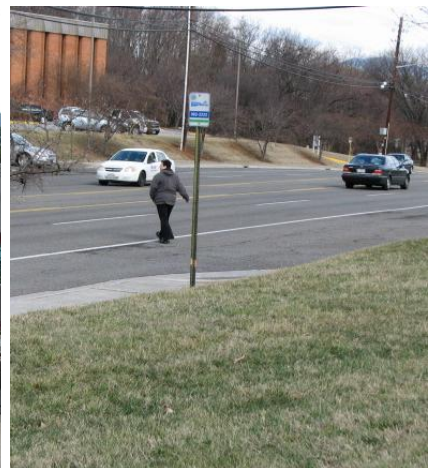




BUS STOP ACCESSIBILITY STUDY

Roanoke Valley Area Metropolitan Planning Organization

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Note: The cost estimates provided in this document are general planning level costs that because of the rough scope of each project, do not necessarily account for all project costs, including mobilization, maintenance of traffic and work area protection, erosion and sediment control measures, demolition of existing infrastructure, utility relocations/adjustments, etc. that would be determined during the design of specific project improvements. Such costs should be considered in the final project budget.

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1.0 INTRODUCTION

The public transit system in the Roanoke Valley operates mainly in the City of Roanoke, the City of Salem, and the Town of Vinton. Fixed-route buses and trolleys, along with regional buses to Blacksburg and Lynchburg provide good options for getting around these areas. Anyone who can get to a bus stop is able to get anywhere in the system within a reasonable amount of time. However, many bus stops in the system lack the appropriate pedestrian infrastructure for people to access the bus stop or to wait for the bus in a safe or comfortable place. The challenge is compounded for people with disabilities.

The Roanoke Valley-Alleghany Regional Commission, in working with the Blue Ridge Independent Living Center, RADAR, and Valley Metro, studied the bus stops in the regional transit system. The purpose of the Bus Stop Accessibility Study was to identify ways to make it safer and easier for pedestrians to get to and from bus stops and to make bus stops themselves easier and safer to use, particularly for pedestrians with disabilities. The Study had the following goals:

- To identify the key bus stops in need of accessibility accommodations, the improvements needed and the estimated costs;
- To identify examples from other places on how to make bus stops more accessible; and,
- To identify funding sources for making accessibility improvements.

Although this study delves into improvements needed at specific high activity bus stops, many other bus stops in the system are also in need of basic accessibility improvements. The recommendations provided for high activity bus stops along with the examples of accessibility improvements should provide sufficient guidance on how to approach accessibility improvements to bus stops throughout the regional transit system. So many bus stops need to be improved in order to make them accessible for people with disabilities that great efforts will need to be made among many parties in order to provide acceptable transit facilities.

2.0 METHODOLOGY

At the time the Bus Stop Accessibility Study was starting, an effort to sample the transit system's ridership was finishing. From July 2010 to June 2011, the National Transit Database (NTD) Survey took place. In general, the survey involved RVARC and Valley Metro staff and volunteers riding randomly selected routes and counting how many people got on and off each stop. The survey provided stop-level sample data that enabled staff to identify the bus stops with the most activity, which in turn were determined to be the bus stops most in need of being accessible.

In addition to analyzing the NTD survey data, staff updated the database of all the bus stops in the system. In August 2011, each bus route was driven and the locations of signed stops were noted on aerial maps. These locations were then mapped in GIS. After entering the NTD data into a MS Access database, the information was linked to the stop locations in GIS to enable a visual perspective of stop activity and allow for further analysis. Field visits were conducted at the 30 bus stops with the most activity to evaluate them for accessibility. The criteria to evaluate accessibility came from the Easter Seals Project Action Bus Stop Accessibility Toolkit. A copy of the survey with some modifications for the Roanoke area is available in Appendix A.

In addition to the NTD survey, a key source of locations accessed by people with disabilities was RADAR's database of STAR trip origins and destinations. RADAR, through its STAR service, provides complementary paratransit service in the City of Salem, the City of Roanoke, and the Town of Vinton. Through these data, the most frequent pick-up locations for each zip code were evaluated. In total, 32 pick-up locations were studied. For locations near a bus stop, field visits were conducted to identify if accessibility improvements were needed.

Recommendations are provided detailing the improvements needed to make the bus stops accessible. Planning-level cost estimates were developed using the VDOT planning level cost estimation table, unit prices from recent City of Roanoke street improvement projects, and actual costs of recent Valley Metro bus stop improvements. Examples of ADA accessible bus stops from other places were reviewed and are provided in this document to highlight options when making accessibility improvements at bus stops. Lastly, potential funding sources were identified and summarized.

3.0 AMERICANS WITH DISABILITY ACT STANDARDS FOR ACCESSIBLE DESIGN

The Americans with Disability Act (ADA) was originally enacted in public law in 1990. The Act prohibits discrimination and ensures equal opportunity for persons with disabilities in many areas including public accommodations and transportation. In 2010, the Department of Justice adopted ADA standards for Accessible Design¹ related to transportation facilities (section 810). Selected standards related to bus stop accessibility are listed below for reference.

Advisory 810.2 Bus Boarding and Alighting Areas:

At bus stops where a shelter is provided, the bus stop pad can be located either within or outside of the shelter.

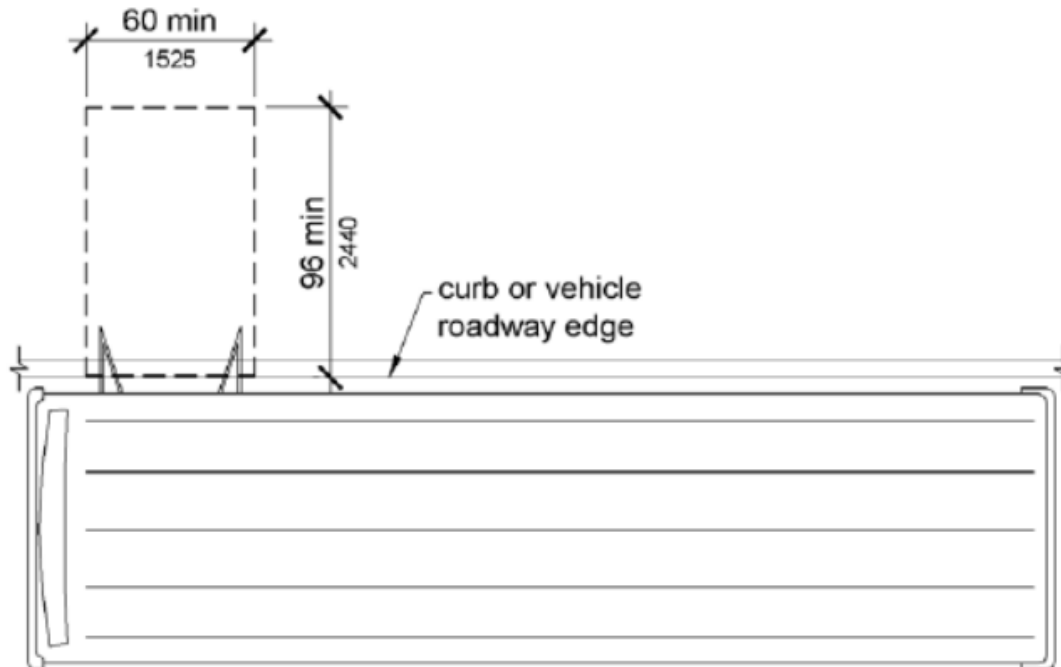
810.2.1 Surface:

Bus stop boarding and alighting areas shall have a firm, stable surface.

810.2.2 Dimensions:

Bus stop boarding and alighting areas shall provide a clear length of 96 inches minimum, measured perpendicular to the curb or vehicle roadway edge, and a clear width of 60 inches minimum, measured parallel to the vehicle roadway.

¹ Reference: 2010 ADA Standards for Accessible Design,
<http://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm#c4>



810.2.3 Connection:

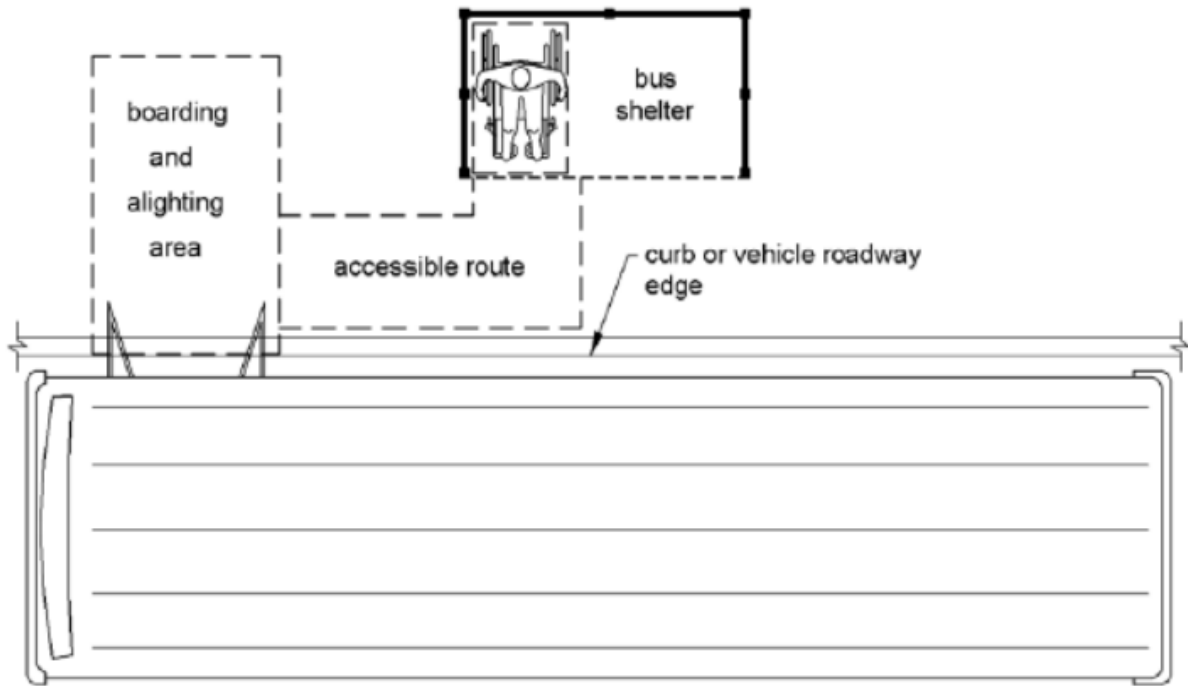
Bus stop boarding and alighting areas shall be connected to streets, sidewalks, or pedestrian paths by an accessible route complying with 402.

810.2.4 Slope:

Parallel to the roadway, the slope of the bus stop boarding and alighting area shall be the same as the roadway, to the maximum extent practicable. Perpendicular to the roadway, the slope of the bus stop boarding and alighting area shall not be steeper than 1:48 (e.g. 1 inch elevation change over 4 linear feet).

810.3 Bus Shelters:

Bus shelters shall provide a minimum clear floor or ground space complying with 305 entirely within the shelter. Bus shelters shall be connected by an accessible route complying with 402 to a boarding and alighting area complying with 810.2.



810.4 Bus Signs:

Bus route identification signs shall comply with 703.5.1 through 703.5.4, and 703.5.7 and 703.5.8. In addition, to the maximum extent practicable, bus route identification signs shall comply with 703.5.5.

EXCEPTION: Bus schedules, timetables and maps that are posted at the bus stop or bus bay shall not be required to comply.

4.0 NATIONAL TRANSIT DATABASE (NTD) SURVEY AND DATA ANALYSIS

The National Transit Database (NTD) is the Nation's main source for information and statistics on the transit systems in the United States. The Federal Transit Administration collects the data and uses it to apportion funding based on formulas that are data-driven. Every three years, a ridership survey is conducted on Valley Metro routes. Using a sampling method, the survey records unlinked passenger trips (all boardings) and passenger miles. In the 2010-2011 survey, in order to make the survey more useful for planning purposes, surveyors captured additional information such as where bikes board/alight and where the lift is used. A sample survey trip sheet is provided below.

SURVEY TRIP SHEET							
Trip ID	M5116	Bus Number	0614	Bus Type	Valley Metro		
Date	5/24/11	Route Number	51	(circle one)	Smart Way		
Stop Description	Odometer	Passengers Boarded	Passengers Deboarded	Passengers On Board	Bikes Boarded	Bikes Deboarded	Lift Used
Campbell Court	107.14	12		12			
Patrick Henry Hotel	114		1	11			
Jefferson & Mountain	1.6		2	9			
Jefferson & Walnut	1.8		1	8			
Carroll & RMH	2.8		1	7			
Franklin & Roberts	4.1	2	1	8			
Franklin & Kmart	4.9	1	1	8			
Franklin & Townside	5.0		1	7			
Franklin & Applemont	5.2		1	6			
Kroger	5.7	1	1	6			
Tanglewood, EOL	6.0	4		10			
Surveyor: <i>Ann Bohm</i>	Start Time:	End Time:					

As shown in the example survey trip sheet, the survey was filled out manually by many surveyors. When the information was input into a spreadsheet, it was necessary to standardize the stop names in order to more accurately aggregate the data. Names were assigned based on the street name on which the stop was located, the direction of travel of the bus, the nearest cross street, and in some cases the adjacent business (e.g. Williamson SB at Carver (Sheetz)). On occasion, the bus stop name was simply that of the nearest major landmark (e.g. Roanoke Memorial Hospital).

Although the NTD Survey data was not collected with the purpose of conducting statistically valid bus stop level activity analysis, based on professional knowledge of the system, the sample data identifies trends that make intuitive sense. Further investigation should be conducted before making permanent service changes or adjustments to stop locations. For this Study, the NTD survey data was helpful in answering the question, which are the most active stops in the transit system? To answer this question, the following variables were calculated for each bus stop.

Average Stop Usage

Description: The average number of people who got on and off the bus at a specific bus stop over the survey period.

Formula: Average Stop Usage = $\frac{\text{total boardings} + \text{deboardings at a bus stop}}{\text{number of times the bus route was surveyed}}$

Ex. Location: Williamson NB at Carver

Calculation: Average Stop Usage = $\frac{2 + 10}{16} = .75$

When the bus passed, an average of 0-1 people got on or off at this stop.

Stop Frequency

Description: How often the bus stopped at a specific bus stop over the survey period.

Formula: Stop Frequency = $\frac{\text{number of times the bus stopped at a bus stop}}{\text{total number of times the bus route was surveyed}}$

Ex. Location: Williamson NB at Carver

Calculation: Stop Frequency = $\frac{7}{16} = 0.44 = 44\%$

Hence, the bus stopped at this location 44% of the time it passed by.

Bus Stop Activity Index

Description: A measure used to gauge overall activity at a bus stop and compare activity among bus stops across the transit system, regardless of the number of times the bus route was surveyed.

Formula: Stop Usage * Stop Frequency

Ex. Location: Williamson NB at Carver

Calculation: $.75 * 44\% = .33$

With an average stop usage less than 1 and a stop frequency less than 50%, the resulting activity index is also low.

The following tables show the top bus stops in each category.

Table1: Bus Stops sorted by Stop Usage
The bus picked up or dropped off an average of two or more people at the following locations.

