CHESTERFIELD COUNTY

ROUTE 60 TRANSIT FEASIBILITY STUDY

January 2022

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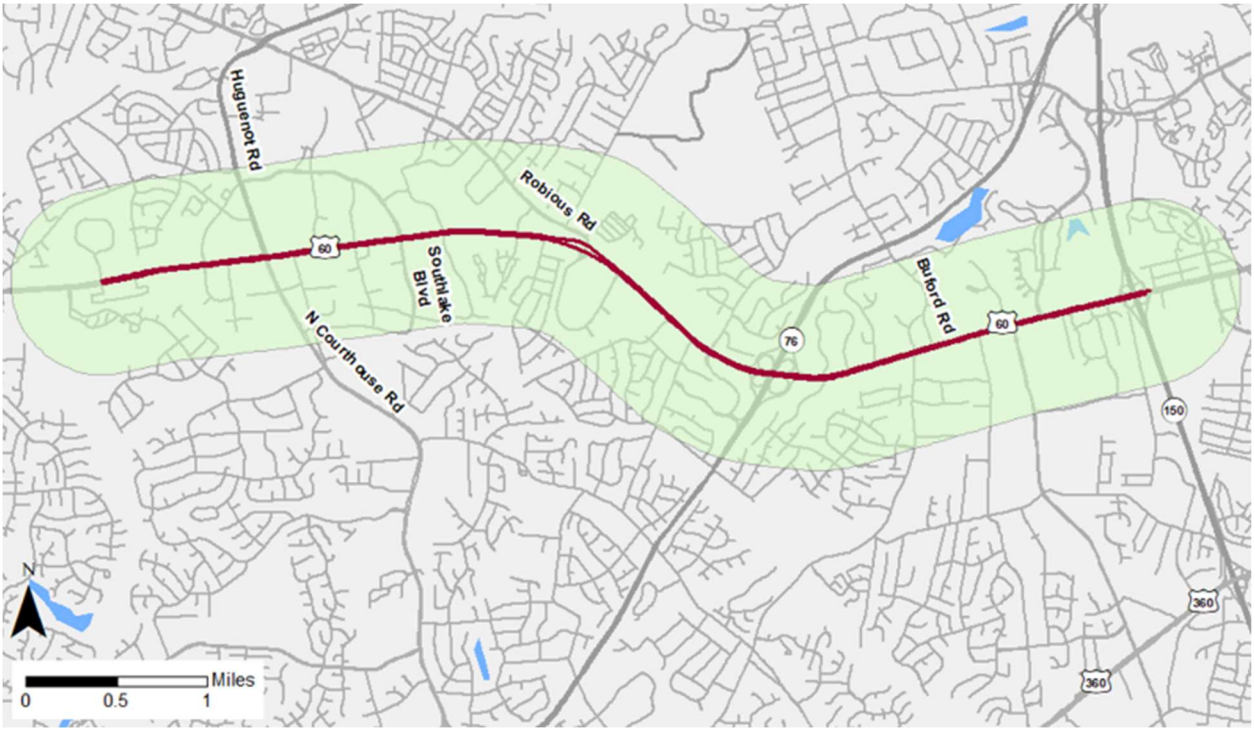
Introduction

Chesterfield County studied the viability of public transportation options along Route 60 (Midlothian Turnpike) between Chippenham Parkway (VA Route 150) and Walmart Way/Stone Village Way as shown in **Figure 1**. The purpose of the Route 60 Transit Feasibility Study was to evaluate the feasibility of implementing new transit service along this approximately six-mile section of Route 60 and determine the capital and operating needs for this new service.

Figure 1: Route 60 Feasibility Study Corridor



As a starting point, a landscape assessment was conducted to review previous study efforts on the Route 60 corridor. The analysis and conclusions from these previous studies were supplemented with additional operations analysis and infrastructure evaluation to inform Chesterfield County on considerations for implementing transit service along the Route 60 corridor in the near term.

The operations analysis considered factors including demographics, existing pedestrian infrastructure and community facilities, and existing traffic conditions to identify the route alignment and potential stop locations. Input from the Greater Richmond Transit Company (GRTC) and Chesterfield County informed the route alignment and stop locations as well as the proposed service hours, headways, and operating costs of the new service.

Infrastructure needs were evaluated at each of the proposed transit stop locations. The evaluation identified both transit stop infrastructure needs and pedestrian infrastructure needs for the surrounding network. Recommendations were developed for the transit stop infrastructure, such as landing pads, benches, and shelters, needed to initiate service on the corridor. In addition, recommendations for future transit stop infrastructure needs that should be considered based on right-of-way availability and ridership were also

identified. The pedestrian infrastructure needs evaluation identified areas where sidewalks, crosswalks, and pedestrian signals should be considered as part of future corridor improvement efforts to provide better connections from transit stops to housing, jobs, and services located along the corridor.

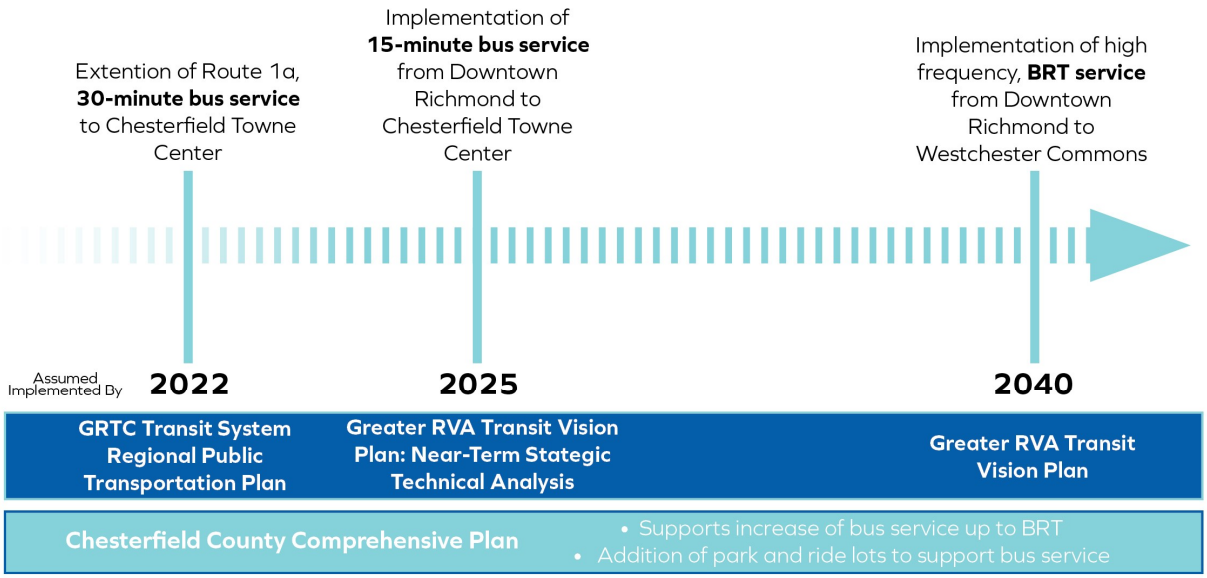
Chapter 1: Landscape Assessment

Several previous regional studies looked at transit on the Route 60 corridor in Chesterfield County. Relevant recommendations and insights from these studies for the Route 60 corridor were reviewed to inform the analysis of the Route 60 Transit Feasibility Study. The previous study efforts reviewed included:

- *Greater RVA Transit Vision Plan* (2017)
- *Comprehensive Plan for Chesterfield County* (2019)
- *Greater RVA Transit Vision Plan: Near-Term Strategic Technical Analysis* (2020)
- *GRTC Transit System Regional Public Transportation Plan – Fiscal Year 2022* (2021)

Recommendations from these studies varied in the time frame of implementation, geographic limits of service, frequency of service and type of service. **Figure 2** summarizes the recommendations of the four studies on a timeline. Additional details on the study recommendations are provided in the following sections.

Figure 2: Summary of Recommendations from Previous Studies



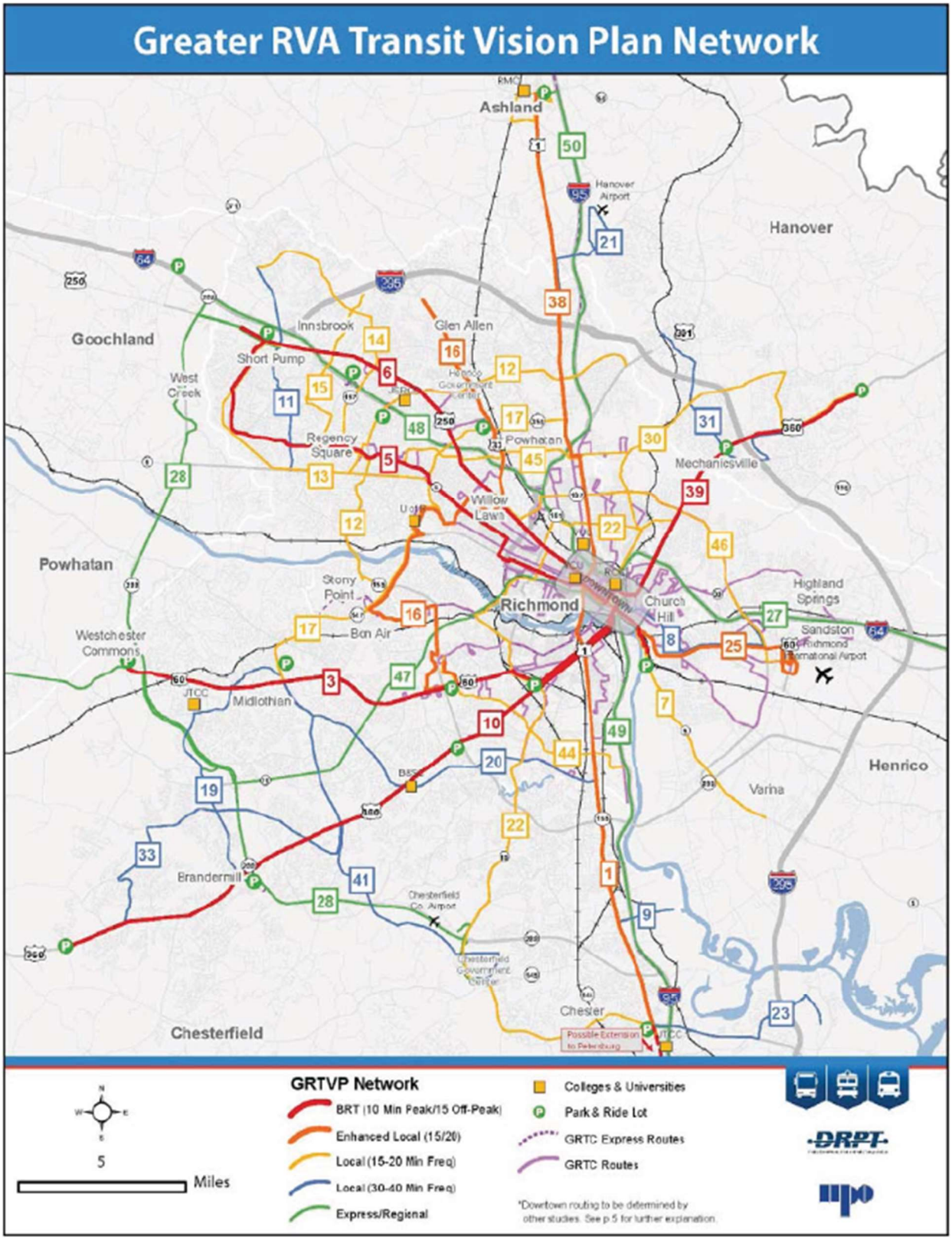
Greater RVA Transit Vision Plan (2017)

The purpose of the *Greater RVA Transit Vision Plan* was to establish a long-term vision for transit in the Richmond region. The study, sponsored by the Virginia Department of Rail and Public Transportation (DRPT) and the Richmond Regional Transportation Planning Organization (RRTPO), evaluated existing transit service

in the Greater Richmond region and identified opportunities for transit investment and expansion through 2040. To develop the 2040 transit vision, the study looked at demographic trends, existing and potential future land uses, forecasted population and employment densities, and opportunities to link people with jobs and services throughout the region. The vision identified recommendations for future transit service, which included a range of service types including Bus Rapid Transit (BRT), local service at various frequencies, express/regional service, and demand-response services in rural areas of the region. The *Greater RVA Transit Vision Plan* recommendations for the region are shown in **Figure 3**.

Route 60 in Chesterfield County was identified as part of one of the future transit corridors in the *Greater RVA Transit Vision Plan*. The *Greater RVA Transit Vision Plan* envisioned a new BRT route connecting the Pulse downtown stations to Westchester Commons, running along Hull Street, Belt Boulevard, and Midlothian Turnpike (Route 60). This BRT service was proposed to operate with 10 to 15-minute frequency, have stops every 0.5 to 1.5 mile, stations with off-board fare collection, and traffic signal enhancements. The western extents of the proposed *Greater RVA Transit Vision Plan* corridor extend to Westchester Commons, approximately four miles west of the study limits of this feasibility study.

Figure 3: Greater RVA Transit Vision Plan Network

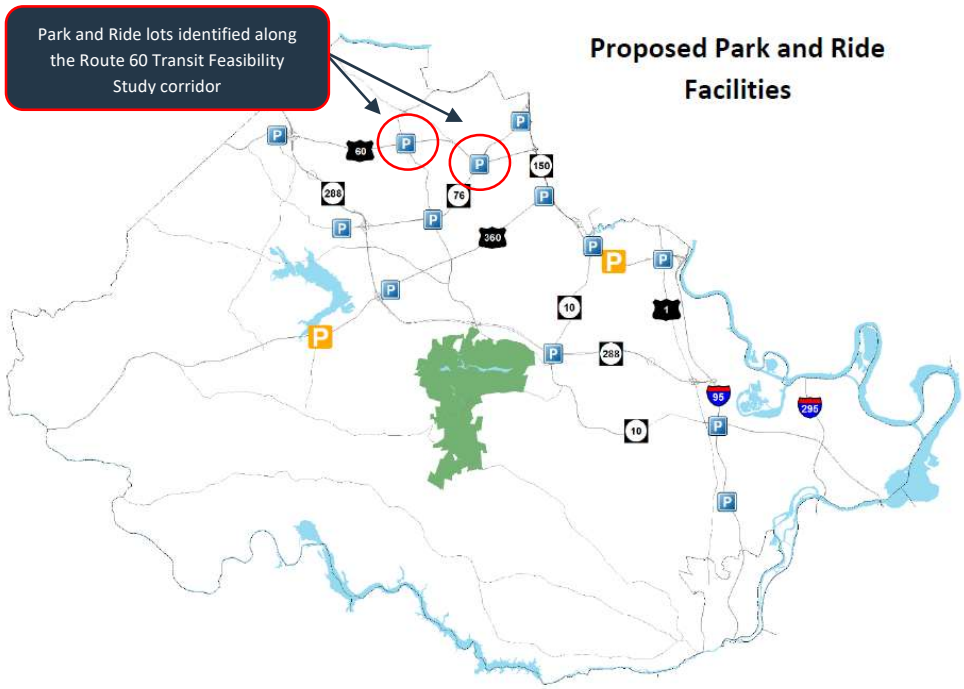


Comprehensive Plan for Chesterfield County (2019)

The *Comprehensive Plan for Chesterfield County*, completed in 2019, established a framework for growth within the county. The plan developed specific goals for public facilities and infrastructure, the economy, the community, the environment, and historical and cultural land. Overarching guidance for transportation decision-making was provided in coordination with the county's land use plan. The plan recognized the need for a multimodal transportation network that includes bus service, bike routes, and pedestrian connectivity to meet the mobility challenges of the county's growing population.

Several potential transportation improvements were identified in the *Comprehensive Plan for Chesterfield County* for the Route 60 corridor. The intersection of Route 60 and Huguenot Road/Courthouse Road, which is within the limits of this feasibility study, was identified as an existing intersection that may benefit from conversion to an innovative intersection to accommodate future forecasted traffic volumes. In addition, the comprehensive plan supports implementation, as appropriate, in the long term of BRT service along Route 60 as described in the *Greater RVA Transit Vision Plan*. In the shorter term, the plan recommends conducting a feasibility study to identify viable transit service options. Furthermore, the comprehensive plan recognized that park and ride lots can help to encourage a shift from single-occupancy vehicles to transit and identified candidate park and ride lot locations at two intersections within the limits of this feasibility study, Route 60 at Huguenot Road and Route 60 at Powhite Parkway, as shown in **Figure 4**. In addition, the Richmond Regional Park and Ride Investment Strategy, completed by the Richmond Regional Transportation Planning Organization (RRTPO) in 2019, recommended the construction of a new park and ride lot near Route 60 at Chippenham Parkway.

Figure 4: Comprehensive Plan for Chesterfield County Feasible Park and Ride Lots Identified

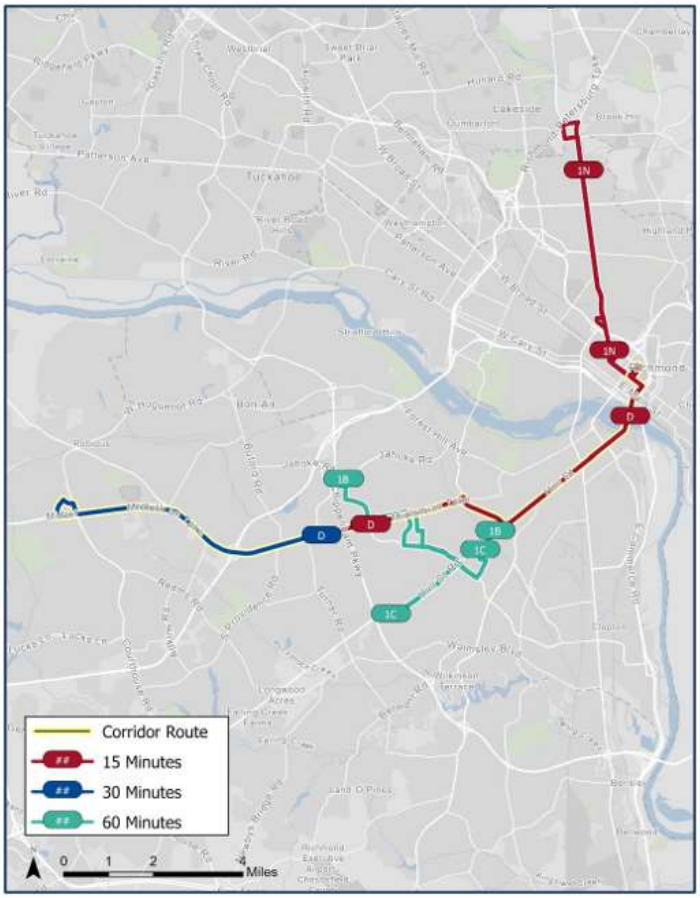


Greater RVA Transit Vision Plan: Near-Term Strategic Technical Analysis (2020)

The *Greater RVA Transit Vision Plan: Near-Term Strategic Technical Analysis* built upon the vision established in the *Greater RVA Transit Vision Plan*. The purpose of the study was to develop a near-term strategy to advance transit in the Richmond region toward the long-term vision established in the *Greater RVA Transit Vision Plan*. The plan developed and prioritized near-term recommendations for the 20 high-frequency corridors identified in the *Greater RVA Transit Vision Plan*.

Route 60 was one of the 20 corridors analyzed as part of the *Greater RVA Transit Vision Plan: Near-Term Strategic Technical Analysis*. The analysis indicated that this corridor demonstrated high-activity density and transit-supportive employment, provided connections to transit-dependent populations, and projected significant near-term development and high ridership potential, when compared to the other 20 analysis corridors. The study identified Route 60 as a top priority for near-term transit service implementation and recommended a route from downtown Richmond to Chesterfield Towne Center along the Midlothian Turnpike (Route 60) corridor with 30-minute frequency service, as shown in **Figure 5**. The recommended Midlothian Turnpike (Route 60) route is within the study limits of this feasibility study.

