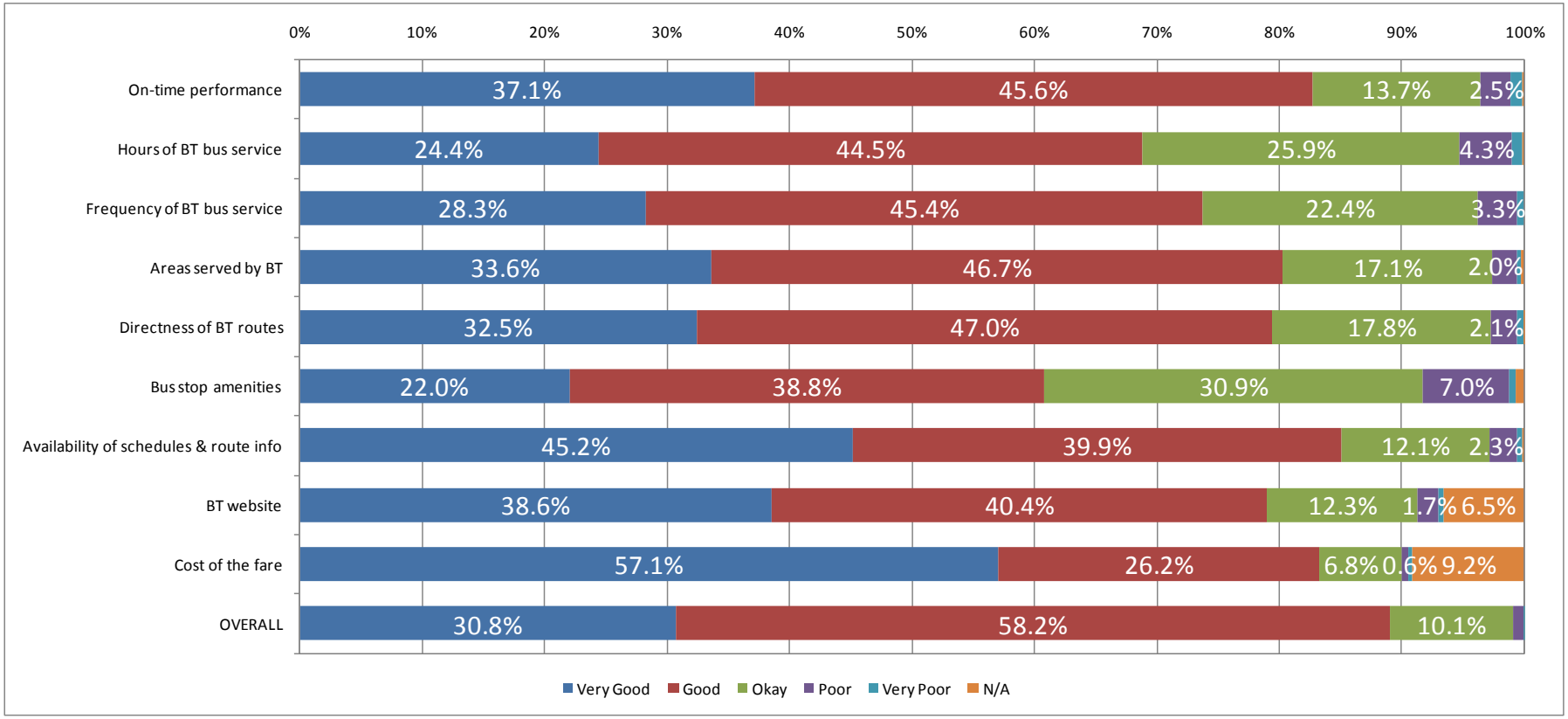
Question 14: How do you primarily access BT's schedule/route information?



	Percentage	Responses
Printed maps	36.4%	856
Website	50.4%	1,185
Blacksburg Alert	4.3%	102
Google Transit	1.7%	41
VT Bus Tracker	4.6%	109
Other	2.5%	58
Total	100.0%	2,351

3.3 Rider Transit Service Perceptions

Question 15: Please rate the following service characteristics:



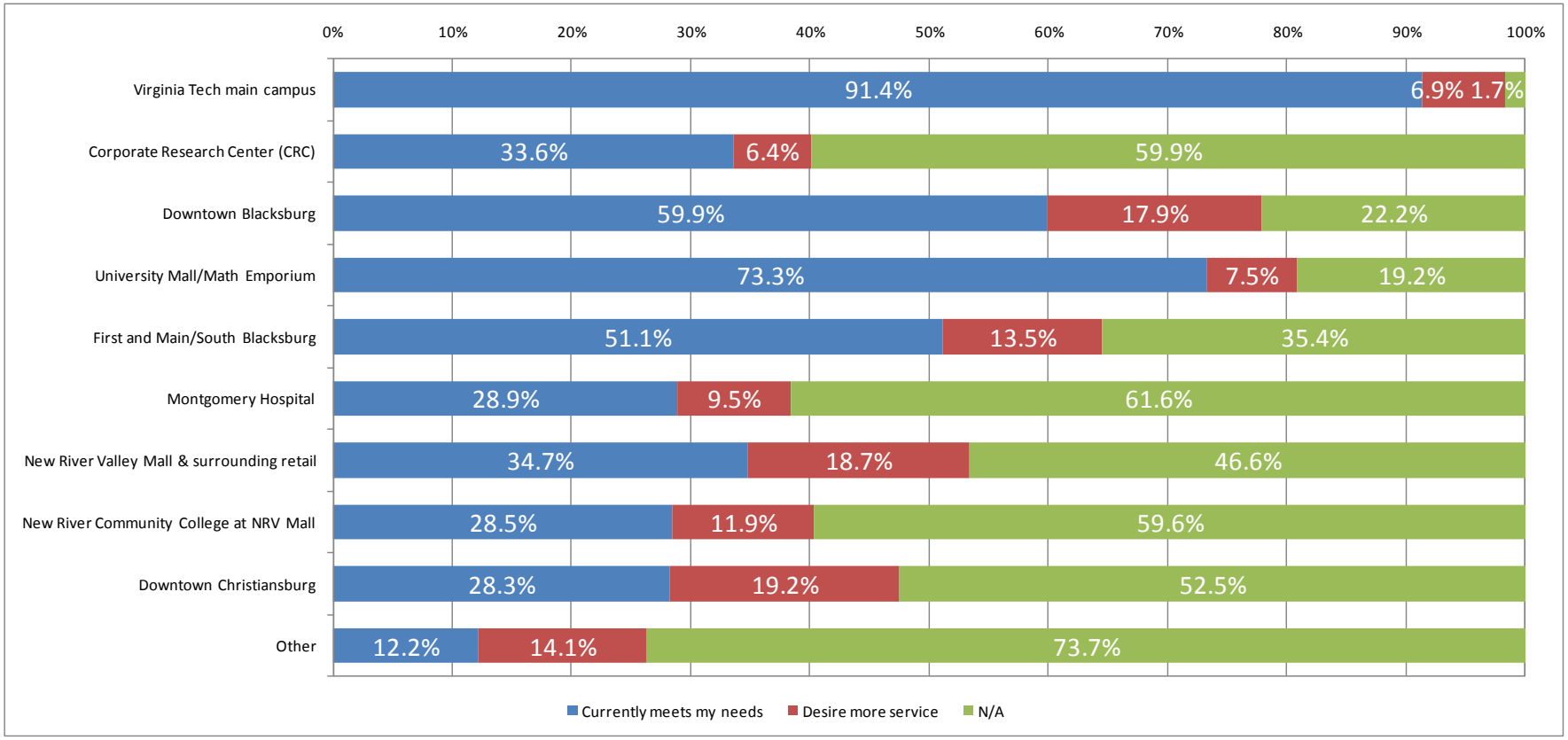
BT Systemwide: Number of Respondents:

	Very good	Good	Okay	Poor	Very poor	N/A
On-time performance	874	1,072	322	60	21	4
Hours of BT bus service	575	1,047	609	101	20	3
Frequency of BT bus service	665	1,067	526	77	13	0
Areas served by BT	788	1,093	401	46	9	5
Directness of BT routes	759	1,098	417	49	13	1
Bus stop amenities	515	906	722	164	14	15
Availability of schedules & route info	1,056	932	283	53	9	4
BT website	903	946	288	40	10	153
Cost of the fare	1,340	614	159	13	6	215
OVERALL	711	1,346	233	20	1	0

BT Systemwide: Percentage of Respondents:

	Very good	Good	Okay	Poor	Very poor	N/A
On-time performance	37.1%	45.6%	13.7%	2.5%	0.9%	0.2%
Hours of BT bus service	24.4%	44.5%	25.9%	4.3%	0.8%	0.1%
Frequency of BT bus service	28.3%	45.4%	22.4%	3.3%	0.6%	0.0%
Areas served by BT	33.6%	46.7%	17.1%	2.0%	0.4%	0.2%
Directness of BT routes	32.5%	47.0%	17.8%	2.1%	0.6%	0.0%
Bus stop amenities	22.0%	38.8%	30.9%	7.0%	0.6%	0.6%
Availability of schedules & route info	45.2%	39.9%	12.1%	2.3%	0.4%	0.2%
BT website	38.6%	40.4%	12.3%	1.7%	0.4%	6.5%
Cost of the fare	57.1%	26.2%	6.8%	0.6%	0.3%	9.2%
OVERALL	30.8%	58.2%	10.1%	0.9%	0.0%	0.0%

Question 16: Please rate BT's ability to connect you to the following locations:



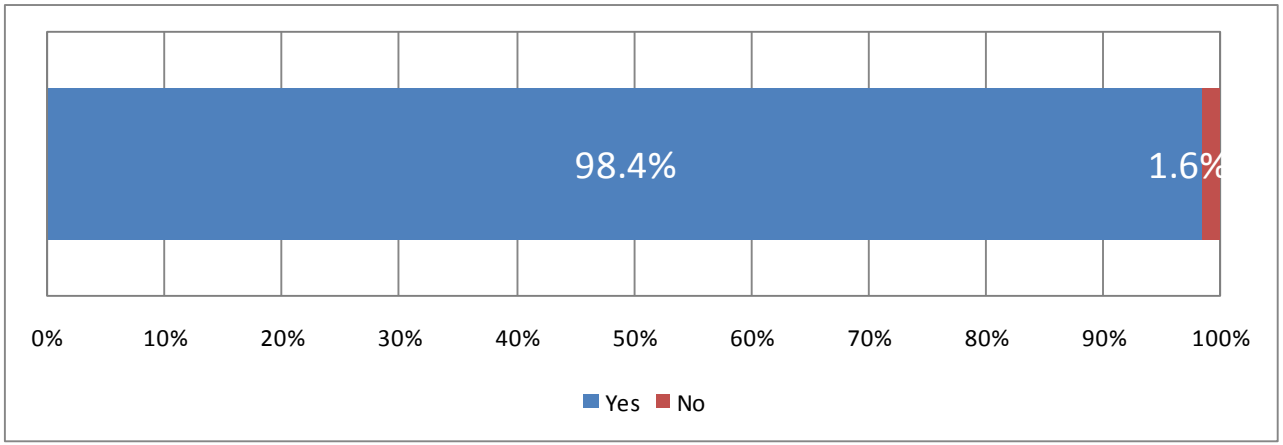
BT Systemwide: Number of Respondents:

	Currently meets my needs	Desire more service	N/A
Virginia Tech main campus	2,105	160	38
Corporate Research Center (CRC)	762	146	1,357
Downtown Blacksburg	1,366	408	505
University Mall/Math Emporium	1,671	172	437
First and Main/South Blacksburg	1,155	304	801
Montgomery Hospital	651	214	1,387
New River Valley Mall & surrounding retail	788	423	1,057
New River Community College at NRV Mall	642	268	1,345
Downtown Christiansburg	640	434	1,188
Other	58	67	350

BT Systemwide: Percentage of Respondents:

	Currently meets my needs	Desire more service	N/A
Virginia Tech main campus	91.4%	6.9%	1.7%
Corporate Research Center (CRC)	33.6%	6.4%	59.9%
Downtown Blacksburg	59.9%	17.9%	22.2%
University Mall/Math Emporium	73.3%	7.5%	19.2%
First and Main/South Blacksburg	51.1%	13.5%	35.4%
Montgomery Hospital	28.9%	9.5%	61.6%
New River Valley Mall & surrounding retail	34.7%	18.7%	46.6%
New River Community College at NRV Mall	28.5%	11.9%	59.6%
Downtown Christiansburg	28.3%	19.2%	52.5%
Other	12.2%	14.1%	73.7%

Question 17a: Would you recommend BT to a friend or colleague?



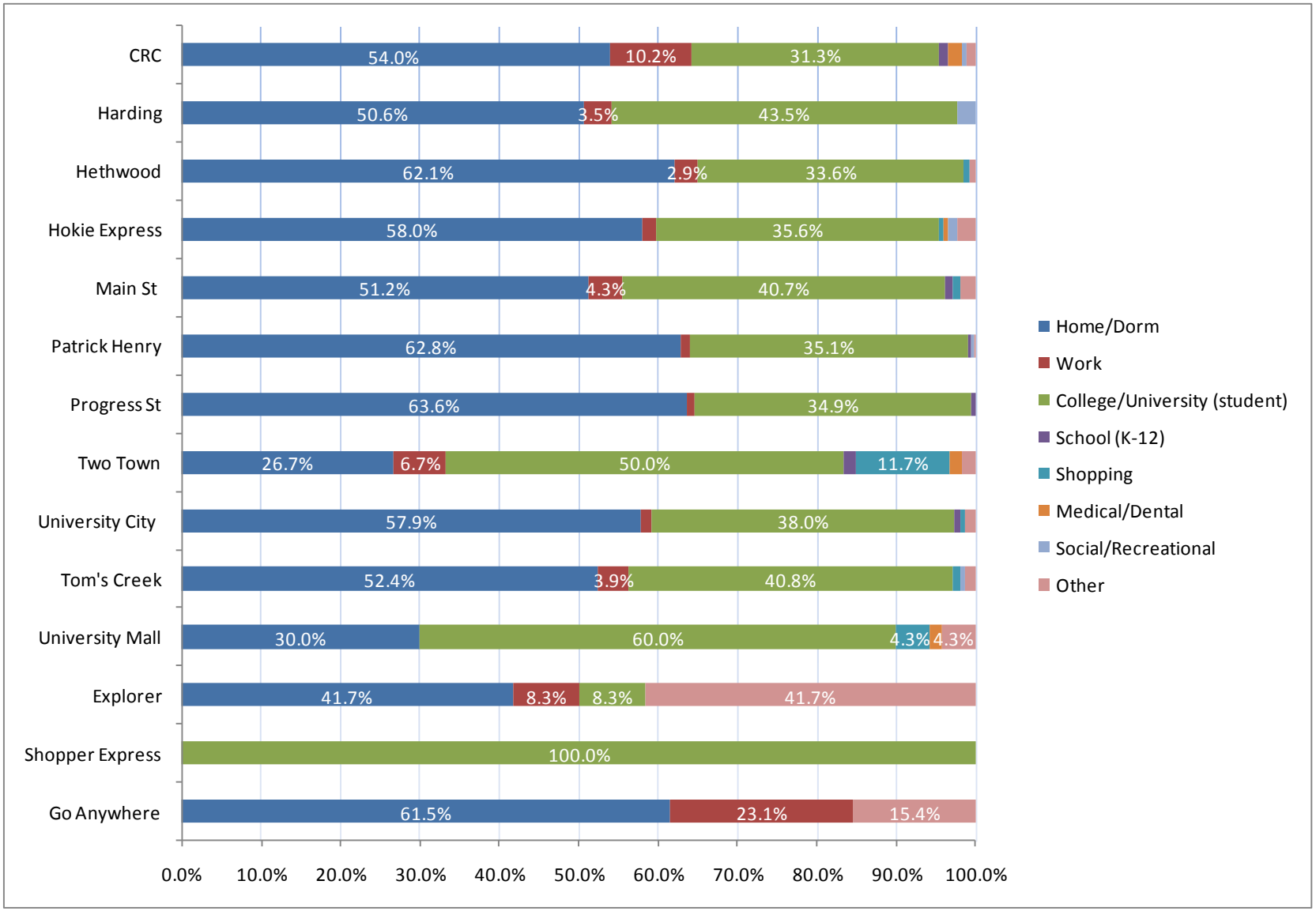
	Percentage	Responses
Yes	98.4%	2,265
No	1.6%	36
Total	100.0%	2,301