Standardized Stop Description	Activity Index	Average Usage	Stop Frequency
Campbell Court	8.7630	9.51	0.92
VT Squires Student Center	8.1333	8.13	1.00
East Main at Goodwill Transfer Center	7.2564	7.83	0.93
Valley View Ring Road SB at Walmart	6.8472	7.25	0.94
Lake Drive Plaza Big Lots (Hardy Road)	4.5000	4.50	1.00
Spartan Square Kroger	4.5000	4.50	1.00
Roanoke Regional Airport	2.9333	4.00	0.73
Towers Shopping Center Kroger	2.2076	3.41	0.65
Crossroads Shopping Center Driveway WB at Work Force/Kmart	2.4375	3.25	0.75
Hunt EB at 8th	2.8438	3.25	0.88
Valley View Mall SB at Sears	2.0663	3.21	0.64
Campbell WB at Norfolk (Valley Metro Admin Bldg)	1.5000	3.00	0.50
Colonial SB at VWCC Pedestrian Overpass	2.1176	3.00	0.71
Towers Shopping Center Upper Lot	2.2426	2.83	0.79
Salem Turnpike WB at Delta	2.5867	2.79	0.93
Tazewell EB at 4th	2.4063	2.75	0.88
Brambleton SB at Ashby	1.0400	2.60	0.40
VA Hospital Private Road Stop 2	1.9513	2.58	0.76
Burrell SB at Whitten	1.8750	2.50	0.75
Edgewood NB at Westover	1.2500	2.50	0.50
Ferncliff SB at Hoback	2.5000	2.50	1.00
Hardy WB at Bedford	2.0000	2.50	0.80
Elm EB at 8th	2.1799	2.47	0.88
Tanglewood Mall at AC Moore	1.4672	2.32	0.63
Plantation NB at Frontier	1.1723	2.24	0.52
Tazewell WB at I-581 Bridge	1.5400	2.20	0.70
Hunt WB at 8th	1.3281	2.13	0.63
Elm EB at 5th	1.7439	2.12	0.82
Towne Square Kroger	1.5404	2.11	0.73
Melrose WB at 35th	1.2781	2.08	0.62

As shown in Table 1 above, a bus stop may rank high in Stop Usage, as in the case of the Brambleton SB at Ashby stop, where the bus picked up or dropped off a lot of people for the number of times the route was surveyed. However, in looking at the Stop Frequency, this bus stop ranked low, thus the survey identified what appears to be an uncommon occurrence when many people used that bus stop. Hence, the resulting Activity Index ranks the stop lower compared to other bus stops in the system.

Table 2: Bus Stops sorted by Stop Frequency

When the bus passed, it stopped at the following locations most frequently.

Standardized Stop Description	Activity Index	Average Usage	Stop Frequency
Ferncliff SB at Hoback	2.5000	2.50	1.00
Lake Drive Plaza Big Lots (Hardy Road)	4.5000	4.50	1.00
Spartan Square Kroger	4.5000	4.50	1.00
VT Squires Student Center	8.1333	8.13	1.00
Valley View Ring Road SB at Walmart	6.8472	7.25	0.94
Salem Turnpike WB at Delta	2.5867	2.79	0.93
East Main at Goodwill Transfer Center	7.2564	7.83	0.93
Campbell Court	8.7630	9.51	0.92
Elm EB at 8th	2.1799	2.47	0.88
Hunt EB at 8th	2.8438	3.25	0.88
Tazewell EB at 4th	2.4063	2.75	0.88
Brandon WB at Stratford Park (Brandon Oaks)	1.2711	1.47	0.87
Melrose EB at Victoria (Melrose Towers)	1.7911	2.07	0.87
Elm EB at 5th	1.7439	2.12	0.82
Hardy WB at Bedford	2.0000	2.50	0.80
Towers Shopping Center Upper Lot	2.2426	2.83	0.79
VA Hospital Private Road Stop 2	1.9513	2.58	0.76
Burrell SB at Whitten	1.8750	2.50	0.75
Crossroads Shopping Center Driveway WB at Work Force/Kmart	2.4375	3.25	0.75
Grandview SB at Hershberger	0.7500	1.00	0.75
Highland EB at 12th	0.8438	1.13	0.75
Hunt WB at Liberty	1.1719	1.56	0.75
Edgewood SB at Westover	0.8800	1.20	0.73
Exit 140 Park and Ride	1.3200	1.80	0.73
Melrose EB at 35th	1.3200	1.80	0.73
Roanoke Regional Airport	2.9333	4.00	0.73
Towne Square Kroger	1.5404	2.11	0.73
18th SB at Patterson	0.7143	1.00	0.71
Grandin NB at Windsor	0.9694	1.36	0.71
Grandin SB at Windsor	0.8163	1.14	0.71
Maiden WB at Bluemont	1.1224	1.57	0.71
Salem Avenue WB at 8th	0.9694	1.36	0.71
Salem Turnpike EB at 24th	1.4796	2.07	0.71
Salem Turnpike WB at 24th	0.8673	1.21	0.71
Colonial SB at VWCC Pedestrian Overpass	2.1176	3.00	0.71

Table 2 shows the Stop Frequency which highlights bus stops that are used a lot, regardless of how many people are getting on or off at that stop. During the NTD survey, every time the corresponding routes were surveyed, the top four stops listed above experienced a pick-up and/or a drop-off. Campbell Court is not listed at 100% because not every route every time the station was surveyed had a pick-up or drop-off.

Table 3: Bus Stops sorted by Activity Index

Activity Index is a factor used to rank stops as a function of how often the bus stopped at a location and the number of people who boarded or alighted.

Standardized Stop Description	Activity Index	Average Usage	Stop Frequency
Campbell Court	8.7630	9.51	0.92
VT Squires Student Center	8.1333	8.13	1.00
East Main at Goodwill Transfer Center	7.2564	7.83	0.93
Valley View Ring Road SB at Walmart	6.8472	7.25	0.94
Lake Drive Plaza Big Lots (Hardy Road)	4.5000	4.50	1.00
Spartan Square Kroger	4.5000	4.50	1.00
Roanoke Regional Airport	2.9333	4.00	0.73
Hunt EB at 8th	2.8438	3.25	0.88
Salem Turnpike WB at Delta	2.5867	2.79	0.93
Ferndale SB at Hoback	2.5000	2.50	1.00
Crossroads Shopping Center Driveway WB at Work Force/Kmart	2.4375	3.25	0.75
Tazewell EB at 4th	2.4063	2.75	0.88
Towers Shopping Center Upper Lot	2.2426	2.83	0.79
Towers Shopping Center Kroger	2.2076	3.41	0.65
Elm EB at 8th	2.1799	2.47	0.88
Colonial SB at VWCC Pedestrian Overpass	2.1176	3.00	0.71
Valley View Mall SB at Sears	2.0663	3.21	0.64
Hardy WB at Bedford	2.0000	2.50	0.80
VA Hospital Private Road Stop 2	1.9513	2.58	0.76
Burrell SB at Whitten	1.8750	2.50	0.75
Melrose EB at Victoria (Melrose Towers)	1.7911	2.07	0.87
Elm EB at 5th	1.7439	2.12	0.82
Towne Square Kroger	1.5404	2.11	0.73
Tazewell WB at I-581 Bridge	1.5400	2.20	0.70
Campbell WB at Norfolk (Valley Metro Admin Bldg)	1.5000	3.00	0.50
Salem Turnpike EB at 24th	1.4796	2.07	0.71
Tanglewood Mall at AC Moore	1.4672	2.32	0.63
Hunt WB at 8th	1.3281	2.13	0.63
Exit 140 Park and Ride	1.3200	1.80	0.73
Melrose EB at 35th	1.3200	1.80	0.73

Table 3 shows Activity Index which is the key variable to compare one bus stop to another. Activity Index takes into account both the Stop Usage and Stop Frequency providing a ranking of bus stops that are used a lot by many people to bus stops that are rarely used by few people. Bus stops ranking high on the Activity Index were visited to assess accessibility.

5.0 FIELD VISITS TO HIGH ACTIVITY STOPS

The 30 most active bus stops in the Valley Metro fixed-route system are reviewed in this section for accessibility needs. They are listed in order starting with the most active.

1.) Campbell Court

Routes:	All routes
Average Usage:	9.51
Stop Frequency:	0.92
Activity Index:	8.76

Campbell Court is the main bus transfer station located in downtown Roanoke. It is the hub of a hub- and spoke-style system. All buses travel through Campbell Court and for most trips, a transfer to another bus is required. Up to fifteen fixed-route buses arrive at one time so people can seamlessly make their connections and reach their destination.



People generally have up to five minutes to transfer buses. Large numbers of people within this time alight one bus and board another bus. ADA accessibility and the resulting ease of transferring at this location is critical; it is a determining factor for people's decision to use the public transit system. If people do not feel they can successfully maneuver from one bus through the station to another bus, they will likely look for another way to get to their destination or not travel at all. The entire transit system depends on the ability to move easily through Campbell Court. While Campbell Court meets basic accessibility requirements, it is not an easy place to move around.



Landing areas can become very crowded at some times during the day making it a challenge for someone with a disability to maneuver from one bus to another. Signs indicating the drive aisle for buses are not easy to see or understand. Visually impaired riders would have an especially difficult time transferring buses. Announcements over a loudspeaker are made to notify people if a bus is in a different location than usual. However, the announcement may be difficult for some people to hear over the hum of buses. Tactile warning surfaces are not present on curb ramps. Several of the pedestrian walkways around the bus station are too narrow to accommodate a wheelchair. As such, people in wheelchairs must travel through the driveways to enter the station. Any pedestrian activity across the driveways causes potential conflicts and



significant safety concerns as buses enter and leave the station. Handicap push buttons are needed on the doors to enter the waiting area.

For several reasons, the future will require the existing station to be reexamined. In the near future, the entrance to new buses will be lower, and the overall bus will be six-inches wider than the current buses. The ability for the bus to fit in the drive aisle and maneuver through the station may require physical changes to the station. Any physical modifications to the station should also consider improvements to make transferring between buses easier and more accessible.

Amtrak passenger rail will soon have a stop in downtown Roanoke, and the rail station will be a gateway for visitors to the Roanoke Valley and points beyond. It will be important that transfers from rail to buses be designed so that people of all ages and abilities can move between modes effortlessly. The City of Roanoke and Valley Metro were recently granted Regional Surface Transportation Program funds to study Campbell Court with respect to its space reallocation needs and connectivity to Amtrak.

Stakeholders	Valley Metro, City of Roanoke, Downtown Roanoke Inc.
Recommendations	As part of the Downtown Roanoke Multimodal Transportation Study, develop options for reallocating space within Campbell Court to improve the ability for pedestrians to more easily transfer between buses including options for more clearly arranging buses within the station, better signage, ADA landings and ramps, and minimizing the need for pedestrians to walk in front of buses.
Estimated Costs	\$300,000 for the study

2.) Virginia Tech Squires Student Center

Routes: Smart Way,
Blacksburg Transit
Average Usage: 8.13
Stop Frequency: 1.00
Activity Index: 8.13

The Virginia Tech Squires Student Center is the main Smart Way pick-up/drop-off location in Blacksburg. The bus stop is located next to a wide sidewalk, which is easily accessible and allows enough room to deploy the lift. The bus stop features a bench and a trash can. Nearby, Squires Student Center provides refuge during inclement weather.



This bus stop is temporary as plans for a multi-modal transit center on the Virginia Tech campus at the corner of West Campus Drive and Perry Street are moving ahead. The project will incorporate the Smart Way commuter bus service. In light of this project, no improvements are recommended at the current location.

Stakeholders	Valley Metro, Blacksburg Transit, Virginia Tech
Recommendations	Coordinate the Smart Way service with the future multi-modal transit facility.
Estimated Costs	N/A

3.) East Main at Goodwill Transfer Center

Routes:	81, 82, 91, 92
Average Usage:	7.83
Stop Frequency:	0.94
Activity Index:	6.84

The NTD survey data showed the East Main at Goodwill Transfer Center stop as the second most used stop in the fixed-route system. Similar in function to Campbell Court, at the time of the NTD survey, this stop required people traveling between Salem and Roanoke to alight one bus and board another in order to continue their trip which was inconvenient for most travelers and an inefficient use of valuable minutes in the transit schedule.

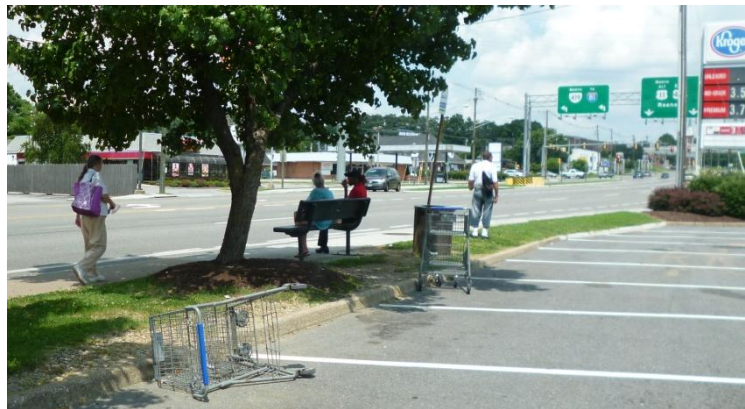
As a result of this realization, and in combination with other factors, the two bus routes were combined in December 2012. This streamlining of the transit line has eliminated the need for people to unnecessarily board and alight at this stop.

As a result, the bus stop at this location has been shifted to the street and is now East Main WB at Lakeside Plaza (Goodwill). The bus stop will continue to be active because of the

commercial trip generators nearby, including the Kroger grocery store. In order for passengers to access Lakeside Plaza, they must cross East Main Street, a five-lane heavily traveled roadway. The nearby intersection of East Main Street and Electric Road features pedestrian signals, crosswalks and curb ramps. However, it is has been frequently observed that people choose to avoid walking a longer distance to cross the street. Favoring a direct path and a few minutes saved, people often cross the five lanes near the driveway entrance to the shopping center, as shown in the picture above. In the case of the lady observed, she was crossing the street from the Goodwill shopping center to access the bus stop at Lakeside Plaza.

The current bus stop location on East Main Street should be reevaluated. Due to people's tendency to cross the street at an unsignalized location, if improvements at the current location cannot be accomplished, the bus stop should be relocated to a nearby signalized intersection.

Kessler Mill Road at East Main Street will be upgraded in the near future to feature pedestrian crossing amenities. The intersection will be part of the East Main Street improvement project and may also feature a greenway crossing as the Hanging Rock Battlefield Trail is extended south.





Another option would be the Route 419/East Main Street intersection. Several activity generators exist near the Route 419/East Main Street intersection. If the stop is relocated closer to this intersection, one location to consider is west of Lakehurst Avenue in front of the Hardees. Curb ramps and pedestrian signals exist to enable users to cross the street safely at the traffic signal.



The ultimate location of this bus stop should feature a small bus shelter along with an adequate landing area.