Figure 5: Greater RVA Transit Vision Plan: Near-Term Strategic Analysis Route 60 Corridor Recommendation



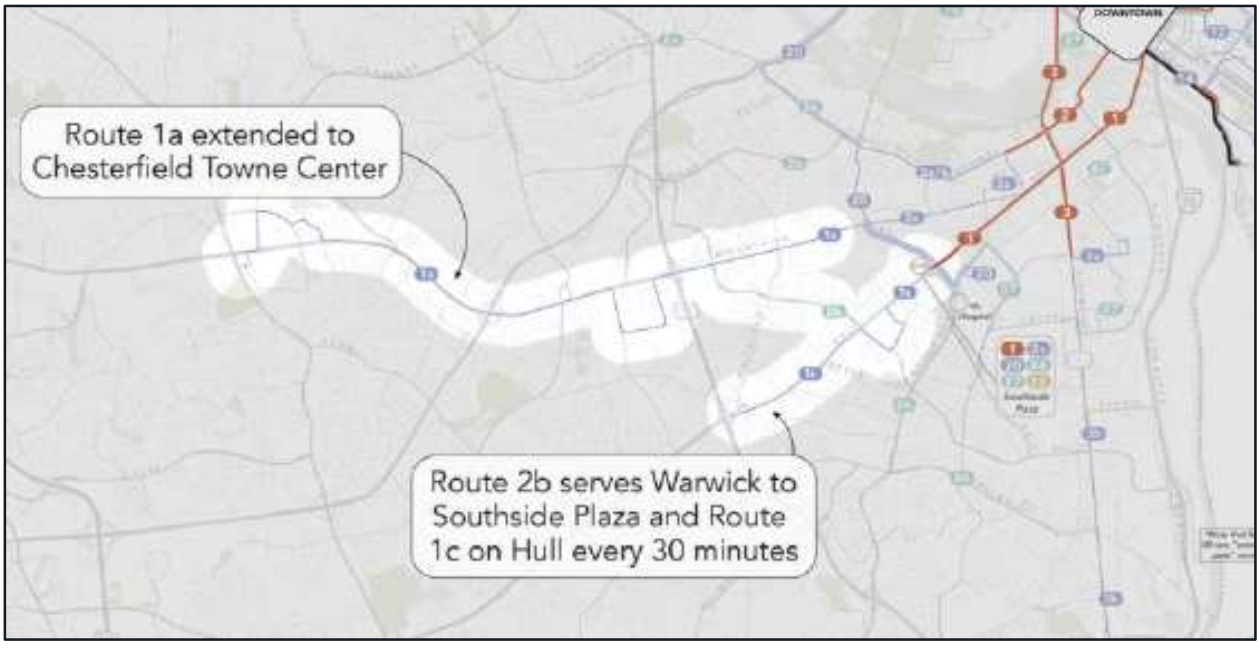
GRTC Transit System Regional Public Transportation Plan – Fiscal Year 2022 (2021)

In 2020, the Virginia General Assembly established the Central Virginia Transportation Authority (CVTA), dedicating sales and fuel taxes to support transportation improvements within the Greater Richmond Region (Planning District 15). Of these dedicated taxes, 15% go toward public transportation as outlined in an annual regional public transportation plan developed in coordination with the RRTPO. GRTC developed the first regional public transportation plan for FY 2022 and it documents how CVTA regional funds will be used to fund public transit services in the region.

The plan summarized the region's existing transit network and performance metrics, GRTC's financial projections, and recommended CVTA transit funding priorities for FY 2022. The recommendations for funding priorities included capital investments, transit studies, funds to maintain existing fixed route and paratransit service, and funds to complete an updated regional transportation plan for FY 2023. The plan also noted an interest to spend future fiscal year CVTA funds on increased and expanded service within the existing network. Route 60 in Chesterfield County was highlighted as a high priority corridor for service extension in the plan.

Specifically, the *GRTC Transit Service Regional Public Transportation Plan – Fiscal Year 2022* listed an extension of Route 1a service to Chesterfield Towne Center along Midlothian Turnpike (Route 60) as a high priority in the coming years. The proposed route would provide all-day and all-week service with 30-minute frequency, running from downtown Richmond through Southside Plaza and along Midlothian Turnpike (Route 60) to Mall Drive in Chesterfield Towne Center. The plan identified the extension as a priority because it would provide access to an area with one of the highest concentration of jobs in Chesterfield County. **Figure 6** shows the proposed Midlothian Turnpike service extension from the *GRTC Transit System Regional Public Transportation Plan – Fiscal Year 2022*.

Figure 6: GRTC Regional Public Transportation Plan Route 1a Extension



Chapter 2: Operations Analysis

Corridor Analysis

The operations analysis for the Route 60 corridor evaluated factors including demographics, pedestrian infrastructure and community facilities, and traffic conditions to understand existing conditions on the corridor and inform recommendations for proposed transit service. Additional details on the analyses and results are provided in the following sections.

Demographic Analysis

Demographic data was analyzed to identify areas along the Route 60 corridor with the highest need for transit service. Eight demographic factors, detailed in **Table 1**, were analyzed using data from the US Census Bureau's 2019 American Community Survey (ACS) 5-Year estimates and the 2017 employment and population estimates from the 2018 Richmond Region Tri-Cities Regional Travel Demand Model.

Table 1: Demographic Analysis Factors

Factor	Measurement	Data Source	Notes
Activity Density	Population and employment per acre within a traffic analysis zone (TAZ)	Richmond Tri-Cities Regional Travel Demand Model (2018)	2017 employment and population estimates used
Transit-Supportive Employment Density	Number of employees per acre within a TAZ	Richmond Tri-Cities Regional Travel Demand Model (2018)	2017 employment estimates used. TAZs with 10 or more employees per acres identified as transit-supportive.
Households with Limited English Proficiency	Percentage of households with limited English proficiency within a census block group	American Community Survey 2019 5-Year Estimates (Table C16002)	Census block groups with higher concentrations of a demographic factor than the average for the Richmond Metropolitan Area were highlighted
Minority Populations	Percentage of minority populations within a census block group	American Community Survey 2019 5-Year Estimates (Table B02001)	
Low-Income Households	Percentage of low-income households within a census block group	American Community Survey 2019 5-Year Estimates (Table B17021)	
Elderly Populations	Percentage of elderly populations (aged 65 years or more) within a census block group	American Community Survey 2019 5-Year Estimates (Table B01001)	
Individuals with Disabilities	Percentage of working-age (20-64 years) population with disabilities within a census block group	American Community Survey 2019 5-Year Estimates (Table B23024)	
Households with Low Vehicle Ownerships	Percentage of households with 0-1 vehicles within a census block group	American Community Survey 2019 5-Year Estimates (Table B25044)	

Summary maps were developed for each of the demographic analysis factors listed in **Table 1** and are provided in **Appendix A**. Each map illustrates the prevalence of one of the demographic factors for the area within ½-mile of the Route 60 study corridor. Review of the demographic analysis summary maps showed distribution of need along the corridor. For example, while one area of the corridor may show higher than average minority populations, another area showed higher than average percentage of low-income households, and a third area showed higher than average percentage of households with low vehicle ownership, indicating that transit service needs exist along the entire corridor. In addition, the activity density map illustrated that the concentration of people and jobs along the corridor varies between locations. Areas with higher activity densities may warrant more stops or more closely spaced stops to match a higher potential demand in these areas.

Pedestrian Infrastructure and Community Facilities

In addition to the demographic analysis, an assessment of existing and planned pedestrian infrastructure and existing community facilities was completed to further inform transit service recommendations for the Route 60 corridor. The factors reviewed as part of this analysis are summarized in **Table 2** and summary maps are provided in **Appendix B**.

Table 2: Pedestrian Infrastructure and Community Facility Factors

Factor	Measurement	Data Source	Notes
Existing and Planned Pedestrian Infrastructure	Locations of existing and planned sidewalk facilities along the corridor	Timmons sidewalk webmap (2020)	Only sidewalk within ½ mile of the study corridor is mapped
Community Facilities	Locations of schools and educational facilities, hospitals, parks and recreation facilities, and government buildings and services	*Greater RVA Transit Vision Plan: Near-Term Strategic Technical Analysis* shapefile	

Overall, the pedestrian infrastructure analysis revealed that the Route 60 corridor lacks pedestrian infrastructure throughout the study area. Directly along Route 60, there was almost no existing sidewalk present; however, future planned improvements include sidewalk on the eastern end of the study corridor between Boulders Parkway and Ruthers Road. Existing sidewalk was present on adjacent roadways, including in the Stonebridge Shopping Center, along Robious Road, and along Huguenot Road, all of which provide access from Route 60 to nearby destinations. In addition to evaluating locations of existing and planned sidewalk, a review of aerial imagery and Google Streetview was also performed to understand the prevalence of other pedestrian amenities on the corridor, including crosswalks and pedestrian signals. This evaluation showed an overall lack of crosswalks and pedestrian signals on Route 60 at major intersections.

Four categories of community facilities were identified on the corridor: schools and educational facilities, hospitals, parks and recreation facilities, and government buildings and services. These community facilities highlight other important destinations along the corridor, including healthcare, education, and recreation. Within ½ miles of the Route 60 corridor, the following community facility destinations were identified:

- Johnston-Willis Hospital
- John Tyler Community College Nursing Education Center
- AM Davis Elementary School
- Post Offices including a Passport Center
- AM Davis Recreational Fields
- DMV
- Social Security Administration
- Centura College and ECPI University (for-profit colleges)
- Virginia Employment Commission
- Virginia Department of Health

Traffic Analysis

AM and PM peak hour Synchro models from the STARS Route 60 Corridor Studies (East and West) were provided by VDOT to evaluate the impacts of buses stopping in through lanes during peak hours. In combination, the Synchro models extended the entire length of the feasibility study area from Chippenham Parkway in the east to Walmart Way/Stone Village Way in the west. These models served as the base conditions to compare to a transit scenario that evaluated bus stops in both the eastbound and westbound directions along Route 60 at all 24 signalized intersections under 2017 (west of Route 76) and 2018 (east of Route 76) conditions. The transit scenario was captured in Synchro by modifying the bus blockages input parameter, which accounts for bus stops that occur within 250 feet upstream or downstream from the stop bar on the intersection approach. Four bus blockages were assumed per hour at each signalized intersection assuming 15-minute headways during the AM and PM peak hours. Service with 15-minute headways was modeled to understand the implications of higher-frequency service, with the assumption that implementing less frequent service, such as 30-minute headways, would result in less impacts to traffic operations than the modeled service.

The traffic analysis results showed that introducing transit along the Route 60 corridor had minimal impacts to existing traffic operations along the corridor. In the AM peak hour, overall average intersection delay changes ranged from no impact to an increase of 1.3 seconds per vehicle. In the PM peak hour, overall average intersection delay changes ranged from no impacts to an increase of 1.2 seconds per vehicle. Tabular results of the existing and build conditions are provided in **Appendix C.**

Route 60 Transit Service Operations Recommendations

The results of the operational analysis, along with input from Chesterfield County and GRTC, informed recommendations for route alignment and stop locations for transit service on the Route 60 corridor. Using the proposed route alignment, GRTC provided the frequency, headways, and estimated operating cost for providing sufficient transit service to the Route 60 corridor. Additional details on the transit service recommendations are provided in the following sections.

Route Alignment

To develop a preferred route alignment, Chesterfield County and GRTC stakeholders reviewed proposed alignments from previous plans, along with the distribution of activity density, demographic groups, pedestrian infrastructure, and community facilities in the Route 60 corridor. The project team explored potential alignment deviations from Route 60 that would more directly serve major destinations, such as Johnston Willis Hospital, Chesterfield Towne Center, and Chesterfield Crossing shopping center. Ultimately,

Chesterfield County and GRTC stakeholders selected a preferred route alignment that did not include any deviations, with the goals of minimizing travel times and improving reliability for potential passengers.

While the alignments proposed under the *Greater RVA Transit Vision Plan: Near-Term Strategic Technical Analysis* (2020) and *GRTC Transit System Regional Public Transportation Plan – Fiscal Year 2022* (2021) included a western terminus at Huguenot Road/N Courthouse Road, the western terminus of the preferred route alignment was located about a mile west on Walmart Way. This western terminus of the proposed alignment allows for direct connections to grocery and shopping destinations on Walmart Way and at Stone Village shopping center. Service terminating on Walmart Way would require westbound buses to turnaround using the cul-de-sac at the end of Walmart Way to reach the terminus and begin the eastbound portion of the route. The feasibility of this turnaround was confirmed through an AutoTurn analysis performed by the project team.

The proposed route alignment, along with the proposed stop locations discussed in the next section, is shown in **Figure 7.**

Stop Locations

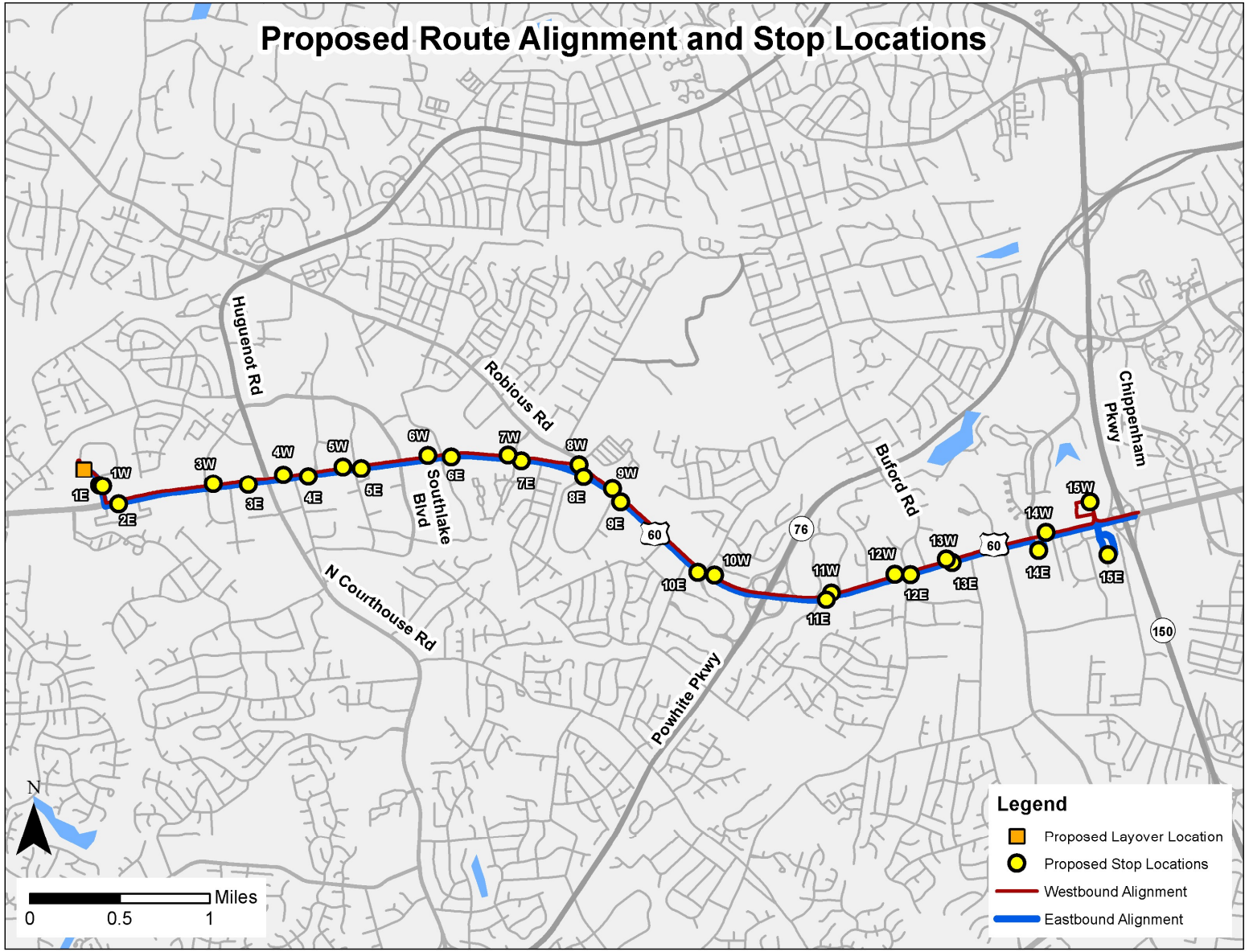
Proposed Route 60 transit stop locations were identified with input from Chesterfield County and GRTC stakeholders and focused on locating stops at major destinations for riders. Placement of stop locations considered GRTC's guidelines for stop spacing provided in the GRTC Transit Development Plan, which recommended a spacing of at least 600-2,500 feet between each stop in suburban areas. In addition, GRTC's has a general preference for placing stops on the far side of an intersection, where feasible and practical, for safe vehicular operation and to keep the flow of traffic moving.

Placement of proposed stop locations was refined through a review of aerial imagery and existing right-of-way limits. Other considerations for stop placement included, where feasible: avoiding conflicts with turning vehicles, minimizing pedestrian hazards and distances between the stop and key destinations, and utilizing areas where public right-of-way is available. In addition, at locations where GRTC currently provides service on Route 60, existing stop locations were proposed to be utilized by the new service. This included five existing stop locations that are currently served by either the GRTC 1A and 2B routes. The proposed stop locations are shown in **Figure 7** and summarized in **Table 3**.

Table 3: Proposed Stop Locations

Eastbound Stop Locations		Westbound Stop Locations	
Stop #	**Description**	**Stop #**	**Description**
1E	Walmart Way	1W	Walmart Way
2E	Stone Village Way	-	-
3E	N Courthouse Road	3W	Alverser Drive
4E	Branchway Road	4W	Chesterfield Towne Center
5E	Research Road	5W	Carmia Way
6E	Johnston Willis Drive	6W	Johnston Willis Drive
7E	Sturbridge Drive	7W	Sturbridge Drive
8E	Robious Road	8W	Robious Road
9E	Moorefield Park Drive	9W	Moorefield Park Drive
10E	Arboretum Place	10W	N Pinetta Drive
11E	Wadsworth Drive	11W	Gateway Center Parkway
12E	S Providence Road	12W	N Providence Road
13E	Ruthers Road (Existing)	13W	Centura College (Existing)
14E	Chippenham Square (Existing)	14W	Boulders Parkway
15E	Stonebridge (Existing)	15W	Spring Rock Green (Existing)

Figure 7: Route 60 Proposed Route Alignment and Stop Locations



Service Frequency and Service Hours

In alignment with GRTC's *Regional Public Transportation Plan for Fiscal Year 2022*, the proposed frequency of the new service is 30 minutes. Service hours are proposed to be between 6 AM and 1 AM on weekdays and Saturdays and between 6 AM and 11:30 PM on Sundays, matching the existing service hours on the GRTC Route 1A. Service hours and frequency may be refined with Chesterfield County and GRTC if needed.

Operations Cost

The operations cost of transit service being implemented along Route 60 between Chippenham Parkway (VA Route 150) and Walmart Way/Stone Village Way is expected to be similar to the Route 1A extension proposed in GRTC's *Regional Transportation Plan for Fiscal Year 2022*, which projects an annual increase of 15,104 revenue hours and an annual operations cost of approximately $1.6 million as outlined in **Table 4** .

Table 4 : Estimated Revenue Hours and Operations Cost for Route 1A Extension in the GRTC's Regional Transportation Plan FY22

Service Change	Revenue Hours Existing	Revenue Hours Proposed	Net Difference	Operations Cost (FY22 Dollars)
Route 1A Extension to Chesterfield Towne Center	57, 597	72,704	15,104	**$1,571,883**

Because the proposed route alignment for the Route 60 Transit Feasibility Study extends further west than the alignment presented in the *Regional Public Transportation Plan for Fiscal Year 2022*, GRTC developed updated the operations projections to match the revised proposed route alignment. The proposed new service was projected to increase annual revenue miles by 118,867, require four additional vehicles and eight additional operators, and have an operations cost of $1,658,089 annually, as shown in **Table 5**. Additional vehicles needed for the proposed Route 1A extension would rely on existing spare buses in the GRTC fleet and would not require the purchase of new vehicles. This projected operations cost includes the cost of providing paratransit service.

Table 5: Estimated Operations Cost of Proposed Service

Annual Revenue Miles Existing Route 1A Service	313,012
Annual Revenue Miles Proposed Route 1A Extension	431,880
Net Difference in Annual Revenue Miles	**118,867**
Additional Vehicles Required for Proposed Service	4
Additional Operators Required for Proposed Service	8
Additional Annual Operations Cost for Proposed Service	**$1,658,089**

Chapter 3: Infrastructure Evaluation

Transit Infrastructure

Needs Evaluation

Transit infrastructure needs were evaluated using the preferred route alignment and proposed stop locations identified in Chapter 2. Since the preferred route alignment extends the existing GRTC Route 1A west to Walmart Way, there is a need to shift the bus layover location for service on Route 60 from the current location at Spring Rock Green to the western terminus at Walmart Way. To prevent damage to the roadway due to idling buses at the layover location, installation of a concrete layover pad is needed.

In addition, at each proposed stop location, the availability of publicly owned right-of-way and activity density were reviewed to inform transit stop infrastructure recommendations discussed in the following sections. Right-of-way availability was evaluated through a desktop review using aerial maps and property limits from Chesterfield County's Open GeoSpace website. At each stop location the approximate distance between the back of curb and property line was measured to estimate the available space for installing transit stop infrastructure. Due to the lack of existing ridership data and stop-level ridership modeling, activity density was used as a proxy for identifying transit stops that may have higher boardings and, therefore, may warrant more stop amenities. Activity density (population and employment per acre) was calculated within a ½-mile radius of each proposed stop location and stop locations with an activity density greater than ten residents and jobs per acre were identified as priority areas for stop amenities.

