

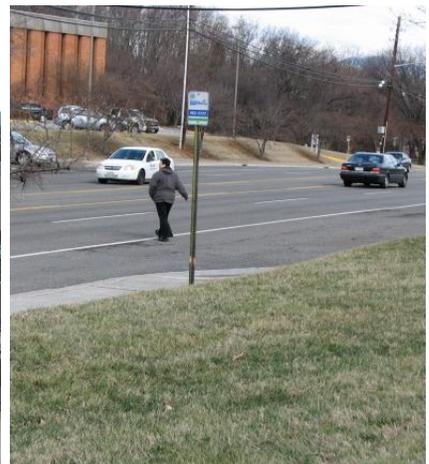


Roanoke Valley-Alleghany  
**REGIONAL**  
commission



# BUS STOP ACCESSIBILITY STUDY DRAFT REPORT

*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.*

# **TABLE OF CONTENTS**

1.0	INTRODUCTION .....	6
2.0	METHODOLOGY .....	6
3.0	AMERICANS WITH DISABILITY ACT STANDARDS FOR ACCESSIBLE DESIGN .....	7
4.0	NATIONAL TRANSIT DATABASE (NTD) SURVEY AND DATA ANALYSIS .....	9
5.0	FIELD VISITS TO HIGH ACTIVITY STOPS .....	14
1.)	Campbell Court .....	14
2.)	Virginia Tech Squires Student Center.....	16
3.)	East Main at Goodwill Transfer Center .....	17
4.)	Valley View Ring Road SB at Walmart .....	19
5.)	Lake Drive Plaza Big Lots (Hardy Road) .....	20
6.)	Spartan Square Kroger.....	21
7.)	Roanoke Regional Airport .....	22
8.)	Hunt EB at 8 <sup>th</sup> .....	23
9.)	Salem Turnpike WB at Delta .....	23
10.)	Fernclyff SB at Hoback.....	24
11.)	Crossroads Shopping Center Driveway WB at Work Force/Kmart.....	25
12.)	Tazewell EB at 4th .....	25
13.)	Towers Shopping Center Upper Lot .....	26
14.)	Towers Shopping Center Kroger .....	27
15.)	Elm EB at 8th .....	28
16.)	Colonial SB at VWCC Pedestrian Overpass.....	29
17.)	Valley View Mall SB at Sears .....	30
18.)	Hardy WB at Bedford.....	31
19.)	VA Hospital Private Road Stop 2.....	32
20.)	Burrell SB at Whitten .....	32
21.)	Melrose EB at Victoria (Melrose Towers).....	33
22.)	Elm EB at 5th .....	33
23.)	Towne Square Kroger .....	34
24.)	Tazewell WB at I-581 Bridge .....	35
25.)	Campbell WB at Norfolk (Valley Metro Admin Bldg) .....	36
26.)	Salem Turnpike EB at 24th.....	36
27.)	Tanglewood Mall at AC Moore .....	37
28.)	Hunt WB at 8th.....	38
29.)	Exit 140 Park and Ride.....	39
30.)	Melrose EB at 35th.....	40

6.0	PARATRANSIT ORIGINS AND DESTINATIONS .....	41
1.)	Adult Day Care .....	43
2.)	VA Hospital .....	44
3.)	NW Dialysis.....	44
4.)	Crystal Spring Dialysis.....	45
5.)	Clearview Manor Apartments .....	46
6.)	Lewis Gale .....	47
7.)	Friendship Manor .....	48
8.)	Stratford Park Residential Apartments.....	49
9.)	Walmart/Valley View Mall .....	51
10.)	Planet Fitness .....	51
11.)	Goodwill Service Center .....	51
12.)	Blue Ridge Village Apartments .....	51
13.)	Melrose Towers.....	51
14.)	Morningside Manor.....	52
15.)	Fairington Apartments .....	52
16.)	McDonald's in Vinton.....	52
17.)	Kroger/Towers Mall .....	52
18.)	Kroger/Vinton .....	52
19.)	Raleigh Court Nursing Home.....	53
20.)	Fallon Park Elementary School .....	54
21.)	Carilion Clinic .....	54
22.)	The Park/Oak Grove Retirement .....	55
23.)	Private Residence .....	55
24.)	Pain Management .....	56
25.)	On Our Own .....	56
26.)	Private Residence .....	56
27.)	Hanover Direct .....	56
28.)	Water Authority.....	57
29.)	Community Hospital .....	57
30.)	BB&T Bank.....	57
31.)	Doctor's Office.....	57
32.)	Bank of Botetourt.....	57
7.0	ACCOMMODATION EXAMPLES.....	58
7.1	Signals for Safe Pedestrians Crossings .....	58
7.2	Bus Stops in Low-Density Areas .....	60

7.3 Street-level Accommodations for All Modes .....62

8.0 STRATEGIES FOR FUNDING IMPROVEMENTS .....63

8.1 Regional Surface Transportation Program .....63

8.2 Transportation Alternatives Funding .....63

8.3 FTA Urbanized Area Formula Funding (Section 5307).....63

8.4 Local Governments.....63

8.5 Public-Private Partnerships.....64

## **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 key enhancements at and around bus stops to make it easier for pedestrians to get to bus stops and onto buses, 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, and
- To identify examples from other places on how to make bus stops more accessible;
- To identify funding sources for making accessibility improvements.

In order to achieve these goals, an extensive process ensued that began with analyzing the bus stops from a system-level perspective. The following methodology explains the process.