4. Cross-Tabulations

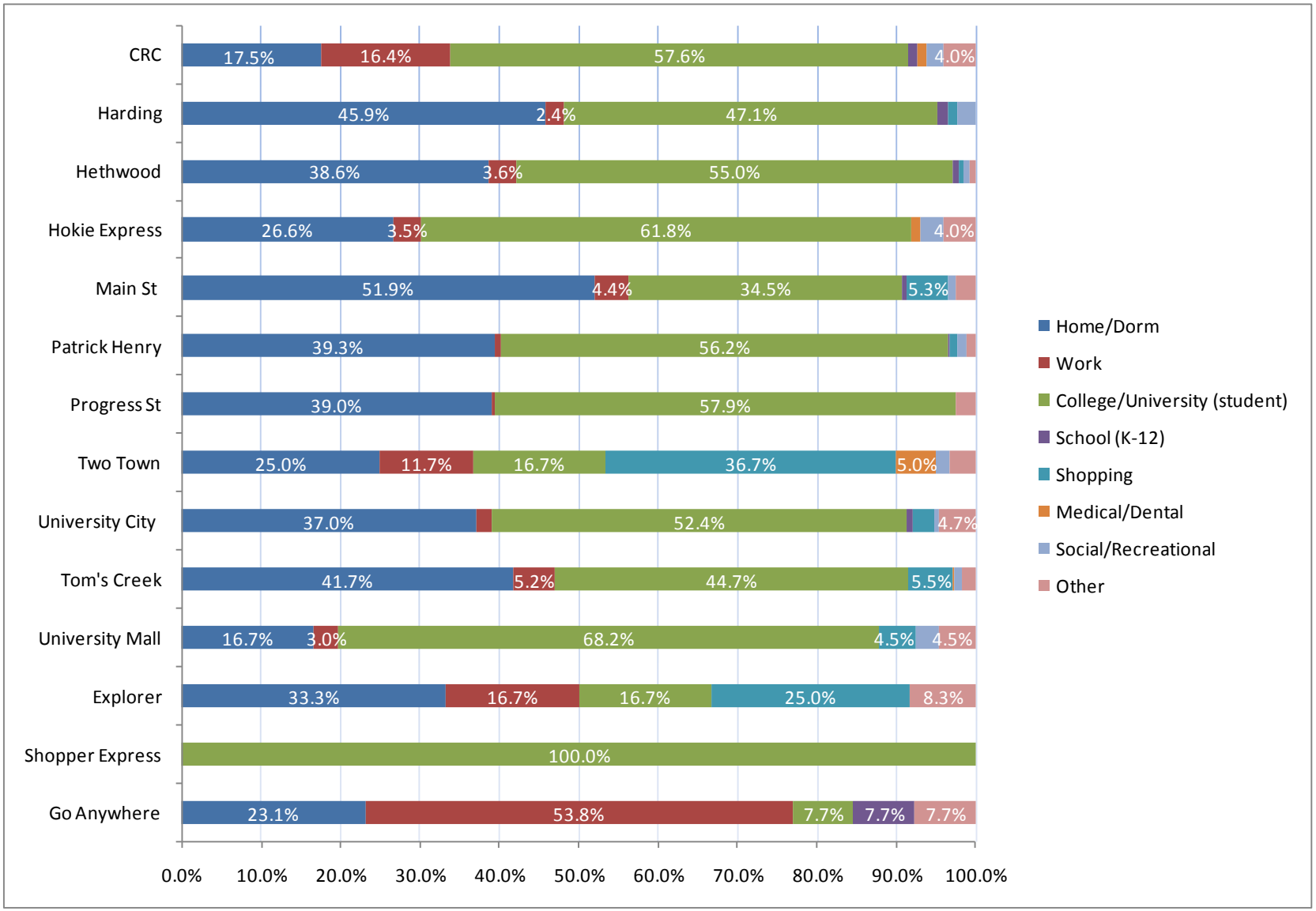
Cross-tabulations were completed only on selected survey data to gain a better understanding of the relationships between certain variables in the survey instrument, particularly differences in rider travel behavior, demographics and opinions varying by each BT route. The following observations were made based on the BT systemwide cross-tabulations that were examined (see figures below):

- Trip purpose-wise, the surveyed respondents were most likely to use BT to travel to and from home/dorm to college/university and from college/university back home or back to their dorms
- In terms of trip origins/destinations (Os/Ds) and specific BT route matches, BT riders were most likely to begin/end their trip at:
    - Home/dorm: begin if they rode Progress Street, Patrick Henry, and Hethwood routes in Blacksburg and Go Anywhere! route in Christiansburg; end if Main Street, Tom's Creek or Harding (different Os/Ds)
    - Work: begin if they rode CRC, Two Town Trolley, Explorer, and Go Anywhere! Routes; end if CRC, Explorer and Go Anywhere (similar routes)
    - As expected, a few routes were very popular for getting to/from VT campus, but University Mall route topped them all in popularity
    - Medical /Dental trips: Two Town Trolley was the route of choice to getting to medical appointments
    - Shopping: Two Town Trolley and Explorer were the most popular ways of getting there by transit
    - Social/Recreational: not a typical starting/ending point, although Harding showed some usage
- Transfers from one BT route to another BT route were common on some routes, notably all routes in Christiansburg, as well as CRC, Hokie Express, and Two Town Trolley in Blacksburg.
- Ridership by route and age: CRC and University Mall were the most popular BT routes with children and young adults; Patrick Henry, Hokie Express, University City and University Mall with college-age persons, and Main Street, Explorer and Go Anywhere with seniors.
- The Explorer, Two Town Trolley, and University Mall routes were the most popular routes with riders without access to a motor vehicle.
- Finally, in terms of VT affiliation and ridership by BT route, on-campus VT students were most likely to ride University Mall and Hokie Express routes, while off-campus VT students were most likely to ride all the other routes operating in Blacksburg, with the exception of the Two Town Trolley. VT faculty were not accounted for on six of the fourteen routes, and made up less than five percent of the ridership on the remaining routes. The most popular routes for VT staff were the Explorer and the Two Town Trolley, but VT staff still accounted for less than ten percent of ridership on these routes. Ridership on the Go Anywhere and Explorer Routes in Christiansburg was predominantly not affiliated with VT.

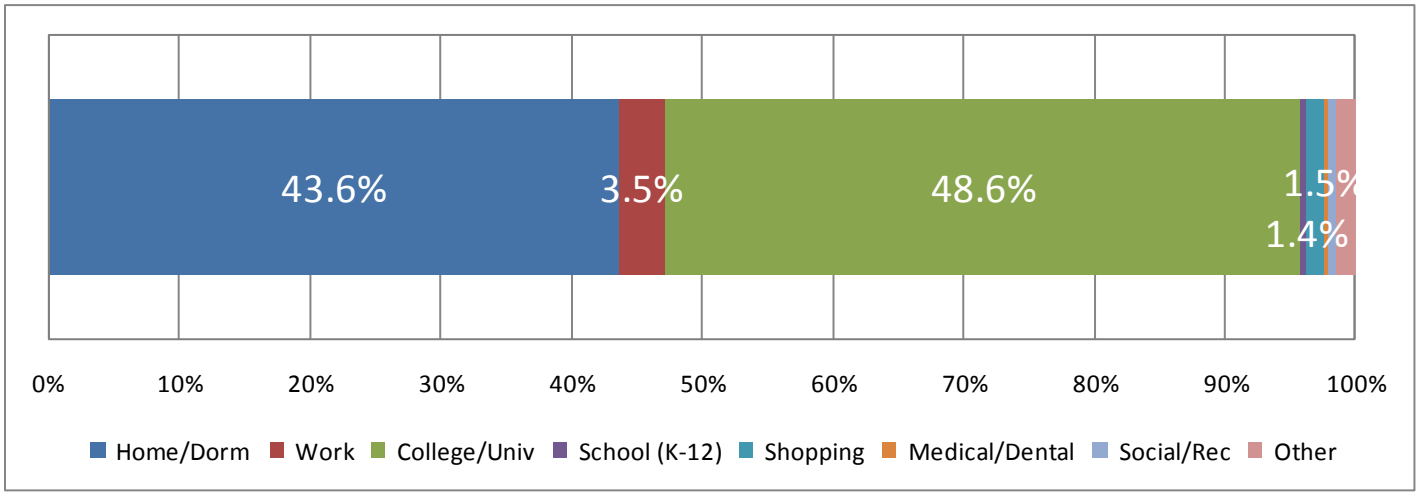
Question 1a: Where did your one-way trip START today? (by BT route)



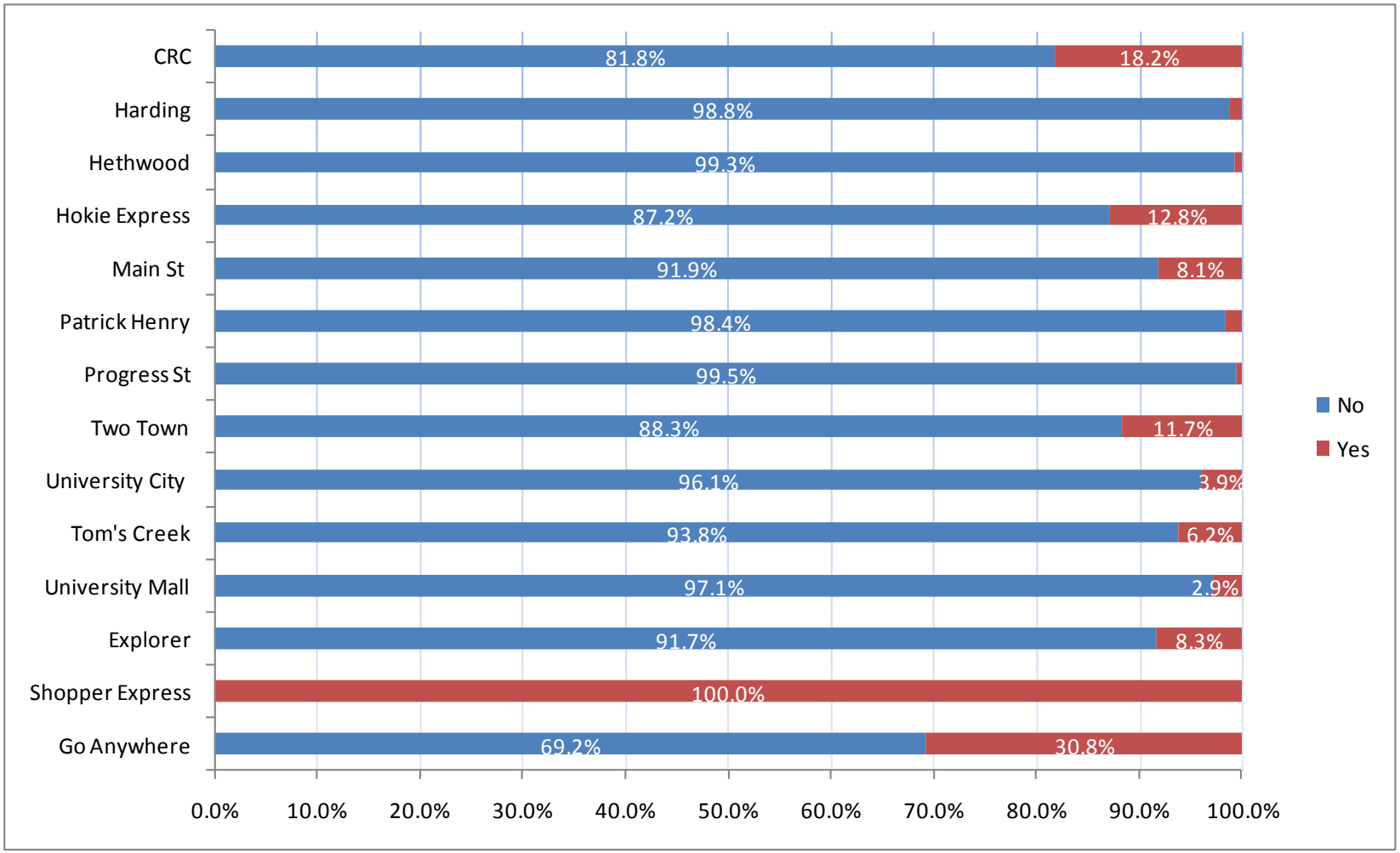
Question 2a: Where did your one-way trip END today? (by BT route)



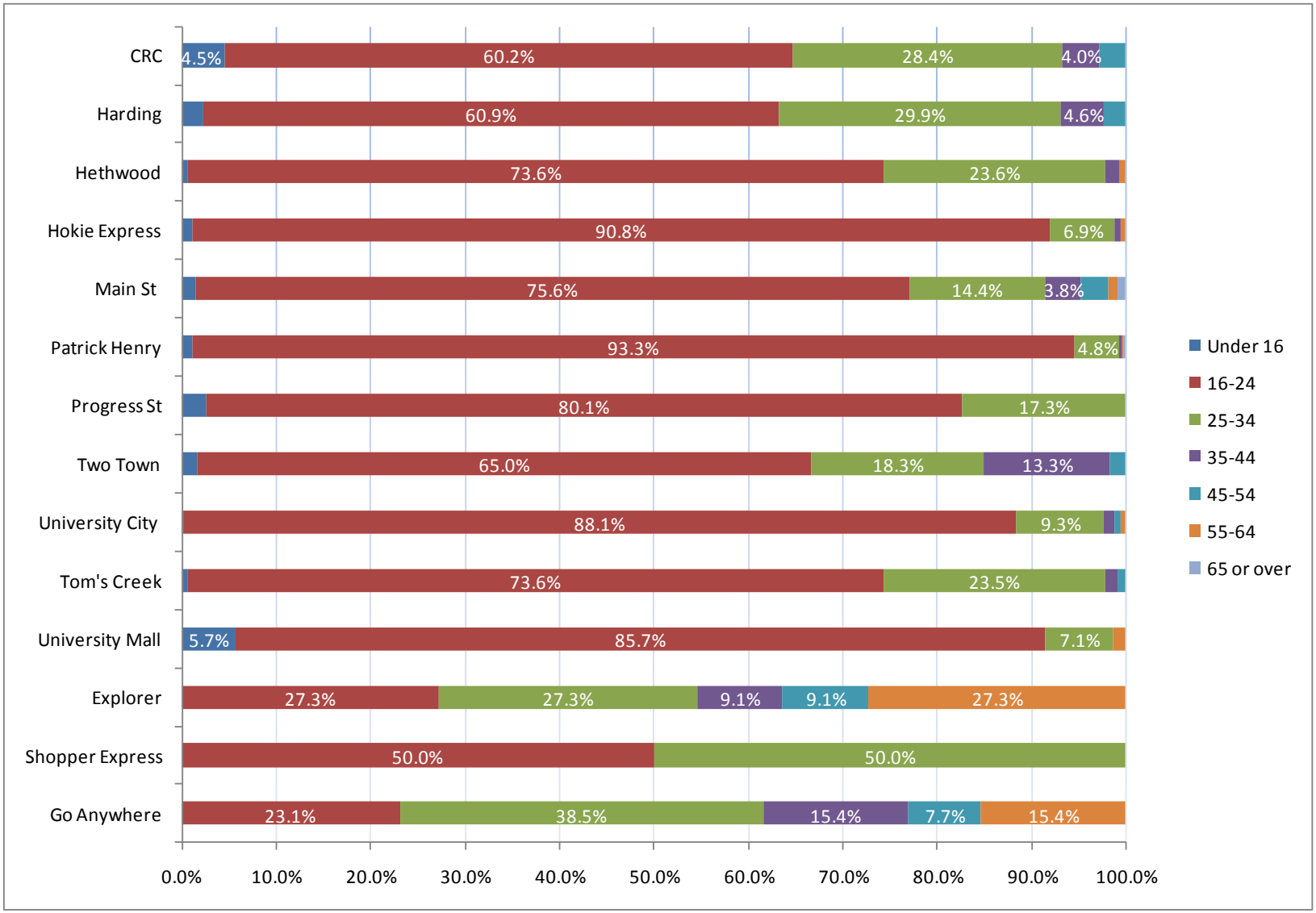
Question 1b and 2b: Trip Origins and Destinations (Combined)



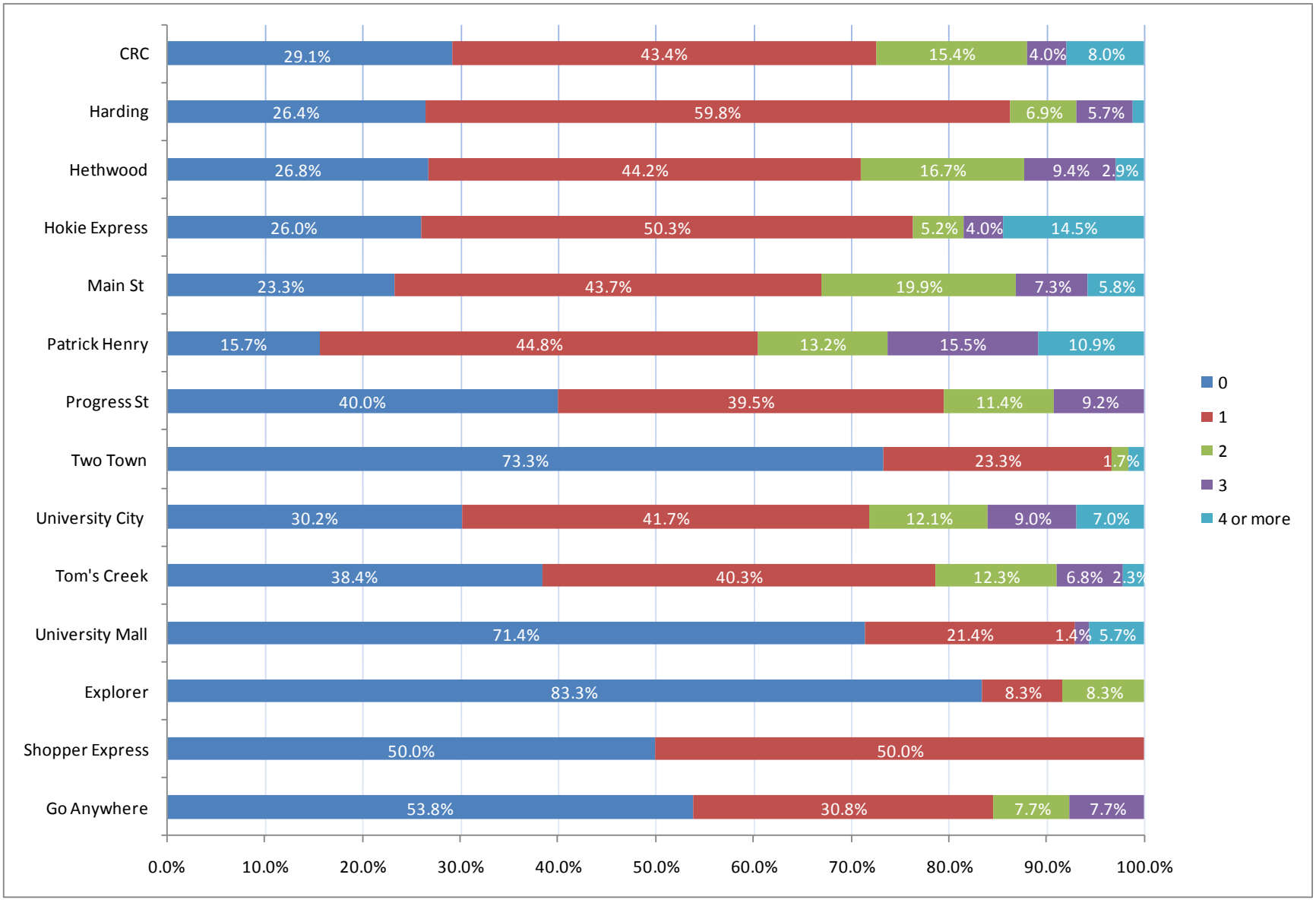
Question 3: Does your one-way trip involve transfer from one route to another? (by BT route)