Service Initiation Recommendations

Recommendations for transit infrastructure to initiate service on the Route 60 corridor focused on two primary objectives: 1) staying within the existing public right-of-way and 2) prioritizing stop amenities at locations where more riders are anticipated to board. **Table 6** summarizes the recommended transit stop infrastructure to initiate service on Route 60, as well as the results of the evaluation of available right-of-way and stop-level activity density that informed the recommendations. In addition to the stop-specific infrastructure shown in **Table 6**, installation of a concrete layover pad was recommended for the western terminus of the proposed service on Walmart Way. Maps showing stop locations, parcel boundaries, and recommended stop amenities are included in **Appendix D**.

Table 6: Recommended Transit Stop Infrastructure for Service Initiation

Stop	Approximate Distance from Curb to Property Limits (Feet)	Activity Density (population + employment per acre)	Recommended Infrastructure for Service Initiation						
			Sign	Post	Bench	Shelter	Small Pad (8'x5')	Medium Pad (8'x12')	Large Pad (10'x19')
1E	12	4.37	X	X	X			X	
1W	5	4.44	X	X					
2E	7	4.50	X	X					
3E	8	7.39	X	X					
3W	30	5.69	X	X			X		
4E	24	10.79	X	X	X			X	
4W	7	9.53	X	X					
5E	22	12.64	X	X		X			X
5W	25	12.25	X	X		X			X
6E	20	12.07	X	X		X			X
6W	25	12.48	X	X		X			X
7E	8	9.71	X	X					
7W	23	10.22	X	X	X			X	
8E	70	7.39	X	X			X		
8W	5	7.39	X	X					
9E	25	6.93	X	X			X		
9W	20	6.82	X	X			X		
10E	7	7.53	X	X					
10W	17	7.21	X	X			X		
11E	21	5.85	X	X			X		
11W	15	5.82	X	X			X		
12E	30	6.26	X	X			X		
12W	9	6.21	X	X					
13E (Existing)	20	6.63	X	E			X		
13W (Existing)	25	6.65	X	E			X		
14E (Existing)	On Parcel	7.64	X	E	E			E	
14W	16	8.63	X	X			X		
15E (Existing)	On Parcel	7.45	X	E					
15W (Existing)	On Parcel	11.50	X	E		E			E

Note: "E" denotes existing stop infrastructure.

While signs and posts would be installed at all stops, recommendations for additional transit stop infrastructure for service initiation were based on the following criteria:

- **Benches**: Benches were recommended at all stop locations with an activity density greater than ten residents and jobs per acre, where at least ten feet of right-of-way was available, and where a shelter was not recommended. The activity density threshold of ten residents and jobs per acre was

identified in DRPT's *Multimodal System Design Guidelines* (2020) as supportive of fixed route services in suburban areas. In addition, a bench was also recommended at the eastbound stop on Walmart Way, despite this location not meeting the activity density threshold, in order to provide a location for riders to sit near the end-of-line layover location.

- **Shelters**: Shelters were recommended at the four stop locations, 5E, 5W, 6E, and 6W, where the highest activity densities in the corridor are present and where at least ten feet of right-of-way was available.
- **Small Concrete Landing Pad**: Concrete landing pads approximately eight feet by five feet were recommended at locations with at least ten feet of available right-of-way and where benches or shelters were not recommended to provide a stable surface for riders to board and alight the bus. Eight feet (perpendicular to the curb) by five feet (parallel to the curb) aligns with the minimum dimensions to meet the Americans with Disabilities Act (ADA) landing pad requirements.
- **Medium Concrete Landing Pad**: Concrete landing pads approximately eight feet by twelve feet were recommended at locations with at least ten feet of available right-of-way and where benches were also recommended. The medium pad size allows for installation of a bench and also provides a landing pad clear of obstructions that meets the minimum ADA required dimensions.
- **Large Concrete Landing Pad**: Concrete landing pads approximately ten feet by nineteen feet were recommended at stops where shelters were recommended. In addition to allowing for installation of a shelter, the large pad also provides a landing pad clear of obstructions that meets the minimum ADA required dimensions.

Transit stop infrastructure recommendations provided in **Table 6** were based on a desktop evaluation and, as a result, field verification of property limits, right-of-way availability, topographic constraints, other site considerations, and boarding data will need to be evaluated at each stop location prior to deployment of recommended stop infrastructure.

Future Recommendations

Future recommendations for additional transit infrastructure after service initiation should be based on the availability of right-of-way and stop-level ridership. Concrete landing pads should be installed at all stop locations where right-of-way is available or can be acquired. In locations with limited publicly available right-of-way, Chesterfield may need to purchase additional right-of-way or get an easement or other agreement from the property owner. Chesterfield County and GRTC should monitor daily boardings at each stop location to determine the need for deployment of additional stop amenities. Installation of benches and shelters should be based on the recommended thresholds for average daily boardings from the *GRTC Shelter Plan for FY23-FY27* shown in **Table 7**.

Table 7: GRTC Recommended Thresholds for Bench and Shelter Installation

Stop Element	Average Daily Boarding Threshold
Bench	**20 average daily boardings** or **15 average daily boardings AND 2 of the following:** • Adjacent to major activity/employment centers • Adjacent to hospitals or social service agencies • Adjacent to senior housing or apartments with 250+ units • Adjacent to schools • Route intersections • 30 minute or greater headway
Shelter	**35 average daily boardings** or **25 average daily boardings AND in an area of special need** or **25 average daily boardings AND 2 of the following:** • Adjacent to major activity/employment centers • Adjacent to hospitals or social service agencies • Adjacent to senior housing or apartments with 250+ units • Adjacent to schools • Route intersections • 30 minute or greater headway

Source: *GRTC Shelter Plan for FY23-FY27* (2021)

Pedestrian Infrastructure

Needs Evaluation

An initial assessment of existing and planned pedestrian infrastructure on the Route 60 study corridor was completed as part of the operations analysis. As discussed in Chapter 2 and shown in **Appendix B**, minimal pedestrian infrastructure exists today directly on and surrounding the Route 60 corridor. Additional evaluation of pedestrian infrastructure was completed at proposed stop locations to understand the needs of specific stop locations.

A review of aerial imagery was conducted to evaluate pedestrian facility needs at each stop location. This review identified where sidewalks were present at stop locations, where sidewalks were present at the nearest leg of the nearest intersection, and the approximate distance between the stop location and closest street corner at the nearest signalized intersection. **Table 8** summarizes the results of this review. As shown in **Table 8**, very few stop locations have sidewalk present and there are limited connections to nearby intersections and pedestrian facilities. Stop locations where sidewalk is currently present are limited to the existing stop locations in Stonebridge Shopping Center, Spring Rock Green Center, and Chippenham Square Shopping Center, which all have little to no connection to a larger pedestrian network.

Chesterfield County has plans to build new sidewalk on Midlothian Turnpike between Boulders Parkway and Ruthers Road, which would provide connections between stops 13E, 13W, 14E, and 14W. Minor

improvements are also anticipated at the intersection of Route 60 and Arboretum Place near Stop 10E, which would provide an improved pedestrian connection to local retail businesses.

In addition to limited sidewalk facilities, the Route 60 corridor also lacks safe locations for pedestrians to cross Route 60 or its intersecting streets. There are no signalized intersections in the Route 60 corridor with crosswalks or with pedestrian signals, making it challenging for transit riders to safely access locations on both sides of the corridor.

Table 8: Sidewalk Network Needs

Stop	Nearest Signalized Intersection	Distance to Nearest Intersection from Stop (Feet)	Sidewalk Present at Stop?	Sidewalk Connection Available at Intersection?
1E	Walmart Way	550	No	No
1W	Walmart Way	550	No	No
2E	Walmart Way	350	No	No
3E	North Courthouse Road	550	No	No
3W	Alverser Drive	250	No	No
4E	Mall Drive	250	No	No
4W	Branchway Road	250	No	No
5E	Carmia Way	200	No	No
5W	Carmia Way	300	No	Yes
6E	Johnston Willis Drive	350	No	No
6W	Johnston Willis Drive	400	No	No
7E	Sturbridge Drive	200	No	No
7W	Sturbridge Drive	200	No	No
8E	Robious Road	150	No	No
8W	Robious Road	200	No	Yes
9E	Moorefield Park Drive	200	No	No
9W	Moorefield Park Drive	200	No	No
10E	Arbotetum Place	150	No	No
10W	N Pinetta Drive	200	No	No
11E	Wadsworth Drive	250	No	No
11W	Garden Center Parkway	250	No	Yes
12E	Providence Road	50	No	Yes
12W	Providence Road	300	No	No
13E (Existing)	Ruthers Road	550	No	No
13W (Existing)	Buford Road	650	No	No
14E (Existing)	Boulders Parkway	350	Yes	No
14W	Boulders Parkway	450	No	No
15E (Existing)	Donald May Jr Drive	500	Yes	Yes
15W (Existing)	Donald May Jr Drive	950	Yes	Yes

Recommendations

Enhancing pedestrian safety in the Route 60 corridor will be a critical component to the long-term success of transit on the corridor. While pedestrian infrastructure improvements are not required prior to initiating transit service on Route 60, Chesterfield County should continue to advance design and construction of pedestrian infrastructure on Route 60 to provide critical first and last mile connections for transit riders.

Providing safe crossing locations is a significant need on the Route 60 corridor. Chesterfield County should evaluate the feasibility of installing crosswalks and pedestrian signals at signalized intersections along the corridor. Intersections closest to proposed stop locations, in particular those in areas with higher activity density and where ridership is anticipated to be greater, should be prioritized for crosswalks and pedestrian signals. For example, intersections near Chesterfield Towne Center and Johnston-Willis Hospital may be priority locations for pedestrian crossing accommodations.

Sidewalk connections from bus stops to rider destinations are also a major need on the Route 60 corridor. Expansion of the sidewalk network in the Route 60 corridor should initially focus on providing connections to safe crossing locations and nearby sidewalk facilities. If crossing locations in areas with higher activity density are prioritized for improvement, sidewalk expansion should follow suit. However, given the potential constraints of right-of-way, Chesterfield County could include areas where publicly-owned right-of-way is available in its prioritization considerations. Additionally, Chesterfield County should continue to work with developers in the Route 60 corridor to include pedestrian facilities in new property development projects as a means of expanding the pedestrian network.

These recommendations align with Chesterfield County's priorities for pedestrian infrastructure improvements to improve accessibility and safety on major corridors. The county is actively working with the Virginia Department of Transportation (VDOT) to improve pedestrian access on the corridor, including adding pedestrian accommodations, where appropriate, as part of signal upgrade projects. In addition, Chesterfield County is pursuing expansions of its pedestrian network on major corridors like Route 60. In general, the county looks to prioritize sidewalk in areas with higher density, areas of higher concentrations of low-income populations, locations where connections can be made to retail and community facilities, and along higher speed and higher volume roadways.

Service Initiation Capital Cost Estimate

Unit Costs

The capital investment for initiating transit service on Route 60 was estimated using the unit costs provided in **Table 9.** These unit costs were based on transit infrastructure estimates from previous planning and construction efforts completed by GRTC and Chesterfield County.

Table 9: Unit Costs for Transit Infrastructure

Stop Element	Unit Cost	Basis of Unit Cost
Bench	$1,500	GRTC quote for amenities on Route 1 (2019)
Shelter	$17,000	GRTC quote for amenities on Route 1 (2019)
Small Pad (8'x5')	$3,000	Virginia Concrete Company quote for Bus Stop Pads on Route 1 (2020), adjusted for smaller pad dimensions
Medium Pad (8'x12')	$4,500	Virginia Concrete Company quote for Bus Stop Pads on Route 1 (2020), adjusted for smaller pad dimensions
Large Pad (10'x19')	$9,000	Virginia Concrete Company quote for Bus Stop Pads on Route 1 (2020)
Layover Pad	$45,000	Estimate for 10'x40' reinforced concrete layover pad

Capital Cost Estimate for Service Initiation

A total capital cost estimate for the initiation of transit service on the Route 60 corridor was developed by applying the unit costs to the recommended transit infrastructure proposed for service initiation. **Table 10** summarizes the costs by stop element and tabulates the total capital cost for initiating Route 60 transit service.

Table 10: Capital Cost Estimate for Service Initiation

Stop Element	Unit Cost	Quantity	Estimated Cost
Bench	$1,500	3	$4,500
Shelter	$17,000	4	$68,000
Small Pad (8'x5')	$3,000	11	$33,000
Medium Pad (8'x12')	$4,500	3	$13,500
Large Pad (10'x19')	$9,000	4	$36,000
Layover Pad	$45,000	1	$45,000
Total			**$200,000**

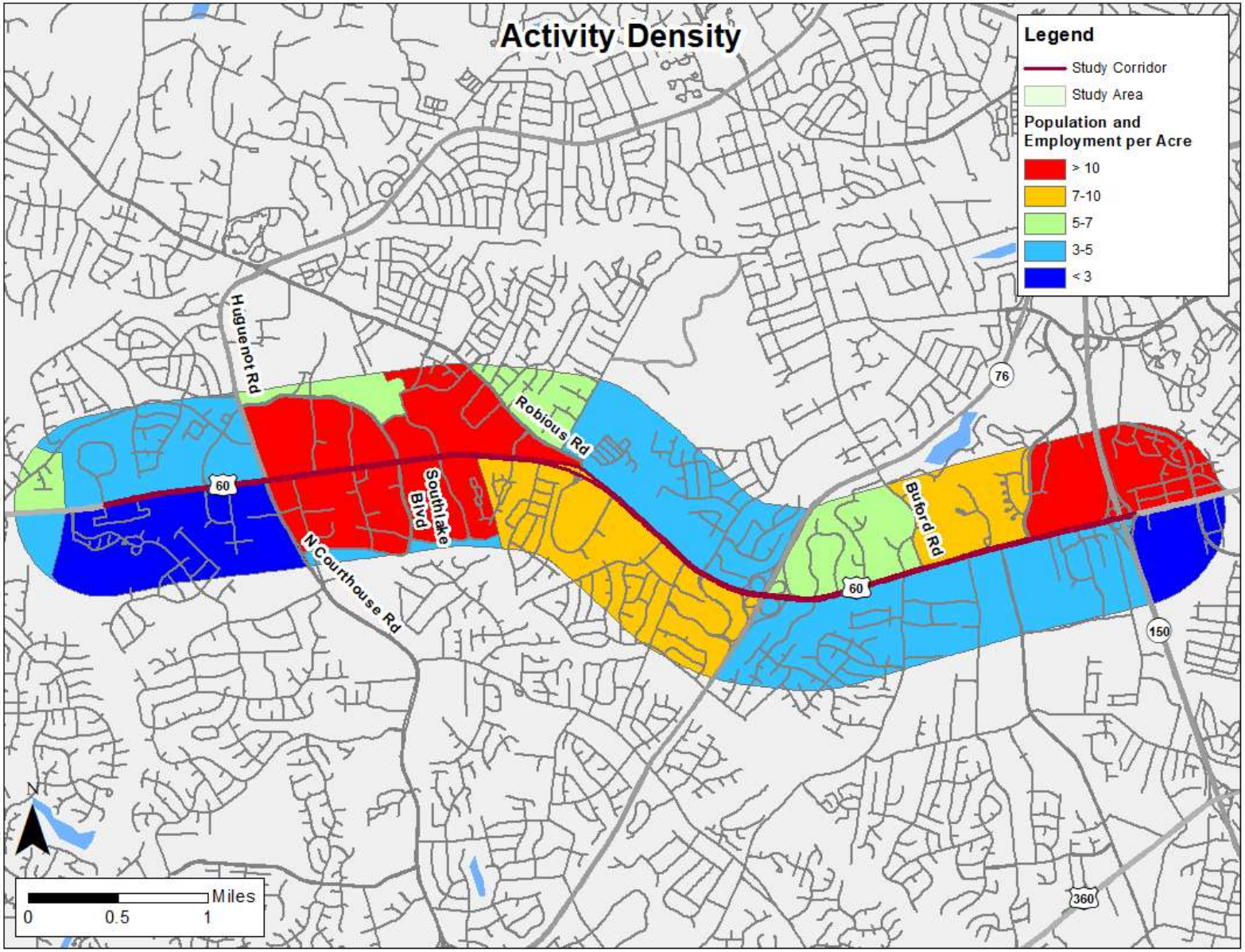
No additional vehicles were assumed to be necessary for service initiation, and, as a result, vehicle costs were not included in the capital cost estimate. Based on the availability of spare vehicles in the GRTC fleet, initiation of the expanded service on Route 60 is feasible with existing vehicles.