## **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 good accessibility.

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 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 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**

In 2010, the Department of Justice adopted ADA standards for Accessible Design<sup>1</sup> related to transportation facilities (section 810). Selected standards related to bus stop accessibility are listed below.

#### **Advisory 810.2 Bus Boarding and Alighting Areas:**

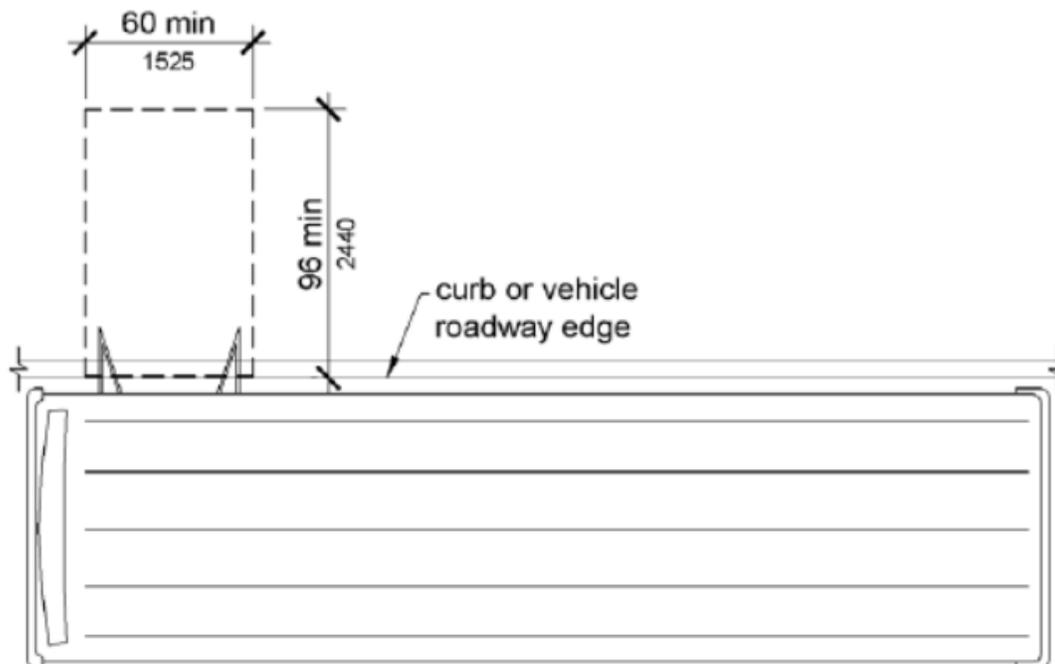
At bus stops where a shelter is provided, the bus stop pad can be located either within or outside of the shelter.

##### **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.



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

**810.2.3 Connection:**

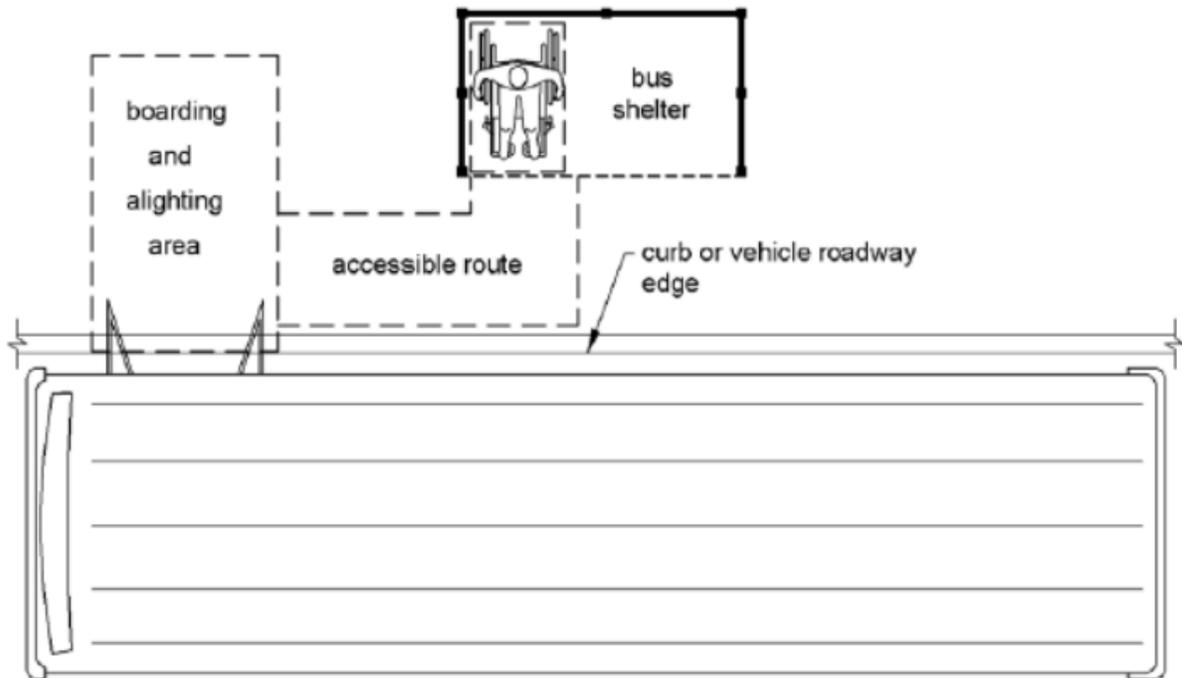
Bus stop boarding and alighting areas shall be connected to streets, sidewalks, or pedestrian paths by an accessible route complying with 402.

