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Rural Transportation Analysis

Final Report

We would like to extend our gratitude to the community members, stakeholders, partners, and advisory group members whose insights, participation, and collaboration have been invaluable in shaping this project.

Your input has provided the foundation for a meaningful exploration of rural transportation needs, and your continued support will help us build a more accessible and connected future for all residents. Thank you for your commitment to this effort.

Prepared by:

PlanRVA
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KLT Group

LaBella
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Acronyms & Definitions

Demand-Response Transit: A service where riders book trips in advance, and vehicles are sent to pick them up.

Department of Rail and Public Transportation (DRPT): A state agency that plans and funds rail and public transportation.

Express Bus: A bus that travels long routes with few stops to save time, often used by commuters.

Federal Transit Administration (FTA): A federal agency that funds and supports public transportation systems.

First-Mile/Last-Mile Connectivity: Transportation that helps people get to or from a transit stop.

Fixed-Route Transit: A transit service that follows a set route with scheduled stops.

Mobility-as-a-Service (MaaS): A system where users can access various transportation options through a single app or platform.

Microtransit: A flexible service using smaller vehicles for door-to-door or local trips in specific areas.

On-Demand Transit: A service where riders request rides when needed, without fixed routes or schedules.

Park-and-Ride: Parking lots where people can leave their cars and switch to public transit or carpools.

Paratransit: Accessible public transportation for people who can't use regular services.

Public Transportation: Buses, trains, and other transit options open to everyone, usually with set routes and schedules.

Ridesharing: Sharing a ride with others going the same way, often arranged through apps to save money.

Traditional Village Development (TVD): Compact, walkable communities designed to reduce car use in rural areas.

Transit-Oriented Development (TOD): Building homes, shops, and offices near transit stations to create walkable, sustainable communities.

Executive Summary

The Rural Transportation Analysis (RTA) provides a comprehensive evaluation of mobility needs and transit options for the rural counties of Charles City, Goochland, Hanover, New Kent, and Powhatan. These areas face significant transportation challenges due to low population densities, geographic dispersion, and a heavy reliance on personal vehicles. Public transportation services are limited and often targeted to specific groups, such as older adults and individuals with disabilities. This limits regional mobility and access to essential destinations like jobs, healthcare, and education.

Through a detailed assessment of existing infrastructure, demographic trends, and service availability, the project team identified widespread gaps in access, especially for vulnerable populations. The region is also experiencing population growth, with projections showing a nearly 30% increase by 2045, making the need for flexible, scalable transportation options even more urgent.
Transit operators currently serving the region include Bay Transit, GRTC, and Hanover DASH. While traditional high-frequency fixed-route bus service is not viable in most rural areas, successful microtransit and demand-response programs demonstrate promise. Interviews with providers confirmed that future efforts should focus on tailored services that reflect local capacity and need, rather than a one-size-fits-all model.

What did the public say?

- The number one reason for people not using public transportation is lack of availability.
- Expressed need for better walking and biking infrastructure, which would enhance overall accessibility and support public transit use in the future.
- There is a strong desire for improved road safety measures, such as better lighting and road maintenance.
- Top improvements that would encourage use of public transportation include (in order) ‘More convenient routes’, ‘More frequent service’, and ‘More park and ride facilities’.

The analysis explored the feasibility of new commuter express routes, microtransit zones, and expanded demand-response services. Commuter express routes were identified as a cost-effective way to connect rural residents to Downtown Richmond via strategically located park-and-ride facilities. Microtransit zones were recommended in Goochland and Hanover counties, while Bay Transit continues to lead similar efforts in Charles City and New Kent.

Expanded demand-response service was also evaluated as a key solution for reaching more isolated areas and populations with limited transportation access. Infrastructure readiness varies by location. While some park-and-ride lots like Bottoms Bridge in New Kent are nearly ready to serve, others—such as Hickory Haven in Goochland and potential sites in Powhatan and Hanover—require significant upgrades or development. The report emphasizes the importance of aligning service planning with infrastructure improvements to ensure safe and accessible rider experiences.

Public engagement and stakeholder feedback were central to the analysis, with residents expressing strong interest in more walking and biking infrastructure, increased service availability, and better regional coordination. Concerns about the limitations of existing services, the need for equitable access, and the importance of community-driven solutions shaped the recommendations.
In summary, the RTA outlines a path toward more inclusive, flexible, and sustainable transportation options for the Richmond region's rural counties. With coordinated investment, improved infrastructure, and collaborative service delivery, the region can begin to address longstanding mobility challenges and prepare for future growth.

