Valley Metro

Transit Development Plan
Fiscal Years 2019 - 2028

Final Report

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Greater Roanoke Transit Company

Valley Metro
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DRPT

KFH GROUP

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Chapter 1
Overview of Public Transportation in the Region

INTRODUCTION

A transit development plan (TDP) is a short-range transit plan that outlines the services and initiatives that a transit provider intends to implement over the course of the planning horizon, estimates what resources will be needed, and identifies what funding opportunities are likely to be available. The Virginia Department of Rail and Public Transportation (DRPT) requires that any public transit (bus, rail, ferry) operator receiving state funding prepare, adopt, and submit a TDP at least every six years. DRPT provides a set of TDP requirements that form the basis of the planning effort. DRPT recently changed the TDP guidelines to increase the planning horizon from six years to ten years.

The most recent Valley Metro TDP was completed in September 2009 and outlined fiscal years 2010 through 2015. This TDP update for Valley Metro will highlight the transit program for FY2019-FY2028. The TDP will serve as a management and policy document for Valley Metro, provide DRPT with an up-to-date set of related transit capital and operating budgets, as well as provide the basis for including capital and operating programs in the Six Year Improvement Program (SYIP), the Statewide Transportation Improvement Program (STIP), and the Long Range Transportation Plan (LRTP).

Many of the recommendations that are outlined in the TDP come from the region's recent major transit planning effort, the Roanoke Valley Transit Vision Plan (TVP). In addition, a Comprehensive Operational Analysis (COA) was conducted concurrently with the TDP, and recommendations from the COA are also included within the TDP projects.

Roanoke Valley Transit Vision Plan

Valley Metro recently participated in the Roanoke Valley TVP, which was led by the Roanoke Valley Transportation Planning Organization. The TVP was a three-year effort, completed in 2016, the goals of which were to:

- Record the region's vision, goals and strategies for improving the transit mode of transportation in the Roanoke Valley as identified through input from citizens and local leaders.

- Serve as a resource guide for transit service planning in the Roanoke Valley.

- Encourage local governments to incorporate transit supportive development and infrastructure in local ordinances, policies, plans, and related guiding documents.
- Identify and map all existing and proposed transit services.
- Identify and map locations where transit services are needed and desired.
- Provide strategies for accomplishing the needed services in a reasonable timeframe.[1]

The short-term recommendations of the TVP proposed a significant expansion to the service area, including adding transit service to the following areas:

- The Hollins Area
- Electric Road Corridor
- Glenvar
- Exit 140 (I-81)
- Bonsack
- Roanoke Centre for Industry and Technology.

The plan also provided a number of recommendations for improving the existing services, including:

- Increasing frequency
- Extending service later into the evenings
- Sunday service

There are recommendations for additional routes within the current service and for:

- Coordination of schedules between Smart Way and Amtrak to increase regional connectivity.
- Further study of additional commuter service and consolidating stops to improve efficiency.
- Developing partnerships with employers to increase job access funding.
- Updating route and schedule publications and maps and provide real-time passenger information.

[1] Roanoke Valley Transit Vision Plan, Executive Summary, September 2016, prepared by the Roanoke Valley Transportation Planning Organization with assistance by Foursquare Integrated Transportation Planning and Michael Baker International.

- Pursuing partnerships among local governments for public bus service to increase and improve transit service access and funding options.

- Reducing costs and significantly improving connectivity by regionalizing services for people with disabilities and for seniors across jurisdictional boundaries.

Valley Metro Comprehensive Operational Analysis

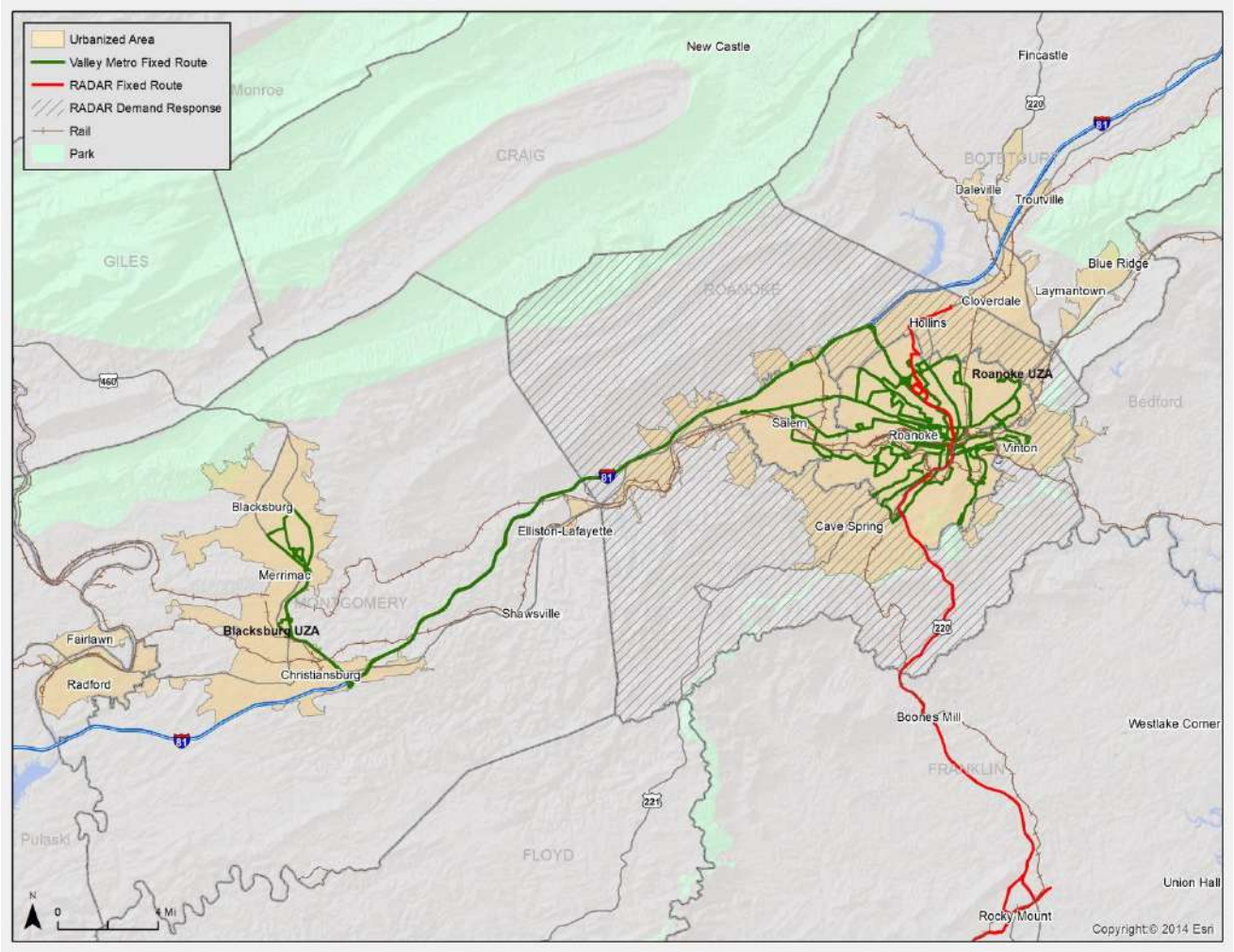
During the TDP process, Valley Metro determined that a more comprehensive examination of the routes and schedules for the fixed route system was needed, and requested that the study team also conduct a Comprehensive Operational Analysis (COA). Valley Metro and the Roanoke Valley Transportation Planning Organization (TPO) provided funding for the COA tasks that were above and beyond the task work being completed for the TDP. The focus of the COA is to improve and strengthen the operational foundation of Valley Metro's existing service delivery network prior to beginning the process of implementing the recommendations of the TVP. A second important goal is to look at ways to reduce the number of transit vehicles that meet at Campbell Court and identify transfer opportunities outside of the downtown area.

BACKGROUND

The Greater Roanoke Transit Company, doing business as Valley Metro, provides fixed route public transit services within the cities of Roanoke and Salem and parts of Roanoke County including the Town of Vinton. Complementary ADA paratransit, termed Specialized Transit – Arranged Rides (STAR) is provided under a contractual arrangement with Unified Human Services Transportation Systems, Inc., Roanoke Area Dial-A-Ride (RADAR). Valley Metro also operates intercity bus service between the New River Valley and Roanoke (the Smart Way Commuter). Prior to the extension of Amtrak service to Roanoke (October 2017), Valley Metro also operated the Smart Way Connector that provided service from Roanoke to Bedford and Lynchburg. This route was discontinued upon the initiation of Amtrak service, and two Smart Way Commuter runs were added in the early morning and late evening hours to allow New River Valley residents to access the train in downtown Roanoke.

The Greater Roanoke Area serves as the center of commerce for Southwest Virginia's Roanoke Valley and includes an urbanized area of over 200,000 people, which classifies the urbanized area as "large," for the purposes of transportation funding and decision making. As shown in Figure 1-1, the urbanized area includes all of the cities of Roanoke and Salem, the Town of Vinton, and portions of the counties of Roanoke, Botetourt, Bedford, and Montgomery. The current transit network is also shown on the map. With the exception of the Smart Way route, which also serves the Blacksburg Urbanized Area, Valley Metro's fixed routes operate within the Roanoke Urbanized Area.

Figure 1-1: Public Transit Services and the Urbanized Area



Major roadway corridors in the region include I-81, I-581, US 220, US 460, US 11, US 221, and the Blue Ridge Parkway. Roanoke also serves as a significant rail hub for the Norfolk-Southern Railway.

For 2017, the Weldon Cooper Center for Public Service estimated that the total population of the three primary service jurisdictions was 219,332. These data are shown in Table 1-1. This compares to the Valley Metro service area population, as defined in the National Transit Database (NTD), of 97,032 (2016).[2]

[2] The NTD definition of service area population for fixed route service is the population within ¾ mile of a fixed route.

Table 1-1: Population in the Fixed Route Service Jurisdictions

Jurisdiction	2000 Census Population	2010 Census Population	2000-2010 Percent Change	2017 Population Estimate	2010-2017 Percent Change
City of Roanoke	94,911	97,032	2%	99,908	3%
City of Salem	24,747	24,802	0%	25,679	4%
Town of Vinton	7,782	8,098	4%	8,065	-0.4%
Subtotal	**127,440**	**129,932**	**2%**	**133,652**	**3%**
Roanoke County*	85,778	92,376	8%	93,735	1%
Total	**205,436**	**214,210**	4%	**219,322**	2%

Source: U.S. Census and the Weldon Cooper Center

*The population of Roanoke County includes the Town of Vinton

The entire urbanized area, shown in Figure 1-1, had a population of 210,111 in 2010.

HISTORY

Public transportation in the Roanoke Valley has a long history, beginning with a railway streetcar service that began operation in 1888 using four mule-pulled cars and two miles of track.[3] This system evolved into the Roanoke Railway and Electric Company (RR&E), which expanded considerably through the early 1900's, with as many as 50 cars in operation and 30 miles of track by 1925.[4]

From 1925 to 1928, the Safety Motor Transit Company (SMT) operated the first bus service in the region, in direct competition with the RR&E. Seven bus routes were operated in Roanoke City, totaling 23 route miles. When SMT's revenue failed to keep up with the expenses of operating the fleet, the bus system was acquired by RR&E.

Between the Great Depression in 1929 and the end of Roanoke's streetcar era in 1948, RR&E gradually made the transition from streetcar service to bus service, similar to the experience in many U.S. cities. Bus transit service remained popular and economically viable through the 1950s and into the 1960s. During the 1960s the viability of privately operated and funded public transportation began to decline as Roanoke City Lines took over the local and regional bus service in the Roanoke Valley. As ridership and revenue continued to decline, Roanoke

[3] Roanoke Transit Vision Plan, Background and Existing Conditions, page 1.
[4] Ibid

City Lines was dissolved. The Greater Roanoke Transit Company (GRTC) was formed in 1975 to take over the provision of public transportation in the City of Roanoke. GRTC, doing business as Valley Metro, is owned by the city and overseen by a Board of Directors.

The following are some significant dates in Valley Metro's history:

1975 – Formed to provide public transportation in the City of Roanoke.

1983 – Opening of Campbell Court Transportation Center as the main bus transfer location.

2004 - Implementation of the first Smart Way service between the New River Valley and Roanoke.

2008 – Implementation of the Star Line Trolley Service.

2011 – Implementation of the Smart Way Connector service between Roanoke and the Lynchburg Amtrak station.

2016 – Completion of the Roanoke Valley Transit Vision Plan.

GOVERNANCE AND ORGANIZATIONAL STRUCTURE

Valley Metro is a private, non-profit, public service organization that is owned by the City of Roanoke. The seven members of the Board of Directors serve one-year terms and are appointed annually by the Roanoke City Council. The current members are:

- William Bestpitch, Board President, Member of the Roanoke City Council
- Anita Price, Vice President, Vice Mayor of the City of Roanoke
- Pete Peters, Assistant Town Manager, Town of Vinton
- Mark Jamison, Member, Manager, Transportation Division, City of Roanoke
- Melinda Payne, Member, Director or Economic Development, City of Salem
- Karen Michalski-Karney, Member, Executive Director, Blue Ridge Independent Living Center
- Michael Shockley, Member, Director of General Services and Sustainability, City of Roanoke. This member will be leaving the Board in September 2018.

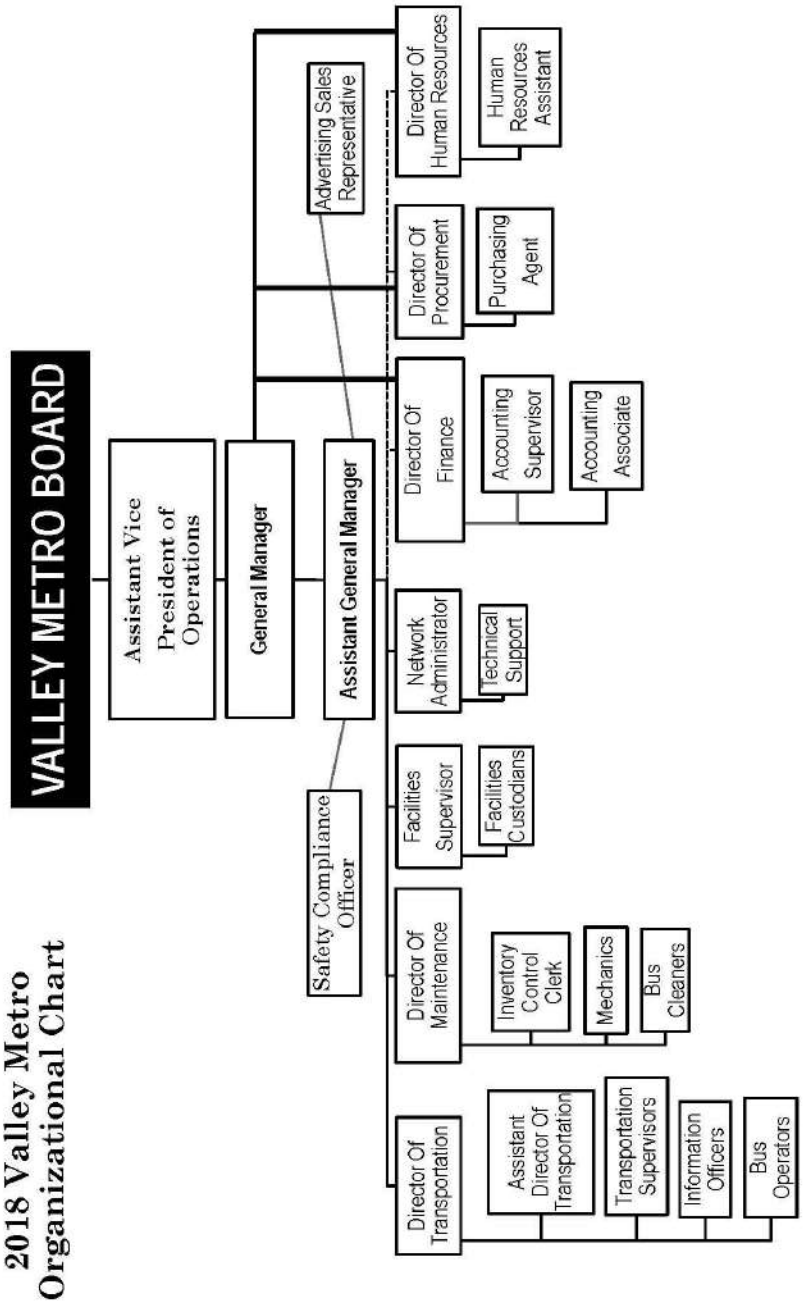
All members were re-appointed in July 2018.

The General Manager and the Assistant General Manager for Valley Metro are employees of First Transit Management Services, through a contractual agreement with the City of Roanoke. All other Valley Metro staff members are employees of the Southwestern Virginia Transit Management Company, Inc., which is a subsidiary of First Transit. The First Transit management team reports to the Board of Directors as well as to the Assistant City Manager, who serves as a liaison.

The last full procurement process to hire a management team was completed in 2009, with a five-year contract awarded to First Transit, beginning in 2010. A five-year extension to the contract was awarded in 2015. Valley Metro has a separate contract with RADAR for the provision of ADA complementary paratransit. The current RADAR contract was awarded in 2012.

As the urbanized area has grown to include service areas that are outside the City of Roanoke, these areas are served via agreements with Valley Metro. The Roanoke Transit Vision Plan included a recommendation for the development of a regional organization so that all areas served have representation on the governing body. This will likely be a regional initiative that will take place during the ten-year period covered by the TDP. The current organizational structure for the program is shown in Figure 1-2.

Figure 1-2: Valley Metro Organizational Chart



TRANSIT SERVICES PROVIDED AND AREAS SERVED

Valley Metro is the primary public transportation provider for the urbanized areas of the Roanoke Valley. Valley Metro services include fixed route, specialized transportation for individuals with disabilities, and special event shuttles. Valley Metro also operates the Smart Way Bus that delivers commuter service between Roanoke and the New River Valley.

Valley Metro Fixed Route Services

Campbell Court in Downtown Roanoke serves as the hub for Valley Metro's fixed route service, allowing for a "hub and spoke" style service. Each route has one end point at Campbell Court and the other end point at another location. At 5:45 a.m. buses begin service at their end point and converge towards Campbell Court. Valley Metro fixed route service operates Monday through Saturday. The following fixed routes are offered:

- Routes 11 and 16 – To Valley View Mall from Campbell Court
- Routes 12 and 15 – To Campbell Court from Valley View Mall
- Routes 21 and 22 - To and from Crossroads Mall from Campbell Court – Williamson Road
- Routes 25 and 26 – To and from Campbell Court from Crossroads Mall – Hollins Road
- Routes 31 and 35 – To Vinton from Campbell Court
- Routes 32 and 36 – To Campbell Court from Vinton
- Route 41- To Southeast Roanoke from Campbell Court
- Route 42 – To Campbell Court from Southeast Roanoke
- Routes 51 and 55 – To Tanglewood Mall from Campbell Court
- Routes 52 and 56 – To Campbell Court from Tanglewood Mall
- Route 61 - To Brambleton and Red Rock from Campbell Court
- Route 62 – To Campbell Court from Red Rock and Brambleton
- Route 65 – To Carlton and Grandin from Campbell Court

- Route 66 – To Campbell Court from Carlton and Grandin
- Route 71 – To Lewis Gale Medical Center from Campbell Court
- Route 72 – To Campbell Court from Lewis Gale Medical Center
- Route 75 – To the Salem VA Medical Center from Campbell Court
- Route 76 – To Campbell Court from the Salem VA Medical Center
- Route 81 – To Goodwill Salem from Campbell Court
- Route 82 – To Campbell Court from Goodwill Salem
- Route 85 – To Peters Creek Road from Campbell Court
- Route 86 – To Campbell Court from Peters Creek Road
- Route 91 – To Salem VA Medical Center and Lewis Gale Medical Center from Campbell Court via Salem
- Route 92 – To Campbell Court via Salem from Salem VA Medical Center and Lewis Gale Medical Center
- Route 31X – To Roanoke Center for Industry and Technology (RCIT) from Campbell Court

The operating statistics for each of these routes are provided in Chapter 3. Figure 1-3 provides a system map for the Valley Metro fixed routes.

Star Line Trolley

Valley Metro operates the Star Line Trolley, which connects Downtown Roanoke with the Carilion Roanoke Memorial Hospital via Jefferson Street. The Star Line Trolley operates Monday through Friday, 7:00 a.m. to 7:00 p.m. providing service every 15 minutes. Service is provided every 10 minutes from 10:00 a.m. to 2:00 p.m. Figure 1-4 depicts the route map for the Star Line Trolley.

Figure 1-3: Valley Metro Fixed Route Service Map

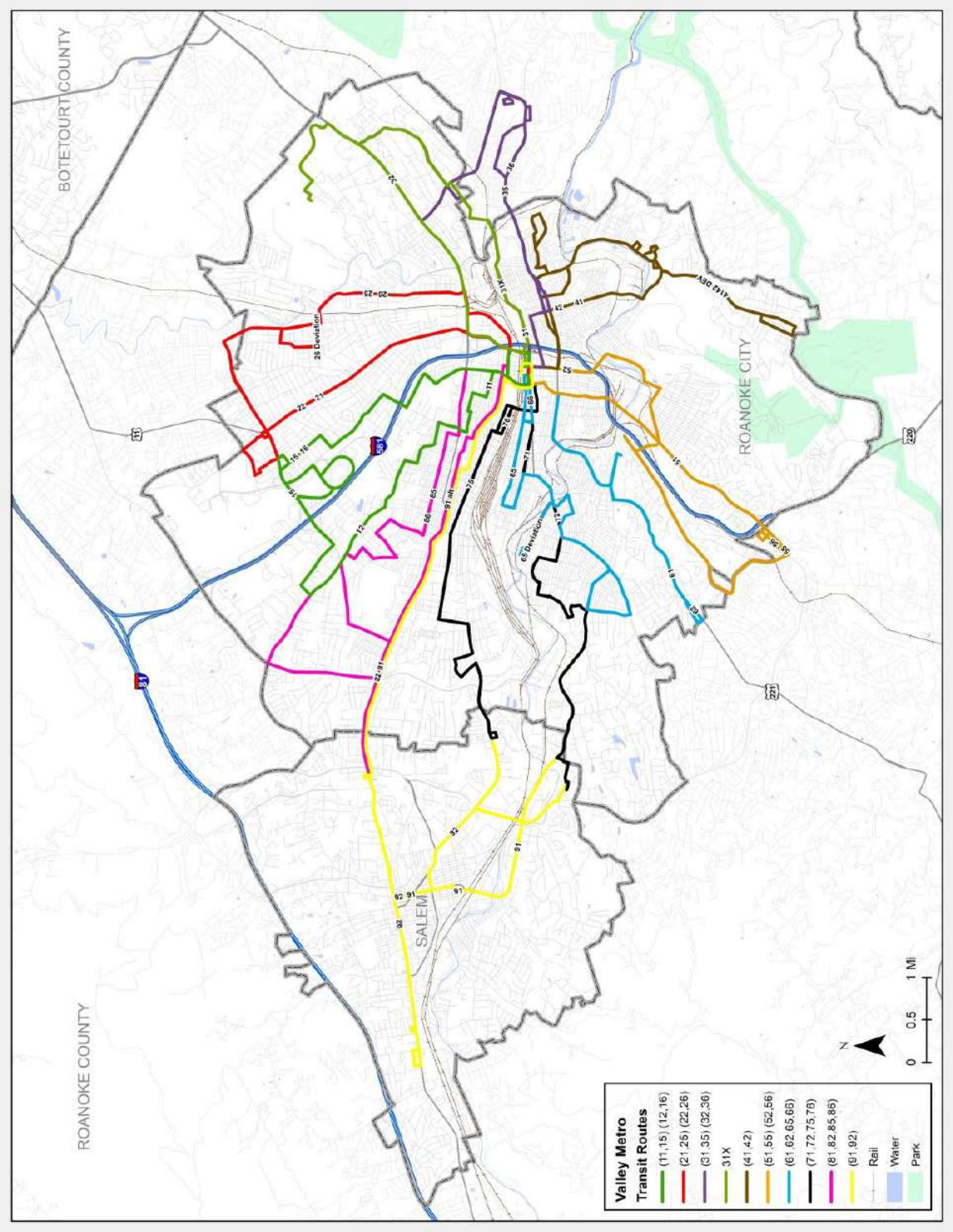
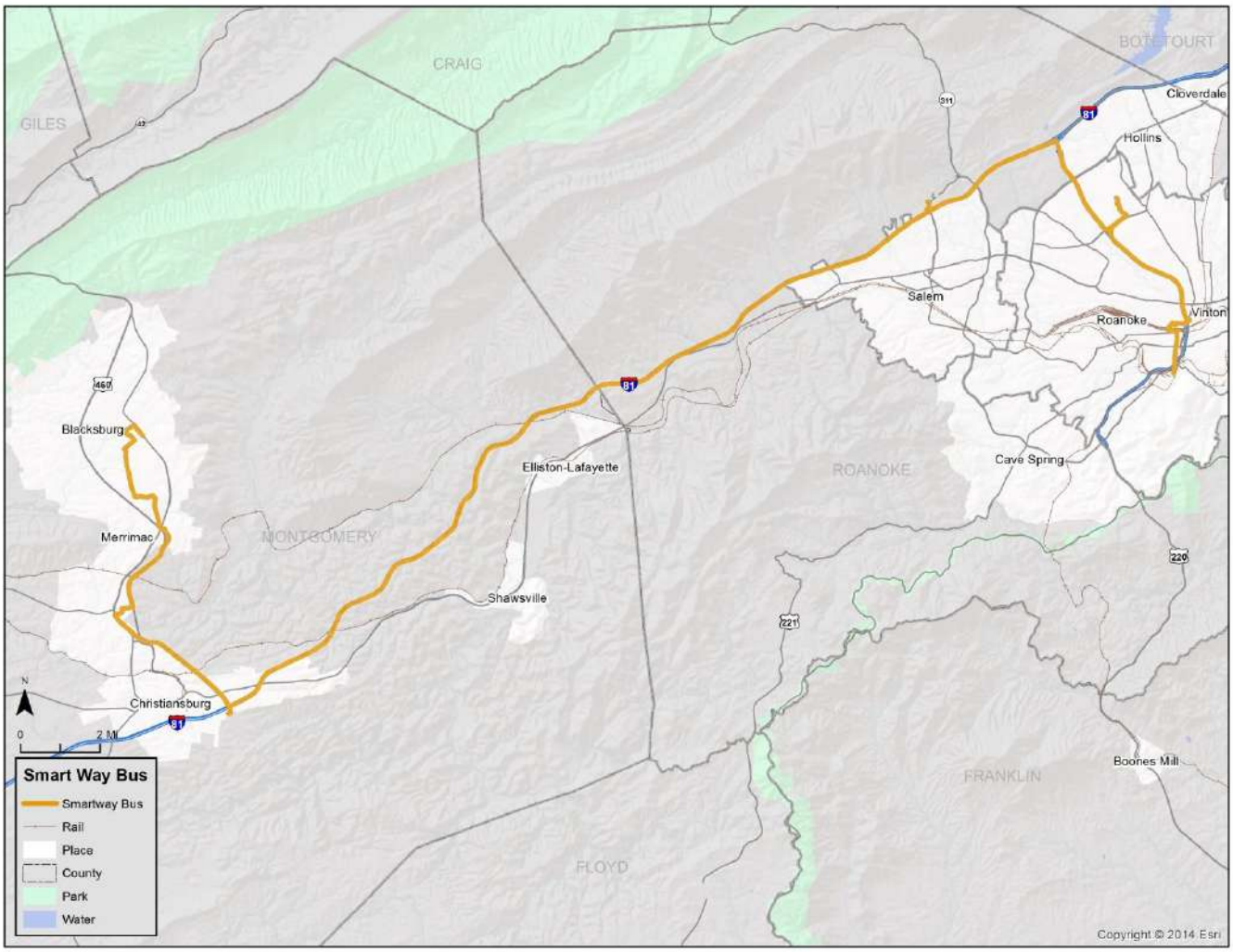


Figure 1-4: Star Line Trolley

Smart Way Bus and Smart Way Express

The Smart Way Bus is a regional bus service operated by Valley Metro that links the Roanoke Valley to the New River Valley. Smart Way Bus service starts at Campbell Court in Downtown Roanoke and ends at Virginia Tech Squires Student Center. Figure 1-5 shows a map of the Smart Way Bus service.

Figure 1-5: Smart Way Bus Service



The Smart Way Express is a relatively recent Valley Metro service that connects the Virginia Tech main campus in Blacksburg with the Virginia Tech Carilion School of Medicine and Research Institute (VTCRI) on the Roanoke campus. The route operates Monday through Friday from 6:15 a.m. to 9:00 p.m. Ten southbound vehicle trips and nine northbound vehicle trips are provided each weekday. The service is fare-free for anyone with a valid ID from Virginia Tech, Carilion Clinic, Virginia Tech Carilion School of Medicine or Research Institute, or Jefferson College of Health Sciences. General public riders pay $4.00 per trip.

ACCESSIBILITY FOR PEOPLE WITH DISABILITIES

Valley Metro's fixed route vehicles are equipped with kneeling features and/or ramps that can be deployed from the front door so that riders who use wheelchairs or have other mobility impairments can safely board the vehicles. In addition, drivers of the fixed routes make stop announcements so that riders with vision impairments can identify their desired alighting locations. For riders whose disabilities prevent them from accessing a bus stop, ADA complementary paratransit service is available.

ADA Complementary Paratransit Service

ADA complementary paratransit service is provided by RADAR under contract to Valley Metro. The service operates as Specialized Transit – Arranged Rides (STAR) - and is available in the Cities of Roanoke and Salem and the Town of Vinton, within ¾ mile of a Valley Metro fixed route. In order to use the service, riders must first complete an eligibility application, which includes verification of a disability by a professional who is familiar with the applicant's disability. The application process is managed by Valley Metro.

Once approved for ADA paratransit service, riders call STAR directly to arrange their trips. Service is provided during the same days and hours as Valley Metro's fixed route services, which are Monday through Saturday, 5:45 a.m. until 8:45 p.m. The ADA paratransit fare is $3.50.

FARE STRUCTURE

Valley Metro's base cash fare is $1.75. While drivers do not carry cash, they do issue transit change cards that are issued to riders who do not have exact change and pay more than the designated fare. Valley Metro's fares were raised in 2017.

The discounted fare for Medicare card holders, persons age 65 or older, and/or persons with disabilities is $0.85, and a Valley Metro Photo ID is required to access the discount. Riders need to apply at Valley Metro's administrative office to obtain the ID card; the cost is $5.00 for the original and $10.00 for a replacement.

Free transfers are offered for passenger trips that require using more than one bus to complete. Transfers expire thirty minutes after the bus reaches the route terminus.

Daily, weekly, and monthly discount passes are available and can be purchased at the Campbell Court Transfer Station. Valley Metro's full fare structure is detailed in Table 1-3.

Table 1-3: Valley Metro Fare Structure

Fare Category	Adults	Seniors and Medicare Card Holders	Students
Fixed route one-way cash fare	$1.75	$0.85	$0.85
Transfers	Free	Free	Free
Smart Way one-way cash fare	$4.00	$2.00	
STAR paratransit one-way cash fare	$3.50	$3.50	
Star Line Trolley	Free	Free	Free
STAR Monthly Pass (1)	$96.00	$96.00	
24-Hour Pass- Basic	$3.50	$1.70	
24-Hour Pass- Smart Way	$10.00	$5.00	
7-Day Pass- Basic	$16.00	$8.00	
15-Ride Pass - Basic	$20.00	$10.00	
15-Ride Pass - Basic/Smart Way	$54.00	$27.00	
31-Day Pass- Basic	$56.00	$28.00	
31-Day Pass- Basic/Smart Way	$120.00	$60.00	

(1) unlimited fixed route and paratransit rides for riders eligible for ADA paratransit

FLEET

Valley Metro's fleet consists of 47 revenue vehicles and eleven non-revenue service vehicles. The peak vehicle requirement is 37 vehicles, resulting in a spare ratio of 27%. This is slightly higher than the FTA guideline of 20%, but may be necessary given the age of the fleet. Of the 37 buses used for Valley Metro's traditional fixed route services, 24 are at least ten years old and six are fourteen years old. The age of the fleet suggests that capital replacement will be an important component of the TDP. Valley Metro recently received four new vehicles (1801, 1802, 1803, and 1804), and will be receiving eight more in 2019. Table 1-4 provides a detailed fleet inventory that includes details on each vehicle. The fixed route and Smart Way vehicles are equipped with bike racks, though the trolleys are not.

Table 1-4: Valley Metro Vehicle Fleet Inventory

Company ID Number	Model Year	Make and Model	Passenger Capacity	Mileage as of 6/15/2018	Notes
1	2008	GMC Acadia	Non-rev		
2	2011	Ford Explorer SUV	Non-rev		
3	2005	Ford Expedition	Non-rev		
4	2009	Ford E150 Van	Non-rev		
5	2012	Dodge Caravan SE	Non-rev		
6	2012	Dodge Caravan SE	Non-rev		
9	1993	Chev Kodiak Tow Truck	Non-rev		
10	2005	Ford Taurus	Non-rev		
11	2008	Ford F250 Truck	Non-rev		
12	2013	Ford Truck	Non-rev		
13	2013	Ford Truck	Non-rev		
1401	2014	Gillig Bus 35'	43	171,491	
1402	2014	Gillig Bus 35'	43	160,418	
1403	2014	Gillig Bus 35'	43	165,529	
1404	2014	Gillig Bus 35'	43	169,674	
1405	2014	Gillig Bus 35'	43	172,504	
1406	2014	Gillig Bus 35'	43	158,594	
1407	2014	Gillig Bus 35'	43	157,476	
1408	2014	Gillig Bus 35'	43	162,718	
1409	2014	Gillig Bus 35'	43	166,449	
401	2004	Gillig Bus 35'	43	450,207	
402	2004	Gillig Bus 35'	43	440,238	To be disposed
403	2004	Gillig Bus 35'	43	434,955	
404	2004	Gillig Bus 35'	43	464,053	
405	2004	Gillig Bus 35'	43	430,977	To be disposed
406	2004	Gillig Bus 35'	43	445,336	
407	2004	Gillig Bus 35'	43	410,489	
408	2004	Gillig Bus 35'	43	431,320	
409	2004	Gillig Bus 35'	43	434,865	To be disposed
410	2004	Gillig Bus 35'	43	451,900	To be disposed
601	2006	Gillig Bus 35'	43	482,785	
602	2006	Gillig Bus 35'	43	419,400	
603	2006	Gillig Bus 35'	43	480,659	

Company ID Number	Model Year	Make and Model	Passenger Capacity	Mileage as of 6/15/2018	Notes
604	2006	Gillig Bus 35'	43	478,657	
605	2006	Gillig Bus 35'	43	469,802	
606	2006	Gillig Bus 35'	43	459,006	
607	2006	Gillig Bus 35'	43	453,462	
608	2006	Gillig Bus 35'	43	458,531	
609	2006	Gillig Bus 35'	43	482,035	
610	2006	Gillig Bus 35'	43	464,251	
611	2006	Gillig Bus 35'	43	481,475	
612	2006	Gillig Bus 35'	43	468,420	
613	2006	Gillig Bus 35'	43	469,641	
614	2006	Gillig Bus 35'	43	485,699	
615	2006	Gillig Bus 35'	43	429,845	
616	2006	Gillig Bus 35'	43	460,778	
617	2006	Gillig Bus 35'	43	469,372	
618	2006	Gillig Bus 35'	43	478,656	
701	2007	ABC 35' Bus	43	503,723	To be disposed
801	2008	Double K 35' Trolley Bus	48	175,406	
802	2008	Double K 35' Trolley Bus	48	172,626	
803	2008	Double K 35' Trolley Bus	48	177,822	
804	2008	Double K 35' Trolley Bus	48	172,393	
901	2010	MCI Coach 45'	54	820,208	
902	2010	MCI Coach 45'	54	844,606	
903	2010	MCI Coach 45'	54	852,916	
904	2010	MCI Coach 45'	54	836,260	
1201	2012	Chevrolet	16	42,789	
1202	2012	Chevrolet	16	51,181	
1801	2018	Gillig Bus 35'	43	13,958	
1802	2018	Gillig Bus 35'	43	13,911	
1803	2018	Gillig Bus 40'	43	12,672	
1804	2018	Gillig Bus 40'	43	12,921	

The vehicles used for Valley Metro's ADA paratransit service are funded and owned by GRTC, but are housed and inventoried through RADAR.

EXISTING FACILITIES

Valley Metro is headquartered in the Roy Z. Meador Operations, Maintenance and Administrative Facility, located at 1108 Campbell Avenue, S.E. The two-level facility houses management offices and the transportation, administrative and maintenance departments. The 70,000 square foot facility features a shop and garage area on the second level, which is accessed by ramps on either side of the building. All bus repair, paint/bodywork and engine rebuilding is completed in this facility. The administrative, transportation, and maintenance offices are located on the second level, as are the dispatch center, conference rooms and employee lounge and recreation area. The first level of the building features a service area with automatic bus wash and indoor parking for the fleet.

Downtown Transportation Hub

The Campbell Court Transportation Center serves as the region's multimodal hub. The center is located at 17-31 West Campbell Avenue and is situated in the heart of the downtown Roanoke business and shopping districts. The terminal serves as a central hub for transfer between Valley Metro buses and other regional transportation services. On the ground level, Valley Metro's Transportation Center provides passenger information, ticket sales, restrooms, and an indoor lobby for transit patrons. A Greyhound bus station is also located in the terminal. The facility features a 104-space parking garage for private vehicles with parking available at monthly rates. The remainder of the first level, the second level, and the third level are available to lease to a variety of retail, restaurant, and business establishments.

Other Passenger Facilities

Valley Metro currently owns and maintains nineteen passenger shelters throughout the service area. There are additional shelters in the service area that are owned by other entities, such as the one located at the Roanoke – Blacksburg Regional Airport (shown at left). An inventory of passenger shelters is provided in Table 1-5.

Table 1-5: Valley Metro Passenger Shelters

Stop Location	Route	Shelter/Size
Ferncliff NB @ WFHS	12	Small Shelter/Art
Liberty SB @ Dupree	16	Small Shelter
Plantation NB @ Frontier	25	Small Shelter
Hershberger EB @ Bluebell	26	Small Shelter
Campbell WB@ Norfolk	32	Small Shelter
Wise WB @ Indian Village	32	Small Shelter
Montrose WB @ 13th	41	Small Shelter
Roanoke Mem. Hospital	52	Large Shelter
Colonial SB @ VWCC	55	Large Shelter
Colonial SB @ Towers	55	Small Shelter
Colonial NB @ McNeil	56	Large Shelter
Maiden WB @ Bluemont	66	Small Shelter
Salem Ave. @ 13th	66	Small Shelter/Art
Goodwill St. Parking	81	Small Shelter
Valley View Mall	11&15	Small Shelter
Towers Shopping Center	61/62	Small Shelter
Grandin NB @ Avenel	65/66	Small Shelter/Art
Melrose EB @ Fentress	82/92	Small Shelter
Exit 118 PNR	Smart Way	Small Shelter
Roanoke-Blacksburg Regional Airport	Smart Way	Large Shelter

TRANSIT SECURITY PROGRAM

Valley Metro's security program includes staffing and equipment/technology elements. Security for the Campbell Court Transit Center is provided by armed security guards. Facilities and vehicles are equipped with surveillance cameras. In addition, the facilities are locked, with staff access provided via proximity cards. Drivers have access to panic buttons that are linked to the fleet tracking software to alert dispatch.

Fares are secured on-board the vehicles via a locked vault that is pulled at the end of the service day and emptied into a master vault at Valley Metro. The fares are counted twice a week and transported by armored car and deposited directly into GRTC's account.

INTELLIGENT TRANSPORTATION SYSTEMS (ITS) PROGRAM

ITS programs in public transportation encompass a broad range of communication-based information and electronics technologies that serve to improve safety, efficiency and service, through use of real-time information. Valley Metro is beginning a phased procurement process for the purchase of integrated on-board ITS, which will include the following features:

- Phase 1 will integrate a number of processes for the driver, including signing into the farebox; entering information from the pre-trip inspection; setting the head signs; and implementing the annunciation system. These functions will all be available through one mobile data terminal for the driver. Automatic vehicle location (AVL) and real-time transit information will also be included as part of Phase 1. The Smart Way and Star Line vehicles will be outfitted with flat screen monitors that will be used for rider information as well as advertising.

- Phase 2 will outfit the remaining fixed route vehicles with the flat screen monitors and add a number of information kiosks around the service area. The kiosks will supply real-time transit information.

- Phase 3 will include the purchase and installation of automatic passenger counters (APCs).

Current technologies used at Valley Metro include electronic fareboxes, annunciators on some vehicles, general transit feed specification (GTFS, used for Google Transit), fleet software, and AVL for internal use.

Data Collection and Ridership and Revenue Reporting Methodology

Ridership data is collected from the farebox. Drivers classify riders by fare type on the farebox as they board. Fareboxes are manually probed at the maintenance and administrative facility daily to transfer data to a vendor database. Ridership reports are generated from the database monthly and processed/ formatted in a spreadsheet. Ridership is compared against collected fares, monthly pass sales, and ride checks conducted weekly by sampling routes. Year-to-year comparison is also used for verification. Revenue miles are collected from hubometers and entered into a Zonar fleet management system during pre/post –trip driver inspection. Data concerning revenue hours are collected from a scheduling spreadsheet and adjustments are made at the end of the month for service disruptions.

Public Outreach

Valley Metro's public outreach activities are coordinated with the Roanoke Valley- Alleghany Regional Commission (RVARC), which staffs the Metropolitan Planning Organization (MPO) for the region. A robust public outreach and engagement process was part of the Roanoke Valley Transit Vision Plan, including the following:

- Rider surveys
- Employee surveys
- General public surveys
- Public workshops
- Focus groups

Valley Metro has a public participation plan in place that is used when the agency is considering fare changes, modifications to routes and schedules, and other transit planning projects. The outreach efforts include public meetings, which are typically held at the MPO. Minor schedule and route changes are posted on the affected routes and stops sixty days in advance of scheduled changes.

In addition, Valley Metro maintains a Facebook page that is used to communicate with riders.

OTHER AREA PUBLIC TRANSPORTATION PROVIDERS/SERVICES

In addition to Valley Metro, there are a number of other public and human transportation services in the Roanoke Valley. These are documented below.

Blue Ridge Behavioral Healthcare

Blue Ridge Behavioral Healthcare serves as the Community Services Board for the region. The agency provides comprehensive services for individuals who have mental health disorders, intellectual disability, or substance use disorders. Transportation is arranged where needed to help clients attend appointments, training, and work opportunities.

Botetourt County Van Service

Botetourt County operates a van service through the Parks and Recreation Department, which provides service for senior citizens and people with disabilities to access essential appointments. The fee to ride is $6.00 per round trip for trips within one hour travel time; $12.00 for trips over one hour travel time or requiring a wheelchair lift; and $15.00 for out-of-town entertainment trips. The county operates two vehicles to support this service.

Goodwill Industries of the Valleys

Goodwill Industries provides work opportunities for people with developmental disabilities. Client transportation is provided to and from work and job activities.

Local Office on Aging

The Local Office on Aging (LOA) in the Fifth Planning District of Virginia offers two critical transportation options within Roanoke County, the City of Roanoke, and the City of Salem.

1. **Vital Services Transportation** is a program available to low-income persons ages 60 or older. Service is available to persons who have a critical need for transportation service to a doctor, pharmacy, grocery store, or critical appointment. Passengers are transported by volunteer drivers or van service to one of the abovementioned qualifying places. Additionally, taxi vouchers are provided to persons who utilize taxi service.

2. **Assisted Transportation** is provided to persons ages 60 and older who need to be accompanied by another person to medical appointments. To be eligible the passenger must be a current Care Coordination client. Assisted Transportation provides a Certified Nursing Assistant (CNA) to assist the person to the vehicle, and drive to and from the appointment.

Logisticare

Logisticare provides non-emergency medical transportation for Medicaid recipients. Routine trips require five-day notice and new standing orders require two-day notice. For public transportation tickets, Logisticare requires seven-day advanced notice. Logisticare purchases tickets from Valley Metro for their clients who can use the fixed route system to access their medical appointments.

CORTRAN and Other Unified Human Services Transportation Systems, Inc. – RADAR Services

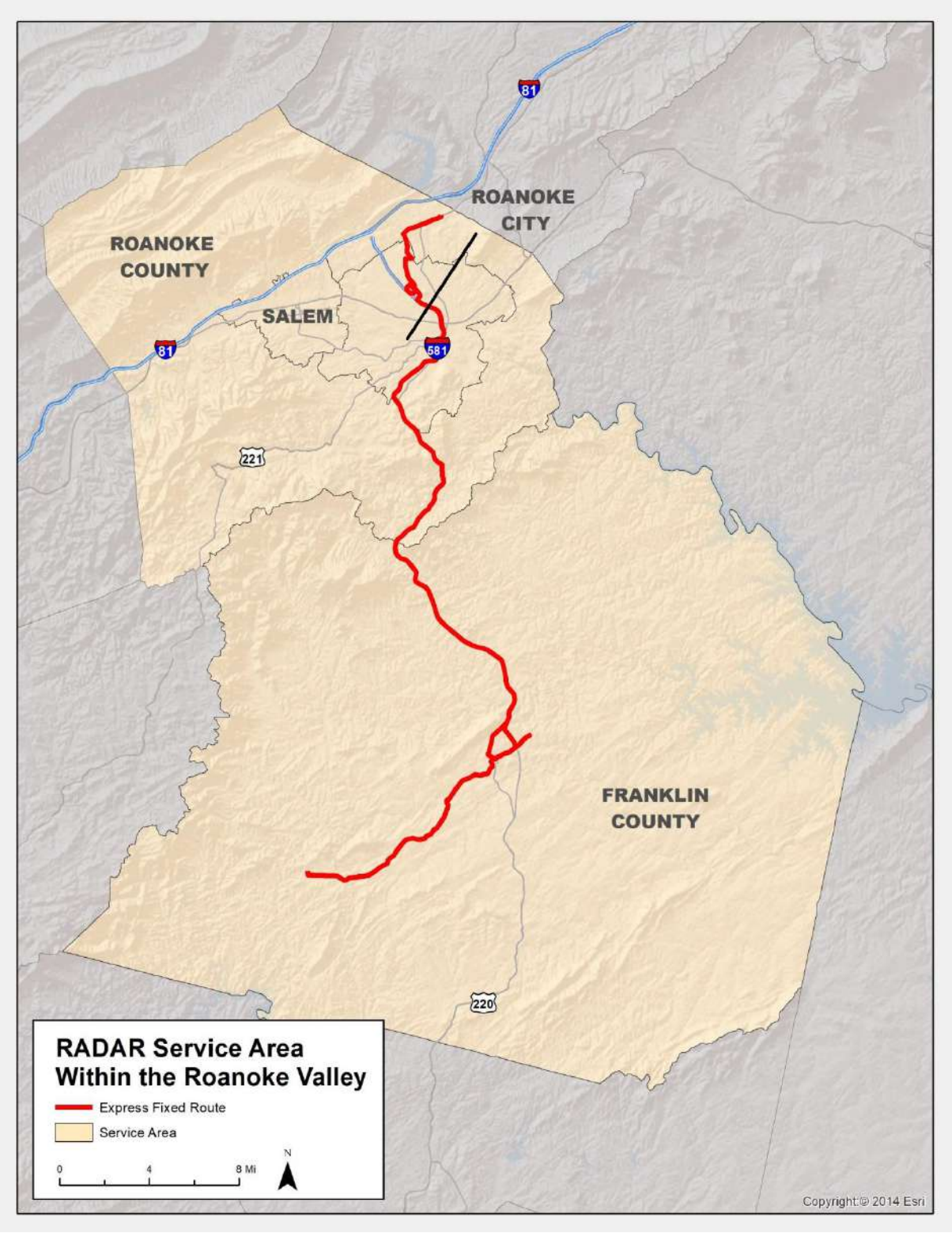
The Unified Human Services Transportation Systems, Inc. known as Roanoke Area Dial-A-Ride (RADAR) operates public transportation in the form of demand response for Roanoke County and the Town of Vinton residents who are disabled or age 60 and over. The fee is $4.00 per trip and service is available Monday through Friday from 6:00 a.m. to 6:00 p.m. As previously presented, RADAR is also the contracted provider of service for Valley Metro's ADA complementary paratransit program.

Other services operated by RADAR include fixed route, deviated fixed route, and demand response services within Roanoke, Alleghany, Franklin, and Henry Counties, including the Cities of Roanoke, Salem, Covington, Buena Vista, Lexington, and Martinsville, and the Towns of Vinton, Clifton Forge, Iron Gate, and Rocky Mount. Table 1-6 presents the six transportation services, including the service type, service area, number of routes, and span of service. Figure 1-6 provides a map of the service area.

Table 1-6: RADAR Transit Services in the Roanoke Valley

Service	Service Type	Service Area	Number of Routes	Span of Service		
				Day	Times	Headway
Valley Metro STAR	Demand Response	• Roanoke County (3/4-mile radius from fixed routes) • City of Roanoke • City of Salem • Town of Vinton	NA	Weekdays Saturday	5:45 a.m. - 8:45 p.m. (24-hour advance reservation required)	NA
CORTRAN	Demand Response	• Roanoke County • Surrounding Areas	NA	Weekdays	7:00 a.m. - 6:00 p.m. (24-hour advance reservation required)	NA
Ferrum Express	Fixed Route (Express)	• City Of Roanoke • Ferrum College • Town of Rocky Mount	2	Thursday Friday Saturday	5:00 p.m. - 11:00 p.m. 1:00 p.m.- 11:00 p.m.	60 min. 120 min.
Hollins Express	Fixed Route (Express)	• City of Roanoke • Hollins College • Roanoke County	1	Wednesday Thursday Friday Saturday	6:00 p.m. - 10:00 p.m. 6:00 p.m. - 12:00 a.m. 12:00 p.m. - 12:00 a.m.	60 min. 60 min. 60 min.