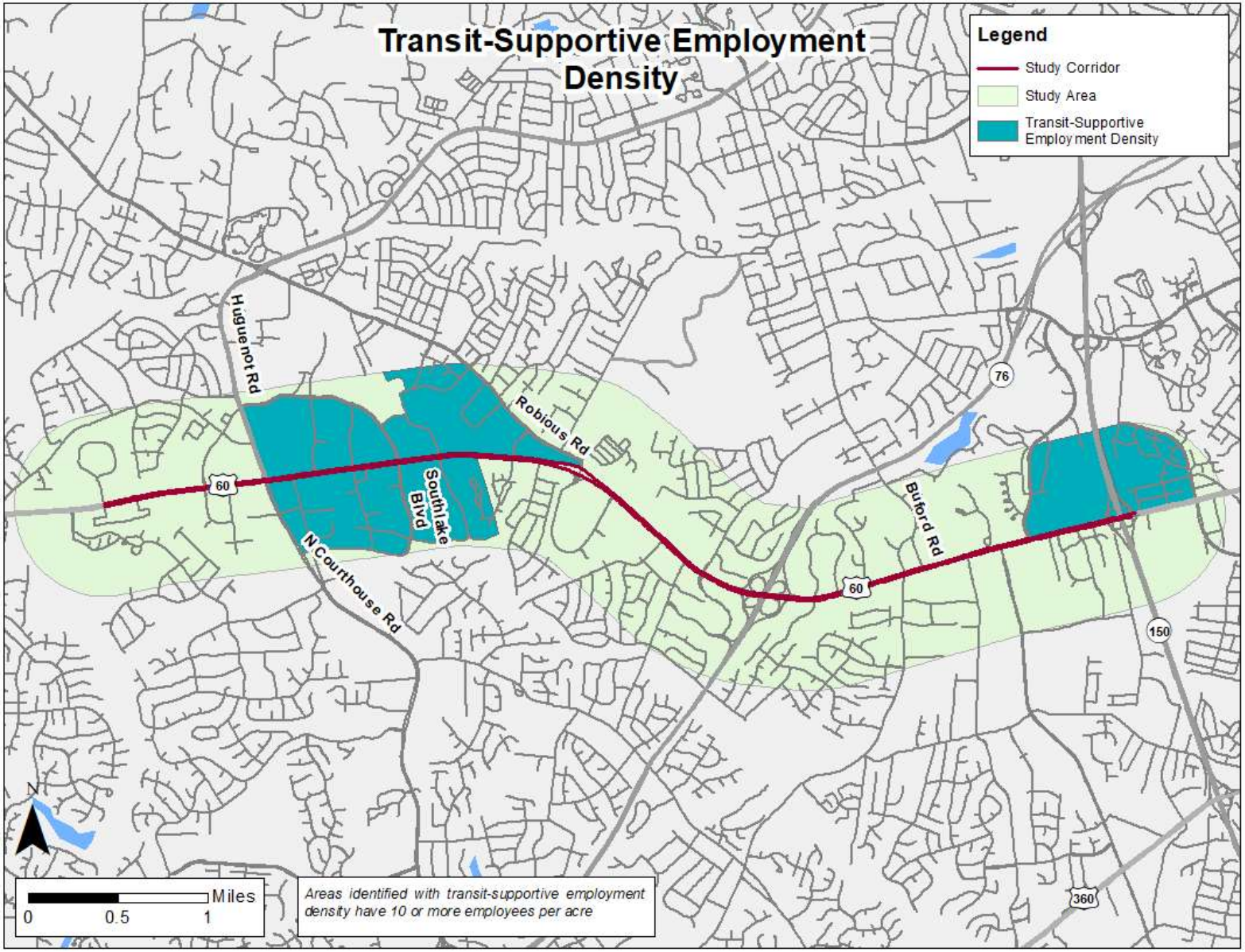
Next Steps

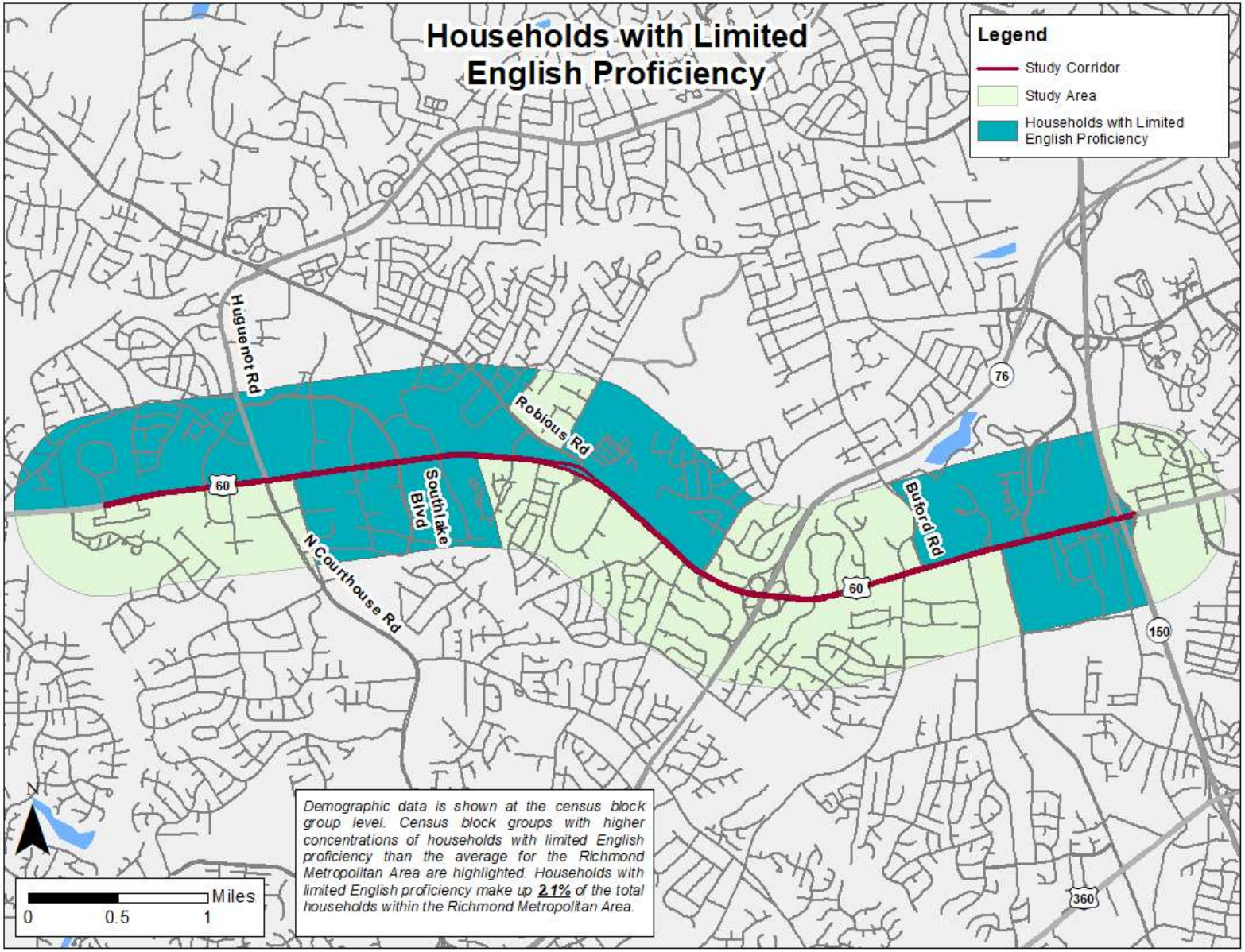
This study evaluated the feasibility of that transit service along Route 60 (Midlothian Turnpike) between Chippenham Parkway (VA Route 150) and Walmart Way/Stone Village Way, developed recommendations for service implementation, and determined the capital and operating needs for service initiation. In addition, Chesterfield County is conducting survey outreach to local residents and businesses along the corridor in early 2022 to better understand the specific needs of the community and inform service implementation.

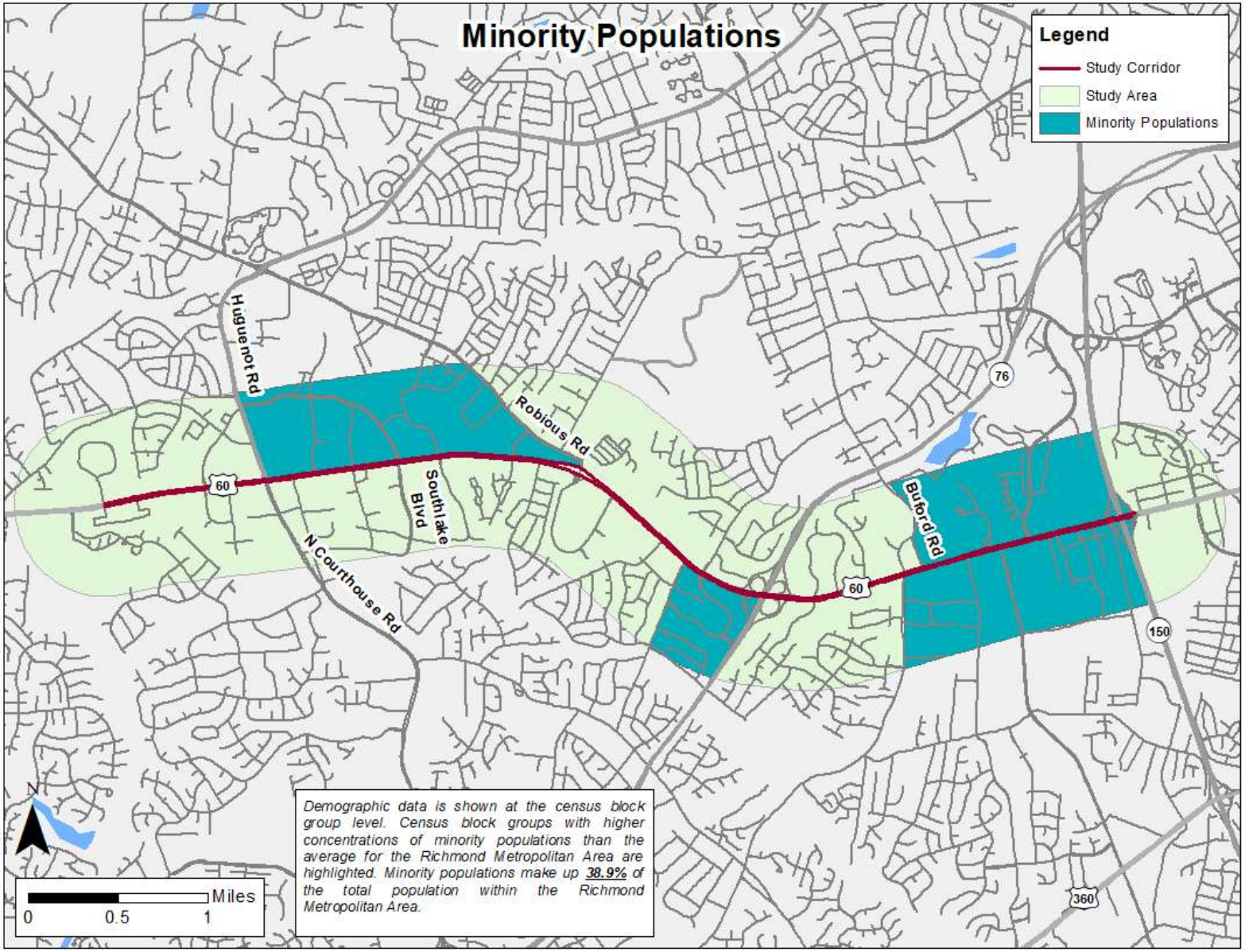
Successful implementation will require collaboration between Chesterfield County, GRTC, and DRPT, as well as local stakeholders in the corridor. Next steps include securing funding, working with GRTC to refine the operations plan and stop locations based on field conditions, infrastructure deployment, driver training, and public outreach. As service is implemented, Chesterfield County should work with GRTC to monitor the performance of the new service and adjust the operations, stop locations, and infrastructure to be responsive to the needs of transit riders in the corridor. In addition, Chesterfield County should continue to advance pedestrian infrastructure improvements along the Route 60 corridor to improve accessibility and safety.

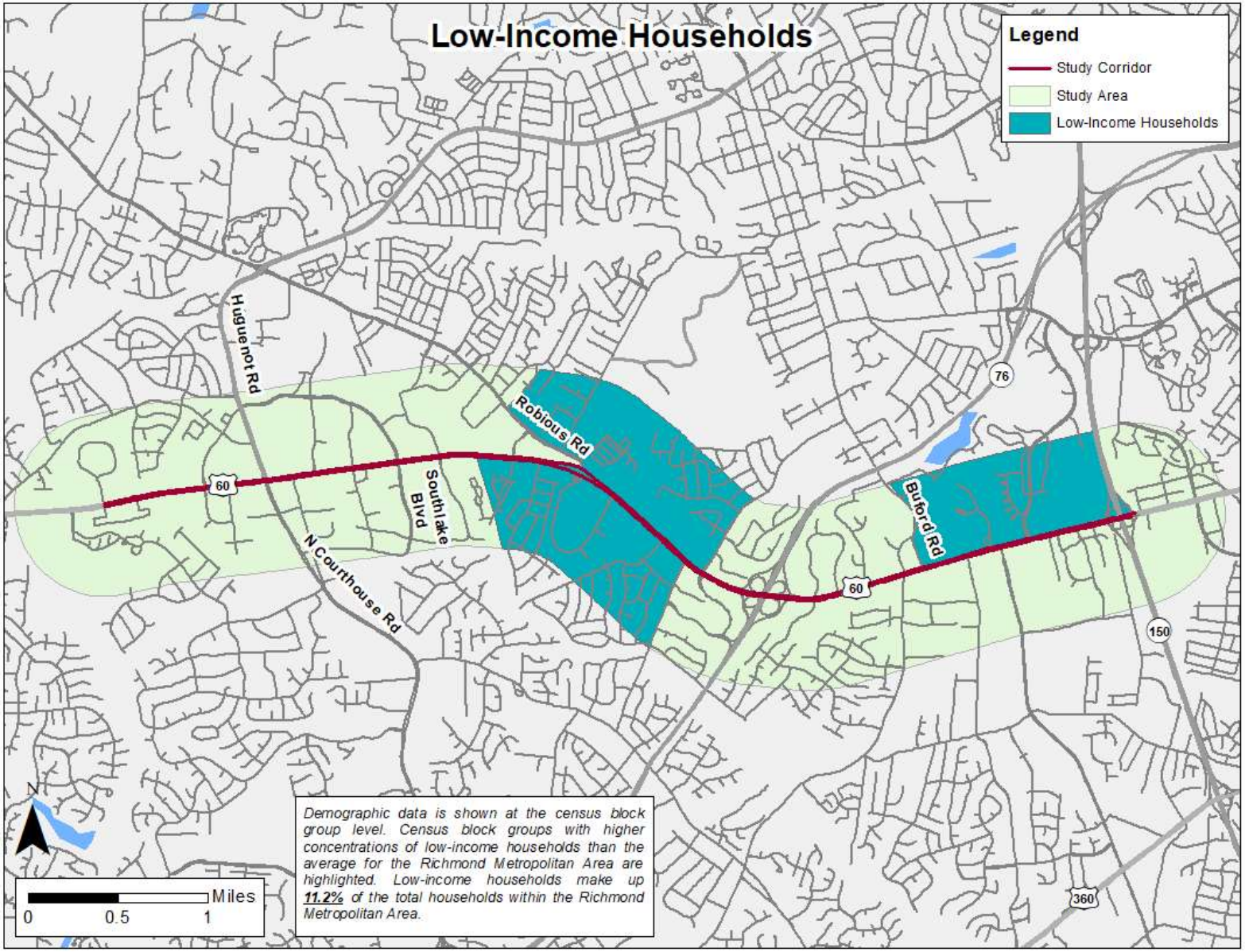
Appendix A: Demographic Analysis Maps

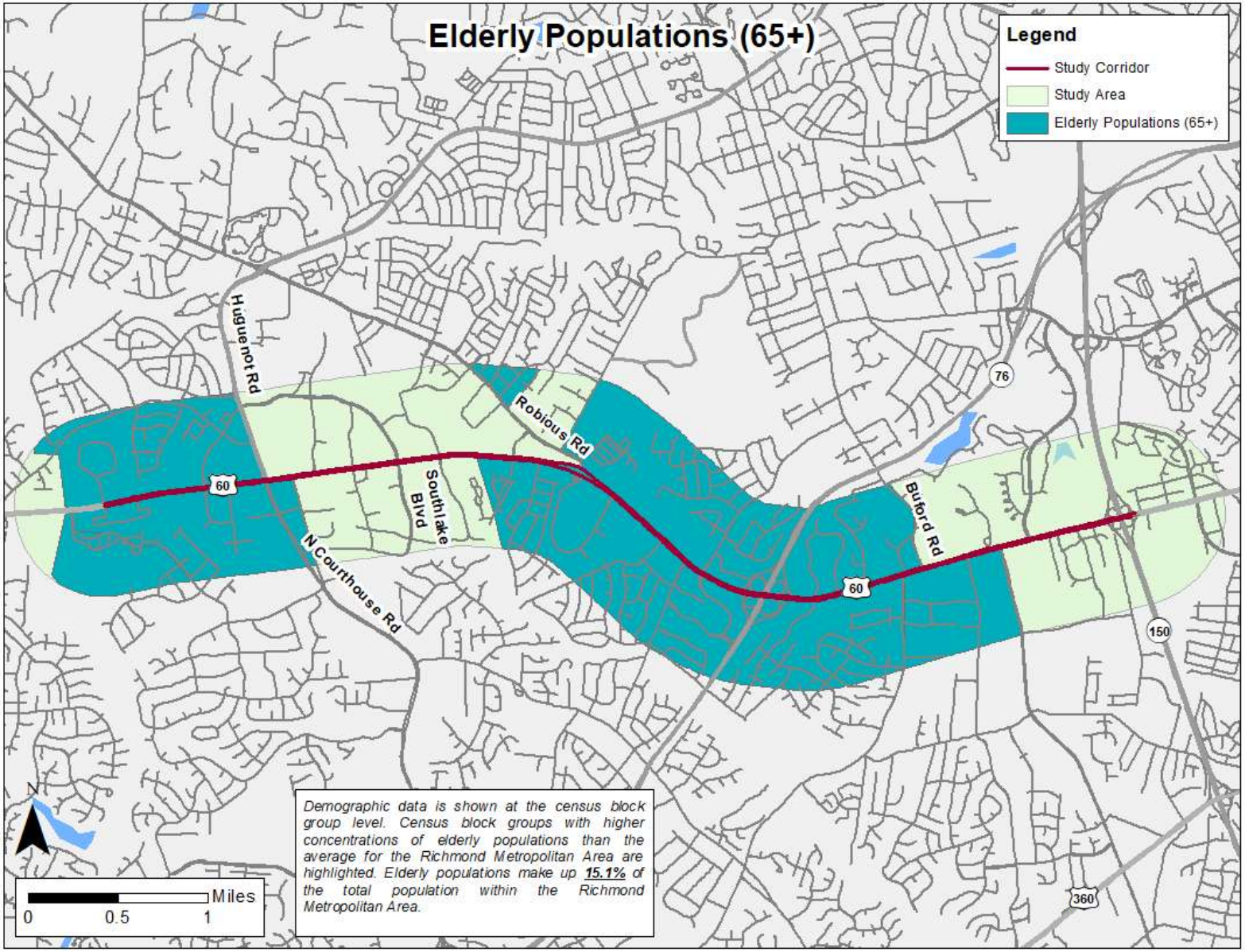

Activity Density
Legend
Study Corridor
Study Area
Population and Employment per Acre
> 10
7-10
5-7
3-5
< 3
Huguenot Rd
Robious Rd
Southlake Blvd
N Courthouse Rd
Buford Rd
60
76
150
360
N
Miles
0
0.5
1

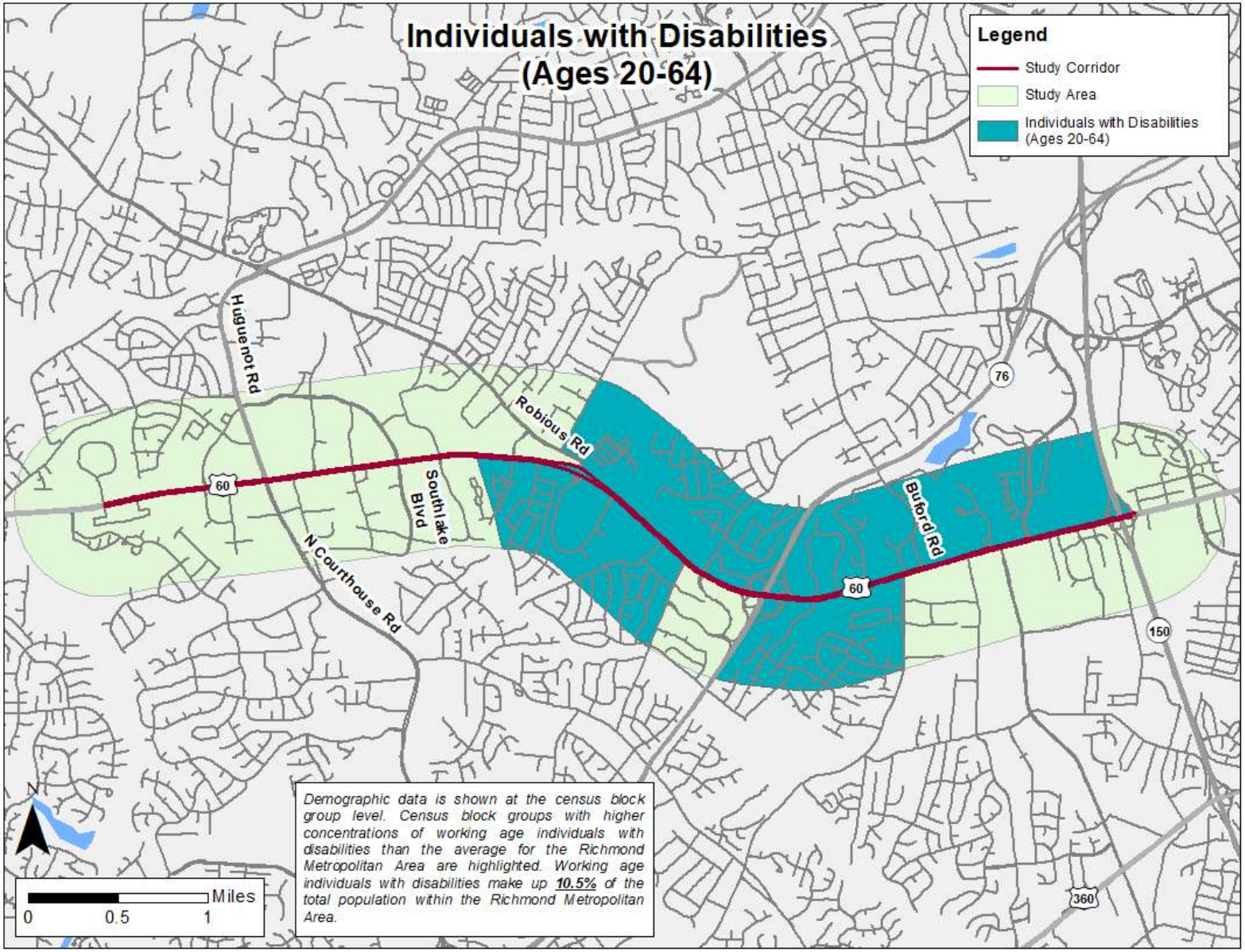

Transit-Supportive Employment Density
Legend
Study Corridor
Study Area
Transit-Supportive Employment Density
Huguenot Rd
Robious Rd
Southlake Blvd
N Courthouse Rd
Buford Rd
60
76
150
360
N
0
0.5
1
Miles
Areas identified with transit-supportive employment density have 10 or more employees per acre