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Location & Framework

The Rural Transportation Analysis focuses on the transportation challenges within the study area (Figure 1) that includes Charles City, Goochland, Hanover, New Kent, and Powhatan counties in the Richmond region. These counties are characterized by low-to-no-density development, making it difficult to provide traditional fixed-route public transportation. The geographic size and distance between residential areas, employment centers, and services further complicate access to reliable transit. These challenges have resulted in a heavy reliance on personal vehicles, which leaves many residents without practical alternatives, especially those without access to a car.

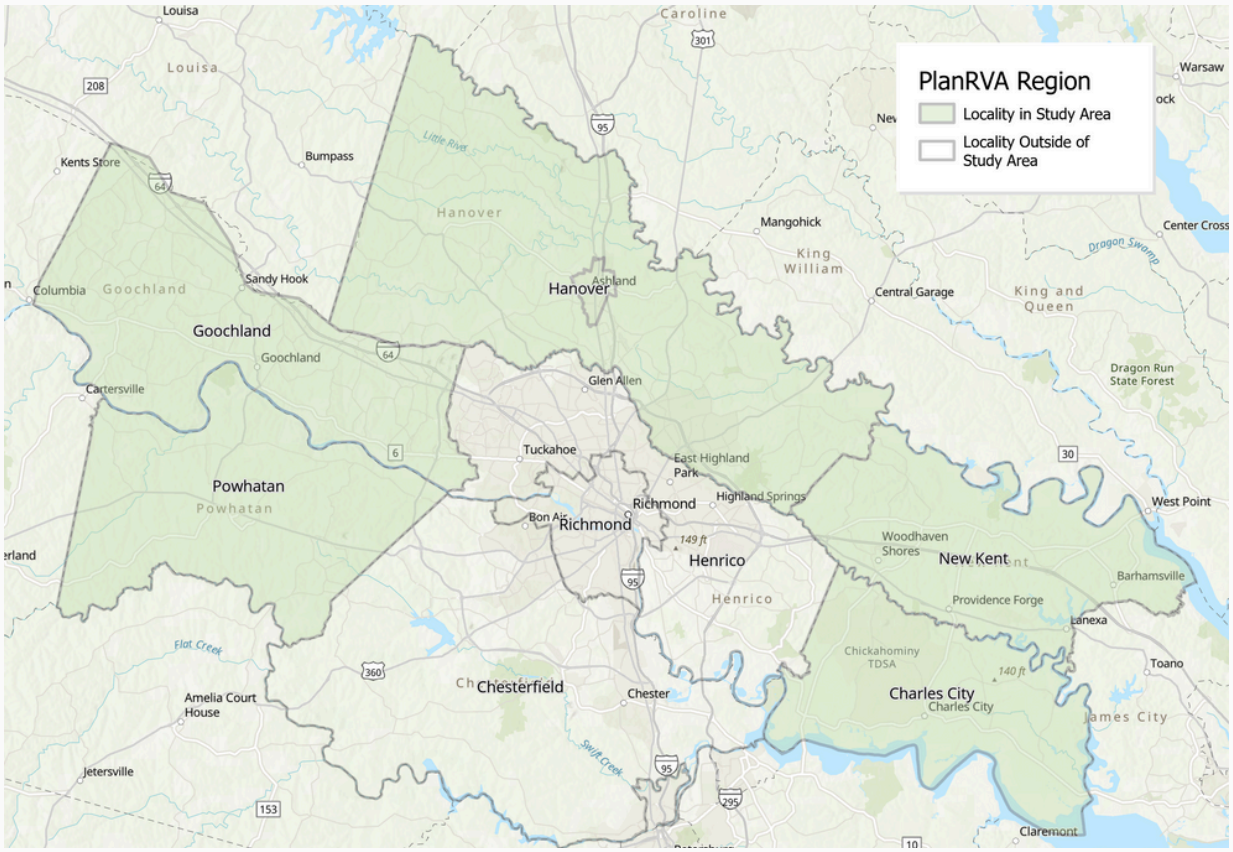

Figure 1. Map of study area

While some public transportation services are available, most offer limited coverage and are primarily focused on serving specific groups, such as older adults, people with disabilities, and low-income individuals. These services, though helpful, are not robust enough to meet the needs of the entire population, and they often face challenges in providing flexible, on-demand service. Compounding the issue, the lack of pedestrian and bicycle infrastructure restricts mobility further, making public transportation less effective and leaving rural residents with few viable options for reaching essential services.