**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.

**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.



### **Stop Usage**

Description: When the bus stops, the number of people getting on and off the bus at a specific bus stop.

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

***When the bus passes, an average of 0-1 people get on at this stop.***

### **Stop Frequency**

Description: The number of times a bus stopped at a specific bus stop.

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 compare bus stops across the transit system, this number describes the average number of people that got on and off the bus at a stop each time the bus passed that stop during the course of the survey.

Formula: Stop Usage \* Stop Frequency

Ex. Location: Williamson NB at Carver

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

***On average, less than one person boarded or alighted the bus at this stop each time the bus passed that stop during the survey period.***

After looking through the results, which are provided as follows, the trends seen in the sample generally appear to reflect reality, based on staff experiences and personal knowledge.

**Table1: Bus Stops sorted by Stop Usage**

*When it passed the following locations,  
an average of two or more people got on or off the bus.*

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 VA Hospital Private Road Stop 1, where the bus picked up a lot of people. However, in looking at the Stop Frequency, this bus stop ranked low, thus the survey picked up a rare occurrence when many people used that stop.

**Table 2: Bus Stops sorted by Stop Frequency**

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

<b>Standardized Stop Description</b>	<b>Activity Index</b>	<b>Average Usage</b>	<b>Stop Frequency</b>
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.

**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.*

<b>Standardized Stop Description</b>	<b>Activity Index</b>	<b>Average Usage</b>	<b>Stop Frequency</b>
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
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Towers Shopping Center Upper Lot	2.2426	2.83	0.79
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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 stops that are used a lot by a lot of people. Bus stops ranking high on the Activity Index were visited to assess accessibility.

## 5.0 FIELD VISITS TO HIGH ACTIVITY STOPS

The thirty 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

<b>Routes:</b>	All routes
<b>Average Usage:</b>	9.51
<b>Stop Frequency:</b>	0.92
<b>Activity Index:</b>	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 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.

<b>Stakeholders</b>	Valley Metro, City of Roanoke, Downtown Roanoke Inc.
<b>Recommendations</b>	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.
<b>Estimated Costs</b>	\$300,000 for the study

## 2.) Virginia Tech Squires Student Center

**Routes:** Smartway, Blacksburg Transit  
**Average Usage:** 8.13  
**Stop Frequency:** 1.00  
**Activity Index:** 8.13

The Virginia Tech Squires Student Center is the main 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 the Squires Student Center provides refuge during inclement weather. More often people stand under the nearby trees in the grass (which has worn away) for shade. Just before the bus stop, there is a shelter though it is not intended for Smartway users. Installing a bus shelter at the current stop location or relocating the stop to the shown bus shelter should be considered.



<b>Stakeholders</b>	Valley Metro, Blacksburg Transit, Virginia Tech
<b>Recommendations</b>	Install a bus shelter at the current stop or consider relocating the Smartway stop to the existing bus shelter.
<b>Estimated Costs</b>	Varies depending on the recommendation pursued.

### 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 system. Similar in function to Campbell Court, 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.



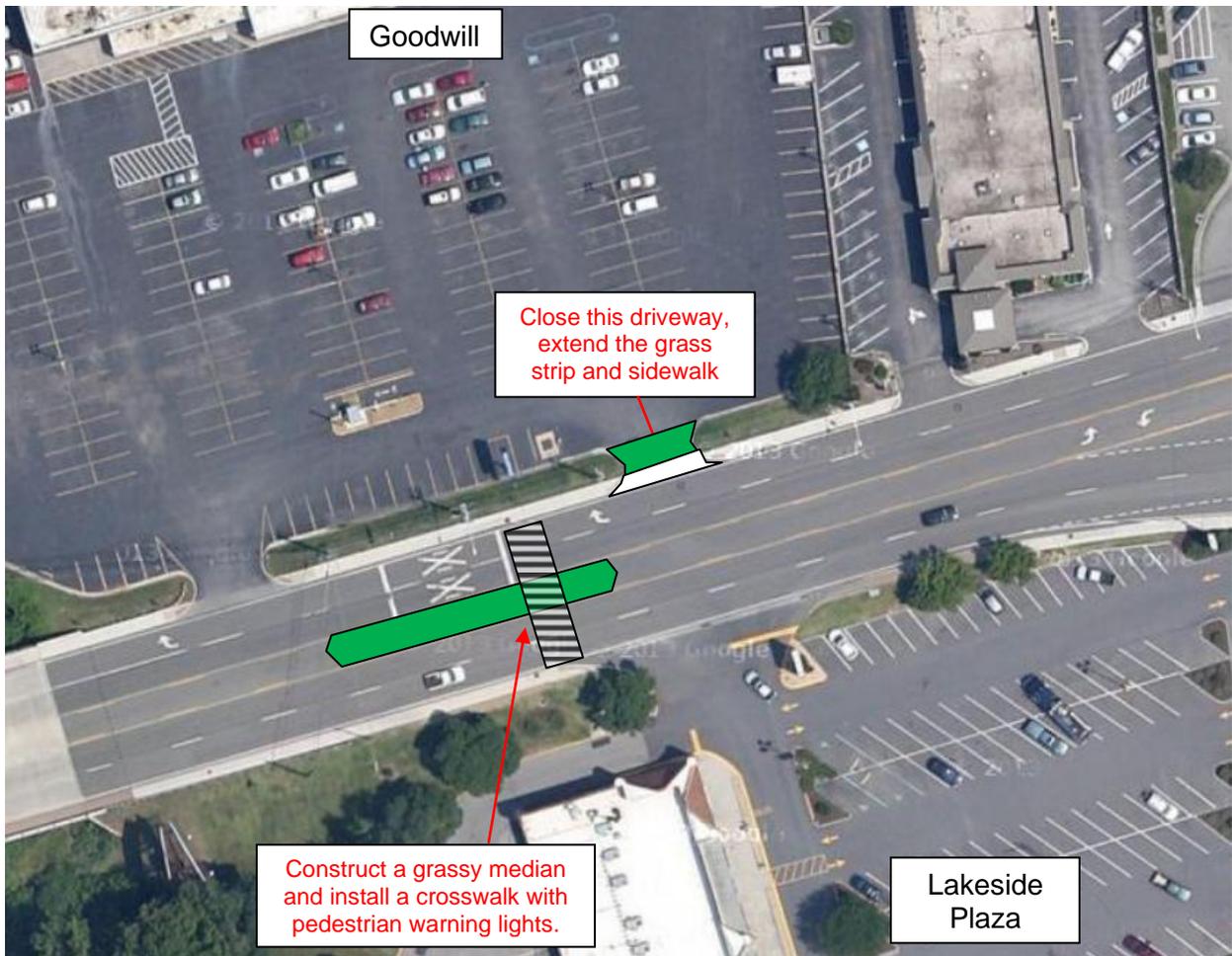
As a result, the bus stop at this location has been shifted to the street and is now East Main WB at Lakeside Plaza (Goodwill). Some activity will