Figure 1-6:RADAR Services in the Roanoke Valley



Taxis, Private Transportation Operators, and Transportation Network Companies

Taxis

The following taxi and private transportation companies operate within the region:

- B Early Cab Service, Salem, VA
- Cartier Limousine and Sedan Service, Roanoke, VA
- City Cab, Roanoke, VA
- Delivery Boys, Salem, VA
- Executive Town Car and Limousine Service, Roanoke, VA
- North West Cab, Roanoke, VA
- Roanoke Airport Transportation Services, Inc., Roanoke, VA
- Roanoke and Salem Taxi, Salem, VA
- Salem Cab Service, Roanoke, VA
- Salem Taxi, Roanoke, VA
- Speedy Taxi, Roanoke, VA
- Virginia Medical Transport, Roanoke, VA
- Yellow Cab Services, Roanoke, VA

On-demand ridesharing (Uber and Lyft) and taxis are available for riders in the Roanoke Valley. These services are described below.

Uber

Uber provides on-demand, ridesharing transportation service within the identified areas of Figure 1-7. Service is available to any person within the designated zone, 24 hours a day, 7 days a week. Customers are required to set up an account with Uber, and link a debit/credit card to their account. To reserve a trip, customers are required to use a smartphone to request a vehicle, indicating their pickup location and destination. No cash is exchanged between drivers and passengers, and two or more passengers can split payments. Uber guarantees a vehicle will arrive at a passenger's location within minutes. Passengers are sent the vehicle type, color, and license plate number, and requested to ensure the license plate matches. Drivers provide courtesy to the rider upon arrival, and wait two minutes for passengers. After two minutes, the driver cancels the trip, and charges a cancellation fee.

Lyft

Lyft provides on-demand, ridesharing transportation service within the identified areas of Figure 1-7. Service is available to any person with the designated zone, 24 hours a day, 7 days a week. Customers are required to set up an account with Lyft, and link a debit/credit card to their account. To reserve a trip, customers are required to use a smartphone to request a vehicle, indicating their pickup location and destination. With Lyft and Lyft Plus, passengers are permitted multiple stops per ride. Lyft guarantees a vehicle will arrive at a passenger's

location within minutes. Passengers are sent the vehicle type, color, and license plate number, and requested to ensure the license plate matches. Drivers provide courtesy to the rider upon arrival and wait two minutes for passengers. After two minutes, the driver cancels the trip and charges a cancellation fee.

Figure 1-7: Uber and Lyft Blacksburg-Roanoke-Lynchburg Service Areas

Uber

Lyft

Ride Solutions

Ride Solutions is the region's transportation demand management (TDM) agency. Ride Solutions provides information concerning alternative transportation options – ridesharing (carpooling and vanpooling), biking, public transit, walking, and guaranteed ride home services – to residents living within the greater New River and Roanoke Valleys and Region 2000 regions of southwestern Virginia. The focus of the agency is to partner with citizens and businesses to connect them with commuting options, beyond the single-occupancy vehicle, to access work and school. More than thirty employers in the region currently partner with Ride Solutions to provide alternative transportation options for their employees. Ride solutions is administered through the RVARC.

Zagster Bike Share

Spearheaded by Ride Solutions, Zagster Bike Share launched in 2017. Ten bike stations have been installed throughout Roanoke. Five bikes per location (50 in total) are available at the stations for 30-minute rental periods.

Intercity Transportation

Intercity transportation is defined as long-distance service connecting major destinations with few or no stops in between cities. In addition to Valley Metro's Smart Way service, which is considered intercity bus service, two other operators – Greyhound and Amtrak - also provide intercity transportation to and from the Roanoke Valley. In addition, the Virginia Breeze is a relatively new service that provides intercity bus service from the New River Valley (Blacksburg and Christiansburg) to Lexington, Staunton, Harrisonburg, Front Royal, Dulles Airport, Arlington, and Washington, DC.

Greyhound

Greyhound provides intercity bus service to Roanoke, Virginia. Greyhound buses stop at the Campbell Court Transportation Center. There are three daily trips eastward to Charlottesville, with connecting service to other cities within the northeast and southeast U.S. corridors. These trips currently are at 1:55 a.m.; 6:00 a.m.; and 2:05 p.m. Three daily trips are provided to points west and south. These trips leave Roanoke at 12:25 a.m.; 10:00 a.m.; and 4:30 p.m.

Virginia Breeze

While Roanoke is not directly served by the Virginia Breeze, it can be accessed via the Smart Way service. The Virginia Breeze leaves the Squires Student Center in Blacksburg at 8:00 a.m. and the Falling Branch Park and Ride in Christiansburg at 8:25 a.m. to travel northbound. The southbound services arrives in Christiansburg at 3:15 p.m. and in Blacksburg at 3:30 p.m.

Amtrak

The Roanoke Passenger Rail Extension Project extended Amtrak service to Roanoke in October 2017. The project included two major elements: construction of a train servicing facility and passenger platform in downtown Roanoke, and construction of network improvements to improve capacity for the extension of passenger rail service from Lynchburg to Roanoke, Virginia.[5] Service is provided via an extension of Amtrak's Northeast Regional Service.

The Amtrak passenger platform is off of Norfolk Avenue at the corner of Jefferson Street, near the Martin Luther King Bridge in downtown Roanoke.

Upon the initiation of service, Valley Metro discontinued the Smart Way Connector service to Lynchburg and added a morning and evening trip on the Smart Way Commuter so that New River Valley area riders could access the train, which leaves Roanoke early in the morning and returns late in the evening.

[5] Virginia Department of Rail and Public Transportation, Major Rail Initiatives, website, viewed 2/28/2017. http://www.drpt.virginia.gov/rail/major-rail-initiatives/amtrak-extension-to-roanoke/

Chapter 2
Goals,Objectives,and Standards

VALLEY METRO - MISSION AND VISION

The mission statement for Valley Metro, as documented in the 2009 Transit Development Plan, and updated during this TDP process is:

"The Greater Roanoke Transit Company will provide quality public transportation in a safe, convenient, reliable, affordable, and environmentally responsible manner. We strive to enhance the quality of life for all who live, work, and visit the Roanoke Valley by continuously improving to meet our customers' needs, maintaining a stable, highly motivated workforce, and using our resources wisely."

ROANOKE VALLEY TRANSIT VISION – ROANOKE VALLEY TRANSIT VISION PLAN

Significant public and stakeholder outreach was conducted for the 2016 Roanoke Valley Transit Vision Plan (TVP), including specific visioning exercises. The vision for transit in the Roanoke Valley, as articulated in the TVP, is as follows:

> *"The Roanoke Valley is a livable community with a growing economy and recognized for its outstanding quality of life. As such, the residents and employees of the Roanoke Valley envision a community where transit provides an easy and timely way for people to get to their destination."*[1]

The regional vision for transit was also articulated in the TVP and is as follows:

"*As the region's decision-makers and citizens work together to develop a more livable community, they envision transit in the Roanoke Valley will:*

- *Serve a greater part of the region than it does now.*
- *Serve people who do not drive as well as people who drive but prefer transit for some trips.*
- *Be part of an integrated multimodal transportation system and complement other modes of transportation.*
- *Be safe.*

[1] Roanoke Valley Transit Vision Plan, Introduction, September 2016, page 4.

- *Be compliant with the Americans with Disabilities Act of 1990.*
- *Be convenient.*
- *Be frequent where it makes sense.*
- *Be dependable.*
- *Be affordable to riders.*
- *Be cost-effective in that the services provided justify the cost.*
- *Be competitive with other modes in travel time.*
- *Be an employee benefit.*
- *Be environmentally-friendly via the vehicles and fuels used.*
- *Help visitors become better acquainted with the region.*
- *Share the cost of providing services and amenities by establishing public-private partnerships with businesses.*
- *Use new technology to make riding transit easier for new riders"*[2]

ROANOKE VALLEY TRANSIT GOALS

Given that Valley Metro previously did not have an established set of transit goals, a series of goals were developed as part of the TVP to support the vision outlined above. These goals are:

Goal #1 – Capitalize on the community's investment in transit to enrich the economy of the Roanoke Valley.

Goal #2 – Utilize transit to support people's ability to live healthy lifestyles.

Goal #3 – Sustain the Roanoke Valley's natural environment by embracing transit on a personal and community level.

Goal #4 – Provide infrastructure to support people's ability to safely use transit.

Goal #5 – Improve the mobility of residents, employees and visitors throughout the Roanoke Valley by providing seamless connections with other transportation modes and enabling people to get around without the need for a personal vehicle.

PERFORMANCE, SAFETY, AND SERVICE STANDARDS

Performance, safety, and service standards are benchmarks by which a system, as well as individual routes and services, can be evaluated. These standards are typically developed in categories such as performance (productivity, fiscal condition); safety; and service (service coverage, passenger convenience, and passenger comfort). The most effective standards are straightforward and relatively easy to calculate and understand. Recent DRPT TDP guidance

[2] Ibid.

suggests that these standards be based on SMART principles – Specific, Measurable, Agreed, Realistic, and Time-Bound.

Service standards are also used as a measure of compliance with Title VI of the Civil Rights Act of 1964, to ensure that services are provided equitably to all persons in the service area, regardless of race, color, or national origin.

Service Standards

Within the Valley Metro Title VI Plan, there are service standards outlined in the categories of vehicle load, vehicle headway, service availability, and on-time performance. Each of these standards is detailed below.

Vehicle Load

Valley Metro's Title VI Plan standards for vehicle load indicate that the average of all loads during the peak operating period should not exceed the vehicles' capacities. These capacities are presented in Table 2-1.

Table 2-1: Valley Metro - Vehicle Load Standards

Vehicle Type	Passenger Capacity
Small Bus	16
35' Transit Bus	50
40' Transit Bus	70
Replica Trolley Shuttle	37
45' Commuter Coach	57

Vehicle loads reflect both safety and passenger comfort, which tie back to Vision Plan Goal #4, which is to provide infrastructure to support people's ability to safely use transit.

Vehicle Headway

The Title VI standards listed in the plan call for 60-minute headways Monday through Saturday throughout the service day, and 30-minute headways Monday through Friday on select routes, from 5:45 a.m. to 8:45 a.m. (from the end of each affected line), and from 3:15 p.m. to 6:15 p.m. from Campbell Court. There is a recommendation within the COA to move the 30-minute service from the morning to the afternoon to reflect ridership demand. **The Title VI standards will need to be updated when this change is implemented.**

Service Availability

Valley Metro's goal is to distribute transit service so that 80 percent of all residents in the Valley Metro service area have reasonable access to transit. Valley Metro defines its service area as the City of Roanoke, the City of Salem, and the Town of Vinton, though there are some services that operate outside of this primary service area.

The Title VI Plan also states that local bus stops will not be more than one-mile apart. **There currently is at least one segment with longer spacing between bus stops, so consistency between the policy, plan, and practice should be reviewed.** Valley Metro indicated that their bus stop location practices are currently under review. Current policy is to locate bus stops at half-mile intervals within high density areas, with stops in other locations spaced at one mile intervals.

On-Time Performance

A Valley Metro bus is considered on-time if it departs a designated scheduled time point no more than 5 minutes late. Valley Metro's on-time performance goal is 93 percent or better. Valley Metro monitors its on-time performance through on-road supervision, supported by GPS technology, and tracks its performance using monthly reports provided by transportation staff. The sample data analyzed for the COA indicated that the on-time performance for the fixed routes was lower than 93 percent.

Performance Standards

While Valley Metro does not currently have set standards for route performance, cost effectiveness is mentioned within the goals of the TVP. **As such, Valley Metro may wish to implement basic performance standards that it can use when evaluating routes and services with regard to cost effectiveness.**

Cost effectiveness measures typically include some measure of service productivity (i.e., passengers per revenue hour), and some inclusion of expenses (i.e., cost per trip). The operating data for FY2017 are provided in Table 2-2.

Valley Metro may want to further break down these performance measures into its four service types: 1) local fixed route service; 2) ADA complementary paratransit service; 3) commuter bus; and 4) downtown trolley circulator service. The detailed breakdown is provided in Chapter 3. Given the different characteristics of each service type, it would make sense that they be evaluated separately.

Table 2-2: Valley Metro Performance – FY 2017

Service	Revenue Hours	Passenger Trips	Operating Cost	Trips/ Hour	Cost/Trip
All services combined	145,403	2,240,679	$9,367,643	15.4	$4.18

Source: Valley Metro

Safety Standard

Safety is listed among the goals for the Vision Plan. **As such it would make sense for Valley Metro to implement a safety standard.** Valley Metro indicated that the goal of their safety program is zero accidents/incidents. In order to achieve that goal, Valley Metro establishes objectives based on their current safety statistics.

PROCESS FOR UPDATING GOALS, OBJECTIVES, AND STANDARDS

Once Valley Metro has reviewed and refined the goals and standards discussed above, it is recommended that Valley Metro use these standards to gauge route and service performance and adjust services as is warranted and feasible. **It is recommended that an annual review of service standards take place as part of the grant preparation cycle to ensure that performance standards are relevant and reasonable.**

Currently, the DRPT grants are due in February of each year, for the upcoming fiscal year. This schedule would suggest that a review of the goals, objectives and standards should take place in October of each year, providing sufficient time for adjustments prior to the due date for the TDP update.

Any changes for these measurement tools can be included in the annual TDP update.

Chapter 3
Service and System Evaluation and Transit Needs Analysis

INTRODUCTION

This chapter documents two particularly important components of the TDP – the evaluation of the current service and the transit needs analysis, both of which contribute to the development of service initiatives and improvements. The first part of the chapter focuses on trend data and current route performance, followed by a review of peer systems, and survey and stakeholder data and opinions as highlighted in the recent Roanoke Valley Transit Vision Plan (TVP). The transit needs analysis completes the chapter.

This chapter has nine major components that are presented in the order shown below:

- Trend and Performance Data and Characteristics
- FY2016 and FY 2017 Route Level Operating Statistics, Analysis, and Profiles
- Financial Analysis
- Recent Compliance Results
- Peer Review and Analysis
- Roanoke Valley Transit Vision Plan - Outreach Results
- Stakeholder Opinions
- Demographics and Land Use
- Chapter Conclusions and Focus for TDP Initiatives

TREND AND PERFORMANCE DATA CHARACTERISTICS

Fixed Route Service - FY2013 – FY2017

Valley Metro provides about 2.1 million annual passenger trips on the fixed route services. Overall fixed route ridership declined by about 11% between FY2013 and FY2017, while the service hours were down by about 3%. Productivity on the fixed routes between FY2013 and FY2017 was down about 8%, from 22.8 trips per revenue hour (FY2013) to 20.9 trips per revenue hour in FY2017. The trend data for FY2013-FY2017 for the fixed routes are provided in Table 3-1. The total ridership numbers are a little higher than the disaggregated route level data, which is likely due to GFI reporting anomalies.

Table 3-1: Valley Metro Fixed Route Trend Data FY2013-FY2017

Fixed Route Only Service	FY2013	FY2014	FY2015	FY2016	FY2017
Fixed Route Passenger Trips	2,328,915	2,281,240	2,228,525	2,159,005	2,068,429
Fixed Route Revenue Hours	102,176	97,957	98,502	98,456	99,148
Fixed Route Revenue Miles	1,187,916	1,193,865	1,198,446	1,238,907	1,240,047
Fixed Route Operating Costs	$6,343,749	$6,304,339	$6,473,118	$6,987,683	$7,090,664
FR Trips/Revenue Hour	22.8	23.3	22.6	21.9	20.9
FR Trips/Revenue Mile	1.96	1.91	1.86	1.74	1.67
FR Miles/Hour	11.6	12.2	12.2	12.6	12.5
FR Cost/Trip	$2.72	$2.76	$2.90	$3.24	$3.43
FR Cost/Revenue Hour	$62.09	$64.36	$65.72	$70.97	$71.52

Source: Valley Metro, 2018

Smart Way

The Smart Way is a regional route that connects the New River Valley to Roanoke, and previously to the Amtrak service in Lynchburg. Ridership on the Smart Way services between FY2013 and FY2017 peaked in FY2014 and has gone down each year since then. The revenue hours have remained relatively stable, with about 400 fewer hours provided in FY2017 than in FY2016. The cost per hour for the service is lower than the cost per hour for the fixed route services. The trend data for the Smart Way service are provided in Table 3-2. These data include both the current Smart Way service and the recently discontinued Smart Way Connector, which accounted for about 3,000 of the annual Smart Way service hours.

Table 3-2: Smart Way Trend Data, FY2013- FY2017

Smart Way/ Smart Way Connector	FY2013	FY2014	FY2015	FY2016	FY2017
Passenger Trips	68,508	81,413	79,456	72,217	65,661
Revenue Hours	14,200	13,880	14,239	14,455	14,040
Revenue Miles	466,061	463,654	468,692	486,536	486,529
Operating Costs	$904,383	$921,429	$947,074	$860,557	$793,680
Trips/Revenue Hour	4.8	5.9	5.6	5.0	4.7
Trips/Revenue Mile	0.15	0.18	0.17	0.15	0.13
Miles/Hour	32.8	33.4	32.9	33.7	34.7
Cost/Trip	$13.20	$11.32	$11.92	$11.92	$12.09
Cost/Revenue Hour	$63.69	$66.39	$66.51	$59.53	$56.53

Source: Valley Metro, 2018

Demand Response Service

Valley Metro's ADA complementary paratransit service is operated by RADAR under a contractual agreement. Demand for ADA paratransit rose steadily between FY2013 and FY2015 (an almost 14% increase), necessitating a 10.5% increase in service hours. The number of passenger trips per revenue hour increased slightly over the three year period, from 2.03 to 2.10. As the level of service increased, the operating costs also increased, from just over $1.6 million in FY2013 to just over $1.95 million in FY2015. In FY2016, the number of service hours and corresponding number of passenger trips decreased by 10% and 11%, respectively. The operating costs also decreased, along with the cost per hour and cost per trip. Ridership in FY2017 increased by about 4.4%. These data are presented in Table 3-3.

Table 3-3: Demand Response Trend Data, FY2013-FY2017

ADA Paratransit	FY2013	FY2014	FY2015	FY2016	FY2017
DR Passenger Trips	65,894	73,900	75,092	73,570	76,875
DR Revenue Hours	32,386	34,717	35,790	32,221	32,215
DR Revenue Miles	573,802	635,587	665,352	594,721	594,721
DR Operating Costs	$1,619,189	$1,871,900	$1,951,488	$1,174,286	$1,211,693
DR Trips/Revenue Hour	2.03	2.13	2.1	2.3	2.4
DR Trips/Revenue Mile	0.11	0.12	0.11	0.1	0.1
DR Miles/Hour	17.7	18.3	18.6	18.5	18.5
DR Cost/Trip	$24.57	$25.33	$25.99	$15.96	$15.76
DR Cost/Revenue Hour	$50.00	$53.92	$54.53	$36.44	$37.61

Source: National Transit Database

Source FY2016: Valley Metro, RADAR, and study team estimates

Combined Data – FY2013 - FY2017

The combined system trend data are provided in Table 3-4.

Table 3-4: Valley Metro FY2013- FY2017 Total System Data- All Services

Total, All Services	FY2013	FY2014	FY2015	FY2016	FY2017
Total Passenger Trips	2,463,317	2,436,553	2,383,073	2,304,792	2,210,965
Total Revenue Hours	148,762	146,554	148,531	145,132	145,403
Total Revenue Miles	2,227,779	2,293,106	2,332,490	2,320,164	2,321,297
Total Operating Expenses	$8,867,321	$9,097,668	$9,371,680	$9,022,526	$9,096,037
Trips/Revenue Hour	16.56	16.63	16.04	15.88	15.21
Trips/Revenue Mile	1.11	1.06	1.02	0.99	0.95
Cost/Trip	$3.60	$3.73	$3.93	$3.91	$4.11
Cost/Hour	$59.61	$62.08	$63.10	$62.17	$62.56
Miles/Hour	14.98	15.65	15.70	15.99	15.96

Source: Valley Metro, RADAR, and the National Transit Database

FY2016 AND FY2017 ROUTE LEVEL OPERATING STATISTICS, ANALYSIS, AND PROFILES

Analysis of Fixed Routes - Productivity

An analysis of these data shows that the average productivity among all fixed routes was 21.9 trips per revenue hour in FY2016 and 20.9 trips per passenger hour in FY2017. The route level data totals to a lower ridership and productivity number, most likely due to GFI reporting anomalies. The FY2017 and FY2017 fixed route statistics by route are shown in Table 3-5.

Routes that Performed Above the System Average

During FY2016 and FY2017, there were three routes that provided over 30 passenger trips per revenue hour. These were Route 15, Route 21, and Route 91. The following routes provided between 25 and 30 passenger trips per revenue hour: Route 11, Route 22, and Route 35. Another eight routes also performed at or above the system average, providing between 20 and 25 passenger trips per revenue hour. These were: Route 12, Route 16, Route 41, Route 61, Route 71, Route 75, Route 76, and Route 92. Route 66 performed above average in FY2016 (22.1 passenger trips per revenue hour), and just above average again in FY2017 (19.9 passenger trips per revenue hour).

Routes that Performed Below the System Average

Nine routes provided between 15 and 19.7 passenger trips per revenue hour in FY2017, which is just below the system average of 19.7 trips per hour. These were Routes 25, 31, 32, 36, 42, 51, 52,

55, and 65. Routes 26, 56, 72, 81, 82, 85, and 86 provided between 10 and 15 passenger trips per revenue hour, as did the Star Line Trolley.

The only fixed route that recorded productivity of below ten passenger trips per revenue hour was Route 31x, which was a new route in FY2016.

Operating Speed- Fixed Routes

The average scheduled operating speed for fixed routes was 13.7 miles per hour, with a range of between 19.5 miles per hour (Route 91) and 6.4 miles per hour (Star Line Trolley). Operating speed is not a performance indicator, but rather a valuable metric to use when planning routes and diagnosing service issues. Routes that require above average operating speeds may have trouble with on-time performance if there are not some segments of the route that have higher operating speeds or no passenger activity.

Operating Cost per Passenger Trip- Fixed Routes

In FY2017, the estimated average total operating cost per passenger trip for the fixed routes was $3.64, with a low of $2.09 for Route 15 and a high of $12.75 for Route 31X. Funding arrangements to cover this cost are generally as follows: 27% revenue (farebox, advertising, building rental, parking rental, and investment income); 30% federal; 18% state; and 24% local.

Table 3-5: Valley Metro Fixed Route Services: FY2016 and FY2017 Route Statistics

Route	Passenger Trips FY2017	Passenger Trips FY2016	Change in Ridership FY16 to FY17	Estimated Cost Per Trip FY2017	Estimated Annual Revenue Hours	Estimated Annual Revenue Miles	Trips Per Revenue Hour FY 2017	Trips Per Revenue Hour FY 2016	Scheduled Miles/ Hour
Route 11	79,685	82,877	-3.9%	$2.74	3,120	48,714	25.5	26.6	15.6
Route 12	77,636	68,447	13.4%	$2.81	3,120	48,714	24.9	21.9	15.6
Route 15	104,523	108,912	-4.0%	$2.09	3,120	52,346	33.5	34.9	16.8
Route 16	68,163	74,497	-8.5%	$3.20	3,120	52,346	21.8	23.9	16.8
Route 21	95,321	99,046	-3.8%	$2.29	3,120	32,621	30.6	31.7	10.5
Route 22	82,584	87,441	-5.6%	$2.64	3,120	32,621	26.5	28.0	10.5
Route 25	48,784	52,692	-7.4%	$4.48	3,120	49,661	15.6	16.9	15.9
Route 26	45,655	48,154	-5.2%	$4.78	3,120	55,121	14.6	15.4	17.7
Route 31	42,070	38,276	9.9%	$3.87	2,325	36,642	18.1	16.5	15.8
31x (1)	8,398	2,331	260.3%	$12.75	1,530	14,321	5.5	2.8	17.3
Route 32	42,693	37,049	15.2%	$3.81	2,325	26,847	18.4	15.8	11.5
Route 35	58,777	67,534	-13.0%	$2.77	2,325	33,340	25.3	28.9	14.2
Route 36	41,303	44,511	-7.2%	$3.94	2,325	26,525	17.8	19.0	11.3
Route 41	53,975	56,059	-3.7%	$3.02	2,325	32,783	23.2	24.0	14.0
Route 42	35,543	34,857	2.0%	$4.58	2,325	32,783	15.3	14.9	14.0
Route 51	60,236	67,140	-10.3%	$3.63	3,120	35,500	19.3	21.5	11.4
Route 52	53,082	55,264	-3.9%	$4.11	3,120	35,500	17.0	17.7	11.4
Route 55	55,560	57,476	-3.3%	$3.93	3,120	40,492	17.8	18.4	13.0
Route 56	40,207	46,035	-12.7%	$5.43	3,120	40,492	12.9	14.8	13.0
Route 61	52,183	53,375	-2.2%	$3.12	2,325	30,062	22.4	23.0	12.9
Route 62	51,524	55,013	-6.3%	$3.16	2,325	30,062	22.2	23.7	12.9
Route 65	51,923	56,640	-8.3%	$4.21	3,120	44,063	16.6	18.2	14.1
Route 66	62,074	69,023	-10.1%	$3.52	3,120	37,265	19.9	22.1	11.9
Route 71	66,123	65,874	0.4%	$3.30	3,120	38,296	21.2	21.1	12.3
Route 72	46,135	53,551	-13.8%	$4.73	3,120	37,797	14.8	17.2	12.1
Route 75	72,343	71,305	1.5%	$3.02	3,120	36,956	23.2	22.9	11.8
Route 76	72,514	74,300	-2.4%	$3.01	3,120	39,676	23.2	23.8	12.7
Route 81	11,166	11,014	1.4%	$4.80	765	9,348	14.6	14.4	12.2
Route 82	10,046	10,884	-7.7%	$5.33	765	9,348	13.1	14.2	12.2
Route 85	45,918	37,659	21.9%	$4.76	3,120	58,710	14.7	12.1	18.8
Route 86	41,057	44,642	-8.0%	$5.32	3,120	58,710	13.2	14.3	18.8
Route 91	139,522	143,115	-2.5%	$2.28	4,554	88,956	30.6	31.4	19.5
Route 92	97,570	111,618	-12.6%	$3.27	4,554	77,837	21.4	24.5	17.1
Star Line	103,371	106,818	-3.2%	$5.20	7,672	48,960	13.5	13.9	6.4
Totals	**1,937,979**	**2,093,429**	**-7.4%**	**$3.64**	**100,840**	**1,373,414**	**19.7**	**20.3**	**13.7**

(1) 31x data for FY2016 are for six months only
Source: Valley Metro

Route Profiles- Directly Operated Routes

For each of the routes operated by Valley Metro, a route profile was developed. These profiles provide a map of the route, as well as the stop activity (sample) and the key operating statistics from FY2016 and FY2017.

Valley Metro's fixed route system identifies its routes by numbers. Odd numbered routes indicate the route is traveling outbound from downtown Roanoke while even numbered routes are traveling inbound to downtown Roanoke from a destination elsewhere in the service area. Generally, each route has an inverse route that travels on the same path but in the opposite direction.

Northern Routes 11, 12, 15, 16

Routes 11, 12, 15, and 16 operate Monday through Saturday from 5:45 a.m. to 8:45 p.m. Base service is provided on hourly frequencies, with 30-minute frequencies offered between 5:45 a.m. and 9:45 a.m., and again between 3:45 p.m. and 6:45 p.m. on weekdays. On Friday evenings peak service is extended by one hour to 7:45 p.m.

Route 11 and Route 15: Downtown Roanoke – Valley View

Route 11 and Route 15 are both outbound routes that provide service to Valley View from downtown Roanoke. Route 11 approaches Valley View from Hershberger and Cove Roads. Major trip generators that are served by Route 11 include downtown Roanoke, City of Roanoke neighborhoods (e.g. Gainsboro, Melrose-Rugby), Gainsboro Library, St. Andrew's Catholic Church, Blue Ridge Behavioral Healthcare, Roanoke Academy for Math and Science, William Fleming High School, Ferncliff Avenue shopping area, and the Valley View shopping area.

Route 15 also begins in downtown Roanoke and proceeds to Valley View via Grandview and Greenland Avenues. Major trip generators accessible via Route 15 include downtown Roanoke, City of Roanoke residential neighborhoods (e.g. Gainsboro, Greater Huntington, and Greater Grandview), the Gainsboro Library, Gainsboro YMCA, St. Andrew's Catholic Church, Washington Park, Lincoln Terrace Elementary School, and the Valley View shopping area.

Route 12 and Route 16: Valley View – Downtown Roanoke

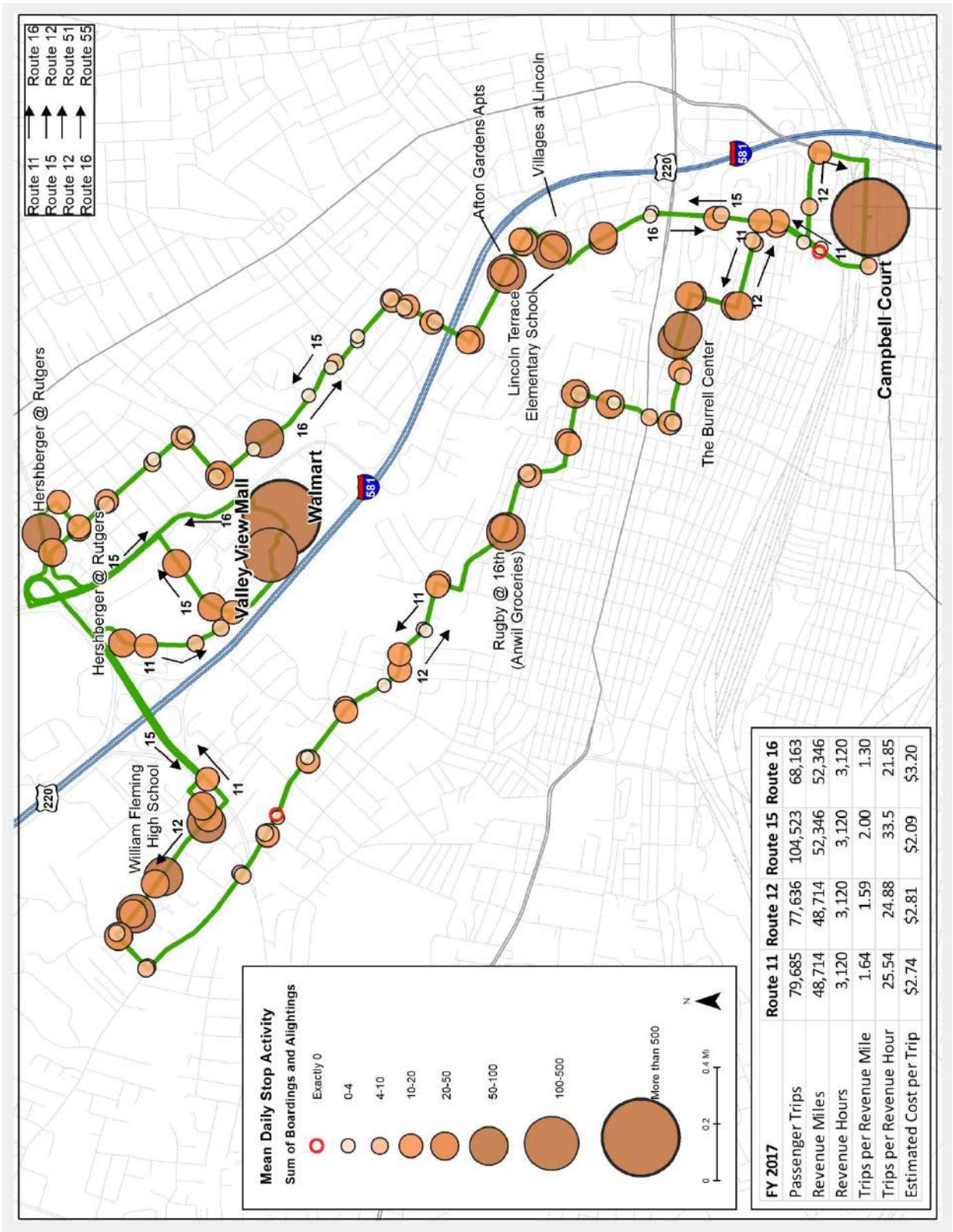
Route 12 and Route 16 are the inbound routes providing service between Valley View and downtown Roanoke. These two routes are the reverse of Routes 11 and 15. Route 12 starts on Hoback Drive at the Big Lots shopping center and proceeds to downtown Roanoke via Hershberger and Cove Roads. It travels the same path as Route 11, but in the reverse order. Route 16 originates at the Valley View Walmart stop, traveling via Grandview and Greenland Avenues to reach downtown Roanoke. Route 16 is the reverse of Route 15 and serves the same trip generators. From downtown Roanoke, Route 12 becomes Route 51 and Route 16 becomes Route 55.

The route maps and statistical profiles for Routes 11, 12, 15, and 16 are provided in Figure 3-1. All four of these routes showed higher productivity than the fixed route average in FY2017, with Route 15 showing the highest productivity, providing 33.5 passenger trips per revenue hour.

These routes are interlined with the southern routes 51, 52, 55, and 56 for the purposes of driver scheduling. The following interline pattern is used by Valley Metro to operate the routes:

- Route 11 (outbound from downtown) becomes inbound Route 16
- Route 15 (outbound from downtown) becomes inbound Route 12
- Route 12 (inbound from Valley View) becomes outbound Route 51
- Route 16 (inbound from Valley View) becomes outbound Route 55
- Route 51 (outbound from downtown) becomes inbound Route 56
- Route 55 (outbound from downtown) becomes inbound Route 52
- Route 56 (inbound from Tanglewood) becomes outbound Route 15
- Route 52 (inbound from Tanglewood) becomes outbound Route 11

Figure 3-1: Route Profile-Routes 11, 12, 15, and 16



FY 2017	Route 11	Route 12	Route 15	Route 16
Passenger Trips	79,685	77,636	104,523	68,163
Revenue Miles	48,714	48,714	52,346	52,346
Revenue Hours	3,120	3,120	3,120	3,120
Trips per Revenue Mile	1.64	1.59	2.00	1.30
Trips per Revenue Hour	25.54	24.88	33.5	21.85
Estimated Cost per Trip	$2.74	$2.81	$2.09	$3.20

Routes 21, 22, 25, 26

Routes 21, 22, 25, and 26 operate Monday through Saturday from 5:45 a.m. to 8:45 p.m. Base service is provided on hourly frequencies, with 30-minute frequencies offered between 5:45 a.m. and 9:45 a.m., and again between 3:45 p.m. and 6:45 p.m. on weekdays. On Friday evenings peak hour service is extended to 7:45 p.m.

Route 21 and Route 25: Downtown Roanoke – Towne Square Shopping Area

Route 21 and Route 25 provide service between downtown Roanoke and the Towne Square shopping area off of Towne Square Boulevard in the City of Roanoke. Route 21 travels via Williamson Road to the end of the line at Kroger on Rutgers Street and Towne Square Boulevard. Major trip generators include downtown Roanoke, the Roanoke Higher Education Center, Hotel Roanoke and Conference Center, Berglund Center and Performing Arts Theater, Williamson Road Library, Breckenridge Middle School, Advanced Auto Parts Corporate Headquarters, the Towne Square shopping area, and numerous small businesses and residential areas just off of Williamson Road.

Route 25 travels from downtown Roanoke via Hollins Road and Hershberger Road. Major trip generators and landmarks along Route 25 include: downtown Roanoke, the Roanoke Higher Education Center, Hotel Roanoke and Conference Center, Roanoke Gas, Cosmetic Essence Innovations (CEI), Edinburgh Square, Friendship Manor, and the Towne Square shopping area. At the end of the line Kroger stop, Route 21 becomes Route 22 and Route 25 becomes Route 26.

Route 22 and Route 26: Towne Square Shopping Area – Downtown Roanoke

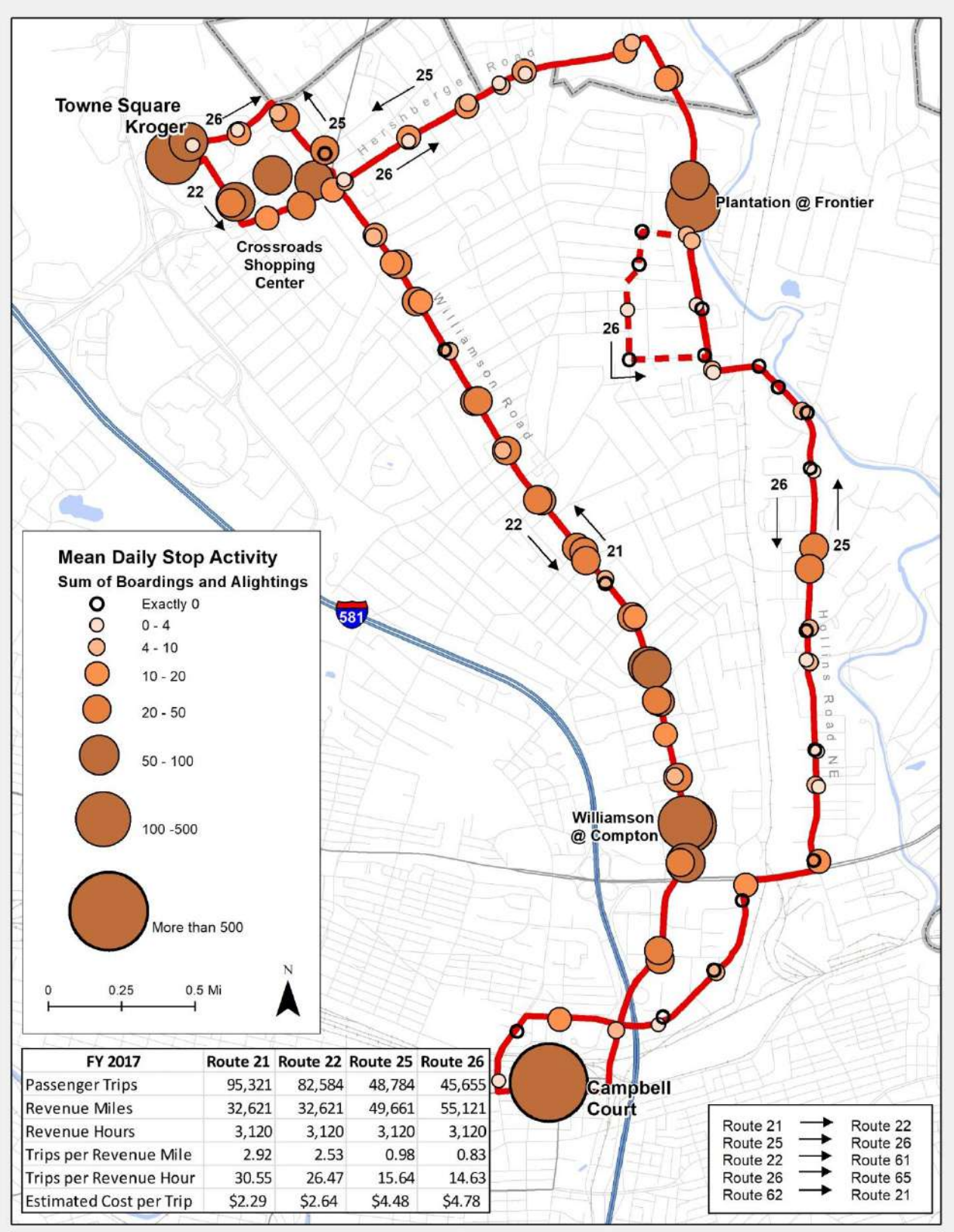
Routes 22 and 26 travel inbound to downtown Roanoke from the Towne Square shopping area. Route 22 travels the same path as Route 21 but in the reverse direction. Route 22 reaches downtown Roanoke from Williamson Road. Route 26 approaches downtown Roanoke from Hollins and Hershberger Roads. From downtown Roanoke, Route 22 becomes Route 61 and Route 26 becomes Route 65,

In FY2017, of these four routes (Routes 21, 22, 25, 26), Route 21 and Route 22 (Williamson Road Corridor) exhibited higher productivity than Routes 25 and 26, which travel through the Hollins Road Corridor. The route profile for these routes is shown in Figure 3-2.

These routes are interlined with Route 61, 62, 65, and 66 for the purposes of driver scheduling. The following interline pattern is used by Valley Metro to operate the routes:

- Route 21 (outbound from downtown) becomes inbound Route 22
- Route 25 (outbound from downtown) becomes inbound Route 26
- Route 22 (inbound from Crossroads) becomes outbound Route 61
- Route 26 (inbound from Crossroads) becomes outbound Route 65
- Route 62 (inbound to downtown) becomes outbound Route 21

Figure 3-2: Route Profile-Routes 21, 22, 25, and 26



FY 2017	Route 21	Route 22	Route 25	Route 26
Passenger Trips	95,321	82,584	48,784	45,655
Revenue Miles	32,621	32,621	49,661	55,121
Revenue Hours	3,120	3,120	3,120	3,120
Trips per Revenue Mile	2.92	2.53	0.98	0.83
Trips per Revenue Hour	30.55	26.47	15.64	14.63
Estimated Cost per Trip	$2.29	$2.64	$4.48	$4.78

Routes 31, 32, 35, and 36

Service for these four routes is offered Monday through Saturday from 5:45 a.m. to 8:45 p.m., on hourly headways.

Route 31 and Route 35: Downtown Roanoke – Wildwood Neighborhood/Vinton

Routes 31 and 35 provide access between downtown Roanoke, the City of Roanoke's Wildwood neighborhood, and the Town of Vinton. Route 31 begins in downtown Roanoke and travels along Campbell Avenue and Wise/Walnut Avenues to Orange Avenue and King Street in the Wildwood neighborhood before continuing along Washington Boulevard and terminating at the River Park Shopping Center in the Town of Vinton. Route 31 serves destinations such as the Valley Metro Administrative Building, the Belmont neighborhood, Indian Rock Village, Tinker Creek Greenway, Fallon Park, Thrasher Park, Granby Street Industrial Park, commercial and residential areas around Route 460/Orange Avenue and King Street, downtown Vinton, and the River Park Shopping Center. Route 31 deviates Monday through Friday to Statesman Industrial Park at 6:15 a.m., and at 3:30 p.m. express service to downtown Roanoke from Statesman Industrial Park is provided.

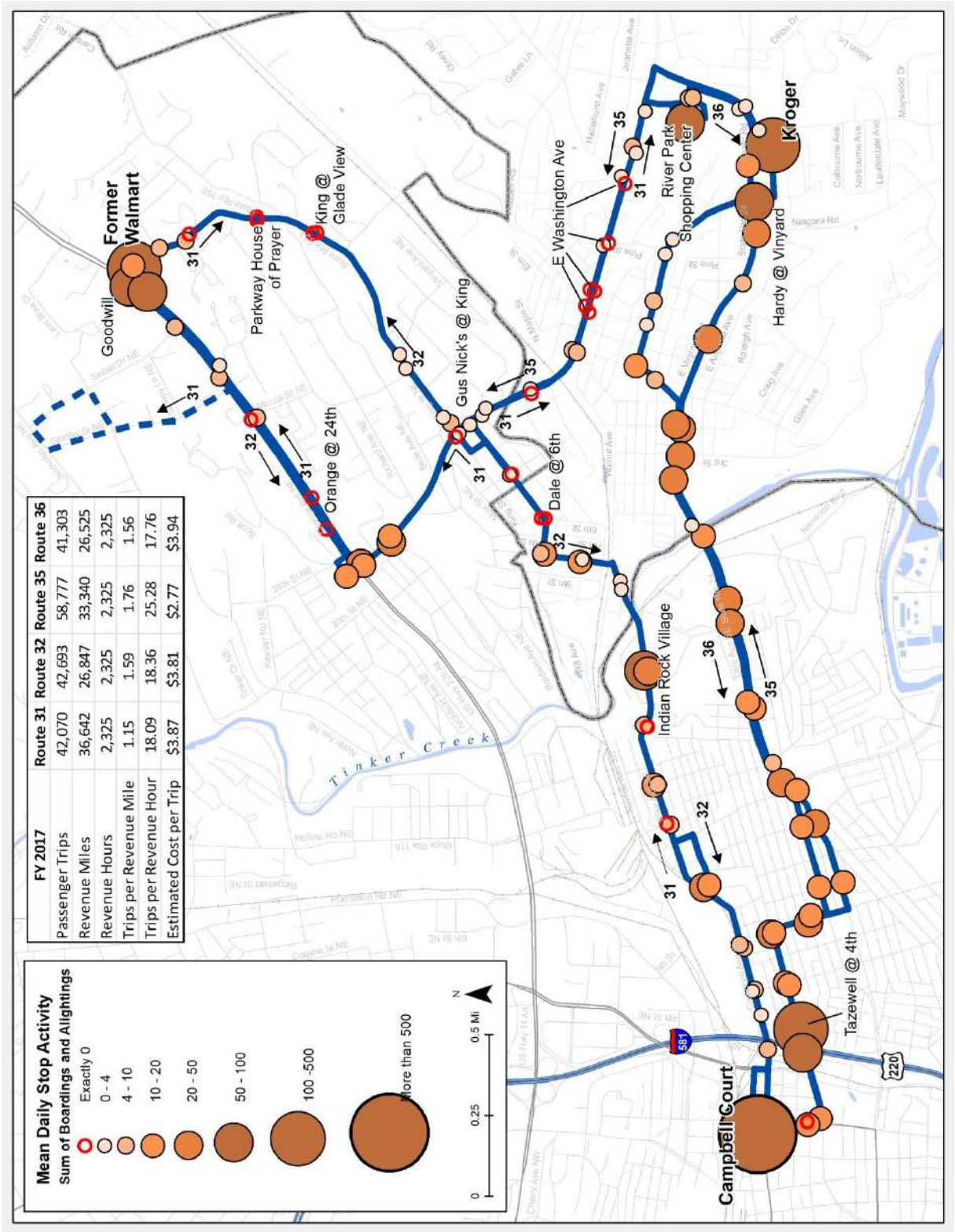
Route 35 also travels to Vinton but via Route 24/Bullitt Avenue/ Dale/Virginia Avenues, Bypass Road, and Washington Avenue before terminating on King Street at Vinton Mill Court (King NB at Vinton Mill). Destinations including downtown Roanoke, the City of Roanoke's Belmont and Fallon neighborhoods, Fallon Park and Elementary School, Tinker Creek Greenway, downtown Vinton, Lake Drive Plaza, and the River Park Shopping Center are served via Route 35, which also deviates to Clearview Manor at 8:15 a.m., 9:15 a.m., 11:15 a.m., 2:15 p.m., and 4:15 p.m.

Route 32 and Route 36: Wildwood Neighborhood/Vinton to Downtown Roanoke

Route 32 and Route 36 are the reverse routings of Routes 31 and 35. Route 32 travels inbound to downtown Roanoke from the City of Roanoke's Wildwood neighborhood via King Street, Orange Avenue, Gus Nicks Boulevard, Dunkirk Avenue, 8th Street, Walnut/Wise Avenue, and Campbell Avenue. Route 36 approaches downtown Roanoke via Bypass Road, Hardy Road, Bedford Road, Cleveland Avenue, and Route 24/Virginia/Dale/Jamison Avenues.

Of these four routes (Routes 31, 32, 35, 36), Route 35 exhibited significantly higher ridership and productivity than the other three in FY2017. Route 36 is the only one of the four that serves downtown Vinton, with a key stop in front of the Vinton Library. Figure 3-3 presents the route profile for these four routes.