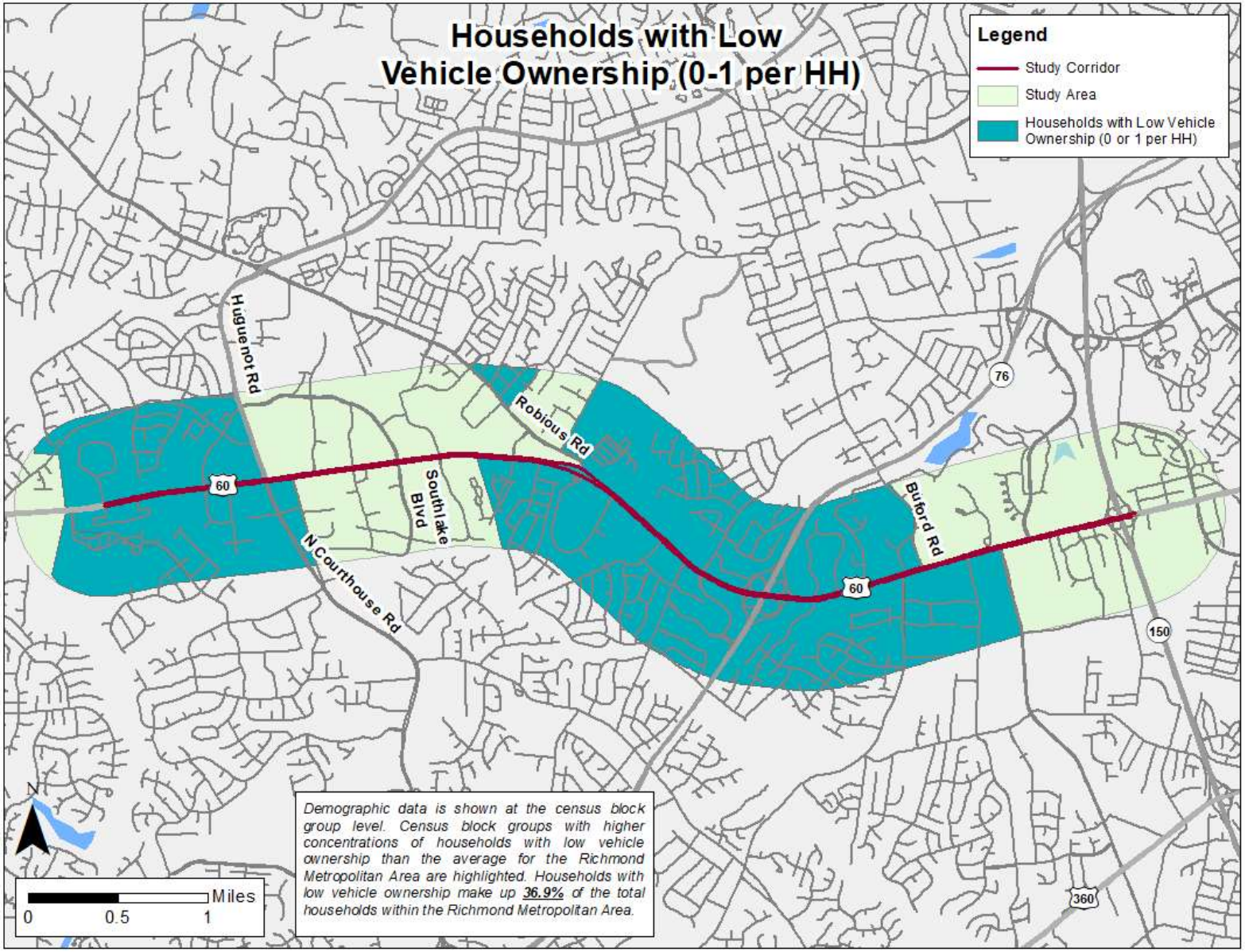

Households with Limited English Proficiency
Legend
Study Corridor
Study Area
Households with Limited English Proficiency
Huguenot Rd
Robious Rd
Southlake Blvd
N Courthouse Rd
Buford Rd
60
76
150
360
N
Miles
0
0.5
1
Demographic data is shown at the census block group level. Census block groups with higher concentrations of households with limited English proficiency than the average for the Richmond Metropolitan Area are highlighted. Households with limited English proficiency make up 2.1% of the total households within the Richmond Metropolitan Area.


Minority Populations
Legend
Study Corridor
Study Area
Minority Populations
Huguenot Rd
Robious Rd
Southlake Blvd
N Courthouse Rd
Buford Rd
60
60
76
150
360
N
Miles
0
0.5
1
Demographic data is shown at the census block group level. Census block groups with higher concentrations of minority populations than the average for the Richmond Metropolitan Area are highlighted. Minority populations make up 38.9% of the total population within the Richmond Metropolitan Area.

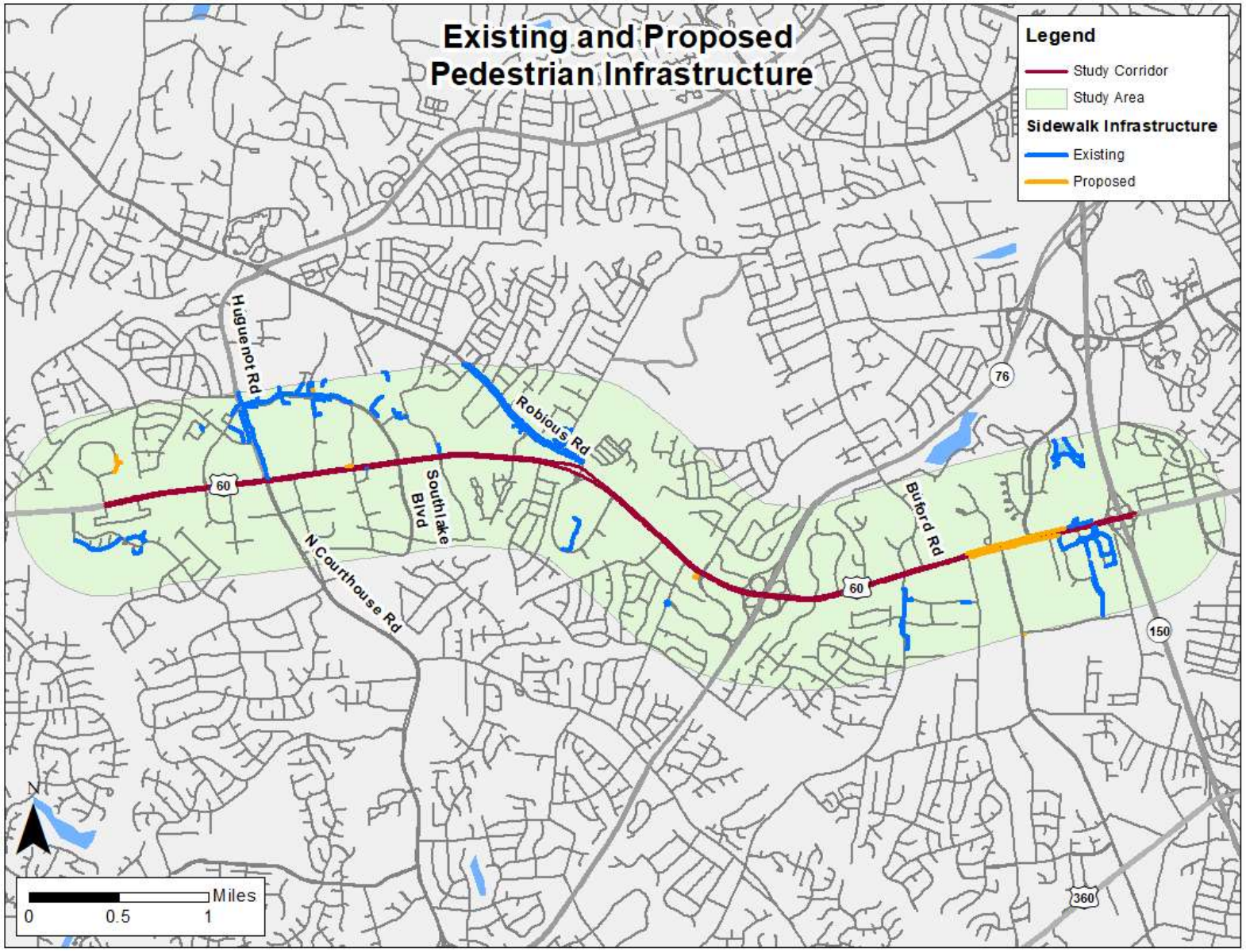

Low-Income Households
Legend
Study Corridor
Study Area
Low-Income Households
Huguenot Rd
Robious Rd
Southlake Blvd
N Courthouse Rd
Buford Rd
60
60
76
150
360
N
Miles
0
0.5
1
Demographic data is shown at the census block group level. Census block groups with higher concentrations of low-income households than the average for the Richmond Metropolitan Area are highlighted. Low-income households make up 11.2% of the total households within the Richmond Metropolitan Area.

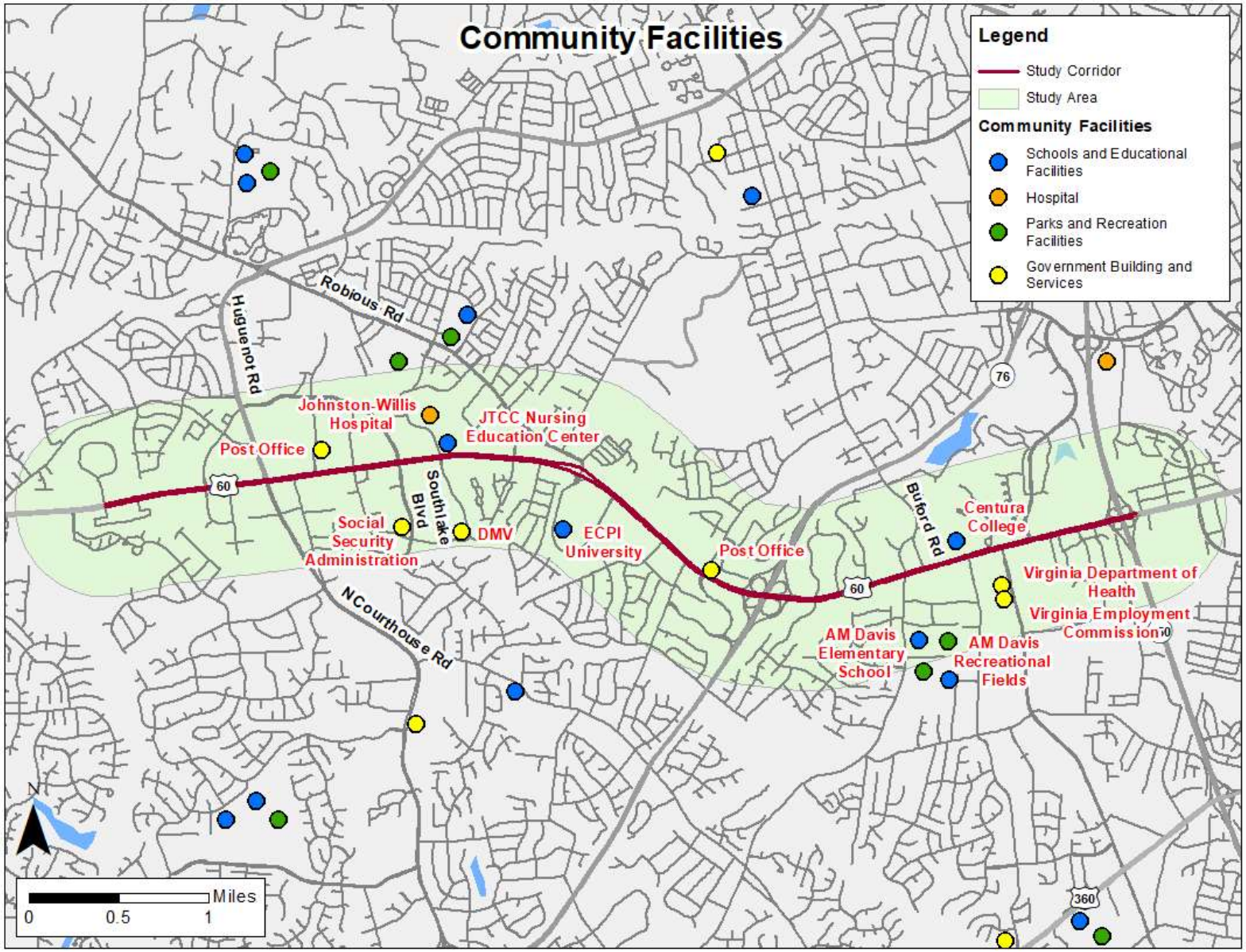

Elderly Populations (65+)
Legend
Study Corridor
Study Area
Elderly Populations (65+)
Huguenot Rd
Robious Rd
Southlake Blvd
N Courthouse Rd
Buford Rd
60
60
76
150
360
N
Miles
0
0.5
1
Demographic data is shown at the census block group level. Census block groups with higher concentrations of elderly populations than the average for the Richmond Metropolitan Area are highlighted. Elderly populations make up 15.1% of the total population within the Richmond Metropolitan Area.


Individuals with Disabilities
(Ages 20-64)
Legend
Study Corridor
Study Area
Individuals with Disabilities (Ages 20-64)
Huguenot Rd
Robious Rd
Southlake Blvd
N Courthouse Rd
Buford Rd
60
76
150
360
N
Miles
0
0.5
1
Demographic data is shown at the census block group level. Census block groups with higher concentrations of working age individuals with disabilities than the average for the Richmond Metropolitan Area are highlighted. Working age individuals with disabilities make up 10.5% of the total population within the Richmond Metropolitan Area.


Households with Low Vehicle Ownership (0-1 per HH)
Legend
Study Corridor
Study Area
Households with Low Vehicle Ownership (0 or 1 per HH)
Huguenot Rd
Robious Rd
Southlake Blvd
N Courthouse Rd
Buford Rd
60
60
76
150
360
N
Miles
0
0.5
1
Demographic data is shown at the census block group level. Census block groups with higher concentrations of households with low vehicle ownership than the average for the Richmond Metropolitan Area are highlighted. Households with low vehicle ownership make up 36.9% of the total households within the Richmond Metropolitan Area.

Appendix B: Pedestrian Infrastructure and Community Facilities Maps


Existing and Proposed
Pedestrian Infrastructure
Legend
Study Corridor
Study Area
Sidewalk Infrastructure
Existing
Proposed
Huguenot Rd
Robious Rd
Southlake Blvd
N Courthouse Rd
Buford Rd
60
76
150
360
N
Miles
0
0.5
1


Community Facilities
Legend
Study Corridor
Study Area
Community Facilities
Schools and Educational Facilities
Hospital
Parks and Recreation Facilities
Government Building and Services
Robious Rd
Huguenot Rd
Johnston-Willis Hospital
JTCC Nursing Education Center
Post Office
60
Southlake Blvd
Social Security Administration
DMV
ECPI University
N Courthouse Rd
Post Office
Buford Rd
Centura College
Virginia Department of Health
Virginia Employment Commission
AM Davis Elementary School
AM Davis Recreational Fields
76
360
N
Miles
0
0.5
1

Appendix C: Traffic Analysis Results

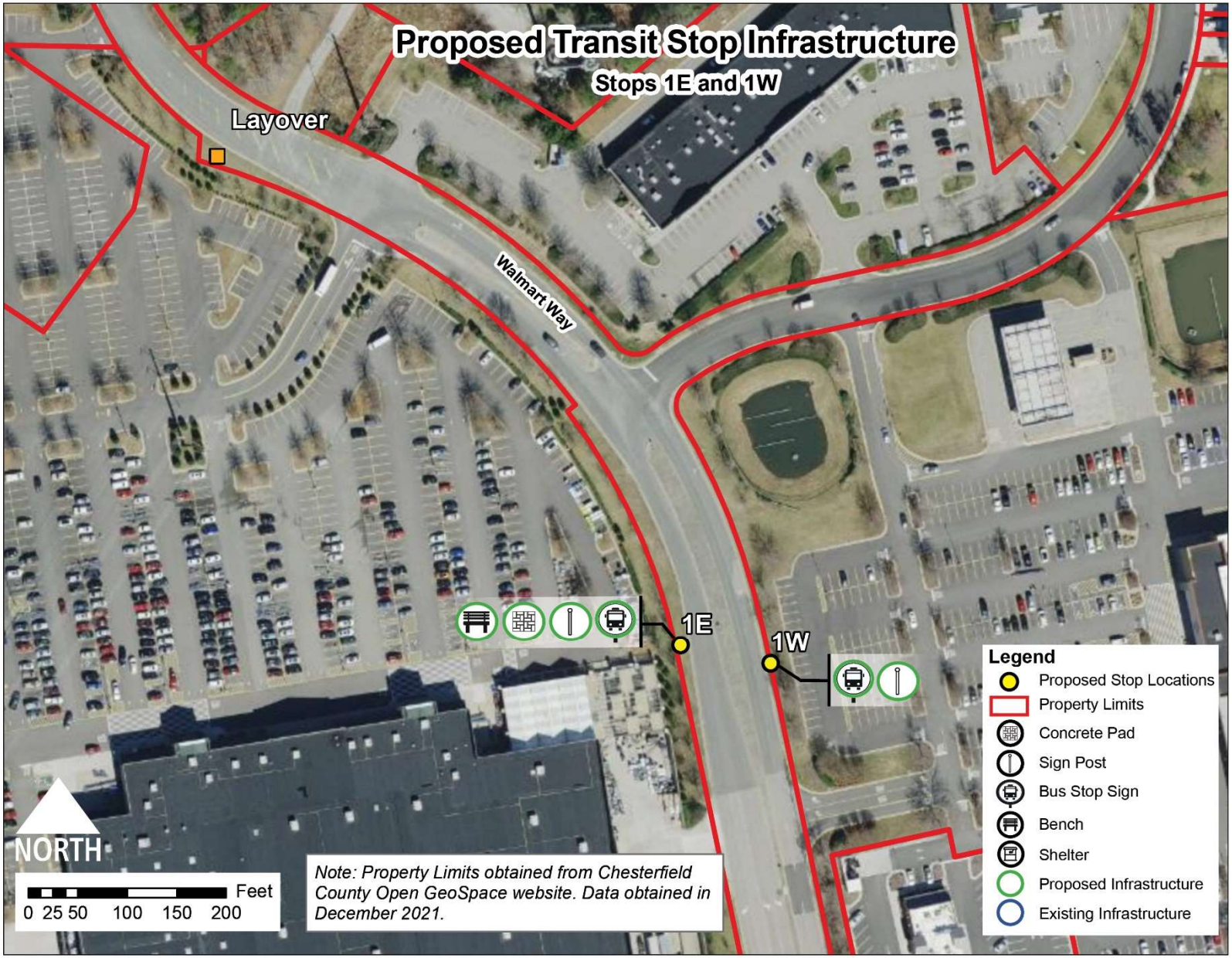
AM Peak Hour		
Intersection Name	**Intersection**	
	Change in Delay (seconds)	**LOS**
Walmart Way & Midlothian Turnpike	0.10	C (C)
Murray Olds Dr & Alverser Dr & Midlothian Turnpike	0.10	C (C)
N Courthouse Rd & Huguenot Rd & Midlothian Turnpike	0.10	D (D)
Branchway Rd & Midlothian Turnpike	0.00	B (B)
Mall Dr & Midlothian Turnpike	0.00	B (B)
Research Rd & Carmia Way & Midlothian Turnpike	0.00	B (B)
Southlake Blvd & Koger Center Blvd & Midlothian Turnpike	0.10	C (C)
Johnston Willis Dr & Midlothian Turnpike	0.10	C (C)
Sturbridge Rd & Midlothian Turnpike	0.00	A (A)
Moorefield Park Dr & Robius Rd & Midlothian Turnpike	0.00	C (C)
Moorefield Park Dr & Midlothian Turnpike	0.10	C (C)
Moorefield Park SC & Midlothian Turnpike	1.30	D (D)
Tuxford Rd & Midlothian Turnpike	0.00	A (A)
N Arch & Midlothian Turnpike	0.10	C (C)
Arboretum Pl & N Pinetta Dr & Midlothian Turnpike	0.10	C (B)
Wadsworth Drive & Midlothian Turnpike & Gateway Centre Pkwy	0.10	B (B)
Retail Entrance & Midlothian Turnpike & Gateway Centre Pkwy	0.10	B (B)
Providence Road & Midlothian Turnpike & Providence Road	0.10	D (D)
Retail Entrance & Midlothian Turnpike & Burford Road	0.10	B (B)
Ruthers Road & Midlothian Turnpike & Wendy's Entrance	0.10	C (C)
Turner Road & Midlothian Turnpike & VDOT Entrance	0.50	E (E)
Chippenham Square Ent. & Midlothian Turnpike & Boulders Parkway	0.30	C (C)
Stonebridge Plaza Ave. & Spring Rock Green Ent. & Midlothian Turnpike	0.00	B (B)
Donald May Jr. Dr. & Spring Rock Green Ent. & Midlothian Turnpike	0.10	A (A)
Arcadia St & Midlothian Turnpike	0.00	B (B)