continue because of the commercial trip generators, including the Kroger grocery store. In order for passengers to access Lakeside Plaza, they must cross East Main Street, a 5-lane heavily traveled roadway. Although the nearby intersection of East Main Street and Electric Road features pedestrian signals and curb ramps, it is has been frequently observed that people choose to avoid this roundabout path to crossing the street. Favoring a direct path and a few minutes saved, people often cross the five lanes at the driveway entrance to the shopping center.

A safe pedestrian crossing at this location is needed. The diagram on the following page shows an option for reducing vehicle turning movement conflicts and creating a safer pedestrian crossing. The picture to the right shows an example of a similar crossing on a smaller scale on Hershberger Road at Friendship Manor.





<b>Stakeholders</b>	Valley Metro, City of Salem, VDOT, Goodwill Industries
<b>Recommendations</b>	Construct a pedestrian refuge island with a crosswalk, signage, and flashing lights in ground and above ground that can be activated by a pedestrian. Close the eastern driveway at Goodwill to enable the crossing and to reduce vehicle turning movement conflicts.
<b>Estimated Costs</b>	Pedestrian Median, Crosswalk, and Signal with flashing lights and signage = \$120,000 Reconstruct driveway with curb, grass and sidewalk = \$4,000

#### 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.



<b>Stakeholders</b>	Valley Metro, Valley View Mall management, Walmart
<b>Recommendations</b>	Construct a bus shelter with lighting and a pedestrian connection to the Walmart parking lot.
<b>Estimated Costs</b>	\$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 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 location, the stop needs a bus shelter and lighting.

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

## 6.) Spartan Square Kroger

**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 in 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 East 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 shopping center.



<b>Stakeholders</b>	Valley Metro, City of Salem, Spartan Square management, Kroger
<b>Recommendations</b>	Pave a landing pad from the curb to the parking lot and construct a bus shelter with lighting and a trash can.
<b>Estimated Costs</b>	Large Shelter = \$9,450 Labor/Installation = \$3,395 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 wheelchairs 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.



<b>Stakeholders</b>	Valley Metro, Roanoke Regional Airport
<b>Recommendations</b>	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.
<b>Estimated Costs</b>	Two Large Shelters = \$18,900 Labor/Installation = \$6,790 Permits/Site Plans = \$895

### 8.) Hunt EB at 8<sup>th</sup>

**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 ramps at the stop, but improvements are needed.

<b>Stakeholders</b>	Valley Metro, City of Roanoke
<b>Recommendations</b>	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.
<b>Estimated Costs</b>	2 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. There is a crosswalk as seen in the picture west of the bus stop. Given the activity at this stop, several improvements are needed.

<b>Stakeholders</b>	Valley Metro, City of Roanoke
<b>Recommendations</b>	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.
<b>Estimated Costs</b>	3 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 and heads towards Valley View Mall. During the NTD survey, twice as many passengers alighted at the stop than boarded. As such, a small shelter is recommended at this location. 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.



<b>Stakeholders</b>	Valley Metro, City of Roanoke
<b>Recommendations</b>	Construct a landing pad, curb ramps at a new crosswalk, and install a bus shelter.
<b>Estimated Costs</b>	2 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 Work Force/Kmart

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



The Virginia Work Force Center is the main attraction for this bus stop's location. 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.

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

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

### 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 each have a bus stop. It is recommended that any bus route that includes Towers Shopping Center provide service to both levels.

<b>Stakeholders</b>	Valley Metro, Towers Shopping Center management
<b>Recommendations</b>	Relocate the bus stop to Colonial Avenue, potentially on the end near Chipotle, and install a shelter, landing pad, trash can, and pedestrian ramps, and sidewalk connections to the shopping center and to the existing sidewalk front of CVS.
<b>Estimated Costs</b>	Large Shelter = \$9,450 Labor/Installation = \$10,185 Permits/Site Plans = \$895 250' x 5' sidewalk connection = \$8,750 Five ADA ramps = \$20,000 Total = \$49,280

**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*



*Proposed 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. 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. It is desirable to keep the stop next to the building to eliminate pedestrian/vehicle interaction in the parking lot. 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. This stop needs a bus stop sign.