Figure 3-3: Route Profile-Routes 31, 32, 35, and 36



FY 2017	Route 31	Route 32	Route 35	Route 36
Passenger Trips	42,070	42,693	58,777	41,303
Revenue Miles	36,642	26,847	33,340	26,525
Revenue Hours	2,325	2,325	2,325	2,325
Trips per Revenue Mile	1.15	1.59	1.76	1.56
Trips per Revenue Hour	18.09	18.36	25.28	17.76
Estimated Cost per Trip	$3.87	$3.81	$2.77	$3.94

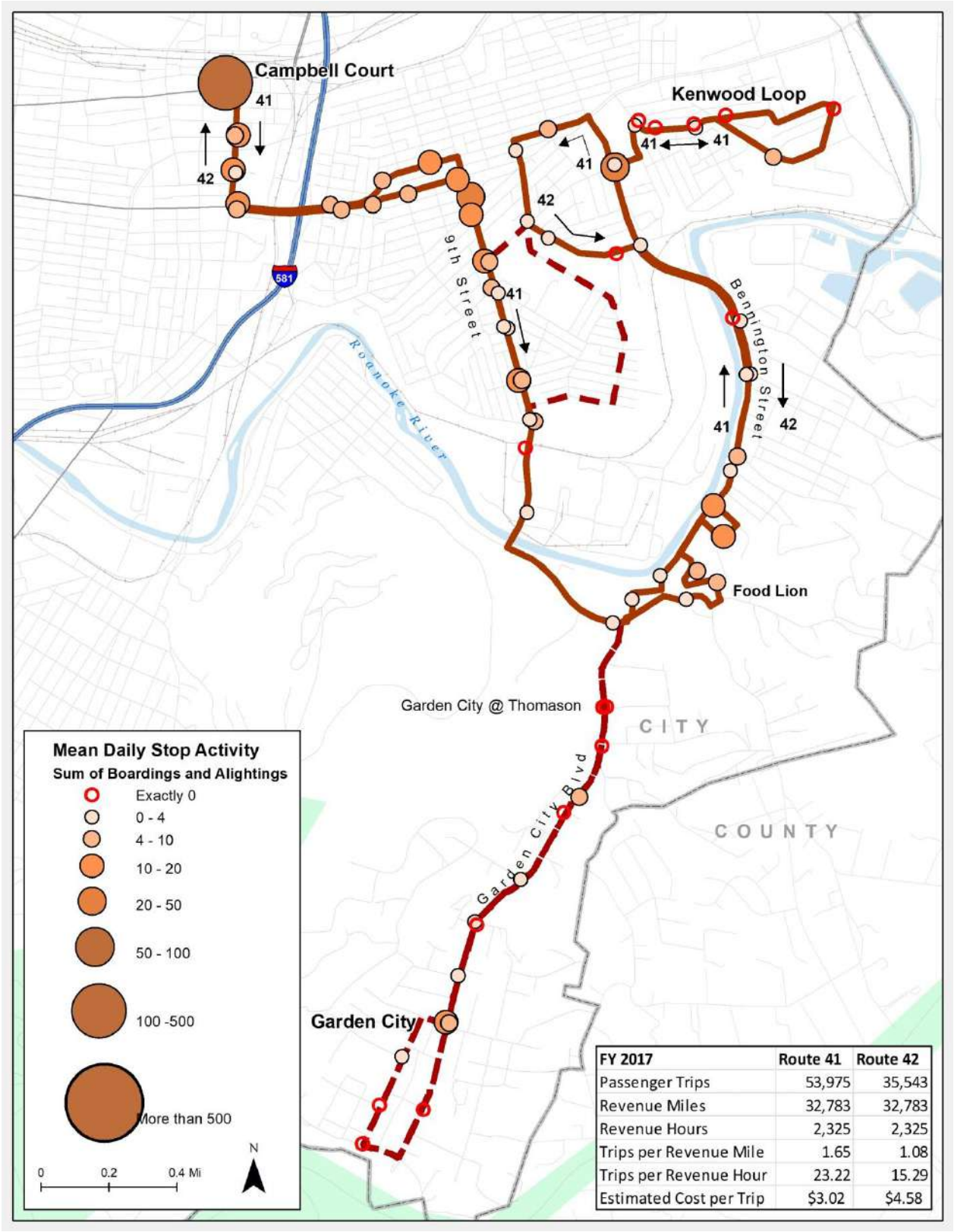
Route 41 and Route 42: Downtown Roanoke - Southeast Roanoke

Routes 41 and 42 provide service between downtown Roanoke and the City of Roanoke's Belmont, Starview, and Southeast neighborhoods. Routes 41 and 42 operate Monday through Saturday from 5:45 a.m. to 8:45 p.m. Base service is provided on hourly frequencies.

Route 41 is the outbound route originating in downtown Roanoke. The route deviates to the Garden City neighborhood six times a day: at 9:15 a.m.; 12:15 p.m.; 2:15 p.m.; 4:15 p.m.; 6: 15 p.m.; and 8:15 p.m. (upon request). Key trip generators include the residential neighborhoods and village centers along 9th Street, Riverland Road and Bennington Street/13th Street, Jackson Park, Jackson Park Library and Middle School, Roanoke River and Garden City Greenways, Star City trailhead at Mill Mountain, and Garden City Elementary School. The route terminates on 11th Street Southbound at Highland Avenue. Deviations to the Southeast Medical Center are available upon request. Route 41 also provides service along Montrose Avenue, 14th Street, Kenwood Boulevard, and Greenbrier Avenue at the following times: 6:15 a.m.; 7:15 a.m.; 8:15 a.m.; 10:15 a.m.; 11:15 a.m.; 1:15 p.m., 3:15 p.m., 5:15 p.m.; 7:15 p.m., and 8:15 p.m.

Route 42 travels inbound to downtown Roanoke from 11th Street southbound at Highland Avenue in the City of Roanoke's Southeast neighborhood. From there, the route retraces the path of Route 41. At 5:45 a.m., Route 42 begins service in the Garden City neighborhood. In FY2017, ridership and productivity on Route 41 were significantly higher than on Route 42. The route profiles for Routes 41 and 42 are depicted in Figure 3-4.

Figure 3-4: Route Profile-Route 41 and Route 42



FY 2017	Route 41	Route 42
Passenger Trips	53,975	35,543
Revenue Miles	32,783	32,783
Revenue Hours	2,325	2,325
Trips per Revenue Mile	1.65	1.08
Trips per Revenue Hour	23.22	15.29
Estimated Cost per Trip	$3.02	$4.58

Route 51 and Route 55: Downtown Roanoke – Tanglewood Mall

Routes 51 and 55 both travel to Tanglewood Mall from downtown Roanoke. Route 51 travels outbound to Tanglewood Mall via Jefferson Street, Avenham Avenue, and Franklin Road, while Route 55 goes to Tanglewood Mall via Franklin Road and Colonial Avenue. Major trip generators on Route 51 include downtown Roanoke, Jefferson College of Health Sciences, numerous medical facilities along Jefferson Street, Carilion Roanoke Memorial Hospital, Virginia Tech – Carilion School of Medicine, Reserve Avenue recreational fields, South Roanoke neighborhoods, Franklin Road businesses and Tanglewood Mall.

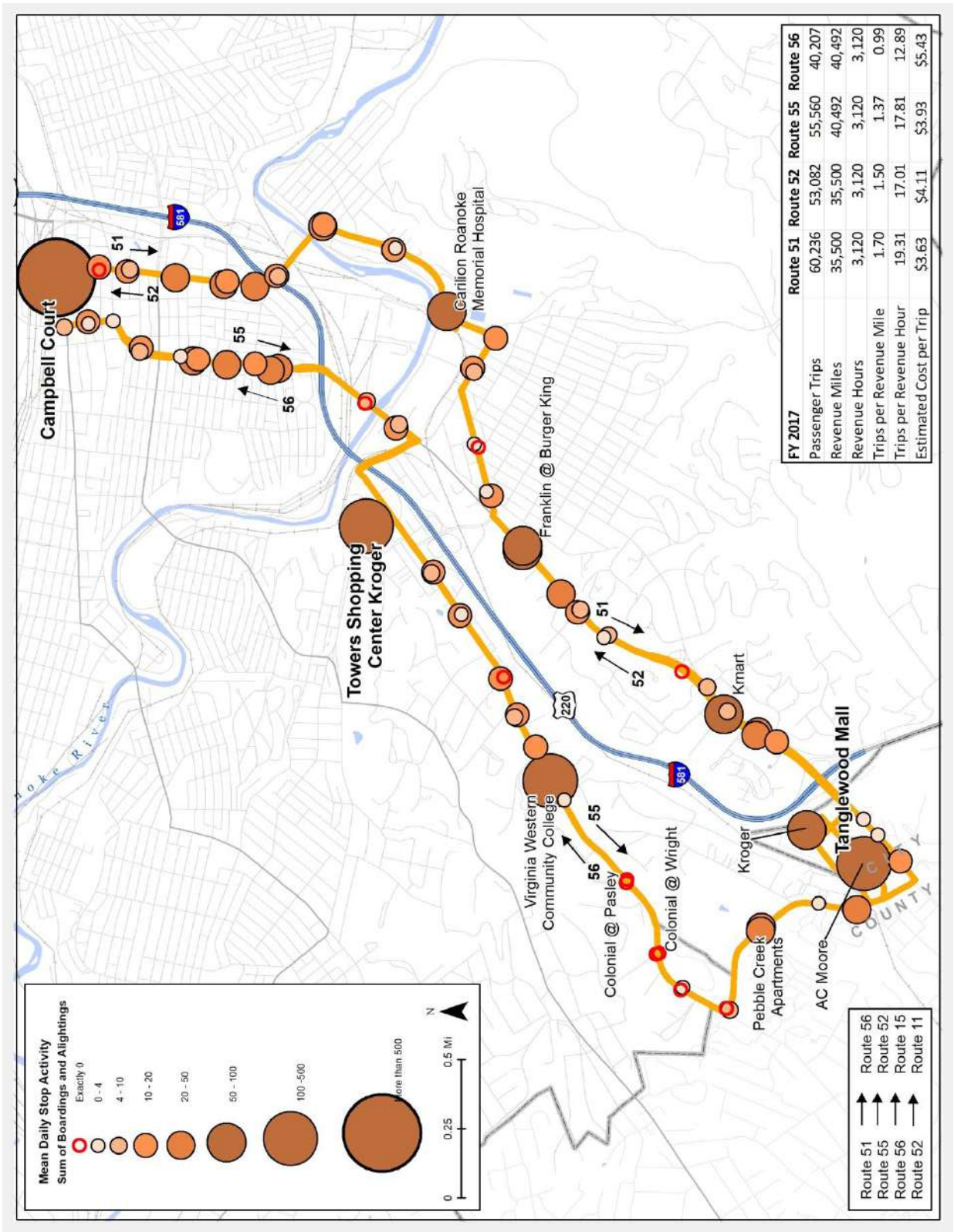
Major trip generators along Route 55 include downtown Roanoke, Old Southwest neighborhood and small businesses, the Reserve Avenue recreational fields, Towers Shopping Center, Virginia Western Community College, Ogden Road residential areas, and Tanglewood Mall. At Tanglewood Mall, Route 51 becomes Route 56 and Route 55 becomes Route 52.

Route 52 and Route 56: Tanglewood Mall – Downtown Roanoke

Routes 52 and 56 provide inbound service to downtown Roanoke from Tanglewood Mall and follow the same paths as Routes 51 and 55, but in the reverse order. Route 52 serves the same destinations as Route 51 and arrives in downtown Roanoke via Franklin Road (south of Brandon Avenue) and Jefferson Street. Route 56 reaches downtown Roanoke from Colonial Avenue and Franklin Road (north of Brandon Avenue). Once in downtown Roanoke, Route 52 becomes Route 11 and Route 56 becomes Route 15.

Figure 3-5 provides the route profiles for Routes 51, 52, 55, and 56. Among these four routes, Route 51 exhibited the highest ridership and productivity in FY2017 and Route 56 exhibited the lowest.

Figure 3-5: Route Profile–Routes 51, 52, 55, and 56



FY 2017	Route 51	Route 52	Route 55	Route 56
Passenger Trips	60,236	53,082	55,560	40,207
Revenue Miles	35,500	35,500	40,492	40,492
Revenue Hours	3,120	3,120	3,120	3,120
Trips per Revenue Mile	1.70	1.50	1.37	0.99
Trips per Revenue Hour	19.31	17.01	17.81	12.89
Estimated Cost per Trip	$3.63	$4.11	$3.93	$5.43

Routes 61, 62, 65, 66

Routes 61, 62, 65, and 66 operate Monday through Saturday from 5:45 a.m. to 8:45 p.m. Base service is provided on hourly frequencies, with 30 minute frequencies offered on Route 65 and 66 between 5:45 a.m. and 9:45 a.m., and again between 3:45 p.m. and 6:45 p.m. on weekdays. On Friday evenings peak service is extended to 7:45 p.m.

Route 61 and Route 62: Downtown Roanoke - Brambleton - Red Rock

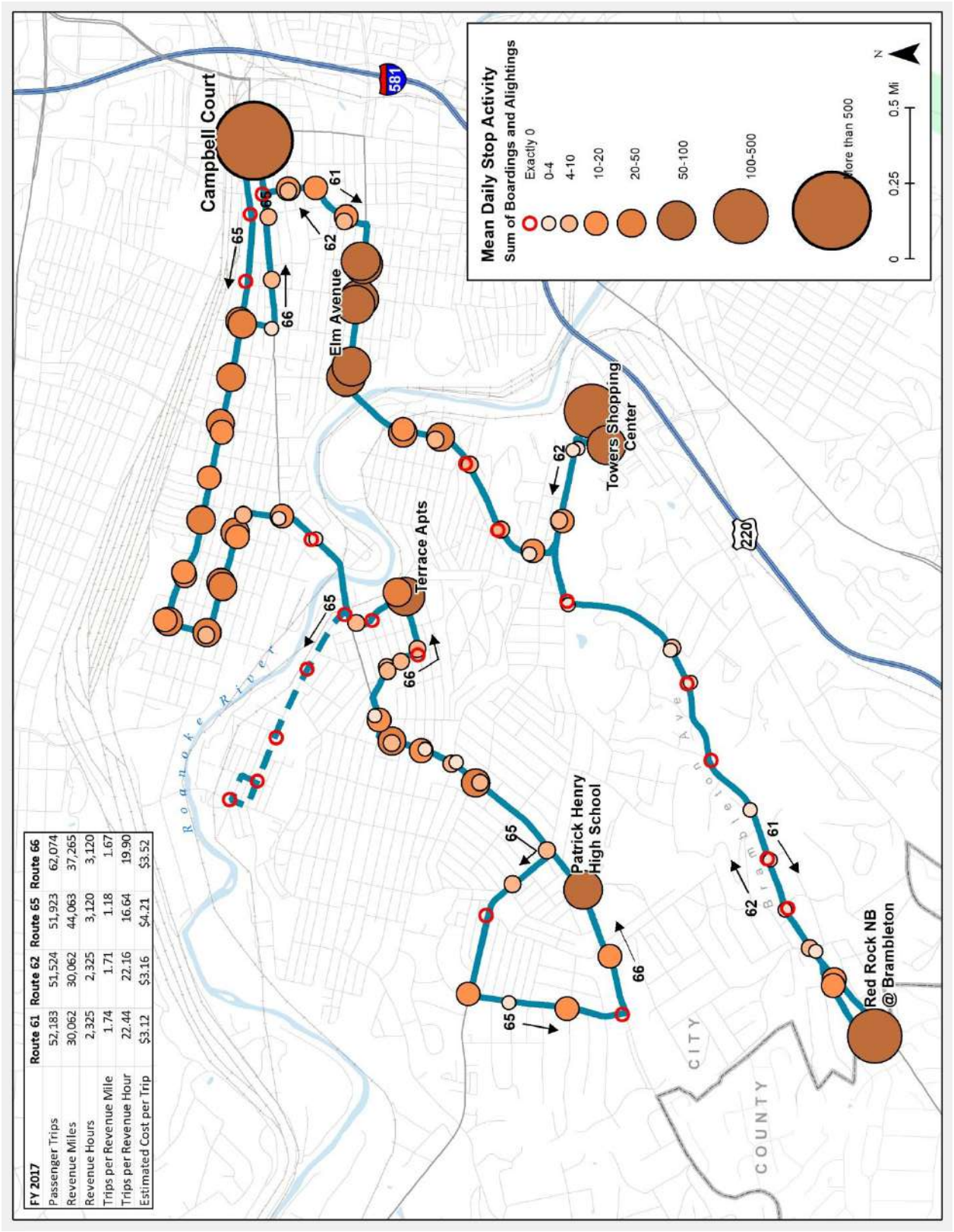
Route 22 from Towne Square becomes Route 61 in downtown Roanoke. Route 61 travels through the Old Southwest and Wasena neighborhoods via Elm Avenue/Main Street to Towers Shopping Center before heading down Brambleton Avenue to Red Rock Road, which is the last street in the City of Roanoke before Brambleton Avenue continues into Roanoke County. Many residential areas as well as Wasena Park, Roanoke River Greenway, Lakewood Park, James Madison Middle School, Murray Run Greenway, Fishburn Park, and Grandin Court Elementary can be accessed via Route 61. Route 62 travels to downtown Roanoke along the reverse path of Route 61. From downtown Roanoke, Route 62 becomes Route 21 continuing north to the Towne Square shopping area.

Route 65 and Route 66: Downtown Roanoke – Raleigh Court

Route 65 begins in downtown Roanoke and travels outbound via Salem Avenue through the West End, Hurt Park, and Mountain View neighborhoods to Memorial Avenue and Grandin Road and the Raleigh Court/Grandin Court neighborhoods. The route turns off of Memorial Avenue to provide service to Terrace Apartments on Maiden Lane. From Grandin Road, Route 65 loops along Brandon Avenue to Carlton Road and back to Grandin Road before terminating at Patrick Henry High School. Key destinations along the route include the Hurt Park Village Center, Hurt Park Elementary School, Vic Thomas Park, Roanoke River Greenway, Grandin Village, Virginia Heights Elementary, Shrine Hill Park, and Raleigh Court Library. At 6:45 a.m.; 9:15 a.m.; 1:15 p.m.; 4:15 p.m. and 8:15 p.m., Route 65 includes a deviation to provide service to the Norwich neighborhood, its businesses, as well as the community facilities located along Roanoke Avenue. Route 66 travels from Patrick Henry High School along much of the same path, in the opposite direction of Route 65.

Of these four routes (Routes 61, 62, 65, 66), Route 66 exhibited the highest ridership in FY2017; however, Routes 61 and 62 showed higher productivity, as they operate fewer revenue service hours. The route profiles for these four routes are provided as Figure 3-6.

Figure 3-6: Route Profile–Routes 61, 62, 65, and 66



FY 2017	Route 61	Route 62	Route 65	Route 66
Passenger Trips	52,183	51,524	51,923	62,074
Revenue Miles	30,062	30,062	44,063	37,265
Revenue Hours	2,325	2,325	3,120	3,120
Trips per Revenue Mile	1.74	1.71	1.18	1.67
Trips per Revenue Hour	22.44	22.16	16.64	19.90
Estimated Cost per Trip	$3.12	$3.16	$4.21	$3.52

Routes 71, 72, 75, and 76

Routes 71, 72, 75, and 76 provide service between downtown Roanoke and Salem. These routes operate Monday through Saturday from 5:45 a.m. to 8:45 p.m. Base service is provided on hourly frequencies, with 30 minute frequencies offered between 5:45 a.m. and 9:45 a.m., and again between 3:45 p.m. and 6:45 p.m., on weekdays. On Friday evenings peak service is extended to 7:45 p.m.

Routes 71 and 72: Downtown Roanoke – Lewis-Gale Medical Center

Route 71 starts in downtown Roanoke and travels southwest through the Raleigh Court neighborhood to Salem until it reaches Lewis-Gale Medical Center. Route 72 travels in the reverse direction starting at Lewis-Gale Medical Center. Besides providing access to Lewis-Gale Medical Center, Routes 71 and 72 also serve the Roanoke Courthouse and Municipal Building, the Kirk Family YMCA, Hurt Park, Raleigh Court and the Greater Deyerle neighborhoods, the Hurt Park and Grandin Villages, Vic Thomas Park and Roanoke River Greenway, Virginia Heights Elementary School, and numerous businesses and medical facilities along Brandon Avenue and Braeburn Drive.

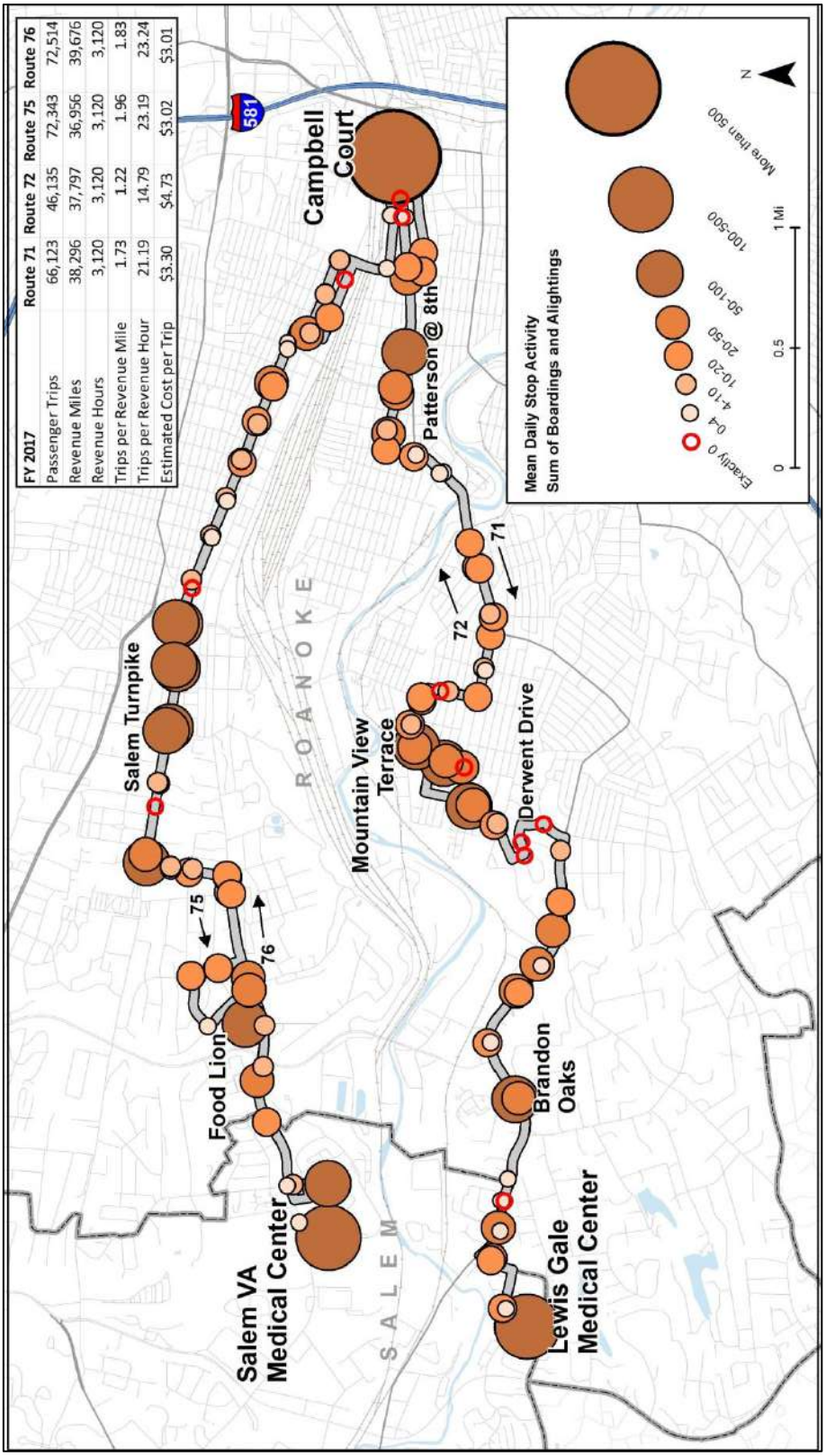
During morning and afternoon peak service, in downtown Roanoke Route 72 becomes Route 81, with continuing service to the Lakewood Plaza area via U.S. 460/Melrose Avenue. Route 82 becomes Route 71 in downtown Roanoke.

Routes 75 and 76: Downtown Roanoke – Salem Veterans Affairs Medical Center

Route 75 provides transit service from downtown Roanoke to the Salem Veterans Affairs (VA) Medical Center, one of the largest VA Hospitals in Virginia. Route 75 serves the City of Roanoke's Gilmer, Loudon-Melrose, Shenandoah West, and Cherry Hill neighborhoods. Other key trip generators include Lansdown Housing Complex, Fairview Elementary School, Greenvale School, Virginia Veterans Care, and the Adult Care Center – Roanoke Valley. Route 76 is the inbound route from Salem VA Medical Center.

Routes 71, 72, 75, and 76 are represented in Figure 3-7. In FY2017, Route 76 had the highest ridership and productivity of these four routes.

Figure 3-7: Route Profile-Routes 71, 72, 75, and 76



Routes 81 and 82: Downtown Roanoke - Salem

Routes 81 and 82 provide peak-only service connecting the City of Salem and the City of Roanoke via U.S. 460/ Melrose Avenue. Route 81 travels outbound from downtown Roanoke, serving the residential neighborhoods and businesses along the Melrose Avenue/East Main Street corridor, Melrose Park, the Goodwill Support Center and Jobs Campus, Forest Park Academy, Melrose Towers, Roanoke Country Club, American National University, and Lakeside Plaza. Route 81 terminates and becomes Route 82 at the Salem Goodwill across from Lakeside Plaza. Route 82 operates a similar route in the inbound direction, from Salem to downtown Roanoke serving the same destinations.

Routes 81 and 82 run Monday through Friday from 5:45 a.m. to 9:45 a.m., and again between 3:45 p.m. and 6:45 p.m., on weekdays. On Friday evenings peak service is extended to 7:45 p.m. Routes 81 and 82 are illustrated in Figure 3-8.

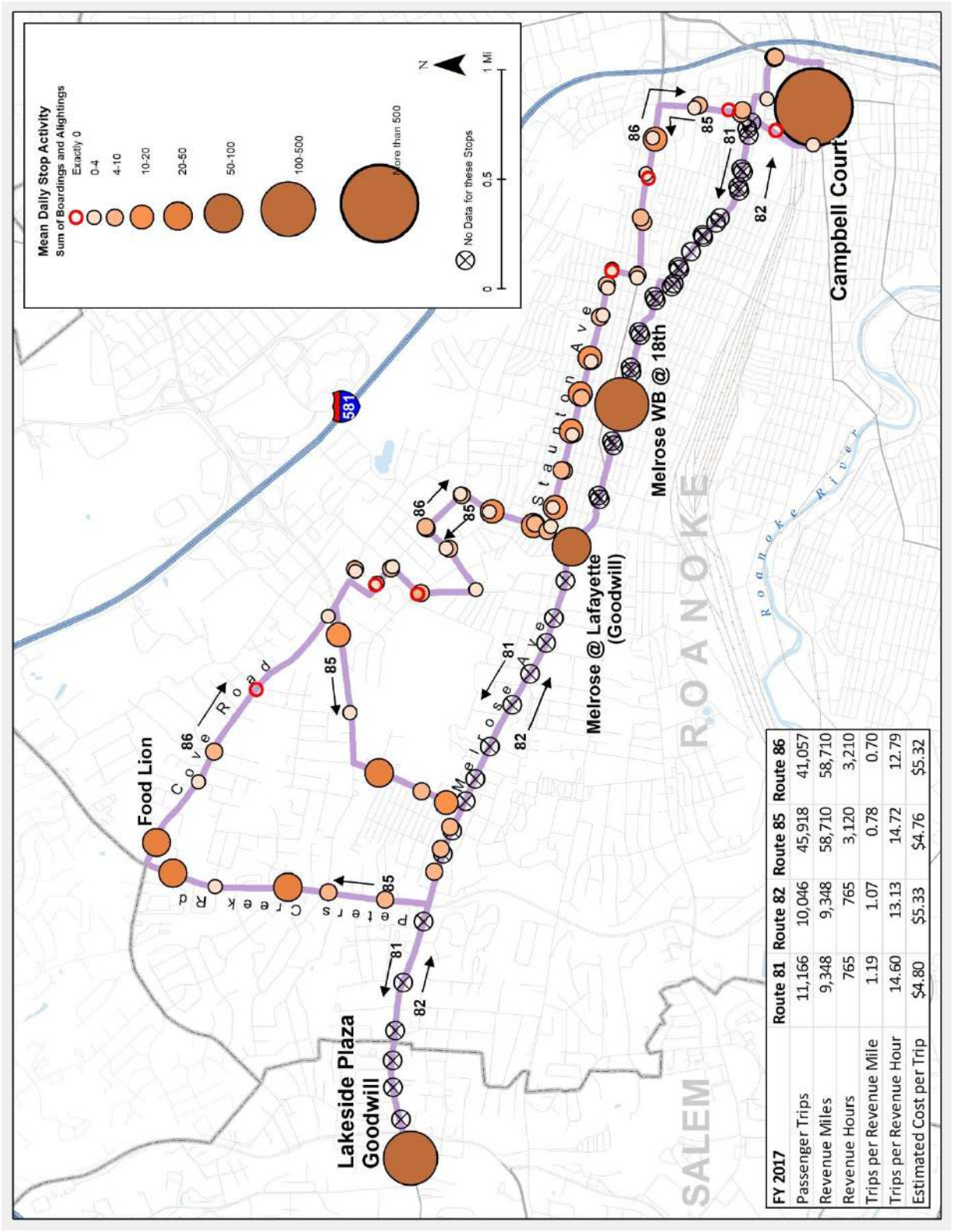
Routes 85 and 86: Downtown Roanoke - Peters Creek Road

Routes 85 and 86 provide service between downtown Roanoke and the Westview Terrace neighborhood at Peters Creek Road/Cove Road in the City of Roanoke. Route 85 begins in downtown Roanoke and travels northwest through the Melrose/Rugby and Villa Heights neighborhoods to reach Peters Creek Road. Other destinations accessible by Route 85 include Gainsboro Library, Gainsboro YMCA, Washington Park, Lucy Addison Middle School, Eureka Park and Recreation Center, and Villa Heights Park. From Cove Road at Hershberger Road, Route 85 begins a loop servicing Westside Elementary School and numerous businesses along Peters Creek Road between Melrose Avenue and Cove Road.

Route 85 becomes Route 86 at the Cove Road Food Lion stop. Route 86 continues along Cove Road, traveling inbound to downtown Roanoke, servicing many of the same places as Route 85.

Routes 85 and 86 operate Monday through Friday 5:45 a.m. to 8:45 p.m. Base service is provided on hourly frequencies, with 30 minute frequencies offered between 5:45 a.m. and 9:45 a.m., and again between 3:45 p.m. and 6:45 p.m., on weekdays. On Friday evenings peak service is extended to 7:45 p.m. Routes 85 and 86 are illustrated in Figure 3-8.

Figure 3-8: Route Profile-Routes 81, 82, 85, and 86



FY 2017	Route 81	Route 82	Route 85	Route 86
Passenger Trips	11,166	10,046	45,918	41,057
Revenue Miles	9,348	9,348	58,710	58,710
Revenue Hours	765	765	3,120	3,210
Trips per Revenue Mile	1.19	1.07	0.78	0.70
Trips per Revenue Hour	14.60	13.13	14.72	12.79
Estimated Cost per Trip	$4.80	$5.33	$4.76	$5.32

Routes 91 and 92: Downtown Roanoke – VA Medical Center via Downtown Salem

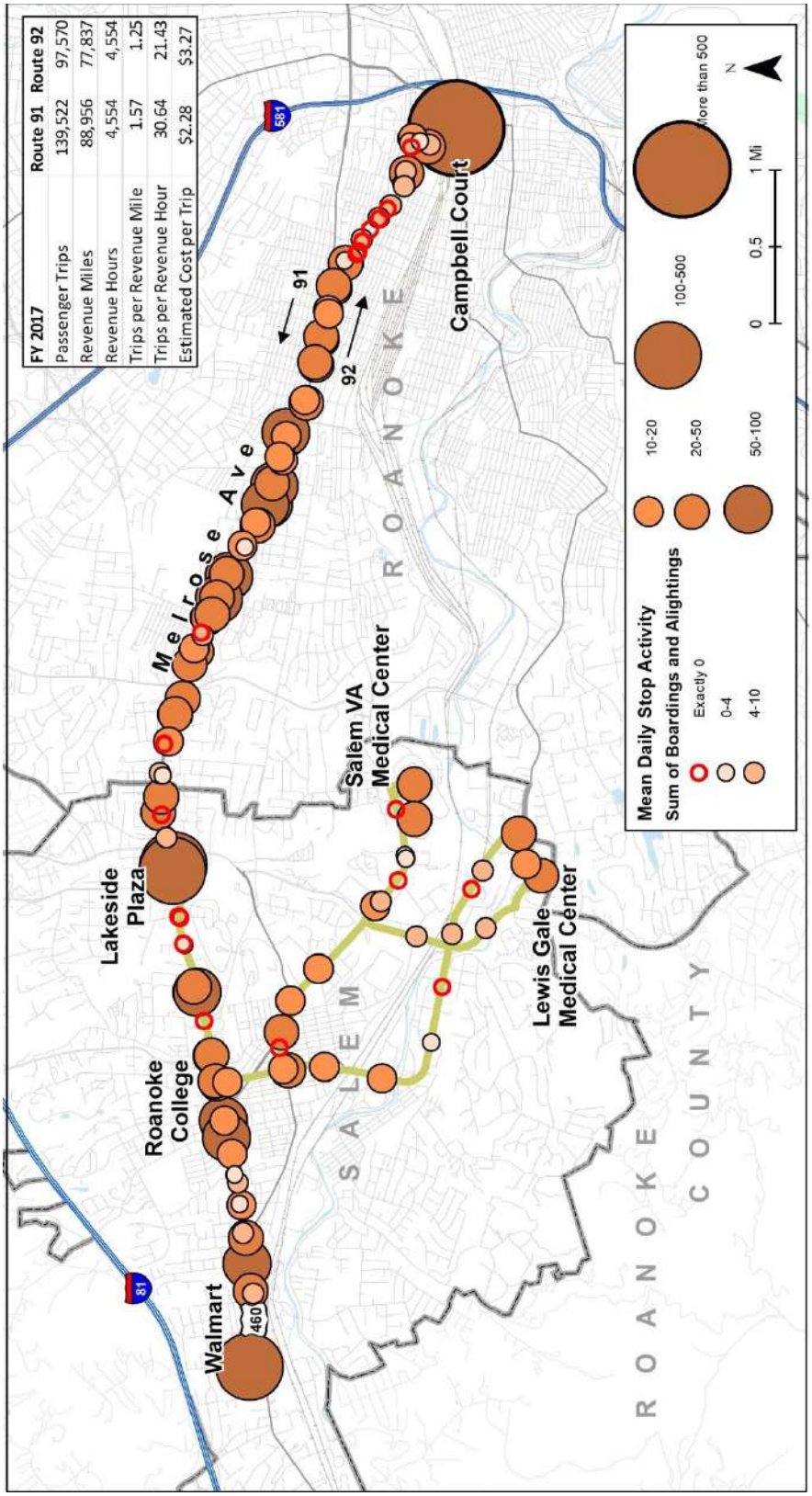
Routes 91 and 92 were altered in 2012 by combining previous versions of Routes 81/82 and 91/92, to become the continuous service between downtown Roanoke, downtown Salem, West Salem, Lewis-Gale Medical Center, and the Salem VA Medical Center that exists today. Routes 91 and 92 are the main transit routes within the City of Salem, with connections to Routes 71/72 (near Lewis-Gale); 75/76 (Salem VA Medical Center), and peak-only Routes 81/82 (Salem Goodwill/Lakeside Plaza).

Route 91 travels from downtown Roanoke through the residential neighborhoods and businesses along the Melrose Avenue/East Main Street corridor to downtown Salem. Route 91 continues through downtown Salem along West Main Street to the commercial areas in West Salem before turning around at the Salem Walmart and returning to downtown Salem. From downtown Salem, the route continues along S. College Avenue and Apperson Drive toward Lewis-Gale Medical Center. From there the route continues north along Electric Road to the Salem VA Medical Center (where Route 91 becomes Route 92), then back toward downtown Salem providing service to the Salem Civic Center, Salem Football Stadium, and the Salem Red Sox Baseball stadium. From downtown Salem, Route 92 service mirrors Route 91 service to downtown Roanoke.

At double the distance and total route time as any of the other fixed routes, Route 91/92 is a key connector among many destinations within the cities of Salem and Roanoke. Major trip generators in the City of Roanoke include those listed under Routes 81/82. Major trip generators in the City of Salem include Longwood Park, Roanoke College, Salem Public Library, Salem Farmer's Market, Salem High School, the James I Moyer Sports Complex, East Salem Elementary School, and the Arnold R. Burton Center for Arts and Technology, as well as numerous businesses and governmental facilities including the Virginia Department of Transportation's Salem District Office, Roanoke County Courthouse, and Salem City Hall.

Regular service is provided Monday through Saturday from 6:15 a.m. to 8:45 p.m. Commuter service, originating at the Salem Walmart and traveling along the U.S. 460 corridor through downtown Salem to downtown Roanoke, is offered Monday through Friday from 5:35 a.m. to 7:15 a.m. In FY2017, Route 91 was one of the three highest performing routes within the Roanoke Valley's fixed route network, generating 30.6 passenger trips per revenue hour. Figure 3-9 provides route profiles for these routes.

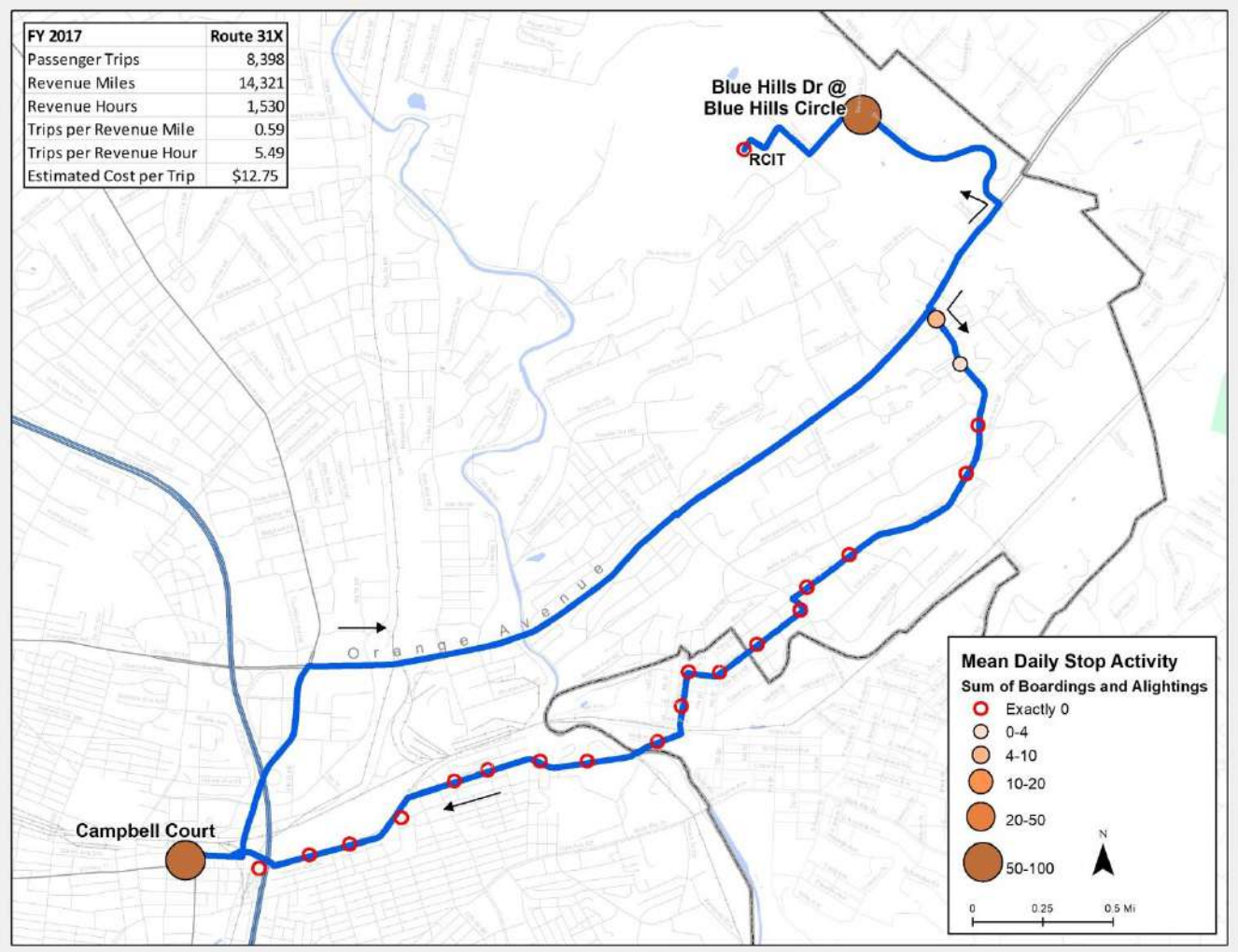
Figure 3-9: Route Profile-Route 91 and Route 92



Route 31X: Downtown Roanoke – Roanoke Centre for Industry and Technology

Route 31X is the region's newest express route; it started on April 16, 2016. It provides express service from 6:25 a.m. to 9:25 a.m. and 3:15 p.m. to 6:45 p.m. during peak periods. Route 31X travels from downtown Roanoke to the Roanoke Centre for Industry and Technology (RCIT) via U.S 460/ Orange Avenue. On the return trip, Route 31X travels by way of King Street, Dunkirk Avenue, 8th Street, Wise Avenue and Campbell Avenue before arriving in downtown Roanoke. While the 31X provides closed-door express service between downtown Roanoke and RCIT, all stops are served on the return trip to downtown Roanoke. A profile of Route 31X is provided in Figure 3-10. Ridership on the route is the lowest among the fixed routes, but the route is only a year old, operates during the limited peak period, and serves an area with seasonal employment.

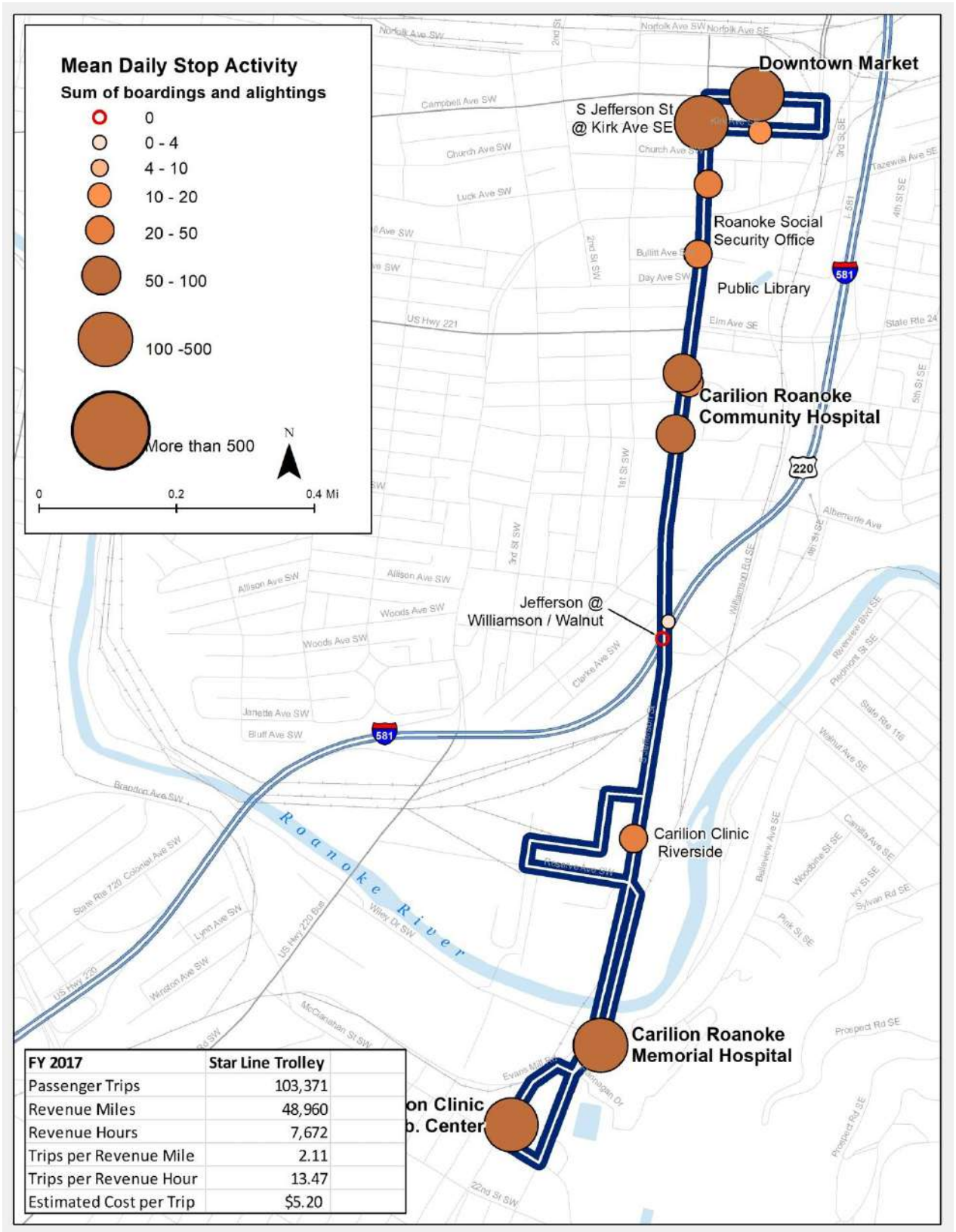
Figure 3-10: Route Profile-Route 31X



Star Line Trolley

The Star Line Trolley has been in service since November 2008. It connects downtown Roanoke to south Roanoke by way of Jefferson Street. Key locations along the route include the Roanoke City Market Building, Center in the Square, Carilion Administrative Services, Elmwood Park, downtown Roanoke Library, Carilion Clinic Community Care, Jefferson College of Health Sciences, Virginia Tech-Carilion Research Institute and Medical School, the River's Edge Sports Complex, Carilion Memorial Hospital and Carilion Clinic, Crystal Spring Medical Center, and numerous other businesses and medical offices. It operates Monday through Friday from 7:00 a.m. to 7:00 p.m. with service every 20 minutes, and 15- minute service offered between 10:00 a.m. and 2:00 p.m. The Star Line Trolley is profiled in Figure 3-11.

Figure 3-11: Star Line Trolley



FY 2017	Star Line Trolley
Passenger Trips	103,371
Revenue Miles	48,960
Revenue Hours	7,672
Trips per Revenue Mile	2.11
Trips per Revenue Hour	13.47
Estimated Cost per Trip	$5.20

Smart Way Bus and Smart Way Express

The Smart Way Bus is a commuter service that connects the Roanoke Valley and the New River Valley areas. The Smart Way Bus operates Monday through Friday from 4:30 a.m. to 11:30 p.m. and on Saturdays from 6:20 a.m. to 11:20 p.m. There are also two trips on Sundays. The first weekday bus begins service at Virginia Tech's Squires Center at 4:30 a.m., which allows passengers to get to the Amtrak train in Roanoke before it departs. The last weekday bus leaves downtown Roanoke at 10:15 p.m., which allows passengers arriving via Amtrak to catch the bus back to the New River Valley. In addition to Virginia Tech's main campus and downtown Roanoke, primary destinations include: Christiansburg; Virginia Tech Corporate Research Center; I-81 Exit 118 and Exit 140 park and ride lots; and the Roanoke-Blacksburg Regional Airport.

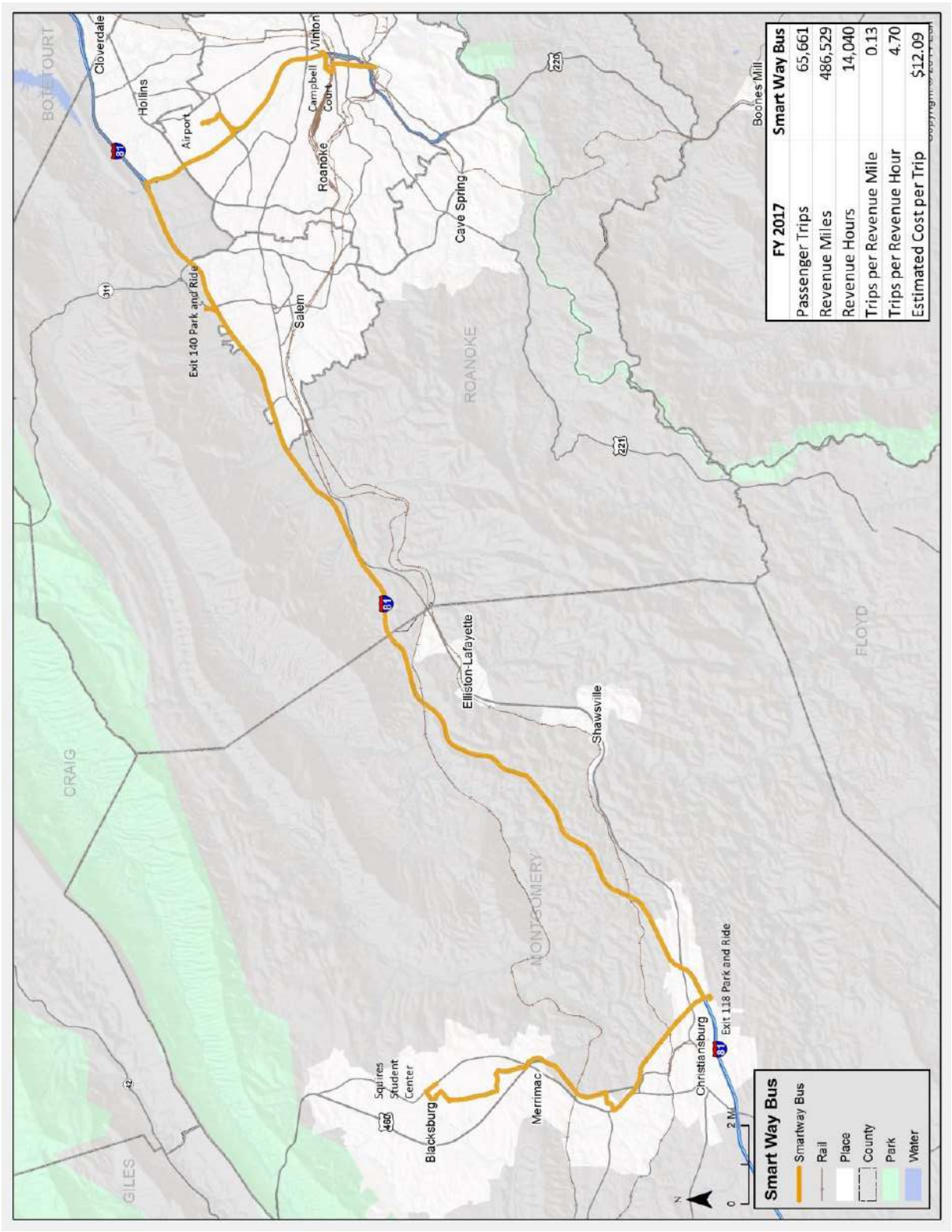
The Smart Way Bus service provides transfers that connect riders to other transit services in the region such as: Blacksburg Transit; Radford Transit; and Valley Metro's fixed route system. The Smart Way Bus also provides connections to Greyhound and the Virginia Breeze, as well as to Amtrak, which began serving Roanoke in October 2017.