Stakeholders	Valley Metro, City of Salem, VDOT, Goodwill Industries
Recommendations	Consider options for relocating the East Main WB at Lakeside Plaza (Goodwill) bus stop closer to a signalized intersection. Install a small bus shelter and adequate landing area.
Estimated Costs	Small bus shelter = \$6,620 Labor/Installation = \$3,395 Permits/Site Plans = \$895

4.) Valley View Ring Road SB at Walmart

Routes: 11, 16, 15
Average Usage: 7.25
Stop Frequency: 0.94
Activity Index: 6.84

The Valley View Walmart stop has long been a location that has been recognized as needing accessibility improvements. Had it been simply a matter of installing a sidewalk and a bus shelter, conditions at this stop would have been improved years ago. The stop is located on private property at the boundary where the Walmart property meets the Sears property. Concerns from some of the private owners have kept officials struggling to find an adequate solution. The current stop location takes advantage of a concrete pad over a convergence of utilities. Improvements at the current location are limited due to the location of the utilities. The most recent concepts involve moving the bus stop slightly north, away from the utilities and completely on the Walmart property. Such a location requires a sidewalk ramp accessible for a wheelchair to accommodate the change in grade from the Walmart parking lot and Valley View Ring Road.



Stakeholders	Valley Metro, Valley View Mall management, Walmart
Recommendations	Construct a bus shelter with lighting and a pedestrian connection to the Walmart parking lot.
Estimated Costs	\$100,000

5.) Lake Drive Plaza Big Lots (Hardy Road)

Routes: 35
Average Usage: 4.50
Stop Frequency: 1.00
Activity Index: 4.50



The Kroger grocery store is the main attraction of trips at this location. Route 35 stops here on its way to Downtown Vinton and Orange Avenue. In order for people to travel back towards Campbell Court they must catch the bus at this stop and ride first through Vinton and Orange Avenue or cross Hardy Road and catch route 36 towards Downtown Roanoke.

The current stop location is convenient in that it is right next to the building, though, if needed to save time in the schedule and provide a more efficient service, the stop could be moved to Hardy Road and still serve the shopping center well. A pair of stops in which one bus stop is opposite the other along a road is sometimes easier for riders to understand where to get on/off to get to/from their destination. In either the current or a new location on Hardy Road, the stop needs a bus shelter and lighting.

Stakeholders	Valley Metro, Town of Vinton, Lake Drive Plaza management
Recommendations	Construct a bus shelter with lighting at the current location.
Estimated Costs	Large Shelter = \$9,450 Labor/Installation = \$3,395 Permits/Site Plans = \$895

6.) Spartan Square Kroger/Salem Walmart

Routes: 91
Average Usage: 4.50
Stop Frequency: 1.00
Activity Index: 4.50



Since the NTD survey, route 91 has been modified in that it no longer stops within the Spartan Square shopping center. Instead the bus stop at Spartan Square Kroger is along the street. The level of bus stop activity may have decreased because this stop, at the time of the survey, was the furthest stop west on West Main Street and now there is one stop further west at Walmart. Regardless, it is recommended that the new bus stop location be improved because of the high activity generators located in the Spartan Square shopping center. The bus stop needs a shopping cart corral, a bus shelter, an adequate landing pad, and a trash can.

Because the new stop at the Salem Walmart did not exist at the time of the NTD survey, its rank among bus stops will be determined after the next NTD survey is complete in June 2014. With the extension of the transit line to Walmart, discussions have already taken place about the next destination that could be added to the transit line, Richfield Retirement Center. Like the Spartan Square Kroger stop, the location of the bus stop in the Salem Walmart parking lot could shift to a location on West Main Street if the transit line extends further west to Richfield.



People at the current Walmart stop wait under nearby trees for the bus. Upon seeing the bus, people who use wheelchairs alight the sidewalk using a nearby curb ramp and wait in the driveway aisle, similar to the riders shown in the picture above. It is not preferable that the bus block parked cars. If this location remains a bus stop, parking should be removed (about five spaces) and a curb ramp, shopping car corral, and shelter be installed in their place.

Stakeholders	Valley Metro, City of Salem, Spartan Square management, Kroger, Walmart
Recommendations	Determine long-term transit line location and associated bus stops. Install bus shelters, curb ramps, and shopping cart corrals at the final Kroger and Walmart stops. If the Walmart bus stop is to remain in the parking lot, discuss potential improvements with Walmart.
Estimated Costs	Two large shelters = \$18,900 Two curb ramps = \$8,000 Two shopping cart corrals = \$800 Labor/Installation = \$6,790 Permits/Site Plans = \$895

7.) Roanoke Regional Airport

Routes: Smartway
Average Usage: 4.00
Stop Frequency: 0.73
Activity Index: 2.93

The Roanoke Regional Airport is currently served only by the Smartway Bus, which travels between Campbell Court and Virginia Tech Squires Student Center. The bus stop and shelter are overall in good condition and accessible. While a wheelchair could physically fit within the shelter, there is no specific location for a wheelchair as the bench spans the width of the shelter. The shelter appears undersized for the location since it can only hold only a few people. On the day of the field visit, several people were observed waiting outside the shelter. Fortunately the weather was pleasing to be outside, but on other days, when weather is not as pleasant, more covered space is recommended for this location. A posted bus schedule is also needed.



Stakeholders	Valley Metro, Roanoke Regional Airport
Recommendations	Upgrade the existing shelter to the current Valley Metro standard and add a second bus shelter, an additional concrete pad, and post the bus schedule.
Estimated Costs	Two Large Shelters = \$18,900 Labor/Installation = \$6,790 Permits/Site Plans = \$895

8.) Hunt EB at 8th

Routes: 11, 12
Average Usage: 3.25
Stop Frequency: 0.88
Activity Index: 2.84



This is an inbound bus stop to Campbell Court that serves Hunt Manor and Afton Apartments. The existing bus shelter is in great disrepair with broken glass below missing windows. There is a crosswalk and curb ramps at the stop, but improvements are needed.

Stakeholders	Valley Metro, City of Roanoke
Recommendations	Install a new shelter and pave the landing pad between the sidewalk and curb, reconstruct two ramps with tactile surfaces on the north side of Hunt Avenue.
Estimated Costs	Two ramps = \$8,000 Small Shelter = \$6,620 Labor/Installation = \$3,395 Permits/Site Plans = \$895

9.) Salem Turnpike WB at Delta

Routes: 75
Average Usage: 2.79
Stop Frequency: 0.93
Activity Index: 2.58



Horton Park, Melrose Library and Lansdowne Park public housing are the activity generators at this bus stop. During the NTD survey, more than 90% of the activity at this stop was from passengers being dropped off. There is no sidewalk at the bus stop, so riders are most likely let off in the street at the driveway entrance to the library. As seen in the picture, there is a crosswalk west of the bus stop. Given the activity at this stop, several improvements are needed.

Stakeholders	Valley Metro, City of Roanoke
Recommendations	Construct a landing pad, sidewalk between the bus stop and the crosswalk, curb ramps at each corner of the library driveway and at the crosswalk.
Estimated Costs	Three ramps = \$12,000 125' x 5' sidewalk = \$4,375 Labor/Installation = \$3,395 Permits/Site Plans = \$895

10.) Ferncliff SB at Hoback

Routes: 11
Average Usage: 2.50
Stop Frequency: 1.00
Activity Index: 2.50

This bus stop is considered an outbound bus stop. It is located near several large retail stores. The bus from this stop travels to Valley View Mall. During the NTD survey, twice as many passengers alighted at the stop than boarded. Given that there are shopping destinations on both sides of the street, a crosswalk with ADA ramps in between the companion bus stops should be striped, and a small shelter installed.



Stakeholders	Valley Metro, City of Roanoke
Recommendations	Construct a landing pad, curb ramps at a new crosswalk, and install a bus shelter.
Estimated Costs	Two ramps = \$8,000 Crosswalk striping = \$1,000 Small shelter = \$6,620 Labor/Installation = \$3,395 Permits/Site Plans = \$895

11.) Crossroads Shopping Center Driveway WB at Workforce/Kmart

Routes: 21
Average Usage: 3.25
Stop Frequency: 0.75
Activity Index: 2.43



The Virginia Workforce Center and Virginia Employment Commission are the main trip attractions for this bus stop. The Advance Auto Parts headquarters is also near this stop. The companion stop is on Hershberger Road at Bean Street.

However, given that the current route loops through the Kroger shopping center and then returns to Campbell Court via Hershberger Road, most people likely choose to loop around rather than walk across the street. This stop could also be relocated on Hershberger Road near the shopping center driveway entrance at Delray or Bean Street if needed in the future.

The current location is accessible. It features a bus stop sign that is propped up in a window. Nearby deteriorating benches at Kmart provide riders a place to sit while waiting for the bus. Parking is prohibited at the stop through No Parking-Fire Lane signs. If this stop is moved to Hershberger Road, depending on the route alignment that would serve the stop, a bus shelter, landing pad, and other amenities may be needed.

Stakeholders	Valley Metro, City of Roanoke, Shopping Center management
Recommendations	Evaluate the long-term desired location of the stop. In the current location, relocate the sign on a post.
Estimated Costs	Minimal for the current location.

12.) Tazewell EB at 4th

Routes: 35
Average Usage: 2.75
Stop Frequency: 0.88
Activity Index: 2.40



The main activity generator at this stop is the Rescue Mission. The bus at this location has traveled from Campbell Court on its way into Vinton. Most people during the NTD survey used this stop for alighting.

Stakeholders	Valley Metro, City of Roanoke
Recommendations	Pave a landing area 5'x8' wide by widening the sidewalk to the back of curb at the bus stop.
Estimated Costs	Sidewalk extension 40 sf = \$280 Labor/installation = to be done within a larger contract for ongoing sidewalk maintenance.

13.) Towers Shopping Center Upper Lot

Routes: 55, 56
Average Usage: 2.83
Stop Frequency: 0.79
Activity Index: 2.24



The bus stop in the upper lot of Towers Shopping Center is not currently signed though people who use the bus regularly know it will pick them up at the main entrance next to Randstad and McCallister's Deli. The building itself provides shelter. There are benches and a trash can available to riders. A person in a wheelchair would need to wait in the fire lane, which is unsheltered and accessible by using the ramp leading to the parking lot. In order to access the stop, the bus must use the drive aisles where at any moment a vehicle may attempt to back out, potentially causing a conflict with an oncoming bus. When one bus is at the stop, it blocks four parked vehicles from backing out of their spaces. If two buses arrive at the same time, many more parking spaces are blocked. The parking lot gets very crowded and driving to the current stop location can often be delayed by the congestion.

If the current stop remains, a sign is needed along with a ramp directly from the hatched area to the building entrance. However, it is preferable that this bus stop be moved to Colonial Avenue in order to avoid vehicle conflicts and delay in the parking lot. In order to accomplish this bus stop shift, the route would need to be modified. Additionally, because there are no elevators in Towers Shopping Center, and no safe pedestrian walkway to get from the upper and lower levels, each side of the shopping center must have a bus stop. It is recommended that any bus route that includes Towers Shopping Center provide service to both levels.

Stakeholders	Valley Metro, Towers Shopping Center management
Recommendations	Relocate the bus stop to Colonial Avenue, and install a shelter, landing pad, trash can, pedestrian ramps, and sidewalk connections to the shopping center and to the existing sidewalk front of CVS.
Estimated Costs	Large Shelter = \$9,450 Labor/Installation = \$10,185 Permits/Site Plans = \$895 700' x 5' sidewalk connection = \$24,500 Five ADA ramps = \$20,000

14.) Towers Shopping Center Kroger

Routes: 61, 62
Average Usage: 3.41
Stop Frequency: 0.65
Activity Index: 2.20



Existing Lower Level Stop Location



Possible Location

The current bus stop at Towers Shopping Center Kroger is conveniently located next to the building so that people can take advantage of the covered space, bench and trash can. This stop is missing a Valley Metro bus stop sign. The main concern with this location is that the back door of the bus opens up against a row of bushes next to the building, causing people to walk through the bushes. A possible location to relocate the stop would be in front of the Tuesday Morning store. The area in front of this store does not have parking as indicated by yellow striped lines. There is a blue marked handicap ramp to the sidewalk, a nearby bench and covered area for people to wait. If the stop were relocated here, because the sidewalk does not wrap around the building, pedestrians would need to walk through the building to access Kroger.

Due to the lack of an elevator within Towers Shopping Center, there is no opportunity for a person in a wheelchair to travel between the upper and lower level shops without going all the way around the building. There are no sidewalks to assist with this travel, so people would need to travel through the parking lots and driveway aisles. Unless conditions change at the Shopping Center, it is recommended that the routes that currently only serve the upper or lower levels be routed to serve both levels of the shopping center.

Stakeholders	Valley Metro, Towers Shopping Center management
Recommendations	Consider other locations to relocate the bus stop.
Estimated Costs	Depends on the final location selected.

15.) Elm EB at 8th

Routes: 62
Average Usage: 2.47
Stop Frequency: 0.88
Activity Index: 2.17



This bus stop is located on an inbound route to Campbell Court. The surrounding area is mostly residential with private homes adjacent to the stop. The current bus stop location is limited in space but given its activity level would warrant a bus shelter. Locating a bus shelter at the current location should be explored fully before looking at relocation options. Locating a shelter at the current stop may be difficult because of the adjacent private homes and the potential for a shelter to cause sight distance limitations from vehicles emerging from driveways.

Another option to explore would be relocating the stop to the open space on the nearside of the Elm Avenue and 8th Street intersection. Due to the proximity to the Main Street and Ferdinand Avenue intersection, and the volume of traffic on this street at some times of the day, it may be desirable to provide a bus pull-off within the green open space. Drainage structures are evident within the open space which may make a bus pull-off more costly. In any location, at a minimum, a bench should be provided facing the sidewalk, a landing area paved between the sidewalk and curb, and a new sign installed.



Stakeholders	Valley Metro, City of Roanoke, adjacent property owners, Old Southwest neighborhood association.
Recommendations	Explore amenity improvement options at the current location. Explore a bus pull-off within the green open space between Ferdinand and 8 th Streets.
Estimated Costs	Varies depending on the option selected.

16.) Colonial SB at VWCC Pedestrian Overpass

Routes: 55
Average Usage: 3.00
Stop Frequency: 0.71
Activity Index: 2.11



Virginia Western Community College is the attraction for this bus stop. The stop currently has no infrastructure or amenities. Able-bodied students walk up a nearby driveway to enter a side door to the building. Students cross the street using the overhead pedestrian walkway. Recently, a new building was constructed nearby. New sidewalks associated with the project did not extend to the bus stop. Additionally, it appears the new sidewalk is higher than the roadway, and no curbs were constructed with the sidewalks. This bus stop is mainly used for dropping off people coming from Campbell Court. However, a small shelter would still be appropriate for people waiting for the southbound bus.

Stakeholders	Valley Metro, City of Roanoke, VWCC
Recommendations	A small bus shelter, trash can, and paved landing area with connections to existing pedestrian facilities are recommended. Coordination with the College is necessary to determine the best location for the bus stop, and if it could be incorporated into the new section of sidewalk.
Estimated Costs	Small bus shelter = \$6,620 Labor/Installation = \$3,395 Permits/Site plans = \$895 Curb and sidewalk connections depending on the final location.

17.) Valley View Mall SB at Sears

Routes: 55
Average Usage: 3.00
Stop Frequency: 0.71
Activity Index: 2.11



Over the years, the main bus stop at Valley View Mall has been moved around due to concerns from nearby businesses. The current location places the bus stop in a parking lot near a main entrance of the mall. Functionally, the location works well. The buses have easy access into the lot through main drive aisles; as such, potential conflicts with vehicles are minimized.