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.

<b>Stakeholders</b>	Valley Metro, Towers Shopping Center management
<b>Recommendations</b>	Relocate the bus stop to the Tuesday Morning store location.
<b>Estimated Costs</b>	Minimal for the sign installation.

**15.) Elm EB at 8th**

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



This bus stop travels inbound to Campbell Court. It is located in a residential area 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 site 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 8<sup>th</sup> 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.



<b>Stakeholders</b>	Valley Metro, City of Roanoke, adjacent property owners, Old Southwest
<b>Recommendations</b>	Explore amenity improvement options at the current location. Explore a bus pull-off design and cost within the green open space between Ferdinand and 8 <sup>th</sup> Streets.
<b>Estimated Costs</b>	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 sidewalk is higher than the roadway, but 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.



<b>Stakeholders</b>	Valley Metro, City of Roanoke, VWCC
<b>Recommendations</b>	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.
<b>Estimated Costs</b>	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**

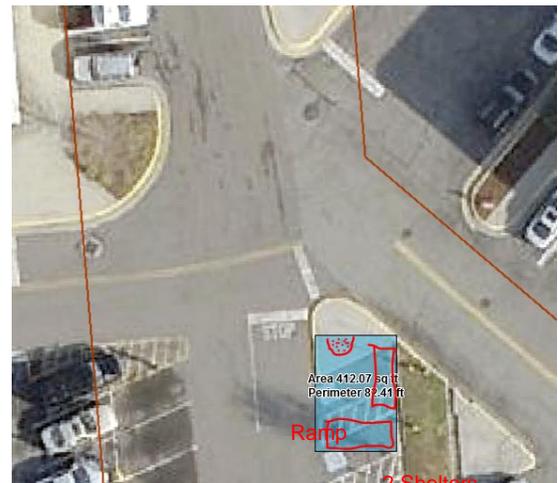
**Routes:** 55  
**Average Usage:** 3.00  
**Stop Frequency:** 0.71  
**Activity Index:** 2.11



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 shelters. Pavement striping of stop bars would also be adjusted.

<b>Stakeholders</b>	Valley View Mall management, Valley Metro
<b>Recommendations</b>	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.
<b>Estimated Costs</b>	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 must 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 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.



<b>Stakeholders</b>	Valley Metro, Town of Vinton, Adjacent property owners
<b>Recommendations</b>	Move bus stop to nearside Hardy Road/Clearview Drive; install a shelter and landing pad; stripe crosswalks on Hardy Road and Clearview Drive; construct and ADA ramp on the existing sidewalk at the Clearview Drive driveway into the shopping center (behind Subway).
<b>Estimated Costs</b>	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 has 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.

<b>Stakeholders</b>	Valley Metro, VA Medical Center management
<b>Recommendations</b>	Install a bus shelter at the current location.
<b>Estimated Costs</b>	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.

<b>Stakeholders</b>	Valley Metro, City of Roanoke Transportation and Parks and Recreation
<b>Recommendations</b>	Install a small shelter and landing pad, extend the sidewalk to the back of the curb at the bus stop, relocate the trash can.
<b>Estimated Costs</b>	Small bus shelter = \$6,620 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 only 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.

<b>Stakeholders</b>	Valley Metro, City of Roanoke, Melrose Towers management
<b>Recommendations</b>	Install a small shelter at the sidewalk.
<b>Estimated Costs</b>	Large bus shelter = \$6,620 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 5<sup>th</sup> 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.

<b>Stakeholders</b>	Valley Metro, City of Roanoke, Citgo property owner
<b>Recommendations</b>	Install a small shelter and landing pad, extend the sidewalk to the back of the curb at the bus stop, relocate the trash can.
<b>Estimated Costs</b>	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 Town Square Kroger bus stop exists as a place for the bus to turn around. The bus stop was put in place prior to the construction of the Aviation Drive/Towne Square Boulevard intersection. Now that the intersection exists, it opens up new opportunities to 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.

<b>Stakeholders</b>	Valley Metro, City of Roanoke, Kroger property management
<b>Recommendations</b>	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, upgrades would be needed for those stops including bus shelters, adequate landing pads, and possibly a pedestrian crosswalk across Towne Square Boulevard.
<b>Estimated Costs</b>	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 generator of activity at this stop. From this stop, the bus travels inbound to Campbell Court. The bus stop is located at a drainage inlet. Currently, the I-581 bridge over Tazewell Avenue provides shelter. Lights mounted under the bridge provide light at night. There is parking adjacent to the bus stop, which prohibits 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 3<sup>rd</sup> Street should be constructed to provide a curb extension that allows waiting passengers to 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.

Second, to avoid vehicles backing up behind the bus, four parking spaces next to the bus stop would need to be removed. Similar to the first option, sidewalk connections, curb ramps, and pedestrian crosswalks would be needed.

<b>Stakeholders</b>	Valley Metro, City of Roanoke
<b>Recommendations</b>	Option 1: Construct a curb extension at the bus stop with new sidewalks and a small bus shelter. Curb ramps on three corners of the Tazewell/3 <sup>rd</sup> Street intersection are needed.
<b>Estimated Costs</b>	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.

<b>Stakeholders</b>	Valley Metro, City of Roanoke
<b>Recommendations</b>	Improve the sidewalk and add ADA ramps on Campbell Avenue from 10 <sup>th</sup> Street to 10 ½ Street.
<b>Estimated Costs</b>	Curb, Gutter, Sidewalk for 600' = \$24,000 Three ADA ramps: Campbell/Norfolk, Campbell/10 ½ Street, Campbell/10 <sup>th</sup> Street = \$12,000 Labor/Installation = \$3,395 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.