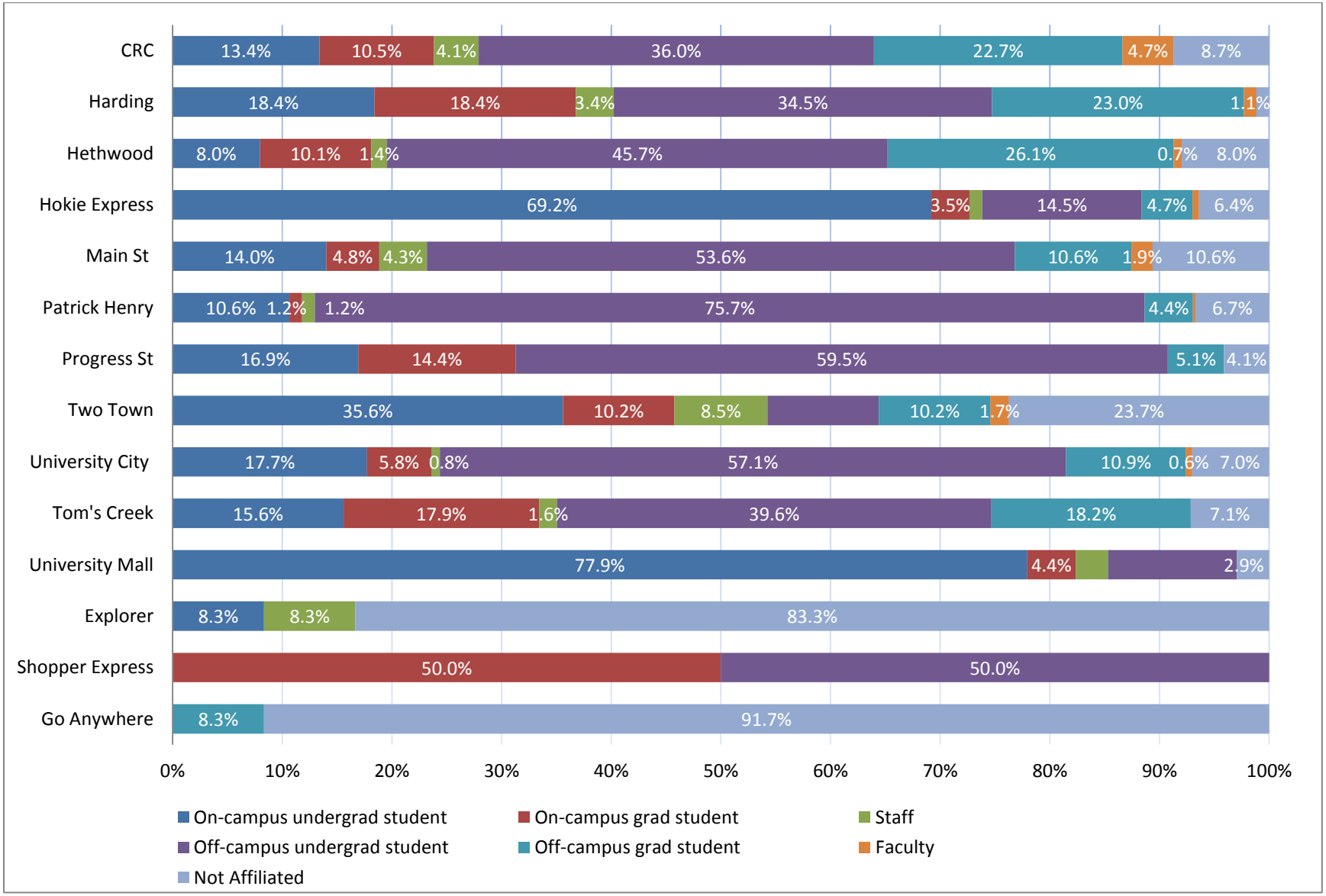
Question 6: Age (by BT route)



Question 8: Number of Vehicles in Household (by BT route)



Question 11: VT/VCOM Affiliation (by BT route)



APPENDIX C

Blacksburg Transit Staff and Stakeholder Outreach Technical Memorandum

1. Overview

As part of the development of the Blacksburg Transit 2017 Transit Development Plan, a series of meetings were held with both BT staff and community stakeholders to garner a qualitative assessment and comprehensive viewpoints regarding BT's existing and future service and operations. A total of 22 meetings took place from October 12-14 and November 8-10, 2010.

Each meeting was framed by a few basic questions to stimulate discussion:

- **How would you assess existing route service?**
  (Service Coverage, Service Hours, Service Frequencies, Directness of Routing, Fares, etc.)
- **How would you assess existing equipment and facilities?**
  (Vehicles, Admin/Maintenance Facilities, Transit Facilities, Stop Amenities, ITS, etc.)
- **What are the new service and capital needs for the next six years?**
  (Within Blacksburg? Within Christiansburg? Across the region? How do needs change before and after the Multimodal Transfer Facility is in place?)
- **How can BT serve existing riders better and attract new riders?**
  (For on-campus students? Off-campus students? Faculty and staff? Non-VT riders? Seniors? Mobility-impaired riders?)

Most meetings were one-on-one or two individuals, while a few meetings – like the BT All Staff Meeting and TDP Task Force Meeting – were handled with large groups. Dialogue was typically informal and open-ended to allow each participant the flexibility to share a broad variety of opinions around these major topics. BT internal meetings also included a thorough interview regarding staff roles and responsibilities.

Major themes that surfaced across the various meetings include:

- **The core service provided by BT – transporting students between residential areas in Blacksburg to Virginia Tech – is very good.** Both within and outside of BT, respondents felt that transit service to campus was well operated, well liked, and productive. Additional frequency would be nice on the heaviest routes (Hethwood and the Toms Creek patterns), as would increases in service hours and summer service, but all in all, BT is succeeding at moving students to VT. Virginia Tech feels they receive a good return on their investment. Many interviewees stressed that BT should not lose sight of this core business even as other services evolve.
- **More local "neighborhood" service is needed through the Blacksburg-Montgomery County-Christiansburg service area.** For as good as service to VT is, many cited a need to provide more service in Blacksburg that was not campus-related and would be attractive to local residents, a "service for everyone." The Christiansburg model was used as an example for this, though most acknowledged that service delivery for the fledgling Christiansburg routes was still being refined. The Business 460 corridor connecting both downtowns, VT, NRV Mall, and the hospital, was often cited as the spine for local service. All recognized that providing neighborhood service meant some financial and political commitment from the Town of Blacksburg and Montgomery

County, and a continued commitment from Christiansburg. It would also mean new challenges in BT's service planning, staffing needs, cost allocations, and marketing outreach.

- **There is a palpable and growing need for regional and commuter service connecting activity centers in the New River Valley.** Most respondents expressed that travel patterns between communities across the New River Valley were significant enough to warrant point-to-point and commuter services. Within BT's service area, Virginia Tech (for both employment and education) and NRV Mall (for both retail and employment) were cited as major attractions for the region, and were considered to be the best hubs for regional services. Areas suggested for connecting service include: Radford, Fairlawn, Pulaski, Giles, Floyd, and the villages of Montgomery County (Shawsville, Elliston & Lafayette, Price's Fork, Riner, Belview, and Plum Creek). Price's Fork was often cited as the area ripest for future growth. There were mixed feelings as to whether BT or some other operator should be the provider of regional services.
- **Passenger amenities, particular at stops, are in need of some upgrades.** Many interviewees felt that bus stops (which currently consist of a small round "BT" sign) could be improved by providing more stop and route information and in some cases benches or shelters. Implementing a bus stop standards policy guiding basic needs and amenity levels was suggested, as well as using IT-based solutions (such as BT4U and NextBus) to bring route information to riders at stops. Conversely, some felt that assets or stops currently unused or underused could be reallocated to areas of greater need.
- **BT is in need of adequate staffing and a focused vision to move forward from existing operations into the future.** Most staff members felt that due to economic conditions, current staffing levels were inadequate to meet current and future transit needs. Immediate needs included another mechanic and supervisor, but in a larger sense some felt the organization needed to rebalance to grow and develop mid- and lower-level employees. Finding the right mix of full- and part-time operators in relation to the addition of neighborhood or regional services was also a concern. Regarding a focused vision, many hoped the TDP document could provide a clear direction for BT to follow and a touch point for BT's engagement of the community. Continuing the Task Force (or something similar) beyond the TDP timeframe as an ad-hoc Transit Advisory Committee was suggested as a way for BT to continue engaging the community regarding existing and future service needs.

2. BT Staff Input

The following chronicles input received from various meetings and interviews with BT staff regarding the desired goals and outcomes of the TDP process, and an internal assessment of existing service and operations and future service needs. In total, ten meetings were held over a three-day period, October 12-14, 2010.

2.1 BT Managers Meeting

Date: October 12, 2010, 2:00 – 5:00

Attendees: Rebecca Martin, Director
Debbie Swetnam, Regulatory Manager

Harland Brown, Operations Manager
Michael Price, Maintenance Manager
Ken Tucker, Marketing Manager
Wayde Kass, Financial Analyst
Erik Olsen, Ph.D., Transportation Planner

General Discussion:

- The Director relies on her team of Managers to keep her well informed. Ms. Martin may not be present for all meetings scheduled for this project, but will ensure that she is aware of the work and schedule.
- BT is a very busy transit system with new projects in the planning process and recently implemented projects. New projects include the Multi-Modal Transit Facility (MMTF) to be located on Virginia Tech (VT) property, potential new local service to Warm Hearth Senior Community and express service from Christiansburg to VT, and possible contracted service with Radford. The Christiansburg local service is a recently implemented project.

Presentation/Discussion:

- The project team provided an overview of the TDP process, including purpose, requirements and content. He reviewed the project schedule. The presentation also solicited ideas from the Managers for BT's goals for the project. It was agreed that an Internal Vision is needed for the project and the department
- Travel patterns grow more and more regional – TDP is an opportunity to develop a regional vision
    - As service continues to grow and become more regional, does it make more sense to look at a regional authority model for service? Should regional service even be BT?
    - Trying to grow smaller partners' (like NRV Mall, Montgomery Hospital, NRCC, Walmart, Warm Hearth, etc) involvement but ultimately need buy-in from TOB and Montgomery County, and continued investment by TOC.
    - Highly important to maintain strong and clear relations with primary partner VT as potentially new partners join system – VT driving most of service will not change.
    - Need a regional cost allocation model that fairly and clearly stratifies costs for partners.
    - Important to market/brand various different regional services to the community it is serving
- Getting TOB to buy into transit should be big part of vision. BT should focus on providing more neighborhood services to better serve the broader Blacksburg community and change mindset that bus is just for VT and poor people.
- The plan for reaching out to the public was discussed. A Task Force consisting of approximately 7 to 9 stakeholders will be created to provide input to the development of the TDP. The Task Force should consist of representatives from: BT, Town of Blacksburg, Town of Christiansburg, VT, MPO, and potentially Radford town/university, NRV Mall, Warm Hearth, and the hospital. The Task Force is tentatively scheduled to meet three times (November 2010, mid January 2011, and mid March 2011).
- Existing riders will be surveyed by a temp agency under contract to the consultant team (scheduled for November 15-17, 2010). The consultant team will develop the survey instrument

and provide BT an opportunity to comment prior to its implementation. A sample of potential survey questions was shown to the Managers.

- A list of candidate peers was discussed for the peer review to be included in the TDP. The following potential peers were identified: Penn State, Boulder CO, Harrisonburg VA, Chapel Hill NC, Bloomington IN, Clemson, and Troy IL.

2.2 BT Multimodal Transfer Facility Kick Off Meeting

Date: October 13, 2010, 11:00 – 1:30

Attendees: BT Staff and Stakeholders (various BT, TOB, and VT)
MMTF Project Team

General Discussion:

- The MMTF team gave a project kick off presentation for the Feasibility Study and Programmatic Needs Assessment, which included the discussion of the following main topics: Roles of the team members, stakeholders, and project goals (utilize current/best thinking, LEED Silver, 50-year design life, safe and accessible, attractive to all users, educational, efficient – integral part of VT and community).
- General site is Perry Street corridor (B Lot). The MMTF team discussed constraints and potential changes to Perry Street, including plan to extend across West Campus Drive. VT has some design data for traffic signals in area.
- The MMFT team reviewed a set of questions and openly discussed each topic with the meeting attendees. Some of the topics included: design and number of bays, bicycle storage, parking, amenities, student and ridership growth projections, environmental controls, security, and signage.
- VT estimates a couple more thousands students in campus growth. Current enrollment over 30,000.
- Over time, VT will need more remote lots for F/S and students.

2.3 All Staff Kick Off Meeting

Date: October 13, 2010, 1:30 – 3:00

Attendees: BT Staff and Operators (30-40, various)
MMTF Project Team

Presentation/Discussion:

The project team repeated the kick off presentation discussed at the Managers Meeting, followed by group discussion revolving around the following topics:

- Existing Operations
  - Current service works well with layout of town
  - Regular service (summer) saw increase in ridership when service levels bumped up – potential for more demand?
  - Connecting from Hethwood to Smart Way is not easy
  - Service hours good in general. Could be later on U-Mall.
  - Start regular service earlier?
- New Services

    - On-campus needs – designated bus lanes, campus circulator, separating bus/ped crossings on Perry Street
    - MMTF – how it will change routes and how BT operates?
    - How do you continue to adapt service to campus changes?
    - Connection to Alumni Center?
    - Why not have some routes not on campus?
    - Givens Lane, Maple Ridge community, and other outer areas of TOB could use service
    - Mt. Tabor and Woodbine could use future service
    - Improving service to First & Main, NRV Mall, Marketplace
    - VT-NRCC at Mall service would be good
    - Commuter needs are most unmet – need more PNR options.
    - Service to Giles County, and in general E-W and N-S of TOB is needed. There is a daily influx of commuters to VT/TOB
    - New school coming down Prices Fork, need for service there? PNR down Prices Fork?
- Facilities & Infrastructure
    - Stops are bare-bones with information
    - Standardize stop amenities based on ridership levels
    - Use Next-Stop information and info kiosks [digital] at key stops
    - Need farebox tracking of VT passport
    - TVs/cameras on buses
    - If more articulated buses, does BT facility need to be modified – space challenges.
    - MMTF – Secondary garage with mechanic?
    - Satellite facility needed?
    - Need keyless entry at facilities
- Marketing/Outreach
    - Need to enhance how BT delivers information to two communities – tech-savvy and non-tech-savvy
    - Need travel training for seniors and mobility-impaired to use regular buses
    - Need better service assessment tools. Work with VT, etc. to survey non-riders.
    - Need to understand purpose and needs of CRC and VCOM and connectivity of Smart Way there
    - Typical travel time is 15 min, but will be longer for commuter service – need wifi?
    - Use on-board marketing effectively
- Miscellaneous
    - Need crosswalk and signal standards
    - Need to coordinate road changes and identify improvements needed
    - Staff for facilities, area manager, and mechanic needed
    - Will need additional mechanic and staff to meet existing and future needs
    - Name the TDP – BT Managers were asked to collect name options for the TDP document from BT staff. A prize will be awarded

2.4 BT Finance Staff Meeting

Date: October 13, 2010, 3:00 – 4:00

Attendees: Wayde Kass, Financial Analyst
Dianna Morris, Grant Coordinator

Discussion:

- Staff includes Mr. Kass, Ms. Morris and 2 accounting techs
- Primary role of department includes:
  - Collect trip sheets for payroll—passengers, hours, etc. tracked by ITS (Robert Thompson)
    - Trip sheets are manual entry now
    - Mentor (Route Management System), used as basis for payroll tracking in the future
  - Fare collection – daily basis, empty vaults. All money is put in one bag (divided by TOB/TOC)
  - Accounts Payable – Invoices, Requisitions (>$1k go downtown for payment)
  - Budgets/expenditures
    - BT has access to Town System
    - Town charges BT for these services (financial and ITS)
    - Town handles payroll checks
- Regional Cost Model
  - Cost accounting – revenue hours
  - 10% Christiansburg
  - 80% Blacksburg
  - 10% Access
  - All expenditures allocated out per model
  - Capital Assets greater than Regionalism equal shared overhead
    - Equitable swaps—guidance needed
  - Five year finance plan
  - Information dissemination is not non-VT friendlyBT requests that TDP team review the Regional Cost Model
- Smart Way – town pays a portion
- Christiansburg cannot get to hospital
  - Warm Hearth – County, Hospital – Blacksburg
- Two town trolley
- Spring commuter routes Christiansburg to BT
- CIP
  - Virginia requires 6 years
  - Blacksburg requires 5 years
  - Working on first draft now
  - Team was given town CIP which includes last year's version of BT's CIP
- Funding primary mechanisms
  - 5309
  - 5307
  - JARC – Christiansburg
  - Revenue – partnership, advertising
    - NRV Mall

        - Walmart
        - New River Community College and Hospital — need to pursue
        - VT – athletics, home games
        - VT – annual contract - BT determines base, based on last year's service and adjusted based on personnel, costs, needs
            - Contract signed by July
            - Route planning – operations makes recommendations and finance determines money

2.5 BT Marketing/Communications Staff Meeting

Date: October 13, 2010, 5:00 – 6:00

Attendees: Ken Tucker, Marketing Manager

Discussion:

- Roles and Responsibilities:
    - Revamp client activity – advertising
    - Administrative functions
    - Policy writing/reports
    - Not much active selling – may use contractor
    - Wraps on buses (Smith's Landing)
- Income
    - Advertising – incremental revenue generates $80-90K annually
    - Gross is net for all ads and wraps
    - Partnership Program – not selling advertising rather bringing partners on which then has value-added benefits like advertising
- Media Communication – Fiona, Becky, Ken
    - Website – handled internally by Fiona Rhodes
    - Newspaper
    - Customer Service
- Current Projects
    - Logo
    - Style guide – colors, etc (service marked)
    - Internal event planning
    - Bus unveiling
    - Hippie bus artwork
    - Job descriptions
- Customer service – how feedback and complaints addressed
    - Fiona is in charge of complaints
    - 3 business days to respond
    - Respond in same manner as received (phone, email, etc)
    - All complaints and return calls are logged
    - Average number of complaints?
    - Guidelines?