The stop itself however is undersized given that it is the primary mall stop. There are seats for only two people and space for one wheelchair under the shelter. Additional riders would be waiting on the pavement next to the drive aisle intersection. At nighttime, the light inside the shelter does not work because of the lights in the surrounding parking lot. This makes the shelter itself dark.



Recommendations include creating a raised curb extension to separate the driving aisle from the passenger waiting space. This could be done by extending the median through some of the handicap parking spaces as shown in the adjacent concept. This concept would add an ADA ramp and an adequately sized ADA landing pad, as well as provide one additional large bus shelter. Pavement striping of stop bars would also be adjusted.

Stakeholders	Valley View Mall management, Valley Metro
Recommendations	Raise the bus stop to the sidewalk level, in line with the adjacent grass median. Enlarge the bus facility landing area to provide one more large bus shelter and one lamppost.
Estimated Costs	400 sq. ft. reinforced pedestrian area = \$5,600 Large shelter = \$9,450 Lighting/Lamppost = \$5,000 ADA ramp = \$4,000 Reuse existing small shelter and trashcan. Additional costs for demolition of existing curb/sidewalk.

18.) Hardy WB at Bedford

Routes: 36
Average Usage: 2.50
Stop Frequency: 0.80
Activity Index: 2.00

This bus stop is the companion to the Lake Drive Plaza Big Lots (Hardy Road) stop across the street. Without pedestrian crossing facilities across Hardy Road at Bedford Road, it is not safe to cross the street at this location and instead pedestrians should walk to the nearest signalized intersection (Clearview Drive or Vinyard Road) in order to safely cross the street. However, the most direct path from Kroger to this bus stop is at the Hardy Road/Bedford Road intersection so it is likely that many riders choose to take their chances and cross at this intersection.

Instead of building a pedestrian crossing at the current location, it is recommended that the bus stop be moved to the nearside of the Hardy Road/Clearview Drive intersection near the Family Dollar as shown in the adjacent picture.



Stakeholders	Valley Metro, Town of Vinton, Adjacent property owners
Recommendations	Move bus stop to nearside Hardy Road/Clearview Drive; install a shelter and landing pad; stripe crosswalks on Hardy Road and Clearview Drive; construct a curb ramp on the existing sidewalk at the Clearview Drive driveway into the shopping center (behind Subway).
Estimated Costs	Large Shelter = \$9,450 ADA Ramp = \$4,000 Crosswalk Striping = \$800 Labor/Installation = \$3,395 Permits/Site plans = \$895

19.) VA Hospital Private Road Stop 2

Routes: 75, 76, 91, 92
Average Usage: 0.76
Stop Frequency: 2.58
Activity Index: 1.95

At the time of the field visit, staff was not able to access the bus stop, due to construction, which had temporarily moved the bus stop to another location on the VA Medical Center campus. The normal bus stop location works well. It is known that at a minimum, the bus stop does not have a bus shelter and one is recommended.

Stakeholders	Valley Metro, VA Medical Center management
Recommendations	Install a bus shelter at the current location.
Estimated Costs	Large Shelter = \$9,450 Labor/Installation = \$3,395 Permits/Site plans = \$895

20.) Burrell SB at Whitten

Routes: 16
Average Usage: 2.50
Stop Frequency: 0.75
Activity Index: 1.87



This bus stop serves route 16, which travels from Valley View Mall to Campbell Court. Many lower income residences are located near this stop, contributing to its high activity level. The stop is adjacent to Washington Park pool. The stop needs a small bus shelter and a repainted crosswalk.

The trash receptacle should be moved to be more easily accessible from the sidewalk.

Stakeholders	Valley Metro, City of Roanoke Transportation and Parks and Recreation
Recommendations	Install a small shelter and landing pad with a short retaining wall, extend the sidewalk to the back of the curb at the bus stop, relocate the trash can.
Estimated Costs	Small bus shelter = \$6,620 Retaining wall = \$4,997 Crosswalk striping = \$400 Labor/Installation = \$3,395 Permits/Site plans = \$895

21.) Melrose EB at Victoria (Melrose Towers)

Routes: 82 (peak), 92
Average Usage: 2.07
Stop Frequency: 0.87
Activity Index: 1.79



Melrose Towers, a residential building for lower income and elderly people, is the main trip generator at this bus stop. An adequate landing pad exists at the bus stop. Currently, a functional but dated shelter exists in the front lawn and serves as the bus shelter for the stop. The main concern with this shelter is the ability of the bus driver to see people waiting inside the shelter, due to its setback from the street. It is also not well lit at nighttime.

Stakeholders	Valley Metro, City of Roanoke, Melrose Towers management
Recommendations	Install a large shelter at the sidewalk.
Estimated Costs	Large bus shelter = \$9,450 Labor/Installation = \$3,395 Permits/Site plans = \$895

22.) Elm EB at 5th

Routes: 61
Average Usage: 2.12
Stop Frequency: 0.82
Activity Index: 1.74



The bus stop at Elm Avenue and 5th Street is within the Old Southwest Village Center. While the activity at the stop is generated mostly from the nearby residences, there are some businesses that benefit from having a bus stop nearby. Valley Metro has been working with the Old Southwest Market (Citgo) property owners about installing a bus shelter on their property adjacent to the sidewalk. The sidewalk at the bus stop is brick. The landing pad, when extended from the back of the curb, should match the material and design of the existing sidewalk.

Stakeholders	Valley Metro, City of Roanoke, Citgo property owner
Recommendations	Install a small shelter and landing pad, extend the sidewalk to the back of the curb at the bus stop.
Estimated Costs	Small bus shelter = \$6,620 Labor/Installation = \$5,000 Permits/Site plans = \$895

23.) Towne Square Kroger

Routes: 21, 22, 25, 26
Average Usage: 2.11
Stop Frequency: 0.73
Activity Index: 1.54



The Towne Square Kroger bus stop exists as a place for the bus to turn around, and it is considered an end-of-the-line stop. The bus route was designed prior to the construction of the Aviation Drive/Towne Square Boulevard intersection. At the time this bus stop location was determined, the end-of-the-line location was logical. Now that the intersection exists, new opportunities arise to easily connect the Crossroads shopping area to the Valley View Mall shopping area. The routes serving Valley View and Towne Square Kroger should be reviewed to determine if a connection can be established. If a redesign of the routes is possible, the existing stop at Kroger could be removed. Bus stops, Towne Square EB at Rutgers and Towne Square WB at Rutgers (Golden Corral) exist nearby to accommodate riders traveling to the Kroger shopping center.

If the bus stop remains at Kroger, no improvements are needed. The building itself provides shelter, a bench is located nearby, and the wide sidewalk provides sufficient space to deploy the lift on the bus.

Stakeholders	Valley Metro, City of Roanoke, Kroger property management
Recommendations	Review the routes that currently travel to Towne Square Kroger and to Valley View Mall to see if they can be connected. If the Kroger stop is removed and companion stops on Towne Square Boulevard are used, amenities should be added including bus shelters and adequate landing pads.
Estimated Costs	None for the current location.

24.) Tazewell WB at I-581 Bridge

Routes: 36
Average Usage: 2.20
Stop Frequency: 0.70
Activity Index: 1.54



The Rescue Mission is the main activity generator at this bus stop. From this stop, the bus travels inbound to Campbell Court. The bus stop is located at a drainage inlet, as seen in the picture.

Currently, the I-581 bridge over Tazewell Avenue provides shelter. Lights mounted under the bridge provide light at night. There is on-street parking adjacent to the bus stop, which prevents the bus from pulling up to the curb. Lack of a sidewalk and curb ramp at the corner require people in wheelchairs to travel to the bus stop on the street and wait in the street for the bus to arrive. Waiting passengers are hidden from view of the approaching bus due to the parked vehicles.

Two options exist to better accommodate riders at this location. First, in order to minimize parking loss at the bus stop, the northeast corner of Tazewell Avenue and 3rd Street could be constructed to provide a curb extension that allows waiting passengers to better see the approaching bus and for the operator to see that passengers are waiting. With a curb extension, a crosswalk should be placed across Tazewell Avenue to allow pedestrians a shorter distance to cross the street. The location is at the bottom of a hill so vehicles are moving quickly by the time they get to this intersection. These improvements would make the environment safer for pedestrians.

To avoid vehicles backing up behind the bus, a second option is to remove approximately four parking spaces next to the bus stop. Similar to the first option, sidewalk connections, curb ramps, and pedestrian crosswalks would be needed.

Stakeholders	Valley Metro, City of Roanoke
Recommendations	Option 1: Construct a curb extension at the bus stop with new sidewalks and a small bus shelter as well as curb ramps on three corners of the Tazewell/3 rd Street intersection.
Estimated Costs	Curb extension and sidewalk connection = \$10,000 Crosswalk = \$1,000 Storm drain structure = \$5,000 Three curb ramps = \$12,000 Small bus shelter = \$6,620 Labor/Installation = \$3,395 Permits/Site plans = \$895

25.) Campbell WB at Norfolk (Valley Metro Admin Bldg)

Routes: 32
Average Usage: 3.00
Stop Frequency: 0.50
Activity Index: 1.50



The Campbell WB at Norfolk stop at the Valley Metro Administration Building is a good example of an accessible bus stop. There is an access ramp leading from the stop toward the building. There is room under the shelter for a wheelchair. There is also an additional bench not associated with a shelter, a trash can, and a bike rack. While the stop itself is very accessible, getting to the bus stop could be improved by constructing a sidewalk on Campbell Avenue west of the Administration Building before it changes to Norfolk Avenue.

Stakeholders	Valley Metro, City of Roanoke
Recommendations	Improve the sidewalk and add ADA ramps on Campbell Avenue from 10 th Street to 10 ½ Street.
Estimated Costs	Curb, Gutter, Sidewalk for 600' = \$24,000 Three ADA ramps: Campbell/Norfolk, Campbell/10 ½ Street, Campbell/10 th Street = \$12,000 Permits/Site plans = \$895

26.) Salem Turnpike EB at 24th

Routes: 76
Average Usage: 2.07
Stop Frequency: 0.71
Activity Index: 1.47



The Lansdowne Park apartments are the main activity generators at this bus stop. The bus route comes from the VA Hospital and heads inbound to Campbell Court. As such, most users are boarding the bus as opposed to alighting. The sidewalk needs to be extended to the curb to create an adequate landing area and a bus shelter installed.

Stakeholders	Valley Metro, City of Roanoke, Lansdowne property management
Recommendations	Extend the sidewalk to the curb at the bus stop to create an adequate landing area (5' wide x 8' deep) and install a bus shelter.
Estimated Costs	Small bus shelter = \$6,620 Retaining wall = \$4,997 Labor/Installation = \$3,395 Permits/Site plans = \$895

27.) Tanglewood Mall at AC Moore

Routes: 51, 52, 55, 56
Average Usage: 2.32
Stop Frequency: 0.63
Activity Index: 1.46



The Tanglewood Mall at AC Moore stop is convenient because it is located adjacent to a primary mall entrance. Two buses fit easily in the space available and two-way traffic can pass even with the buses stopped. The “No Parking Fire Lane” signs that prohibit cars from parking along the curb also serve the dual purpose of providing a dedicated space for the buses. There is no bus stop sign here, and one should be installed. The nearby benches shown in the picture are part of the mall’s designated smoking area, yet the benches work well to also accommodate transit riders. The nearby building currently provides shelter as needed, but it is preferable to have a bus shelter closer to the bus stop.



Stakeholders	Valley Metro, Tanglewood Mall Management
Recommendations	Install a large bus shelter next to the bench closest to the driveway and install a bus stop sign.
Estimated Costs	Large bus shelter = \$9,450 Labor/Installation = \$3,395 Permits/Site plans = \$895

28.) Hunt WB at 8th

Routes: 15
Average Usage: 2.13
Stop Frequency: 0.63
Activity Index: 1.32



This bus stop serves Route 15, which travels outbound from Campbell Court to Valley View Mall. Several apartment complexes are located near the stop, which contribute to its high use. The stop is used more for alighting than boarding, but a shelter is still needed for people traveling to Valley View Mall. The nearby intersection at Hunt Avenue and 8th Street features a crosswalk across Hunt Avenue and ramps on each corner. The ramps, however, were constructed without tactile warning plates. As the City is able to replace older ramps with new ramps that feature tactile surfaces, it is recommended that all three ramps be upgraded.

Stakeholders	Valley Metro, City of Roanoke
Recommendations	Construct a landing pad preferably 5' wide x 8' deep by paving the grassy area between the sidewalk and the curb at the bus stop. Install a bus shelter and three curb ramps with tactile warning plates.
Estimated Costs	Small bus shelter = \$6,620 Labor/Installation = \$3,395 Permits/Site plans = \$895

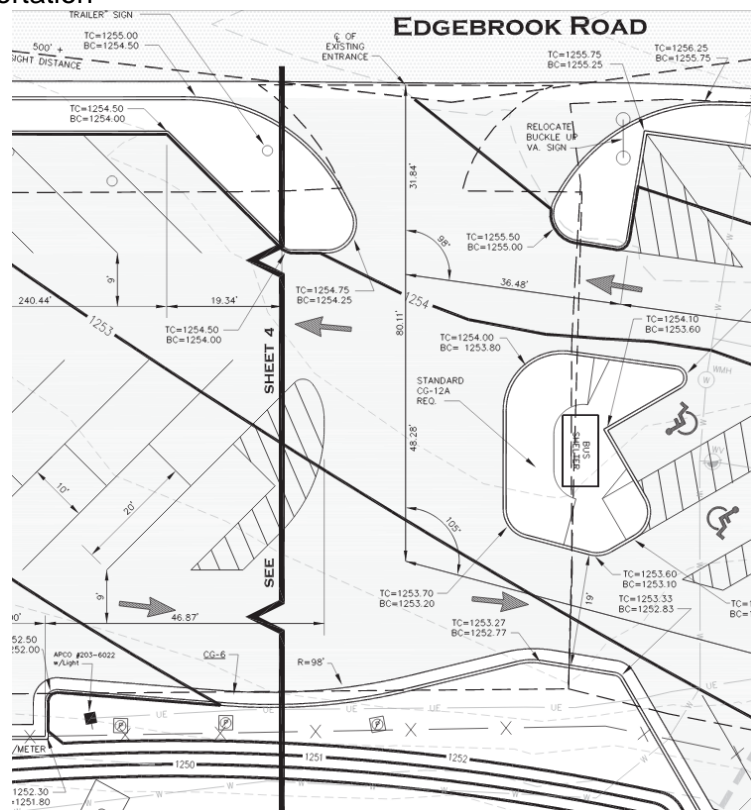
29.) Exit 140 Park and Ride

Routes: Smartway
Average Usage: 1.80
Stop Frequency: 0.73
Activity Index: 1.32



The Exit 140 Park and Ride lot was constructed in the 1970s as part of the I-81 Exit 140 construction. With the increase in gas prices, particularly since 2008, the lot has experienced consistent capacity and overflow use. The lot was expanded in 2009 when VDOT surface treated the adjacent overflow area. Recently, through the Regional Surface Transportation Program, the Exit 140 Park and Ride was selected for significant upgrades including repaving, the addition of curbs, lighting, trash receptacles, a bus shelter, bike rack, and stormwater measures. While most people drive to this stop, it is possible that some folks will also be dropped off. The bus shelter should be large enough to accommodate several people waiting for the bus.