<b>Stakeholders</b>	Valley Metro, City of Roanoke
<b>Recommendations</b>	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.
<b>Estimated Costs</b>	Small bus shelter = \$6,620 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 immediately 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 above 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.



<b>Stakeholders</b>	Valley Metro, Tanglewood Mall Management
<b>Recommendations</b>	Replace one of the benches with a large bus shelter.
<b>Estimated Costs</b>	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 8<sup>th</sup> Street



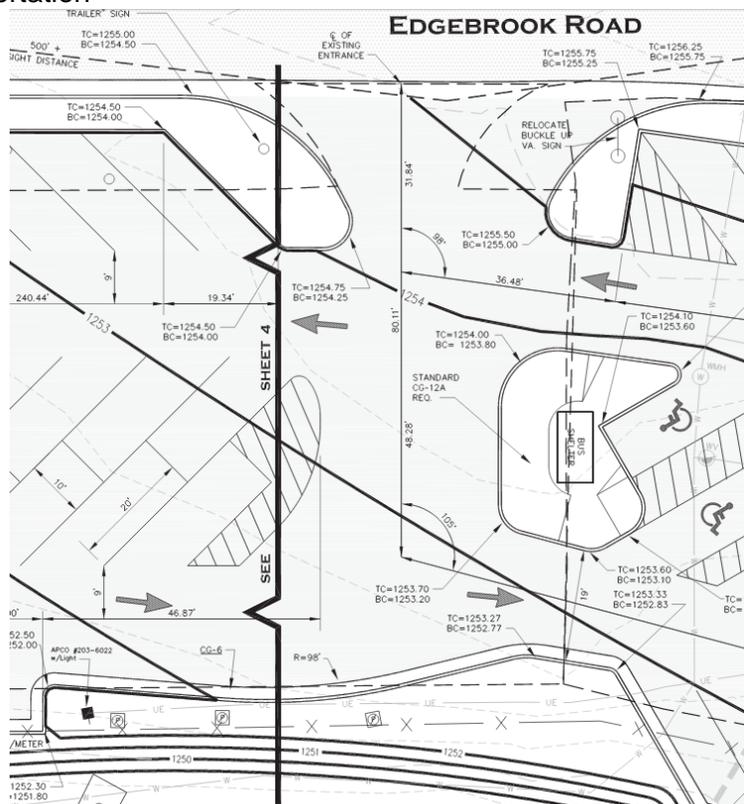
features a crosswalk across Hunt Avenue and ramps on each corner. The ramps, however, were constructed without tactile warning plates. As the City is able to replace older ramps with new ramps that feature tactile surfaces, it is recommended that all three ramps be upgraded.

<b>Stakeholders</b>	Valley Metro, City of Roanoke
<b>Recommendations</b>	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.
<b>Estimated Costs</b>	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. 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.



<b>Stakeholders</b>	Valley Metro, Roanoke County, VDOT
<b>Recommendations</b>	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.
<b>Estimated Costs</b>	\$1,608,243.85 (per 2013 RSTP Project Application)

**30.) Melrose EB at 35th**

**Routes:** 82 (peak), 92  
**Average Usage:** 1.80  
**Stop Frequency:** 0.73  
**Activity Index:** 1.32



A large apartment complex is located up the hill off of 35<sup>th</sup> Street and is the main generator of activity at this stop and its companion stop, Melrose WB at 35<sup>th</sup> (which actually 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 should be repaved.

Consideration should also 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 at the time of the site visit was vacant. 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.



<b>Stakeholders</b>	Valley Metro, City of Roanoke, Adjacent property owner (The Clean Machine Car Wash)
<b>Recommendations</b>	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. Various ADA ramps at the intersection of Melrose Avenue and 35 <sup>th</sup> Street and at the pedestrian crossing.
<b>Estimated Costs</b>	Small bus shelter = \$6,620 Curb, gutter and sidewalk reconstruction at the driveway = \$4,000 Four ADA 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 ADA 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.

Common paratransit pick-up locations provide insight to where people with disabilities travel. RADAR origin and destination data was studied for the period between 12/27/2011 and 1/25/2012. The data provides an idea of the most popular pick-up locations during a sample period and potentially provides guidance on where bus stop accessibility improvements could be needed. Making improvements to bus stops at these key locations may provide someone with the option of taking the fixed-route bus, 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 the fixed-route bus 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 in this document, any infrastructure improvement made at an origin or destination's bus stop would not overcome the burden of needing to transfer 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 bus.

In any case, the option of having a single seat origin-to-destination via the STAR service is very attractive in which the only real 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.

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

**Table 4: RADAR “STAR” Pick-up Locations – December – 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	4519 Pennsylvania Ave Ne	24019	DOCTOR'S OFFICE	9	1
32	3130 Peters Creek Rd	24019	BANK OF BOTETOURT	5	2

## 1.) Adult Day Care

**Routes:** 75  
**Nearest Stop:** 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 RADAR STAR service, as well as CORTAN 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 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 stopping. It would be preferable to shift the 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. Given that a rider who accesses this location may be a wheelchair, the bus may be stopped for an extended period to drop-off or pick-up a passenger. Certainly ADA 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. Given the high cost to local governments for each passenger transported on paratransit, any improvements that enable people to use the fixed-route bus is beneficial for everyone.