To address these challenges, the existing conditions analysis explores the current state of transportation services, infrastructure, and accessibility in these rural areas. This report incorporates insights from various sources and are listed in the Summary of Findings from Previous Studies & Reports section. These frameworks provide a foundation for identifying innovative, flexible solutions tailored to the unique needs of rural communities, which will be essential as the region explores ways to enhance transportation access, improve mobility, and foster greater connectivity.

Considering the landscape of the region's rural counties, it's vital to consider factors like population growth, age distribution, income levels, and commuting habits. These demographic elements significantly influence both the challenges and opportunities for improving rural mobility. By examining these demographic trends and travel behaviors, the study aims to identify valuable insights and opportunities to develop transportation solutions that meet the unique needs of these communities. This approach can help improve accessibility and connectivity for all residents, ensuring that transportation options are more inclusive and responsive to the specific challenges of the region.

Public Transportation in a Rural Context

The fundamental difference between urban/suburban and rural transit lies in the characteristics of the areas they serve, leading to different transit models, demands, and operational challenges.

Population Density and Development Patterns

Urban and suburban areas have higher population densities and more concentrated development, leading to greater demand for fixed-route transit services like buses. These areas often have a well-established network of roads, sidewalks, and bike paths that support multiple transportation modes. Because people live closer together and nearer their destinations (workplaces, schools, shopping centers), frequent and regular service is feasible and cost-effective.

In contrast, rural areas are typically characterized by low population density and spread-out development. Homes, services, and employment centers are often far apart, which makes it challenging or impractical to implement fixed-route services in most places. In these areas, demand-response or microtransit models are more effective, with transit operating on an as-needed basis, allowing residents to schedule rides rather than rely on fixed stops and schedules. This is key in rural areas because a traditional bus route with low ridership would be inefficient and costly to maintain.

Service Frequency and Coverage

In urban and suburban areas, public transit services are often more frequent, with short wait times between buses or trains due to higher demand and a larger number of riders. Urban transit systems are designed to run throughout the day and night to accommodate workers, students, and tourists.

In rural areas, transit services are infrequent or even non-existent in some places. Many rural transit options are limited to a few scheduled trips per day, or they are entirely on-demand services. Coverage is also a challenge in rural areas, as it's harder to serve large, spread-out regions with a fixed route system. As a result, rural transit tends to focus on specific populations (older adults, people with disabilities) or essential trips (medical appointments, grocery trips), and there's a greater emphasis on paratransit services.

Cost Efficiency and Funding

Urban and suburban transit systems typically benefit from larger budgets, fueled by greater ridership and more diverse revenue streams. The costs are spread out over a larger number of users, making urban transit more financially sustainable.

Rural transit faces higher per-passenger costs due to lower ridership and longer travel distances. This often necessitates additional funding support, such as government grants or partnerships with local organizations, to ensure service is maintained.

Mode of Service Delivery

Urban areas use a combination of systems and services to move large numbers of people efficiently. These systems are well-suited for densely populated areas where many people travel to and from similar destinations.

Due to their dispersed population, rural areas rely more on on-demand transit models or van services like microtransit and paratransit, which cater to specific groups, such as older adults or those without access to personal vehicles. These services are more flexible but can have longer wait times and limited availability.

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The Pedestrian and Bike Element

While rural walking and biking infrastructure can't reach everyone, it can still provide valuable connections for residents to certain services, offering more transportation options. These paths and sidewalks make it easier for those living near village centers or public amenities to access services like medical facilities, grocery stores, or transit hubs without needing a car.

For residents who wish to age in place, having safe, accessible pedestrian and bike infrastructure is crucial. It allows older adults to maintain their independence by providing them with more ways to get around locally. By enhancing local mobility, rural areas can support older residents, giving them better access to essential services, while also complementing broader transportation solutions like microtransit for longer trips.

Pedestrians in the Powhatan Courthouse area

Traditional Village Development

In a rural context, traditional village development (TVD) (or traditional neighborhood development) promotes compact, walkable communities that concentrate housing, services, and public spaces in close proximity, resembling historic rural development patterns. This design strategy reduces reliance on cars

by allowing more residents to walk, bike, or take public transportation to essential services and public amenities. By incorporating pedestrian and bicycle infrastructure, such as sidewalks and bike lanes, these developments create safe, accessible routes for non-motorized travel, enhancing connectivity within the village and to potential transit hubs.