Currently, the regional Smart Way commuter bus is the only transit service at the Exit 140 Park and Ride lot. Improvements should be made with consideration of accommodating a connecting second bus or local transit service in the future. Additionally, the location of the bus shelter and bus turning radius should be coordinated with Valley Metro to ensure that the bus will be able to pull up flush with the curb. The current design, as shown, adequately connects handicap parking spaces with the shelter.



Stakeholders	Valley Metro, Roanoke County, VDOT
Recommendations	As the Exit 140 Park and Ride lot improvements are designed, stakeholders should coordinate to ensure that current and future transit services and amenities are adequately accommodated within the plan.
Estimated Costs	\$1,608,243.85 (per 2013 RSTP Project Application)

30.) Melrose EB at 35th

Routes: 82, 92
Average Usage: 1.80
Stop Frequency: 0.73
Activity Index: 1.32



A large apartment complex is located up the hill off of 35th Street and is the main activity generator of activity at this stop and its companion stop, Melrose WB at 35th (which is #31 in the ranking of most active stops). Nearby driveways serve as curb ramps for riders crossing the street. The current landing area is not level and needs to be repaved.

Consideration should be given to closing the driveway adjacent to the bus stop on Melrose Avenue. Two driveways next to each other currently serve the same building which was vacant at the time of the site visit. A crosswalk on Melrose Avenue connecting the two bus stops along with signage and pedestrian activated flashing lights as well as a pedestrian refuge within the existing median would provide a safer crossing.



Stakeholders	Valley Metro, City of Roanoke, Adjacent property owner (The Clean Machine Car Wash)
Recommendations	Stripe a crosswalk across Melrose Avenue with signage and flashing lights, repave the landing area and close one driveway nearest the stop. Install a small bus shelter. Construct curb ramps on both sides of 35 th Street and at the pedestrian crossing.
Estimated Costs	Small bus shelter = \$6,620 Curb, gutter and sidewalk reconstruction at the driveway = \$4,000 Four curb ramps = \$16,000 Crosswalk, flashing lights, tactile warning surfaces in the median refuge, signage = \$22,500 Labor/Installation = \$3,395 Permits/Site plans = \$1,790

6.0 PARATRANSIT ORIGINS AND DESTINATIONS

RADAR is the transit operator providing complementary paratransit services in the City of Salem, the City of Roanoke, and the Town of Vinton. Because fixed-route services exist in these three localities, additional specialized transit services are required within $\frac{3}{4}$ mile of the transit route for people who are unable to use the fixed-route buses due to a disability.

The inability to use the fixed-route service is likely not because of the buses themselves because buses have amenities such as handicap lifts and auditory messages about stop locations. In many cases, a person's inability to use the fixed-route buses has to do with being able to physically get to a bus stop, make any necessary transfers, and then get from a bus stop to their destination.

Currently, the fully allocated cost per trip for fixed-route transit is approximately \$3 versus \$28 for paratransit. Because the government subsidy of a paratransit trip is much higher than the subsidy of a fixed-route transit trip, it is beneficial to provide safe options to access fixed-route services whenever possible.

The option of having a single seat origin-to-destination via a paratransit service is attractive to transit riders because the main burden is the requirement to schedule a reservation the day before. While taking paratransit is convenient, it does require planning trips ahead of time, which makes the freedom of travel without prior planning an attractive quality of fixed-route transit.

For these reasons, STAR paratransit pick-up locations were studied for a sample period between 12/27/2011 and 1/25/2012. The data indicate where people with disabilities travel. An analysis of the data identified the three most popular pick-up locations by zip code during the sample period. These locations provide guidance on where bus stop accessibility improvements are needed. Making improvements to these key bus stops may provide someone with the option of taking fixed-route transit, whereas currently it is not an option.

As shown in Table 4, the Adult Day Care and the VA Hospital in Salem generated the most paratransit trips, followed by NW Dialysis and Crystal Spring Dialysis in Roanoke. For many people who access these centers, taking fixed-route transit may not ever be an option because of their condition or disability. For anybody with a disability, if a transfer is required at Campbell Court, due to the difficult conditions at this station as discussed previously, any infrastructure improvement made at an origin or destination's bus stop would not overcome the difficulty of transferring at Campbell Court. If a transfer at Campbell Court is not necessary, improved accessibility at a bus stop could become a factor in someone's decision to use the fixed-route transit system.

The following table lists the STAR pick-up locations and the following sections review each location in detail.

Table 4: Top STAR Paratransit Pick-up Locations: December 2011 – January 2012

Rank	Address	Zip Code	Pick-up Location	Number of Trips Originating at this Location	Number of Destinations Associated with this Origin
1	2321 Roanoke Blvd	24153	ADULT DAY CARE	311	28
2	1970 Roanoke Blvd	24153	VA HOSPITAL	216	41
3	1326 7th St Ne	24012	NW DIALYSIS	131	15
4	404 McClanahan Street	24014	CRYSTAL SPRING DIALYSIS	101	14
5	1150 Vinyard Road	24179	CLEARVIEW MANOR APARTMENTS	80	21
6	1802 Braeburn Drive	24153	LEWIS GALE	75	42
7	331 Hershberger Road	24012	FRIENDSHIP MANOR	74	14
8	3819 Stratford Park Drive	24018	STRATFORD PARK RESIDENTIAL APARTMENTS	61	20
9	4870 Valley View Blvd	24012	WALMART/VALLEY VIEW MALL	60	34
10	672 Brandon Ave	24015	PLANET FITNESS	59	5
11	2520 Melrose Ave Nw	24017	GOODWILL SERVICE CENTER	58	10
12	2744 Melrose Ave Nw	24017	BLUE RIDGE VILLAGE APTS	50	11
13	3038 Melrose Ave Nw	24017	MELROSE TOWERS	43	20
14	1020 13th Street Se	24013	MORNINGSIDE MANOR	40	12
15	4930 Grandin Road Sw	24018	FAIRINGTON APARTMENTS	38	14
16	809 Hardy Road	24179	MCDONALD'S	36	6
17	614 Brandon Ave	24014	KROGER / TOWERS MALL	33	9
18	915 Hardy Road	24179	KROGER / VINTON	33	15
19	1527 Grandin Road	24015	RALEIGH COURT NURSING HOME	32	14
20	502 19th Street Se	24013	FALLON PARK ELEMENTARY SCHOOL	30	2
21	3 Riverside Circle	24016	CARILION CLINIC	28	26
22	4920 Woodmar Dr Sw	24018	THE PARK / OAK GROVE RETIREMENT	28	7
23	Address Removed	24015	PRIVATE RESIDENCE	27	7
24	5374 Fallowater Ln	24014	PAIN MANAGEMENT	24	2
25	429 Elm Ave Sw	24016	ON OUR OWN	22	2
26	Address Removed	24016	PRIVATE RESIDENCE	21	1
27	5022 Hollins Rd Ne	24019	HANOVER DIRECT	20	1
28	601 South Jefferson Street	24011	WATER AUTHORITY	18	3
29	101 Elm Ave Se	24013	COMMUNITY HOSPITAL	12	5
30	37 Church Avenue	24011	BB&T BANK	9	2
31	Address Removed	24019	PRIVATE RESIDENCE	9	1
32	3130 Peters Creek Rd	24019	BANK OF BOTETOURT	5	2

1.) Adult Day Care

Routes: 75
Nearest Stops: Roanoke Blvd WB at Disabled Veterans Store
Average Usage: 0.93
Stop Frequency: 0.50
Activity Index: 0.46

The Adult Day Care is the most frequented location for the STAR service, as well as Roanoke County's CORTRAN service. The people who take paratransit to get to this location are often not able to take care of themselves. Therefore, it is unlikely that an accessible bus stop would change many people's choice on travel mode to the Center.

The nearest bus stop, Roanoke Blvd WB at Disabled Veterans Store, is not a high activity stop though the bus stops there about every other time it passes to either pick up or drop someone off. The current bus stop location is not ideal in that the bus blocks the adjacent driveway when stopped. It would be preferable to shift the bus stop in front of or directly adjacent to the Adult Day Care and construct a bus pull-off so that the bus does not impede traffic flow on the two-lane road. Given that a rider who accesses this location may be in a wheelchair, the bus may be stopped for an extended period to drop-off or pick-up a passenger. Certainly accessibility improvements between the bus stop and the facility would make riding the fixed-route bus a better option for someone who is able to use the service and would like the opportunity.



Stakeholders	Valley Metro, City of Salem, Adult Day Care management
Recommendations	Construct a bus pull-off on Roanoke Blvd. just east of the Adult Day Care driveway. Construct a landing pad, a large shelter, and a sidewalk connection to the Adult Day Care.
Estimated Costs	Large bus shelter = \$9,450 Labor/Installation = \$3,395 Permits/Site plans = \$895 Bus pull-off paving = \$30,000 Sidewalk connection approximately 150' long = \$5,250

2.) VA Hospital

This location was reviewed in the previous section.

3.) NW Dialysis

Routes: 25, 26
Nearest Stops: Kimball NB at Orange; Kimball SB at McDowell
Average Usage: 0.05; no use
Stop Frequency: 0.05; no stops
Activity Index: 0.002; no activity

The Northwest Dialysis Center is about a quarter-mile from the closest bus stops at Orange Avenue and Kimball Avenue/Plantation Road. There are no sidewalks from the bus stop to the Center, which is located in a cul-de-sac on 7th Street, up a small hill off of Plantation Road. These bus stops experienced very little to no activity during the NTD survey.

In order for people to access the Northwest Dialysis Center, a pair of bus stops should be located at the Plantation Road and 7th Street intersection. Doing this would involve placing bus service on Plantation Road, which does not currently exist. Dialysis patients are encouraged to exercise, and walking a short distance to/from the bus stops would be a natural way to maintain physical activity. Providing a bus stop at the Plantation Road/7th Street intersection with sidewalks to the Center would make the option to take fixed-route bus service a possibility.



Stakeholders	Valley Metro, City of Roanoke
Recommendations	Provide fixed-route bus service on Plantation Road, construct a pair of bus stops with landing pads, a crosswalk across Plantation Road, and a sidewalk connecting the stops to the Dialysis Center.
Estimated Costs	One small bus shelter for the southbound (inbound) stop = \$6,620 Landing pad for the outbound stop = \$280 Labor/Installation = \$3,395 Permits/Site plans = \$895 Crosswalk striping = \$1,000 Sidewalk connection (approx. 700') = \$24,500 Two driveway reconstructions = \$8,000 Three curb ramps = \$12,000

4.) Crystal Spring Dialysis



The closest stops to the Crystal Spring Dialysis Center are at McClanahan Street and Rosalind Avenue and on Franklin Road at the Pure Gas Station. Neither location is accessible for people getting to the Dialysis Center. Sidewalk connections along McClanahan Street are lacking, and there is no safe pedestrian crossing across Franklin Road. The Franklin Road stops are more than a quarter-mile away and the McClanahan stops are just at a quarter-mile away. Neither are attractive options for dialysis patients, regardless of infrastructure deficiencies. In order to make fixed-route transit service an option for dialysis patients, the bus route would need to be evaluated to see if there is a way to route the bus past the building. Such a route and corresponding bus stops could be incorporated into an improved connection between Roanoke Carilion Memorial Hospital and Towers Shopping Center.



Stakeholders	Valley Metro, City of Roanoke
Recommendations	Consider options for routing a bus past the Crystal Spring Dialysis Center. If a route is possible, construct a small bus shelter, landing pad, and crosswalk across McClanahan Street to a companion stop that features the same amenities.
Estimated Costs	Two small bus shelters = \$6,620 Labor/Installation = \$6,790 Permits/Site plans = \$895 Crosswalk striping = \$1,000 Curb ramp = \$4,000

5.) Clearview Manor Apartments

Routes: 36
Nearest Stops: Clearview Manor on Vinyard
Average Usage: no use
Stop Frequency: no stops
Activity Index: no activity

Bus service at Clearview Manor is limited; the 36 bus stops there six times a day on its way into Campbell Court. For people to take the bus back to Clearview Manor, because service is not bi-directional, they must take the 31, which turns into the 36, and ride around most of Vinton before reaching Clearview Manor. The actual bus stop at Clearview Manor is missing a sign.



During the site visit, several people in wheelchairs were seen traveling on the road from the direction of the Lake Drive Plaza shopping center headed to the apartment building. They were clearly comfortable traveling in their wheelchair and able to get to nearby destinations on their own. They were riding on the street instead of the sidewalk due to missing curb ramps along their route which prevented them from using the sidewalk. Given an accessible route, some residents at Clearview Manor Apartments would probably feel comfortable traveling to Hardy Road to use the fixed-route bus service. The closest bus stops are Hardy EB at Vinyard (McDonalds) and Hardy WB at Bedford. If the latter is relocated as suggested in the previous section, another stop near the Hardy Road/Vinyard Road intersection should be constructed to be the companion to Hardy EB at Vinyard (McDonalds).

One option for an accessible route between the Apartments and the Hardy Road bus stops would be to continue the sidewalk on the east side of Vinyard Road from the pool to the main shopping center driveway. Then stripe a crosswalk on the south side of the driveway, which would lead to a new sidewalk connection on the west side of Vinyard Road continuing north to the existing McDonalds sidewalk. The Hardy Road/Vinyard Road intersection itself needs crosswalks striped and pedestrian signals.

Stakeholders	Valley Metro, Town of Vinton, Adjacent property owners
Recommendations	Provide a bus stop inbound near the Hardy Road/Vinyard Road intersection. Construct sidewalk connections and curb ramps between the Clearview Manor Apartments and the bus stops on Hardy Road. Install pedestrian signals and crosswalks at the Hardy Road/Vinyard Road intersection.
Estimated Costs	Small bus shelter for inbound stop = \$6,620 Labor/Installation = \$3,395 Permits/Site plans = \$895 Crosswalk striping = \$1,000 Eight curb ramps = \$32,000 Sidewalk connection (approx. 500') = \$17,500 Pedestrian signal = \$40,000

6.) Lewis Gale

Routes: 71, 72, 91
Nearest Stops: Lewis Gale Medical Center
Average Usage: 1.69
Stop Frequency: 0.69
Activity Index: 1.17



Lewis Gale Medical Center sidewalks around the bus stop need ADA ramps

Lewis Gale Medical Center is well-served by multiple bus routes both from the City of Roanoke and the City of Salem. It has an adequate landing area to deploy the wheelchair lift and amenities including a bench and trash can. This bus stop, however, is not accessible in that the sidewalks lack curb ramps. Therefore a person in a wheelchair cannot get to the bus stop. Rather, they would need to wait nearby in the travel lane or driveway aisle. Likewise, a person in a wheelchair alighting the bus would also need to be let off in the travel lane or driveway aisle. Two ramps are needed to make a seamless wheelchair accessible pathway to the Medical Center. A bus shelter is also needed.