- Regionalism - Becky is the face, staff participates as needed based on their job responsibilities
- Not really engaging TOB for needs
- Service changes
    - Use public hearings when routes change dramatically but don't alert public for minor changes
    - Nothing done when Tom's Creek A/B changed to Tom's Creek and University Cty routes
- Off campus housing fair, Sustainability Week, New Student Orientation
    - Provide transportation (sell sponsorships), goodie bag
- Drivers often pick up marketing shifts, which hurts driver staff levels
- Reports
    - No formal presentations to TOB
    - Internal weekly managers brief
    - Christiansburg will get a weekly report starting next week on ridership, customer feedback and marketing
    - VT gets quarterly report in marketing format, trends by route, passengers/revenue an hour
    - Annual reports
- Schedules and Route Maps are handled in house and use vendor for layout and printing
- Buses rotate so hard to do individual route schedules
- BT4U: will tell rider information via text, call, or email a request. Plug in stop #. Requires new stop design
- Bus design - Need to freshen up the look, bring in a consultant to rebrand?
- BT's vision moving forward
    - Regional service- BT and/or others to manage other areas. Add Radford? Who should run what services? Consider becoming an Authority, pay structure saves. Pros and cons to being part of TOB
    - Cannot lose sight of home market in regionalism
    - TDP should be living document that both guides and restricts so BT can be less reactionary
    - Organizational chart is top heavy
        - Middle management development plan
        - Management structure
        - Management performance review
        - Organizational changes to adapt to operational changes
        - What new talent will BT need in the future?

2.6 BT Regulatory Staff Meeting

Date: October 14, 2010, 8:00 – 9:00

Attendees: Debbie Swetnam, Regulatory Manager

Discussion:

- Roles and responsibilities:
    - NTD Reports

    - CDL tests – use third party testers (annual audit)
    - Reporting for OLGA (state) is FR and ADA and for NTD is FR and DR, so variations on where TOC service goes (Robert's report breaks this out)
    - Triennial Review
    - Title VI
    - Internal Handbooks (Drug/Alcohol Testing, etc)
    - Order Buses – work with Maintenance and Finance
    - Almost everything that needs to be audited except financials
- Oversees Planning position – when planning money came from MPO, needed someone to manage planning projects (like Warm Hearth study)
    - Most MPO and PDC duties handed over to this position
    - MPO is very transit supportive
    - PDC relationship is getting better – employee mobility report and community services plan will be useful
- Ms. Swetnam has been with BT since inception. Historical information:
    - Started April 1983 (started studying in 1978)
    - Started with 3 routes: Hethwood/Windsor Hills, Tom's Creek, Main Street
    - First addition was the hospital
        - BusBurg Committee was started to review transit in Blacksburg
        - A plan and grant application were prepared but rejected the first year
        - Committee began talking with VT because traffic and parking were getting bad and a year later the town put in another grant along with VT
    - Michael Connelly was first manager. Originally managed by ATC but TOB eventually took over.
    - Regionalism has been on table since 1978
    - 30' Bluebirds- blacked out windows, packed students in, got retired buses from elsewhere at first
    - 1991 – began service to TOC with TTT
    - Town Council is the Board
    - Everything went through a TAC with 6 VT representatives (Steve Mouras, grad, undergrad, professors, administration) and 5 town representatives (interested citizens appointed by town)
        - Approved budgets, route changes, etc.
        - TAC was in place until October 2001 when Becky came on and dissolved as part of TOB initiative to reduce number of committees
- VT – originally provided a 3% increase in operating every year with reserve maintained for mid-year changes. BT still hasn't caught up to growth in terms of staffing
    - Systems Peer Review – Statewide survey: 7 vehicles/mechanic, average is 15
- 2000 census – TOB-Montgomery-TOC becomes urbanized
- Operating funds have been pretty flat
- Built new facility in late 1980s with section 3 grant and moved in 1991
    - 30 storage bays
- 2005/6 renovation

    - Added 10 storage bays on each side and 2 maintenance bays at back
    - Added items BT could not afford in 1991
    - Also added administrative and conference area
- Urbanized - more regional approach
    - Radford lost a lot of revenue services. Towns don't have money
    - Radford University wanted BT to take over their service for students (2 buses) but VA said they cannot take over service without a study
    - KFH study for Radford – Debbie will provide*
- Downtown Trolley Plan – all day trolley bus service from VPI Mall to First & Main
- Main Street road project to be complete end of 2011
- Have put off vehicle replacement for support and paratransit – tend to keep after replacement (5-6 yrs instead of 4) because need the spares for reliability
- There are some inefficiencies in PT, possibly as a result of combining FR and PT operations
- Spare ratio (14-16 spares) is twice what it should be but hard to not because mechanic staff is tight
- Hard to meet DBE requirements – 0% goal for 2011
- With Limited Resources, would:
    - Add neighborhood service in TOB
    - Keep TOC service balanced (monitor on Mentor)
    - Keep applying trippers well to respond to data
    - South Main service could be less than North Main levels
    - Windsor Hills doesn't need 15 minutes
    - TOC-VT commuter service (starting Jan 2011) will be good addition
- With Unlimited Resources, would:
    - Hub at NRV Mall to TOB, TOC, Radford
    - Staff differently – fewer trainers and better balance of full- to part-time operators

2.7 BT Operations Staff Meeting

Date: October 14, 2010, 10:00 – 11:00

Attendees: Harland Brown, Operations Manager
Ron Parker, Supervisor

Discussion:

- Current Service
    - Current services fit town footprint
    - Changing service now is difficult due to limited funds
    - Changing mindset of residents that BT is a town service and not just for VT
    - Community Transit Services – no town money so none implemented
    - Current routes are efficient and were set up years ago with some tweaks
    - Two Town Trolleys used to meet each other – needs to have direct service into downtown Christiansburg or to 81
    - 7 minute service runs for Tom's Creek had issues of pedestrian traffic on Perry Street. Could implement 7 minute runs again (which are needed) if MMTF with elevated pedestrian crossing is in place

- Operations role – manage operations
    - 7 supervisors, 5 assistant supervisors, 5 dispatchers, 2 assistant dispatchers, 120+ bus operators
    - High turnover
    - Disciplinary action, personnel issues
    - Routing requests
    - Work with maintenance to assist them with bus cleaning, etc
- Shifts
    - Op 3 – FT, Op 2 – 30 hours, Op 1 – 9 to 40 hours
    - Schedule is set up around VT class schedule
    - 5 shift changes—9:45, 12:45, 3:45, 6:45, 9:45
    - 27-30 buses - first pullout
    - Vans take some drivers to VT
    - Supervisors must SEE drivers before they drive
- Training program
    - Run by separate staff now
    - All operations staff need to know how all job duties are performed
    - Each supervisor needs to know all duties but has a special job description
    - Training coordinator/supervisor, 1 fulltime trainer (Fulltime operators are also onboard trainers), 2 part time trainers.
    - Training feedback loop is lacking
    - Supervisors in charge of review of operators but they are not familiar with nuances of training program
- Run Cutting/Bids
    - Ron does this – no software like Trapeze, use Excel, plug holes with part time ops
    - Run bid/shift bid
        - January-June and July-December
        - Goes by seniority
    - Window work – online scheduling software
        - Operators are notified when there are open shifts
        - Operators can pick up shifts from home
    - Issues with running so many part time operators
        - Summer drop off from 30 buses to 8-10 buses
        - Lose 50-75 operators a year
        - A lot of training expenses due to turnover
- Monthly safety meeting
    - Meeting topic exclusively is safety
    - Review accidents, intersection problems, pedestrians on campus
    - Open discussion for operators
    - If 2-3 note a similar issue, then additional training or additional review is conducted
    - Issues taken to town Traffic Committee if needed (signals, curb cuts, remove parking on Giles Road)
- Top Trouble Areas

    - Roanoke/Main turning (mirror taps)
    - Windsor Hills EOL - only area where BT backs up
    - Main/Givens, esp. in bad weather (not used for snow route)
    - Buses pulled off Broce for safety
    - Campus crosswalks
    - Main Street Route - Marlington loop is done backwards once a day. Support more in the area, but what about in the future?
    - (TOC) Depot and Radford Road has intersection issues as driver has to wait multiple cycles to get through—need to work with TOC
    - (TOC) Lester and Park – bus makes left turn onto Park but there is always a red car parked in the way
- New Services
    - Hard to sell routes that don't have high productivity
    - End-to-end Main Street route
    - Warm Hearth and new development
    - Mobile Home Park – west of Whipple on Givens Lane
    - Consider call ahead/offpeak tripper service to hospital?
        - Only get 2 riders a month
        - Low productivity
        - Warm Hearth has one van that could connect with BT route
        - Connect to med offices on Davis
    - Considered a route through Jefferson Apartments area but lacked support
        - At the time was looking more at revisions and not new routes
        - May be a candidate to run smaller van or cutaway
- Bicycle and Pedestrian Traffic
    - More bicycle traffic in Blacksburg and VT in particular
    - Bicycle and Pedestrian crossing is important factor for route considerations (Stanger Rd)
    - Campus roundabout – new academic and student service buildings - more foot traffic
    - Every bus has racks for at most 2 bicycles, but there are only a few bike racks on campus and not at stops
- Areas with too many stops?
    - There are areas with too many stops; very difficult to delete stops
    - Need to review existing stops to see where some can be eliminated
- Some stops in Christiansburg with shelters have been abandoned so these shelters could be used elsewhere
- Operational Reporting
    - Accidents are logged by operations staff
    - ITS does data collection through Mentor system
    - ITS issues on time performance report to managers on street reports
    - Policies and procedures/standards for accident reporting are needed
    - Ops send reports when requested by town
    - All dispatch is logged with daily report of all activity
- Routes - Dispatching

    - BT Access – separate schedules (2) Route Match—one working at a time
        - Online application for Access
        - Access at peak has 5 buses but typically 3-4 vehicles
        - Most trips are single passenger
        - Used more for shopping than medical, but dialysis is popular
    - Go Anywhere – take calls (2) – one working at a time
        - Same day trips can be scheduled
    - Route Match – used for both
        - Still working out issues
        - Only for last 4-5 months
        - Will provide handbooks for both services to PBS&J
- With Limited Resources, would:
    - Minor tweaks, more hours (Main St was 20 minutes and now is 15)
    - Morale boosters
    - Cost of living raises
    - Internal training
    - Tom's Creek changes – how is it working?
        - Beginning to balance the load
        - 10 minute headway
        - But still leaving people behind due to full buses
        - Additional tweaks needed
        - Add service every hour after 6pm in January 2011
- With Unlimited Resources, would:
    - Add key staff positions (esp. maintenance) – need budget approval
    - Improve every route with more service, esp. Hethwood, Main Street, and Hospital
    - Commuter services - connect 2 towns
    - Run more break service in specific areas which would require more operators and help retention of operators so less turnover
    - Upgrade stops
    - Change branding
    - Improve safety program
    - Give Part-time more incentives, such as insurance benefits
    - Interface with Smart Way
    - BRT – from 81 to 460
    - Campus – fix issues
    - Prioritized signals and bus-only lanes
    - Downtown trolley
    - New neighborhood services
- Service patterns (other than home to VT)
    - Main Street has North to South flow
    - Evening to downtown and use other methods to return
    - VT campus to apartments
    - Evenings when social functions come to a close

- Safety
    - Not many passenger issues
    - Not much vandalism, windows broken occasionally
- On Time Performance
    - Main Street construction is causing some delay
        - In future hope to use light at Alumni Mall to turn left onto Main so bus can U-turn at VPI Mall
    - Routes through campus get delayed but catch back up once off campus
    - Christiansburg has deviation time built in to route—ridership is low so need to slow buses down not to sit at time checks as long
- Need new stop away from Burruss Hall – spread to 3 other stops until MMTF in place
    - Right now Torgersen (3 spots), Newman (3 spots), Burruss (6 spots)New buildings on campus need to be considered for transit such as the Performing Arts Center which has 1300-1500 seats
    - Burruss webcam can be used to observe heavy pedestrian traffic on campus

2.8 BT Maintenance Staff Meeting

Date: October 14, 2010, 11:00 – 12:00

Attendees: Mike Price, Maintenance

Discussion:

- Facility Parking
    - All buses (60) parked inside every night
    - Facility is at maximum capacity so additional buses would require more indoor storage or would have to be stored outside
    - Satellite facility? – not much discussion but was talked about for Radford if/when brought on
- Maintenance Bays
    - 5 maintenance spots
    - 3 sets of above ground lifts that are mobile on wheels
    - 1 in ground lift
    - 1 medium sized above ground lift for cutaway which is stationary and 4 years old
    - 2 pits
- Parts and Tools
    - All parts are barcoded, inventory is handled by Parts Supervisor, Jerry Stoneking
    - Mechanics can check out parts without Parts present
    - There is a checkout board logging which vehicles mechanics take for maintenance
    - Check sheet is then input into tracking for the vehicle
- Needs and Capital requests
    - Town requires BT to use specific vendor - HTE Sunguard Maintenance System is primarily a financial tool and not very applicable to maintenance
    - Need new Wash Bay system in next year or two
        - Every night each vehicle is washed and fueled
        - Existing wash system is nearly 20 years old and very time consuming

        - Takes all night to wash 30 vehicles each night plus more time to mop interior
        - 20 minutes a vehicle is fast for experienced staff
    - In 2011 received Grant of $75k for RF system fueling sensors, mileage log accuracy
    - Usually have $100k list of capital needs
    - Working on ceiling levels, suspended air and oil lines, safety needs for mechanics
- Vehicles
    - Operations determines which vehicle goes out on a run
    - Maintenance asks that buses get rotated for battery performance and to balance mileage usage
    - All vehicles except cutaways have 12 year lifespans
    - Funding has been there when needed and pretty consistent
    - Going toward hybrid vehicles for the future
    - No CNG plans, expense and facility needs excessive
    - At 4 am they email a maintenance hold sheet which explains problems with vehicle and the work on it
    - Regular reports such as the Triennial Report of preventative maintenance, it was behind due to short-staffing
- Maintenance Staff works full time with benefits
    - 1 Lead Mechanic (7:30am-4pm)
    - 1 Parts Supervisor
    - 2 Mechanics (7:30am – 4:00pm, 3:30pm – midnight) – 1 more open position available
    - 1 Mechanics Assistant (5am-1:30pm)
    - 2 FT Maintainers (10pm-6:30am), need two more
    - 2 PT Maintainers
    - Number of mechanics would ideally be 7-8 mechanics
    - Mechanics are equipped for new vehicles (currently 2 artics)
    - Could use more artic training but can't afford the loss of maintenance work to train
- Facility Maintenance
    - The responsibility of facility maintenance is handled by the vehicle mechanics.
    - A Maintenance and Replacement Schedule for the facility is needed
    - Need dedicated building and facility maintenance supervisor and staff
    - Waste Management is taken care of by Town
    - Cleaning the garage is handled by mechanics
    - Facility custodian is contracted by BT not handled by the Town
    - Bus stop maintenance is handled by the vehicle mechanics
    - Drivers report issues regarding bus stop maintenance
    - Drivers provide support for cleaning duties during regular season
    - Perhaps BT can develop "Adopt a Stop" and have the students handle stop maintenance
- Incident response
    - Day mechanics respond to incidents on week days and weekends
    - Night mechanic responds during week nights and late nights
- Some outsourcing is necessary for paratransit and support fleet due to cost benefit and short staff

2.9 BT Special Projects/ITS Staff Meeting

Date: October 15, 2010, 8:30 – 10:30

Attendees: Tim Witten, Special Projects

Discussion:

- General History/Observations:
    - BT always has to be responsible to VT leadership (moving buses from Burruss Hall is an example)
    - In last 40 years, shift in population from Pulaski and Radford to TOB and TOC
    - Feeling was that PDC was not responsive to TOB and TOC needs
    - No good connectors between Radford or Pulaski and TOB – Prices Fork not a part of the regional plans
    - At time TAC was dropped, TOB had 25-30 committees – was hard to follow open committee/FOYA laws and desired fewer committees, so TAC was dropped
        - Was too bloated, hard to quorum
        - Too focused on small issues and conflict
        - Was also a Paratransit subcommittee that got very adversarial
    - Contract with VT is only about 5 years old
    - TOC service is also contract
    - Susan Angle or Virginia Reilly – good ADA rep?
- BT has long history of using AVL/GPS (since 1994)
- ITS and Paratransit has been organizationally linked
- Paratransit is using Route Match to schedule trips
- ITS maintains a list of projects for next 6-10 years – Dashboard
- ITS holds biweekly meetings with each department to follow needs
- ITS also responsible for maintaining department hardware, software, and servers
    - Provide employees with best networks and software possible (dual-monitors, etc)
    - Use 4-year replacement cycle
    - Store data across three physical sites
- Every vehicle has an ITS suite
    - APC, GPS/AVL, Radio, CAD
    - Vendors used for hardware and installs
    - Software and maintenance is internal
- Automated Passenger Counters (APCs)
    - 85% of buses have APC units – new 6000 series buses do not yet – trouble getting parts for these
    - Half are overhead / half are door (accuracy: 95% overhead / 65% door)
    - Hard to mix deployment of APC-ready fleet because of PT operators (but BT couldn't exist without PT operators because FTE benefit load is 65%)
    - Cutaways do not have APCs, so no tracking done on TOC service
- Reporting is done with the Mentor System
    - Non-recording farebox – acts as an electronic counter

    - Used to generate reports for NTD, DRPT, and VT quarterly reports
    - No regular internal reports generated – sense we're doing excellent but not a desire to know if we're not
    - Route and trip data is available for project team
- Rider Information
    - Use Google Transit for trip planning
        - TOB's GIS department working to get all stops in Google database
    - BT4U.org
        - Text for next bus service based on stop number and connecting with real-time AVL info
        - Starting it with first 75-85 stops (about 239 stops in system)
    - BT is looking to avoid application development
        - Focused only on delivering info via web, phone, text
        - Will make data available to outside sources for development (e.g., VT Bustracker app)
- Looking to have Wi-Fi available in 3-5 years
    - Not a high priority since so many short trips and smart phones can use cell platform already to access internet
    - Smart Way has 2 aircards on buses
- April 16 changed perception on using Radios vs. Cell, so radio communication will stay for BT
- Service Thoughts
    - Direction of new service will be guided by where VT goes in next 20 years
        - If university continues pursuit to be Tier 1 research university, will mean influx in grad students -> year-round riders
    - Not sure BT could act as the regional authority, enough issues in TOB to worry about
        - More frequent route services
        - BRT services?
    - TOB FR, TOC FR, and PT is all intermingled re: drivers, operations, etc. – is it better to separate going forward?
    - Service vs. Passenger allocation model for partners?
    - Main Street is way behind schedule due to construction, considering lengthening frequency to 60 min

2.10 BT Transportation Planning Staff Meeting

Date: October 15, 2010, 3:00 – 4:00

Attendees: Erik Olsen, Transportation Planner

Discussion:

- Planner position existed at one time, but fairly new in current inception
    - Brought on when TOC service started
        - Comprehensive 6-page mailer survey
        - Operations had ideas for service already
        - Shopper and Explorer have 1.4-mile deviation but not well understood

    - Lots of time spent prepping Becky for meetings
- Currently doing focus groups for TOC to VT commuter service – vanpool? Door-to-door or major intersection?
- Technically only VT F/S who buy a parking pass can rider bus for free but no way to enforce
- Developing stop improvement plan from recently completed stop database
- Working on the Downtown Trolley Plan
- About 55 shelters at stops
- Working on plans to disperse Burruss stop to other locations to reduce number of buses lining up in front of VT's signature building
- Need for more experience and staff in Planning Department to become proactive with route planning
- With Limited Resources, would:
    - Is PT overinflated? Can resources be moved to Neighborhood service?
    - Through trips on Main Street
    - Add 3 guards to improve safety around Drillfield
    - More staff for Maintenance
    - Use more interns to beef up Operations, Finance, and ITS
- With Unlimited Resources, would:
    - 5-min Hethwood service
    - Regional service

3. Community Stakeholder Input

The following text chronicles input received from various meetings and interviews with stakeholders regarding the desired goals and outcomes of the TDP process, along with an assessment of existing service and operations and future service needs. In total, twelve meetings were held between October 13-14 and November 8-10, 2010.

3.1 Task Force Kickoff Meeting

Date: November 8, 2010, 11:00 – 1:00

Attendees: Marc Verneil, TOB Town Manager
Barry Helms, TOC Interim Town Manager
Steve Mouras, VT Transportation and Campus Services Director
Steve Sandy, Montgomery County Planning Director
Dan Brugh, Blacksburg- Christiansburg-Montgomery MPO Executive Director
Kevin Byrd, NRV Planning District Commission Executive Director
Nichole Hair, TOC Comprehensive Planner
Becky Martin, Director
Debbie Swetnam, Regulatory Manager
Erik Olsen, Transportation Planner

Discussion:

The project team opened with the kick off presentation discussed at the BT All-Staff Meeting, followed by group discussion revolving around the following topics:

- Existing service
    - BT is very effective at moving students, but not so much at moving residents in TOB
    - TOB service and demographics have been stable for years, very good on-campus
    - Service is very high-quality for students
    - TOC is still getting a handle on what type and level of service should be
    - TOC will continue to evolve
    - Must keep service levels up as demand still exceeding capacity in some places
    - Should fares increase more than every 10 years?
    - New buses are great, but new operating dollars are needed
- New service
    - Commuter routes from TOC
        - 21-ft vehicle, subscriber service
        - Near-door service
    - MMTF is the time to look at overall route restructuring
    - Local needs are lost amid student needs
    - The TOB-TOC corridor (US-460 Bus) – how much and what type of service is needed? Needs a bit of everything
        - Is it more of an employment corridor?
        - Hospital and mobile parks should be generators
        - High Top to Merrimac loop
    - Merrimac and Prices Fork are growth areas in County
    - As BT evolves regionally, VT's role in department changes; must keep that balance
        - BT is paid for through student comprehensive fees for VT
        - Need to not lose sight of core services
- Bus stops
    - Need more shelters and ped crossings
    - BT4U starting soon – what is value/need for stop info in tech age?
    - Are bike needs (lockers, racks) being met?
    - More standardization of shelters, etc
- Why have rider demographics remained so stable?
    - 80% of staff are outside of County
    - 60% of faculty are TOB
- By default, parking at VT is moving to fringe
    - F/S are billed through Parking Services
- With Unlimited Resources, would:
    - Regional service from Floyd, Giles, and Radford. Push beyond borders
    - Look east to Roanoke/Salem
    - Different rider bases
    - Neighborhood service?
    - Employer services?
    - TOC service from Mall to town 7 days/wk

    - Event needs
        - Also keep visitors in town after events
- Smart Way is 50% VT (25 student/25 staff). Pretty balanced directionally

3.2 Town of Blacksburg Town Manager Meeting

Date: November 10, 2010, 10:30 – 11:15

Attendees: Marc Verneil, TOB Town Manager
Becky Martin, Director
Erik Olsen, Transportation Planner

Discussion:

- Related discussion from other stakeholder meetings
- TOB is interested in regional development and local service, but does not have money available to do it now
- Perhaps bringing TOB in at partner level is way to dip Town's foot in funding to get neighborhood service
- Possibility that TDP Task Force could transition into TAC-like group that met quarterly to continue forward momentum of TDP goals
    - Would help BT to promote transit, advance goals, and communicate more effectively with partners

3.3 Town of Blacksburg Deputy Town Manager Meeting

Date: October 13, 2010, 4:00 – 5:00

Attendees: Steve Ross, TOB Deputy Town Manager
Josh Lawrence, Project Manager, McDonough Bolyard Peck
Debbie Swetnam, Regulatory Manager
Rebecca Martin, Director

Discussion:

- Vision
    - Neighborhoods (student AND citizens)
    - Christiansburg – continue service and fine tune it, survey it (?)
    - Radford – connection, provider for New River Valley
    - Smart Way – continue relationship. Key element is MMTF
    - Access Paratransit – critical service, under-recognized
- Town Departments
    - See BT as service for all?
    - Greater community? – recognizes the value to move students safely (esp. at bar closing time) and game day opportunities
    - BT is a town department
- Emergency Management for BT
    - Bomb on a bus training
    - School bus accident training
- Move people in and out of downtown

- Underserved/un-serviced areas
    - Balance student housing with non-student housing
    - Stretch as needed
- Task Force: SGA, ADA, General Public
- If BT's budget doubled, where would they want service?
    - Stretch out to more rural areas of New River Valley
    - Bring flex service to Blacksburg (a la Christiansburg Go Anywhere)
    - Dedicated bus lanes
- BT public involvement
    - Town Council
    - VT, Debby Freed
    - MPO
    - Christiansburg – go door to door at businesses, clubs, Rotary, retirement homes

3.4 Town of Blacksburg Planning Department Meeting

Date: October 14, 2010, 9:15 – 10:00

Attendees: Karen Drake, AICP, Blacksburg Town Comprehensive Planner

Discussion:

- 2046 Comprehensive Plan is available online
    - Written in 1996 with a 50 year vision
        - Anticipates growth to full build out in each town and Montgomery County – in general, TOB under plans (slow growth) and TOC over plans
    - 45k people including VT students
        - 9k on campus, but where the rest live is unknown
        - A lot of grad students live in Christiansburg (can get single family homes)
        - VT needs grad housing near campus
        - Push for more professional housing downtown
    - County would like 2/3 of population in the two towns, probably without new annexations
    - Residents in Blacksburg want transit service in neighborhoods, part of larger sustainability drive - "whole life community" – including economic development, high tech
    - Regionalism – how do Blacksburg, Christiansburg, VT and the county etc work together
    - CP Trans. Chapter – greenways, bikes, pedestrians, more about mobility than modes
    - Daytime influx of plus or minus 10k people (45k)
- VT Growth
    - Lots of VT growth does not consider traffic/transit/mobility
    - Second phase of CRC is going on - will need internal campus transportation and to homes
    - Bypass – from east side of town, south of Prices Forks – development
    - Developing area between Prices Fork, Main, and Turner
    - VT is proposing parking decks over next 20 years
        - Including College/Otey, "Cage" lot, and others

- Virginia requires Blacksburg and the County to designate urban areas
    - 2010 census conclusion means Christiansburg will probably have to as well
    - CP already meets growth requirements
- Potential TOB development/construction
    - Old middle school site - 19 acres on Main Street, school has surplused it and is in hands of County to sell, but TOB to zone
        - CP - mixed use
        - Could be site of downtown transit center
        - Will be a few years until all issues resolved and economy turns
    - First and Main – available land but lawsuit with landowner and Virginia in court
    - Some along North Main Street – construction plans online
    - Progress/Givens – extension is waiting for funding
    - North Main Street will be elevated interchange with US460 Bypass
    - Build out of Industrial Park
    - Ramble Road/Main Street – VCOM students, just starting to grow
- Number of permanent residents in TOB is growing and BT needs to accommodate residents and students
- Montgomery County - town village with 1500 people just outside of town boundary west of Merrimac Road near Prices Fork
- 2011- downtown planning sector will be looked at for cohesion and future potential
- No annexations allowed in Virginia but can do boundary adjustments and current boundaries pretty well set
- Water system authority – Christiansburg, Blacksburg – VT
- Jefferson Apartments have own van service to VT
- Churches have own vans
- Current issue regarding new HS location - High school could move next to elementary school and middle school but undecided

3.5 Town of Christiansburg Town Manager Meeting

Date: November 10, 2010, 3:30 – 5:00

Attendees: Barry Helms, TOC Interim Town Manager
Becky Martin, Director

Discussion:

- All sales tax is split between County, TOC, and TOB
- Property tax is County, and each city levies additional amount
- Need is downtown TOC to NRV Mall. Is Fixed Route between TOC and NRV Mall an option?
    - What about TTT? Or does it need to serve Hospital area?
    - Fixed route may be more for future than right now
- Explorer
    - Deviations of Explorer were not well publicized
    - Can Explorer use Wades Ln to Betty Dr? Could hit some residences and Pioneer apartments

    - Drivers will deviate on Explorer on direct request, but really should call it in
- Go Anywhere
    - Success of Go Anywhere is a function of both door-to-door and where it goes
    - Go Anywhere will wait for you
- BT needs to be able to get into rec center better – TOC will work on this
- TOC Commuter routes should have stop in common with Explorer and Shopper/Smart Way
- Future growth
    - Hopefully more employers at Industrial Park
    - PNR and 8 and 81 (exit 114)
    - Lots out Belmont Farms (route 114)
    - Hopefully more retail in NRV Mall area
    - TOC-Fairlawn-Radford loop
    - Running out Roanoke Street (low income and apartments)
- TOC is considering going to priority-based funding
- BT needs to bill TOC quarterly

3.6 Virginia Tech Transportation and Campus Services Meeting

Date: November 9, 2010, 1:30 – 2:30

Attendees: Steve Mouras, VT Transportation and Campus Services Director
Debby Freed, VT Alternate Transportation Manager
Becky Martin, Director
Erik Olsen, Transportation Planner

Discussion:

- MMTF
    - Still need to sort last details of MMTF before it is officially a "go"
    - "Regionality" of hub is sensitive issue to VT – want to insure center is primarily for getting students to/from campus
    - Should MMTF be in TDP plan? Yes, perhaps contingency plan to have same service located along Perry Street if not built
- VT defers to BT on mechanics of providing service
- Can we reduce bus size on campus? Don't need to eliminate Drillfield, just reduce
- Campus Changes
    - Admissions moving in Fall 2011 to Prices Fork, will change Burruss usage
    - Alumni Mall will improve in a year or so
        - Light at Main Street
        - Back to parallel parking, not head-in
    - Center for the Arts - looking at Turner Street side for a transit spot (one)
    - Remote parking lots coming, will be where existing surface parking is
    - CRC Phase 2 is happening now
    - US-460 interchange plan is 10-20 year horizon
    - VCOM is fairly static in size
    - Life Sciences expansion and West Campus expansion are most active now

- Funding priorities
    - Top priority with BT is moving students to campus
    - Localities may need to set priority on moving other markets/purposes
    - Other services may be more low-level (Smart Way model), not fare free
    - Last major growth opportunity for VT is TOC; outside of there, becomes different funding model not driven by VT
    - Wait and see on viability of outer services
- Current funding growth is 1.5% annually. Can use 1-3% for outer years

3.7 Montgomery County Staff Meeting

Date: November 10, 2010, 2:00 – 3:00

Attendees: Craig Meadows, Montgomery County Administrator
Steve Sandy, Montgomery County Planning Director
Becky Martin, Director
Erik Olsen, Transportation Planner

Discussion:

- Peppers Ferry corridor to Fairlawn is needed, linking to Fairlawn-Radford-Pulaski
- Traffic on Route 8 (Floyd and Riner)
- East County – Shelor/Meadowbrook van
- Giles could use service
- Prices Fork growth will be driven by schools being built
- Schools may have transportation needs
- Development slated in Merrimac/Hightop area, but no money for roads; might be Able to get one-time money from developer
- Urban development areas coming across counties – could be density attractors
    - Will have mixed used, TIGER
- VT and NRV Mall will continue to be major hubs
- County would be willing to sit and talk with partners (Warm Hearth)
- Park and Rides
    - PDC/Ride Solutions would have trip data
    - 118 facility or shelters/superstop
    - Cracker Barrel exit another choice
- TOC Industrial Park - Echostar

3.8 Blacksburg-Christiansburg-Montgomery MPO Meeting

Date: November 10, 2010, 1:00 – 2:00

Attendees: Dan Brugh, Blacksburg- Christiansburg-Montgomery MPO Executive Director
Becky Martin, Director
Erik Olsen, Transportation Planner

Discussion:

- TOC came reluctantly to transit, but ahead of TOB
- Lots of calls from TOB residents for local service

- Prices Fork, Elliston/Shawsville, Riner all will need to come into system
- Smart Way didn't work for Shawsville because it didn't hit their destinations
- Elliston/Shawsville shop in Salem, government services in TOC
- Prices Fork is highest area for growth
- Doesn't hear much from County no man's land between TOB and TOC
- Corning has about 140 employees
- 114 growth happening just outside TOC
- Moog employs lots of people, not sure of need
- BT would be best provider service to Floyd, Giles, and Radford
- Smart Way costs about $75K, 56% is paid by VT, remainder split 3 ways between TOB, TOC, and County
- Getting intercity service (Greyhound) off I-81 is hard, won't get them to MMTF, but maybe to 114 (NRV Mall)
- Megabus is looking at Knoxville-Roanoke-DC route 3 times/day (118/140 for stop)
- Radford may want to tie in Smart Way
- Bus Bridge – VT to Amtrak

3.9 NRV Planning District Commission Meeting

Date: November 9, 2010, 8:15 – 9:00

Attendees: Kevin Byrd, NRV Planning District Commission Executive Director
Becky Martin, Director
Erik Olsen, Transportation Planner

Discussion:

- MPO and PDC collaborating on a regional transit model structure analysis
  - Is authority best? Remain local entities?
  - Finished in Sept 2011
  - Important to understand costs involved for various partners under each model
- Need to have regional providers either working together of under same umbrella
  - Mobility manager is one concept to coordinate across region
- Everyone is waiting on Radford to know how to proceed regionally
- Travel relationships growing across region
  - 900 people/day coming to VT from Giles
  - Floyd wants to get into TOC and Radford better
- Potential services
  - Giles – VT – NRV Mall: easy to do PtP down US-460; Pearisburg has hospital and Walmart, but strong traffic to NRV Mall area
  - Pulaski – CC – Hospital – Visco – Bellevue – 114
  - Floyd – Riner – NRV Mall - via Rte 8; Floyd is harder to serve since they are more disperse
  - Connecting 7 County villages with TOB
  - Prices Fork village has growth potential and should be identified in plan
  - East County residents split between TOB and Roanoke – base in Shawsville? (YMCA?)

- Decentralized parking in NW area of US-460/South Main for commuters and game day?