This type of development also helps to protect rural areas by limiting the spread of sprawling, low-density housing. By clustering development in designated areas, TVD preserves open space, farmland, and natural landscapes, safeguarding the rural character of the region. Additionally, focusing growth within compact areas makes it easier to provide services like microtransit or other flexible transit solutions, making transportation more efficient for residents while maintaining the rural environment outside these villages. By encouraging multimodal connections, traditional village design also addresses transportation gaps for vulnerable populations, such as older adults or residents without access to personal vehicles, while promoting environmental sustainability.

Current TVD policies and practices stress thoughtfully planned development that balances growth with preserving open space. Conservation subdivisions are one type of dense rural development where homes are clustered together to create a village-like setting while keeping large portions of land undeveloped. This design concentrates housing and services in specific areas, allowing for walkable communities, while protecting farmland, forests, and rural landscapes. These developments offer a blend of rural character and modern conveniences, providing essential services within a smaller footprint and supporting a more fiscally and ecologically sustainable community.

Greater Rural Community Overview

Locality	Population (2022)	Population Forecast (2045)	Area (sq mi)	Fixed-Route	LINK Micro-transit	Bay Transit	Hanover DASH
Charles City	6,760	8,540	182	No	No	Yes	No
Goochland	24,906	33,738	284	Yes	No	No	Partial
Hanover	110,513	145,559	473	No	Yes	No	Yes
New Kent	23,296	36,270	210	No	Yes	Yes	No
Powhatan	30,503	39,251	261	No	Yes	No	No
Total	195,978	263,358	1,410	-	-	-	-

Figure 2. Source: 2022 ACS 5-Year Estimates, ConnectRVA 2045 for 2045 population forecasts

We examine both existing and future population (Figure 2) as part of the analysis to ensure that services meet current needs and are scalable for future growth. Understanding the present population helps identify who needs transportation now, such as older adults or low-income residents, while future population trends allow us to plan for shifts in demand due to projected growth or demographic changes. This ensures that proposed solutions are sustainable, adaptable, and capable of addressing both immediate gaps and future needs, avoiding reactive measures and ensuring long-term success.

Older Population and Persons with a Disability

Locality	65+ Years	85+ Years	Total Population with a Disability
Charles City	25.6%	2.0%	19.2%
Goochland	23.0%	2.2%	12.6%
Hanover	18.5%	2.0%	11.1%
New Kent	18.0%	1.3%	10.7%
Powhatan	19.3%	1.0%	11.7%
Virginia	16.0%	1.8%	12.1%

Figure 3. Source: 2022 ACS 5-Year Estimates

Older adults and people with disabilities (Figure 3) often have specific mobility needs that require accessible and reliable transportation options. Older adults may no longer drive or have limited access to personal vehicles, while people with disabilities often face barriers in using traditional public and private transportation options. Identifying the size and distribution of these populations helps ensure that transportation solutions such as paratransit, demand-response options, and accessible infrastructure that can meet their needs. Addressing these considerations is critical for creating equitable transportation systems that enhance independence and quality of life for these vulnerable groups.

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Income and Travel Characteristics

Locality	Median Household Income	Poverty	No Vehicle Available	1 Vehicle Available
Charles City	$65,573	12.5%	6.4%	19.7%
Goochland	$105,600	4.2%	2.7%	20.8%
Hanover	$104,678	5.2%	2.7%	21.2%
New Kent	$113,120	3.9%	1.5%	17.0%
Powhatan	$108,089	4.5%	1.6%	13.9%
Virginia	$87,249	10.0%	6.1%	30.3%

Figure 4. Source: 2022 ACS 5-Year Estimates

Figure 4 highlights some key socioeconomic and transportation characteristics for the rural localities in the Richmond region, emphasizing the relationship between income levels, poverty rates, and vehicle availability. Notably, New Kent and Powhatan Counties have the highest median household incomes and correspondingly low poverty rates at 3.9% and 4.5%, respectively. These counties also have the lowest percentage of households with no vehicles available, with fewer than 2% of households affected.

In contrast, Charles City County has a significantly lower median income ($65,573) and a much higher poverty rate (12.5%), which may explain the slightly higher percentage (6.4%) of households without vehicles. Despite overall high vehicle ownership rates in the region, the data suggests that residents in lower-income areas, such as Charles City, may face more barriers to transportation access compared to more affluent counties like New Kent and Powhatan. This underscores the need to address transportation equity and mobility for lower-income and vehicle-limited households across these rural areas.