Stakeholders	Valley Metro, Lewis Gale Medical Center
Recommendations	Discuss potential improvements with Lewis-Gale to improve accessibility including, but not limited to constructing curb ramps to make an accessible path from the Medical Center entrance to the bus stop, and replacing the bench with a bus shelter.
Estimated Costs	Large bus shelter = \$9,450 Two curb ramps = \$8,000 Labor/Installation = \$3,395 Permits/Site plans = \$895

7.) Friendship Manor

Routes: 25, 26

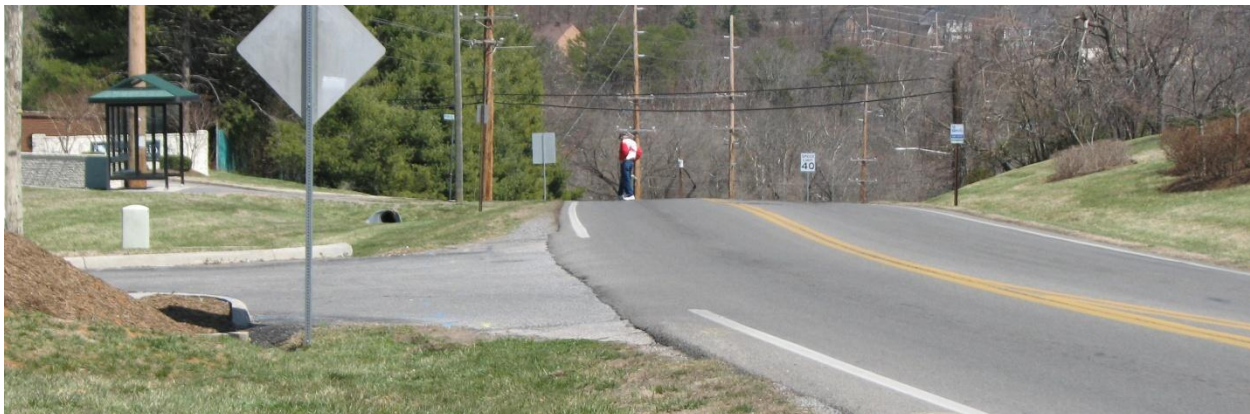
Nearest Stops:

	Average Usage	Stop Frequency	Activity Index
Hershberger WB at Bluebell (Friendship Manor)	1.10	0.48	0.52
Hershberger EB at Bluebell (Friendship Manor)	0.33	0.33	0.11
Hershberger WB at Friends (Friendship Manor)	0.05	0.05	0.002
Hershberger EB at Friends (Friendship Manor)	0	0	0

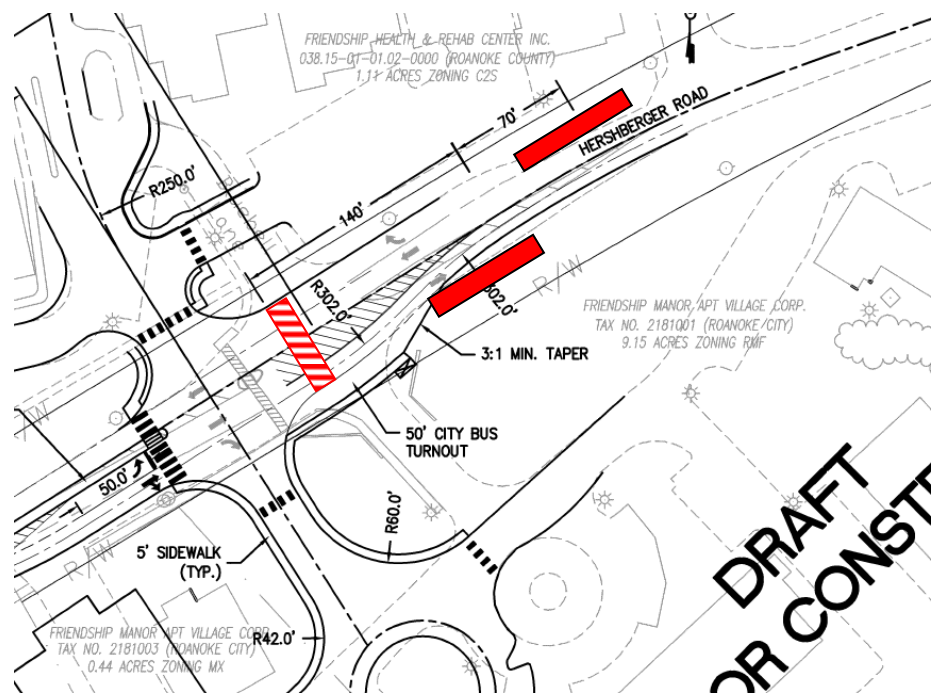
Friendship Manor Retirement Community provides many services to senior citizens including independent living. There are four bus stops available to the Community. At the time of this writing, Friendship Manor is undergoing plans to relocate the main driveway on the south side of Hershberger Road, which will remove the sheltered bus stop and pedestrian crossing. The design consultant has been in contact with Valley Metro about how to incorporate the bus stop in the new configuration.



The current bus stop amenities are excellent examples for the region on how to make bus stops safe, accessible, and easy to use. As shown in the pictures, when safe facilities are provided, senior citizens and people with disabilities will use them. There is a bus shelter, a marked crosswalk with pedestrian signage and a signal that when activated flashes warning lights on the signs. The bus stops are clearly companions, which make it easy for people to understand that they function together as boarding and alighting stops.



The four bus stops available to Friendship Manor should, for efficiency and minimization of financial resources, be combined into two bus stops, one on either side of Hershberger Road. Upon visiting the location and reviewing the conceptual Friendship Manor renovation plans, bus stops are recommended for the locations approximately shown in red in the diagram below. At these locations, bus pull-offs should be constructed so as to not cause traffic to stack behind the bus. Each bus stop should feature a small bus shelter with an adequate landing pad and similar pedestrian crossing as is currently provided across Hershberger Road. Sidewalks along Hershberger Road should lead from the bus stops to the entrances of nearby buildings.



Such improvements will make riding the bus an accessible option for Friendship Manor residents and visitors, as well as dialysis patients at the Fresnius Medical Center.

Stakeholders	Valley Metro, Friendship Manor Retirement Community management, VDOT, Roanoke County, City of Roanoke
Recommendations	Construct new bus stops concurrent with the Friendship Manor entrance reconstruction including a new pedestrian median and crosswalk, landing pads, bus pull-offs and bus shelters.
Estimated Costs	Two small bus shelters = \$13,240 Pedestrian crossing and four curb ramps = \$36,000 Sidewalk connections approximately 700' = \$24,500 Bus pull-offs = \$180,000 Labor/Installation = \$6,790 Permits/Site plans = \$895

8.) Stratford Park Residential Apartments

Routes:	71, 72
Nearest Stops:	Brandon WB at Stratford Park (Brandon Oaks); Brandon EB at Stratford Park (Brandon Oaks)
Average Usage:	1.47; 0.63
Stop Frequency:	0.87; 0.38
Activity Index:	1.27; 0.23



Brandon WB at Stratford Park (Brandon Oaks)



Brandon EB at Stratford Park (Brandon Oaks)

Stratford Park Residential Apartments are located up a small hill off of Brandon Avenue. The main building is a quarter-mile from the nearest bus stop. Sidewalks are lacking between the bus stop and the building. People now walk along the Clear Channel Radio driveway and through the parking lot behind the building to travel between the bus stop and the residential building which, while not ideal, works fairly well.

Of most difficulty, because the apartments are located on a bi-directional bus route, to use the bus efficiently, people must also use the bus stop on the opposite side of the road. The bus stops are located on Brandon Avenue, which is a five-lane 35 mph roadway and no pedestrian crossing facilities near the bus stops. In order to safely use the fixed-route bus people need to either ride to the route endpoint (Lewis Gale or Campbell Court) and loop around or get on/off at a farther stop where it is safer to cross. However, some people will simply take their chances, like the woman in the picture above, and cross the street because the other options, although safer, are time-consuming and frustrating.



To make it safer for pedestrians to cross the street, a pedestrian island with crosswalks, a pedestrian traffic signal, and pedestrian push buttons are recommended. With these accommodations, a pedestrian crossing the street would push a button to activate the traffic signal, which would turn red, stopping traffic on Brandon Avenue to allow the pedestrian to cross safely. Such improvements could enable residents at Brandon Oaks Retirement Community and Stratford Park to travel independently and more safely without a car.

Stakeholders	Valley Metro, City of Roanoke, Brandon Oaks Retirement Community management
Recommendations	Construct a pedestrian refuge and install a traffic signal to be activated only by a pedestrian for crossing Brandon Avenue. Install small bus shelters at the bus stops and widen the landing area to the standard size.
Estimated Costs	Two small bus shelters = \$13,240 Two small retaining walls = \$10,000 Pedestrian island and crosswalk= \$22,500 Traffic signal = \$150,000 Two curb ramps = \$8,000 Labor/Installation = \$6,790 Permits/Site plans = \$895

9.) Walmart/Valley View Mall

These locations were reviewed in the previous section.

10.) Planet Fitness

The nearest bus stop is Towers Shopping Center Kroger, which was reviewed previously. However, two of the three destinations associated with this origin, could be better connected to fixed-route bus stops through accessibility improvements at the intersection of Brambleton Avenue and Brandon Avenue as well as on streets in Roanoke County near Tanglewood Mall.

11.) Goodwill Service Center

Routes: 81, 82, 91, 92

Nearest Stops:

	Average Usage	Stop Frequency	Activity Index
Melrose Avenue Goodwill Work Center Building	0.23	0.15	0.03
Melrose EB at Lafayette (Goodwill)	0.43	0.93	0.47
Melrose WB at Lafayette (Goodwill)	0.46	0.15	0.07

The 81 peak service stops in front of the Goodwill Service Center main entrance. This route specifically was likely surveyed very little during the NTD survey. The bus stops on Melrose Avenue at Lafayette Boulevard are accessible with curb ramps and pedestrian signals to cross the street. There are no shelters at these stops. Many people who travel to the Goodwill Service Center have severe disabilities in which the installation of a bus shelter would not alter their need to take paratransit. No additional infrastructure is recommended.

12.) Blue Ridge Village Apartments

Routes: 81, 82, 91, 92

Nearest Stops: Melrose EB at Palmetto; Melrose WB at Palmetto

Average Usage: 0.73; 0.31

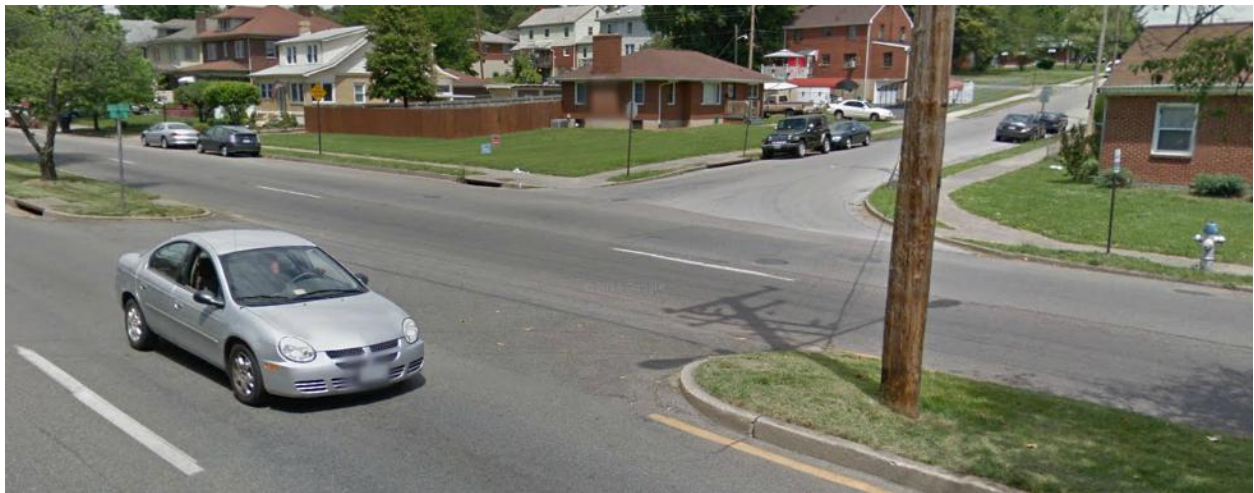
Stop Frequency: 0.27; 0.23

Activity Index: 0.19; 0.07

The Blue Ridge Village Apartments provide housing for approximately 48 lower-income senior citizens, who are generally capable of using the fixed-route transit system. The closest stops to the Apartments are on Melrose Avenue at Palmetto Street. Some residents may also be using

the stops at Forest Park Boulevard, which although they are farther, crossing the street is safer at that location. In talking with the apartment staff, the distance to Forest Park Boulevard, because no connection to it was made on the eastern side of the property when it was constructed, the circuitous path takes residents more than a quarter-mile to reach the stops, and the distance is not realistic for many of the residents.

Therefore, the stops at Palmetto Street are a better option for residents, but safety improvements are needed for crossing Melrose Avenue, since there is no traffic signal at the intersection. Although the bus stops at Palmetto Street did not experience much activity during the NTD survey, the potential for them to better serve the residents exists. A crosswalk with pedestrian-activated flashing lights should be placed across Melrose Avenue on the west side of the Palmetto Street intersection. The following picture shows the current westbound bus stop, which should be relocated to the west side (far side) of Palmetto Street and a bus shelter installed.



A bus shelter is also needed at the eastbound bus stop shown in the picture below. The shelter could be installed in the grass area just beyond the bus stop.



Curb ramps are needed in conjunction with the pedestrian crosswalk as well as on the corners at Palmetto Street and at 29th Street. Residents should be educated on which bus stops should be used and crossing the street safely.

Stakeholders	Valley Metro, City of Roanoke
Recommendations	Install pedestrian flashing lights and crosswalks, curb ramps and relocate the westbound bus stop. Install small bus shelters at the bus stops and widen the landing area to the standard size.
Estimated Costs	Two small bus shelters = \$13,240 Pedestrian signs with flashing lights and crosswalk= \$22,500 Three curb ramps = \$12,000 Labor/Installation = \$6,790 Permits/Site plans = \$895

13.) Melrose Towers

This location was reviewed in the previous section.

14.) Morningside Manor

- Routes:** 41
- Nearest Stops:** Montrose WB at 13th
13th NB at Montrose
- Average Usage:** 0.29; 0.71
- Stop Frequency:** 0.12; 0.47
- Activity Index:** 0.03; 0.33

Morningside Manor is a residential facility for lower income or elderly people. The Montrose WB at 13th bus stop is part of the Kenwood Loop, which has transit service only a handful of times every day. The low activity index may be due to low sampling during the NTD survey and lower use than other stops on a regular route that has service throughout the day. This stop however does feature a bus shelter and adequate landing pad. No other improvements are needed.



The 13th NB at Montrose stop had a higher activity index, probably because it has service every hour. This stop however, does not have a bus shelter and one is needed. The bus route itself is inconvenient for residents because in order to get to Downtown Roanoke, they need to loop through Garden City. Residents also have the option of walking to Jamison Avenue and catching a direct bus into Campbell Court. The intersection of Jamison Avenue and 13th Street has pedestrian signals and most corners have curb ramps. One location that needs a ramp is in the island on the northeast corner of the intersection.