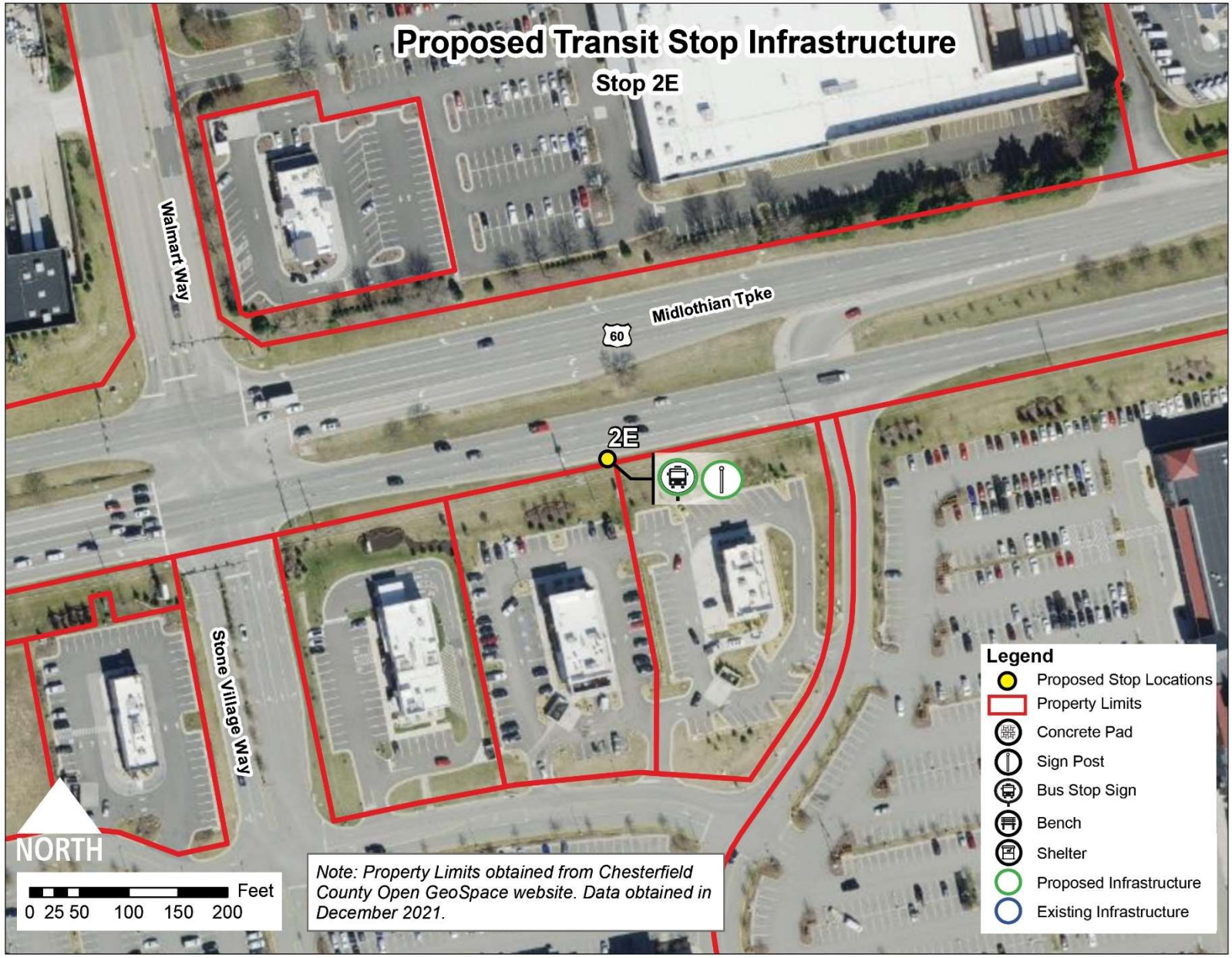
The intersection column shows delay per vehicle in seconds and level of service (LOS) of the intersection. The LOS in brackets shows the LOS of the existing intersection. The LOS not in brackets is the LOS of the intersection with 4 bus blockages per hour.

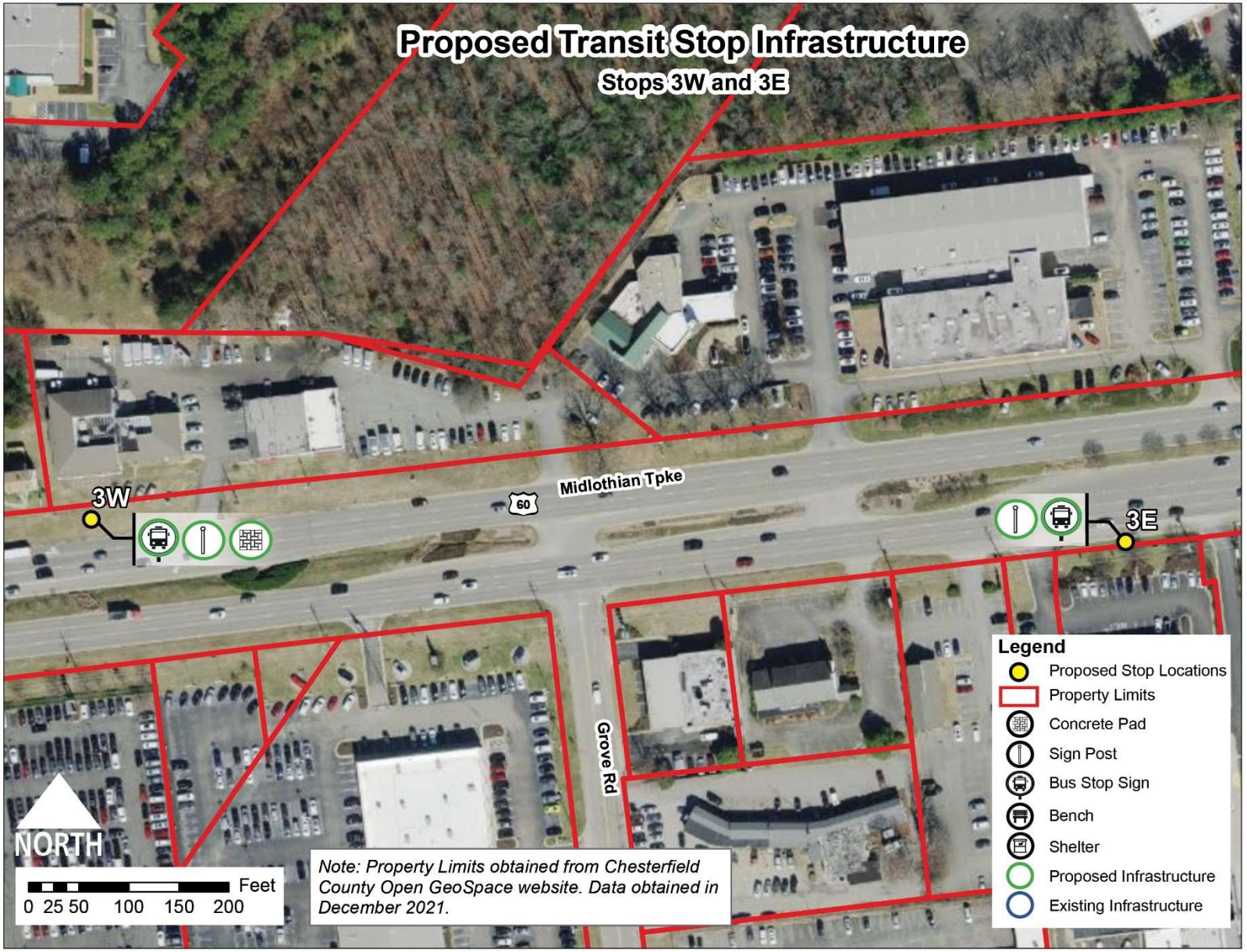
PM Peak Hour		
Intersection Name	**Intersection**	
	Change in Delay (seconds)	**LOS**
Walmart Way & Midlothian Turnpike	0.80	D (D)
Murray Olds Dr & Alverser Dr & Midlothian Turnpike	0.10	F (F)
N Courthouse Rd & Huguenot Rd & Midlothian Turnpike	0.20	E (E)
Branchway Rd & Midlothian Turnpike	0.00	B (B)
Mall Dr & Midlothian Turnpike	0.20	C (B)
Research Rd & Carmia Way & Midlothian Turnpike	0.10	C (C)
Southlake Blvd & Koger Center Blvd & Midlothian Turnpike	0.00	C (C)
Johnston Willis Dr & Midlothian Turnpike	0.00	C (C)
Sturbridge Rd & Midlothian Turnpike	0.00	D (D)
Moorefield Park Dr & Robius Rd & Midlothian Turnpike	0.10	B (B)
Moorefield Park Dr & Midlothian Turnpike	1.20	D (D)
Moorefield Park SC & Midlothian Turnpike	0.90	D (D)
Tuxford Rd & Midlothian Turnpike	0.10	B (B)
N Arch & Midlothian Turnpike	0.50	C (C)
Arboretum Pl & N Pinetta Dr & Midlothian Turnpike	0.70	D (D)
Wadsworth Drive & Midlothian Turnpike & Gateway Centre Pkwy	0.00	B (B)
Retail Entrance & Midlothian Turnpike & Gateway Centre Pkwy	0.10	C (C)
Providence Road & Midlothian Turnpike & Providence Road	0.90	D (D)
Retail Entrance & Midlothian Turnpike & Burford Road	0.10	C (C)
Ruthers Road & Midlothian Turnpike & Wendy's Entrance	0.10	C (C)
Turner Road & Midlothian Turnpike & VDOT Entrance	0.30	D (D)
Chippenham Square Ent. & Midlothian Turnpike & Boulders Parkway	0.30	C (C)
Stonebridge Plaza Ave. & Spring Rock Green Ent. & Midlothian Turnpike	0.10	C (C)
Donald May Jr. Dr. & Spring Rock Green Ent. & Midlothian Turnpike	0.10	B (B)
Arcadia St & Midlothian Turnpike	0.10	C (C)

The intersection column shows delay per vehicle in seconds and level of service (LOS) of the intersection. The LOS in brackets shows the LOS of the existing intersection. The LOS not in brackets is the LOS of the intersection with 4 bus blockages per hour.

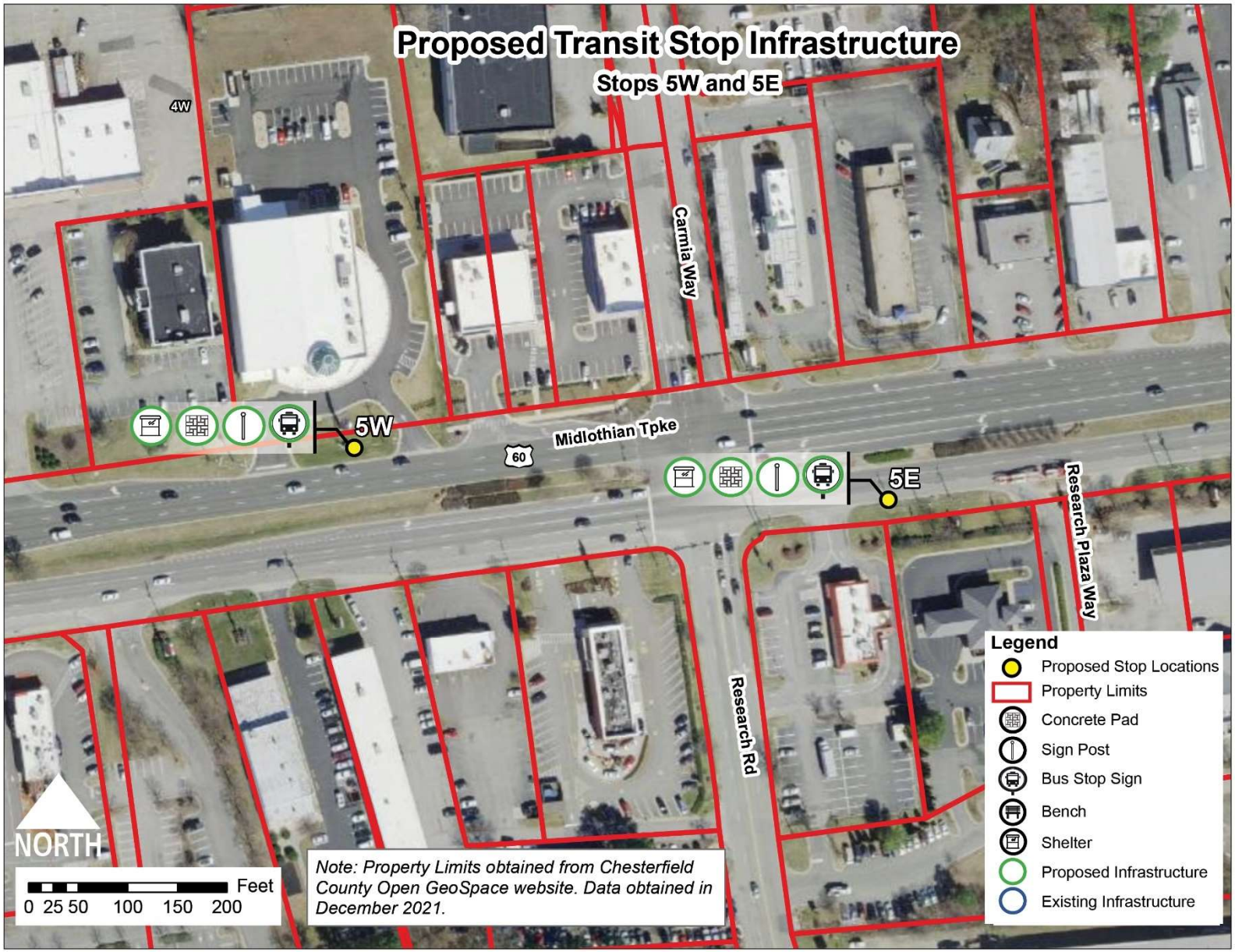
Appendix D: Recommended Stop Infrastructure Maps

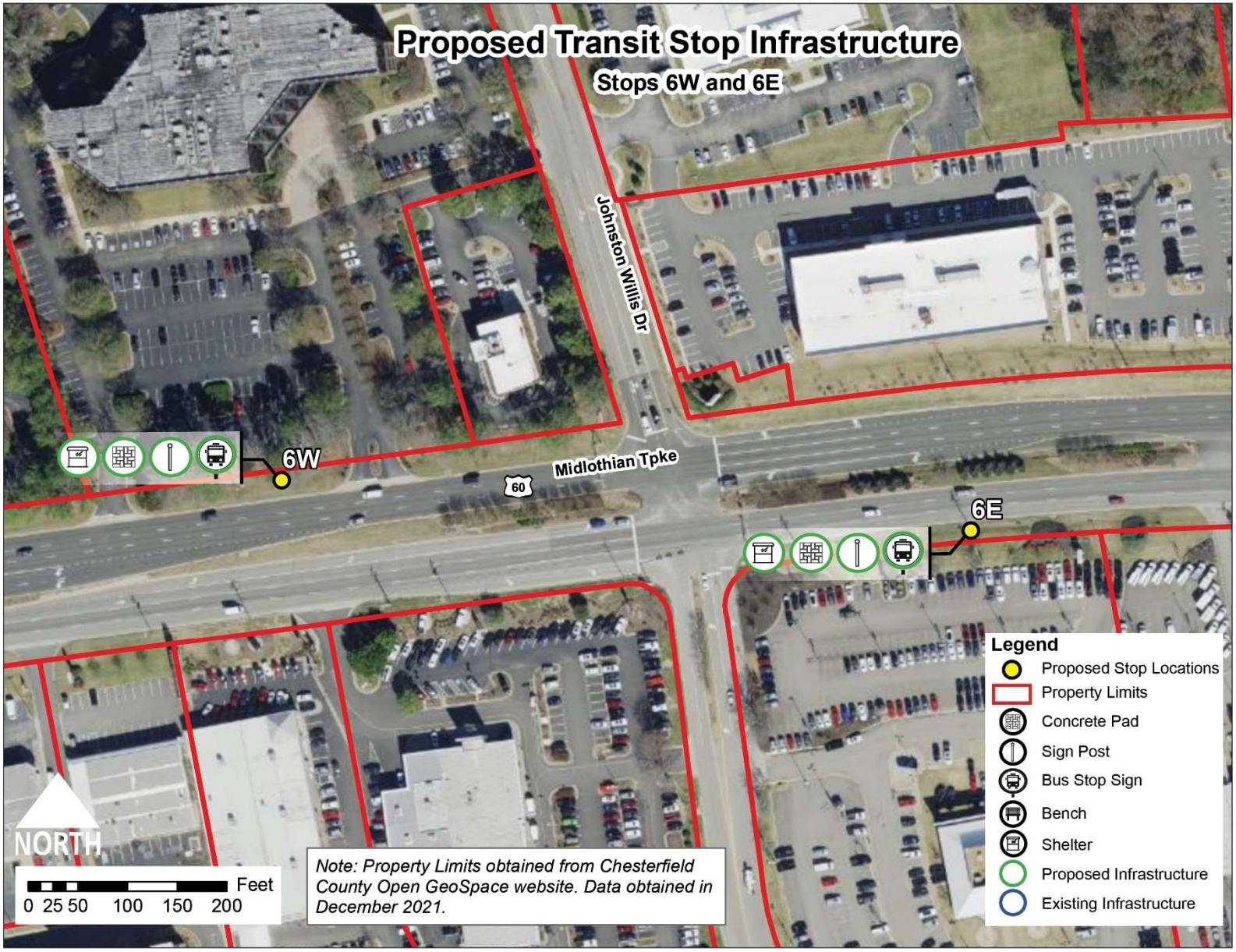

Proposed Transit Stop Infrastructure
Stops 1E and 1W
Layover
Walmart Way
1E
1W
Legend
Proposed Stop Locations
Property Limits
Concrete Pad
Sign Post
Bus Stop Sign
Bench
Shelter
Proposed Infrastructure
Existing Infrastructure
NORTH
Feet
0 25 50 100 150 200
Note: Property Limits obtained from Chesterfield County Open GeoSpace website. Data obtained in December 2021.

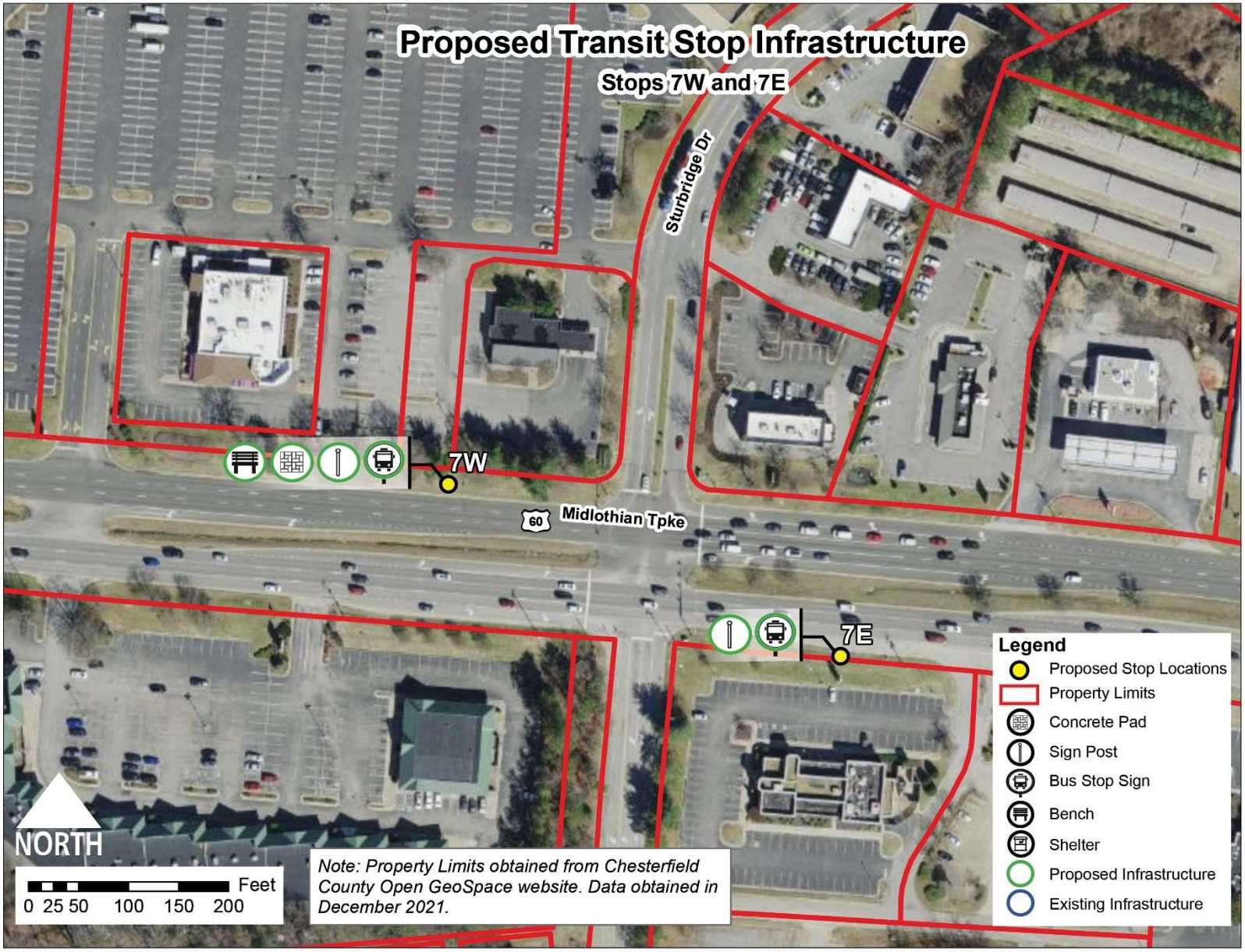

Proposed Transit Stop Infrastructure
Stop 2E
Walmart Way
Midlothian Tpke
60
2E
Stone Village Way
NORTH
Feet
0 25 50 100 150 200
Note: Property Limits obtained from Chesterfield County Open GeoSpace website. Data obtained in December 2021.
Legend
Proposed Stop Locations
Property Limits
Concrete Pad
Sign Post
Bus Stop Sign
Bench
Shelter
Proposed Infrastructure
Existing Infrastructure