The Smart Way Express is a relatively recent Valley Metro service that connects the Virginia Tech main campus in Blacksburg with the Virginia Tech Carilion School of Medicine and Research Institute (VTCRI) on the Roanoke campus. The route operates Monday through Friday from 6:15 a.m. to 9:00 p.m. Ten southbound vehicle trips and nine northbound vehicle trips are provided each weekday. The service is fare-free for anyone with a valid ID from Virginia Tech, Carilion Clinic, Virginia Tech Carilion School of Medicine or Research Institute, or Jefferson College of Health Sciences. General public riders pay $4.00 per trip.

Ridership on the Smart Way services between FY2013 and FY2017 peaked in FY2014 and has gone down each year since then. The revenue hours have remained relatively stable, with about 400 fewer hours provided in FY2017 than in Fy2016. In FY2017 the Smart Way services provided 65,661 passenger trips.

These data include the original Smart Way bus to the New River Valley as well as the Smart Way Connector, which was recently discontinued upon the initiation of Amtrak service to Roanoke. The Smart Way Connector previously provided service from Roanoke to the Lynchburg Amtrak Station. A profile of the current Smart Way Bus is included in Figure 3-12.

Figure 3-12: Smart Way Bus



Valley Metro Survey of Boardings and Alightings

As part of Valley Metro's data collection efforts for the National Transit Database (highlighted in the Roanoke Valley Transit Vision Plan), boarding/alighting counts were conducted and compiled by staff from RideSolutions and the Roanoke Valley-Alleghany Regional Commission. The 2013-2014 survey included data for 933 Valley Metro bus stops.[1]

Of these 933 stops, there was activity at 80% of them. There were 28 stops in the 2013-2014 survey where the bus stopped to pick-up or drop off passengers at least 75% of the time and 125 stops where the bus stopped for passengers at least 50% of the time. Data collected via this effort was used to calculate a bus stop activity index, which is a measure used to gauge activity at a bus stop, regardless of the number of times the route was surveyed. The index is a calculation of the stop activity that takes into consideration how many times the stop was served as well as how frequently the bus stopped for activity. Table 3-6 provides the list of the 25 most active bus stops in the 2013-2014 survey.

Table 3-6: Valley Metro – 25 Most Active Bus Stops

Stop	Activity Index [1]
Seibel SB at Nicholas	20.00
Campbell Court	9.12
Squires Student Center	8.20
Valley View Ring Road SB at Walmart	5.16
Towne Square Kroger	4.04
Towers Shopping Center Kroger	3.60
Red Rock NB at Brambleton	3.42
Jefferson SB at Kirk	3.34
Crossroads Shopping Center Driveway WB at Work Force/Kmart	2.74
Campbell WB at Wall (City Market Building)	2.64
Williamson SB at Compton	2.60
Lake Drive Plaza Big Lots	2.59
Tanglewood Mall at AC Moore	2.52
Williamson NB at Compton	2.42
Crossroads Shopping Center Driveway WB at Firestone	2.24

[1] Roanoke Valley Transit Vision Plan, Part 3: Existing Conditions Technical Report: Preliminary Surveys and Data Analysis, September 22, 2016, pages 37-44. Prepared by the Roanoke Valley Transportation Planning Organization.

Stop	Activity Index [1]
Colonial SB at VWCC Pedestrian Overpass	2.10
Valley View Mall at Sears	1.98
Elm WB at 5th	1.91
Elm EB at 8th	1.88
Roanoke Memorial Hospital	1.85
Salem Turnpike EB at 30th	1.84
Salem Avenue WB at 24th	1.74
Melrose WB at 35th	1.70
East Main WB at Lakeside Plaza (Goodwill)	1.59

(1) Bus Stop Activity Index = Stop Usage * Stop Frequency
Stop Usage = (Total Boardings + Total Alightings)/ Total # of times route was surveyed
Stop Frequency = Total # of times the bus stopped at a bus stop/Total # of times the bus route was surveyed

Analysis of STAR Services

An important task conducted for the Roanoke Valley Transit Vision Plan was an in-depth analysis of the trips taken by customers of CORTRAN and STAR for two full calendar years (2012 and 2013). A total of 165,275 passenger trips were taken by STAR customers during this two-year period. The analysis indicated that:

- The average trip length for a STAR customer was 4.03 miles.
- The no-show rate for STAR customers was 7%.
- The most commonly reported trip purpose was medical (38%), followed by recreation (32%), and employment (16.1%).
- About half of all STAR customers use wheelchairs.

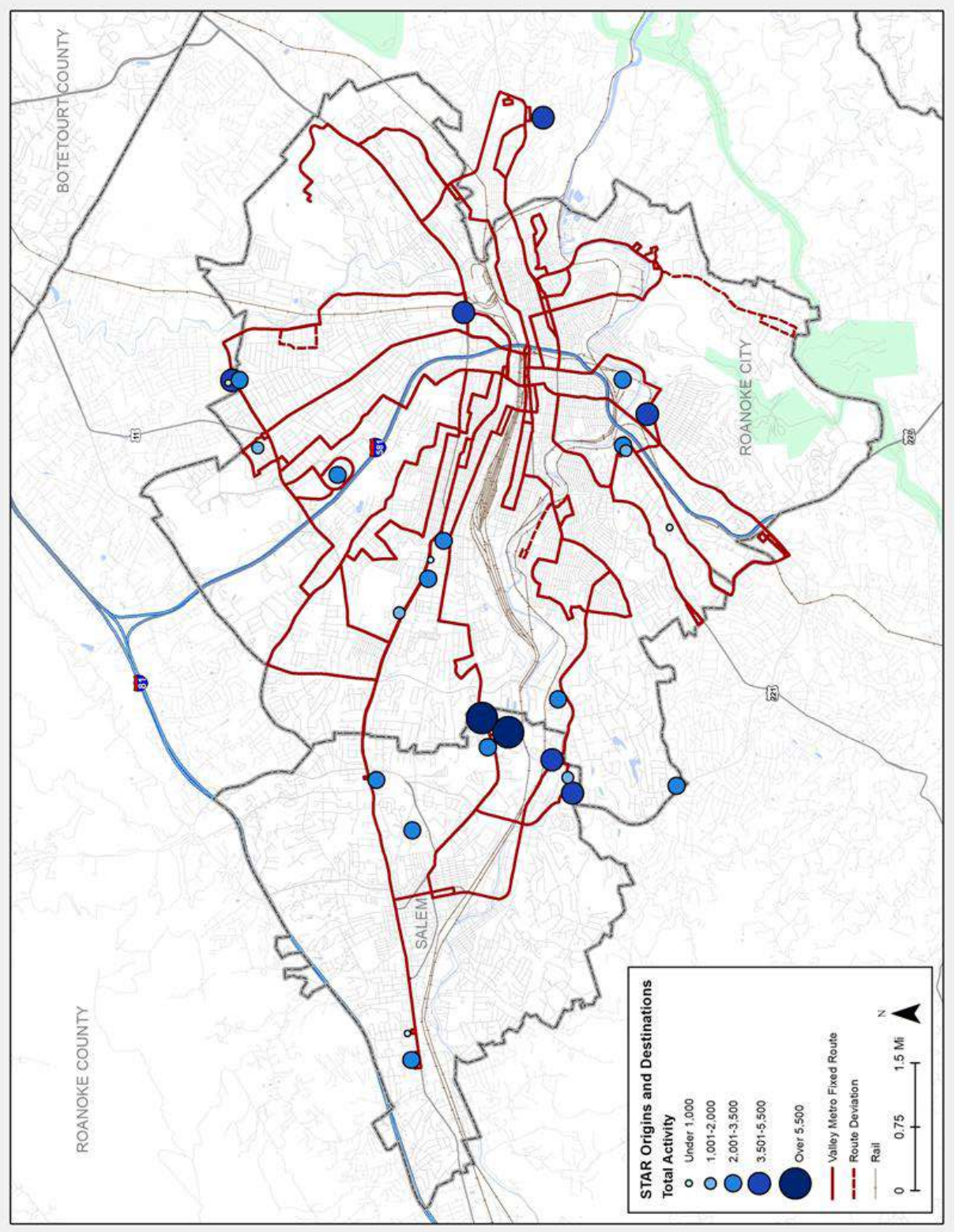
STAR Origins and Destinations

The analysis also showed multiple common origin and destination locations among STAR customers. Table 3-7 shows the locations of the most number of pick-ups and drop-offs, according to the analysis conducted for the RVTVP. These data confirm the prevalence of medical trips among STAR riders, with seven of the top ten activity locations classified as medical destinations. The only origin that comprised the top ten activity list was Clearview Manor, which is a subsidized apartment complex of 100 homes in Vinton. A map of these common origins and destinations, overlaid with the Valley Metro fixed routes, is provided in Figure 3-13.

Table 3-7: STAR Major Origins and Destinations – Calendar Years 2012 and 2013

Location	Address	Locality	Pick-Ups	Drop-Offs	Total Activity
Adult Care Center	2321 Roanoke Blvd	Salem	7,758	8,313	16,071
VA Medical Center	1970 Roanoke Blvd	Salem	5,312	5,179	10,491
Fresenius Medical Care Friendship Manor	331 Hershberger Road, NW	Roanoke County	2,698	2,751	5,449
Northwest Dialysis	1326 7th St., NE	Roanoke	2,654	2,587	5,241
Clearview Manor	1150 Vinyard Road	Vinton	2,351	2,396	4,747
Fresenius Medical Care BMA	404 McClanahan St, SW	Roanoke	1,877	1,902	3,779
Fresenius Medical Care	2021 Apperson Drive	Salem	1,951	1,790	3,741
Lewis Gale Physicians	1802 Braeburn Drive	Salem	1,890	1,807	3,697
Valley View	4870 Valley View Blvd., NW	Roanoke	1,857	1,637	3,494
Walmart	1841 W. Main Street	Salem	1,675	1,606	3,281
Veterans Care Center	1945 Roanoke Blvd	Roanoke	1,513	1,545	3,058
Carilion Clinic	3 Riverside Circle	Roanoke	1,403	1,444	2,847
Goodwill Industries	2520 Melrose Ave, NW	Roanoke	1,398	1,293	2,691
Towers Shopping Center	614 Brandon Ave., SW	Roanoke	1,525	1,113	2,638
Stratford Park	3780 Stratford Park Dr., SW	Roanoke	1,316	1,312	2,628
Fairington Apartments	4930 Grandin Road, SW	Roanoke	1,266	1,264	2,530
YMCA	1126 Kime Lane	Salem	1,264	1,246	2,510
Melrose Towers	3038 Melrose Ave, NW	Roanoke	1,169	1,244	2,413
Friendship Retirement Community	320 Hershberger Road	Roanoke	1,075	1,091	2,166
Lakeside Plaza	161 Electric Road	Salem	1,032	1,007	2,039
All Star Bingo	3435 Melrose Ave, NW	Roanoke	806	797	1,603
Roanoke Valley Workforce Center	1351 Hershberger Rd, NW	Roanoke	793	793	1,586
Lewis Gale Medical Center	1900 Braeburn Drive	Salem	750	793	1,543
Planet Fitness	672 Brandon Ave, SW	Roanoke		1,197	1,197
Blue Ridge Village	2744 Melrose Ave. NW	Roanoke		965	965
Friendship Retirement Community	327 Hershberger Road	Roanoke County	380	406	786
Virginia Western Community College	3095 Colonial Ave, SW	Roanoke		774	774
Kroger	1477 W. Main St.	Salem		687	687

Figure 3-13: STAR Major Origins and Destinations – Calendar Years 2012 and 2013



FINANCIAL ANALYSIS

Operating Budget

Valley Metro's operating budgets (and actuals where available) are provided in Table 3-8 for Fiscal Years 2015 through 2018. As these data show, expenses generally were reduced between FY2015 and FY2017, with about a $900,000 increase shown for the FY2018 budget. This increase is spread among several budget categories.

Table 3-8: Valley Metro Operating Expenses – FY2015 –FY2018

	FY2015 Actual	FY2016 Budget	FY2017 Actual	FY2018 Budget
Operating Item				
Labor	$3,383,861	$3,559,216	$3,747,490	$3,977,886
Fringe Benefits	$1,710,024	$1,712,892	$1,728,837	$1,901,463
Services	$555,321	$563,419	$574,812	$710,080
Materials and Supplies	$1,763,539	$1,482,454	$1,211,060	$1,342,324
Utilities	$260,009	$271,915	$238,731	$260,181
Insurance	$358,633	$361,286	$253,460	$269,306
Purchased Transportation and Other	$1,340,292	$1,217,023	$1,341,647	$1,562,041
Total Operating Expenses	**$9,371,679**	**$9,168,205**	**$9,096,037**	**$10,023,281**

Funding Sources

Revenue to help offset Valley Metro's operating expenses is derived primarily from passenger fares, advertising revenue, rental of buildings, and parking income. Valley Metro's revenue makes up about 25% of the total operating budget. The net deficit of just over $7 million is split among federal (43%), state (24%), and local (33%) sources. Federal funding includes the Federal Transit Administration's (FTA) Section 5307 urbanized area formula program, which helps support Valley Metro's fixed routes and ADA paratransit services, and the FTA Section 5311 rural program, which helps support the Smart Way services. The line item details regarding the funding sources for Valley Metro's operating expenses are provided in Table 3-9.

Table 3-9: FY2015- FY2018 Revenue and Funding Sources for Valley Metro

Operating				
Revenue	**FY15 Actual**	**FY16 Budget**	**FY17 Actual**	**FY18 Budget**
Passenger Fares	$ 2,156,886	$ 2,240,744	$ 1,928,696	$ 1,922,571
Advertising Income	$ 105,935	$ 147,255	$ 109,273	$ 111,036
Investment Income	$ 1,923	$ 4,183	$ 1,211	$ 1,130
Other Revenues	$ 133,232	$ 117,961	$ 200,034	$ 148,426
Subtotal- Operating Revenue	**$ 2,397,976**	**$ 2,510,143**	**$ 2,239,214**	**$ 2,183,163**
Federal, State, Local Funds	**FY15 Actual**	**FY16 Budget**	**FY17 Actual**	**FY18 Budget**
Federal	$ 2,799,764	$ 2,752,209	$ 2,963,963	$ 2,967,855
State	$ 1,911,201	$ 1,911,201	$ 2,184,637	$ 2,021,469
City of Roanoke	$ 1,779,917	$ 1,820,941	$ 1,898,847	$ 1,991,161
New River Valley	$ 63,046	$ 65,248	$ 44,763	$ 52,310
VA Tech			$ 10,361	$ 409,950
Other Local	$ 368,256	$ 336,147	$ 379,829	$ 397,373
Total Operating Funding	**$ 6,922,184**	**$ 6,885,746**	**$ 7,482,400**	**$ 7,840,118**
Total Revenue and Funding	**$ 9,320,160**	**$ 9,395,889**	**$ 9,721,614**	**$ 10,023,281**
Total Operating Expenses	**$ 9,371,679**	**$ 9,168,205**	**$ 9,096,036**	**$ 10,023,281**

Source: Valley Metro

Capital Budget

The capital program for Valley Metro for FY2017 and FY2018 is provided in Table 3-10. The budget for the two years represents some significant capital items, including the replacement of 14 heavy-duty buses, 4 trolleys, and 3 body-on-chassis (BOC) vehicles. The facility work includes repairing leaks to concrete at the entrance and exit ramps, repairing the diesel exhaust smoke vent, renovating the money-counting room, repairs to restrooms, and replacing door levers. In addition, Valley Metro will be replacing its bus wash system and eight bus lifts.

Table 3-10: Valley Metro FY2017 and FY 2018 Capital Programs

FY2017 Capital Items from DRPT's Statewide Improvement Program

Capital Item	Amount	Local Funds	State Funds	Federal Funds	Source
15 Passenger BOC (3)	$166,131	$6,645	$26,581	$132,905	FTA Section 5339 - 2015
Bus Lifts	$180,000	$7,200	$28,800	$144,000	FTA Section 5339 - 2015
Replace Floor Scrubber	$20,000	$800	$3,200	$16,000	FTA Section 5339 - 2016
Rehab/Renovation - Admin/Maintenance Facility	$252,350	$10,094	$40,376	$201,880	FTA Section 5339 - 2016
Engineering/Design - Transfer Facility	$30,000	$1,200	$4,800	$24,000	FTA Section 5339 - 2016
ADP Software	$4,450	$178	$712	$3,560	FTA Section 5339 - 2016
Capital Outlay	**$652,931**	**$26,117**	**$104,469**	**$522,345**	

FY2017 and FY2018 Valley Metro Bus Replacement Program

Capital Item	Amount	Local Funds	State Funds	Federal RSTP
Heavy Duty Transit Buses (14)	$6,035,890	$170,092	$3,486,416	$2,379,382
Trolleys (4)	$1,444,554	$40,708	$834,395	$569,451
Capital Outlay	**$7,480,444**	**$210,800**	**$4,320,811**	**$2,948,833**

Recent Compliance Results

Valley Metro was reviewed by the FTA in 2014 for compliance with federal requirements associated with the receipt of federal funds. The Triennial Review focused on Valley Metro's compliance in 17 areas. No deficiencies were found with the FTA requirements in 16 of these 17 areas. The one deficiency that was found was with regard to inactive grants and untimely grant closeouts, in the area of Technical Capacity. Valley Metro provided the FTA Regional Office with a grant close-out plan, and the deficiency was closed in September 2014.

Peer Review and Analysis

In order to better understand how Valley Metro's operating and performance characteristics compare to peers within the transit industry, data on five peer systems were collected primarily from the FY2015 National Transit Database (NTD). Annual data collected for the peer review focused on the following basic operating statistics: unlinked passenger trips; revenue miles; revenue hours; and operating expenses. The focus for these data was on directly-operated fixed route service.

The study team chose peers based on the service area population, square miles, fleet size, and geographic proximity. While the study team generally excluded systems with major university components, Blacksburg Transit was included because it is in close proximity to Roanoke, which makes it a peer with regard to operating cost parameters. Given its major university partner (Virginia Tech), its farebox revenue and its system productivity are significantly higher than the other peers, as is typical for a university transit program.

The other peer systems include: Asheville Re-Defines Transit (Asheville, NC); Charlottesville Area Transit; Cambria County Transit Authority (Johnstown, PA); and the Greater Lynchburg Transit Company. Table 3-11 provides the data for Valley Metro and the peer systems.

These data show that Valley Metro:

- Provides the highest number of vehicle revenue hours and has the largest service area population among the peer group. The closest peer within the group is Charlottesville Area Transit, which provided about 5,000 fewer vehicle revenue hours in FY2015 and serves a population of about 11,000 fewer people. While there is a major university presence in Charlottesville, the university operates its own transit program.

- Operates in a service area that is slightly smaller than the mean (43 square miles compared to the mean of 48 square miles). The density of Valley Metro's service area is 2,257 people per square mile, which is higher than the mean of the peer group (1,717 people per square mile).

- Has a lower cost per revenue hour than the mean.

- Has lower productivity than the mean and a higher cost per trip.
- Operates the most number of vehicle revenue miles.

Table 3-11: Selected Peer Comparison

System	Service Area Population	Service Area Sq. Miles	# of Peak Fixed Route Vehicles	Annual Passenger Trips	Total Operating Expenses	Farebox Revenue	Farebox Recovery	Vehicle Revenue Hours	Vehicle Revenue Miles
Asheville Re-Defines Transit (Asheville, NC)	83,393	45	16	1,458,306	$ 5,208,630	$ 670,025	13%	64,345	949,550
Blacksburg Transit	63,661	28	35	3,699,328	$ 5,552,198	$ 3,304,739	60%	80,826	785,495
Charlottesville Area Transit	85,755	38	24	2,423,740	$ 7,188,657	$ 551,563	8%	104,572	1,043,767
Cambria County Transit Authority (Johnstown, PA)	80,508	60	32	1,148,509	$ 7,406,227	$ 819,173	11%	78,798	1,052,672
Greater Lynchburg Transit Company	80,846	72	28	2,850,332	$ 6,576,559	$ 922,862	14%	86,910	975,551
Valley Metro	**97,032**	**43**	**34**	**2,288,335**	**$ 7,286,263**	**$ 2,015,768**	28%	**109,265**	**1,563,403**
Mean	**81,866**	**48**	**28**	**2,311,425**	**$ 6,536,422**	**$ 1,380,688**	**21%**	**87,453**	**1,061,740**

System	Density Population/ Square Mile	Trips/ Revenue Hour	Trips/ Revenue Mile	Cost/ Trip	Cost/ Revenue Hour	Cost/ Revenue Mile
Asheville Re-Defines Transit (Asheville, NC)	1,853	22.66	1.54	$ 3.57	$ 80.95	$ 5.49
Blacksburg Transit	2,274	45.77	4.71	$ 1.50	$ 68.69	$ 7.07
Charlottesville Area Transit	2,257	23.18	2.32	$ 2.97	$ 68.74	$ 6.89
Cambria County Transit Authority (Johnstown, PA)	1,342	14.58	1.09	$ 6.45	$ 93.99	$ 7.04
Greater Lynchburg Transit Company	1,123	32.80	2.92	$ 2.31	$ 75.67	$ 6.74
Valley Metro	2,257	**20.94**	**1.46**	**$ 3.18**	**$ 66.68**	**$ 4.66**
Mean	**1,717**	**26.43**	**2.18**	**$ 2.83**	**$ 74.74**	**$ 6.16**

Source: National Transit Database, FY2015, directly operated fixed route data.

ROANOKE VALLEY TRANSIT VISION PLAN – OUTREACH RESULTS

The Roanoke Valley Transit Vision Plan was developed over a three-year period, beginning in July 2013 and ending in September 2016. Led by the Roanoke Valley Transportation Planning Organization, the development of the Transit Vision Plan was a comprehensive effort that included outreach to transit riders (Valley Metro, RADAR, and Botetourt Senior Van), Valley Metro employees, and the public. The outreach effort resulted in a total of 4,161 "contacts" with people through a myriad of efforts including surveys, public workshops, and focus groups. Because the effort was so comprehensive and recent, the TDP is incorporating these results rather than initiating new survey efforts. These are summarized below.

Rider Survey Input Regarding Unmet Transit Needs

The Valley Metro Rider Survey was administered on board the vehicles on June 24, 2014. A total of 1,895 surveys were returned. The survey results that discuss the riders' opinions regarding unmet public transportation needs and desired improvements are discussed below.

Locations Needing Improved Transit Connections

The locations (listed by 20 or more respondents) that riders think need to be better connected to the bus system are listed in Table 3-12, along with the number of survey respondents that indicated each location.

Table 3-12: Locations Needing Improved Transit Connections

Location	Number of Respondents
DMV	147
Salem	74
Roanoke County (general)	55
Bonsack	44
Peters Creek Road	39
Electric Road	31
Cave Spring/Corners	30
Williamson Road	30
Hollins	27
Blue Hills Drive	25
Happy's Flea Market	25
Valley View	25
Vinton	24

According to the analysis provided within the survey results, the DMV is about two miles from the nearest bus stop (Peters Creek Road and Cove Road) and is not accessible by sidewalks. The analysis indicated that the travel path via Valley Metro service from western Salem to Roanoke is not direct, which is likely why so many respondents listed Salem.

The rider survey also asked participants to list the most important message they would like to share with decision makers. These results were categorized, with the top ten topic areas for the messages provided in Table 3-13.

Table 3-13: Messages to Decision-Makers

Message	Number of Respondents
Additional Service	368
Sunday Service	240
Great Service	214
Bus Conditions	71
Consider the Needs of Others	52
Timeliness	42
Thank you!	32
Improve Communication	32
Transit Stop Accessibility	27
Decision Making	23

In addition to Sunday service, which had 240 mentions, the additional service requests included the following:

- **Service to additional specific places:**
  - Blue Hills Industrial Park
  - Bonsack
  - Carilion Clinic Riverside
  - Department of Motor Vehicles
  - Dixie Caverns
  - Expanded service area
  - Further into Vinton; Route 31 to Vinton Library
  - Garst Mill Road
  - Martinsville/Collinsville
  - Melrose Avenue
  - Peters Creek Road up to Williamson Road; Williamson Road – Dollar General, Maxway, Kroger

  - Roanoke County; to jobs in the County; routes that extend farther to eliminate long walks from the last stop
  - Salem Turnpike
  - South County Library
  - Smart Way to Natural Bridge
  - Target
  - Union Street, Salem
  - Valley View movie theater

- **Improved frequency of service:**
  - Buses every 15-30 minutes
  - Extended peak hour
  - Hourly service in Garden City
  - Increased service frequency
  - More frequency in Norwich
  - Peak service in Salem
  - Peak service in Vinton
  - Peak service on the 61/62, 35, and 41
  - Route 41 – Kenwood Boulevard- hourly service

- **Specific route/network suggestions:**
  - Connect 71 and 91 at Lewis-Gale Medical Center
  - Connect Smart Way and Valley Metro at the Salem Park and Ride
  - Daily Smart Way Blacksburg – Roanoke Amtrak
  - Direct service from western Salem to Roanoke
  - Extra Smart Way bus at 4:30 or 5:00 p.m.
  - Transfer at key intersections instead of only at Campbell Court
  - Transfer routes to avoid all buses going to Campbell Court
  - Trolley route extension
  - Stop on 5th Street and Rutherford Avenue
  - 419 Crosstown route
  - CRC Smart Way service on snow days

- **Service day/hour improvements:**
  - Earlier bus service
  - Holidays
  - Later service until 10 or 11 p.m.
  - Weekend Trolley service

- **Other:**
  - More routes
  - More bus stations
  - Reinstate stops that have been removed

Public Survey

The public survey effort completed for the Vision Plan resulted in 471 completed surveys. The majority of the respondents (51%) reported that they had not used public transit within the last year. Though most respondents were not public transit users, eighty percent of the respondents indicated that they would use public transportation if it were convenient and affordable. The majority (84%) also indicated that they would like to see local governments allocate more money to improve transit services.

Locations for Improved Connections

Similar to the rider survey, the public survey also asked respondents to indicate the locations they felt should be better connected via the public transit network. The top five locations were: the airport, Bonsack, Hollins University, Roanoke County, and Cave Spring Corners.

Important Transit Ideas

The survey asked respondents to indicate ideas that they felt were so important that they would be disappointed if the ideas were not included in the final plan. These responses were grouped into the following categories and are summarized below:

- General Feedback
- Amtrak
- Downtown transfer Center
- Hours of Service
- Fares
- Additional Service
- System Efficiency
- Vehicles
- Amenities

General Feedback

- No regional divides for buses and RADAR
- Expand the reach of RADAR
- Make the system more efficient
- Bus transportation to all residents
- Keep in mind lower-income areas
- Decision-makers required to use public transportation for a month
- Safety
- Re-think the entire bus system and create a long-range plan that addresses changing demographics

Amtrak

- Passenger rail and access to it
- A fixed route light rail trolley as the centerpiece of the system
- Train from the New River Valley
- Smart Way to Amtrak
- Begin planning now for future light rail lines connecting towns in the region (e.g., Roanoke to Blacksburg)
- Train service from Roanoke to Lynchburg/Richmond
- Connection of Amtrak location to Valley View and South Roanoke
- Dedicated bike/pedestrian accommodations related to Amtrak service

Downtown Transfer Center

- ...A more open, inviting setting would be much more appealing...
- A centrally located transit center is important, but the current location on Campbell Ave. creates a hole in the streetscape and a barrier to pedestrian movement along Campbell Ave. I will be disappointed if a new location is not considered, with a multi-modal location with the new train station being my primary suggestion.
- Move the bus terminal
- Bus loading shelter on the street – Campbell or Salem for easy on/off service.
- Medical facilities should be located adjacent to the bus station in the downtown area
- Extended transit service in the exterior areas into the downtown hub for further transit.

Hours of Service

- Later hours on weekdays and weekends
- More frequent bus service
- Bus service on Sundays
- More buses that come around more frequently
- Give more frequent stops in areas where people use transit more often
- More times in Christiansburg to catch the bus to Roanoke
- Expansion of hours for Star Line Trolley Service including weekend service, even if fares were introduced for expanded hours
- Bus service until 10 p.m.
- Expanded evening hours for Smart Way bus

Fares

- Reduced or eliminated bus fares
- Free bus service on the weekends
- More free transportation like the trolley

- Free rides within a designated radius of downtown Roanoke so downtown residents and shoppers can hop on and off at any stop

Additional Service

- Where it goes it seems to work well, just need to expand
- Better bus service in Bedford County
- Bus service spread out over a larger area (like Franklin County)
- Bus to Kroger in Vinton
- Additional trolley between Jefferson Center to the Market area
- Bus transportation to Hollins
- Plantation Road service
- Connect the Bridges development on Jefferson Street to Towers Shopping Center, the medical school, and downtown via the trolley
- Improve access to major employment centers such as Hollins/Plantation, and Blue Hills
- Continue the Smart Way connection between Roanoke and New River Valley
- Extension of service out 460, 220, and 221
- Bus service between Rocky Mount and Roanoke
- Smart Way bus stop at I-81, Exit 128
- Some public transit for Botetourt County
- Public transit on Route 419 in Roanoke County and its feeder roads with a direct connection to the airport and Valley View Mall
- Public transit along the entirety of Route 419
- A bus stop at Hollins University
- Additional routes to the airport, Mill Mountain, and Clearbrook
- Smart Way connection to Radford Transit at I-81, Exit 118 or to Radford University
- Bus service to connect suburban and rural communities to urban Roanoke and Salem areas
- Smart Way stop at Litton Reeves or the Coliseum, most of the campus extension is in that direction
- Grandin Road intersecting Route 419
- Connection to the airport
- Bus service connecting SW city/county (419 corridor) to downtown Roanoke
- Bus schedule for Cave Spring Corner shopping center to and from downtown and to several SW county locations

System Efficiency

- A study of where people who need/want public transit live and where they need to go
- Offer end to end point routes that run less frequently but earlier and later with fewer stops (similar to Megabus model of city to city) for quick efficient way to get across the city

- Routes need to be easy to use without having to transfer downtown
- Direct connection from Western Salem to Roanoke.
- Transit options in Roanoke County
- Smaller buses to save energy, coming at least every half hour during the day
- Changing bus routes, schedules, and days buses run, such as on Sundays
- More frequency when people are going to and getting off from work so that people without transportation have reasonable options for getting to work on time and picking up kids, etc. instead of having to wait just because they do not have a car.
- Transit from suburbs to the cities and civic centers
- Create a bus route(s) that interests the other bus routes to shorten trip times by avoiding a necessary trip into Campbell Court
- Trolley circulation between the core neighborhood commercial districts and downtown

Vehicles

- Electric buses
- City shuttles
- Smaller buses
- Taxi
- Smaller more efficient buses with more routes

Amenities

- Greater and safer mobility for disabled
- Accessible buses for wheelchairs
- Wayfinding signage downtown
- Consider bikes and transit
- Better planned transit stops with better accommodations
- Adding trash cans and recycling cans at bus stops
- On-board bus internet
- More seating
- Dispense change
- Better transit signs
- Covered bus stops
- A mobile app with routes and connections
- Bus shelters

The public survey also asked respondents to indicate what they thought the most important messages were for decision-makers. These responses are shown in Table 3-14.

Table 3-14: Messages for Decision- Makers

Category	Number of Responses
Service Addition	65
Improved Service	47
Livability	28
Marketing	18
Funding	15
Environment	13
Economy	9
Amenity Addition	6
Parking	6
Rail	6
Frequency	4
Pedestrian Access	4
Fares	3
Good like it is	2
Regional Transportation Authority	2
Technology Integration	2
Fares	1
Land Development	1
Transit not needed	1

Valley Metro Employee Survey

Another data collection tool that was used during the Roanoke Valley Transit Vision Plan was an employee survey. The employee survey was completed by 27 respondents. The following questions were asked:

1. What is the most frequent customer complaint about the transit system?

2. Please list any locations where there is currently no bus service and you think there should be service.

3. Please list any routes that are rushed to accomplish within the available time. For these routes, indicate the reason why it feels rushed.

4. Please list any routes that should be structured differently and what changes you recommend.

5. Please list any routes that experience crowding and at what time of day.

6. Please list any other recommendations you have for public transportation in the Greater Roanoke Valley region.

The primary answers to questions 1 and 2 are summarized below.

Customer Complaints

Hours of Operation

- Need service past 8:15 p.m., until 11:00 p.m. or 12:00 a.m./12:45 a.m.
- Need half-hour service from 9:45 a.m. to 6:45 p.m.
- Need Sunday service from 8:00 a.m. to 4:00 p.m.
- Need earlier service in order to commute to work
- First two weeks of each month are busiest and need 30 minute service from 2:30 p.m. to 7:30 p.m.

Network Structure

- Have to ride 30 minutes in the wrong direction (towards downtown) to get the bus they need.

Service Delivery

- Buses are often late
- Transfers are often missed
- Downtown events make buses late

Travel Time

- Travel time is too long. It should not take an hour to get from one end to another. Should be 30 minutes.

Service Area

- Need service to Clearbrook Walmart, 460, DMV, and Target.

Fares

- Eliminate transfer passes and charge a fare for each boarding
- Fare is too high
- Should not have to show an I.D.

Comfort

- Buses too hot/too cold

Locations Where Transit Service is Needed

- 220 to Clearbrook Walmart
- 419 Corridor from Franklin Road/Tanglewood to Lewis Gale to Salem (Lakeside Plaza)
- 460 – Blue Hills Drive Industrial Park
- 460 – Bonsack – Kroger area and Walmart area
- Brambleton south of Red Rock to medical offices
- Brambleton at 419, Cave Spring Corners
- Cave Spring area
- DMV
- Ferrum College
- Franklin County
- Happy's Flea Market (*this has since closed*)
- Peters Creek corridor to include DMV/Williamson Road to Hollins corridor
- Route 11 needs a stop at Cove and Sherman
- Roanoke County
- Rocky Mount
- Main Street in Salem – all stops should have a paired stop across the street, especially Goodwin Avenue and Kroger Spartan Square
- More of Salem
- Salem Turnpike from Westwood Boulevard to Peters Creek Road
- West Main Street from Turner Road to Garman Road (Atlas Logistics/Kroger Warehouse)
- West 4th from Main Street to Colorado Street
- Williamson Road to Peters Creek Road
- Williamson Road from Hershberger Road to Peter's Creek Road

STAKEHOLDER OPINIONS

Initial Meeting

The initial meeting for the TDP was held on September 1, 2016, in conjunction with the initial meeting for the RADAR TDP. The following issues and unmet needs were discussed:

- There is a need to examine the funding and governing structure for Valley Metro. The current official service area includes the Cities of Roanoke and Salem and the Town of Vinton. The short, mid, and long-term recommendations from the Roanoke Valley Transit Vision Plan included expansions of fixed route service to areas outside of these jurisdictions and recommended a change to the governance structure of Valley Metro to include additional partners.

- RADAR currently offers service in Roanoke County on a demand response basis (CORTRAN). How can this service adapt and be part of the future network?

- Botetourt County operates a service for senior citizens and people with disabilities. There is interest in expanding to include additional public transit services.

- There is a need to reach out to additional stakeholders to help address the issue of governance, as well as unmet needs. Those specifically mentioned were: economic development offices; planning directors; and representatives from higher education facilities.

- What will the federal and state funding scenario look like over the next six to ten years? DRPT is working on a strategy to replace the revenue bond funds that have expired, but the details are not yet available. How will the Smart Scale funding process affect the region? What regulations with regard to FTA funding change when the fleet is larger than 50 buses? How can these be addressed?

- How can the region maximize the use of the Section 5310 funds?

- How can the short-term recommendations from the RVTVP be implemented?

- Improving technology to better communicate with passengers will be an important task over the next several years. Valley Metro is working on a procurement to provide real-time transit information for the riders.

Downtown Plan Re-Launch Meeting

The study team attended a meeting of the Downtown Plan, held on October 27, 2016 and had a chance to ask meeting attendees a few questions with regard to public transportation in Roanoke. The questions and responses are summarized below.

1. **What do you like about current transit services in Roanoke?**
    - The trolley, like the route, it's free
    - Transit is centralized
    - Smart Way- it goes to the train station
    - The bike route system

2. **What changes or improvements would you like to see in the next 6 years?**
    - Apps for phone
    - More routes
    - Routes that serve the northeast section of Roanoke
    - More frequency
    - A route that goes to the Star
    - Additional passenger amenities
    - Bus stops in some locations are too close together
    - The Smart Way bus goes to the airport, would like for a regular route to go to the airport.
    - A route should go to Blue Hills Industrial Dr. (*note that the 31x does this*)
    - Personalized trip information for riders
    - Transit Center-poor design, make it more people- friendly, discourage vagrants

3. **Are there locations that need new or better transit services?**
    - Orange Ave.
    - Blue Hills Industrial Dr.
    - Northeast Roanoke

4. **How do you like to receive information about transit services? How can Valley Metro do a better job promoting available transit services?**
    - Email
    - Internet/Website
    - Kiosks
    - Phone
    - App
    - Real time information on trip

DEMOGRAPHICS AND LAND USE

This section provides an analysis of current and future population trends in the study area, as well as an analysis of the demographics of population groups that often depend on transportation options beyond an automobile. Data sources for this analysis include the 2010 U.S. Census, American Community Survey (ACS) 5-year estimates, and Weldon-Cooper Center for Public Service, University of Virginia.

Population Trends

Table 3-15 shows the U.S. Census population counts for the Commonwealth of Virginia and the study area from 1990 to 2010. The study area's population in 2010 was 7% higher than it was in 1990. All jurisdictions in the study area increased in population from 1990 to 2010. Roanoke County's population increased the most (16%) followed by the City of Salem (4%). Roanoke City's population increased the least at 1%. The Town of Vinton, which is included in Roanoke County's population, grew by 6%.

Table 3-15: Historical Populations

Place	1990	2000	2010	1990-2000 Percent Change	2000-2010 Percent Change	1990-2010 Percent Change
Virginia	6,187,358	7,078,515	8,001,024	14%	13%	29%
City of Roanoke	96,397	94,911	97,032	-2%	2%	1%
City of Salem	23,756	24,747	24,802	4%	0.2%	4%
Roanoke County	79,332	85,778	92,376	8%	8%	16%
*Town of Vinton**	*7,665*	*7,782*	*8,098*	*2%*	*4%*	*6%*
Region	**199,485**	**205,436**	**214,210**	**3%**	**4%**	**7%**

Source: U.S. Census, American Factfinder

*The population of the Town of Vinton is included in Roanoke County's population

The American Community Survey data show that the study area's population has continued to increase since the 2010 Census. However, the study area is growing at a slightly slower rate than the Commonwealth of Virginia, as shown in Table 3-16.

Table 3-16: Recent Population Trends

Jurisdiction	2000 Census Population	2010 Census Population	% Change, 2000-2010	2017 Population Estimate	% Change, 2010-2017
City of Roanoke	94,911	97,032	2%	99,908	3%
City of Salem	24,747	24,802	0%	25,679	4%
Town of Vinton	7,782	8,098	4%	8,065	-0.4%
Subtotal	127,440	129,932	2%	133,652	3%
Roanoke County *	85,778	92,376	8%	93,735	1%
Total	**205,436**	**214,210**	4%	**219,322**	2%

Source: U.S. Census and the Weldon Cooper Center

*The population of the Town of Vinton is included in Roanoke County's population

Population Forecast

Table 3-17 provides population projections for the years 2020-2040. The study area is estimated to experience a 3% growth rate from 2020 to 2030, a 2% growth rate from 2030-2040. and a 1% growth rate from 2030 to 2040. These growth rates are lower than the projections for the Commonwealth.

Table 3-17: Population Forecast

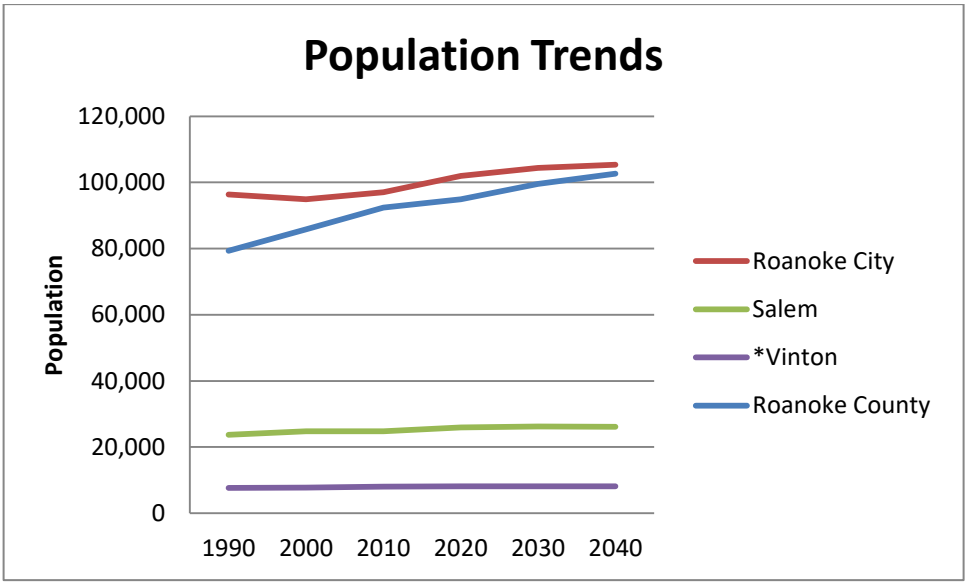
	2020 Population Projection	2030 Population Projection	2040 Population Projection
Virginia	8,744,273	9,546,958	10,201,530
City of Roanoke	101,951	104,398	105,357
City of Salem	25,979	26,256	26,165
Roanoke County	94,883	99,516	102,683
Vinton *	8,122	8,145	8,169

Source: Weldon Cooper Center for Public Service, Demographics & Workforce Group

*The population of the Town of Vinton is included in Roanoke County's population

Figure 3-14 provides a visual representation of the population from historical census numbers to population projections. If current population projections are correct, the study area can anticipate a 17% increase in population by 2040. All of the jurisdictions are projected to increase in population.

Figure 3-14: Study Area Population Trends

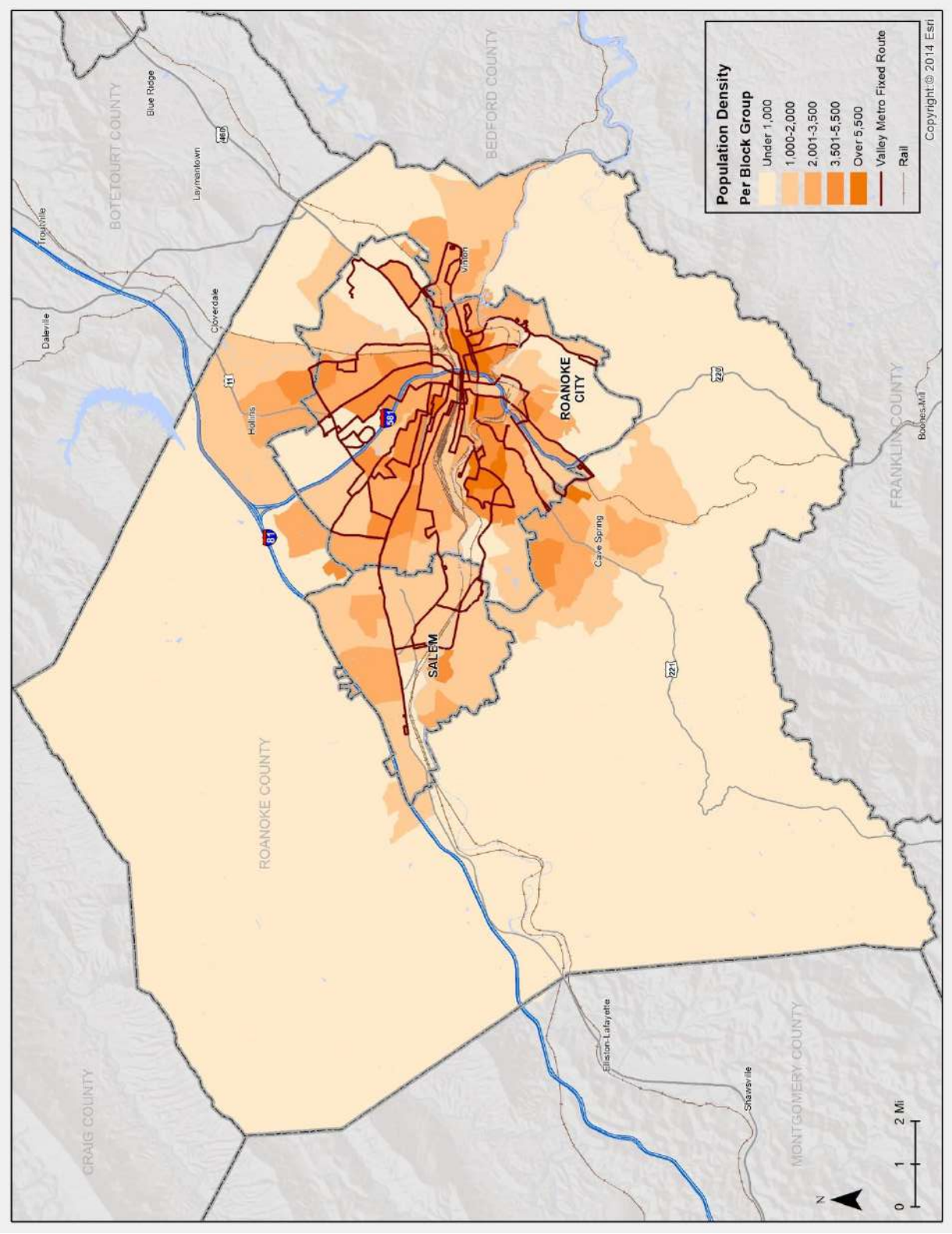


Population Density

Population density is often used as a determinate for the type of public transportation service that is feasible in an area. Typically, an area with a density greater than 2,000 persons per square mile will be able to sustain frequent daily fixed route bus service. Whereas, an area with a population density below 2,000 persons per square mile may be better suited for deviated fixed route, flex schedule, or dial-a-ride service.

Figure 3-15 shows the population density at the Census block group level and Valley Metro's fixed route service. Most of the population density in the study area is located in Roanoke City and the areas surrounding the city. In general, the study area becomes less dense the further away from Roanoke City. Within the study area, Roanoke County is the least densely populated.

Figure 3-15: Study Area Census Block Groups by Population Density



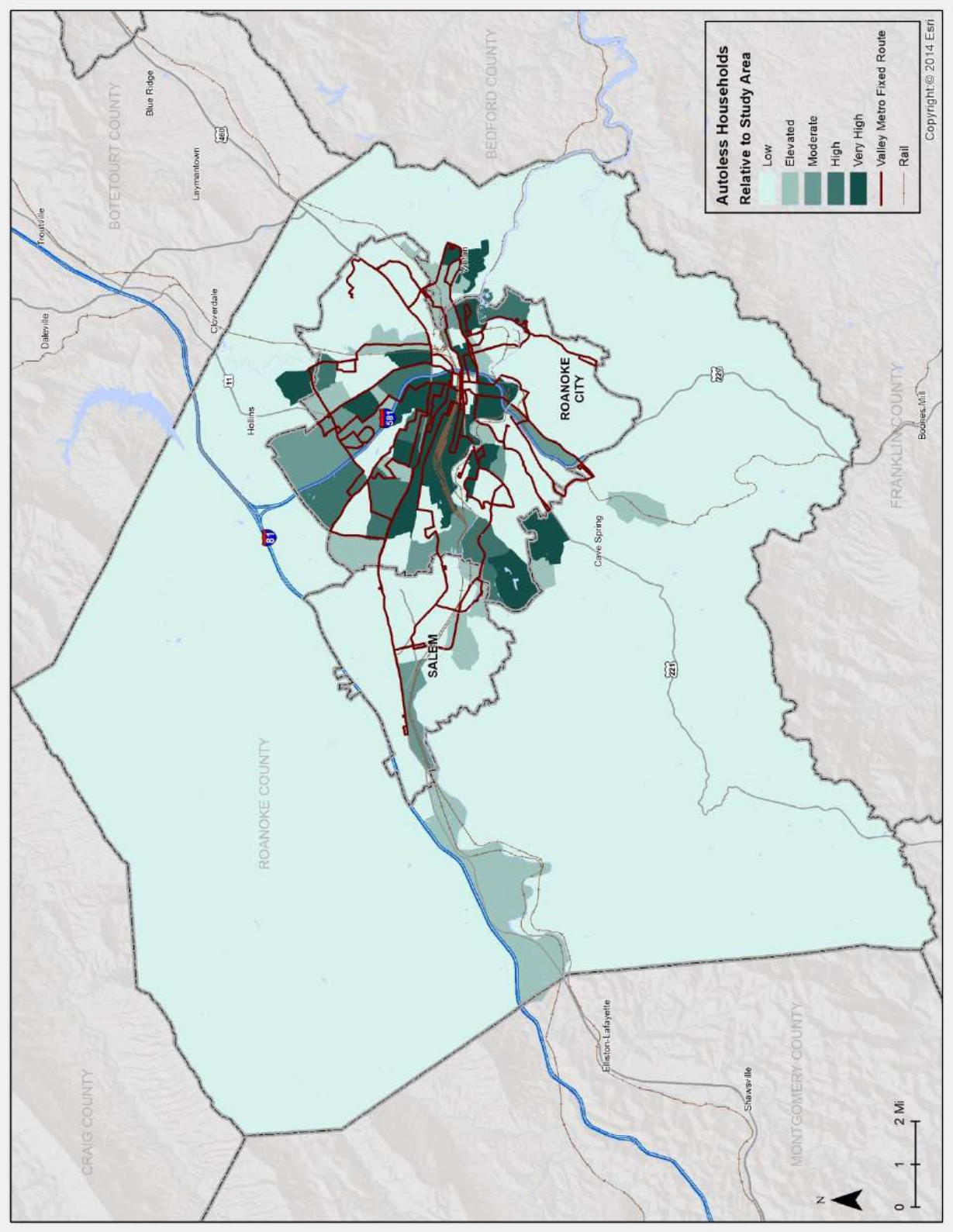
Demographic Factors Influencing Transit Use

Identifying the size and location of segments within the general population that are more likely to use public transportation is important when defining public transportation needs. These demographic factors include access to an automobile, age, disability status and income. The population data for the study area was analyzed at the Census block group level to better understand the extent to which people who may need public transportation are served by the current public transportation network.