Even with high vehicle ownership overall, rural transit remains justified as a lifeline for residents without reliable transportation—particularly low-income, elderly, or disabled individuals. In areas like Charles City, small percentages still represent real unmet needs. Flexible, lower-cost transit options can help bridge access gaps, support economic mobility, and prepare for aging populations, aligning with regional equity, health, and workforce goals.

Key Challenges for Rural Areas in the Region

Limited Public Transit Services: Rural public transit is often restricted by limited operating hours and days, and some services are only available to specific populations, further limiting transportation access for many.

Limited Access to Services: Residents in the region's more remote areas without access to a vehicle face barriers in accessing employment, healthcare, and essential services.

Aging Population: The growing number of older adults and 55+ communities in our rural areas has increased the demand for accessible transportation options, particularly for every day, non-emergency medical transport.

Economic Barriers: Low-income households may struggle with the costs associated with owning and maintaining a vehicle, further emphasizing the need for affordable transportation alternatives.

Economic Barriers: Maintaining personal vehicles can be costly, especially for low-income residents, making affordable transportation options a critical need.

Geographic Spread and Low Population Density: Much of our region is rural, with long distances between homes and essential services, making it difficult to establish efficient public transportation systems.

Limited Access to Employment Centers: Many residents commute to Richmond or other surrounding counties for work, and those without vehicles face significant challenges in accessing employment and opportunity.

Opportunities for Rural Areas in the Region

Expansion of Demand-Response Services: Enhancing demand-response options could provide more flexible and comprehensive coverage for residents who need transportation to medical appointments or essential services.

Continued Collaboration with Neighboring Counties: Partnering with neighboring counties and the wider region to provide public transportation options covering more of the region could improve access to employment centers and services.

Targeted Transportation for Older Adults: Given the aging population, developing services specifically for older residents, such as non-emergency medical transport or community shuttles, could address a growing need.

Targeted Services for Persons with Disabilities: Creating tailored services for this diverse population could help address the increasing demand for transportation, especially for those living in rural areas with limited alternative mobility options.

Collaboration with Regional Transit Providers: Partnering with nearby counties or regional transit services could improve access to employment centers and reduce the need for private vehicles.

Coordination of Volunteer Services: Coordinating volunteer ride services under one system could improve efficiency and expand access in rural areas by pooling resources, streamlining scheduling, and ensuring that more residents have reliable transportation options.

Partnerships between the Private and Public Sectors: Collaboration with local employers, healthcare providers, and nearby counties could help fund or implement new transportation services to better serve rural residents.

Regional Connectivity: Improving connections with transit systems in neighboring localities could increase access to jobs and services in other areas of our region.

Transit Service Types

The following provides a brief technical definition of each of the transit service types considered for implementation within the PlanRVA counties. Definitions reflect the FTA National Transit Database (NTD) Glossary from February 2025.

- Fixed-Route System: A system of transporting individuals (other than by aircraft), including the provision of designated public transportation service by public entities and the provision of transportation service by private entities, including, but not limited to, specific public transportation service, on which a vehicle is operated along a prescribed route according to a fixed schedule.
- Microtransit: A technology-enabled service that uses multi-passenger vehicles to provide on-demand services with dynamically generated routing. Microtransit services are traditionally provided in designated service areas. Service models include first mile/last mile connections to fixed route services; hub to hub zone-based services; the commingling of ADA complementary paratransit services with general transit service; and point-to-point service within a specific zone or geography.
- Demand Responsive System: Any system of transporting individuals, including the provision of designated public transportation service by public entities and the provision of transportation service by private entities, including, but not limited to, specified public transportation service, which is not a fixed route system.

- Commuter Service: Fixed-route service characterized by service predominately in one direction during peak periods, with limited stops and routes of extended length, usually between the central business district and outlying suburbs. It may also include other service characterized by a limited route structure, no attempt to comprehensively cover a service area, limited purposes of travel, or a coordinated relationship to another mode of transportation.
- Express Service: Fixed-route service that picks up passengers from park and ride lots in suburban areas and takes them to a central urban location. Express bus service runs on longer-distance trips during work-week rush hours and has limited or no service during midday.