<b>Stakeholders</b>	Valley Metro, City of Salem, Adult Day Care management
<b>Recommendations</b>	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.
<b>Estimated Costs</b>	Large bus shelter = \$9,450 Labor/Installation = \$3,395 Permits/Site plans = \$895 Bus pull-off paving, curb, gutter = Sidewalk connection =

**2.) VA Hospital**

*This location was reviewed in the previous section.*

**3.) NW Dialysis**

**Routes:** 25/26  
**Nearest Stop:** 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 Plantation Road. There are no sidewalks from the bus stop to the Center, which is located in a cul-de-sac on 7<sup>th</sup> Street, up a small hill off of Plantation Road. The 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 would need to be located at the Plantation Road and 7<sup>th</sup> Street intersection and involve placing bus service on Plantation Road, which does not exist currently. 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/7<sup>th</sup> Street intersection with sidewalks to the Center would make the option to take fixed-route bus service a possibility.



<b>Stakeholders</b>	Valley Metro, City of Roanoke
<b>Recommendations</b>	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.
<b>Estimated Costs</b>	Small bus shelter = \$6,620 Labor/Installation = \$3,395 Permits/Site plans = \$895 Crosswalk striping = \$1,000 Two driveway reconstructions = \$8,000 Three curb ramps = \$12,000 Sidewalk connection (approx. 700') = \$24,500

#### 4.) Crystal Spring Dialysis



The closest stops to the Crystal Spring Dialysis Center would be at McClanahan Street and Rosalind Avenue or on Franklin Road at the Pure Gas Station. Neither location is accessible for people getting to the Dialysis Center. There is a lack of sidewalk connections along McClanahan Street and no safe 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 the fixed-route bus an option for dialysis patients, the bus route would need to be evaluated to see if there is a way to route it 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.



<b>Stakeholders</b>	Valley Metro, City of Roanoke
<b>Recommendations</b>	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.
<b>Estimated Costs</b>	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 Stop:** 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 using 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 previously, 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 leads 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.

<b>Stakeholders</b>	Valley Metro, Town of Vinton, Adjacent property owners
<b>Recommendations</b>	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 at Hardy Road/Vinyard Road and crosswalks.
<b>Estimated Costs</b>	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 Stop:** 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 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. In addition to two ramps needed to make a seamless wheelchair accessible pathway, a bus shelter is also needed.

<b>Stakeholders</b>	Valley Metro, Lewis Gale Medical Center
<b>Recommendations</b>	Construct curb ramps to make an accessible path from the Medical Center entrance to the bus stop. Replace the bench with a bus shelter.
<b>Estimated Costs</b>	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 Stop:

	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 affect the sheltered bus stop. 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 an example 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, should 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, the stops are recommended for the locations shown in the diagram below. At these locations, if possible, bus pull-offs should be constructed so as to not cause traffic to stop 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.



<b>Stakeholders</b>	Valley Metro, Friendship Manor Retirement Community management, VDOT, Roanoke County, City of Roanoke
<b>Recommendations</b>	Construct new bus stops with the Friendship Manor entrance reconstruction including a new pedestrian median and crosswalk, landing pads, and bus shelters.
<b>Estimated Costs</b>	Two small bus shelters = \$ Two curb ramps = \$8,000 Labor/Installation = \$3,395 Permits/Site plans = \$895

## 8.) Stratford Park Residential Apartments

**Routes:** 71/72  
**Nearest Stop:** 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 route, to use the bus efficiently, people must also use the bus stop on the opposite side of the road. This section of Brandon Avenue is a five-lane 35 mph roadway. 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 road 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, flashing warning lights, and push buttons are recommended. With these accommodations, for example, a pedestrian crossing from the south to the north would push a button to activate flashing lights on sign posts and in the pavement along the crosswalk that would warn eastbound motorists to stop for the pedestrian crossing. Once in the median, the pedestrian would push another button to activate the second set of flashing lights, wait for westbound vehicles to stop, and

proceed with crossing the street. The opposite would occur for someone walking north to south.

Such improvements could enable residents at Brandon Oaks Retirement Community and Stratford Village to travel independently and more safely without a car.

<b>Stakeholders</b>	Valley Metro, City of Roanoke, Brandon Oaks Retirement Community management
<b>Recommendations</b>	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.
<b>Estimated Costs</b>	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 Stop:**

	<b>Average Usage</b>	<b>Stop Frequency</b>	<b>Activity Index</b>
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 Stop:** Melrose EB at Forest Park; Melrose WB at Forest Park

**Average Usage:** 1.87; 1.23

**Stop Frequency:** 0.60; 0.46

**Activity Index:** 1.12; 0.56

**13.) Melrose Towers**

This location was reviewed in the previous section.

**14.) Morningside Manor**

**Routes:** 41  
**Nearest Stop:** Montrose WB at 13<sup>th</sup>; 13<sup>th</sup> 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 13<sup>th</sup> 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. This stop however does feature a bus shelter and adequate landing pad.



No other improvements are needed. The 13<sup>th</sup> 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 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 Dale Avenue and catching a direct bus into Campbell Court, but are then faced

<b>Stakeholders</b>	Valley Metro, City of Roanoke
<b>Recommendations</b>	Install a bus shelter at the 13 <sup>th</sup> NB at Montrose stop with a landing pad and directional curb ramps across Montrose Avenue.
<b>Estimated Costs</b>	Small bus shelter = \$6,620 Two curb ramps = \$8,000 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 Stop:** 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 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.