Autoless Households

Households without a personal vehicle are more likely to use public transit than households with access to a personal vehicle. Understanding where there are autoless households in the region is important because many land uses in the region are at distances too far for non-motorized travel. As seen in Figure 3-16, there is a cluster of very high concentrations of autoless households west of Interstate 581. There are also very high numbers of autoless households in Cave Spring, and Vinton.

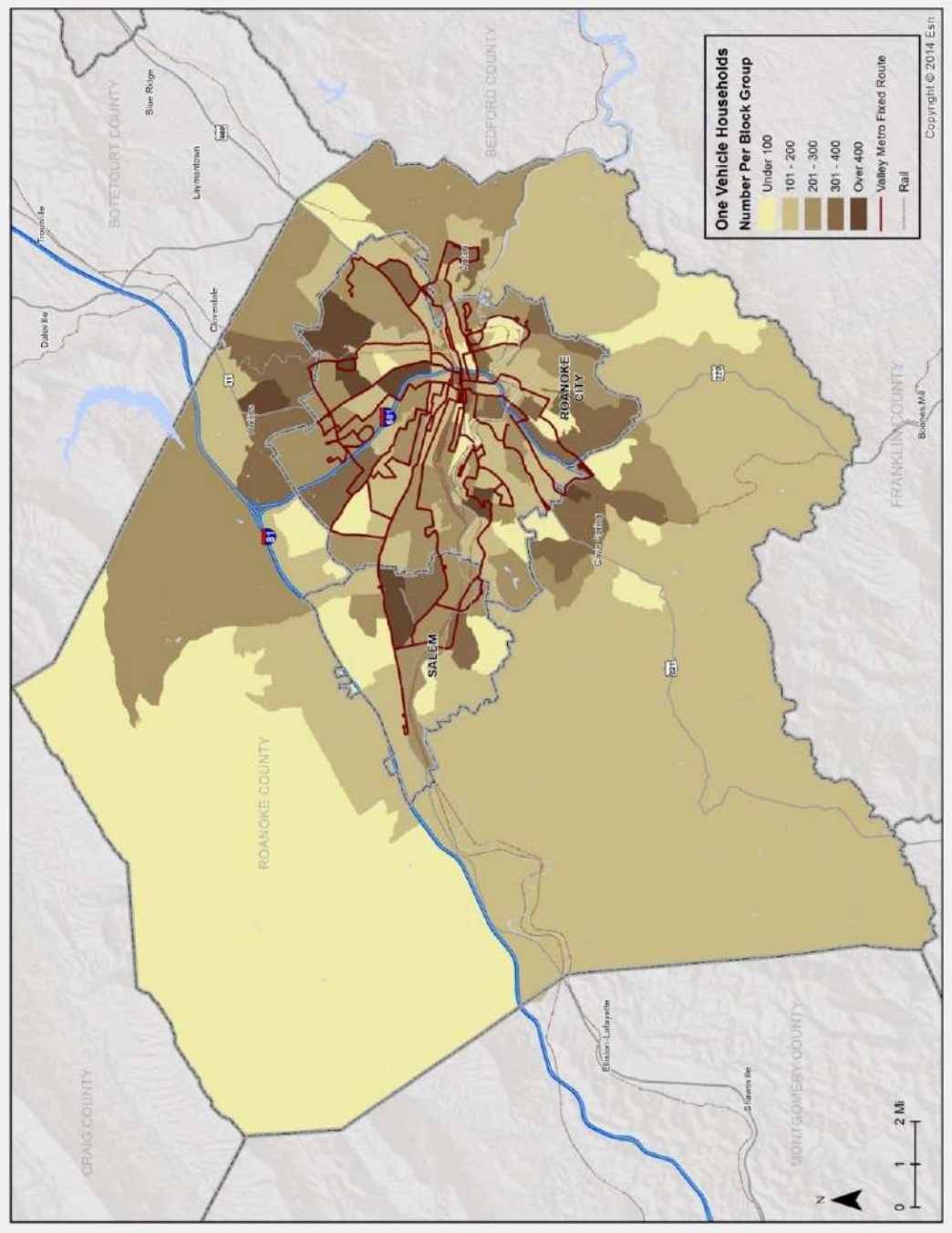
Figure 3-16: Autoless Households by Census Block Group



Auto "Light" Households

Households with two or more occupants with access to only one vehicle may rely more on public transportation due to the limited availability of the vehicle. Figure 3-17, depicts the number of one car households in the study area. It should be noted that Figure 3-17 also includes one person households with one vehicle, which would not be considered "auto-light"

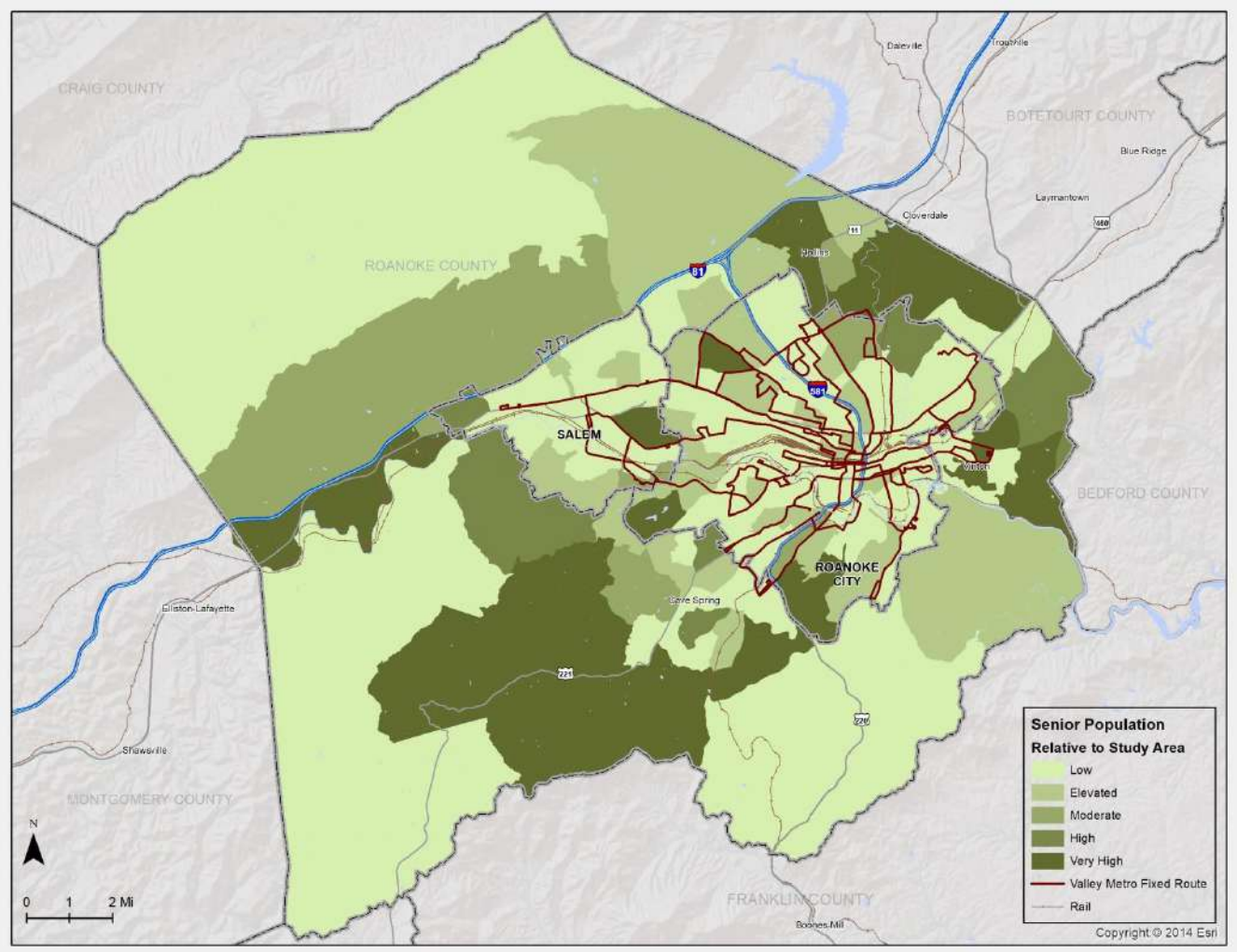
Figure 3-17: Census Block Groups Displayed by Number of One-Car Households



Senior Adult Population

Individuals ages 65 and older may scale back their use of personal vehicles as they age, leading to a greater reliance on public transportation compared to those in other age brackets. Illustrated in Figure 3-18, the areas in Roanoke City with high senior populations are located on the fringes of Roanoke City. Most of the areas of higher concentrations of seniors are in Roanoke County, including localities such as Hollins and Vinton. The City of Salem also has a block group with a high concentration of senior adults.

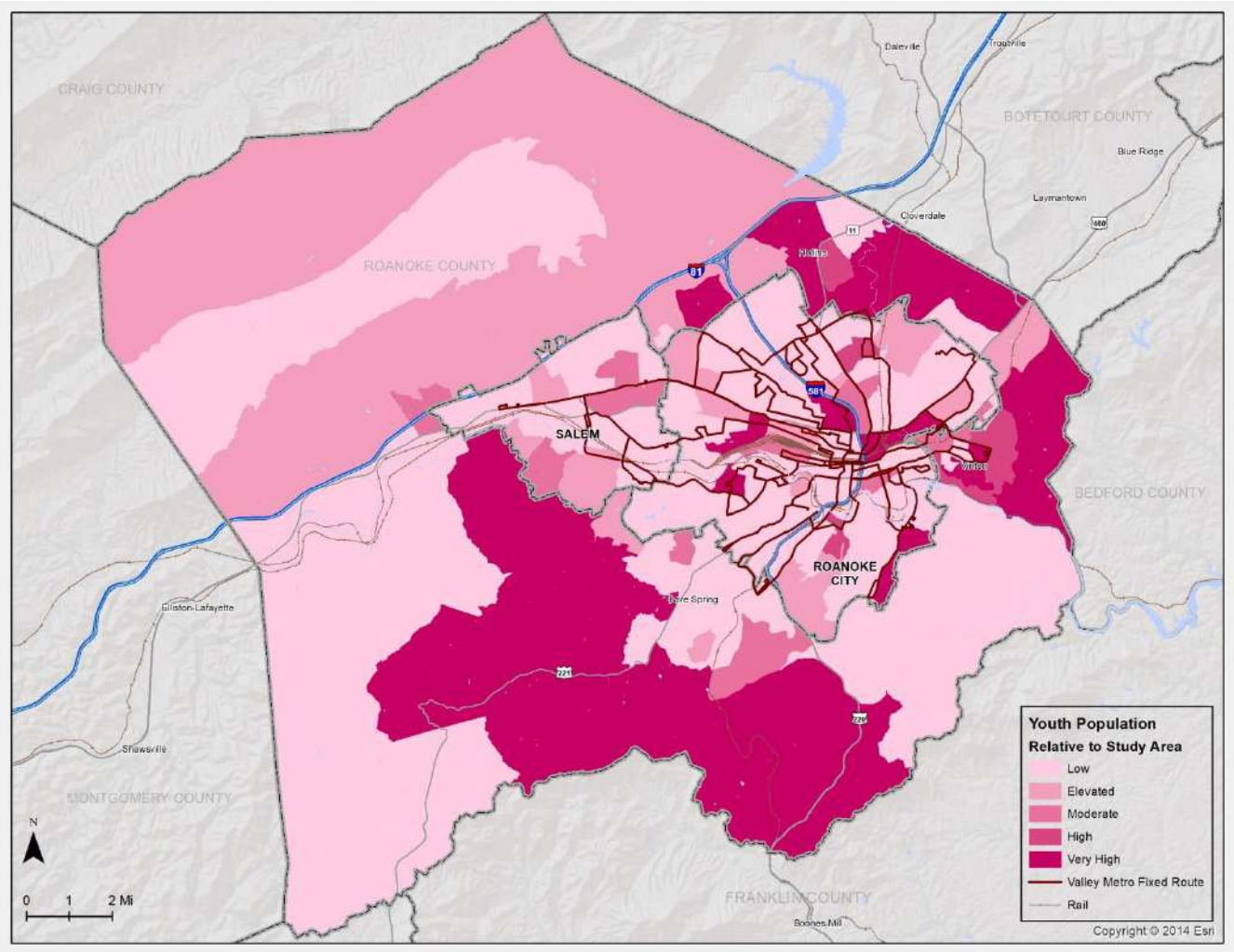
Figure 3-18: Relative Concentration of Senior Adults by Census Block Group



Youth Population

Youths and teenagers, ages 10 to 17, who cannot drive or are just starting to drive but do not have an automobile available also tend to use public transportation. Figure 3-19 illustrates the concentrations of the youth population in the study area. Though there are pockets of high and very high concentrations of youth in Roanoke City, the majority of the high concentration areas are located outside of the city, such as in Roanoke County including Hollins and Vinton. Salem does not have a high or very high concentration of youth.

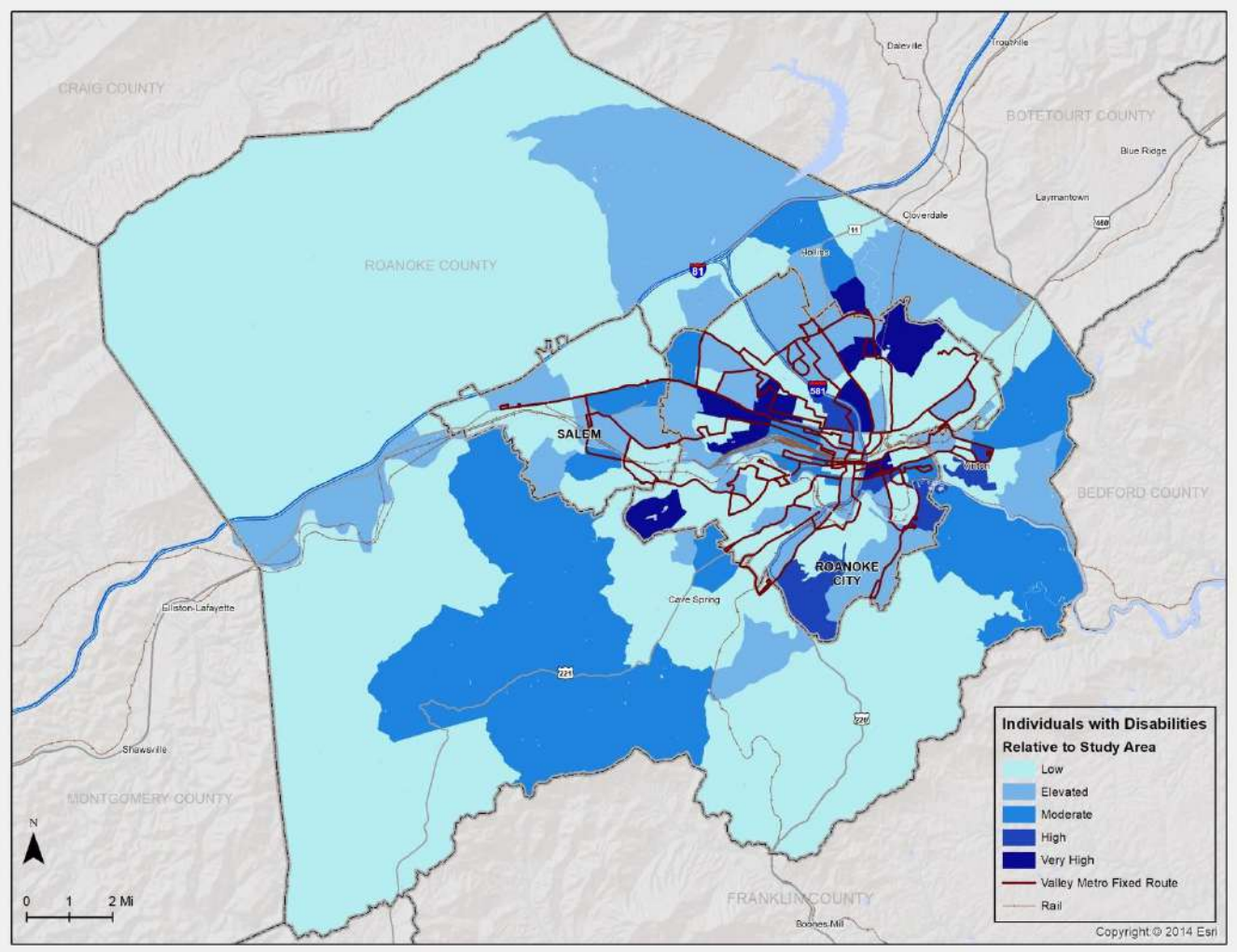
Figure 3-19: Relative Concentration of Youth by Census Block Group



Individuals with Disabilities

Figure 3-20 illustrates the relative concentrations of people with disabilities in the study area. Persons with disabilities often use public transit for many of their trips. Moderate to very high concentrations of people with disabilities are found throughout the Roanoke Valley

Figure 3-20: Individuals with Disabilities by Census Block Group



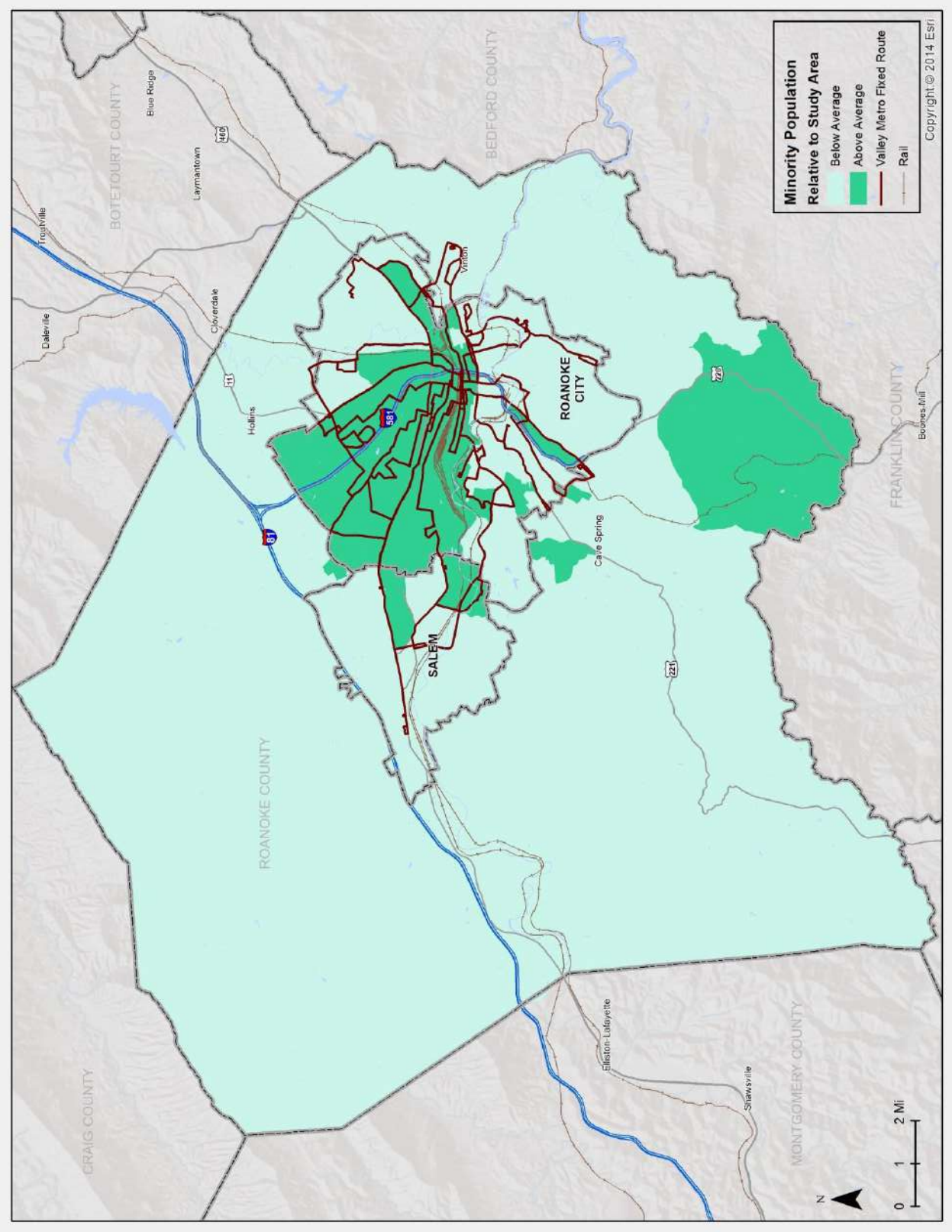
Title VI Analysis

Title VI of The Civil Rights Act of 1964 prohibits discrimination on the basis of race, color or national origin in programs and activities receiving federal subsidies. This includes agencies providing federal funds for public transportation. In accordance with Title VI, the following section examines the minority and below poverty populations in the service area. This section also summarizes the prevalence of residents with Limited-English Proficiency (LEP) in the service area.

Minority Population

In accordance with Title VI of the Civil Rights Act of 1964, it is important to ensure that areas with a higher than average concentration of racial and/or ethnic minorities are not negatively impacted by proposed alterations to existing public transportation services. To determine whether an alteration would have an adverse impact it is necessary to first understand where concentrations of minority individuals reside. Figure 3-21 provides a map of the service area showing the Census block groups shaded according to whether they have minority populations of above or below the service area average (23%). Above average concentrations of minorities reside predominately in northwest Roanoke City and in southern Roanoke County. There are also above average concentrations of minorities in eastern Salem.

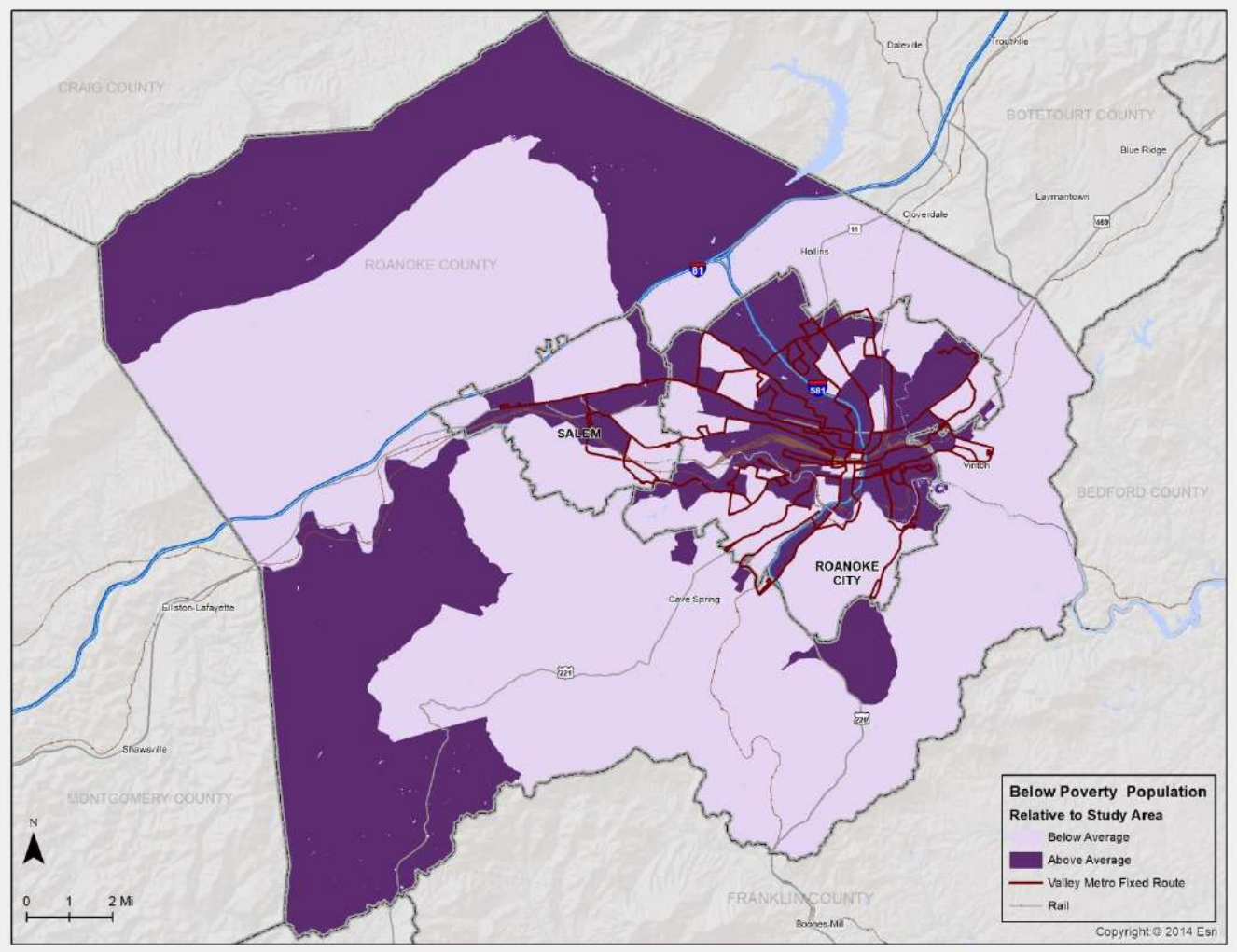
Figure 3-21: Areas Above and Below the Study Area Average for Minority Populations



Low-Income Population

This socioeconomic group represents individuals who earn less than the federal poverty level. These individuals face financial hardships that make owning and providing the necessary maintenance of a personal vehicle difficult. For this segment of the population, public transportation may be the more economical choice. Figure 3-22 provides a map that shows the census block groups according to whether the poverty rate is above or below the study area average of 15.2%. According to the map, above average concentrations of below poverty individuals are located predominately in northeast and southeast Roanoke County, as well as in Roanoke City and Salem.

Figure 3-22: Areas Above and Below the Study Area Average Poverty Level



Limited-English Proficiency (LEP)

In addition to equitably providing public transportation to individuals of diverse socioeconomic backgrounds, it is also important to realize the variety of languages spoken by area residents so that public information can be provided in other languages, if needed. According to the American Community Survey's five-year estimates for 2011-2015, English is the most predominately spoken language of residents. Spanish is the most common language amongst non-English speakers in Roanoke City (4%). Though 3% of Roanoke County's population age five and older speak Spanish, in Vinton, 3% speak Spanish. In Salem, Spanish (2%) and Indo-European languages (2%) are the most common spoken languages amongst non-English speakers. As seen in Table 3-18, in the study area, themajority of non-English speakers have the ability to speak English "Very Well" or "Well"

Table 3-18: Limited-English Proficiency

Place	Roanoke City		Roanoke County		Salem		*Vinton	
5 years and up	91,650		89,106		23,866		7,779	
Language Spoken	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
English	83,161	91%	83,458	94%	22,579	95%	7,263	93%
Non-English	8,489	9%	5,648	6%	1,287	5%	516	7%
Spanish	3,853	4%	1,802	2%	565	2%	233	3%
Indo-European	2,204	2%	2,066	2%	512	2%	118	2%
Asian/Pacific Island	1,233	1%	1,269	1%	154	1%	61	1%
Other	1,199	1%	511	1%	56	0%	104	1%
Ability to Speak English:	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
"Very Well: or "Well"	6,445	76%	4,932	87%	1,122	87%	457	89%
"Not Well" or "Not at All"	2,044	24%	716	13%	165	13%	59	11%

Source: American Community Survey, Five-Year Estimates (2011-2015), Table B16004.
*Included in Roanoke County's Population

Land Use Profile

Major Trip Generators

Identifying land uses and major trip generators in the study area complemented the above demographic analysis by indicating where transit services may be most needed. Trip generators attract transit demand and include common origins and destinations, like dense residential areas, major employers, medical facilities, educational facilities, non-profit and government agencies, and shopping centers. These locations are mapped in Figure 3-23.

Educational Facilities

Many individuals that comprise the school age population are unable to afford or operate their own personal vehicle; therefore, it may be assumed that this segment of the population is one that is reliant upon public transportation. Additionally, many faculty and staff members are associated with these institutions as a place of employment. Educational facilities that are located in the study area are American National University, Hollins University, Jefferson College of Health Services, Roanoke College, Roanoke Higher Education Center, Virginia Tech-Carilion Research Institute and School of Medicine, and Virginia Western Community College. All of these educational institutions are accessible via Valley Metro services with the exception of Hollins University.

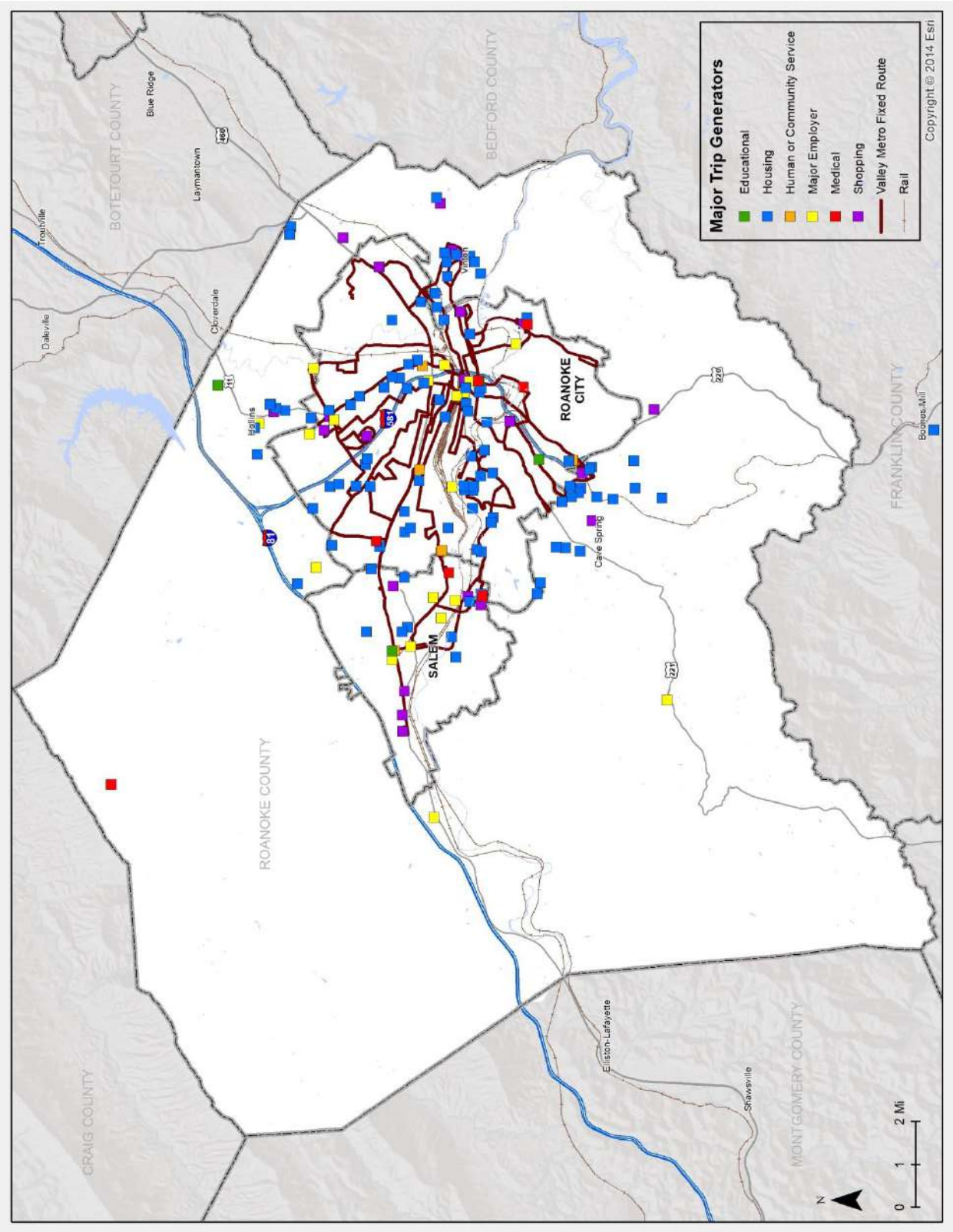
Major Employers

Public transportation is vital for the region's economy because it provides an option for people to reach employment destinations. This is especially true for individuals without a personal vehicle or other transportation options. Transit plays a large role in providing access to jobs, as well as providing employer's access to employees. The major employers defined as those that have at least 250 employees are displayed in Figure 3-23.

Medical Facilities

Medical facilities, classified as general hospitals and their immediate network of outpatient services, represent significant destinations for people. Older adults and persons with disabilities often rely more heavily upon the services offered by medical facilities than other population segments. Since older adults and persons with disabilities represent a large faction of transit users, it is imperative that these facilities are made accessible through public transit services. Medical facilities in the study area are the VA Medical Center, Lewis-Gale Medical Center, Carilion Roanoke Community Hospital, and Carilion Roanoke Memorial Hospital - Carilion Clinic.

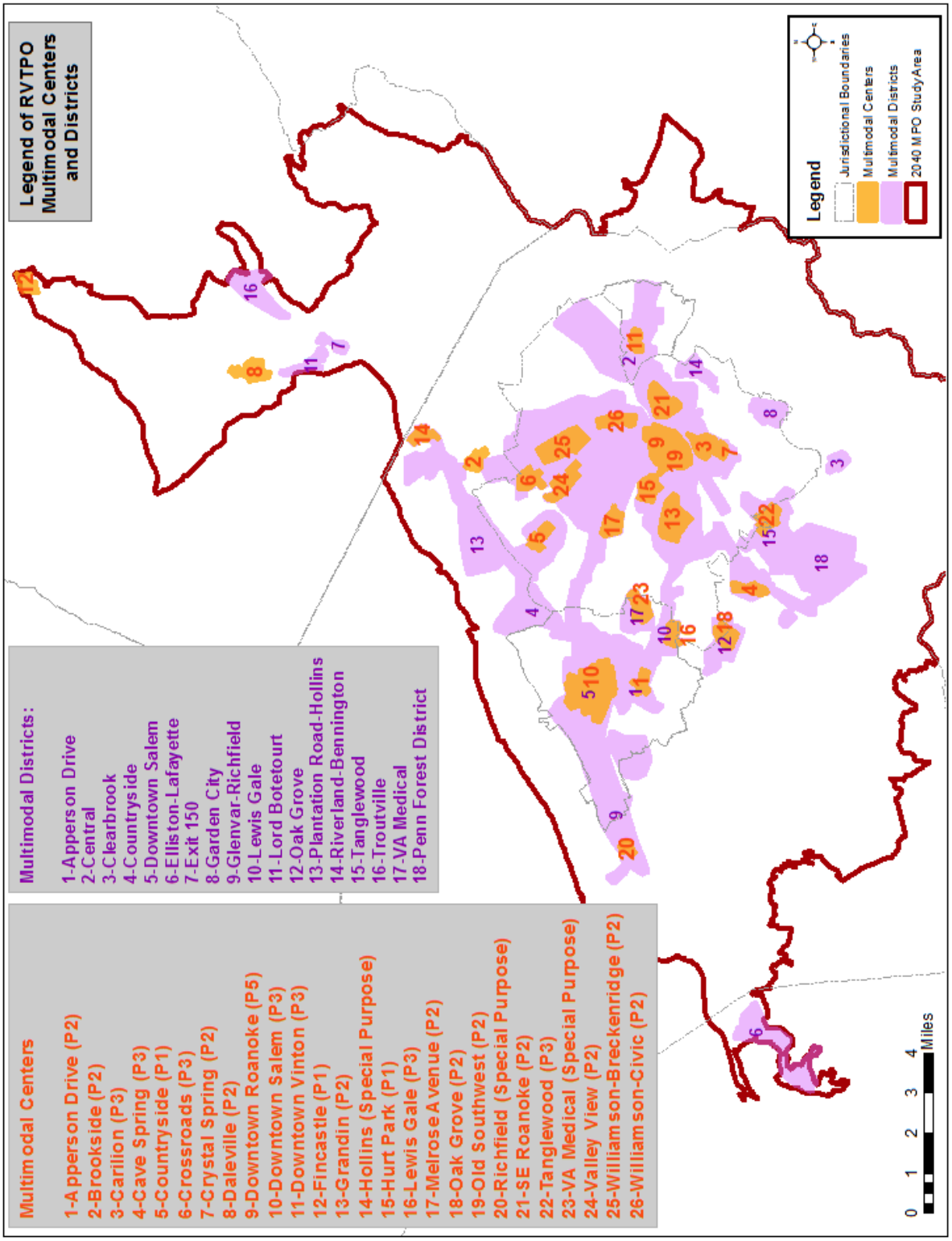
Figure 3-23: Major Trip Generators in the Roanoke Valley



High-Density Residential

Residents who live in areas with high density housing tend to drive fewer miles and use public transportation more frequently than residents of lower density housing. There are many pockets of dense housing located within the study area, particularly in the areas identified as multi-modal centers of districts in Figure 3-24, as identified in the TVP.

Figure 3-24: Multimodal Centers and Districts



Source: Roanoke Valley Transit Vision Plan, September 22, 2016, Part 2 Background and Existing Conditions, Pg. 57.

Employment Travel Patterns

In addition to considering the locations of the major employers, it is also important to account for the commuting patterns of residents working inside and outside of the service area. According to ACS five-year estimates, a majority of residents in Roanoke City tend to work in Roanoke City unlike those of Salem and Vinton. In Salem and Vinton the majority of residents work outside their respective place of residence. In Salem, 50% of the workforce travels outside of Salem, and in Vinton 64% of the workers travel outside of Vinton. In terms of the means residents use to go to work, the majority of residents in the study area drive alone to work. Table 3-19 illustrates commuting patterns of residents in the service area.

Table 3-19: Journey to Work Patterns for Study Area

Place of Residence	Roanoke City		Roanoke County		Salem		*Vinton	
Workers (Ages 16 +)	45,584		44,580		12,362		3,909	
Employment Location	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
In State of Residence	45,227	99%	44,076	99%	12,287	99%	3,880	99%
In County	28,280	62%	15,096	34%	6,085	49%	1,375	35%
Outside of County	16,947	37%	28,980	65%	6,202	50%	2,505	64%
Outside State of Residence	357	1%	504	1%	75	1%	29	1%
Means of Transportation to Work	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Car, Truck, or Van - drove alone	36,466	80%	39,142	88%	9,990	81%	3,409	87%
Car, Truck, or Van - carpooled	4,578	10%	2,977	7%	1,208	10%	383	10%
Public Transportation	1,385	3%	176	0%	133	1%	28	1%
Walked	1,137	2%	297	1%	517	4%	30	1%
Taxicab, motorcycle, bicycle, other	911	2%	336	1%	115	1%	21	1%
Worked at Home	1,107	2%	1,652	4%	399	3%	38	1%

Source: ACS, Five-Year Estimates (2011-2015), Table B08130
* Included in Roanoke County's Population

Another source of data that provides an understanding of employee travel patterns is the Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) dataset. Table 3-20 provides the results of this analysis. According to LEHD data, Roanoke City, Salem, and Cave Spring are the top employment destinations for area residents.

Table 3-20: Major Work Destinations Outside of Home Jurisdiction

Roanoke City	Salem
Place	**Place**
Salem city, VA	Roanoke city, VA
Cave Spring CDP, VA	Cave Spring CDP, VA
Hollins CDP, VA	Hollins CDP, VA
Lynchburg city, VA	Glenvar CDP, VA
Vinton town, VA	Blacksburg town, VA
Blacksburg town, VA	Lynchburg city, VA
Glenvar CDP, VA	Christiansburg town, VA
Christiansburg town, VA	Richmond city, VA
Richmond city, VA	Daleville CDP, VA
Roanoke County	**Vinton**
Place	**Place**
Roanoke city, VA	Roanoke city, VA
Salem city, VA	Salem city, VA
Cave Spring CDP, VA	Cave Spring CDP, VA
Hollins CDP, VA	Hollins CDP, VA
Vinton town, VA	Lynchburg city, VA
Lynchburg city, VA	Daleville CDP, VA
Blacksburg town, VA	Christiansburg town, VA
Christiansburg town, VA	Bedford town, VA
Glenvar CDP, VA	Richmond city, VA
Rocky Mount town, VA	

Source: Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics, 2014.

CHAPTER CONCLUSIONS AND FOCUS FOR TDP INITIATIVES

Chapter Conclusions

The data collected and analyzed for Chapter 3 provides a system-wide analysis of the current performance of the transit system, and documents the key findings from the Roanoke Valley Transit Vision Plan with regard to transit needs. A demographic review is also provided.

From these analyses, the following conclusions are offered:

- The highest performing routes are primarily those that serve the Valley View Mall area.

- There are some routes within the network that perform significantly below the system average. These routes should be evaluated for adjustments and include the entire 80 series (81, 82, 85, and 86), as well as the new 31x and the Star Line Trolley.

- The demographic and land use analysis indicates that Valley Metro provides fixed route transit service coverage for the areas with the highest population densities.

- Valley Metro provides a relatively high level of transit service as compared to peer systems, providing over 145,000 revenue hours of service annually. The cost per revenue hour is lower than the peer systems, while the productivity is also a bit lower than the peer systems.

- Valley Metro provides relatively comprehensive geographic coverage along major corridors within the City of Roanoke, oriented to traveling to and from the downtown Roanoke Campbell Court Hub.

- Areas of unmet transit need are primarily in newer growth areas, located outside of the City of Roanoke. Specific areas of unmet transit need documented by multiple sources in the Vision Plan note the following areas:

    - 220 to Clearbrook Walmart
    - 419 Corridor from Franklin Road/Tanglewood to Lewis Gale to Salem (Lakeside Plaza)
    - 460 – Blue Hills Drive Industrial Park
    - 460 – Bonsack – Kroger area and Walmart area
    - Brambleton south of Red Rock to medical offices
    - Brambleton at 419, Cave Spring Corners
    - Cave Spring area
    - DMV
    - Ferrum College
    - Franklin County
    - Peters Creek corridor to include DMV/Williamson Road to Hollins corridor
    - Route 11 needs a stop at Cove and Sherman
    - Roanoke County
    - Rocky Mount
    - Main Street in Salem – all stops should have a paired stop across the street, especially Goodwin Avenue and Kroger Spartan Square
    - More of Salem
    - Salem Turnpike from Westwood Boulevard to Peters Creek Road
    - West Main Street from Turner Road to Garman Road (Atlas Logistics/Kroger Warehouse)
    - West 4th from Main Street to Colorado Street

  - Williamson Road to Peters Creek Road
  - Williamson Road from Hershberger Road to Peter's Creek Road

- Given that many of the unmet need areas are located outside of the City of Roanoke, coupled with the recommendations contained within the Vision Plan, there is a need to re-evaluate the governing structure in the short-term to ensure that financial and political support is available to implement needed system improvements.

- The needs information collected for the Vision Plan also indicated a need for Sunday service, later evening service, and earlier morning service.

- The Vision Plan also documented a need to re-locate or renovate the major transfer hub.

Focus for TDP

The focus for the TDP initiatives is to use the COA recommendations, as well as some of the short-term recommendations from the Vision Plan and turn them into specific projects. The following short-term recommendations are included in the TDP and the Vision Plan:

- Expand of service to the following areas:
  - Hollins area
  - Electric Road Corridor
  - Glenvar
  - The Roanoke Center for Industry and Technology (this is already served via the 31X)

- Extend service to later in the evenings, adding Sunday service, and adding additional routes within the existing service area.

- Coordinate Smart Way and Amtrak schedules to increase regional connectivity and the convenience of longer trips.

- Update route and schedule publications and provide real-time passenger information.

- Pursue partnerships among local governments for public bus service to increase and improve transit service and funding.

The following short-term Vision Plan recommendations were not included in the TDP:

- Service to Exit 140
- Service to Bonsack
- All-day 30-minute service (though this is included for Melrose Avenue)
- Further study of additional commuter service

Medium-term recommendations from the Vision Plan include the following:

- Increase frequencies between key activity centers and make new connections within the existing and short-term service area.
- Implement new connections to areas in Daleville, Clearbrook, Vinton, and South and East Roanoke County.
- Create new crosstown connections
- Create new cross-regional express services
- Extend the Star Line Trolley
- Improve convenience and access to medical services.

Chapter 4
Service and Capital Improvement Plan

INTRODUCTION

This fourth chapter prepared for the Valley Metro TDP provides a service and capital plan for the ten- year TDP horizon. The focus of the TDP projects is to implement the recommendations contained within the Comprehensive Operational Analysis, which align fairly closely with the short-term recommendations included in the Roanoke Valley Transit Vision Plan (TVP).

Once adopted, this plan will feed into the Roanoke Valley Area Transportation Planning Organization's (RVTPO) Long Range Transportation Plan and Transportation Improvement Program (TIP), as well as the Virginia Department of Rail and Public Transportation's (DRPT) Six Year Improvement Program (SYIP) and Statewide Transportation Improvement Program (STIP).

In addition to the service and capital plan sections, which are prescribed sections from the DRPT TDP Scope of Work, we have included a section to address organizational projects that do not fit neatly into either the service or capital category.

SERVICE PLAN

The service plan was developed by reviewing the data collected and analyzed for the first three chapters of the TDP, as well as reviewing the recommendations outlined in the TVP and the Valley Metro Comprehensive Operational Analysis (COA).

Each service improvement project is detailed in this section, including:

- A summary of the service improvement
- An estimate of operating and capital costs
- Ridership estimates (if applicable)
- Implementation schedule

The cost information for these improvements is expressed as the fully allocated costs, which means all of the program's costs on a per unit basis were considered when contemplating expansions. This overstates the incremental cost of minor service expansion, as there are likely to be some administrative expenses that would not be increased with the addition of a few service hours. These cost estimates are based on Valley Metro's estimated FY2019 cost per

hour of $76.00 per revenue hour and are revised to reflect inflation in Chapter 6 – Financial Plan, based upon the planned implementation year.
A major feature of the plan is an initiative to reduce the number of routes that offer 30-minute service (based on service productivity), and shift these resources to implementing other service improvements and hiring a service planner to help Valley Metro implement the COA and the TVP.

Service Improvement #1 – Implement the Minor Route Adjustments Outlined within the COA

A major task within the recent COA was to examine each route to analyze the following options:

- Are there segments of the route that could be eliminated to provide a more direct route and improve travel time?
- Are any changes to the path of travel needed to accommodate the new wider transit vehicles?
- Are there opportunities to serve additional destinations using the existing transit network?

The full analysis for these route changes can be found in the COA report. The following recommendations resulted from this major task area of the COA:

Routes 11/12

- Minor change to reduce the risk of the vehicle bottoming out – after serving the Burrell Center, turn right onto Seventh Street and left onto McDowell Street to continue to Tenth Street. This minor change eliminates the dip in the road that is located on Madison as it crosses Eighth Street. This path of travel will then be reversed for the inbound Route 12.
- Valley Mall Circulation (Route 11)
    - Delete the left turn into the Belk/Sears Lot.
    - Bus to remain on the Ring Road. Investigate potential for transfer location at the pull-off located along Ring Road. This option is discussed within the passenger facility section of the COA.
    - Reduces opportunities for parking lot conflicts and improves travel time through the mall area.

- This proposed change does increase the walk distance to the stop from the shopping mall, but is not significantly different than the walk a patron would experience if they arrived via private auto.
- There are safety concerns about having riders cross Ring Road, but these could potentially be ameliorated with pedestrian crossing improvements.

- These changes are ridership and cost neutral.

- These changes are shown in Figures 4-1 and 4-2.