Stakeholders	Valley Metro, City of Roanoke
Recommendations	Install a bus shelter at the 13 th NB at Montrose stop with a landing pad and directional curb ramps across Montrose Avenue. Construct a curb ramp in the northeast pedestrian island on Jamison Avenue.
Estimated Costs	Small bus shelter = \$6,620 Three curb ramps = \$12,000 Labor/Installation = \$3,395 Permits/Site plans = \$895

15.) Fairington Apartments

No fixed-route bus service exists in this part of Roanoke City. Due to the high residential and commercial density along Electric Road between Banbury Lane and Woodmar Drive, this area should be considered in future fixed-route transit service proposals.

16.) McDonald's in Vinton

These STAR trips were made by a single person, and the location was not evaluated.

17.) Kroger/Towers Mall

This location was reviewed in the previous section.

18.) Kroger/Vinton

This location was reviewed in the previous section.

19.) Raleigh Court Nursing Home

- Routes:** 65, 66
- Nearest Stops:** Grandin SB at Windsor; Grandin NB at Windsor
- Average Usage:** 1.14; 1.36
- Stop Frequency:** 0.71; 0.71
- Activity Index:** 0.81; 0.96



Grandin SB at Windsor



Grandin NB at Windsor

People traveling to Raleigh Court Health and Rehabilitation Center have good access to bus stops located at the Grandin Road/Windsor Avenue intersection near the property. With few improvements, these stops will be easily accessible for people. At the Grandin SB at Windsor stop, the No Parking sign needs to be moved further north, away from Windsor Avenue, in order to allow room for the bus to pull up to the curb. The sidewalk also needs to be extended to the curb to better accommodate the wheelchair lift. The Grandin NB at Windsor bus stop is accessible in its current state. There are accessible ramps on each street corner and there is a landing pad that extends from the curb to the sidewalk. As opposed to its companion across the

street, this bus stop is considered a “boarding” stop because most people who use it are getting on the bus rather than getting off. This bus stop would be a good candidate for a bus shelter with lighting.

It should be noted that the transit route itself, route 65/66, can be circuitous on its way to/from Campbell Court. The route travels as far south as Patrick Henry High School and turns back towards Downtown. These limitations may be deterrents to some potential riders.

Stakeholders	Valley Metro, City of Roanoke
Recommendations	Install a bus shelter at the Grandin NB at Windsor stop and a landing pad at the Grandin SB at Windsor stop. Remove parking at the bus stop on the southbound side of Grandin Road.
Estimated Costs	Small bus shelter = \$6,620 Landing pad = \$140 Labor/Installation = \$3,395 Permits/Site plans = \$895

20.) Fallon Park Elementary School

Routes: 35, 36
Nearest Stops: Dale WB at 19th; Dale EB at 19th
Average Usage: 0.60; 0.25
Stop Frequency: 0.50; 0.13
Activity Index: 0.30; 0.03

The two destinations associated with pick-ups at Fallon Park Elementary School are in Salem neighborhoods where sidewalks are limited or non-existent, and the bus ride is among the longest duration in the system. Depending on the disabilities, infrastructure improvements may not be enough to make fixed-route an option for these riders. Nevertheless, prior to the streamlining and modification of fixed-route bus service between Salem and Roanoke in December 2012, this trip would have required two transfers. The improvements make the possibility of using the fixed-route for this trip easier by eliminating a transfer and introducing a new bus stop within 0.5 miles of one destination.



The bus stop activity at these stops was low during the NTD survey. Certainly the need to cross Dale Avenue may deter some people from attempting to use the bus. Consideration should be given to a pedestrian activated traffic signal as shown in section 7.1. Such a signal may also be beneficial to students who want to walk to school.

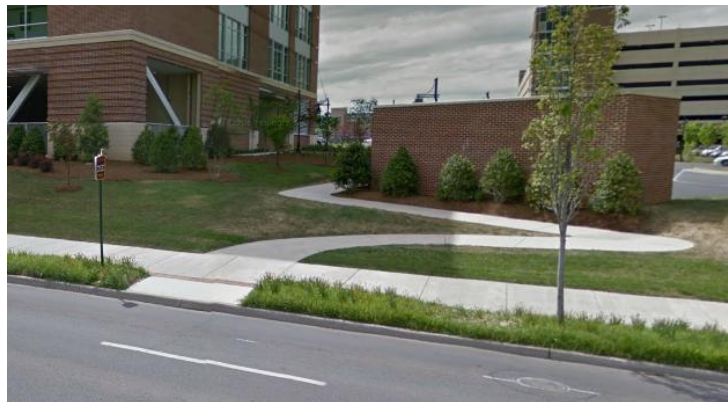


Stakeholders	Valley Metro, City of Roanoke
Recommendations	Provide a more prominent pedestrian crossing through flashing lights or a traffic signal. Extend the sidewalk to the back of the curb.
Estimated Costs	Landing pads = \$280 Additional cost for safer pedestrian crossing various depending on technology chosen.

21.) Carilion Clinic

Routes: Star Line Trolley
Nearest Stops: Jefferson SB at Reserve
Average Usage: Route not surveyed during the 2010-2011 NTD
Stop Frequency: N/A
Activity Index: N/A

Carilion Clinic is located along the trolley line. The nearest Valley Metro route is about a half-mile away at Walnut Avenue or Carilion Roanoke Memorial Hospital. People traveling to Carilion Clinic may alight at Campbell Court and walk a block to the nearest Star Line Trolley stop or take the fixed-route service to the Hospital and transfer to the trolley. The Jefferson SB at Reserve stop is primarily an alighting stop. It is an accessible location with an adequate landing pad and pathway to the Clinic. A small shelter would be appropriate for people traveling southbound.



Stakeholders	Valley Metro, City of Roanoke
Recommendations	Install a small bus shelter at the stop.
Estimated Costs	Small bus shelter = \$6,620 Labor/Installation = \$3,395 Permits/Site plans = \$895

22.) The Park/Oak Grove Retirement

Similar to #15, Fairington Apartments, The Park/Oak Grove Retirement does not currently have access to fixed-route bus service. Such service would be feasible in this area given the high commercial and residential density, and should be considered in future fixed-route transit plans.

23.) Private Residence

Routes: 61, 62
Nearest Stops: Brambleton SB at Brandon, Brambleton NB at Brandon
Average Usage: 0.20; 0.06
Stop Frequency: 0.20; 0.06
Activity Index: 0.04; 0.003

This private residence is closest to the bus stops at Brambleton Avenue and Brandon Avenue. Accessibility at the Brambleton SB at Brandon stop would be improved by extending the sidewalk to the curb. Additionally, directional curb ramps need to be constructed on the southeast and southwest corners of the intersection to allow wheelchairs to cross Brandon Avenue and Brambleton Avenue.



Brambleton NB at Brandon



Brambleton SB at Brandon

Stakeholders	Valley Metro, City of Roanoke
Recommendations	Construct curb ramps on both sides of Brambleton Avenue at Brandon Avenue. Extend the sidewalk to the back of the curb on the southbound stop.
Estimated Costs	Two curb ramps = \$8,000 Landing pad = \$280

24.) Pain Management

Routes: 55
Nearest Stops: Ogden SB at Leslie
Average Usage: 0.65
Stop Frequency: 0.29
Activity Index: 0.19

Pain Management is located off of Fallowater Lane, a half-mile from the nearest fixed-route bus stop on Ogden Lane. The path to travel from the stop to Pain Management is missing sidewalks both along the street and within the developments that exist between Ogden Road and the Pain Management facility. A bus route and stop should be considered for Starkey Road or Electric Road that would provide better access to this location, as well as the many other businesses nearby. As a minimum, a sidewalk should be constructed from the bus stop to Starkey Road. The intersection of Ogden Road at Starkey Road is inclined at the northwest corner and a short retaining wall may be needed.



Stakeholders	Valley Metro, Roanoke County
Recommendations	Construct a sidewalk from the bus stop to Starkey Road. Consider bus routes for Starkey Road or Electric Road in future transit plans.
Estimated Costs	Three curb ramps = \$12,000 Retaining wall = \$5,000 Sidewalk connection approximately 350' = \$12,250 Labor/Installation = \$3,395 Permits/Site plans = \$895

25.) On Our Own

Routes: 61, 62
Nearest Stops: Elm WB at 5th, Elm EB at 5th
Average Usage: 0.64; 2.12
Stop Frequency: 0.23; 0.82
Activity Index: 0.14; 1.74

On Our Own is located on Elm Avenue near 5th Street. Valley Metro bus stops are located at this intersection in both directions. The eastbound bus stop on Elm Avenue at 5th Street was reviewed and the associated information can be found in the previous section. The westbound bus stop experiences much less activity.



Recommendations for the Elm WB at 5th stop include extending the sidewalk to the back of the curb to create an adequately-sized landing area, installing a bench, and replacing the existing ramps at the intersection of Elm Avenue and 5th Street with directional curb ramps with tactile warning plates.

Stakeholders	Valley Metro, City of Roanoke, Old Southwest, Inc.
Recommendations	Construct an adequately sized landing area and install a bench.
Estimated Costs	Four curb ramps = \$16,000 Landing Area and Bench = \$2,000 Labor/Installation = \$3,395 Permits/Site plans = \$895

26.) Private Residence

There is one destination associated with this origin, and it is in Salem where the nearest bus stop is a mile and a half away. For this reason, this pick-up location was not studied.

27.) Hanover Direct

Routes: 25, 26
Nearest Stops: Plantation SB at Hollins/John Richardson (opposite Food Lion Driveway)
Plantation NB at Hollins/John Richardson (opposite Food Lion Driveway)
Average Usage: 0.44; 0.43
Stop Frequency: 0.28; 0.33
Activity Index: 0.12; 0.14

In 2012, this business, which employed 200 people closed. However, a new manufacturing business is planned for this location which will employ an estimated 96 people. It is possible that some of these employees will want to use public transit to access their job. The location is more than a ¾ mile walk from the nearest bus stops which is beyond the traditional acceptable walkshed (¼- to ½-mile walk) of a bus stop. While this is a walkable distance for some, pedestrian infrastructure solely for this purpose is not recommended. The previous business had an agreement with Valley Metro to provide a shuttle service from Campbell Court to the business. Options for transit service for employees should be considered for this business as it makes plans to move to the location.

28.) Water Authority

Routes: 41, 42, 51, 52
Nearest Stops: Jefferson SB at Bullitt; Jefferson NB at Bullitt (Main Library)
Average Usage: 0.45; 0.52
Stop Frequency: 0.30; 0.34
Activity Index: 0.13; 0.17

The Water Authority is located in Downtown Roanoke and has several bus stops within a block of the building that are accessible. The two bus stops reviewed are at the intersection of Jefferson Street and Bullitt Avenue. The Jefferson SB at Bullitt stop is located near the Patrick Henry, a residential building that extends over the sidewalk, providing shelter for transit riders when necessary. As such a bus shelter is not needed at this location. However, on-street parking prohibits the bus from pulling up next to the curb, making it difficult for pedestrians with disabilities to get onto the bus. Parking should be prohibited during transit hours to allow the bus to properly service the stop and enable riders with disabilities the opportunity to safely board the bus.



The Jefferson NB at Bullitt stop is located in front of the Downtown Roanoke Main Library. This bus stop is served by inbound buses to Campbell Court. Given its location within the system, more people would alight at this stop than board. As such a bus shelter is not needed at this location, and a nearby brick wall around the patio serves as a makeshift bench for riders. One of the standard black backless benches used in downtown could be installed near this stop to provide a better accommodation for riders.

Both stops are also located along the Starline Trolley though the trolley does not currently stop at either location. With the improvements at Elmwood Park finishing in the Fall 2013, along with the adjacent trip generators already mentioned, consideration should be given to incorporating these stops into the trolley service.

Stakeholders	Valley Metro, City of Roanoke
Recommendations	Remove on-street parking during transit service hours at the bus stops. Install a bench near the northbound stop.
Estimated Costs	Bench = \$1,700

29.) Community Hospital

Routes: 41, 42
Nearest Stops: Elm EB at Jefferson (Community Hospital); Elm WB at Jefferson
Average Usage: 0.47; 0.27
Stop Frequency: 0.29; 0.27
Activity Index: 0.13; 0.07

Upon review of the data, of the five destinations associated with this origin, four of them have inadequate or non-existent transit service. Therefore, the need to use paratransit is not based on accessibility concerns at these bus stops. No improvements are recommended.

30.) BB&T Bank

Campbell Court is two blocks from BB&T Bank in Downtown Roanoke. While there are other stops a block closer, the need to transfer buses to access these stops makes Campbell Court the more attractive option. The destinations associated with this origin are within a quarter-mile of Valley Metro bus stops. Accessibility concerns at the destinations or at Campbell Court may inhibit riders from choosing to use fixed-route transit.

31.) Private Residence

This location is over a mile walking distance from the nearest bus stop along roads without sidewalks. As such, this pick-up location was not reviewed.

32.) Bank of Botetourt

Routes: 85
Nearest Stops: Cove SB at Food Lion Entrance
Average Usage: 0.93
Stop Frequency: 0.50
Activity Index: 0.46

This location is a half-mile from the nearest bus stop on Cove Road at the Food Lion shopping center. There are no sidewalks along this road nor pedestrian features at the intersections. Any future infrastructure projects along Peters Creek Road should include pedestrian accommodations on both sides for safely walking along and crossing Peters Creek Road. This location should be evaluated for incorporation into a future bus route that travels along Peters Creek Road.

7.0 ACCOMMODATION EXAMPLES

The following examples are from other parts of the country and show various innovative methods for making bus stops more accessible and safer.

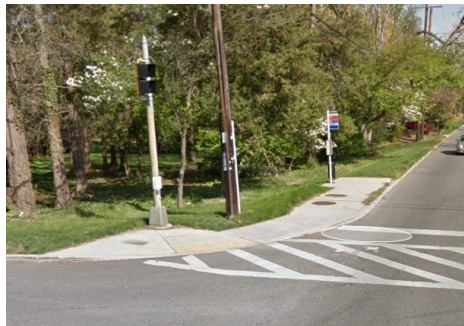
7.1 Signals for Safe Pedestrians Crossings

The following two examples show where a traffic signal for the sole purpose of stopping traffic in order to allow pedestrians to cross the street safely.

7.1.1 Montgomery County, Maryland



A pedestrian-activated signal is present on New Hampshire Avenue in Montgomery County Maryland. The bus stop is located on the left side of the picture; Sunrise Senior Living is located to the right. The signals on the mast arms are typically black and are only activated by a pedestrian pushing a button.



Google through Google Maps captured the image above of an elderly man crossing the street with the signal activated. With these accommodations, using public transit is made possible because walking across a six-lane highway to reach a destination can be accomplished safely.

Infrastructure costs can be minimized by focusing on the essential features. In this picture, sidewalks are provided only from the bus stop to the curb ramp on the corner.

The side streets feature a stop sign and stop bar along with a signal that turns red when it is not permissible to proceed. In the second picture below, the traffic pattern was designed to only allow right turns due to conflicts turning left onto a six-lane highway. Drivers wanting to turn left are expected to turn right and then make a U-turn at the next intersection.



7.1.2 St. Augustine, Florida

In St. Augustine, Florida, on S. Castillo Drive, a traffic signal was installed for the sole purpose of allowing a safe pedestrian crossing across a four-lane highway that separates the Castillo de San Marcos National Monument area from the St. Augustine tourist area. The traffic signal is green unless activated by a pedestrian which turns the light red.