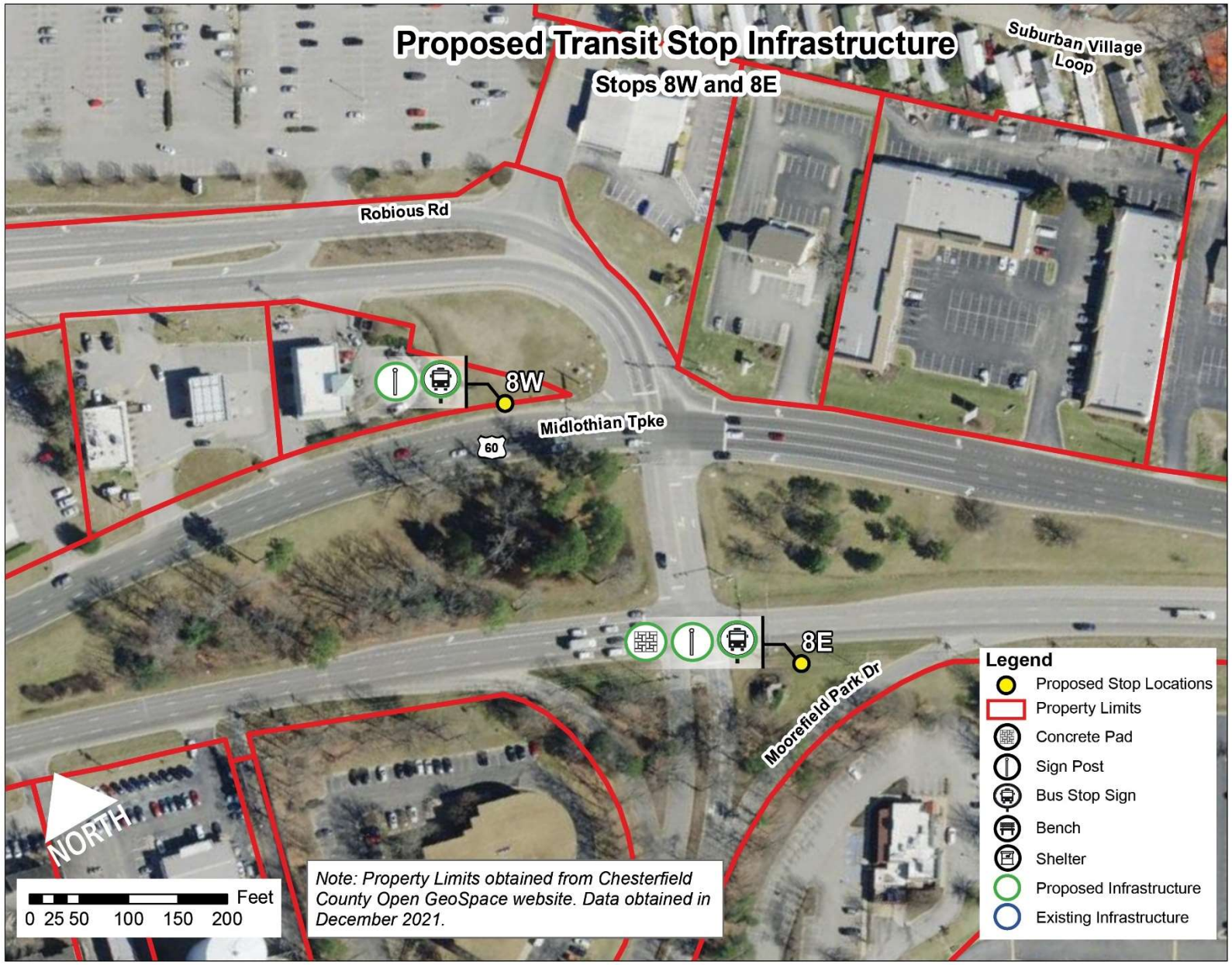

Proposed Transit Stop Infrastructure
Stops 3W and 3E
3W
3E
60
Midlothian Tpke
Grove Rd
NORTH
Feet
0 25 50 100 150 200
Note: Property Limits obtained from Chesterfield County Open GeoSpace website. Data obtained in December 2021.
Legend
Proposed Stop Locations
Property Limits
Concrete Pad
Sign Post
Bus Stop Sign
Bench
Shelter
Proposed Infrastructure
Existing Infrastructure

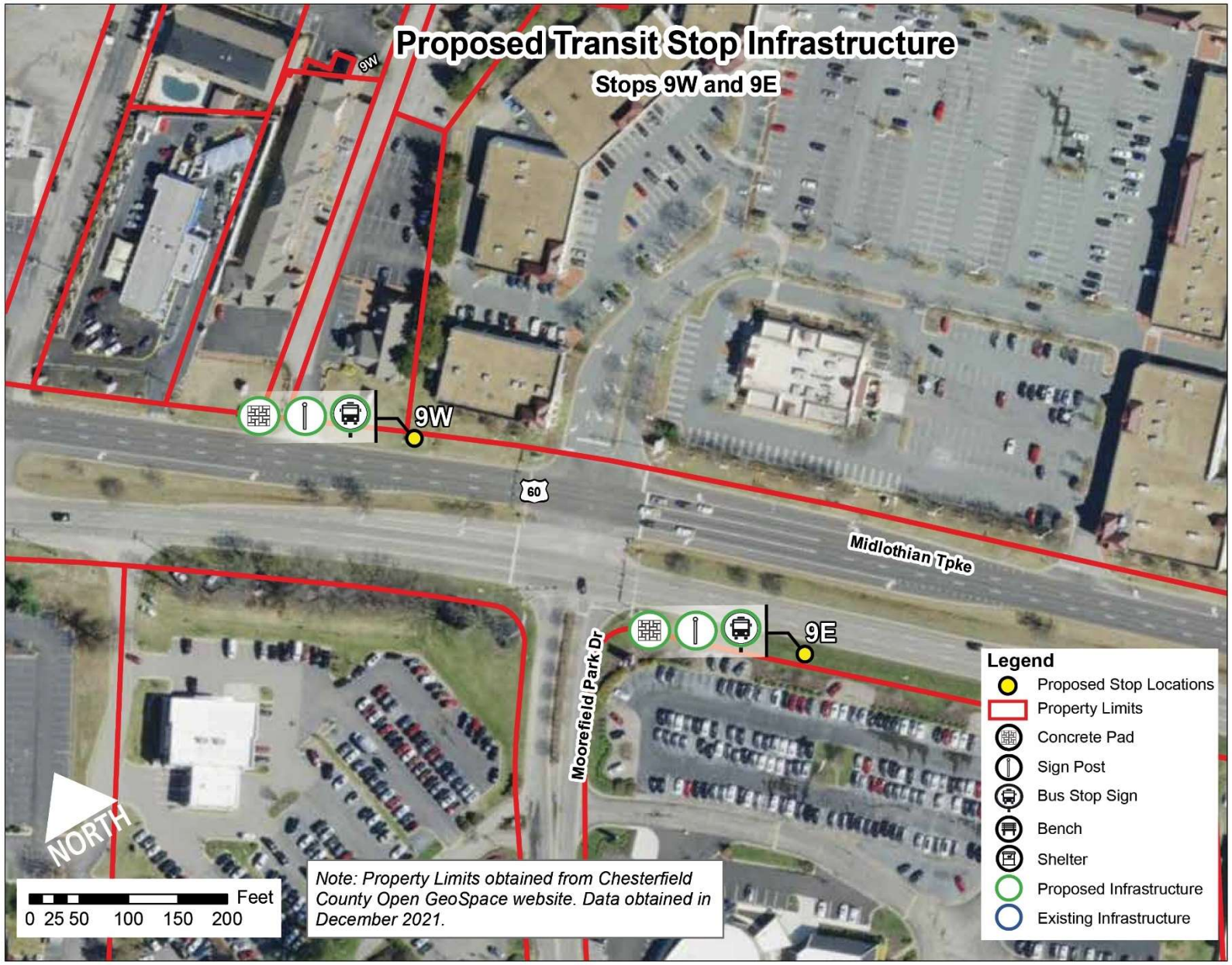

Proposed Transit Stop Infrastructure
Stops 4W and 4E
4W
4E
Midlothian Tpke
60
Mall Dr
Branchway Rd
NORTH
Feet
0 25 50 100 150 200
Note: Property Limits obtained from Chesterfield County Open GeoSpace website. Data obtained in December 2021.
Legend
Proposed Stop Locations
Property Limits
Concrete Pad
Sign Post
Bus Stop Sign
Bench
Shelter
Proposed Infrastructure
Existing Infrastructure

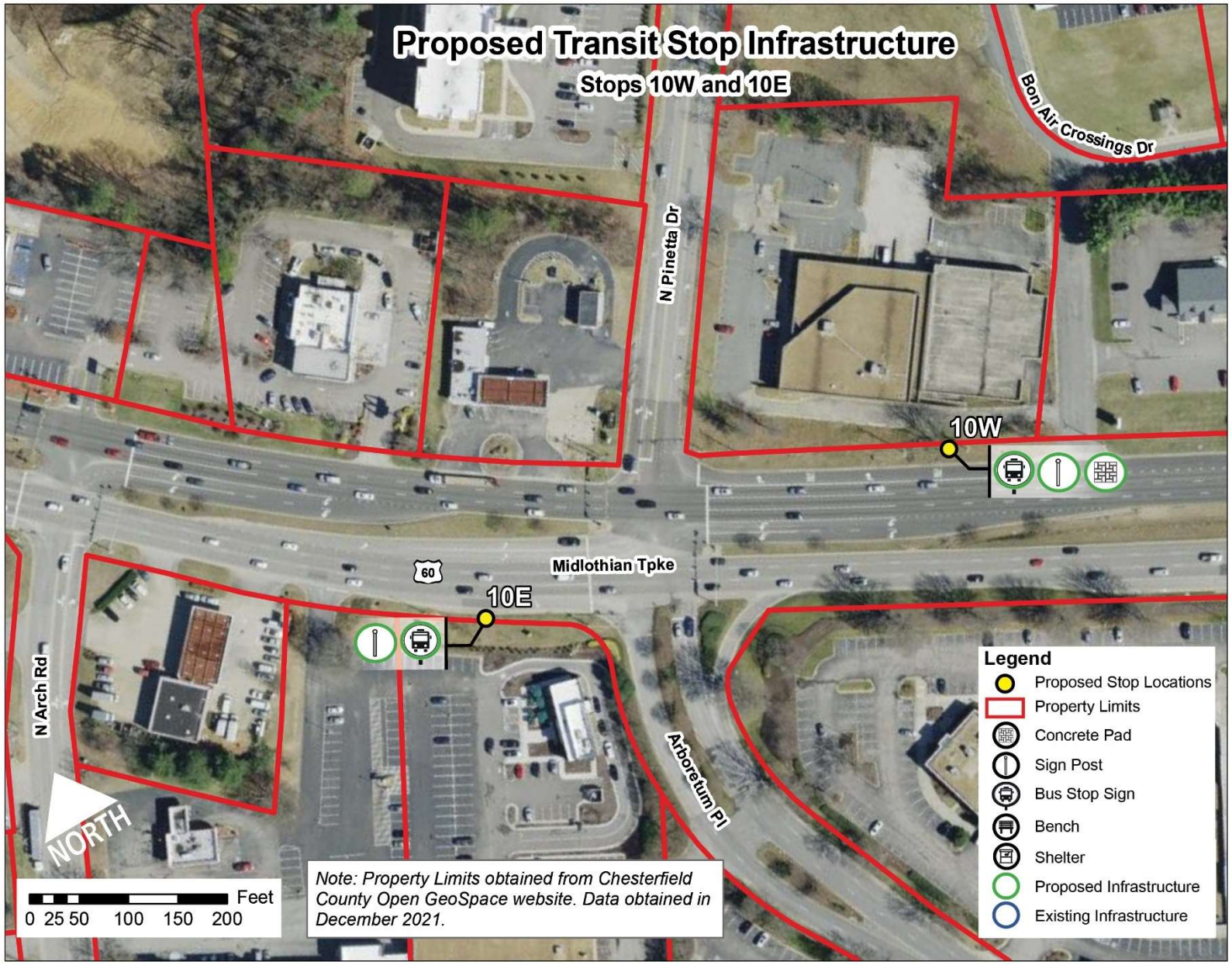

Proposed Transit Stop Infrastructure
Stops 5W and 4E
4W
Carmia Way
5W
Midlothian Tpke
60
5E
Research Plaza Way
Research Rd
NORTH
Feet
0 25 50 100 150 200
Note: Property Limits obtained from Chesterfield County Open GeoSpace website. Data obtained in December 2021.
Legend
Proposed Stop Locations
Property Limits
Concrete Pad
Sign Post
Bus Stop Sign
Bench
Shelter
Proposed Infrastructure
Existing Infrastructure

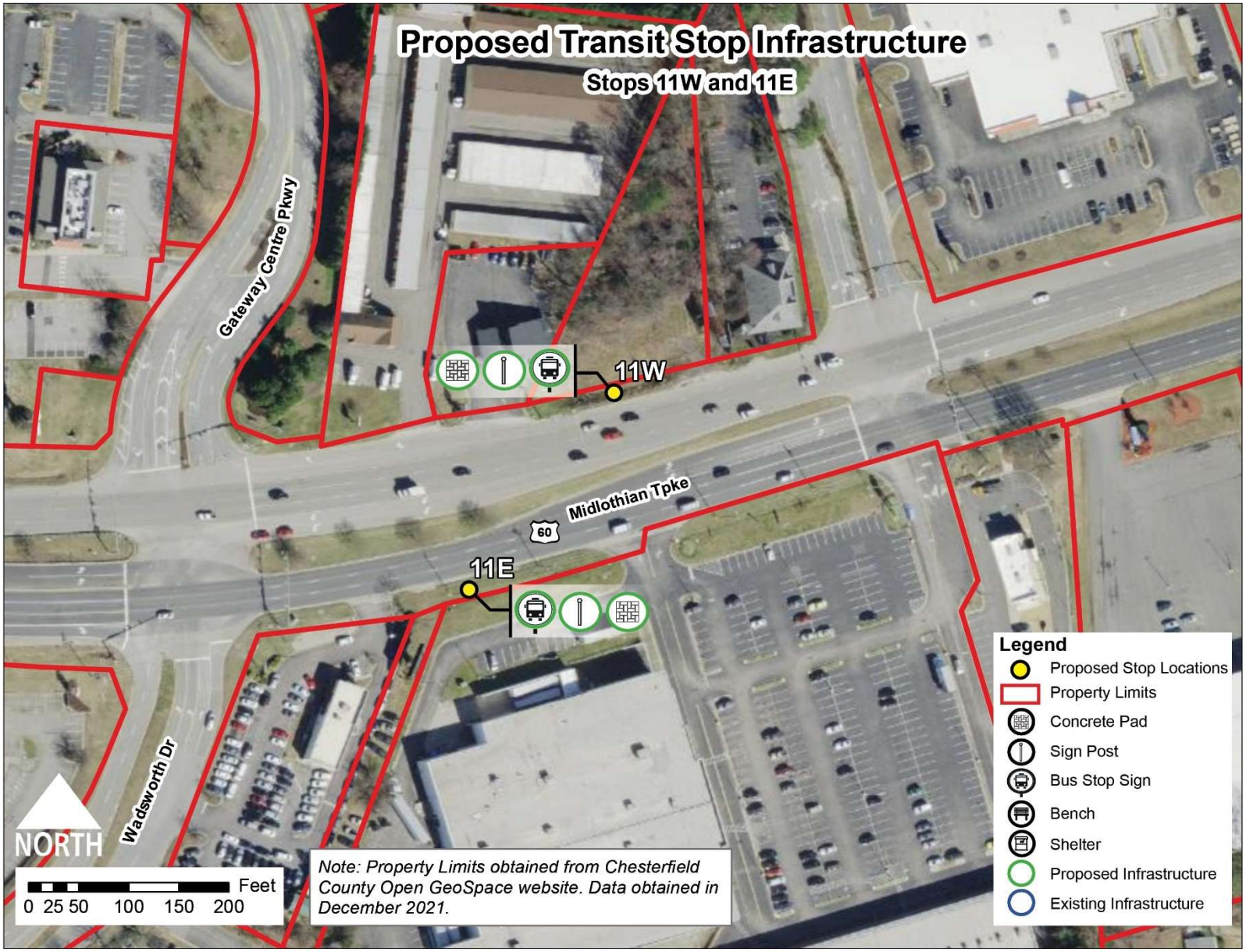

Proposed Transit Stop Infrastructure
Stops 6W and 6E
Johnston Willis Dr
Midlothian Tpke
60
6W
6E
Legend
Proposed Stop Locations
Property Limits
Concrete Pad
Sign Post
Bus Stop Sign
Bench
Shelter
Proposed Infrastructure
Existing Infrastructure
NORTH
Feet
0 25 50 100 150 200
Note: Property Limits obtained from Chesterfield County Open GeoSpace website. Data obtained in December 2021.

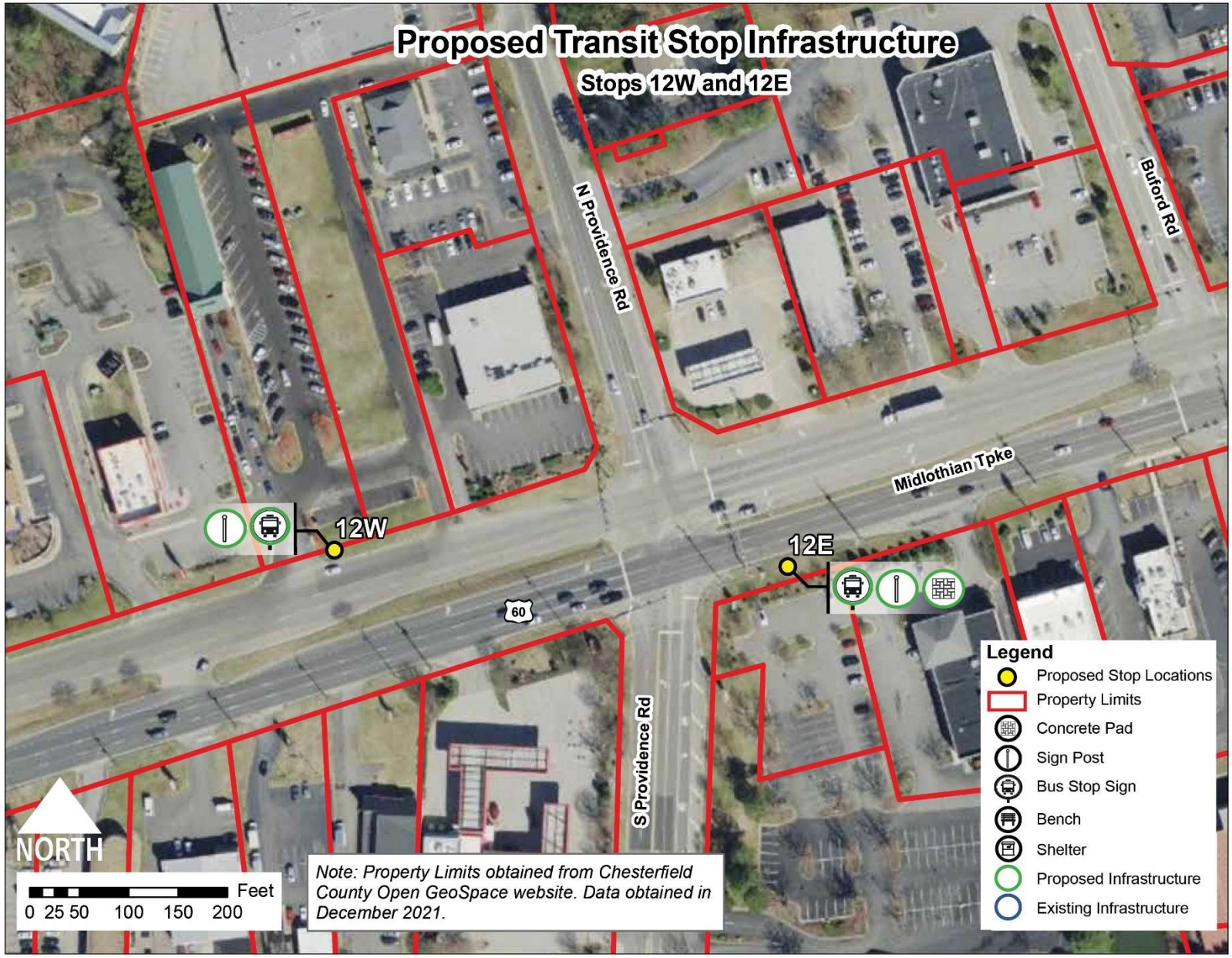

Proposed Transit Stop Infrastructure
Stops 7W and 7E
Sturbridge Dr
7W
60
Midlothian Tpke
7E
Legend
Proposed Stop Locations
Property Limits
Concrete Pad
Sign Post
Bus Stop Sign
Bench
Shelter
Proposed Infrastructure
Existing Infrastructure
NORTH
Feet
0 25 50 100 150 200
Note: Property Limits obtained from Chesterfield County Open GeoSpace website. Data obtained in December 2021.