Figure 4-1: Valley Metro Route 11 and Proposed Changes

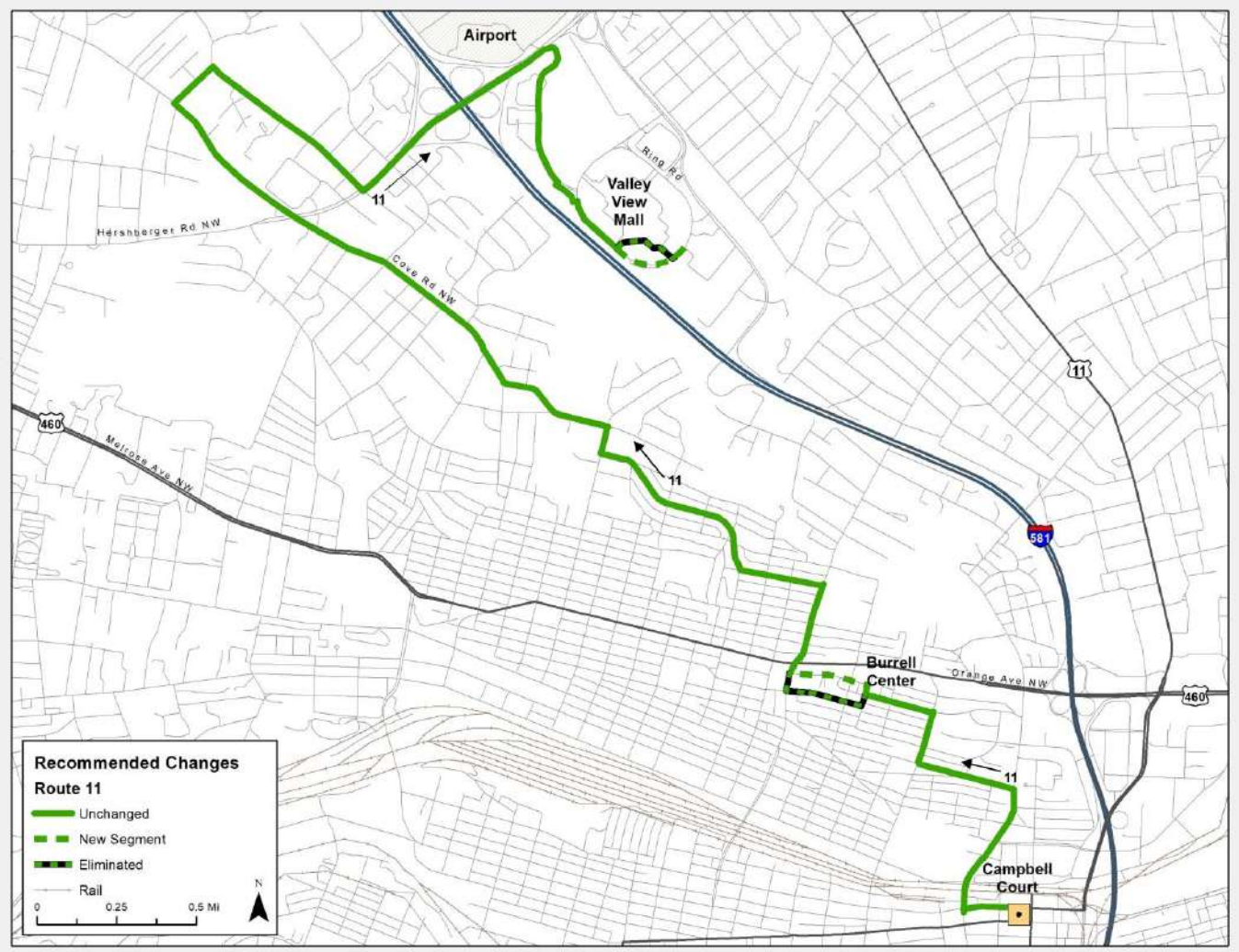
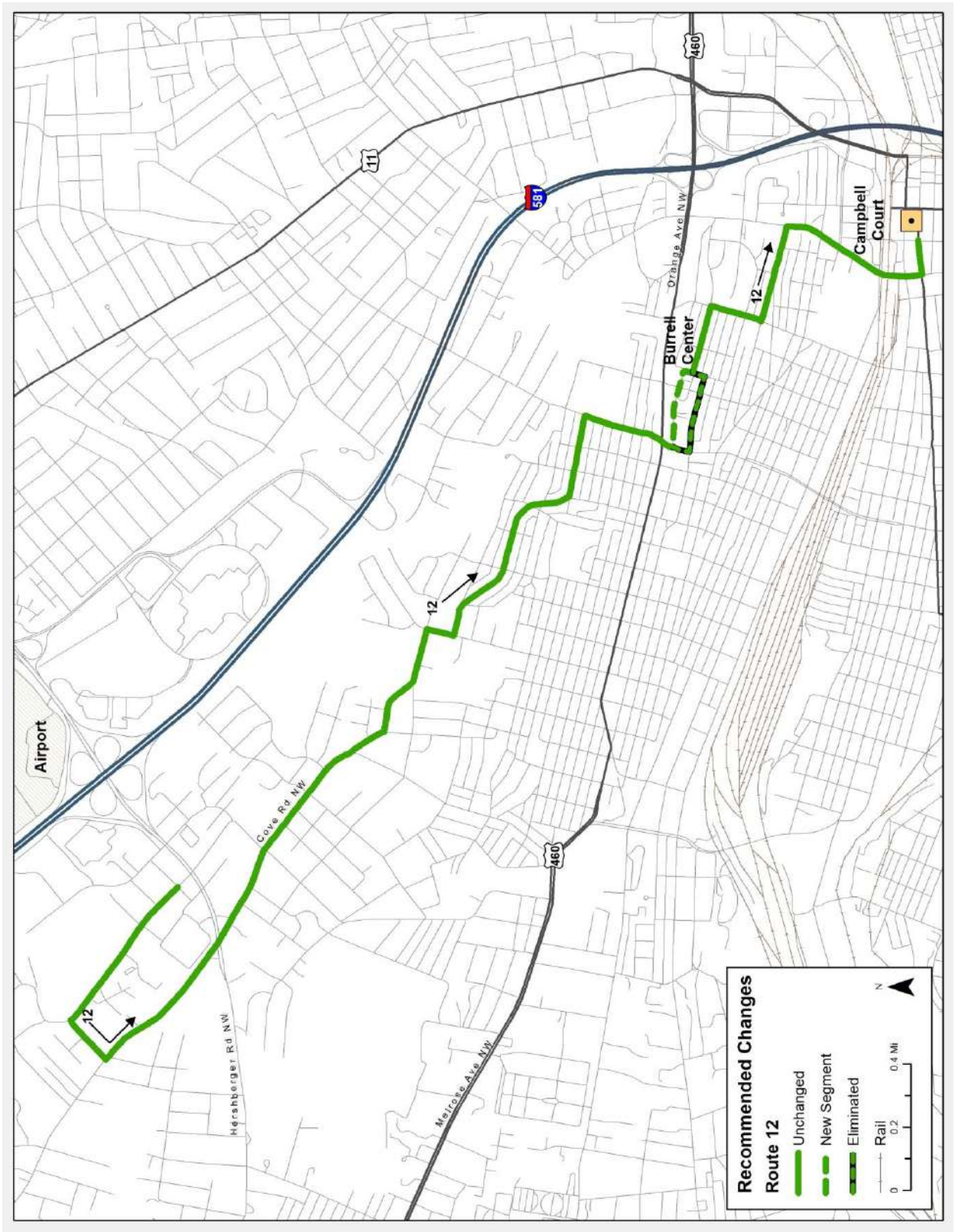


Figure 4-2: Valley Metro Route 12 and Proposed Changes



Route 15

The current path of travel for Route 15 travels west from the mall area to the end of the line on Hoback Drive. Given this direction of travel, this route was chosen for modification to accommodate the additional development in the mall area. The proposed change to the path of travel is highlighted below.

- From the Valley View Stop on Ring Road – Exit Ring Road onto Valley View Boulevard at Chick-Fil-A. Right onto Valley View Boulevard to serve the additional shopping areas of Valley View Boulevard (Cinemas, Target), and the Lick Run Greenway trail head.

- Right onto 581 north – stay in right protected lane.

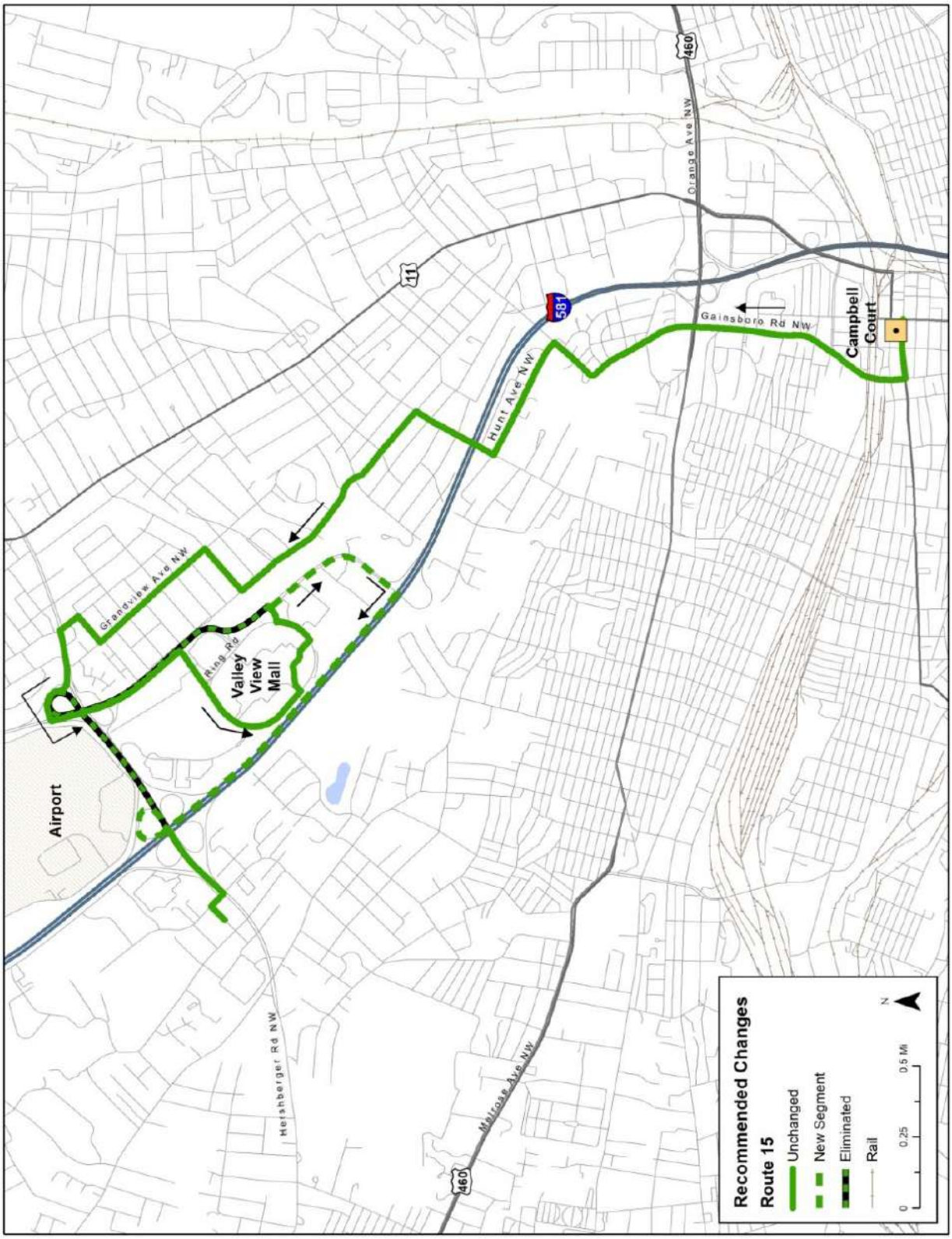
- Exit onto Hershberger Road to resume current routing.

- This change will extend the route length by about 0.41 miles, but the extension will be at a higher travel speed than is currently experienced back through the mall area traffic. The new route length is 8.42 miles, up from 8.01 miles currently.

- This change will result in a minor incremental cost increase associated with the additional 0.41 miles and will likely result in some additional riders traveling to and from the extension along Valley View Boulevard.

- This proposed change is shown in Figure 4-3.

Figure 4-3: Valley Metro Route 15 and Proposed Changes



Routes 21/22

- Change the end of the line from the Kroger to the Virginia Career Works Center and the Virginia Employment Commission, co-located at 3601 Thirlane Road. This will eliminate the parking lot conflicts and add an important transit destination that has been requested. The proposed routing will also provide a stop for the Roanoke-Blacksburg Airport at the edge of the airport property. Kroger will still have transit service, but the stop will be on the street.

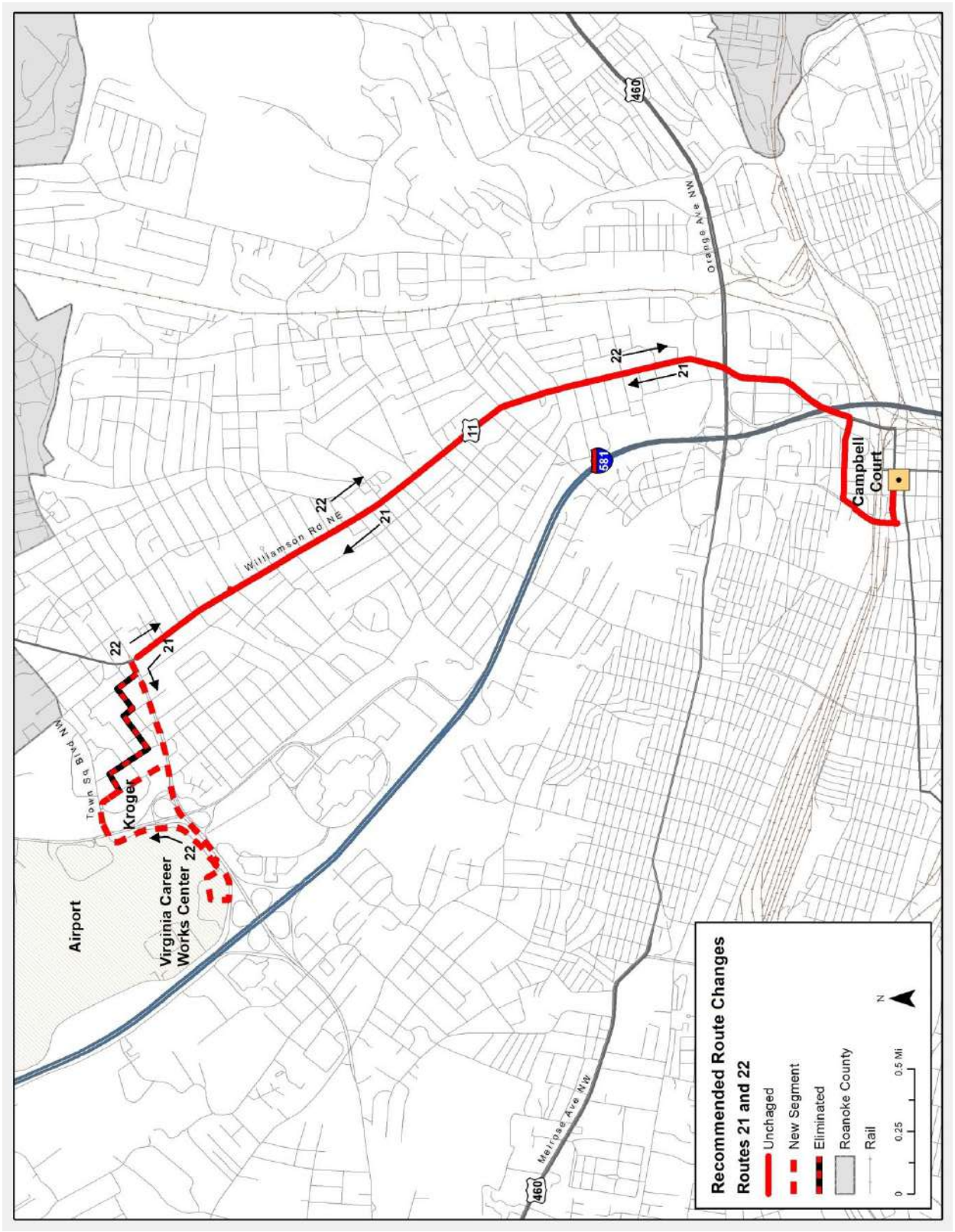
- The routing for this change is:

    - From Hershberger, continue on Hershberger to a right on Thirlane Road and a right into the Virginia Career Works Center.
    - From the Virginia Career Works Center – Left onto Thirlane and a right onto Towne Square Boulevard. A bus stop can also be added at Thirlane and Aviation to serve the Roanoke-Blacksburg Regional Airport.
    - Resume the current routing along Hershberger without entering the Kroger lot.

- This change will result in a minor incremental cost increase due to the additional mileage and will likely result in additional ridership as a result of the two additional major destinations.

- This change is shown in Figure 4-4.

Figure 4-4: Valley Metro Routes 21/22 and Proposed Changes



Routes 25/26

- Change the end of the line (EOL) from Kroger to the airport. This will eliminate parking lot conflicts and add a major destination where service has been requested. The Kroger will still have transit service, but the stop will be on the street.

- Adds 0.80 miles, but removes the route from the Towne Square Kroger parking lot. The new route length is 7.5 miles.

- From Towne Square Boulevard, do not turn into the Kroger parking lot.

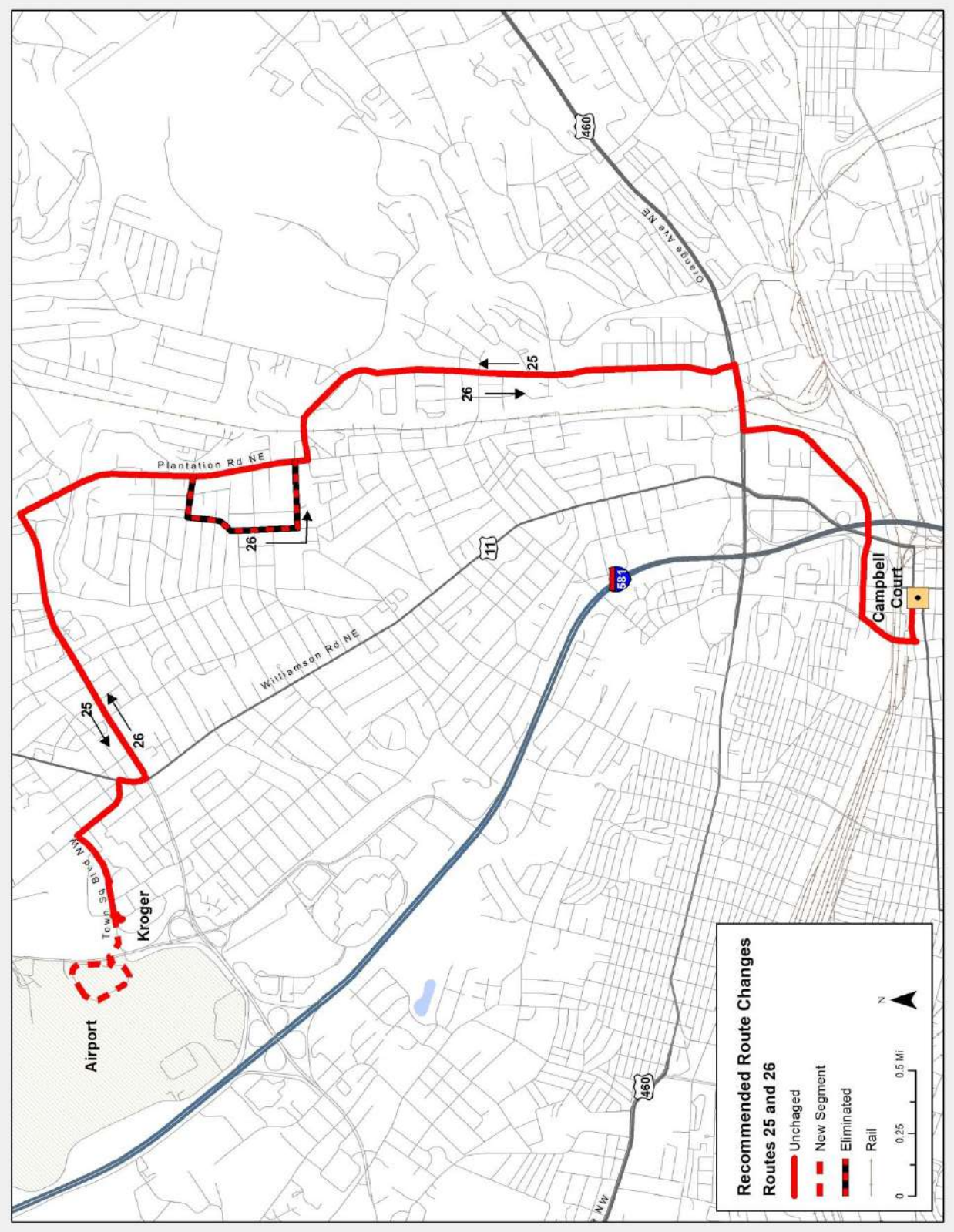
- Continue to Airport Loop to EOL at Roanoke- Blacksburg Airport.

- Eliminate the Oliver loop from all trips on Route 26. This will eliminate 0.90 miles for each trip where the Oliver loop had been served before.

- This change will result in a very minor increase in total miles and the associated fuel. With the addition of the airport, the route should attract additional riders.

- The changes are shown in Figure 4-5.

Figure 4-5: Valley Metro Routes 25/26 and Proposed Changes



Routes 31/32

- Eliminate King Street and E. Washington Street from Route 31. This change will reduce the travel time and allow the route to operate on time.

- Change the interline pattern to combine the 31 and 32, rather than the current pattern that also includes the 35/36.

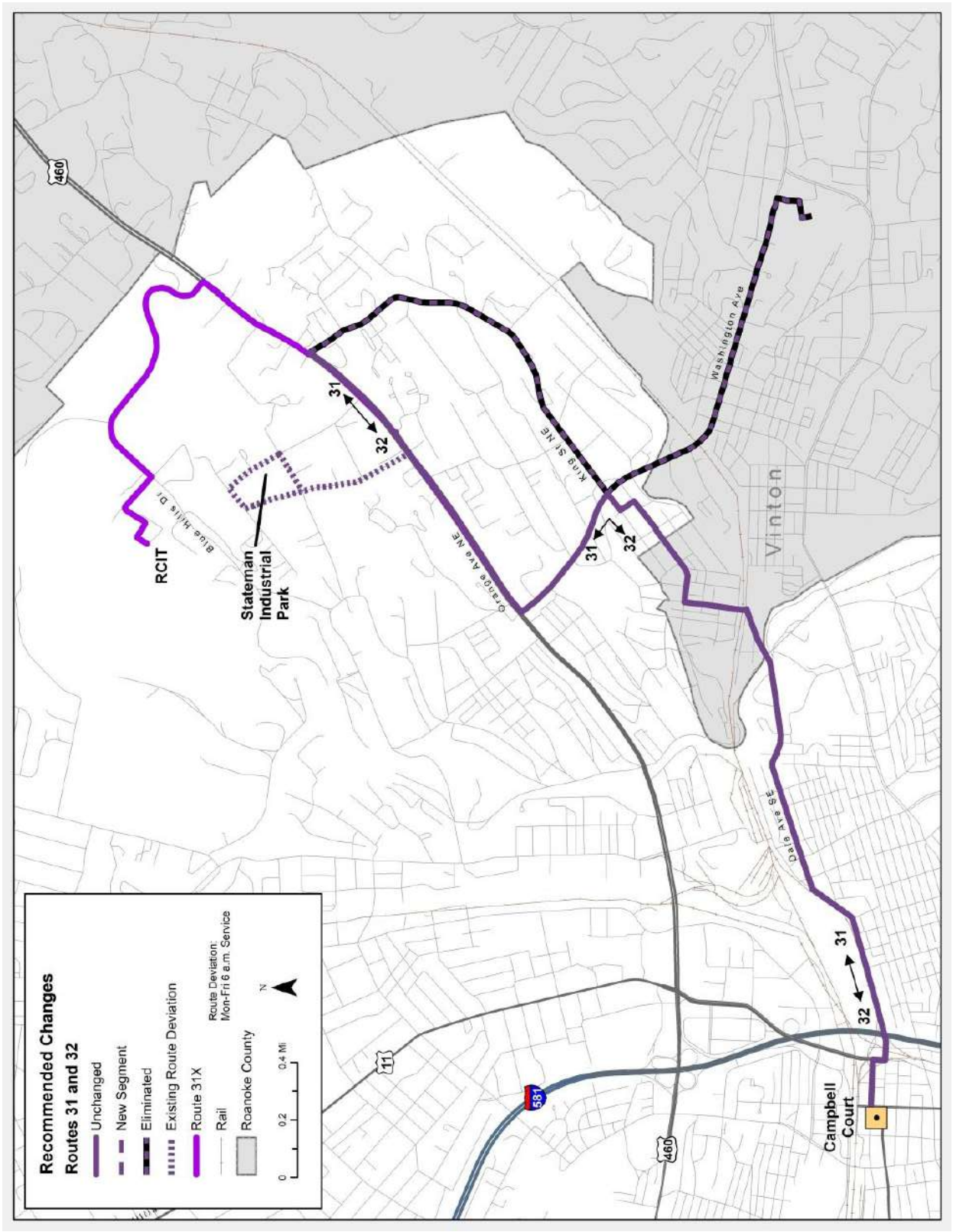
- Combine Route 31/32 with the 31x so that the EOL is the Blue Hills Industrial Park. This will save the operating expenses associated with the 31X.

- The route would then come back as Route 32, following the same path of travel in reverse.

- This change will save approximately $116,000 annually. Ridership will likely remain similar, with a loss of a few trips from the eliminated segments, but additional riders will likely be taking advantage of more daily trips to the Blue Hills Industrial Park and the added segment of Orange Avenue.

- Figure 4-6 shows these proposed changes.

Figure 4-6: Valley Metro Routes 31/32 and Proposed Changes



Routes 35/36

- Change the interline pattern so that Route 35 comes back as Route 36. This change will reduce travel time and improve on-time performance.

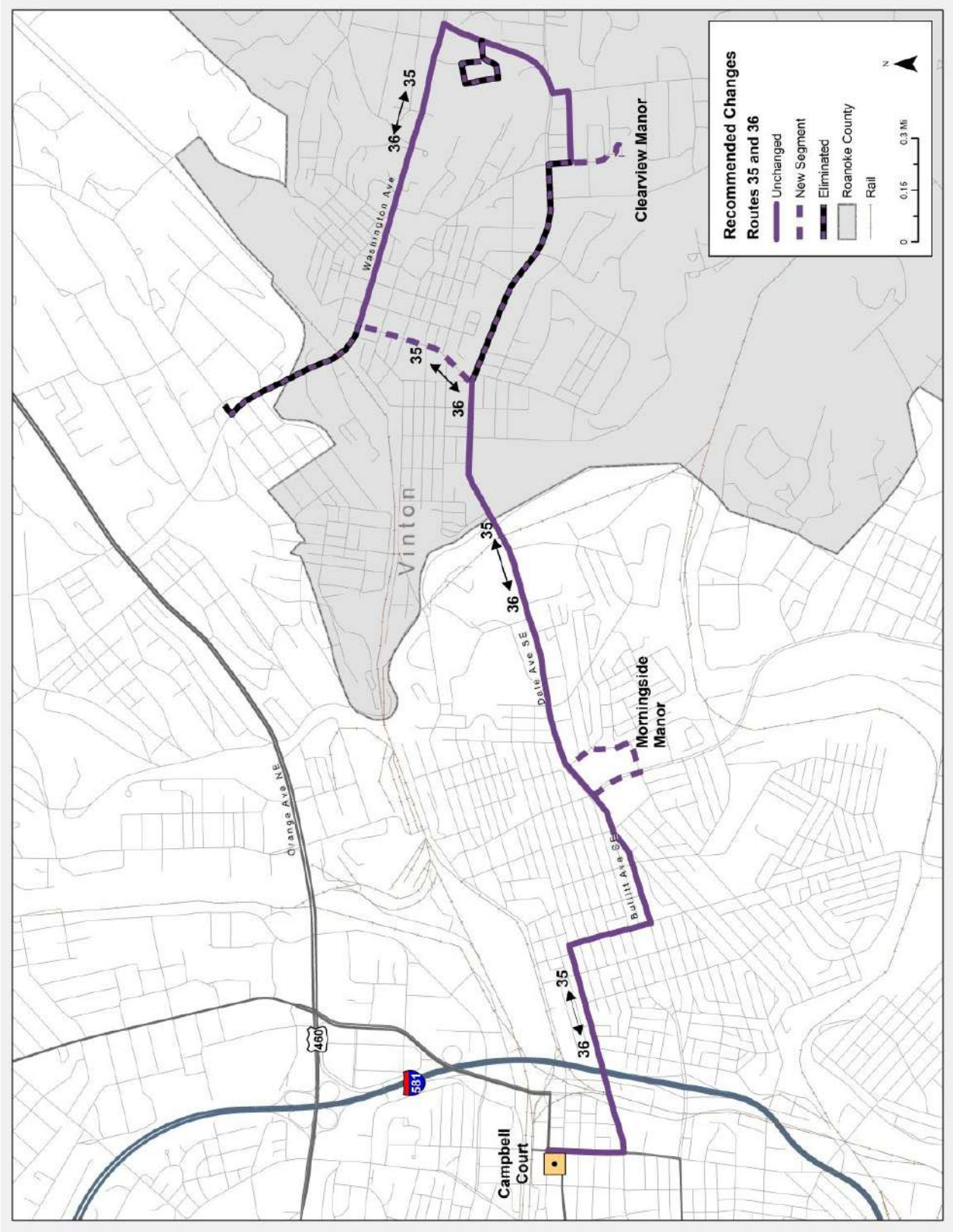
- Add Morningside Manor to the route. This will allow this destination to be eliminated from Route 41/42 and will provide direct service for Morningside Manor to and from both Roanoke and Vinton.

- The Town of Vinton has proposed a new path of travel for Route 35/36, which will provide bi-directional travel along Washington Avenue. There is some concern about the suggested new alignment, as it will eliminate Virginia Avenue, which has relatively strong ridership. The town's preferred alignment is shown in Figure 4-7.

- Given the loss of the Virginia Avenue segment, this route may see lower ridership. It will be interesting to see if ridership on the Washington Avenue segment improves with bi-directional service.

- This change is cost neutral.

Figure 4-7: Valley Metro Routes 35/36 and Proposed Changes



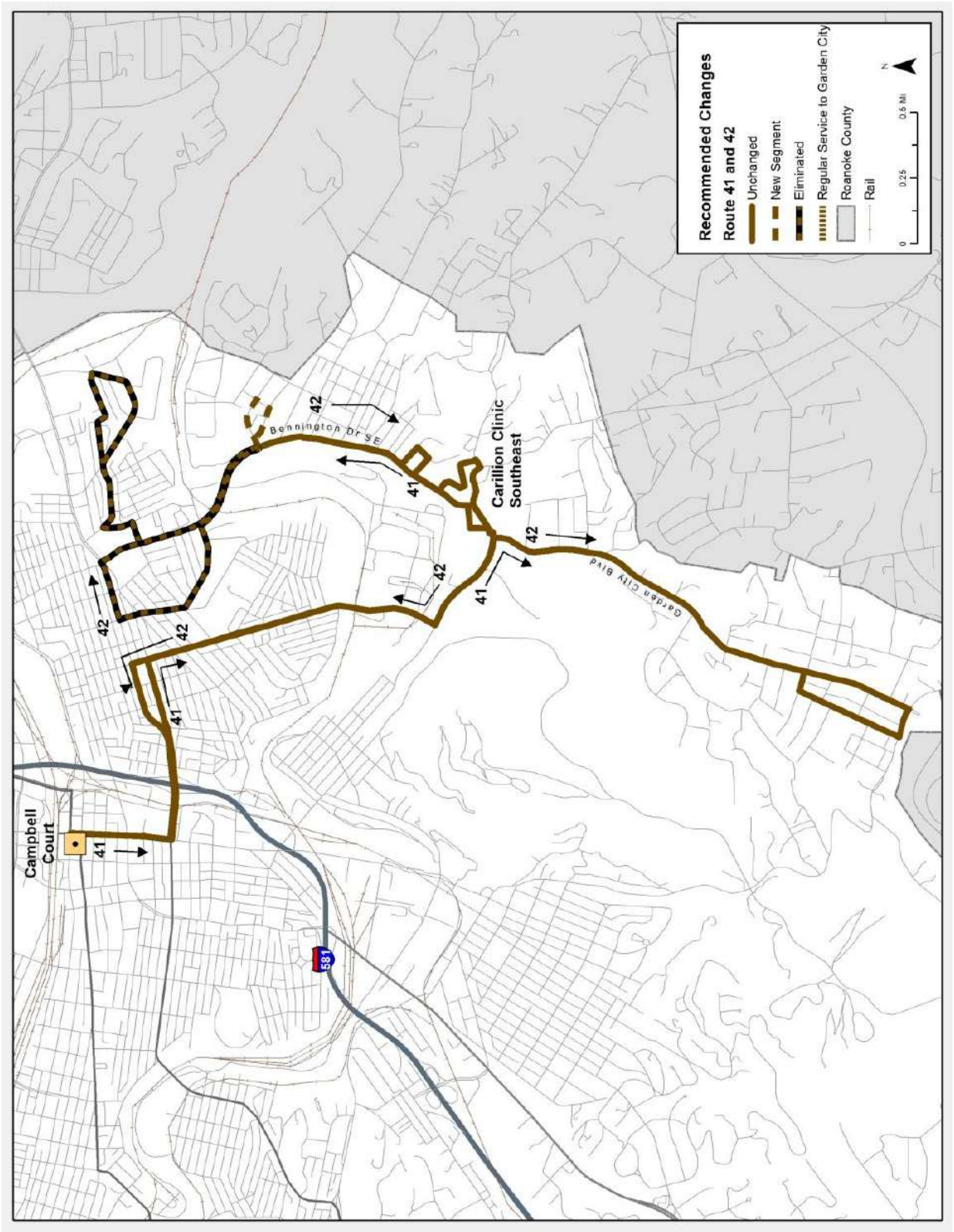
Route 31X

- Route 31X is proposed to be combined with Route 31/32, as discussed above in association with Route 31/32.

Routes 41/42

- Eliminate the Kenwood Loop from the route.
- Use the street grid adjacent to Golden Park to turn around, after serving Jamestown and a few additional stops north of Jamestown along Bennington Street. This will eliminate Morningside Manor from this route. It will be served by Routes 35/36.
- Use the time savings to serve Garden City on every trip. This additional service will need to be monitored to determine if sufficient demand exists.
- The new route mileage for both routes combined is 11 miles, down from 17.5 miles. This should help Route 42 with on-time performance.
- There should be a minor incremental cost savings in fuel by reducing the combined route mileage.
- Figure 4-8 shows these proposed changes.

Figure 4-8: Valley Metro Routes 41/42 and Proposed Changes



Routes 51/52 and Routes 55/56

- Eliminate peak route diversion to Avenham Avenue (Routes 51/52).
- Adjust routing to stay on McClanahan to a left onto Franklin, rather than turning left on to Broadway.
- Extend Route 51 to serve the Roanoke County Administration Center. After leaving Tanglewood Mall, travel straight on Starkey Road, right on Electric Road, and left on Bernard Drive. At this point Route 51 becomes Route 56, taking a left on Penn Forest, left on Starkey, and left onto Ogden Road. Bernard Drive would serve as the EOL for Route 51 for these trips.
- This route will need to be checked to ensure the route has enough time to accomplish this extension. The time checks conducted on Route 51 did not show late performance, however, Route 52 (the inbound route) was late on 21% of the trips sampled. The extension is 0.80 miles each way.
- If there is insufficient time, there could be a consideration of having the 51/52 stay on Electric Road and not enter Tanglewood Mall until the mall is re-developed, including a designated bus transfer location.
- Change the end of the line for Route 55 to the front of the County Administration building, similar to Route 51. At this point, Route 55 would become Route 52 taking a left onto Penn Forest Road, left on Starkey Road, and a right on Electric Road.
- This change will result in vehicles not having to idle in a busy shopping center parking lot.
- There will be a minor increase in fuel cost with the extension to the County Administration building. There should also be an increase in ridership.
- These changes are shown in Figures 4-9 and 4-10.

Figure 4-9: Valley Metro Routes 51/52 and Proposed Changes

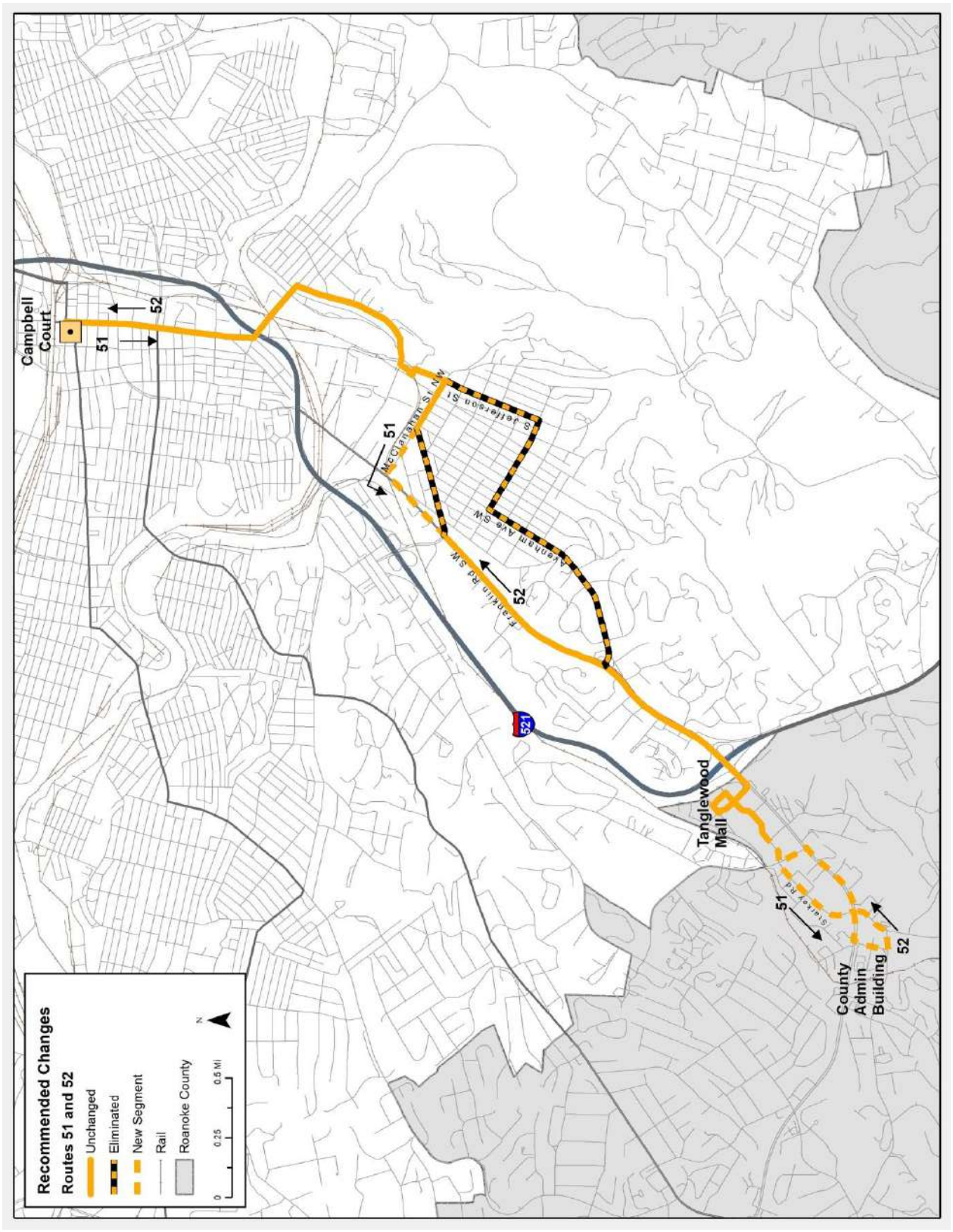
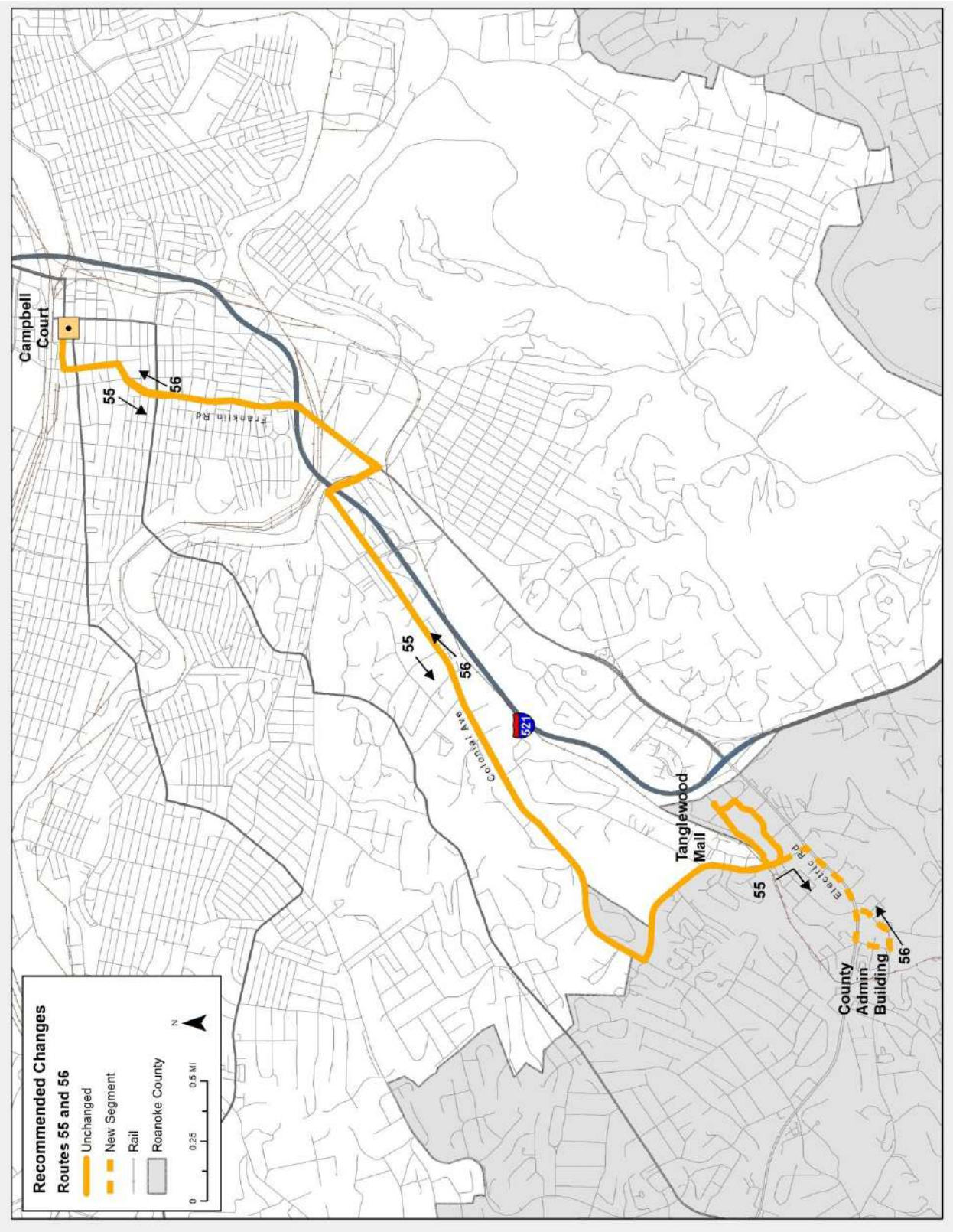


Figure 4-10: Valley Metro Routes 55/56 and Proposed Changes



Routes 61/62

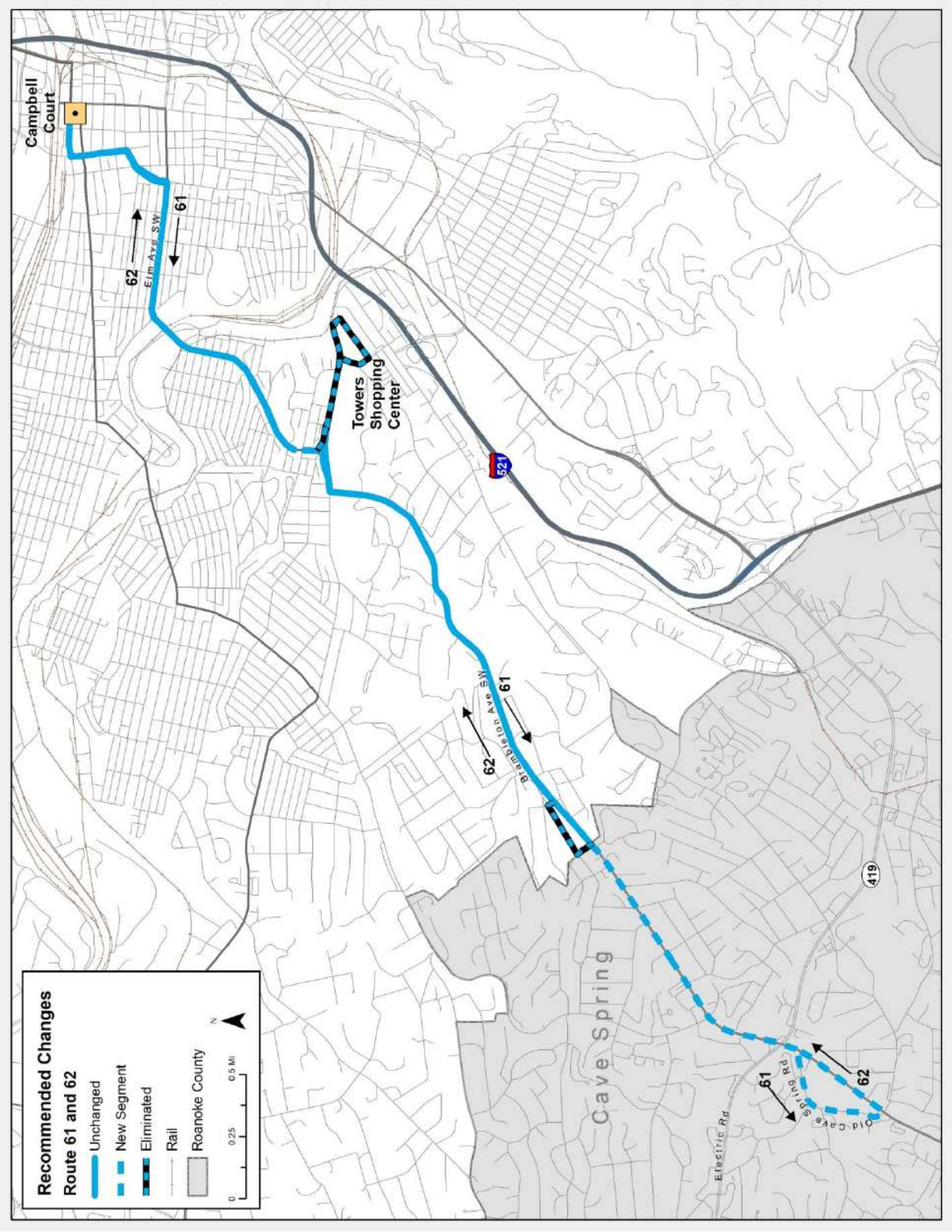
- Following the concepts that were included within the Roanoke Transit Vision Plan, it is recommended that the route be extended to Cave Spring using the following routing: from Brambleton Avenue, continue past the current terminus and through the intersection with Electric Road. Turn right onto Old Cave Spring Road and follow it around back to Brambleton Avenue. Turn left onto Brambleton Avenue and continue north, joining the current route at the city line.

- This will add 1.12 miles onto the route, necessitating that the Towers Shopping Center be removed from the route. With the addition of Cave Spring and the elimination of Towers, the new route length will be 6.25 miles. This is an increase of 0.75 miles from the current mileage. This change should be feasible, as the eliminated segment (Towers) experiences significant congestion.

- This change will result in an incremental increase in fuel costs. There will likely be a significant increase in ridership by adding this area of both commercial and residential development.

- This concept is shown in Figure 4-11.

Figure 4-11: Valley Metro Routes 61/62 and Proposed Changes



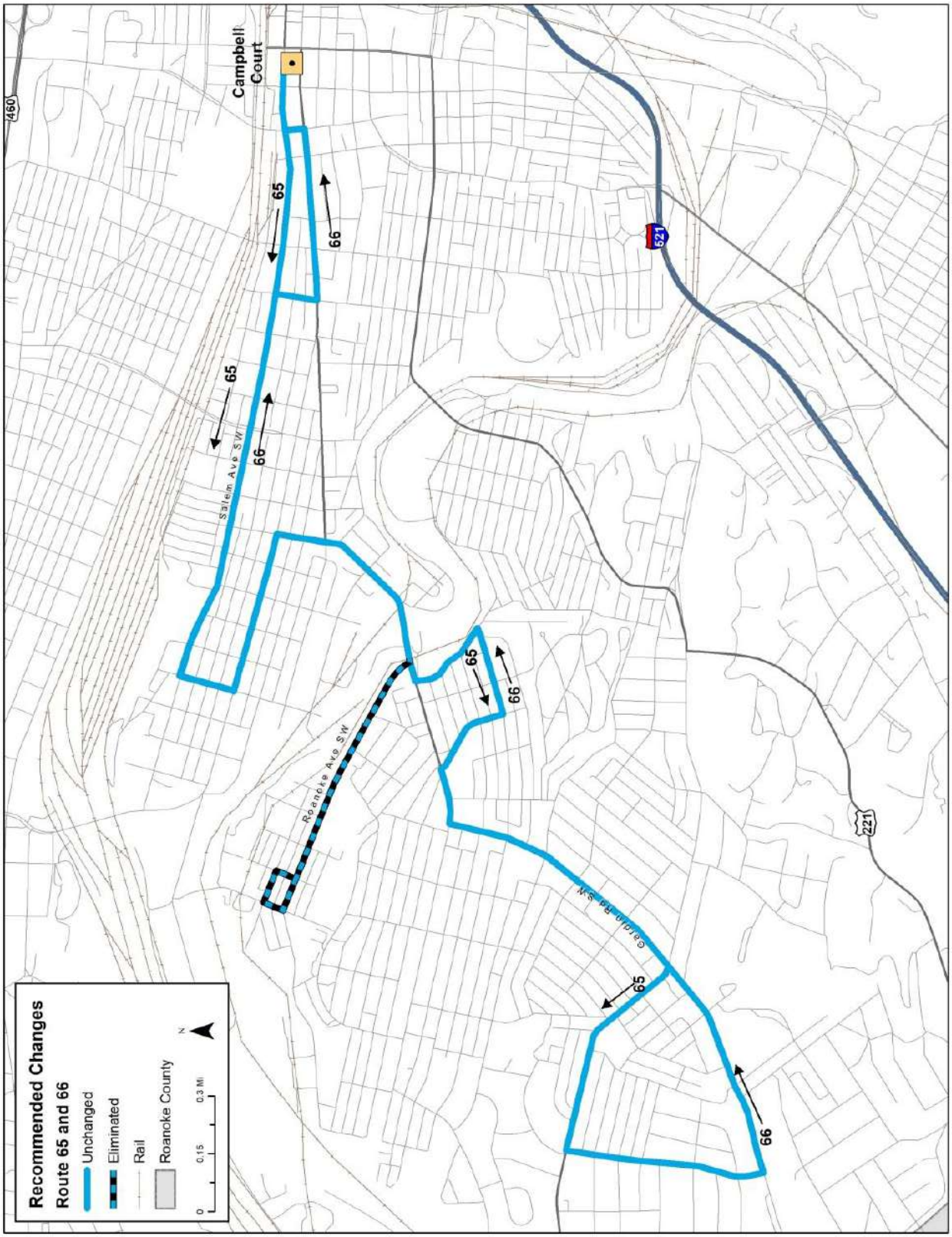
Routes 65/66

- Eliminate the Roanoke Avenue Loop to streamline the route and improve on-time performance. This will eliminate about 0.90 miles from the route.