3.10 New River Community College Meeting

Date: November 8, 2010, 2:00 – 3:00

Attendees: Jack Lewis, NRCC President
Pat Huber, NRCC Vice President for Instruction and Student Services
Linda Claussen, NRCC Director of Distance Education & Off-Campus Services
Fredrick (Fritz) Streff, NRCC Director of Institutional Effectiveness & Research
Becky Martin, Director
Erik Olsen, Transportation Planner

Discussion:

- Mall site opened Fall 2007 (was on Roanoke St before that). Main campus is in Dublin
- 1,350 students enrolled
  - Many take classes at both Main and Mall campuses, or at Mall and VT
    - Sometimes within same day, sometimes day to day
    - 200-400 co-enrolled at VT and NRCC
  - Lots of core science, technology, engineering, and math classes (STEM)
  - 100% commuter
  - About 8,500 students have a class at main campus over course of one year
- Evening classes are looking to grow
- Mall site also serves as an exam testing facility for distance learning and other classes
- 140 distance learning classes – FTEs
- Why would students ride bus to NRCC?
  - Some are in real need for transportation
  - How do you attract others?
- What students is NRCC not getting because of no transportation?
  - Dept of Labor grants available
- NRCC could market and advertise on BT, would be able to put some money in there
- Current service times don't mesh with class schedules
  - 10am, noon, and 6pm-9pm are prime times for classes
  - Overall hours are 8am to 10pm
- Transportation needs would be academic calendar based (fall to spring)
- Jenny Boltey and Ron Chatin can help explain PAT experience with NRCC

3.11 Montgomery Regional Hospital Meeting

Date: November 9, 2010, 10:30 – 11:30

Attendees: David Cashwell, Montgomery Regional Hospital Chief Operating Officer
Becky Martin, Director
Erik Olsen, Transportation Planner

Discussion:

- Patients are using BT often to come to medical offices (Hilltop Medical) behind hospital

    - Medical offices on Davis are growing
    - ER sees about 75 patients/day
    - Can get patient volumes
- Hospital Staff
    - About 425 employees (80% day/20% night); 60% are nurses (7:00 to 7:00 shifts)
    - 15 physicians, 6 residents, 6 students
    - 200 volunteers (6am-4:15pm shift)
    - Most in US-460 corridor
    - Can provide zip or address info or coordinate employee survey
- Technically "Lewis-Gale Hospital Montgomery", part of L-G network in Roanoke and Pulaski. Connection might be something, but probably not large
- No expansion is planned for hospital
- Hospital is very open to transit access
- VCOM to Hospital is huge pattern (7am-4pm is typical pattern)
    - Many students doing informal PNR from Hospital to VCOM
- Hospital to Walmart is a pattern
- Other providers
    - PATH (Partnership for Access to Health Care)
    - MedRide does rural pickups

3.12 Warm Hearth Village Meeting

Date: November 9, 2010, 3:00 – 4:00

Attendees: Fern Moschella, Warm Hearth Chief Administrator
Erik Olsen, Transportation Planner

Discussion:

- Hospital and VCOM looking to have FQHC in Hospital area – uninsured and underinsured community health center for SW VA
- Community
    - 220 active employees
    - 550 residents in various care – active adult, independent living, HUD-subsidized living, assisted living, nursing care
    - Within 3 years, will have 35 homes in Wood's edge
    - 100-year plan is 2,000 residents
- WH at Home – work in your home with your needs
- Community Center breaking ground in 2011
    - 15,700 sq ft
    - Wellness and Fitness Center side (20-30 people) – initially open only to residents, then to age-qualified if space permits
    - Community Gathering side (200+ capacity) – music and theatre, civic groups
    - Welcome Center
- Potential BT service

- Need better intra-village transportation; would like BT to take on extra-village travel and can focus WH shuttle on intra-village
- Concept: circulate between Hospital and WH, with connecting service at Hospital to NRV Mall and TOB
- WH will do fair share of support for such service, would be great if county can share in that and access surrounding county needs as well

3.13 Blacksburg Partnership Meeting

Date: January 19, 2011, 2:00 – 3:00

Attendees: Diane Akers, Blacksburg Partnership President
Becky Martin, Director
Erik Olsen, Transportation Planner

Discussion:

- BP is involved in numerous aspects of local life
  - Attracting retail and commercial enterprises to Blacksburg
  - Improving quality of life
    - Retail and commercial marketing and recruitment
    - Development of Interchange Park (US-460 & South Main area) – 6 areas allotted to development to pay for park
    - Improving CRC/Ramble Rd signage and name change
  - Financial support to Farmer's Market, etc
  - 2 annual festivals draw 3500 people
  - Arts initiative
- Transit projects BP has interest in
  - Downtown Trolley – great idea needs more time to develop
  - Festival Shuttles – bringing folks in from satellite parking
  - Drawing folks into Blacksburg from other points
  - Linking to passenger rail
  - Local transit focused more on special events than day to day
  - ACC and Football connections – hotel runs?
  - Industrial Park
  - Lunch route
- Growth in downtown business coming – more tech-savvy crowd
- Center for the Arts (2014) as catalyst for economic growth
  - The "art" bus
  - Artist live/work space
- Possibility of grant-funding for transit coming through BP?

3.14 VT Corporate Research Center Meeting

Date: January 20, 2011, 1:00 – 2:00

Attendees: Joe Meredith, VT CRC President
Becky Martin, Director

Erik Olsen, Transportation Planner

Discussion:

- CRC hosts 90,000 square feet, 140 companies, and 2200 employees
- Demographic survey (2009) indicated more Christiansburg residents employed at CRC from 2004
- Improving signalization at south end of CRC has been priority - $1M for signalization, etc
- Phase 2 will double CRC population (to 4400 people)
    - Nov 2011 – infrastructure for CRC2 in place
    - Early 2012 – first building of CRC2
    - 2020 – build out of CRC2 – land lease or will prebuild as space is needed
- CRC Demographics
    - 10% are VT students
    - Over 50% are not VT graduates
    - 12% of companies have faculty relations
- More aggressive parking policy is needed because people are using CRC for VT parking and riding BT onto campus
- Lynchburg-Roanoke-Blacksburg is key to transportation issue
- CRC to NOVA route 2 times/week – could BT do this?
- Desire to reduce parking at CRC – can Joe use transit to help reduce needed spots/acre?
- Interest in new US-460 intrechange is great, but money is not there yet
- Need for connections to CRC are not just with campus, but that is only connection now
- CRC route needs same schedule year-round – ramping down in summer discourages CRC ridership, which is not on academic calendar
    - 15-min service so people see frequent bus
    - Education of folks to use system is important
    - WH will do fair share of support for such service, would be great if county can share in that and access surrounding county needs as well

APPENDIX D

Blacksburg Transit Title VI Report and Triennial Review

Blacksburg Transit
Title VI Submission

Submitted to:
Federal Transit Administration
1200 New Jersey Ave. SE
Suite E54-422
Washington, DC 20590

July 23, 2009

RECIPIENT INFORMATION

RECIPIENT: Town of Blacksburg, Virginia, Blacksburg Transit
Small Urban Transit Agency (population between 50,000 and 200,000)

SUBMITTAL DATE: July 23, 2009

EXPIRATION YEAR: 2012

CONTACT INFORMATION:

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I. PROVISION OF TITLE VI ASSURANCES

The Town of Blacksburg (The Town) hereby certifies that, as a condition of receiving Federal financial assistance under the Urban Mass Transportation Act of 1964, as amended, it will ensure that:

a. The Town shall submit on an annual basis, their Title VI Assurance, as part of their annual Certification and Assurance submission to the FTA.

b. No person, on the basis of race, color, or national origin, will be subjected to discrimination in the level and quality of transportation services and transit-related benefits.

c. The Town will compile, maintain, and submit in a timely manner, Title VI information required by FTA Circular 4702.1A and in compliance with the Department of Transportation's Title VI Regulation, 49 CFR, Part 21.7.

d. The Town will make it known to the public that those persons alleging discrimination on the basis of race, color, or national origin as it relates to the provision of transportation services and transit-related benefits may file a complaint with the Federal Transit Administration and/or the U.S. Department of Transportation.

II. TITLE VI COMPLIANCE HISTORY

a. There are no outstanding lawsuits or complaints naming The Town of Blacksburg which allege discrimination on the basis of race, color or national origin with respect to service or other transit benefits.

b. There are no pending applications for Federal financial assistance, and there is no Federal financial assistance currently being provided to The Town other than that being supplied by the Federal Transit Administration (FTA). Currently The Town is applying for Section 5309 funding through the FTA.

c. During the course of the last three (3) years, there have not been any civil rights compliance review activities conducted with respect to The Town and, to the best of our knowledge, there are not presently any ongoing civil rights compliance review activities being conducted with respect to The Town.

d. There are currently no pending construction projects which would negatively impact minority communities being performed by The Town.

III. INCORPORATION OF THE PROGRAM

The Town of Blacksburg (hereinafter referred to as "the Town" or "Recipient") hereby agrees that, as a condition to receiving any Federal financial assistance from the Department of Transportation, it will comply with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C. 2000d-42 U.S.C. 2000d-4 (hereinafter referred to as the "Act"), and all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-Assisted Programs of the Department of Transportation - Effectuation of Title VI of the Civil Rights Act of 1964 (hereinafter referred to as the "Regulations"), and other pertinent directives. No person in the United States shall, on the grounds of race, color or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Town receives Federal financial assistance from the Department of Transportation, including the Federal Transit Administration, and HEREBY GIVES ASSURANCE THAT it will promptly take any measures necessary to effectuate this agreement. This assurance is required by subsection 21.7(a) of the Regulations.

More specifically, and without limiting the above general assurance, the Town hereby gives the following specific assurances with respect to its Federal Transit Administration program:

a. That the Town agrees that each "program" and each "facility", as defined in subsections 21.23(e) and 21.23(b) of the Regulations will be (with regard to a "program") conducted, or will be (with regard to a "facility") operated, in compliance with all requirements imposed by, or pursuant to, the Regulations.

b. That the Town shall insert the following notification in all solicitations for bids for work or material subject to the Regulations and made in connection with all Federal Transit Administration programs and, in adapted form in all proposals or negotiated agreements:

The Town of Blacksburg, in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C. 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-Assisted Programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders/proposers that it will affirmatively insure that in any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to the invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

c. That the Town shall insert the clauses contained herein as **APPENDIX A** in every contract subject to this Act and the Regulations.

d. That the Town shall insert the clauses contained herein as **APPENDIX B**, as a covenant running with the land, in any deed from the United States affecting a transfer of real property, structures, or improvements thereon, or interest herein.

e. That where the Town receives Federal financial assistance to construct a facility, or part of a facility, the assurance shall extend to the entire facility and facilities operated in connection therewith.

f. That where the Town receives Federal financial assistance in the form, or for the acquisition of real property or an interest in real property, the assurance shall extend to rights to space on, over or under such property.

g. That the Town shall include the appropriate clauses contained herein as **APPENDIX C**, as a covenant running with the land, in any future deeds, leases, permits, licenses, and similar agreements entered into by the Town with other parties: (a) for the subsequent transfer of real property acquired or improved under Federal Transit Administration programs; and (b) for the construction or use of, or access to, space on, over, or under real property acquired, or improved under Federal Administration programs.

h. That this assurance obligates the Town for the period during which Federal financial assistance is extended to the program, except where the Federal financial assistance is to provide, or is in the form of personal property or real property or interest therein or structures or improvements thereon, in which case the assurance obligates the Town or any transferee for the longer of the following periods: (a) the period during which the property is used for a purpose for which the Federal financial assistance is extended, or for another purpose involving the provision of similar services or benefits; or (b) the period during which the Town retains ownership or possession of the property.

i. The Town shall provide for such methods of administration for the programs as are found by the Secretary of Transportation or the official to whom he/she delegates specific authority to give reasonable guarantee that it, other interest, and other participants of Federal financial assistance under such program will comply with all requirements imposed or pursuant to the Act, the Regulations and this assurance.

j. The Town agrees that the United States has a right to seek judicial enforcement with regard to any matter arising under the Act, the Regulations, and this assurance.

k. The Town assures that the level and quality of transit service and related benefits are provided in a manner consistent with Title VI of the Civil Rights Act of 1964.

THESE ASSURANCES are given in consideration of, and for the purpose of, obtaining any and all Federal grants, loans, contracts, property, discounts or other Federal financial assistance extended after the date hereof to the Town by the Department of Transportation under the Federal Administration and is binding on it, other recipients, subgrantees, contractors, subcontractors, transferees, successors in interest and other participants in the Federal Transit Administration programs.

The person whose signature appears below is authorized to sign these assurances on behalf of the Town.

Date: _____

Marc Verniel, Town Manager
Town of Blacksburg, Virginia

IV. GENERAL GUIDELINES/REQUIREMENTS

a. Annual Certification and Assurance

As stated in Section I, The Town shall submit annually, their Title VI assurance, as part of their annual Certification and Assurance submission to the FTA. The most recent submission for the Town was executed and submitted to the FTA January 15, 2009.

b. Complaint Procedures

In compliance with 49 CFR Section 21.9(b), The Town has developed procedures for investigating and tracking Title VI complaints filed against them. Such procedures shall be made available to the public upon request. Town of Blacksburg complaint procedures are contained herein as **APPENDIX A**.

c. Record Title VI Activities

In compliance with 49 CFR Section 21.9(b), The Town shall prepare and maintain a list of any active investigations conducted by entities other than the FTA, lawsuits, or complaints naming The Town of Blacksburg that allege discrimination on the basis of race, color, or nation origin. Such list shall include:

1) Date the investigation, lawsuit, or complaint was filed;

2) Summary of the allegation(s);

3) The status of the investigation, lawsuit, or complaint; and

4) Actions taken by the Town in response to the investigation, lawsuit or complaint.

d. Access for LEP Persons

The Town of Blacksburg shall take steps to ensure meaningful access to the benefits, services, information, and other important portions of their programs and activities for individuals who are Limited English Proficient (LEP). The Town will assist persons with limited English proficiency to participate in the transportation planning process. Town Staff will make every effort to provide translators and document translation, where feasible, upon request. Blacksburg Transit's Limited English Proficiency (LEP) Assessment is contained herein as **APPENDIX B**.

e. Public Notification

In compliance with 49 CFR Section 21.9(d), the Town shall provide information to the public regarding their Title VI obligations and apprise members of the public of the protections against discrimination afforded to them by the Title VI. Town of Blacksburg complaint procedures and public notification information are contained herein as **APPENDIX C**.

f. Additional Information

The Town acknowledges that, at the discretion of the FTA, information other than that which is required by FTA C 4702.1A, may be requested in writing to the Town to investigate complaints of discrimination or to resolve concerns about possible noncompliance with Title VI.

g. Timely Submission

The Town acknowledges that their Title VI submissions and/or updates thereto, shall be supplied to their FTA Regional Office once every three (3) years. The submission shall include, but is not limited to:

1) A summary of public outreach and involvement activities undertaken since the last submission and a description of steps taken to ensure that minority and low-income people had meaningful access to these activities;

2) The Town's process for persons with limited English proficiency (LEP);

3) Title VI Complaint and Tracking procedures;

4) A list of any Title VI investigations, complaints or lawsuits filed since the last submission; and

5) A copy of the Town's public notice regarding Title VI compliance and public access and instructions for the Town's Title VI complaint procedures.

Portions of the Plan which have not changed since the last submission will not be resubmitted, however, the Town shall include a statement to this effect in lieu of copies of the original documents in order to eliminate redundancy in resubmissions.

h. Environmental Analysis of Construction Projects

The Town shall integrate an environmental justice analysis into their National Environmental Policy Act (NEPA) documentation of construction projects of which require NEPA. If a Categorical Exclusion (CE) is performed, the Town shall complete FTA's standard CE check-list which includes a section on community disruption and environmental justice. While preparing an Environmental Assessment (EA) or Environmental Impact Statement (EIS), the Town shall integrate into their documents, the following:

1) A description of the low-income and minority population within the study area affected by the project, and a discussion of the method used to identify this population;

2) A discussion of all adverse effects that would affect the identified minority and low-income population;

3) A discussion of all positive effects that would affect the identified minority and low-income population;

4) A description of all mitigation and environmental enhancement actions incorporated into the project to address the adverse effects, including, but not limited to, any special features of the relocation program that go beyond the requirements of the Uniform Relocation Act and address adverse community effects such as separation or cohesion issues, and the replacement of the community resources destroyed by the project, if applicable;

5) A discussion of the remaining effects, if any, and why further mitigation is not proposed; and

6) For projects that traverse predominantly minority and low-income and predominantly non-minority and non-low-income areas, a comparison will be completed of mitigation and environmental enhancement actions between the two stated areas. If there is no basis for such a comparison, the Town shall describe why this is so.

i. Public Participation

The Town shall seek out and consider viewpoints of minority, low-income, and LEP populations in the course of conducting public outreach and involvement activities in regards to proposed transportation decisions. The Town shall make every effort to include the following practices:

1) Coordination with individuals, institutions, or organizations and implementing community-based public involvement strategies to reach out to members in the affected minority and/or low-income communities;

2) Provision of opportunities for public participation through means other than written communication, such as personal interviews or use of audio or video recording devices to capture oral comments;

3) Utilization of locations, facilities and meeting times that are convenient and accessible to low-income and minority communities;

4) Utilization of different meeting sizes or formats, or varying the type and number of news media used to announce public participation opportunities; and

5) Implementation of DOT's policy guidance regarding the Town's responsibilities to LEP persons.

The person(s) whose signature appears below, are authorized to sign on behalf of the grant applicant or recipient.