<b>Stakeholders</b>	Valley Metro, City of Roanoke
<b>Recommendations</b>	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.
<b>Estimated Costs</b>	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 Stop:** Dale WB at 19<sup>th</sup>; 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 of the trips associated with the RADAR trips to 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 people. Nevertheless, prior to the streamlining and modification of fixed bus routes 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.

**21.) Carilion Clinic**

**Routes:** Star Line Trolley  
**Nearest Stop:** 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 fixed 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 likely



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.

<b>Stakeholders</b>	Valley Metro, City of Roanoke
<b>Recommendations</b>	Install a small bus shelter at the stop.
<b>Estimated Costs</b>	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 have access to fixed-route bus service, but such service would be feasible in this area given the high commercial and residential density.

**23.) Private Residence**

**Routes:** 61, 62  
**Nearest Stop:** 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. The Brambleton NB at Brandon stop should be relocated to Brandon Avenue just beyond the Oak Hill Commons shopping center. A sidewalk would need to be constructed to connect the bus stop to the shopping center. Given the low activity levels at both stops, neither would be a priority for a bus shelter.



*Brambleton NB at Brandon*



*Brambleton SB at Brandon*

<b>Stakeholders</b>	Valley Metro, City of Roanoke
<b>Recommendations</b>	Relocate Brambleton NB at Brandon to Brandon Avenue. 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.
<b>Estimated Costs</b>	Two curb ramps = \$8,000 Sidewalk approx. 60' long = \$2,100 Landing pad = \$280 Labor/Installation = \$3,395 Permits/Site plans = \$895

## 24.) Pain Management

**Routes:** 55  
**Nearest Stop:** 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.



## 25.) On Our Own

**Routes:** 61, 62  
**Nearest Stop:** Elm WB at 5<sup>th</sup>, Elm EB at 5<sup>th</sup>  
**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 between 4<sup>th</sup> and 5<sup>th</sup> Streets. Valley Metro bus stops are located at both of these intersections in both directions. For the purpose of this Study, the bus stops at 5<sup>th</sup> Street were reviewed and the associated information can be found in the previous section.

## 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

This business no longer exists.

**28.) Water Authority**

**Routes:** 41/42, 51/52  
**Nearest Stop:** 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 three destinations associated with this pick-up location are all within one-quarter mile of a bus stop. Given the good accessibility of these bus stops, any number of reasons may be affecting people’s decisions to use paratransit instead of taking the fixed-route bus.

**29.) Community Hospital**

**Routes:** 41/42  
**Nearest Stop:** 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.

**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.) Doctor’s Office**

This location is over a mile 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 Stop:** 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 show various innovative methods for making bus stops more accessible and safer.

### 7.1 Signals for Safe Pedestrians Crossings

The following two examples are 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.

### **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



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. The only additional recommendation may be a trash can; garbage seems to have accumulated in the ditch.



### 7.3 Street-level Accommodations for All Modes



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 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 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

### **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.

# Appendix A

<b>Bus Stop Accessibility Survey</b>	
<b>A. LOCATION</b>	
	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>B. INFORMATION FEATURES</b>	
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")
<b>C. WHEELCHAIR ACCESS</b>	
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)
<b>D. SAFETY AND SECURITY</b>	
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:

<b>E.</b>	<b>CONNECTIONS</b>
<b>25</b>	<b>How wide is the sidewalk?</b> (1-No sidewalk, 2-less than three feet., 3-three-five feet, 4-more than five feet)
<b>26</b>	<b>For existing sidewalks, list any barriers that constrict the width of the sidewalk within the block on which the bus stop is located.</b>
<b>27</b>	<b>Rank the condition of the sidewalk.</b> (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)
<b>28</b>	<b>Where is the nearest street crossing opportunity?</b> (Name intersection or mid-block crosswalk.)
<b>29</b>	<b>Check off which pedestrian amenities are at the nearest intersection (or other crossing opportunity).</b>
	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
<b>30</b>	<b>Pedestrian connection recommendations:</b>
	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):
<b>F.</b>	<b>BENCH</b>
<b>31</b>	<b>Is there a bench, not associated with a shelter, at this bus stop?</b>
<b>32</b>	<b>Rank the condition of the bench</b> (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)
<b>33</b>	<b>Seating recommendations</b> (specify where seating should be moved to improve accessibility, specify repairs needed, other)
<b>G.</b>	<b>BUS SHELTER</b>
<b>34</b>	<b>Is there a bus shelter at this stop?</b>
<b>35</b>	<b>Could a person using a wheelchair maneuver into the shelter?</b>
<b>36</b>	<b>Could a person using a wheelchair fit completely under the shelter?</b> (min. space 2.5' x 4')
<b>37</b>	<b>What is the distance between the front of the shelter and the curb in feet?</b>
<b>38</b>	<b>Rank the condition of the shelter</b> (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)
<b>39</b>	<b>Shelter recommendations</b> (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)
<b>H.</b>	<b>LIGHTING - to be assessed at night</b>
<b>40</b>	<b>What type of lighting is available?</b> (1-none, 2-street light, 3-shelter lighting, 4-outside light on adjacent building, 5-other-specify)
<b>41</b>	<b>Is additional lighting recommended?</b>
<b>42</b>	<b>List other comments related to lighting.</b>
<b>H.</b>	<b>TRASH</b>
<b>40</b>	<b>What type of trash receptacle is available?</b> (1-none, 2-City trash can, 3-other trash can-specify)
<b>41</b>	<b>Is a trash receptacle recommended?</b>
<b>42</b>	<b>List other comments related to trash.</b>