- This change will result in an incremental decrease in fuel expenses and will not likely have an impact on ridership.

- This change is shown in Figure 4-12.

Figure 4-12: Valley Metro Routes 65/66 and Proposed Changes



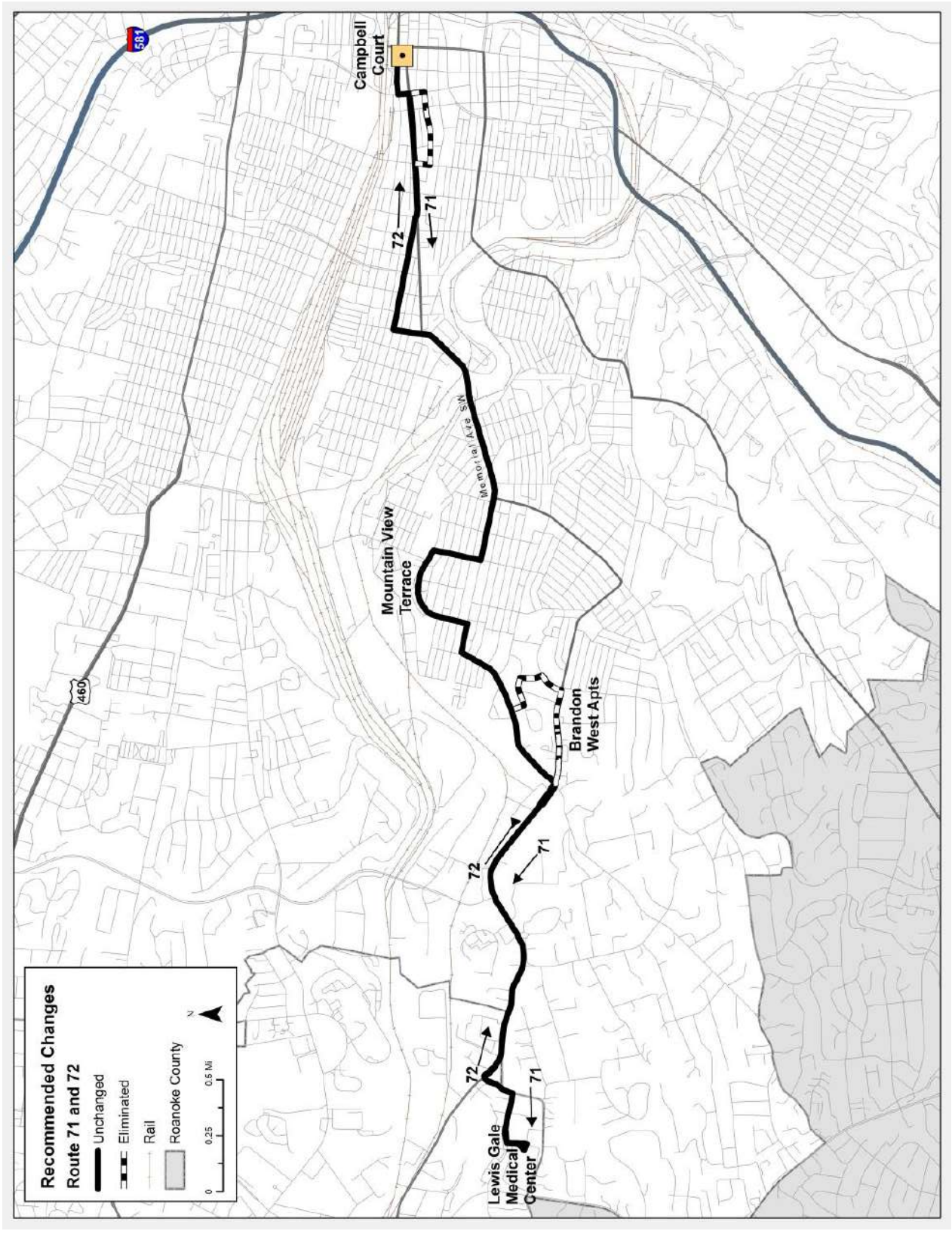
Routes 71/72

- To streamline travel on the outbound segment downtown (Route 71), it is recommended that the route remain on Campbell Avenue rather than traveling to Church Avenue. This change will eliminate four turning movements.

- When a Brandon Avenue route is implemented (see section on page 4-36 that discusses new routes), it is recommended that the route be streamlined to use Edgewood Street to Brandon Avenue to serve the area just west of Grandin Village, instead of traveling through the neighborhood. This change should allow for a modest improvement in travel time and is cost neutral.

- These proposed changes are shown in Figure 4-13.

Figure 4-13: Valley Metro Routes 71/72 and Proposed Changes



Routes 75/76

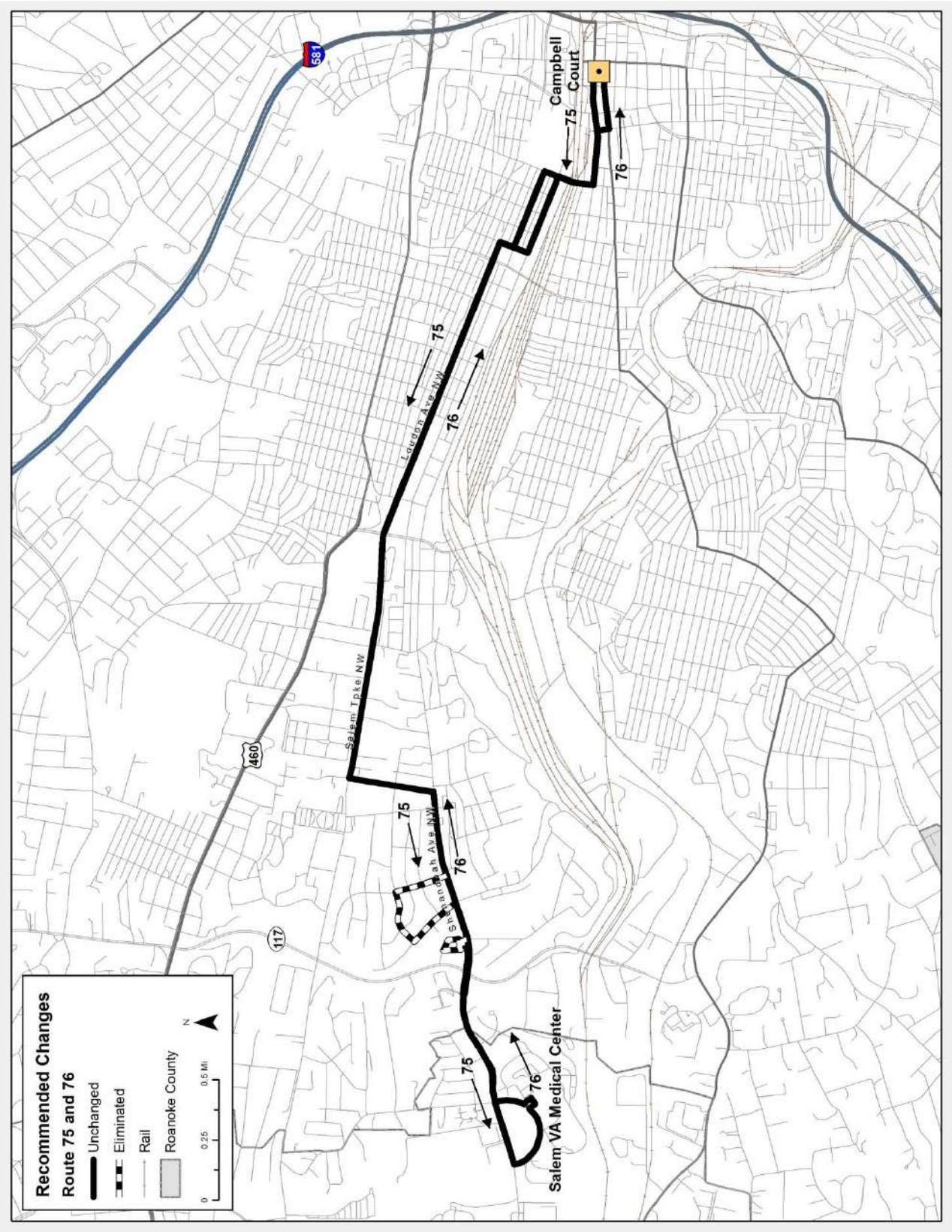
- Eliminate Route 75 diversion into a neighborhood (Westside/Troutland/Old Stevens) that is used by a few riders, but seems arbitrary. The walk distance to the main road from anywhere along the loop is less than ½ mile.

- Eliminate the diversion into the Food Lion parking lot, located off of Shenandoah Avenue, just prior to Peters Creek Road.

- These changes will result in an incremental decrease in fuel expenses and will not likely have an impact on ridership.

- These proposed changes are shown in Figure 4-14.

Figure 4-14: Valley Metro Routes 75/76 and Proposed Changes



Routes 81/82

- Change the timing of this route so that it adds capacity and frequency in the Melrose Avenue Corridor for most of the service day. The proposed hours of service for this route pair is: 8:45 a.m. to 7:45 p.m., leaving downtown Roanoke on the 0:45, serving as a complement to Route 91 that leaves downtown Roanoke on the 0:15.

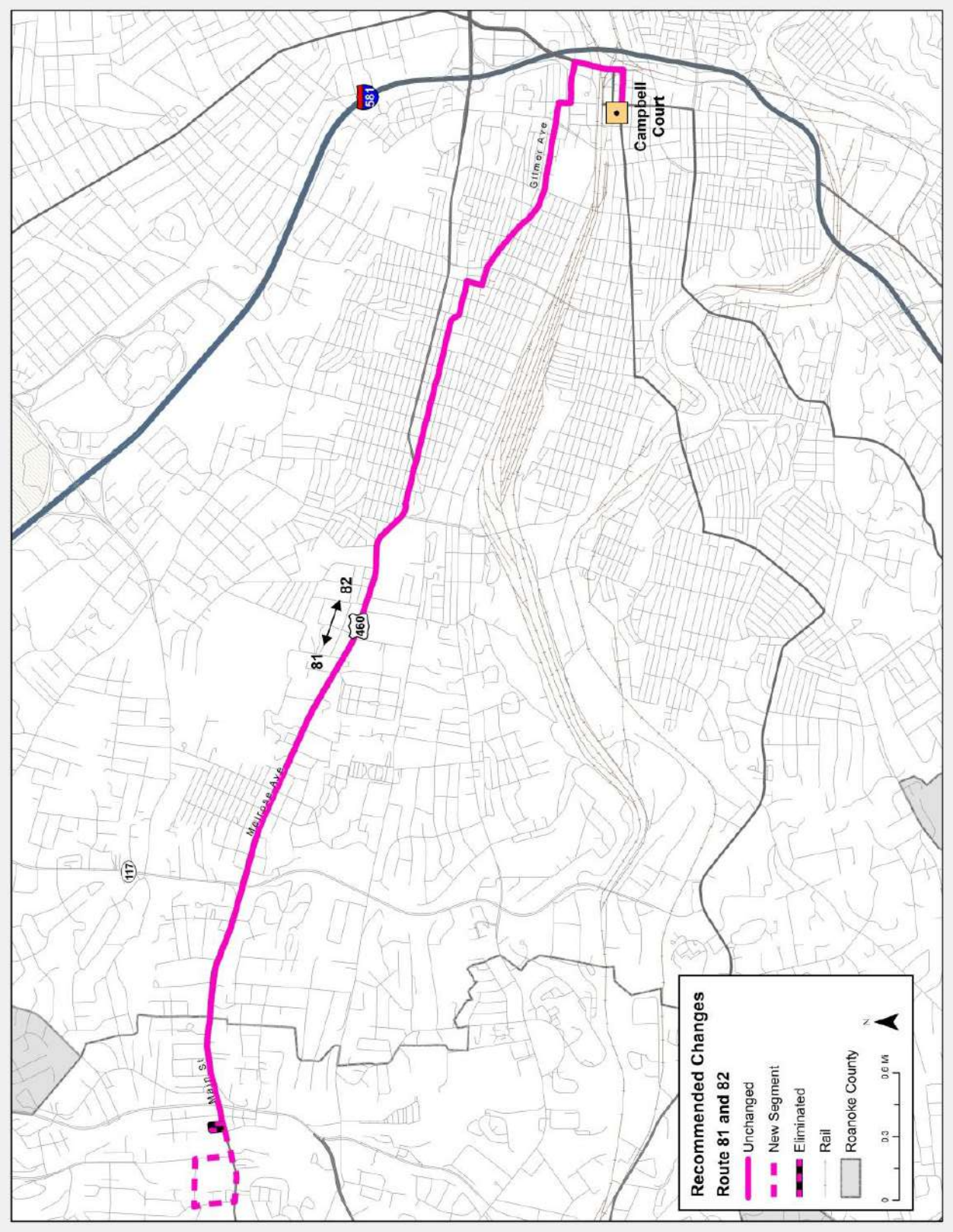
- This recommendation was also included in the TVP.

- Change the turnaround from Lakeside Plaza to an around-the-block configuration. Drivers have reported difficulties turning left out of Lakeside Plaza to begin the inbound trip. The suggested movement is to travel just west of Lakeside Plaza on E. Main, and make a right onto Parkdale, then a right onto Forest Lawn, a right onto Kessler Mill to a left at the light back onto East Main Street. There may be other options for this change and Valley Metro operations staff will determine the optimum solution from a safety standpoint.

- This change will increase the cost of the 81/82 by about $118,000 annually and should increase ridership on the route by an estimated 30,000 passenger trips per year. Some of these trips will likely come from current trips being taken on the 91/92.

- This change is shown in Figure 4-15.

Figure 4-15: Valley Metro Routes 81/82 and Proposed Changes



Routes 85/86

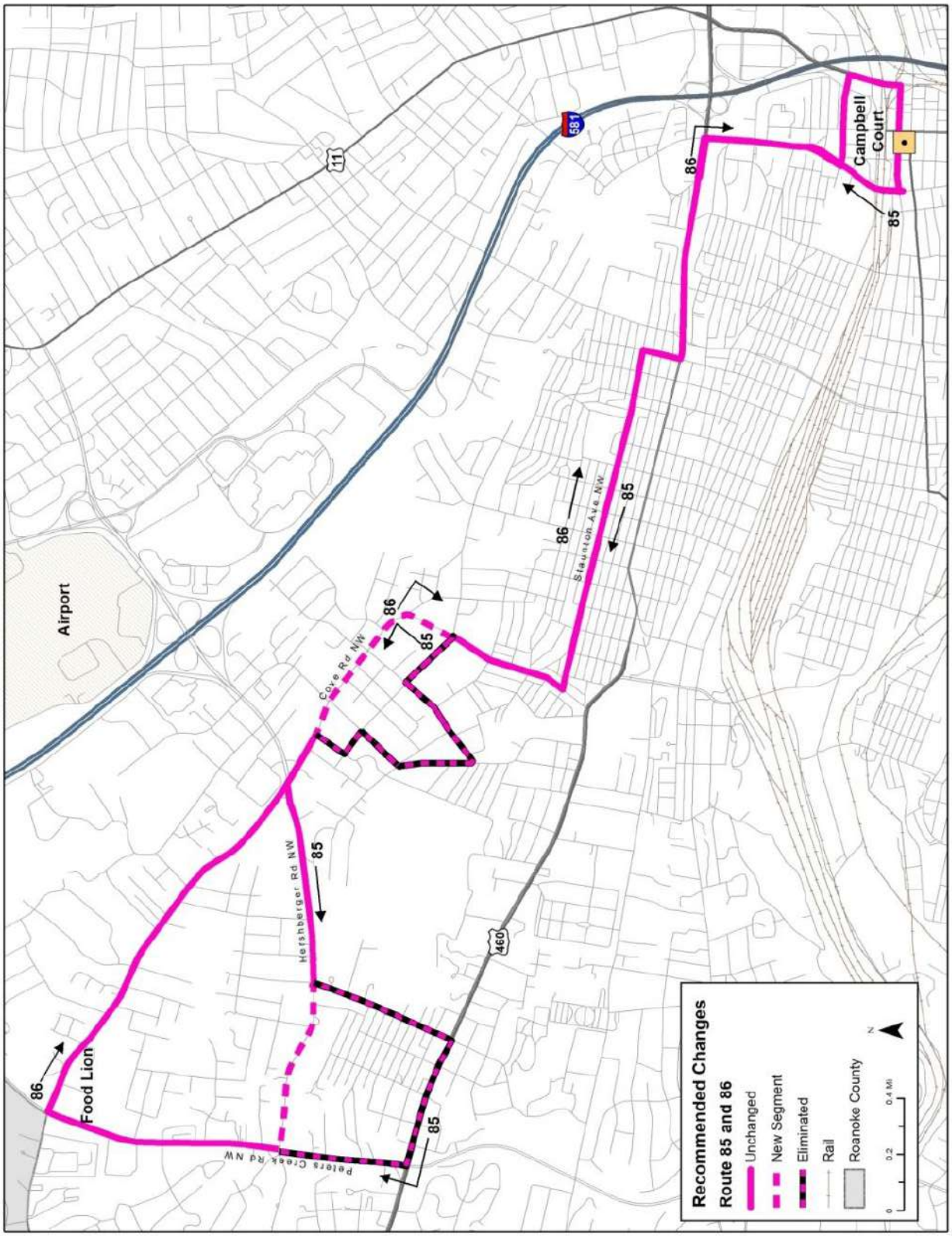
- Change the routing pattern, eliminating the circuitous neighborhood routing by traveling Lafayette Boulevard to Cove Road, eliminating Florida, Aspen, Forest Park, Fresno, and Golfside. From Cove Road, make a left turn onto Hershberger Road. Follow Hershberger Road to Peter's Creek Road, then a right turn onto Peter's Creek Road, and right turn onto Cove Road at Food Lion EOL.

- This change should allow the route to operate on-time and will make the route easier to navigate with Valley Metro's new larger vehicles. The total route mileage for the routes together will be 10.75 miles, down from the current 14.9 miles.

- These changes will result in an incremental decrease in fuel expenses and will not likely have an impact on ridership.

- This proposed change is shown in Figure 4-16.

Figure 4-16: Valley Metro Routes 85/86 and Proposed Changes



Routes 91/92

- Split the route into two, with the 91/92 serving the Melrose/Main Street corridor with two vehicles and a new Route 93 providing service from the Main Street Corridor to the Lewis Gale Medical Center and the Salem VA Medical Center.

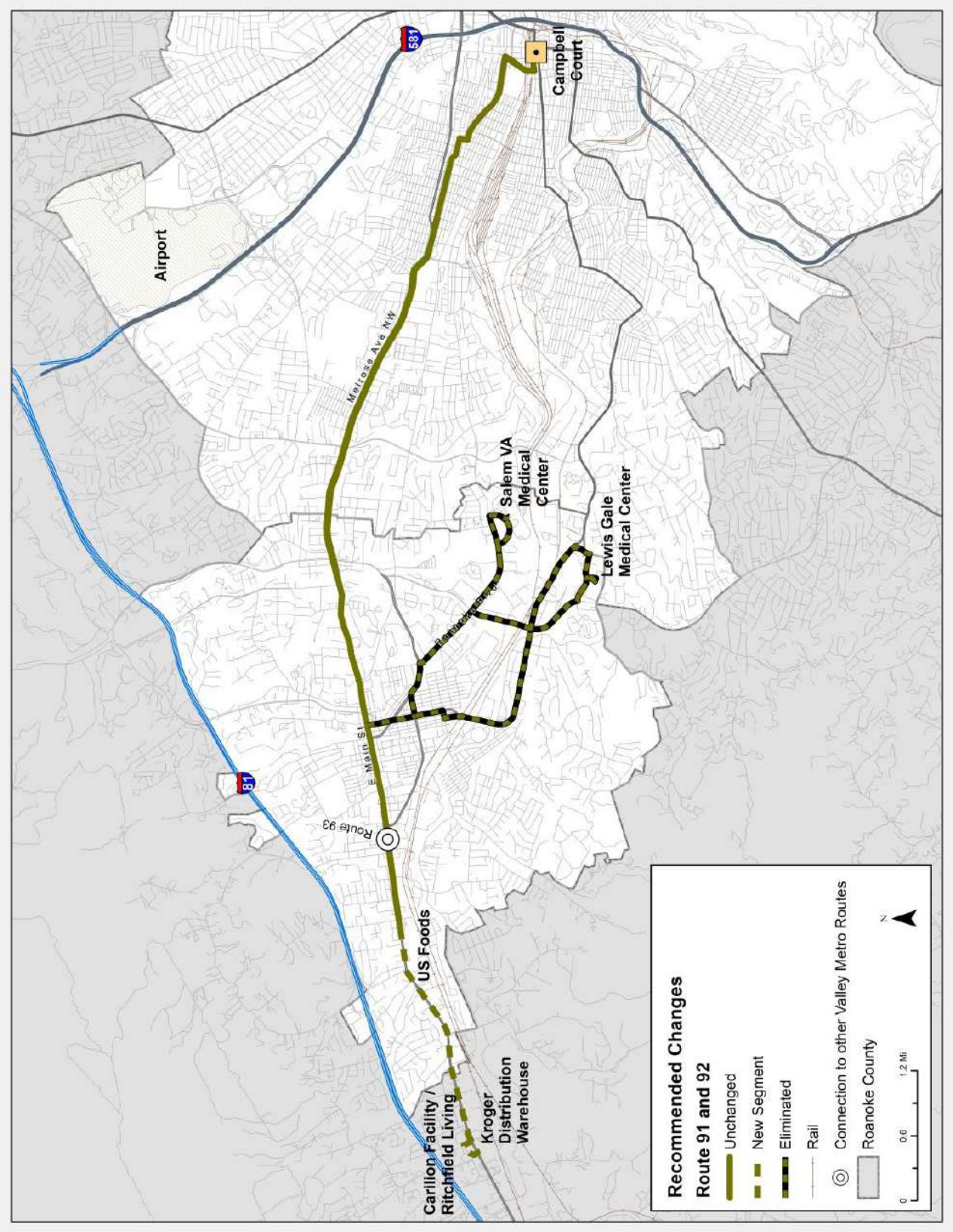
- Given the significant reduction in route mileage for the 91/92, this change should allow the 91/92 to be extended to the west in the direction of Glenvar. It is estimated that the route could handle about 2 additional miles each direction, which would bring it about to Richfield Living, just west of Salem.

- Increasing the capacity and streamlining the route will result in an increase in ridership.

- The cost for this change will be about $331,360 per year. A vehicle will also be required, but is likely available from Valley Metro's existing fleet. The funding to implement this route change is suggested to come from savings realized by reducing the number of routes that have 30-minute service.

- This change is shown in Figure 4-17.

Figure 4-17: Valley Metro Routes 91/92 and Proposed Changes



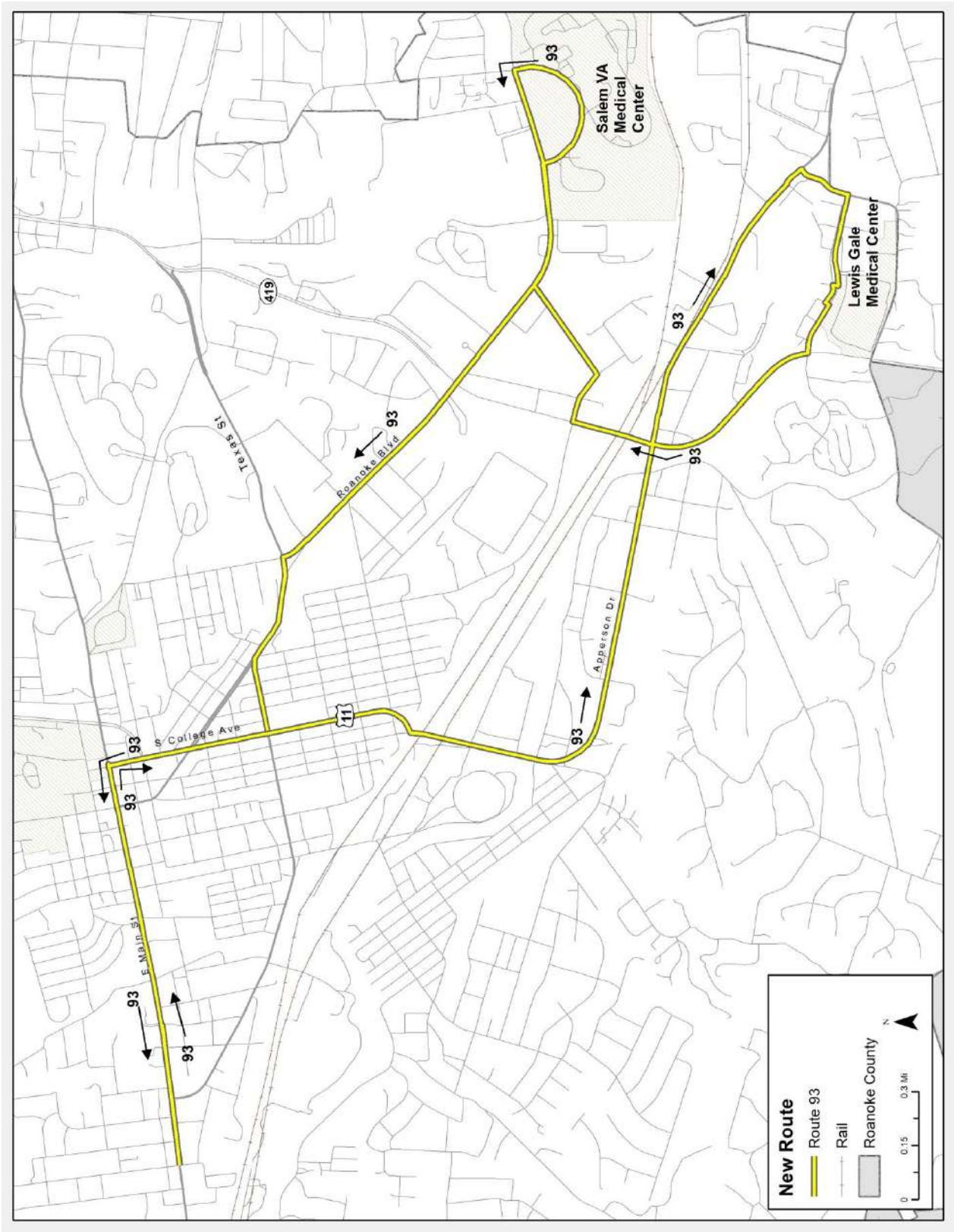
Route 93

- The new Route 93 would provide service from the Main Street corridor in Salem to the Lewis Gale Medical Center and Salem VA Medical Center.

- The expenses associated with this route were assigned to adding a second vehicle on Route 91/92. Productivity on this route is expected to be lower than the current 91/92, as the density in the Salem area is not as high as that in the Melrose Avenue corridor, which the 91/92 travels through. If the system average of about 20 passenger trips per revenue hour is achieved, this route will carry about 87,000 passenger trips per year.

- A route map is provided as Figure 4-18.

Figure 4-18: Valley Metro Route Proposed Route 93



Implementation

The minor route adjustments associated with the COA are scheduled for implementation in FY2020.

Service Improvement #2 – Implement the New Routes Suggested within the COA

Route 93

This route was discussed as it related to Routes 91/92. It is proposed that a Route 93 be implemented to provide service from Main Street in Salem to the Salem VA Medical Center and Lewis Gale Medical Center. It is proposed that this route operate 14 hours per day, six days per week, with transfer opportunities to Routes 91/92, 71/72, and 75/76. These revenue hours total 84 per week. Given that this route is proposed to be implemented using savings from a reduction in the number of routes that have peak service, a bus will not need to be purchased.

The routing was shown in conjunction with the discussion of splitting Route 91/92. This recommendation is slightly different than the one contained within the TVP, which proposed a Route 93 that would connect the medical centers to downtown Salem and to the Park and Ride Lot adjacent to Exit 140 of I-81, serving the Electric Road corridor and Lakeside Plaza.

Implementation

Route 93 is scheduled for implementation in FY2020.

Brandon Avenue Connector – Routes 1 and 2

The Brandon Avenue Connector is a proposed new route that would serve as a cross-town connector, originating at the Carilion Roanoke Memorial Hospital and terminating at the Lewis Gale Medical Center. The TVP suggested that the route be numbered Route 1 (outbound) and Route 2 (inbound). The route would travel as follows:

Outbound (Route 1)

- Carilion complex
- Right on McClanahan to Brandon Avenue
- Left on Colonial Avenue, serving the Towers Shopping Center stop
- Right on 23rd Street
- Left on Brandon Avenue to Apperson
- Left on Keagy
- Right on Braeburn to EOL at Lewis Gale

Inbound (Route 2)

- Lewis Gale Medical Center
- Right on Braeburn
- Left on Keagy
- Right on Brandon Avenue
- Right on Colonial Avenue
- Left on Wonju
- Left on Franklin
- Right on McClanahan
- Left on Jefferson to Carilion Complex

The concept of this route was discussed within the Roanoke Valley Transit Vision Plan, though it was included as a medium-term recommendation, rather than a short-term recommendation. The route would connect the following current routes:

- Star Line Trolley
- Routes 51/52
- Routes 55/56
- Routes 61/62
- Routes 65/66
- Routes 71/72
- Route 91/92 (or possibly the future 93)

The route is 6.1 miles each way. The implementation of this route would support Route 61/62 discontinuing service to the Towers Shopping Center and would also allow Route 71/72 to eliminate the circuitous Carlton/Fareham/Derwent/Malvern segment to stay on Edgewood. The Brandon Avenue Connector would serve the Brandon Ridge Apartments, allowing Route 71/72 to remain on Edgewood. For these reasons, the COA proposed recommendation is to implement this route in the short-term, rather than the mid-term.

The timing of the route will need detailed study to determine the best approach to reduce duplication on the shared segments, while promoting connectivity. This route could be implemented on a 14 hour service day, six days per week, which would total 84 revenue service hours per week. Given that this route is proposed to be implemented using savings from reducing the number of routes that have peak service, a bus will not need to be purchased.

Cost

If the Brandon Avenue Connector is operated on an hourly schedule similar to the rest of the route network (i.e., 14 hours per day, six days per week), this would result in about 4,360 annual revenue hours. Using an estimated fully-allocated cost of $76 per hour, the annual operating costs would be about $331,000 per year.

Ridership

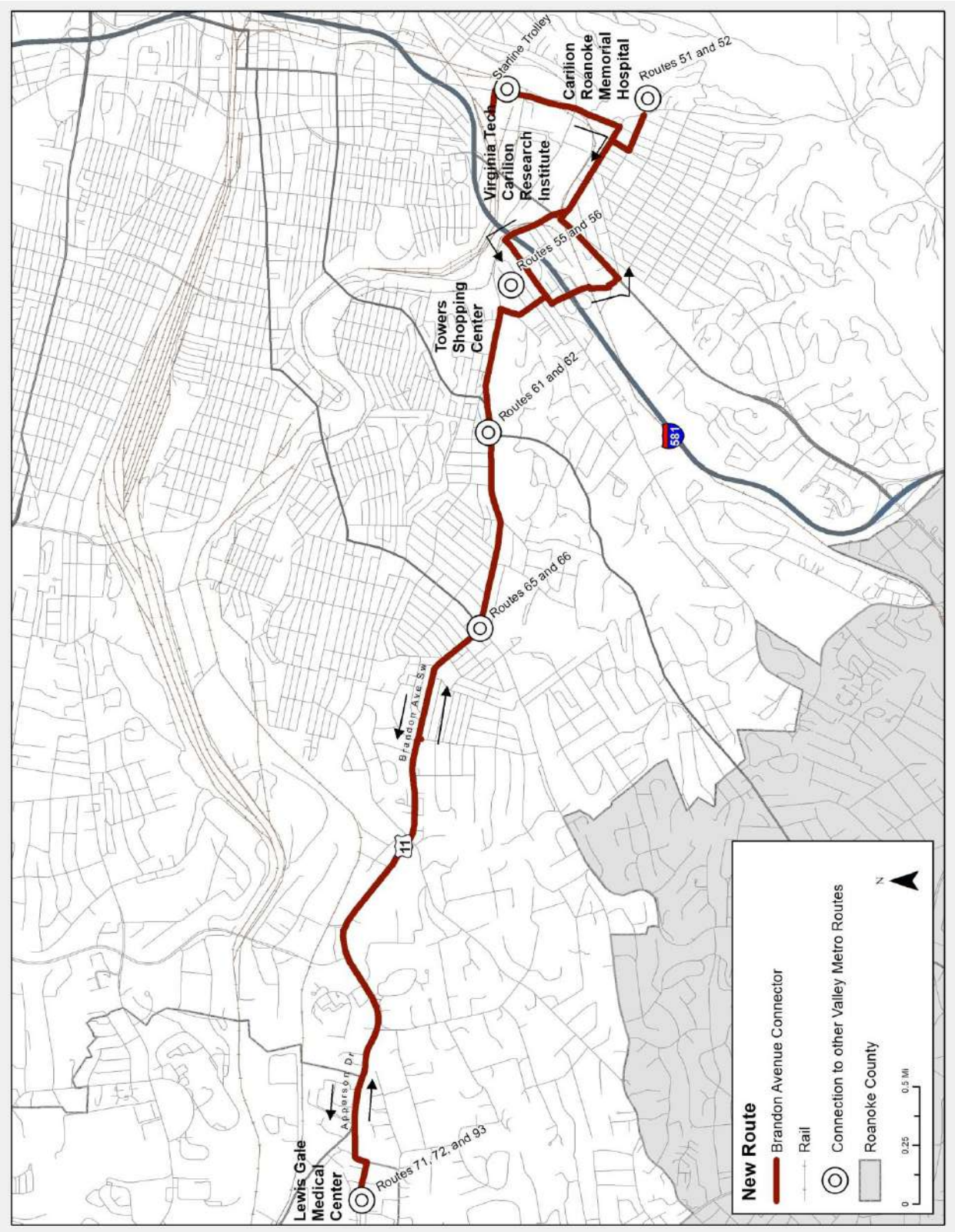
Ridership is estimated to be 78,000 per year, based a productivity of 18 passenger trips per revenue hour.

Implementation

The Brandon Avenue Connector is scheduled for implementation in FY2021.

A route map is provided as Figure 4-19.

Figure 4-19: Proposed Brandon Avenue Connector (Routes 1 and 2)



Electric Road Corridor – Routes 4 and 5

The Electric Road corridor (Route 4) is proposed to originate at Tanglewood Mall and travel north along Electric Road (Virginia Route 419) and terminate at Salem VA Medical Center. This route would connect with Routes 51/52; 55/56; 61/62; 71/72; 75/76; and 91/92 (or new 93), and would also serve a number of existing and new transit origins and destinations. This route would provide connecting service for riders so that they would not have to travel to downtown Roanoke to connect to several travel corridors west of downtown Roanoke. Route 5 would be the return trip, originating at the Salem VA Medical Center and terminating at Tanglewood Mall.

Routes 4 and 5 together would be about 16 miles round trip, which is close to the maximum feasible for one bus to accomplish in one hour. It would likely be feasible given that there are many segments along the route that do not have origins and destinations and would likely have higher operating speeds. The proposed route is provided as Figure 4-20. This route is inter-jurisdictional, serving parts of the cities of Roanoke and Salem, as well as Roanoke County. This corridor was discussed within the TVP.

Cost

If the Electric Road Corridor route operated on an hourly schedule similar to the rest of the route network (i.e., 14 hours per day, six days per week), this would result in about 4,360 annual revenue hours. Using an estimated fully-allocated cost of $76 per hour, the annual operating costs would be about $331,000 per year. A vehicle would also be needed at a cost of about $450,000.

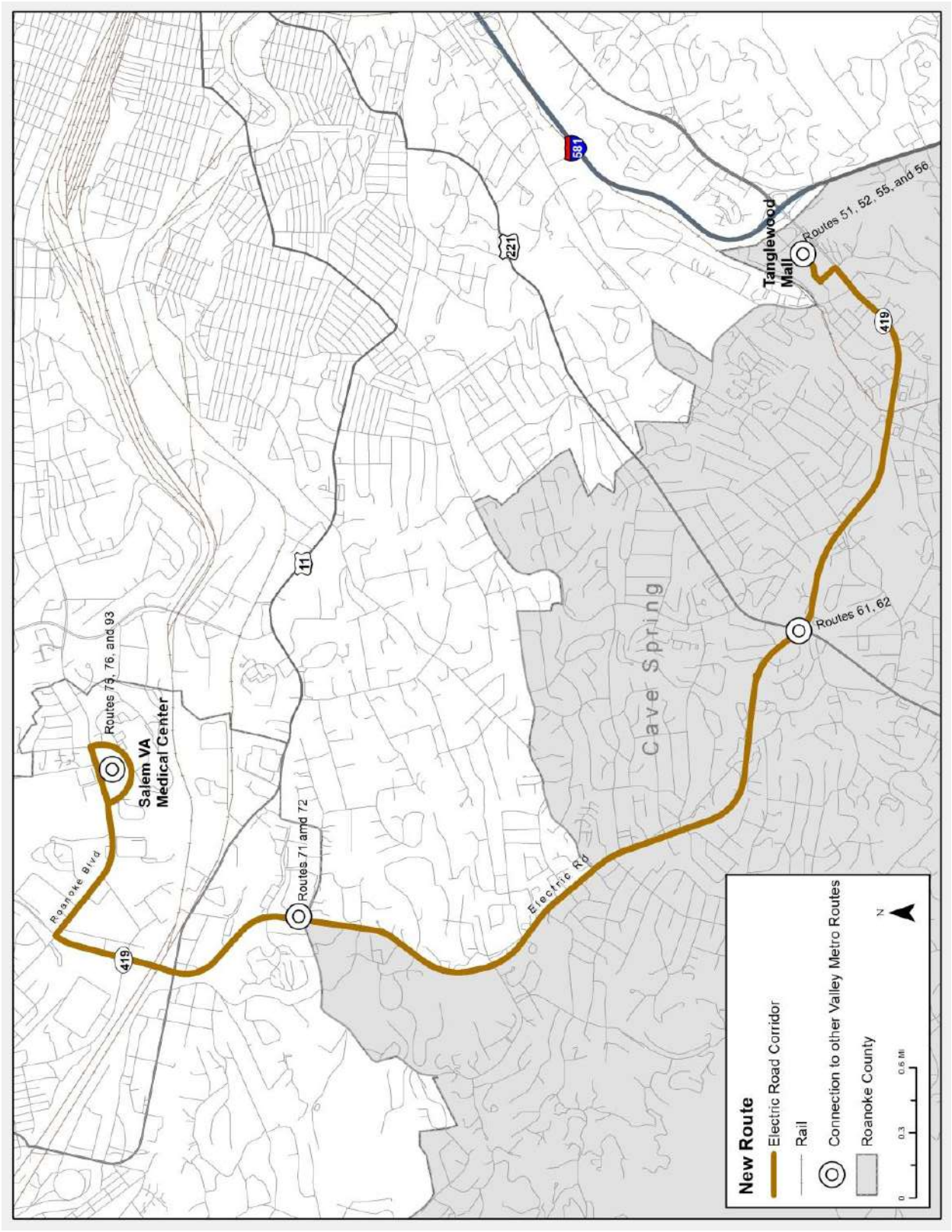
Ridership

Ridership is estimated to be 65,400 per year, based a productivity of 15 passenger trips per revenue hour.

Implementation

A specific year has not yet been assigned for the Electric Road corridor route, as its implementation will require the development of a financial arrangement with Roanoke County. For the purposes of constructing a multi-year TDP budget, this route has tentatively been assigned to FY2022.

Figure4-20: Proposed Electric Road Corridor Route (Routes 4 and 5)



Towne Square / Williamson / Plantation / Peters Creek / DMV

There are a number of important destinations north of the City of Roanoke, including the Department of Motor Vehicles (DMV) on Valleypointe Parkway, Green Ridge Recreation Center on Wood Haven Road, Hollins Library on Peters Creek Road, many large businesses on Plantation Road, Williamson Road, and Waldron Drive, as well as Hollins University. These destinations are not currently served by Valley Metro. A route to serve these areas could originate at the Towne Square Area, connecting to the 20 series, then travel north on Williamson Road to Hollins University, then west on Peters Creek Road to Plantation, Hitech Road, Enon Drive, Walrond Drive, back to Plantation, Peters Creek, Wood Haven and Valleypointe to terminate at the DMV. This routing is about 9 miles in each direction, or 18 miles round trip, which is the maximum route length feasible for one bus to accomplish in one hour. It would likely be feasible given that there are a few segments along the route that do not have origins and destinations and would likely have higher operating speeds. The proposed route is provided as Figure 4-21. This route is inter-jurisdictional, serving both Roanoke City and County.

Cost

If the Towne Square – Williamson – Plantation-Peters Creek - DMV route operated on an hourly schedule similar to the rest of the route network (i.e., 14 hours per day, six days per week), this would result in about 4,360 annual revenue hours. Using an estimated fully-allocated cost of $76 per hour, the annual operating costs would be about $331,000 per year. A vehicle would also be needed at a cost of about $450,000. Given that some of the destinations on this route are only open Monday through Friday during business hours, it may be feasible to operate this route on a reduced schedule, which would cost less and result in better productivity.

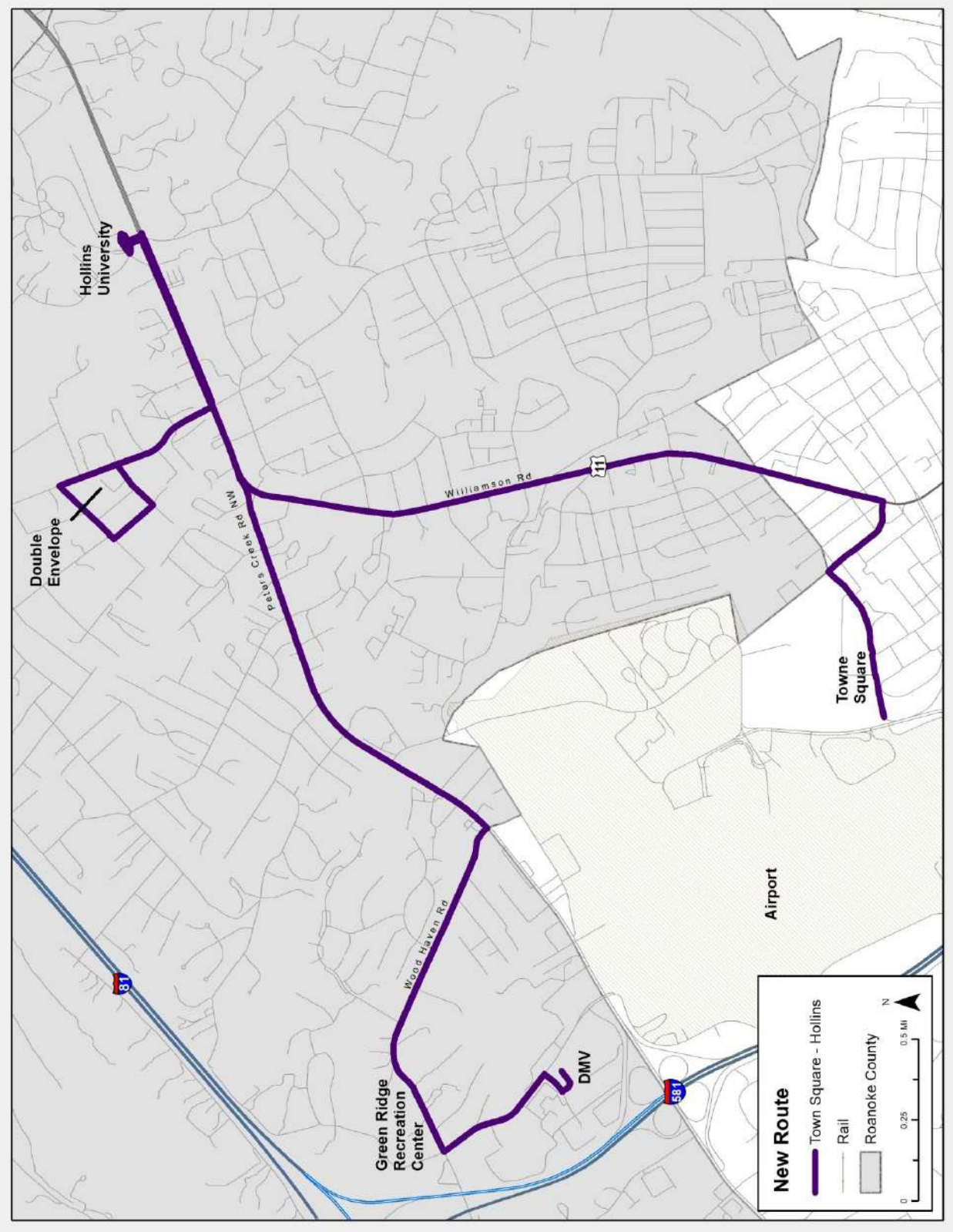
Ridership

Ridership on this route is likely to be lower than the system average, as the population density in this area is not as high as some of the other parts of the Valley Metro service area. There are also some segments of the route with few opportunities for boarding/alighting. Annual ridership is estimated to be about 52,000 passenger trips based on 4,360 annual revenue hours.

Implementation

A specific year has not yet been assigned for the Towne Square–Williamson–Plantation-Peters Creek-DMV route, as its implementation will require the development of a financial arrangement with Roanoke County. For the purposes of constructing a multi-year TDP budget, this route has tentatively been assigned to FY2022.

Figure4-21: Towne Square-Williamson-Plantation-Peters Creek- DMV



Salem Circulator

The changes under consideration for Salem include splitting Route 91/92 so that the portion of the route that travels to the medical centers is independent of the main line that operates on Main Street (Salem) and the Melrose Corridor (Roanoke). The new 93 will connect to the 91/92 in Salem. Late in the TDP process, it was brought up that the City of Salem may be interested in a circulator route, perhaps using a specialty vehicle. The concept of a second Salem-based route, in addition to the new Route 93, was not studied in detail, but could provide a viable option to connect downtown Salem with the park and ride at Exit 140 of I-81. For planning purposes, we are including this potential project as an option for more detailed study.

Service Improvement #3 – Changes to the 30-minute Service Pattern

One of the recommendations contained within the COA is to change the hours of the day during which 30-minute service is provided. Currently the 30-minute service coincides a traditional morning and afternoon peak pattern. Ridership patterns on the Valley Metro fixed routes do not follow this pattern, with ridership building during the afternoon hours to a daily peak at about 5:00 p.m. There is a morning peak, but it is not as significant as the afternoon ridership increases. Valley Metro currently has crowding issues in the afternoon; whereas the morning peak runs have relatively light ridership.[1] In addition, there are several routes that have 30-minute service, but the route productivity is below the system average of about 20 passenger trips per revenue hour. For these routes, it is recommended that 30-minute service be eliminated. These routes are: 25/26; 51/52; 55/56; 65/66; 71/72; and 85/86.

There is some concern about ensuring that riders are able to get to work by 7:00 a.m., so there may need to be additional early morning trippers to accommodate this shift, similar to the additional capacity currently provided for Route 91/92 at the 6:00 a.m. hour.

Cost

This service change will reduce revenue service hours by 7,360 annually, which equates to an annual savings of about $555,581. This calculation includes a reduction of 9,360 service hours and the addition of 2,000 hours to provide morning tripper services to ensure that people can get to work by 7:00 a.m. This savings will then be used for other service needs within the system.

Ridership

This change may reduce ridership slightly, but will improve productivity and match capacity with the current ridership patterns, maximizing the efficiency of the service provided and reducing afternoon crowding.

[1] This pattern is documented in Chapter 4 of the Comprehensive Operational Analysis.

Implementation

This improvement is scheduled for implementation in FY2020.

Service Improvement #4 – Consider Splitting the Pulse

There is an option presented within the COA to split the pulse, so that about half of the routes pulse at 0:15 after the hour and the other half pulse at 0:45 after the hour in order to reduce the number of vehicles in Campbell Court at one time. The transfer patterns were studied to figure out the least disruptive way to make this change, which is being considered because of the limited capacity at Campbell Court.

Cost

This option is cost neutral.

Ridership

Splitting the pulse could result in reduced ridership from current riders whose trips become less convenient due to a 30-minute wait time at Campbell Court to connect with a transfer route.

Implementation

A final decision with regard to splitting the pulse has not yet been made.

Service Improvement #5 – Extend the Hours of Service

Another improvement discussed within the TVP is that of providing a longer service day. The TVP discussed increasing daily service hours from 15 to 18. This type of improvement could be phased in and applied strategically to the routes where there is likely to be evening ridership. Providing an additional three hours of service would result in the last buses leaving downtown Roanoke at 11:15 p.m. ADA paratransit service would also need to be extended for this time period.

Cost

The estimated annual operating cost for ten routes (11 vehicles) and ADA paratransit (2 vehicles) to extend service three additional hours, Monday through Saturday, is $925,000 No additional capital is required.