Date: _____

Marc Verniel, Town Manager
Town of Blacksburg, Virginia

APPENDIX A

Blacksburg Transit Title VI Complaint Process:

The objective of the FTA's Title VI Program, as set forth in FTA Circular 4702.1, "Title VI Program Guidelines for Federal Transit Administration Recipients", are:

- To ensure that FTA-assisted benefits and related services are made available and are equitably distributed without regards to race, color, or national origin;
- To ensure that the level and quality of FTA-assisted transit service are sufficient to provide equal access and mobility for any person without regards to race, color, or national origin;
- To ensure that opportunities to participate in the transit planning and decision-making process are provided to persons without regards to race, color, or national origin;
- To ensure that decisions on the location of transit service and facilities are made without regards to race, color, or national origin; and
- To ensure that corrective and remedial action is taken by all applicants and recipients of FTA assistance to prevent discriminatory treatment of any beneficiary based on race, color, or national origin.

To ensure compliance with Title VI Blacksburg Transit has implemented the following policies and procedures.

All customer contacts are recorded, documented, and tracked in a process overseen by the BT Marketing Department. Careful attention is given to analysis of data; including overlaying community, MPO and national information to identify issues or problems. The information is presented to the Director of Transit weekly for her review. If an issue is identified as a Title VI issue in this review, an investigative team, from across the Town of Blacksburg is assembled, to investigate the issue and prepare a report with recommended corrective actions as needed. Following implementation of corrective actions, the issue will be review monthly by the Director of Transit for the next six months.

APPENDIX B

Blacksburg Transit
Limited English Proficiency (LEP) Assessment

Submitted to:
Federal Transit Administration
Region 3
1760 Market Street
Philadelphia, PA 19103

April 30, 2009

Blacksburg Transit Limited English Proficiency Assessment
Submitted to FTA on April 30, 2009

GUIDANCE

The purpose of this limited English proficiency policy guidance is to clarify the responsibilities of recipients of federal financial assistance from the U.S. Department of Transportation (DOT) and assist them in fulfilling their responsibilities to limited English proficient (LEP) persons, pursuant to Title VI of the Civil Rights Act of 1964 and implementing regulations. It was prepared in accordance with **Title VI of the Civil Rights Act of 1964, 42 U.S.C. 2000d, et seq**., and its implementing regulations provide that no person shall be subjected to discrimination on the basis of race, color, or national origin under any program or activity that receives federal financial assistance, and;

EXECUTIVE ORDER 13166

Executive Order 13166 “Improving Access to Services for Persons With Limited English Proficiency," reprinted at 65 FR 50121 (August 16, 2000), directs each Federal agency that is subject to the requirements of Title VI to publish guidance for its respective recipients clarifying that obligation. Executive Order 13166 further directs that all such guidance documents be consistent with the compliance standards and framework detailed in the Department of Justice's (DOJ's) Policy Guidance entitled “Enforcement of Title VI of the Civil Rights Act of 1964--National Origin Discrimination Against Persons With Limited English Proficiency." (See 65 FR 50123, August 16, 2000 DOJ's General LEP Guidance). Different treatment based upon a person’s inability to speak, read, write, or understand English may be a type of national origin discrimination.

Executive Order 13166 applies to all federal agencies and all programs and operations of entities that receive funding from the federal government, including state agencies, local agencies such as the Town of Blacksburg (Blacksburg Transit), and governments, private and non-profit entities, and subrecipients.

FOUR FACTOR ANALYSIS

Blacksburg Transit followed FTA’s Four Factor Analysis to conduct an LEP needs assessment.

Factor 1: The number and proportion of LEP persons served or encountered in the eligible service population

The first step was to collect and analyze data from the 2000 US Census. We produced maps showing linguistically isolated households within our service area (3/4 mile radius buffer from bus stops) for Spanish, Asian, other Indo-European and other language speaking, and a map with all linguistically isolated households combined. A linguistically isolated household is one in which all members of the household 14 years and over have at least some difficulty with English. The real numbers of these households are:

Asian: 270
Indo-European: 62
Spanish: 51
All Other: 19

The total number of linguistically isolated households in Blacksburg Transit's service area is 402. For the most part, these households are clustered in areas close to or right on bus routes, except for some Asian households that are more widely spread into outlying areas.

Using data from the 2000 US Census STF Table, we estimate the Spanish population with language isolation to be 119 (.4%), the Indo-European population with language isolation is 145 (.5%), the Asian population with language isolation is 632 (2%), and the population of all other languages with isolation is 44 (.1%).

The proximity of linguistically isolated households to Blacksburg Transit routes suggests that the LEP population is well served by existing BT routes.

Factor 2: The Frequency with which LEP individuals come in contact with a Blacksburg Transit program, activity, or service

The second step in the process was to collect information on how frequently agency staff come into contact with LEP persons.

a). The front desk receptionist has been tracking phone calls for several months. She stated that she has never encountered a person who could not speak English. She receives an average of 1.6 calls per week from persons who do not speak English well, with the majority of these being Asian speaking people. Most of the calls are from folks looking for items left on the bus, which indicates that they are already using the service.

b.) An informal survey of bus operators resulted in mixed responses. Most operators responded that they encountered LEP individuals once or twice per month, while others reported that they had experiences once or twice per week. One reason for the difference could be the amount of hours driven per week. One operator pointed out that he sometimes has more problems communicating with native English speakers. Another operator stated that her biggest problem was communicating with women who don't speak English who get on the bus with baby strollers, trying to get them to understand that they need to fold the strollers while they are on the bus. According to the responses received, the routes where LEP persons are most frequently encountered are the Hethwood and Tom's Creek routes. Chinese and Arabic are the most commonly encountered languages. We have operators who speak German, French, Spanish, Lebanese, Greek and Arabic, and these operators do, in fact, occasionally communicate with passengers in their native language.

c.) Blacksburg Transit has never had a request for interpreters or for translated BT documents.

Factor 3: The nature and importance of the program, activity, or service provided by Blacksburg Transit to LEP community

Blacksburg Transit has had a working relationship with the Cranwell International Center on the Virginia Tech campus for many years. They provided the following information for this assessment:

1. Cranwell receives bus schedules from Blacksburg Transit and provides them to foreign students who utilize services at the center;
2. Foreign students who attend Virginia Tech must speak English;
3. Cranwell also deals with visitors such as scholars and researchers who have a range of English proficiency, but most have some skill;
4. The prominent languages they come across are Arabic, Spanish, Mandarin Chinese, Korean and French;
5. Spanish speaking persons are more in the community and not affiliated with the university;
6. Most of Cranwell's contacts are comfortable with public transportation;
7. Cranwell could provide translation services for schedules, information cards, etc., and could distribute these materials from their office;
8. Cranwell, the YMCA and various churches offer conversational English classes;
9. Cranwell staff has never heard any complaints about services offered by Blacksburg Transit.

Blacksburg Transit has also had a working relationship with the English Language Institute (ELI) at Virginia Tech for many years. We provide bus passes for their students and ELI includes bus schedules in the students' orientation packages. Students using the ELI passes ride the buses regularly. Staff at ELI generally feels that Blacksburg Transit is meeting the needs of their students.

Factor 4: The resources available to Blacksburg Transit and overall costs

Blacksburg Transit has several resources available for little or no cost. As stated under previous sections, we have bus operators who are fluent in German, French, Spanish, Lebanese, Greek and Arabic. One current full-time operator is fluent in four languages and translates for the court system. All of these employees have offered their services if needed and, in fact, already use this skill from time to time. We also have staff from the Cranwell International Center and the English Language Institute who are available for translation and outreach purposes.

Conclusions:

We draw the following conclusions from our LEP Assessment:

1. The proximity of linguistically isolated households to Blacksburg Transit routes suggests that the LEP population is well served by existing BT routes;
2. The vast majority of phone calls to Blacksburg Transit from LEP individuals are from folks looking for items left on the bus, which indicates that they are already using the service.

3. We have bus operators who speak German, French, Spanish, Lebanese, Greek and Arabic, and these operators do, in fact, occasionally communicate with passengers in their native language, and could be called on to interpret if needed.
4. Blacksburg Transit has never had a request for interpreters or for translated BT documents.
5. Blacksburg Transit has a close working relationship with the Cranwell International Center and the English Language Institute, both of which promote the use of Blacksburg Transit to their students and other contacts. Students using ELI passes ride the buses frequently.
6. Blacksburg Transit has access to current employees, the Cranwell Center staff and ELI staff for interpretation purposes.

Blacksburg Transit has chosen not to develop a written LEP language implementation plan at this time. We have identified some ways to reasonably provide meaningful access by LEP persons to our services. Some strategies that Blacksburg Transit could undertake in the future to reach the LEP population as the need arises and the budget allows include:

1. Provide information in Spanish, Arabic, Korean or other languages when requested;
2. Provide more information pictorially, perhaps to solve such issues as the baby stroller;
3. Provide information targeted to the Spanish population not affiliated with Virginia Tech;
4. Provide meeting announcements in different languages;
5. Provide additional training to employees on dealing with LEP individuals.

This assessment is designed to be flexible and is one that can be easily updated. At a minimum, Blacksburg Transit will revisit the assessment when data is available from the 2010 census. Any questions regarding this assessment should be directed to Blacksburg Transit's Regulatory Manager at:

Blacksburg Transit
Attn: Regulatory Manager
2800 Commerce St.
Blacksburg, VA 24060
Phone: 540-961-1185
Fax: 540-951-3142
Email: dswetnam@blacksburg.gov

APPENDIX C

Notification of Blacksburg Transit Title VI Complaint Procedures:

The following statement appears on the Blacksburg Transit website and in the Route Schedule and Map brochure:

We Serve Everyone

Services, programs, and employment opportunities offered by the Town of Blacksburg are available without regard to race, color, sex, age, religion, national origin, political affiliation, or disability.

To receive more information on the Town's nondiscrimination obligations, or if you wish to file a discrimination complaint against the Town or Blacksburg Transit, you may contact us by mail at:

c/o Transit Director
2800 Commerce Street,
Blacksburg, VA 24060

You may contact us by phone at (540) 961-1185, or by email at btransit@blacksburg.gov

We are in the process of providing translation of this statement in the brochure coming out this fall and on the website that is currently being redesigned.

DRAFT REPORT

FY2008 TRIENNIAL REVIEW

of the

Town of Blacksburg
Blacksburg, Virginia

Desk Review: February 27, 2008
Site Visit: August 4 & 5, 2008

August 2008

Prepared for the
Federal Transit Administration
Region 3
Philadelphia, PA

by

Reid Consulting, LLC

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I. TRIENNIAL REVIEW BACKGROUND

The United States Code, chapter 53 of title 49, requires the Federal Transit Administration (FTA) of the United States Department of Transportation (USDOT) to perform reviews and evaluations of Urbanized Area Formula Grant activities at least every three years. This requirement is contained in 49 U.S.C. 5307(i).

> (2) At least once every 3 years, the Secretary shall review and evaluate completely the performance of a recipient in carrying out the recipient's program, specifically referring to compliance with statutory and administrative requirements and the extent to which actual program activities are consistent with the activities proposed under subsection (d) of this section and the planning process required under sections 5303-5306 of this title.
>
> (3) The Secretary may take appropriate action consistent with the review, audit and evaluation under this subsection, including making an appropriate adjustment in the amount of a grant or withdrawing the grant.

The Triennial Review includes a review of the grantee's compliance in 23 different areas. The basic requirements for each of these areas are summarized below.

This report presents the findings from the Triennial Review of the Town of Blacksburg in Blacksburg, Virginia. This review was performed in accordance with FTA procedures (published in FTA Order 9010.1B, April 5, 1993) and included preliminary reviews of documents on file at the Region 3 Office in Philadelphia and on-site discussions and review of the procedures, practices, and records of the Town of Blacksburg as deemed necessary. The review concentrated primarily on procedures and practices employed during the past three years; however, coverage was extended to earlier periods as needed to assess the policies in place and the management of grants. During the visit, administrative and statutory requirements were discussed, documents were reviewed, and facilities were toured. Specific documents examined during the Triennial Review are available in FTA's and the Town of Blacksburg's files.

II. REVIEW PROCESS

The desk review was conducted in the Region 3 Office on February 27, 2008. Following the desk review, an agenda package was sent to the Town advising it of the site visit and indicating additional information that would be needed and issues that would be discussed.

The site visit to the Town of Blacksburg occurred on August 4 and 5, 2008. The individuals participating in the review are listed in Section VII of this report.

At the entrance conference, the purpose of the Triennial Review and the review process were discussed. During the site visit, urbanized area formula grant program administrative and

statutory requirements were discussed and documents were reviewed. The Town of Blacksburg's transit facilities were toured to provide an overview of activities related to FTA-funded projects. A sample of FTA-funded vehicles was inspected during the site visit.

On completion of the review, an exit conference was held with the Town of Blacksburg staff to discuss findings, corrective actions and schedules. This information is summarized in the table in Section V of this report. A draft copy of this report was provided to the Town at the exit conference.

III. DESCRIPTION OF THE GRANTEE

Blacksburg Transit is a department of the Town of Blacksburg and has provided transit service in the Blacksburg urbanized area since 1983. The service area encompasses the towns of Blacksburg and Christiansburg and adjacent areas of Montgomery County, including the campus of Virginia Tech. The population of the urbanized area is 56,260. All service is operated by Town employees.

Blacksburg Transit operates a network of eight fixed routes. Service is provided between 7:00 a.m. to 12:45 a.m. Monday thru Thursday. On Fridays, the service is extended to 2:45 a.m. Saturday service is from 9:30 a.m. to 2:45 a.m. and Sunday service is from 11:30 a.m. to 11:30 p.m. During the summer and school breaks, service hours are limited and no service is provided on Sundays.

Blacksburg Transit operates a fleet of 36 vehicles in fixed-route service. The fleet consists of New Flyer full-sized buses. The daytime peak requirement is for 24 vehicles resulting in a 50 percent spare ratio. The high spare ratio is due to the need for extra buses to serve Virginia Tech football and basketball games.

Complementary paratransit service, known as *BT Access*, is provided during the same days and hours of service as the fixed routes. *BT Access* operates beyond ¾ of a mile of fixed routes, as it serves any origin and destination in the towns of Blacksburg and Christiansburg. There are eleven vehicles in the *BT Access* fleet.

The adult fare for bus service is $0.50. A reduced fare of $0.25 is offered to persons over the age of 65, disabled persons and Medicare cardholders during all hours. The fare for ADA paratransit is $0.50. Virginia Tech and the Virginia College of Osteopathic Medicine provide funding for passes for their students, faculty and staff.

Blacksburg Transit operates from a town-owned maintenance and administration facility in an industrial park in Blacksburg. It is approximately two miles from downtown Blacksburg and the other departments that are located at Town Hall.

The Town of Blacksburg's FY 2007 National Transit Database Report provided the following financial and operating statistics for its fixed-route and paratransit services:

	Fixed-Route Service	Paratransit Service
Unlinked Passengers	2,431,250	14,549
Revenue Hours	67,814	6,663
Operating Expenses	$3,358,400	$486,669

Over the past three years, the Town of Blacksburg has purchased buses and vans, completed the initial phase of an AVL system and renovated and expanded its transit facility.

Over the next three to five years, the Town of Blacksburg plans to purchase additional buses and construct a multi-modal facility.

IV. RESULTS OF THE REVIEW

The Triennial Review focused on the Town of Blacksburg's compliance in 23 areas. This section provides a discussion of the basic requirements and findings in each area. No deficiencies were found with the FTA requirements in 18 of the 23 areas. Deficiencies were found in the other five areas: Maintenance, Procurement, Title VI, Half Fare and Equal Employment Opportunity. During the site visit, the Town closed the finding in the Equal Employment Opportunity area.

1. Legal

Basic Requirement: The grantee must be eligible and authorized under state and local law to request, receive, and dispense FTA funds and to execute and administer FTA funded projects. The authority to take all necessary action and responsibility on behalf of the grantee must be properly delegated and executed.

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for legal.

2. Financial

Basic Requirement: The grantee must demonstrate the ability to match and manage FTA grant funds, to cover cost overruns, to cover operating deficits through long-term stable and reliable sources of revenue, to maintain and operate federally funded facilities and equipment, and to conduct an annual independent organization-wide audit in accordance with the provisions of OMB C A-133.

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for financial.

3. Technical

Basic Requirement: The grantee must be able to implement the Urbanized Area Formula Grant Program of Projects in accordance with the grant application, Master Agreement, and all applicable laws and regulations, using sound management practices.

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for technical.

4. Satisfactory Continuing Control

Basic Requirement: The grantee must maintain control over real property, facilities and equipment and ensure that they are used in transit service.

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for satisfactory continuing control.

5. Maintenance

Basic Requirement: The grantee must keep federally funded equipment and facilities in good operating order.

Findings: During this Triennial Review of the Town of Blacksburg, deficiencies were found with the FTA requirements for maintenance.

A review of the preventive maintenance records for both fixed-route buses and paratransit vehicles found that the Town has not been maintaining these vehicles according to the schedules included in its vehicle maintenance plan. Some of the intervals reviewed far exceed the recommended 5,000 to 6,000 mile schedules. Discussions with staff indicated that they were aware of the problem, which was due to inadequate staffing in the maintenance area.

The Town has a maintenance plan for its maintenance and administration facility. However, the plan does not include any checklists for maintenance activities to the facility. In addition, there are no records of maintenance activities on the facility

Corrective Action and Schedule: By December 5, 2008, the Town of Blacksburg must develop and submit to FTA a remediation plan to ensure that it is maintaining its FTA-funded vehicle according to the Town's preventive maintenance schedules. At that time, the Town will report to FTA on its progress during the previous three months to demonstrate that it has conducted at least 80 percent of its preventive maintenance inspections for its vehicle on schedule. If the schedule cannot be made, progress towards this goal should be reported in the Milestone/Progress Reports.

1) Plan
2) Excel sheet showing maintenance
3) Document personnel issues that contributed to issues.