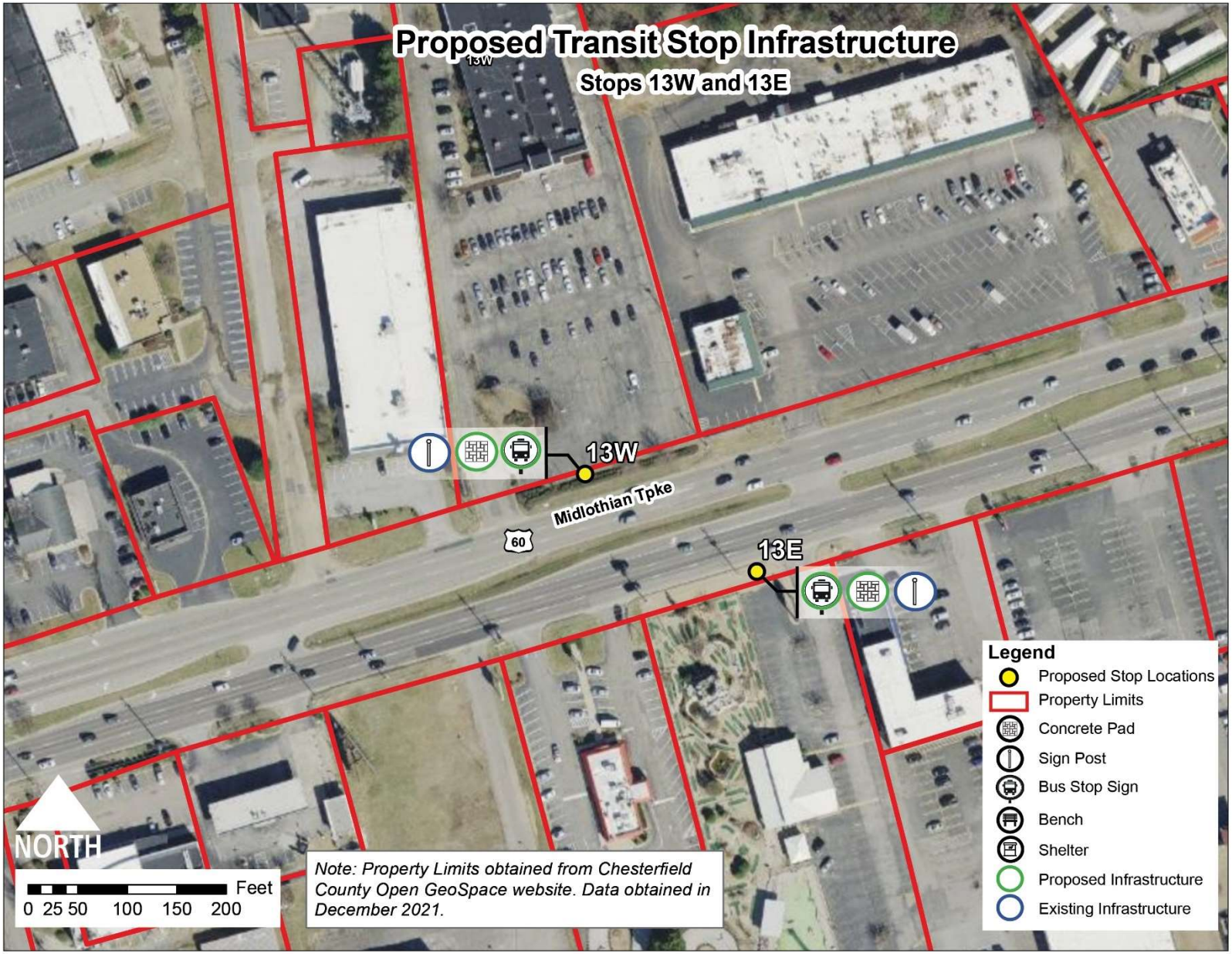

Proposed Transit Stop Infrastructure
Stops 8W and 8E
Suburban Village Loop
Robious Rd
8W
Midlothian Tpke
60
8E
Moorefield Park Dr
NORTH
Feet
0 25 50 100 150 200
Note: Property Limits obtained from Chesterfield County Open GeoSpace website. Data obtained in December 2021.
Legend
Proposed Stop Locations
Property Limits
Concrete Pad
Sign Post
Bus Stop Sign
Bench
Shelter
Proposed Infrastructure
Existing Infrastructure

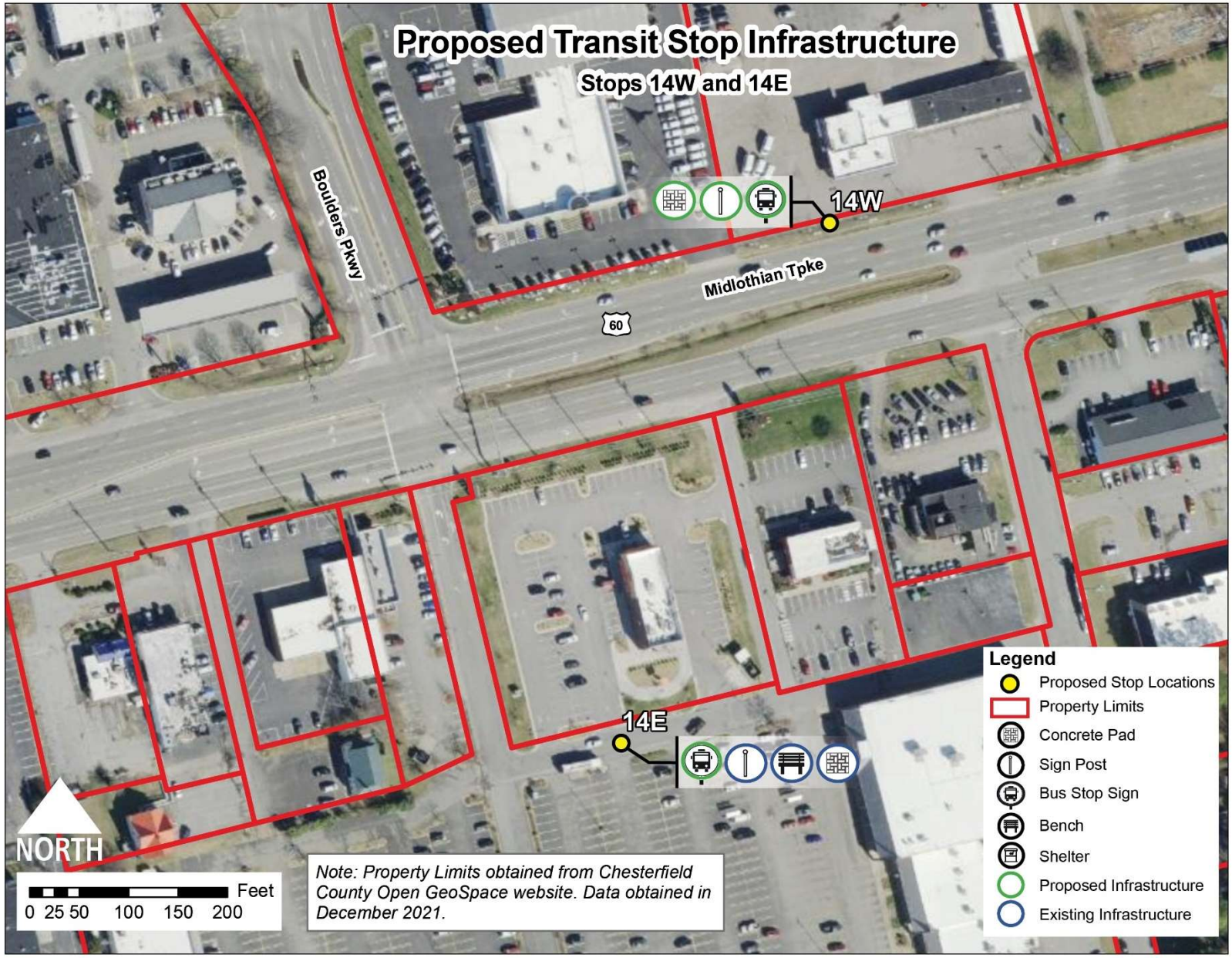

Proposed Transit Stop Infrastructure
Stops 9W and 9E
9W
9W
60
Midlothian Tpke
9E
Moorefield Park Dr
NORTH
Feet
0 25 50 100 150 200
Note: Property Limits obtained from Chesterfield County Open GeoSpace website. Data obtained in December 2021.
Legend
Proposed Stop Locations
Property Limits
Concrete Pad
Sign Post
Bus Stop Sign
Bench
Shelter
Proposed Infrastructure
Existing Infrastructure

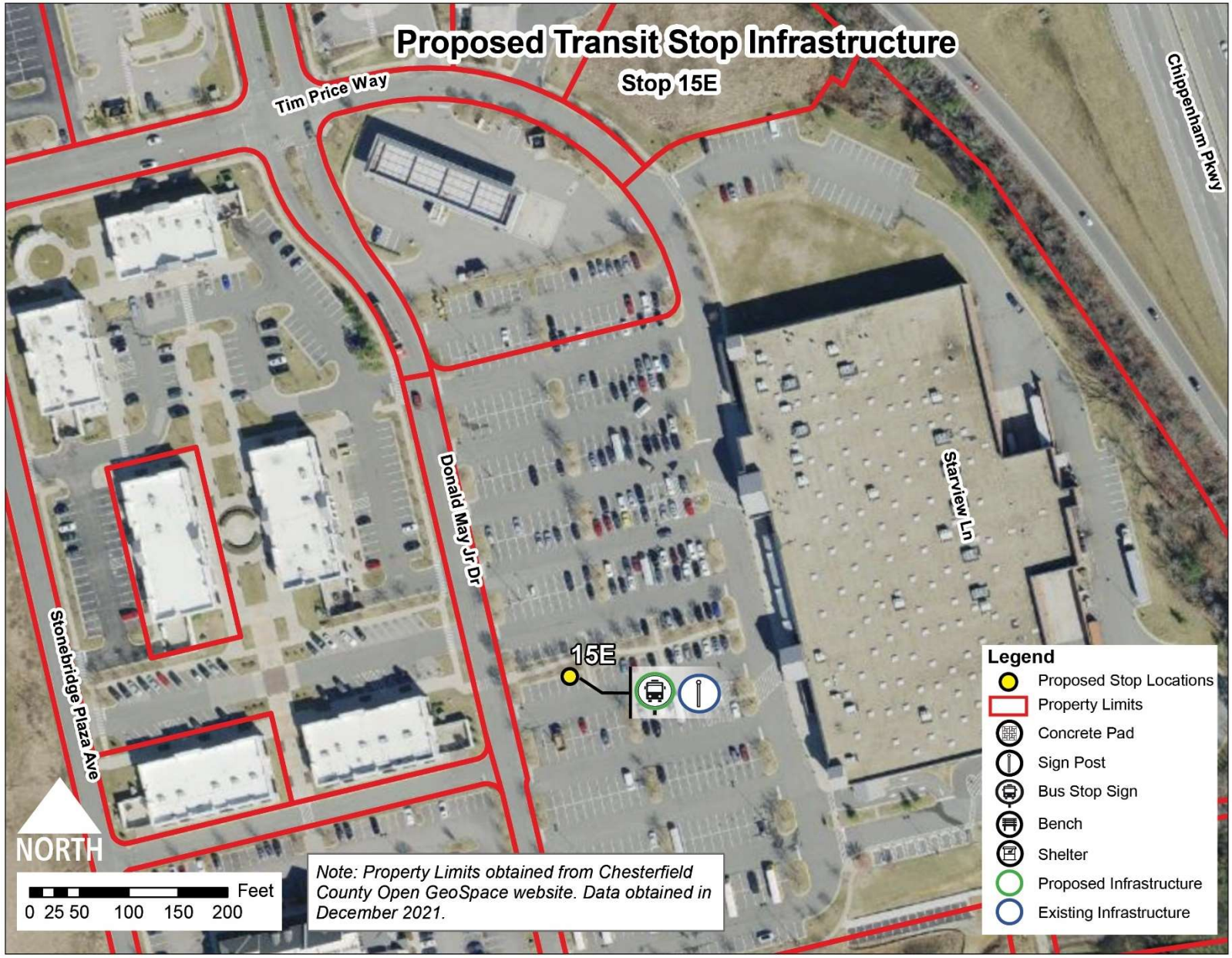

Proposed Transit Stop Infrastructure
Stops 10W and 10E
Bon Air Crossings Dr
N Pinetta Dr
10W
Midlothian Tpke
60
10E
N Arch Rd
Arboretum Pl
NORTH
Feet
0 25 50 100 150 200
Note: Property Limits obtained from Chesterfield County Open GeoSpace website. Data obtained in December 2021.
Legend
Proposed Stop Locations
Property Limits
Concrete Pad
Sign Post
Bus Stop Sign
Bench
Shelter
Proposed Infrastructure
Existing Infrastructure

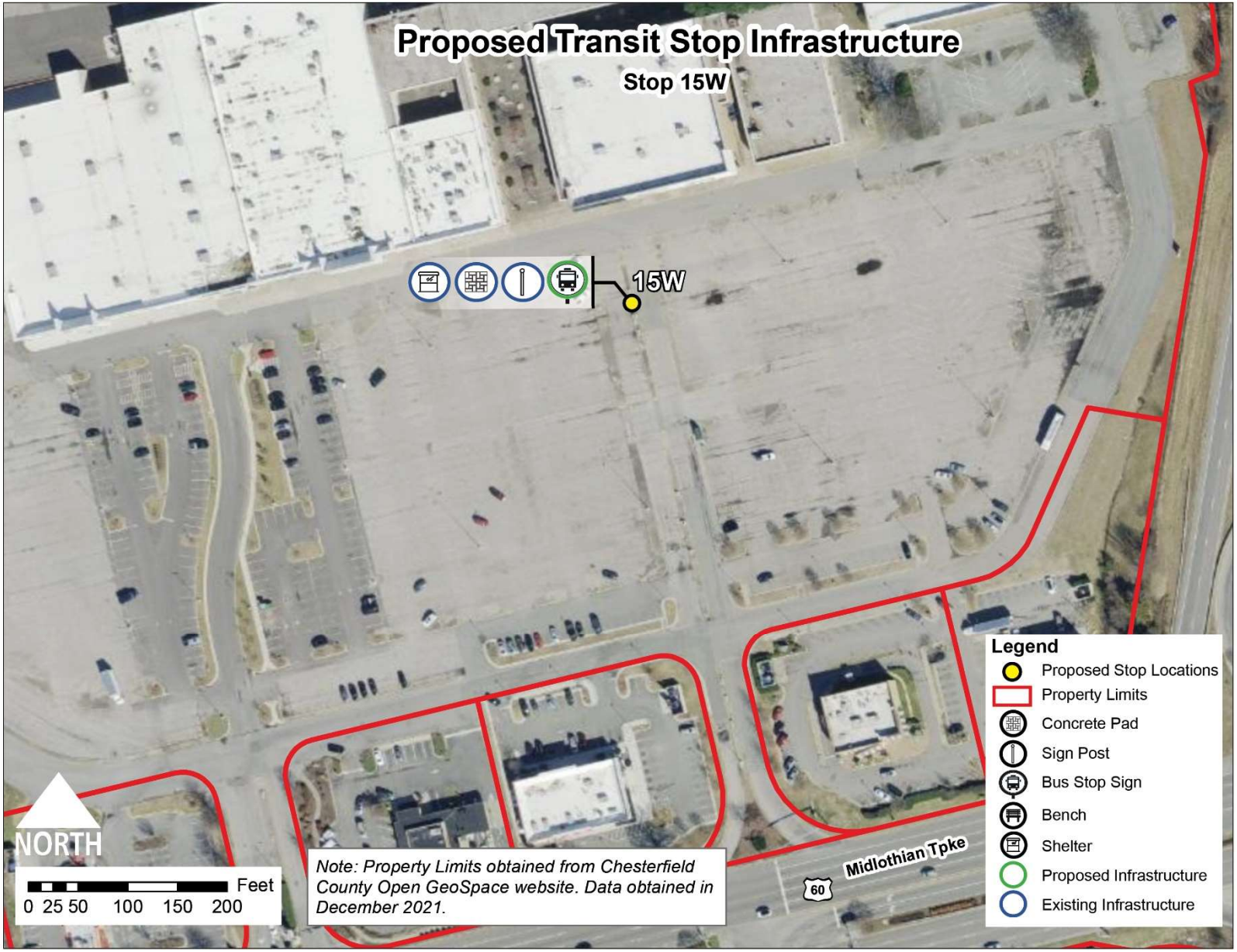

Proposed Transit Stop Infrastructure
Stops 11W and 11E
Gateway Centre Pkwy
11W
Midlothian Tpke
60
11E
Wadsworth Dr
NORTH
Feet
0 25 50 100 150 200
Note: Property Limits obtained from Chesterfield County Open GeoSpace website. Data obtained in December 2021.
Legend
Proposed Stop Locations
Property Limits
Concrete Pad
Sign Post
Bus Stop Sign
Bench
Shelter
Proposed Infrastructure
Existing Infrastructure


Proposed Transit Stop Infrastructure
Stops 12W and 12E
N Providence Rd
Buford Rd
Midlothian Tpke
12W
12E
60
S Providence Rd
NORTH
Feet
0 25 50 100 150 200
Note: Property Limits obtained from Chesterfield County Open GeoSpace website. Data obtained in December 2021.
Legend
Proposed Stop Locations
Property Limits
Concrete Pad
Sign Post
Bus Stop Sign
Bench
Shelter
Proposed Infrastructure
Existing Infrastructure


Proposed Transit Stop Infrastructure
Stops 13W and 13E
13W
Midlothian Tpke
60
13E
Legend
Proposed Stop Locations
Property Limits
Concrete Pad
Sign Post
Bus Stop Sign
Bench
Shelter
Proposed Infrastructure
Existing Infrastructure
NORTH
Feet
0 25 50 100 150 200
Note: Property Limits obtained from Chesterfield County Open GeoSpace website. Data obtained in December 2021.


Proposed Transit Stop Infrastructure
Stops 14W and 14E
Boulders Pkwy
Midlothian Tpke
60
14W
14E
NORTH
Feet
0 25 50 100 150 200
Note: Property Limits obtained from Chesterfield County Open GeoSpace website. Data obtained in December 2021.
Legend
Proposed Stop Locations
Property Limits
Concrete Pad
Sign Post
Bus Stop Sign
Bench
Shelter
Proposed Infrastructure
Existing Infrastructure


Proposed Transit Stop Infrastructure
Stop 15E
Tim Price Way
Chippenham Pkwy
Donald May Jr Dr
Starview Ln
Stonebridge Plaza Ave
15E
NORTH
Feet
0 25 50 100 150 200
Note: Property Limits obtained from Chesterfield County Open GeoSpace website. Data obtained in December 2021.
Legend
Proposed Stop Locations
Property Limits
Concrete Pad
Sign Post
Bus Stop Sign
Bench
Shelter
Proposed Infrastructure
Existing Infrastructure


Proposed Transit Stop Infrastructure
Stop 15W
15W
Legend
Proposed Stop Locations
Property Limits
Concrete Pad
Sign Post
Bus Stop Sign
Bench
Shelter
Proposed Infrastructure
Existing Infrastructure
NORTH
Feet
0 25 50 100 150 200
Note: Property Limits obtained from Chesterfield County Open GeoSpace website. Data obtained in December 2021.
Midlothian Tpke
60