Ridership

Ridership on the last run of the evening is likely to be lighter than the average experienced throughout the service day. If the productivity on the last hour of service averaged 10 passenger trips per revenue hour (fixed route) and 2 passenger trips per hour (ADA paratransit), the total ridership increase would be about 106,700 passenger trips.

Implementation

Later evening service is scheduled for implementation in FY2024.

Service Improvement #6 – Sunday Service

One of the short-term recommendations contained with the TVP is to provide Sunday service. Within the rider survey conducted for the TVP, this improvement was listed as the most important improvement by 240 respondents.

A Sunday service pattern could be developed that is not as comprehensive as the Monday through Saturday pattern, in recognition that Sunday ridership is likely to be lower than on other days of the week. Total current daily revenue hours (fixed route and paratransit) are about 428. If about half of this level of service were to be provided on Sundays (215 hours), the total annual increase in revenue hours would be 11,180.

Cost

The annual operating cost for 11,180 additional hours of service would be about $850,000. No additional capital is required.

Ridership

Ridership on Sunday service in other communities is typically lighter than on weekday and Saturday services. If about 60% of the current service productivity can be achieved, the annual Sunday ridership would be about 134,000 annual passenger trips, based on 11,180 hours of service.

Implementation

Sunday service is scheduled for implementation in FY2025.

ORGANIZATIONAL IMPROVEMENTS

Organizational Improvement #1 –Continue Dialogue with Roanoke County and Other Jurisdictions to Consider Regional Transit Organization

An important focus of the TVP is that of regionalizing transit services, both for fixed route and paratransit services. There are several growth areas in the region that are located outside of the current Valley Metro fixed route service area. Some of these areas could likely currently support fixed route services. The focus of this organizational improvement is to work jointly with Roanoke County and Botetourt County so that they become full members of the Greater Roanoke Transit Company, with an agreed upon financial contribution, level of service, and Board representation.

This project will need the consent and cooperation from leaders and staff members from Roanoke City, Roanoke County, Botetourt County, Salem City, the Town of Vinton, RADAR, and the Roanoke Valley Transportation Planning Organization (RVTPO).

The RVTPO would provide leadership for the development of a regional body with the RVTPO Policy Board providing direction. These efforts will likely need additional financial resources so that the RVTPO can hire outside assistance for consultant and legal expenses to help define the potential regional options. The expenses for this project would fall under the RVTPO rather than Valley Metro.

Implementation

It is anticipated that this project will be ongoing throughout the planning period covered by the TDP, even if a formal planning effort is not conducted.

Organizational Improvement #2 – Update of Public Information Materials

Valley Metro's route and schedule information needs to be updated. Most of the route maps that are available on the system's website were prepared by the Roanoke Valley – Alleghany Regional Commission in March of 2000. Several are no longer completely accurate. The system also uses time points in ten-minute increments that tie the schedule to five interim points along each route. These time points are numbered one through five and are printed on the route maps. The issue with this approach is that it is difficult to see on the maps which exact location is depicted by each number.

An alternate approach would be to list the location of each of these time points on a schedule that is unique to each route. This method is standard in the industry and is less confusing to new riders who may not understand how to use the system.

Given the need to have these maps and schedules as user-friendly and graphically-pleasing as possible, it is recommended that Valley Metro conduct a procurement process to hire a company that specializes in creating these materials.

Once completed, these maps and schedules should be made available in print form for riders, as well as uploaded to Valley Metro's website. Valley Metro may want to also budget each year for updates to the maps and schedules so that they can remain current.

Cost

A preliminary cost estimate for this project is $35,000.

Implementation

This project is scheduled for implementation during FY2020 as the adjustments recommended in the COA are implemented.

Organizational Improvement #3 – Service Planner

Valley Metro's operations staff performs the day-to-day service planning tasks that are required in response to road closures, events, and customer requests and complaints. In addition, the RVTPO conducts planning tasks for Valley Metro as well as leading the data collection required for reporting to the National Transit Database. The missing link for Valley Metro is an in-house service planner who could take the recommendations made within local planning documents such as the TDP and the TVP and develop specific routes and schedules that could then be tested by the operations staff. An in-house planner could also keep the route and schedule information up to date, as well as staying abreast of new development and land use changes that may affect Valley Metro.

Cost

The salary for this position would likely be in the range of $50,000 annually, plus fringe benefits that have been estimated to be about 30% of the salary.

Implementation

While the city's budget is already constructed for FY2019, if this position can be included it would help Valley Metro implement the COA and the TVP. If it is not possible to add it for FY2019, then this position should be considered for FY2020. It is included in the multi-year TDP budget in FY2020.

CAPITAL IMPROVEMENT PLAN

In addition to the routine replacement of vehicles and other capital equipment, there are five specific capital projects that Valley Metro intends to implement over the course of the TDP planning horizon. These projects are described below.

Capital Improvement #1 – Develop a New Downtown Transit Center

As documented in the COA, and in the 2015 Downtown Roanoke Intermodal Study, Valley Metro has outgrown Campbell Court and the facility is reaching the end of its useful life. The focus of this project is to build a new multi-modal transit center on a site that is large enough to accommodate Valley Metro's needs, as well as being accessible to Amtrak and intercity bus carriers.

This initiative will be a multi-year effort, including site selection, design and engineering, and construction. The city will need to make a number of decisions that will affect the cost of the project, including whether or not a multi-use building will be associated with the center, and what amenities may be available at the site (i.e., Public bathrooms? Or only bathrooms for staff? Ticket sales and information?).

The city will have to follow FTA site selection criteria as well as the FTA's procurement guidelines.

Cost

For planning purposes a cost of $10 million was assigned for this project. There are a number of unknown variables at this stage, so this estimate will likely change.

Implementation

This project will be implemented over several years, beginning in FY2019 with site selection and FY2020 with design and engineering. Upon securing project funding, construction could then occur in FY2021 and FY2022.

Capital Improvement #2- Implement Improved Technologies

Valley Metro has begun the process of implementing real-time schedule information for passengers, as well as implementing automatic passenger counting (APC) technology. In addition, Valley Metro operations staff members are interested in purchasing driver scheduling software that will aid the system to develop the new driver schedules that will be required for implementing the COA changes and the TVP initiatives. Valley Metro currently uses simple spreadsheets for these tasks.

Real-Time Transit Information and Automatic Passenger Counters

The initial phase of the transit technology project will be implemented in early FY2019 and will focus on providing real-time transit information for the Star Line Trolley and the Smart Way services. These vehicles will be outfitted with flat screen monitors that can be used for rider information as well as advertising. This project will be of great value for riders, allowing them to access real time transit information via a computer, tablet, or smart phone. The second phase of the project will outfit the rest of the fixed route fleet and add a number of information kiosks around the service area to display real-time transit information. The final phase of the project will include the purchase and installation of automatic passenger counters, which will help Valley Metro to further understand ridership patterns and collect data for the National Transit Database (NTD) without needing to use the labor-intensive method of manual boarding/alighting counts.

Cost

The first phase of the project was included in DRPT's FY2016 SYIP (Six-Year Improvement Plan), with a budget of $300,000. The cost to include the full fixed route network is about $1.7 million and will be funded through the Smart Scale program.

Implementation

The first phase is currently in the process of implementation. It is expected that the second phase will be implemented in FY2020 and FY2021.

Driver Scheduling Software

The implementation of driver scheduling software will allow Valley Metro operations staff to construct efficient driver runs and test a number of scenarios in a much faster manner than is possible using the current spreadsheet-based system. This will be particularly helpful as the system implements the changes suggested in the COA and the new initiatives recommended in the TVP.

Cost

Pricing for driver scheduling software is individualized, based on the number of vehicles as well as the number of "modules" procured. There are a number of vendors currently in the transit marketplace. For planning purposes, we have assigned a cost of $200,000 for this project. Typically there will be an upfront cost, and then an annual license fee to use the product.

Implementation

This improvement is scheduled for implementation in FY2020.

Capital Improvement #3 – Develop Additional Satellite Transit Centers

The COA and TVP discuss the need to develop satellite transit centers to accommodate the passenger transfer function at other locations within the service area. These are also termed "super stops" and typically include the necessary number of bus pull-outs; a passenger shelter; and transit information. These satellite facilities do not typically involve a building or restrooms, but they could if the number of passengers through the site warranted that level of development.

Satellite centers can sometimes be included as part of a re-development effort, which would shift the cost to the development community rather than Valley Metro. An example of where this may be possible is Tanglewood Mall, which is slated for development and has been identified as a location for a satellite transit center. Other locations include the Towne Square area and the Valley View Mall area.

Cost

For planning purposes, a cost of $500,000 has been assigned for each satellite transit location. The actual cost may be significantly different, based on the complexity of the site and the level of amenities chosen.

Implementation

This project will be implemented over several years, beginning in FY2023.

Capital Improvement #4 – Bus Stop Improvements

There are a number of bus stop improvements cited in the 2013 Bus Stop Accessibility Study conducted under the leadership of the RVTPO. Some of the recommendations have been implemented, some may no longer be relevant, and others have yet to be addressed. Valley Metro is getting ready to implement improvements in the Melrose Avenue corridor.

Cost

The cost to improve bus stops with passenger amenities can range from $200 to $15,000 depending on the level and type of improvements. In some instances it can exceed $15,000 if extensive engineering is required to install the amenities and comply with the Americans with Disabilities Act (ADA). Table 4-1 provides cost estimates for potential stop improvements. For planning purposes, this initiative is budgeted for $20,000 per year.

Table 4-1: Estimated Bus Stop Improvement Costs

Improvement	Unit Cost
Shelter (installed)	$5,000 - $10, 000
Bench (installed)	$1,500 - $2,500
4' Wide Sidewalk	$17.50 - $25.00 per linear foot
Bicycle Racks	$200 - $500
Curb Ramps	$2,000 - $2,500

Capital Improvement #5 – Facility Improvements

The Roy Z. Meador Operations, Maintenance, and Administrative Facility is in need of some upgrades to better accommodate several Valley Metro functions. These upgrades include:

- Re-modeling of the maintenance department's break room,
-
- Re-modeling of the training room, and
-
- A project to pave the grass parking area across Campbell Avenue. Valley Metro currently uses this area to store vehicles that are waiting for disposal, but could use the lot for back-up storage and training if it were to be paved.

Cost

These projects have not yet been through the design phase, which makes it difficult to assign a cost estimate. For planning purposes, the interior renovations have been assigned a cost of $80,000 and the lot paving has been assigned a cost of $60,000.

Implementation

The interior projects are assigned to FY2021 and the lot paving is assigned to FY2022.

SUMMARY OF PLANNED IMPROVEMENTS

Tables 4-2 and 4-3 provide summaries of the potential improvements described within this chapter. Implementation of these improvements is dependent upon final refinement of the concepts, as well as the availability of federal, state, and local funds.

Table 4-2: Summary of Service Improvement Initiatives

Service Initiatives	Annual Operating Hours	Annual Operating Costs	Capital Costs	Estimated TDP Year
COA Minor Route Adjustments	Generally cost neutral			FY2020
Changes to 30-minute Service Pattern	(7,360)	-$559,360		FY2020
New Route 93	4,360	$331,360	Use existing	FY2020
Brandon Avenue Connector	4,360	$331,360	Use existing	FY2021
Electric Road Corridor	4,360	$331,360	$450,000	TBD
Towne Square/Williamson/Peters Creek	4,360	$331,360	$450,000	TBD
Salem Circulator			TBD	
Split Pulse	Generally cost neutral			TBD
Extended Hours of Service	12,168	$924,768	$0	FY2024
Sunday Service	11,180	$849,680	$0	FY2025
Totals	**33,428**	**$2,540,528**	**$900,000**	

Note: Operating costs are based on $76 per revenue hour.

Table 4-3: Organizational and Infrastructure Initiatives

Organizational and Infrastructure Initiatives	One-Time Operating Cost	Annual Operating Cost	Capital Costs	Proposed TDP Year
Dialogue with Roanoke County and Other Jurisdictions				Ongoing
Update of Public Information Materials	$35,000	$2,500	$0	FY2020
Service Planner		$65,000	$0	FY2020
Develop New Downtown Transfer Center			$10,000,000	Multi-Year
Real Time Transit Information and APCs			$1,700,000	FY2020 and 2021
Driver Scheduling Software		$12,000	$200,000	FY2020
Develop Additional Satellite Centers			$1,500,000	Multi-Year
Bus Stop Improvements			$20,000	Multi-Year
Facility Improvements			$140,000	FY2021 and 2022
	$35,000	**$79,500**	**$ 13,560,000**	

(1) Based on $50,000 annual salary and 30% fringe.

Chapter 5
Implementation and Capital Plan

INTRODUCTION

The Implementation and Capital Plan provides a general outline of the steps required to implement the Service and Capital Improvement Plan described in Chapter 4. This first section includes a discussion of the major activities for each year of the plan, followed by a capital replacement plan for vehicles, facilities, passenger amenities, and technology systems. For Valley Metro this plan focuses on implementing the projects outlined in the Comprehensive Operational Analysis (COA) and positioning the agency for the growth outlined in the Roanoke Valley Transit Vision Plan (TVP).

TRANSIT DEVELOPMENT PLAN INITIATIVES BY YEAR

Each planning year covered by the Valley Metro 2018 TDP is listed below, followed by the list of improvements scheduled for the year, along with some general implementation steps. Greater detail is provided for the short-term projects than for the longer- term projects. It should be noted that this schedule has been constructed using currently available information with regard to service priorities and funding constraints. Additional resources or shifting priorities may change this schedule and Valley Metro can address these changes through the annual TDP update process.

FY2019

- Formally adopt the TDP (scheduled for September 2018).
- Fine-tune each recommended route change in preparation for implementation.
    - The route change process will involve a final look at each proposed change by Valley Metro staff to ensure each suggested change is safe and will improve overall route performance.
    - Once the alignments are reviewed and changed as necessary, Valley Metro staff will need to publicize the changes and allow for public comment.
    - When public comment has been received and acknowledged, the route adjustments can be finalized for FY2020 implementation.

- Make a decision with regard to the feasibility of splitting the pulse, as described in the COA. This process should involve several public meetings to ensure the impact on the riders is fully understood, and negative impacts are minimized.

- Discuss potential options for a Salem Circulator.

- Implement Melrose Avenue bus stop improvements.

- Begin implementation of real-time passenger information on Smart Way and Trolley services.

- Continue dialogue with Roanoke County and other jurisdictions to consider the development of a regional transit organization.

- Begin process of site selection for a new Downtown Transit Center.

- Identify potential projects for grant cycles in FY2020 – Smart Scale, Regional Surface Transportation Program (RSTP), Transportation Alternatives, etc.

FY2020

- Hire a service planner to take the lead in implementing the changes associated with the COA and the TVP.

- Implement the minor route adjustments outlined in the COA. Some of these adjustments add expenses, while others reduce expenses. For example, eliminating Route 31X saves about as much operating expense as will be added by providing all-day service to Route 81/82. Taken together, these adjustments are generally cost neutral.

- Implement the change to the 30-minute pulse pattern.

    - This change will free up resources to split Route 91/92 (adding Route 93), hire a service planner, and re-do the public information.

    - This change will need to be publicized prior to implementation.

- Update the public information materials to reflect the current routes and the route changes implemented.

- Implement driver scheduling software.

- Continue with the implementation of real-time passenger information.

- Continue with the development of a new Downtown Transit Center.
- Continue with bus stop improvements.
- Continue dialogue with Roanoke County and other jurisdictions to consider the development of a regional transit organization.
- Apply for grant funding through the Smart Scale, RSTP, Transportation Alternatives, and other grant programs.

FY2021

- Monitor the changes implemented in FY2020 and make adjustments as needed.
- Implement the new Brandon Avenue Connector, conducting the appropriate public outreach process.
- Continue dialogue with Roanoke County and other jurisdictions to consider the development of a regional transit organization.
- Re-model the maintenance department's break room and training room.
- Continue with the development of a new Downtown Transit Center.
- Continue with the implementation of real-time passenger information.
- Continue with bus stop improvements.

FY2022

- Monitor the changes implemented in FY2021.
- If a financial arrangement can be developed with the jurisdictions served, implement the Electric Road corridor route, conducting the appropriate public outreach process.
- If a financial arrangement can be developed with the jurisdictions served, implement the Towne Square- Williamson- Peters Creek- Plantation – DMV route, conducting the appropriate public outreach process.
- Begin work on the development of satellite transit centers.
- Pave the grass parking area across Campbell Avenue.

- Continue with the development of a new Downtown Transit Center.
- Continue with bus stop improvements.

FY2023

- Monitor the changes implemented in FY2022.
- Begin the process of implementing extended hours of service.
    - Conduct a public process to help determine the appropriate route scheme for night service.
- Continue work on the development of satellite transit centers.
- Continue with bus stop improvements.

FY2024

- Monitor the changes implemented in FY2023.
- Implement extended hours of service.
- Begin the process of implementing Sunday service:
    - Conduct a public process to help determine the appropriate level of service for Sunday service.
    - Decide on the Sunday route and schedule network.
    - Implement Sunday service.
- Prepare for a full TDP update.
- Begin to implement the projects associated with the TVP that have not been implemented.

FY2025

- Monitor the changes implemented in FY2024.
- Implement Sunday service.

- Conduct a full TDP update.
- Continue to implement projects associated with the TVP.

FY2026 – FY2028

- Monitor the changes implemented in FY2025.
- Begin implementing projects recommended within the FY2025 TDP.
- Continue to implement projects associated with the TVP.

CAPITAL NEEDS

Vehicle Replacement and Expansion Plan

This section presents details of the vehicle replacement and expansion plan, including vehicle useful life standards and estimated costs. A vehicle replacement and expansion plan is necessary to maintain a high quality fleet and to dispose of vehicles that have reached their useful life. The capital program for vehicles was developed by applying FTA/DRPT vehicle replacement standards to the current vehicle fleet which was presented in Chapter 1. Valley Metro has recently begun a major transit vehicle replacement program funded through the Regional Surface Transportation Program (RSTP).

Useful Life Standards

The useful life standards used by the FTA were developed based on the manufacturer's designated vehicle life-cycle and the results of independent FTA testing. The standards indicate the expected lifespans for different vehicle types. If vehicles are allowed to exceed their useful life they become much more susceptible to break-downs, which may increase operating costs and decrease the reliability of scheduled service. With some exceptions for defective vehicles, DRPT/FTA funds are not typically available to replace vehicles that have not yet met the useful life criteria. The FTA's vehicle useful life policy for a number of different vehicle types is shown in Table 5-1. DRPT's useful life policy mirrors the FTA's useful life policy.

Table 5-1: FTA's Rolling Stock Useful Life Policy

Vehicle Type	Useful Life
Light Duty Vans, Sedans, Light Duty Buses and All Bus Models Exempt from Testing Under 49 CFR, part 665	Minimum of 4 Years or 100,000 Miles
Medium, Light Duty Transit Bus	Minimum of 5 Years or 150,000 Miles
Medium, Medium Duty Bus	Minimum of 7 Years or 200,000 Miles
Small, Heavy Duty Transit Bus	Minimum of 10 Years or 350,000 Miles
Large, Heavy Duty Transit Bus, including over the road coaches	Minimum of 12 Years or 500,000 Miles

Source: FTA Circular 5100.1: Bus and Bus Facilities Formula Program Guidance

Vehicle Replacement Plan – Baseline Estimate

The majority of Valley Metro's revenue service vehicles are heavy-duty buses, with a useful life of twelve years or 500,000 miles. These vehicles have diesel engines. Table 5-2 provides the existing fleet inventory with the estimated calendar year that each vehicle is eligible for replacement. The operating condition of the vehicles and the availability of funding will dictate the actual replacement year.

Valley Metro also purchases vehicles that RADAR uses for ADA paratransit service. These vehicles are inventoried with the RADAR fleet, but are owned by Valley Metro. These vehicles are ADA accessible body-on-chassis vehicles with a useful life of five to seven years. RADAR and Valley Metro tend to keep these vehicles a bit longer, closer to eight years.

While budgets are typically presented following fiscal years, vehicle models are typically associated with calendar years. This plan reflects this practice, with the vehicle replacement schedule presented by calendar year, and the budgets presented by fiscal year.

In addition to helping Valley Metro and DRPT plan future fleet needs, this vehicle replacement plan will also feed DRPT's transit asset management plan (TAM), which is an FTA-required plan that must include an asset inventory; condition assessments of inventoried assets; and a prioritized list of investments to improve the state of good repair of its capital assets.[1] The new TAM requirements establish state of good repair standards and four state of good repair performance measures. Valley Metro is required to set performance targets for its capital assets based on the state of good repair measures and the condition of its capital assets, and to report these to the National Transit Database (NTD).

[1] Federal Register, Volume 81, No. 143, Tuesday July 26, 2016, Rules and Regulations, DOT, FTA, 49 CFR Parts 625 and 630, Transit Asset Management; National Transit Database.

Table 5-2: Valley Metro Vehicle Inventory and Replacement Schedule

Company ID Number	Model Year	Make and Model	Passenger Capacity	Mileage as of 6/15/2018	Estimated Replacement Year
1	2008	GMC Acadia	Non-rev		2021
2	2011	Ford Explorer SUV	Non-rev		2022
3	2005	Ford Expedition	Non-rev		2020
4	2009	Ford E150 Van	Non-rev		2021
5	2012	Dodge Caravan SE	Non-rev		2022
6	2012	Dodge Caravan SE	Non-rev		2022
9	1993	Chev Kodiak Tow Truck	Non-rev		2023
10	2005	Ford Taurus	Non-rev		2020
11	2008	Ford F250 Truck	Non-rev		2021
12	2013	Ford Truck	Non-rev		2024
13	2013	Ford Truck	Non-rev		2024
1401	2014	Gillig Bus 35'	43	171,491	2026
1402	2014	Gillig Bus 35'	43	160,418	2026
1403	2014	Gillig Bus 35'	43	165,529	2026
1404	2014	Gillig Bus 35'	43	169,674	2026
1405	2014	Gillig Bus 35'	43	172,504	2026
1406	2014	Gillig Bus 35'	43	158,594	2026
1407	2014	Gillig Bus 35'	43	157,476	2026
1408	2014	Gillig Bus 35'	43	162,718	2026
1409	2014	Gillig Bus 35'	43	166,449	2026
401	2004	Gillig Bus 35'	43	450,207	2021
402	2004	Gillig Bus 35'	43	440,238	To be disposed
403	2004	Gillig Bus 35'	43	434,955	2021
404	2004	Gillig Bus 35'	43	464,053	2020
405	2004	Gillig Bus 35'	43	430,977	To be disposed
406	2004	Gillig Bus 35'	43	445,336	2021
407	2004	Gillig Bus 35'	43	410,489	2021
408	2004	Gillig Bus 35'	43	431,320	2021
409	2004	Gillig Bus 35'	43	434,865	To be disposed
410	2004	Gillig Bus 35'	43	451,900	To be disposed
601	2006	Gillig Bus 35'	43	482,785	2020
602	2006	Gillig Bus 35'	43	419,400	2021
603	2006	Gillig Bus 35'	43	480,659	2019

Company ID Number	Model Year	Make and Model	Passenger Capacity	Mileage as of 6/15/2018	Estimated Replacement Year
604	2006	Gillig Bus 35'	43	478,657	2019
605	2006	Gillig Bus 35'	43	469,802	2019
606	2006	Gillig Bus 35'	43	459,006	2021
607	2006	Gillig Bus 35'	43	453,462	2021
608	2006	Gillig Bus 35'	43	458,531	2021
609	2006	Gillig Bus 35'	43	482,035	2019
610	2006	Gillig Bus 35'	43	464,251	2019
611	2006	Gillig Bus 35'	43	481,475	2019
612	2006	Gillig Bus 35'	43	468,420	2021
613	2006	Gillig Bus 35'	43	469,641	2019
614	2006	Gillig Bus 35'	43	485,699	2019
615	2006	Gillig Bus 35'	43	429,845	2021
616	2006	Gillig Bus 35'	43	460,778	2020
617	2006	Gillig Bus 35'	43	469,372	2019
618	2006	Gillig Bus 35'	43	478,656	2019
701	2007	ABC 35' Bus	43	503,723	To be disposed
801	2008	Double K 35' Trolley Bus	48	175,406	2019
802	2008	Double K 35' Trolley Bus	48	172,626	2019
803	2008	Double K 35' Trolley Bus	48	177,822	2019
804	2008	Double K 35' Trolley Bus	48	172,393	2019
901	2010	MCI Coach 45'	54	820,208	2023
902	2010	MCI Coach 45'	54	844,606	2022
903	2010	MCI Coach 45'	54	852,916	2022
904	2010	MCI Coach 45'	54	836,260	2023
1201	2012	Chevrolet	16	42,789	2020
1202	2012	Chevrolet	16	51,181	2020
1801	2018	Gillig Bus 35'	43	13,958	2030
1802	2018	Gillig Bus 35'	43	13,911	2030
1803	2018	Gillig Bus 40'	43	12,672	2030
1804	2018	Gillig Bus 40'	43	12,921	2030
Paratransit Vehicles Owned by Valley Metro Garaged at RADAR					
9	2011	Body on Chassis	12		2018
22	2016	Body on Chassis	9		2022
27	2011	Body on Chassis	12		2018
33	2011	Body on Chassis	20		2018

Company ID Number	Model Year	Make and Model	Passenger Capacity	Mileage as of 6/15/2018	Estimated Replacement Year
42	2012	Body on Chassis	12		2020
62	2012	Body on Chassis	12		2020
63	2011	Body on Chassis	12		2020
64	2011	Body on Chassis	12		2020
65	2012	Body on Chassis	12		2020
66	2011	Body on Chassis	20		2020
67	2016	Body on Chassis	9		2022
68	2016	Body on Chassis	9		2022

Vehicle Replacement and Expansion Plan

The annual schedule for vehicle replacement and expansion, based on the implementation schedule provided in this chapter and the FTA's vehicle useful life standards, is shown in Table 5-3.

This vehicle replacement and expansion schedule is based on estimates; actual vehicle purchases may vary depending upon service changes, funding availability, and unexpected economic shifts. Changes to this vehicle replacement and expansion schedule can be made by Valley Metro within its annual TDP update letter to DRPT, if needed. The vehicles due to be delivered in FY2019 are funded with RSTP funds from FY2017 and FY2018.

This plan includes only the short-term TDP expansions. There are significant expansions associated with the TVP that may be implemented during the out-years of the TDP horizon.

Table 5-3: Vehicle Replacement and Expansion Schedule

Number of Vehicles	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Replacement	12	14	4	2	2	0	0	9	0	0
Replacement - ADA	0	6	0	3	0	0	3	0	6	0
Expansion	0	0	2	0	0	0	0	0	0	0
Non-Revenue	2	2	1	3	1	2	0	0	0	0
Total Vehicles	**14**	**22**	**7**	**8**	**3**	**2**	**3**	**9**	**6**	**0**

Estimated Vehicle Costs

The estimated vehicle replacement costs are presented in Table 5-4. These costs are based on vehicle costs experienced by Valley Metro in FY2018. For FY2019 to FY2027 a 4% inflationary

factor was applied, as per guidance found in the "DRPT Transit Development Plan Requirements, February 2017." These cost estimates were used to develop the capital budget, which is included with the Financial Plan in Chapter 6. The plan includes the replacement of 61 revenue vehicles, eleven non-revenue vehicles and two expansion vehicles. Potential funding sources for the replacement and expansion vehicles include FTA Section 5307 funds, DRPT's Mass Transit Trust Fund and Mass Transit Capital Fund, Regional Surface Transportation Program funds, and local funds. All revenue service vehicles purchased will be lift or ramp-equipped. Bicycle racks are also purchased for all vehicles, with the exception of trolley vehicles.

Table 5-4: Estimated Costs of New Vehicles

Fiscal Year	35-Foot, Low-Floor Heavy Duty Transit Bus - Diesel	Over-the-Road Coach - Smart Way	Rubber-Tired Trolley Replica	Paratransit Vehicle - Gasoline
2018	$420,000	$620,000	$350,000	$65,000
2019	$448,000	$644,800	$364,000	$67,600
2020	$465,920	$670,592	$378,560	$70,304
2021	$484,557	$697,416	$393,702	$73,116
2022	$503,939	$725,312	$409,450	$76,041
2023	$524,097	$754,325	$425,829	$79,082
2024	$545,061	$784,498	$442,862	$82,246
2025	$566,863	$815,878	$460,576	$85,536
2026	$589,537	$848,513	$478,999	$88,957
2027	$613,119	$882,453	$498,159	$92,515

Facilities and Passenger Amenities

Several significant facility projects are planned for the period covered by this TDP, including the re-location and replacement of the Downtown Transfer Center, the development of satellite transfer locations, and bus stop improvements. In addition, there are improvements planned for the operating and maintenance facility, including improvements to the maintenance break room, the training room, and a currently un-paved parking area.

The provision of additional passenger shelters and benches is included in the ten-year plan. A budget of $20,000 is included for each plan year. This level of funding should allow Valley Metro to add shelters, benches, and other bus stop amenities over the course of the ten-year period.

Technology and Equipment

Valley Metro is beginning the process of implementing real-time transit schedule information, as well as automatic passenger counters. These projects will be the technological focus for the first two years of the TDP planning period. In addition, the plan includes the purchase of driver scheduling software, which will allow Valley Metro staff to design the driver work schedules efficiently as the COA and TVP are implemented.

The routine replacement of computer hardware and software is included in the plan, as are shop equipment and spare parts.

Chapter 6
Financial Plan

INTRODUCTION

This chapter provides a financial plan for funding existing and proposed Valley Metro services for the TDP's ten-year planning period. The projects indicated in Years 1-3 should be considered short-term, those in Years 4-7 are considered mid-term, and those planned for years 8 through 10 should be considered long-term projects. The financial plan addresses both operations and capital budgets, focusing on the project and capital recommendations that were highlighted in Chapter 4 and the implementation schedule and capital needs highlighted in Chapter 5.

It should be noted that over the course of the ten-year period there are a number of unknown factors that could affect transit finance including: the future economic condition of the City of Roanoke and its local municipal partners; the availability of funding from the Federal Transit Administration; and the availability of funding from the Commonwealth Transportation Fund. The relatively new Smart Scale program was recently implemented by the Virginia Secretary of Transportation and may also be an important funding source for projects that are multi-modal in nature. In addition, the Virginia Department of Rail and Public Transportation (DRPT) is currently considering the most feasible way to replace revenue bonds that expired in Fy2016 and had been used to fund transit capital projects. The decisions made by DRPT with regard to future revenue generation for transit will affect Valley Metro's capital funding scenarios.

The Roanoke Valley Transit Vision Plan (TVP), completed in 2016, presented a comprehensive vision of public transportation services for the entire Roanoke Valley. The TVP contemplates a higher level of transit service than is planned for within this current TDP and should be closely consulted should additional funding sources become available.

OPERATING EXPENSES AND FUNDING SOURCES

Tables 6-1 and 6-2 provide a financial plan for the operation of Valley Metro's services under the ten-year plan. Table 6-1 summarizes the annual revenue hours of service for the existing transit program as well as for the service projects that are recommended. Table 6-2 provides operating cost estimates, and Table 6-3 identifies the funding sources associated with these service projects. A number of assumptions used in developing the operating cost estimates are described as follows.

For FY2019, the first year of the plan, the expenses and revenues are based on Valley Metro's adopted budget for the fiscal year. In FY2020, the TDP includes a reduction in the number of routes that have 30-minute service, which frees up funding to implement a new Route 93, as well as hire a service planner and update the agency's public information.

In FY2021 one additional route is projected to be implemented (Brandon Avenue Connector). Two additional routes planned for implementation during the TDP period are inter-jurisdictional, which will require additional local match from the city's funding partners. These routes (Electric Road Corridor and Towne Square/Williamson/Peters Creek/DMV are shown for implementation in FY2022 for planning purposes, but implementation is conditional on financial assistance from the jurisdictions serviced. Service later in the evening is added in FY2024 and limited Sunday service is added in FY2025.

The projected cost per revenue hour and the operating costs to maintain the current level of service between FY2020 and FY2028 assume a 3% annual inflation rate. It is understood that none of the funding partners are committing to these funding levels, but that they are planning estimates. Specific funding amounts for each year will be determined during the annual SYIP adoption and budget cycle for the Commonwealth and the local funding partners.

The planning estimates used on the funding side of the equation are presented with flat funding from federal and state sources, and local funding increases are based on 3% annual inflation. Presenting the financial plan in this manner draws attention to the level of funding that will be needed from a variety of sources to implement the plan. Some level of additional federal and state resources may be available to help the region implement planned service improvements, but it is not a given.

Table 6-1: Valley Metro TDP Financial Plan for Operations – Planned Revenue Hours

Projects	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028
Projected Incremental Annual Revenue Hours											
Current Level of Service - all services	144,811	144,811	144,811	144,811	144,811	144,811	144,811	144,811	144,811	144,811	144,811
TDP Improvements											
Minor COA Route Adjustments - no additional hours											
Split Pulse (TBD), no additional hours											
Changes to 30-Minute Service Pattern (-9,360 hours, +2000 hours)			(7,360)	(7,360)	(7,360)	(7,360)	(7,360)	(7,360)	(7,360)	(7,360)	(7,360)
New Route 93			4,360	4,360	4,360	4,360	4,360	4,360	4,360	4,360	4,360
Brandon Avenue Connector				4,360	4,360	4,360	4,360	4,360	4,360	4,360	4,360
Electric Road Corridor (TBD)					4,360	4,360	4,360	4,360	4,360	4,360	4,360
Towne Square/Williamson/DMV (TBD)					4,360	4,360	4,360	4,360	4,360	4,360	4,360
Salem Circulator (TBD)											
Extended Hours of Service							12,168	12,168	12,168	12,168	12,168
Sunday Service								11,180	11,180	11,180	11,180
Total Transit Revenue Hours	**144,811**	**144,811**	**141,811**	**146,171**	**154,891**	**154,891**	**167,059**	**178,239**	**178,239**	**178,239**	**178,239**

Table 6-2: Valley Metro TDP Financial Plan for Operations – Estimated Annual Operating Expenses

Projects	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028
Projected Operating Expenses											
Cost Per Revenue Hour	$69.22	$73.92	$76.14	$78.42	$80.78	$83.20	$85.70	$88.27	$90.92	$93.64	$96.45
Current Level of Service	$10,023,281	$10,704,827	$11,025,972	$11,356,751	$11,697,453	$12,048,377	$12,409,828	$12,782,123	$13,165,587	$13,560,555	$13,967,371
TDP Improvements											
Minor COA Route Adjustments - no additional hours											
Split Pulse (TBD), no additional hours											
Changes to 30-Minute Service Pattern (-9,360 hours, +2000 hours)			-$560,394	-$577,205	-$594,522	-$612,357	-$630,728	-$649,650	-$669,139	-$689,213	-$709,890
New Route 93			$331,972	$341,931	$352,189	$362,755	$373,638	$384,847	$396,392	$408,284	$420,533
Service Planner			$66,950	$68,959	$71,027	$73,158	$75,353	$77,613	$79,942	$82,340	$84,810
Update of Public Information			$35,000	$2,500	$2,575	$2,652	$2,732	$2,814	$2,898	$2,985	$3,075
Driver Scheduling Software			$12,000	$12,360	$12,731	$13,113	$13,506	$13,911	$14,329	$14,758	$15,201
Brandon Avenue Connector				$341,931	$352,189	$362,755	$373,638	$384,847	$396,392	$408,284	$420,533
Electric Road Corridor (TBD)					$352,189	$362,755	$373,638	$384,847	$396,392	$408,284	$420,533
Towne Square/Williamson/DMV (TBD)					$352,189	$362,755	$373,638	$384,847	$396,392	$408,284	$420,533
Salem Circulator (TBD)							$1,042,758	$1,074,040	$1,106,262	$1,139,450	$1,173,633
Extended Hours of Service								$986,832	$1,016,437	$1,046,930	$1,078,338
Sunday Service											
Total Projected Operating Expenses	**$10,023,281**	**$10,704,827**	**$10,911,501**	**$11,547,227**	**$12,598,023**	**$12,975,963**	**$14,408,000**	**$15,827,072**	**$16,301,884**	**$16,790,941**	**$17,294,669**
% Change Year by Year		**7%**	**2%**	**6%**	**9%**	**3%**	**11%**	**10%**	**3%**	**3%**	**3%**

Table 6-3: Valley Metro Financial Plan for Operations – Estimated Annual Operating Funding and Revenue

Anticipated Revenue and Subsidies	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028
Passenger Revenue	$1,922,571	$2,244,672	$2,312,012	$2,381,373	$2,452,814	$2,526,398	$2,602,190	$2,680,256	$2,760,663	$2,843,483	$2,928,788
Advertising	$111,036	$121,210	$124,846	$128,592	$132,449	$136,423	$140,516	$144,731	$149,073	$153,545	$158,152
Interest	$1,130	$1,507	$1,552	$1,599	$1,647	$1,696	$1,747	$1,799	$1,853	$1,909	$1,966
Other Revenue	$148,426	$152,387	$156,959	$161,667	$166,517	$171,513	$176,658	$181,958	$187,417	$193,039	$198,830
Subtotal, Revenue	$2,183,163	$2,519,776	$2,595,369	$2,673,230	$2,753,427	$2,836,030	$2,921,111	$3,008,744	$3,099,007	$3,191,977	$3,287,736
Net Deficit	$7,840,118	$8,185,051	$8,316,131	$8,873,997	$9,844,595	$10,139,933	$11,486,889	$12,818,328	$13,202,877	$13,598,964	$14,006,933
Federal Funds	$2,967,855	$3,319,227	$3,319,227	$3,319,227	$3,319,227	$3,319,227	$3,319,227	$3,319,227	$3,319,227	$3,319,227	$3,319,227
State Funds	$2,021,469	$2,126,805	$2,126,805	$2,126,805	$2,126,805	$2,126,805	$2,126,805	$2,126,805	$2,126,805	$2,126,805	$2,126,805
Other Local Funds	$397,373	$402,536	$414,612	$427,050	$439,862	$453,058	$466,650	$480,649	$495,069	$509,921	$525,218
New River Valley	$52,310	$101,302	$104,341	$107,471	$110,695	$114,016	$117,437	$120,960	$124,589	$128,326	$132,176
Virginia Tech	$409,950	$244,020	$251,341	$258,881	$266,647	$274,647	$282,886	$291,373	$300,114	$309,117	$318,391
City of Roanoke	$1,991,161	$1,991,161	$2,050,896	$2,112,423	$2,175,795	$2,241,069	$2,308,301	$2,377,550	$2,448,877	$2,522,343	$2,598,013
Subtotal, Subsidies	$7,840,118	$8,185,051	$8,267,222	$8,351,857	$8,439,032	$8,528,822	$8,621,306	$8,716,564	$8,814,680	$8,915,739	$9,019,831
Total Projected Operating Revenue and Subsidies	**$10,023,281**	**$10,704,827**	**$10,862,591**	**$11,025,088**	**$11,192,459**	**$11,364,852**	**$11,542,417**	**$11,725,308**	**$11,913,687**	**$12,107,716**	**$12,307,567**
Net Income / Additional Funding Needs	**$0**	**$0**	**-$48,910**	**-$522,139**	**-$1,405,563**	**-$1,611,111**	**-$2,865,583**	**-$4,101,764**	**-$4,388,198**	**-$4,683,224**	**-$4,987,102**

Note: This budget shows level funding for state and federal sources. An inflation factor of 3% per year is included for local sources. Federal and state funds may be available above the current level for future expansions, but are not certain.

CAPITAL EXPENSES AND FUNDING SOURCES

Replacement and Expansion Vehicle Expenses and Funding

Table 6-4 offers the financial plan for Tier 1 projects including vehicle expansion and replacement over the ten-year period.

Eligible activities for funding under Tier 1 include[1]:

- Replacement and expansion vehicles
- Assembly line inspection
- Fare collection equipment
- Automated passenger counters
- On-vehicle radios and communication equipment
- Surveillance cameras
- Aftermarket installation of farebox, radios, and surveillance cameras
- Vehicle tracking hardware and software
- Rebuilds and mid-life repower of rolling stock

Over this plan's ten-year timeline a total of two expansion and 61 replacement vehicles are recommended. These vehicles are ordered with bicycle racks, with the exception of the trolleys.

Federal and state matching ratios for Tier 1 projects are currently as follows: federal – 80%; state – 16%.

DRPT is in the process of implementing significant changes to the capital funding program. These changes will go into effect for FY2020, with guidance provided for transit agencies prior to the FY2020 grant application deadline. Preliminary information from DRPT suggests that the tiered approach will be replaced and that up to a 68% state match will be available for capital items.

[1] DRPT FY2015 Revised Budget. http://www.drpt.virginia.gov/media/1293/fy15-drpt-agency-budget-revised.pdf

Table 6-4: Tier 1 Projected Capital Expenses and Funding

Type of Vehicle	FY2018 and FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028
Revenue Vehicles - Replacement										
Heavy Duty	14	5	11	2				9		
Over the Road Coach					2					
Trolley	4									
Body-on-Chassis		6		3			3		6	
Expansion										
Heavy Duty				2						
Sub-Total Revenue Vehicles	**18**	**11**	**11**	**7**	**2**	**0**	**3**	**9**	**6**	**0**
Vehicle Costs										
Replacement		$2,751,424	$5,330,127	$1,236,001	$1,508,650	$0	$256,608	$5,305,833	$555,090	$0
Expansion				$1,007,878						
Sub-Total Vehicle Costs	**$7,480,444**	**$2,751,424**	**$5,330,127**	**$2,243,879**	**$1,508,650**	**$0**	**$256,608**	**$5,305,833**	**$555,090**	**$0**
Real Time Info and APCs		$850,000	$850,000							
Sub-Total Tier One	**$7,480,444**	**$3,601,424**	**$6,180,127**	**$2,243,879**	**$1,508,650**	**$0**	**$256,608**	**$5,305,833**	**$555,090**	**$0**
Anticipated Funding Sources - Federal/State/Local Matching Ratios										
Federal	$2,948,833	$2,881,139	$4,944,102	$1,795,103	$1,206,920	$0	$205,286	$4,244,666	$444,072	$0
State	$4,320,811	$576,228	$988,820	$359,021	$241,384	$0	$41,057	$848,933	$88,814	$0
Local	$210,800	$144,057	$247,205	$89,755	$60,346	$0	$10,264	$212,233	$22,204	$0
Total Funding	**$7,480,444**	**$3,601,424**	**$6,180,127**	**$2,243,879**	**$1,508,650**	**$0**	**$256,608**	**$5,305,833**	**$555,090**	**$0**

Notes:
FY2018 and FY2019 vehicles are funded with MPO CMAQ RSTP funds.
Future vehicle purchases are assumed to be funded as follows: 80% federal; 16% state; and 4% local.
DRPT is in the process of changing the capital funding program, which could change these ratios to a 68% state match.
Bike racks and radios are also included in base vehicle costs

Infrastructure Facilities Expenses and Funding

Table 6-5 provides the financial plan for infrastructure facilities, considered Tier 2 capital projects. Eligible activities under this funding tier include[2]:

- Construction of infrastructure or facilities for transit purposes
- Real estate used for a transit purpose
- Signage
- Surveillance/security equipment for facilities
- Rehabilitation or renovation of infrastructure and facilities
- Major capital projects

The focus of the Tier 2 projects for Valley Metro is to improve passenger facilities, including the replacement of Campbell Court and the development of satellite transit centers. In order to help improve bus stops throughout the service area, a budget of $20,000 per year of the TDP was included. Estimated unit costs for bus stop improvements (e.g. shelters and benches) are shown in Table 6-6.

Federal and state matching ratios for Tier 2 projects are currently as follows: federal – 80%; state – 16%. These are the ratios that have been used for Table 6-5; however, as previously noted DRPT is in the process of changing its capital finance program.

[2] DRPT FY2015 Revised Budget. http://www.drpt.virginia.gov/media/1293/fy15-drpt-agency-budget-revised.pdf

Table 6-5: Tier 2 Projected Capital Expenses and Funding

Capital Need	FY 2019	FY 2020	FY 2021	FY2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Transit Infrastructure Facilities										
Downtown Transit Center		$500,000	$500,000	$4,500,000	$4,500,000					
Satellite Transit Centers					$500,000		$500,000		$500,000	
Additional shelters and benches	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000
Facility Improvements			$80,000	$60,000						
Total Costs	**$20,000**	**$520,000**	**$600,000**	**$4,580,000**	**$5,020,000**	**$20,000**	**$520,000**	**$20,000**	**$520,000**	**$20,000**
Anticipated Funding Sources- Current Federal/State/Local Matching Ratios										
Federal	$16,000	$416,000	$480,000	$3,664,000	$4,016,000	$16,000	$416,000	$16,000	$416,000	$16,000
State	$3,200	$83,200	$96,000	$732,800	$803,200	$3,200	$83,200	$3,200	$83,200	$3,200
Local	$800	$20,800	$24,000	$183,200	$200,800	$800	$20,800	$800	$20,800	$800
Total Funding	**$20,000**	**$520,000**	**$600,000**	**$4,580,000**	**$5,020,000**	**$20,000**	**$520,000**	**$20,000**	**$520,000**	**$20,000**

Table 6-6: Bus Stop Improvement Costs

Improvement	Unit Cost
Shelter (installed)	$5,000 - $10, 000
Bench (installed)	$1,500 - $2,500
4' Wide Sidewalk	$17.50 - $25.00 per linear foot
Bicycle Racks	$200 - $500
Curb Ramps	$2,000 - $2,500

Other Capital Expenses and Funding Sources

Other capital expenses, considered Tier 3 capital projects, are presented in Table 6-7. Capital projects eligible for funding under this tier include[3]:

- All support vehicles
- Shop equipment
- Spare parts
- Hardware and software not installed on a vehicle
- Project development expenses for capital projects
- Office furniture and other equipment
- Handheld radios
- Landscaping
- Other transit-related capital items

Federal and state matching ratios for Tier 3 projects are currently as follows: federal – 80%; state – 16%. These are the ratios that have been used for Table 6-7; however, as previously noted, DRPT is in the process of changing its capital finance program.

Table 6-7: Tier 3 Projected Capital Expenses and Funding

Other Capital	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Shop Equipment/Parts		$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000
Technology Equipment	$78,783	$205,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000
Service Vehicles		$60,000	$90,000	$90,000	$100,000	$60,000				
Subtotal	**$78,783**	**$275,000**	**$105,000**	**$105,000**	**$115,000**	**$75,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**
Anticipated Funding Sources - Current Federal/State/Local Matching Ratios										
Federal	$63,026	$220,000	$84,000	$84,000	$92,000	$60,000	$12,000	$12,000	$12,000	$12,000
State	$12,605	$44,000	$16,800	$16,800	$18,400	$12,000	$2,400	$2,400	$2,400	$2,400
Local	$3,151	$11,000	$4,200	$4,200	$4,600	$3,000	$600	$600	$600	$600
Total Funding	**$78,783**	**$275,000**	**$105,000**	**$105,000**	**$115,000**	**$75,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**

Total Capital Expenses over TDP Timeframe

Table 6-8 presents a summary of the total capital program categorized by tier for the TDP period. Under each tier, the projects are listed by fiscal year. Actual project implementation will be determined each year based on available funds.

As previously discussed, DRPT is in the process of changing its capital program. Valley Metro will need to keep abreast of how the new capital program will affect its annual capital grant application. DRPT has indicated that there will be information sessions scheduled prior to the FY2020 grant application cycle.

Table 6-8: Valley Metro Capital Budget- FY2019-FY2028

	FY2018 and FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028
Tier 1 Costs										
Replacement	$7,480,444	$2,751,424	$5,330,127	$1,236,001	$1,508,650		$256,608	$5,305,533	$555,090	$0
Expansion				$1,007,878						
Real Time Info and APCs		$850,000	$850,000							
Sub-Total Cost	**$7,480,444**	**$3,601,424**	**$6,180,127**	**$2,243,879**	**$1,508,650**	**$0**	**$256,608**	**$5,305,533**	**$555,090**	**$0**
Tier 2 Costs										
Downtown Transit Center		$500,000	$500,000	$4,500,000	$4,500,000					
Satellite Transit Centers					$500,000		$500,000		$500,000	
Additional Shelters and Benches	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000
Facility Improvements			$80,000	$60,000						
Sub-Total Cost	**$20,000**	**$520,000**	**$600,000**	**$4,580,000**	**$5,020,000**	**$20,000**	**$520,000**	**$20,000**	**$520,000**	**$20,000**
Tier 3 Costs										
Shop Equipment/Parts	$0	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000
Technology Equipment	$78,783	$205,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000
Service Vehicles	$0	$60,000	$90,000	$90,000	$100,000	$60,000				
Sub-Total Cost	**$78,783**	**$275,000**	**$105,000**	**$105,000**	**$115,000**	**$75,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**
Total Capital Cost	**$7,579,227**	**$4,396,424**	**$6,885,127**	**$6,928,879**	**$6,643,650**	**$95,000**	**$791,608**	**$5,340,533**	**$1,090,090**	**$35,000**
Anticipated Funding Sources - Current Federal/State/Local Matching Ratios										
Federal	$6,063,382	$3,517,139	$5,508,102	$5,543,103	$5,314,920	$76,000	$633,286	$4,272,426	$872,072	$28,000
State	$1,212,676	$703,428	$1,101,620	$1,108,621	$1,062,984	$15,200	$126,657	$854,485	$174,414	$5,600
Local	$303,169	$175,857	$275,405	$277,155	$265,746	$3,800	$31,664	$213,621	$43,604	$1,400
Total Funding	**$7,579,227**	**$4,396,424**	**$6,885,127**	**$6,928,879**	**$6,643,650**	**$95,000**	**$791,608**	**$5,340,533**	**$1,090,090**	**$35,000**