By December 5, 2008, the Town of Blacksburg must submit to FTA a revised maintenance plan for its facility that includes checklists used for maintenance activities. The Town will report to FTA on its progress during the previous three months to demonstrate that it has conducted at least 80 percent of its preventive maintenance activities on its facility on schedule. If the schedule cannot be made, progress towards this goal should be reported in the Milestone/Progress Reports.

Facility Maintenance checklist added to maint. policy.
3 month history of maintenance

6. **Procurement**

Basic Requirement: FTA grantees will use their own procurement procedures that reflect applicable state and local laws and regulations, provided that the process ensures competitive procurement and that the procedures conform to applicable federal law including 49 CFR Part 18, specifically Section 18.36 and FTA C 4220.1E, "Third Party Contracting Requirements." Grantees will maintain a contract administration system that ensures that contractors perform in accordance with terms, conditions, and specifications of their contracts or purchase orders.

Findings: During this Triennial Review of the Town of Blacksburg, deficiencies were found with the FTA requirements for procurement.

In June 2007, the Town entered into a sole source procurement for the replacement and repair of its existing shelters. However, the project file did not contain a sole-source justification, which includes a cost analysis.

Corrective Action and Schedule: By December 5, 2008, the Town of Blacksburg must develop and submit to FTA a written assurance that it understands the requirements for noncompetitive procurements and will follow them in the future. Include verbage from procurement / Best Practices /

7. **Disadvantaged Business Enterprise (DBE)**

Basic Requirement: The grantee must comply with the policy of USDOT that DBEs, as defined in 49 CFR Part 26, are ensured nondiscrimination in the award and administration of USDOT-assisted contracts. Grantees also must create a level playing field on which DBEs can compete fairly for USDOT-assisted contracts; ensure that only firms that fully meet eligibility standards are permitted to participate as DBEs; help remove barriers to the participation of DBEs; and assist the development of firms that can compete successfully in the marketplace outside the DBE program.

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with USDOT requirements for DBE.

8. Buy America

Basic Requirement: Per Buy America law, federal funds may not be obligated unless steel, iron, and manufactured products used in FTA-funded projects are produced in the United States, unless FTA has granted a waiver, or the product is subject to a general waiver. Rolling stock must have a 60 percent domestic content and final assembly must take place in the United States.

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for Buy America.

9. Suspension/Debarment

Basic Requirement: To protect the public interest and prevent fraud, waste, and abuse in federal transactions, persons or entities, which by defined events or behavior, potentially threaten the integrity of federally administered programs, are excluded from participating in FTA assisted programs. Federal agencies use the government-wide nonprocurement debarment and suspension system to exclude from Federal programs persons who are not presently responsible. Grantees are required to ensure to the best of their knowledge and belief that none of the grantee's "principals" (as defined in the governing regulation 49 CFR Part 29), subrecipients, and third-party contractors and subcontractors is debarred, suspended, ineligible, or voluntarily excluded from participation in federally assisted transactions or procurements. Grantees are required to review the Excluded Parties Listing System (http://epls.arnet.gov/) before entering into any third party contracts.

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for suspension/debarment.

10. Lobbying

Basic Requirement: Recipients of federal grants and contracts exceeding $100,000 must certify compliance with Restrictions on Lobbying before they can receive funds. In addition, grantees are required to impose the lobbying restriction provisions on their contractors.

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for lobbying.

11. Planning/Program of Projects

Basic Requirement: The grantee must participate in the transportation planning process in accordance with FTA requirements, SAFETEA-LU, and the Metropolitan and Statewide Planning Regulations.

Each recipient of a grant shall have complied with the public participation requirements of Section 5307(c)(1) through (7). Each recipient is required to develop, publish, afford an opportunity for a public hearing on, and submit for approval a Program of Projects (POP).

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for planning/POP.

12. Title VI

Basic Requirement: The grantee must ensure that no person in the United States shall, on the ground of race, color, or national origin, be excluded from participating in, or denied the benefits of, or be subject to discrimination under any program or activity receiving federal financial assistance. The grantee must ensure that federally supported transit service and related benefits are distributed in an equitable manner.

Findings: During this Triennial Review of the Town of Blacksburg, deficiencies were found with the FTA requirements for Title VI.

The Town has not completed an assessment or addressed the ability of persons with limited English proficiency (LEP) to use transit services.

The Town of Blacksburg does not notify it customers of their rights under Title VI either on its web site or on other materials available to the public. Website / Schedule. Wording in triennial workbook.

Corrective Action and Schedule: By December 5, 2008, the Town of Blacksburg will submit to FTA an assessment of whether it has a significant LEP population. If it does, it must prepare and submit an LEP implementation plan including identifying its significant LEP population and determining its needs, providing translation services, notifying the LEP population of its services, staff training, and monitoring and updating its LEP plan.

By December 5, 2008, the Town of Blacksburg will submit to FTA documentation on how it notifies its customers of their rights under Title VI.

Guidance on website. Send to Karen or cc if email.

13. Public Comment Process for Fare Increases and Service Reductions

Basic Requirement: The grantee must have a locally developed process to solicit and consider public comment before raising a fare or carrying out a major reduction of transportation services.

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for public comment process for fare increases and service reductions.

14. Half Fare

Basic Requirement: Grantees must ensure that elderly persons and persons with disabilities, or an individual presenting a Medicare card, will be charged during non-peak hours for transportation using or involving a facility or equipment of a project financed under Section 5307 not more than 50 percent of the peak hour fare.

Findings: During this Triennial Review of the Town of Blacksburg, deficiencies were found with the FTA requirements for half fare.

BT's web site and printed schedules describe the availability of the half fare program to the elderly, persons with disabilities and persons with a Medicare card. However, the fare information on its buses does not describe the availability of the half fare program to the disabled or persons with a Medicare card.

Corrective Action and Schedule: By December 5, 2008, the Town of Blacksburg will submit to FTA documentation that is has revised its description of the half fare program on its buses to include the availability of the program to persons with disabilities and persons with a Medicare card. Change sticker on farebox.

15. ADA

Basic Requirement: Titles II and III of the Americans with Disabilities Act of 1990 provide that no entity shall discriminate against an individual with a disability in connection with the provision of transportation service. The law sets forth specific requirements for vehicle and facility accessibility and the provision of complementary paratransit service.

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for ADA.

16. Charter Bus

Basic Requirement: Grantees are prohibited from using federally funded equipment and facilities to provide charter service except on an incidental basis and when one or more of applicable exceptions for urban areas set forth in the charter service regulation at 49 CFR 604.9 (b) applies.

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for charter bus.

17. School Bus

Basic Requirement: Grantees are prohibited from providing exclusive school bus service unless the grantee qualifies under specified exceptions. In no case can federally funded equipment or facilities be used.

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for school bus.

18. National Transit Database (NTD)

Basic Requirement: The grantee must collect, record, and report financial and non-financial data in accordance with the Uniform System of Accounts (USOA) and updated with the *National Transit Database (NTD) Reporting Manual* as required by 49 USC 5335(a).

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for National Transit Database.

19. Safety and Security

Basic Requirement: Any recipient of Urbanized Area Formula Grant Program funds must annually certify that it is spending at least one percent of such funds for transit security projects or that such expenditures for security systems are not necessary.

Under the safety authority provisions of the Federal transit laws, the Secretary has the authority to investigate the operations of the grantee for any conditions that appear to create a serious hazard of death or injury, especially to patrons of the transit service. However, FTA has no specific requirements for transit safety. States are required to oversee the safety of rail fixed guideway systems through a designated oversight agency.

Under security, a list of 17 Security and Emergency Management Action Items has been developed by FTA and the Department of Homeland Security's Transportation Security Administration (TSA). This list of 17 items, an update to the original FTA Top 20 security action items list, was developed in consultation with the public transportation industry through the Mass Transit Sector Coordinating Council, for which the American Public Transportation Association (APTA) serves as Executive Chair. Security and Emergency Management Action Items for Transit Agencies aim to elevate security readiness throughout the public transportation industry by establishing baseline measures that transit agencies should employ.

Findings: A summary of the Town of Blacksburg's expenditures of Section 5307 funds for security projects is provided in Section VI of this report.

During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for safety and security.

20. Drug-Free Workplace

Basic Requirement: Grantees are required to maintain a drug-free workplace for all employees and to have an ongoing drug-free awareness program.

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for drug-free workplace.

21. Drug and Alcohol Program

Basic Requirement: Grantees receiving FTA funds under Capital Grant, Urbanized Area Formula Grant, or Non-Urbanized Area Formula Grant Programs must have a drug and alcohol testing program in place for all safety-sensitive employees.

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for the drug and alcohol program.

22. Equal Employment Opportunity (EEO)

Basic Requirement: The grantee must ensure that no person in the United States shall, on the ground of race, color, creed, national origin, sex, age, or disability be excluded from participating in, denied the benefits of, or be subject to discrimination in employment under any project, program or activity receiving federal financial assistance from the federal transit laws.

Findings: During this Triennial Review of the Town of Blacksburg, deficiencies were found with the FTA requirements for EEO.

The Town of Blacksburg has over 50 transit-related employees and received more that $1 million in operating and capital assistance in FY2007. However, the Town has not submitted an EEO program to FTA. It should be noted that this was a finding in the last triennial review.

During the site visit, BT submitted to FTA the required EEO program. Therefore, this finding is closed.

23. ITS Architecture

Basic Requirement: Intelligent Transportation Systems (ITS) projects funded by the Highway Trust Fund and the Mass Transit Account must conform to the National ITS Architecture, as well as to U. S. Department of Transportation (USDOT) adopted ITS standards.

Findings: During this Triennial Review of the Town of Blacksburg, no deficiencies were found with the FTA requirements for ITS architecture.

V. SUMMARY OF FINDINGS AND CORRECTIVE ACTIONS

Review Area	Finding	Deficiency	Corrective Action	Response Days/Date	Date Closed
1. Legal	ND-00				
2. Financial	ND-00				
3. Technical	ND-00				
4. Satisfactory Continuing Control	ND-00				
5. Maintenance	D-04	Late vehicle preventive maintenance	Develop and submit a remediation plan to ensure that it is maintaining its FTA-funded vehicle according to the Town's preventive maintenance schedules. At that time, the Town will report to FTA on its progress during the previous three months to demonstrate that it has conducted at least 80 percent of its preventive maintenance inspections for its vehicle on schedule. If the schedule cannot be made, progress towards this goal should be reported in the Milestone/Progress Reports.	12/5/08	
	D-06	Facility/equipment maintenance plan lacking or inadequate	Submit a revised maintenance plan for its facility that includes checklists used for maintenance activities. The Town will report to FTA on its progress during the previous three months to demonstrate that it has conducted at least 80 percent of its preventive maintenance activities on its facility on schedule. If the schedule cannot be made, progress towards this goal should be reported in the Milestone/Progress Reports.	12/5/08	
6. Procurement	D-20	Lacking required justifications(s) and documentation for non competitive award	Develop and submit a written assurance that it understands the requirements for noncompetitive procurements and will follow them in the future.	12/5/08	
7. Disadvantaged Business Enterprise					
8. Buy America	ND-00				
9. Suspension/ Debarment	ND-00				
10. Lobbying	ND-00				
11. Planning/POP	ND-00				

Review Area	Finding	Deficiency	Corrective Action	Response Days/Date	Date Closed
12. Title VI	D-06	Lacking assessment or provisions for LEP persons	Submit an assessment of whether it has a significant LEP population. If it does, it must prepare and submit an LEP implementation plan including identifying its significant LEP population and determining its needs, providing translation services, notifying the LEP population of its services, staff training, and monitoring and updating its LEP plan.	12/5/08	
	D-10	Title VI public notification deficiencies	Submit documentation on how it documentation on how it notifies its customers of their rights under Title VI.	12/5/08 ✓	
13. Public Comment Process for Fare Increases and Service Reductions	ND-00				
14. Half Fare	D-05	Information incomplete for half fares in general	Submit documentation that is has revised its description of the half fare program on its buses to include the availability of the program to persons with disabilities and persons with a Medicare card.	12/5/08 ✓	
15. ADA	ND-00				
16. Charter Bus	ND-00				
17. School Bus	ND-00				
18. National Transit Database	ND-00				
19. Safety and Security	ND-00				
20. Drug-Free Workplace	ND-00				
21. Drug and Alcohol Program	ND-00				
22. Equal Employment Opportunity	D-02	Program not submitted or expired	Submit the required EEO program.	12/5/08 ✓	8/5/08
23. ITS Architecture	ND-00				

Findings: ND = No Deficiencies; D = Deficient; AC = Advisory Comment; NA = Not Applicable; NR = Not Reviewed

VI. TRANSIT SECURITY EXPENDITURES

Does the grantee expend one percent or more of its Section 5307 Urbanized Area Formula Grant funds for transit security? Yes___ No_X_

If no, why does the grantee consider such expenditure unnecessary (check all that apply):
_____ No deficiency found from a threat and vulnerability assessment
_____ TSA/FTA Security and Emergency Management Action Items met or exceeded
_____ Other (please describe): The level of incidents does not warrant further security expenditures and the potential security threats are minimal.

Security Funding	FTA Section 5307 Funds (in Dollars)		
	FY 2005	FY 2006	FY 2007
Total amount of 5307 Funds expended	$3,062,776	$3,333,737	$3,748,120
Amount of 5307 Funds expended on security	$11,197	$4,550	$15,775
Percent of 5307 Funds expended on security	.3%	.13%	.42%
Infrastructure/Capital Improvement Security Projects:			
Lighting, Fencing & Perimeter Control			
CCTV and Surveillance Technology			
Communications Systems			
Security Planning*			
Drills & Tabletop Exercises*			
Employee Security Training*			
Other Security-Related Infrastructure & Capital Improvements (please list): _____			
Operating/Personnel Expenditures (can only be used by agencies in areas with populations UNDER 200,000):			
Contracted Security Force			
In-house Security Force			
Other Security-Related Operating Expenditures (please list): Cell Phones, First Aid, Training Materials_____	$11,197	$4,550	$15,775

* SAFETEA-LU amended the definition of a capital project to include:
- projects to refine and develop security and emergency response plans;
- the conduct of emergency response drills with public transportation agencies and local first response agencies; and
- security training for public transportation employees.

VII. ATTENDEES

Name	Title	Phone Number	e-mail address
Town of Blacksburg			
Rebecca Martin	Transit Director	540-961-1185	rmartin@blacksburg.gov
Debra Swetnam	Regulatory Manager	540-961-1185	dswetnam@blacksburg.gov
Tim Witten	Special Projects Manager	540-961-1185	twitten@blacksburg.gov
Michael Price	Maintenance Manager	540-961-1185	mprice@blacksburg.gov
Dianna Morris	Grant Coordinator	540-961-1185	dmorris@blacksburg.gov
Erik Olsen	Transportation Planner	540-961-1185	eolsen@blacksburg.gov
Jerry Stoneking, Jr.	Parts & Service Administrator	540-961-1185	jstoneking@blacksburg.gov
Bonnie Preas	Purchasing Manager	540-961-1140	bpreas@blacksburg.gov
Jenny Mills	BT Access Supervisor	540-961-1185	jmills@blacksburg.gov
Kevin Price	Training & Safety Coordinator	540-961-1185	kprice@blacksburg.gov
Virginia Department of Rail and Public Transportation			
Jeff Sizemore	Planning and Program Manager	804-382-3805	Jeff.Sizemore@drpt.virginia.gov
FTA			
Karen Roscher (via phone)	Transportation Program Specialist	215-656-7002	Karen.Roscher@dot.gov
Reid Consulting, LLC			
John R. Caruolo	Senior Transit Analyst	610-983-3694	Jcaruolo@aol.com

APPENDIX E

Blacksburg Transit Revenue and Expenditures, 2007-2011

	FY 2007 Actual	FY 2008 Actual	FY 2009 Actual	FY 2010 Revised	FY 2011 Adopted
Beginning Cash Balance (July 1)	$ 2,400,319	$ 3,105,164	$ 2,922,038	$ 3,033,552	$ 2,907,191
REVENUES					
Federal/State Grants	$ 4,244,059	$ 2,897,787	$ 3,723,411	$ 15,851,252	$ 5,139,469
Virginia Tech Contract	2,183,765	2,097,074	2,229,733	2,959,045	2,330,042
Christiansburg Reimbursement	31,821	34,959	140,366	289,582	199,757
Fares and passes	50,703	79,981	75,156	70,726	103,000
Interest	64,164	43,581	57,489	40,000	40,000
Other	120,075	184,342	421,202	331,875	303,568
Total Revenues	$ 6,694,587	$ 5,337,724	$ 6,647,357	$ 19,542,480	$ 8,115,836
EXPENDITURES					
Administration	$ 685,243	$ 668,580	$ 882,839	$ 636,005	$ 683,835
Marketing	0	190,365	180,936	291,905	328,800
Information Technology	0	0	0	247,786	235,017
Operations	1,719,883	1,881,786	2,202,149	2,049,335	2,193,726
Training	0	0	0	225,773	235,957
Access	344,055	353,608	365,224	488,873	565,126
Maintenance	1,078,168	1,319,822	1,331,923	1,371,329	1,354,936
Capital	2,162,393	1,106,689	1,572,772	14,357,835	2,663,614
Total Expenditures	$ 5,989,742	$ 5,520,850	$ 6,535,843	$ 19,668,841	$ 8,261,011
OTHER FINANCING SOURCES					
Net Gain (Loss)	704,845	(183,126)	111,514	(126,361)	(145,175)
Ending Cash Balance	$ **3,105,164**	$ **2,922,038**	$ **3,033,552**	$ **2,907,191**	$ **2,762,016**

[1]For comparison purposes with other fund summaries, projected and budgeted expenditures are recognized on the modified accrual basis of accounting.