7.1.3 Arlington, Virginia

The picture below shows Columbia Pike, a four-lane arterial, featuring a pair of bus stops with a crosswalk connecting the two. The crosswalk is highlighted with pedestrian-activated flashing lights and signage, similar to the pedestrian crossing on Hershberger Road at Friendship Manor. In the picture, a bus shelter is placed on the inbound side where most riders board the bus. The companion stop does not have a shelter because it is used mainly for alighting.



7.2 Bus Stops in Low-Density Areas in Montgomery County, MD



This bus stop features a landing pad from the back of the curb, 8' deep, bordered by a decorative wall used to separate the pad from the soil. The short wall serves as a retaining wall and a bench.



This is a basic bus stop that meets the needs of a person in a wheelchair. It is a 5' wide by 8' deep concrete pad with a curb along the backside for safety. The bus stop is connected to a short sidewalk and curb ramp. For an area in a local residential neighborhood, that does not have sidewalks and pedestrians are expected to walk on the low traffic streets, this bus stop does a nice job to provide a safe place for people to wait for the bus.



This bus stop is the most basic of accessible bus stops. The picture shows how the sidewalk has been extended to the back of the curb and out towards the adjacent parking lot, accomplishing the minimum 5' x 8' landing pad.



This bus stop features a landing pad bordered by a curb used to separate the pad from the hill. The curb also serves as a pseudo-bench.



The adjacent pictures show an excellent example of how to accommodate multiple modes within a corridor in a low-density area. This two-lane road features on-street bike lanes, a pair of bus stops with simple built-in benches, a clearly marked crosswalk, a sidewalk leading from the crosswalk over the drainage ditch to a shared-use path. The bus stop features a raised concrete landing area that has also been incorporated into the bike lanes. An additional recommendation may be a trash can; garbage seems to have accumulated in the ditch.



7.3 Street-level Accommodations for All Modes in FL



Gulf Boulevard is a two-lane street in Indian Shores, Florida. It features a bicycle lane in black, an on-street pedestrian lane in red, no curb, and a signed bus stop area. The bus stop features include a slightly raised concrete platform leading to a bench, schedule and route signage, and a small trash receptacle.

A person in a wheelchair can safely wait for a bus on the landing area within the red, pedestrian zone. In the picture below, on the right-hand side, a bus shelter is also shown. It is highlighted in the bottom picture.



In the same area, a pedestrian crosswalk provides yellow flags for use in the dark. Pedestrians carry across a reflective flag to warn motorists of a pedestrian in the crosswalk. The flag is then deposited in a container on the opposite side of the street. The example shows strategic use of limited space within a right-of-way to provide a multimodal corridor which minimizes infrastructure and costs by using striping and colors instead of concrete.



8.0 STRATEGIES FOR FUNDING IMPROVEMENTS

The following funding sources present opportunities for accomplishing accessibility improvements at and around bus stops.

8.1 Regional Surface Transportation Program

As a result of the U.S. Census 2010, the Roanoke urbanized area grew to over 200,000 people. This threshold is set by the Federal Government and indicates that the area be designated a Transportation Management Area. Due to its new designation, the Roanoke Valley Area Metropolitan Planning Organization is now charged with deciding how best to use federal funds associated with a Regional Surface Transportation Program (RSTP). The MPO Policy Board reviews the RSTP projects annually and every few years or as needed solicits new project applications. These applications are scored and ranked by the Transportation Technical Committee (TTC). The TTC provides recommendations to the MPO Policy Board, who ultimately makes the final funding decision. Currently, Roanoke Valley Area MPO has been granted approximately \$4 million a year to allocate. Each year the program will be reviewed and an updated six-year RSTP program will be incorporated into the Commonwealth Transportation Board's Six-Year Improvement Program. The MPO Policy Board approved the first RSTP program in May 2013. It is expected that the MPO Policy Board will solicit new application in the Fall of 2014. Projects funded through the RSTP are incorporated into the MPO's Transportation Improvement Program.

8.2 Transportation Alternatives Funding

Like the RSTP funding, due to its TMA status, the Roanoke Valley Area MPO has been given authority over the allocation of some Transportation Alternatives (TA) funding. In March 2013, the MPO Policy Board approved the use of \$236,347 in FY 2014 TA funds. The Commonwealth Transportation Board also makes decisions over a separate pot of TA funds through which the Roanoke area may also receive project funding. New TA project applications will be solicited in the Fall 2013 with a due date of November 1, 2013. Projects receiving TA funds are incorporated into the MPO's Transportation Improvement Program.

8.3 FTA Urbanized Area Formula Funding (Section 5307)

Section 5307 refers to the main funding source from the Federal Transit Administration for transit capital and operating assistance in urbanized areas. The Greater Roanoke Transit Company (Valley Metro) is the designated recipient of these funds for the Roanoke urbanized area.

The most recent federal transportation legislation, MAP-21, mandated the use of a minimum 1% of Section 5307 funds be used for Associated Transit Improvements, which include items such as bus shelters, pedestrian access and walkways, and enhanced access for persons with disabilities to public transportation. In FY2014, Valley Metro had allocated \$29,000 for transit improvements. The MPO Policy Board approves the use of Section 5307 funds for projects identified through the Transportation Improvement Program.

8.4 Local Governments

Resources exist through the everyday work of local governments that can assist with making accessibility improvements to bus stops. Methods to incorporate bus stop infrastructure include the following suggestions:

- during the development review process
- as part of a proffer during rezoning petitions
- during any infrastructure improvement project (curb, sidewalk, drainage, etc.) undertaken by the locality that contains a bus stop or is adjacent to a bus route
- as a project in the Capital Improvement Program

Many departments within a local government do work that affects the public right-of-way. Each department, in the examples listed above and in other ways, has the ability to make getting to bus stops, waiting at bus stops, and getting from the bus stop onto the bus easier and safer for transit riders.

8.5 Public-Private Partnerships

Another key strategy that does not use federal funds is partnering with local businesses, particularly those that may host the bus stop on or next to their property and may financially benefit greatly from being in close proximity to the bus stop. Such partnerships take time to develop because they are unique to each bus stop and because of the significant coordination effort it takes to find the appropriate people to speak with at the organization, obtain construction permission and financing approvals. Untapped resources exist within the private arena that merit the time spent to seek new ways to finance improvements.

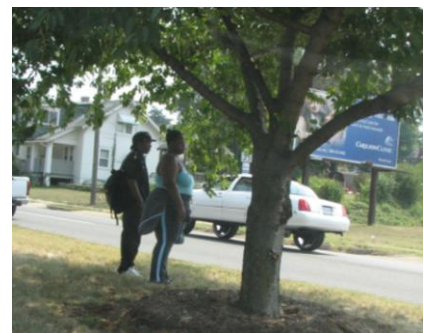
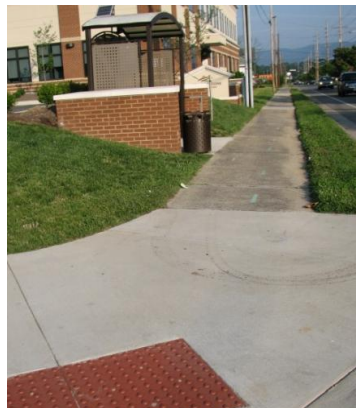
9.0 CONCLUSION: Implementing Bus Stop Improvements

In conclusion, a person's decision to take fixed-route transit relies on many factors including the conditions at the origin, transfer point, and destination. Poor conditions at any one of these locations could affect someone's ability to use fixed-route transit. The purpose of the Bus Stop Accessibility Study was to identify ways to make it safer and easier for pedestrians to get to and from bus stops and to make bus stops themselves easier and safer to use, particularly for pedestrians with disabilities.

The specific bus stop improvements discussed in this document may be implemented individually or as part of a greater area or corridor project. Although this Study focused on the most active stops, there are many more stops in the transit network that also need infrastructure improvements. The NTD Survey data will be a valuable resource as improvements are pursued. This data will be useful in particular for identifying suitable locations for bus shelters, which require a higher proportion of boardings than alightings. Benches are also an appreciated amenity at bus stops, particularly those that are primarily boarding stops but do not experience the high activity which demands a bus shelter. Installing a bench is more cost efficient than installing a bus shelter and limited resources can serve more stops if it is determined that a bench is sufficient accommodation. As bus stop improvements are considered system-wide, the following recommendations apply broadly to many bus stops.

- Provide a wheelchair-accessible landing pad at each bus stop.
- Use the space between the sidewalk and the curb to accomplish adequate landing pads.
- Restrict parking during transit service hours next to bus stops to enable the bus to pull-up to the curb and safely allow passengers to board from and alight onto the sidewalk.
- Include improvements to bus stops in all infrastructure projects in which a bus stop is contained within the project limits.

Developing partnerships between Valley Metro, local governments, neighborhood associations, and private property owners will be necessary in implementing bus stop accessibility improvements. There are so many ways to improve bus stops that each one is truly a unique project. With many stakeholders working together to improve bus stop accessibility in the Roanoke Valley, citizens will be served by adequate facilities such as the new bus shelter and curb ramp shown below at the New Horizons Healthcare facility on Melrose Avenue. Just down Melrose Avenue at another bus stop, riders determine their own amenities by waiting in the median under a tree ready to run across two lanes to the transit stop upon seeing the bus. Together, the Region can make the former accommodation the norm.



Appendix A

Bus Stop Accessibility Survey	
A. LOCATION	
	Date surveyed:
1	Route #
2	Bus Stop Name
3	Nearest Landmark (business name, house address)
4	Position in relation to nearest intersection (1-nearside; 2-far side; 3-mid-block; 4-not near an intersection)
5	Outbound or Inbound or Both?
6	If there is a companion bus stop across the street, what is its name?
B. INFORMATION FEATURES	
7	Is there a bus stop sign?
8	Is there a snowflake sticker on the sign indicating that it is on a snow route?
9	How is the bus stop sign installed? (1-on its own pole, 2-on a utility pole, 3-on a building, 4-on a shelter, 5-other-specify)
10	Are there problems with the signage? (1-no, 2-sign in poor condition, 3-pole in poor condition, 4-sign position hazardous to pedestrians, 5-other-specify)
11	Recommendations for signage: (also specify any repairs needed or enter "none")
C. WHEELCHAIR ACCESS	
12	Where would a person in a wheelchair likely be let off? (1-in the street (no landing area), 2-on the sidewalk next to the bus stop, 3-other (specify))
13	What is the current material of the correct location (off-street, next to bus stop) of the landing area? (1-concrete; 2-concrete and grass; 3-grass; 4-gravel; 5-asphalt; 6-other-specify)
14	What are the obstacles to creating an adequate landing area? (1-confined space, 2-steep slope, 3-uneven landing, 4-other-specify, 5-none)
15	Are there any objects that would limit the mobility of a wheelchair? (e.g. traffic poles, signs, trashcans, sewer covers, drainage grates, overhead hazards, etc.)
16	Recommendations for building an appropriate landing area? (1-Pave landing area, 2-Widen existing sidewalk to back of curb, 3-remove on-street parking, 4-Install curb bulbout, 5-other-specify)
D. SAFETY AND SECURITY	
17	What is the bus stop next to? (1-travel lane, 2-parking lane, 3-bus lane/pull-off area, 4-paved shoulder, 5-right-turn only lane, 6-unpaved shoulder, 7-"no parking" portion of the parking lane, 8-other-specify)
18	If there is parking, is the bus stop zone designated as a "no parking" zone?
19	If yes above, how is the "no parking" zone marked? (1-one "no parking" sign, 2-two or more "no parking" signs, 3-painted curb)
20	Are cars or could there potentially be cars parked between the landing area and the bus stopping area?
21	What are the traffic controls at the nearest intersection for the street? (1-Traffic signals, 2-Stop/Yield Sign on all approaches, 3-stop/yield on minor approaches only, 4-Other-specify)
22	Are there potential traffic hazards? (Check all that apply.)
	The bus stop is just over the crest of a hill.
	The bus stop is just after a curve in the road.
	The bus stop is near an at-grade railroad crossing.
	Waiting passengers are hidden from view of approaching bus.
	A stopped bus straddles the crosswalk.
	Bus stop just before crosswalk.
	High speed traffic.
	No crosswalk.
	Other (specify)
23	Improve pedestrian safety by (1-trimming trees or branches, 2-moving bus stop to (specify location), 3-other-specify)
24	Other traffic safety comments/recommendations:

E.	CONNECTIONS
25	How wide is the sidewalk? (1-No sidewalk, 2-less than three feet., 3-three-five feet, 4-more than five feet)
26	For existing sidewalks, list any barriers that constrict the width of the sidewalk within the block on which the bus stop is located.
27	Rank the condition of the sidewalk. (1-hazardous-large breaks, cracks root uplifting, someone could get hurt from normal use or use of a wheelchair would be difficult, 2-poor but not hazardous-very rough, some root uplifting, cracks, breaks, 3-fair-minor root uplifting, minor cracks or breaks, 4-good-not perfect but no immediate repair, 5-cosmetically excellent or new)
28	Where is the nearest street crossing opportunity? (Name intersection or mid-block crosswalk.)
29	Check off which pedestrian amenities are at the nearest intersection (or other crossing opportunity).
	curb cuts - 1, 2, 3, or all corners
	pedestrian crossing signal
	crosswalk(s)
	audible crosswalk signal
	pedestrian push-buttons
	tactile warning strip on curb cut
	other
	none of the above
30	Pedestrian connection recommendations:
	Construct a sidewalk at the bus stop
	Construct sidewalks on adjacent streets leading to the bus stop (specify which streets)
	Widen the sidewalk at the bus stop
	Improve landing area connections to the sidewalk
	Install curb cuts at (list corners - all or specify NE, SE, NW, SW)
	Move object to improve accessibility (specify what object):
	Make the following repairs (specify):
	Other (specify):
F.	BENCH
31	Is there a bench, not associated with a shelter, at this bus stop?
32	Rank the condition of the bench (1-hazardous-broken, someone could get hurt from normal use, 2-in poor shape though not hazardous, 3-fair-needs repainting or other cosmetic attention, 4-good-not perfect, but no immediate repair needed, 5-cosmetically excellent/new)
33	Seating recommendations (specify where seating should be moved to improve accessibility, specify repairs needed, other)
G.	BUS SHELTER
34	Is there a bus shelter at this stop?
35	Could a person using a wheelchair maneuver into the shelter?
36	Could a person using a wheelchair fit completely under the shelter? (min. space 2.5' x 4')
37	What is the distance between the front of the shelter and the curb in feet?
38	Rank the condition of the shelter (1-hazardous, broken glass, unstable, 2-in poor shape though not hazardous, 3-fair-needs repainting, glass panels need thorough cleaning, protruding but not hazardous bolts, 4-good-not perfect but no immediate repair need, 5-cosmetically excellent, new)
39	Shelter recommendations (specify repairs needed, objects that should be moved to improve accessibility and where, if shelter needs to be moved to improve accessibility and where, other)
H.	LIGHTING - to be assessed at night
40	What type of lighting is available? (1-none, 2-street light, 3-shelter lighting, 4-outside light on adjacent building, 5-other-specify)
41	Is additional lighting recommended?
42	List other comments related to lighting.
H.	TRASH
40	What type of trash receptacle is available? (1-none, 2-City trash can, 3-other trash can-specify)
41	Is a trash receptacle recommended?
42	List other comments related to trash.