Capital and operating costs relative to ridership potential is a critical factor in determining the viability and suitability of transit services for a given area. Different transit service types vary significantly in startup capital required, as well as in ongoing operating and maintenance expenses. Implementing a new traditional fixed-route bus service typically requires higher upfront capital costs due to the cost of vehicles, facilities, and supportive systems, but provide lower operating costs per passenger trip relative to other transit services considered due to economies of scale. Microtransit and demand-response services are more flexible and better suited for low-density rural areas and require lower start-up capital costs. They typically also have much higher per-trip costs due to lower ridership and the need for on-demand scheduling backend services and/or technology.

Commuter bus services, typically serve peak-period and peak-directional travel over longer distances. These can be a cost-effective option due to predictable high demand between residential and commercial areas. Commuter/express routes typically do not operate outside of peak periods, reducing operating costs from running service in low-ridership-demand times. Paratransit services, which provide essential mobility for seniors and individuals with disabilities, tend to have the highest cost per trip due to specialized vehicles, door-to-door service, and ADA compliance requirements.

When assessing the viability of a particular transit service type, decision-makers must weigh these cost variations against ridership potential, geographic coverage, and service goals, ensuring that investments align with the mobility needs and financial sustainability of the region.

Study Area Demographics

The team reviewed and compiled several demographic metrics within the PlanRVA study area to develop a comprehensive understanding of each county and to inform the assessment of which service types might be most appropriate for each. Comparative metrics for census blocks or tracts were developed for data on Transportation, Population, Household, Demographics, Employment, and Climate. These were then compiled using interactive map tools and were overlayed with the existing GRTC fixed route bus network as well as current and planned on-demand Microtransit zones in each county. Additionally, the locations of transportation resources such as park and ride facilities. A web-based map portal was developed to allow for rapid and easy viewing and evaluation of these metrics.

Population Density

Initial observations from a review of population data indicates low population density across most census tracts which present a challenge to implementing additional traditional fixed-route transit services. With an average population density of 502 people per square mile and a maximum density of 2,711 people per square mile in Hanover County, most areas fall well below the density threshold of 4,500-6,500 people per square mile needed to sustain cost-effective, high-frequency bus service. Richmond's fixed route transit network is supported by a population density of 3,781 people per square mile – between 1.5 and 7.5 times greater than that with the surrounding counties.

Transit-supportive infrastructure, including continuous sidewalks and signalized pedestrian crossings, is also generally lacking in these counties. This is a further barrier against implementation of productive fixed-route bus services. The sparse distribution of activity generators, particularly outside of Powhatan, further limits the feasibility of frequent fixed-route service.

Employment Density

Employment data indicate a need for stronger regional connectivity rather than intra-county transit solutions. The region has a low proportion of people both living and working within the same county, meaning that commuter service between Richmond and surrounding counties is likely the most needed and most likely to be successful.

However, without accurate Origin-Destination (O-D) data, it is difficult to determine specific demand corridors. Job density is generally low, with most of the area having fewer than 1.0 jobs per acre, except for Hanover's I-295 corridor and Memorial Regional Medical Center, which are already covered by a GRTC Link zone. Eastern Goochland has relatively higher job density and could be a strong candidate for transit service. Additionally, gaps in service exist for younger, non-disabled individuals who do not qualify for existing demand-response programs, particularly in Charles City, where transit access is limited despite lower median household incomes. The lack of connectivity between transit systems and confusion surrounding the GRTC fare-free model further highlight the need for a cohesive, well-structured regional transit strategy.

Transit Propensity Analysis

Transit Propensity is a metric which can suggest the likelihood of a population segment within a geographic area to utilize transit. It is a numerical output that is derived using several demographic metrics as inputs including population, employment statistics, household income, household car ownership rates, and other transportation metrics. A high measure of Transit Propensity is not a guarantee that services would be successful in each area. However, it can provide planners with good insight into areas of probable demand.

Using a the *TCRP Report 28: Transit Markets of the Future* and the *NORTA Market Analysis*, the team developed a methodology to normalize and weight the various metrics used as inputs for the Transit Propensity analysis. Different metrics provide have been judged to contribute to likelihood of using transit differently. The metrics used to measure Transit Propensity for each census tract in the PlanRVA study area and the weights applied to those metrics are summarized in the Apendix.

Demographic metrics for each census tract was weighted against the factors included in the previous figures to generate a numerical representation of Transit Propensity. The result of this analysis is provided in Figure 5.

This analysis suggests high propensity for transit within the full geographic area of Charles City County, northern parts of New Kent County, and parts of Hanover County and Powhatan County abutting Henrico County.

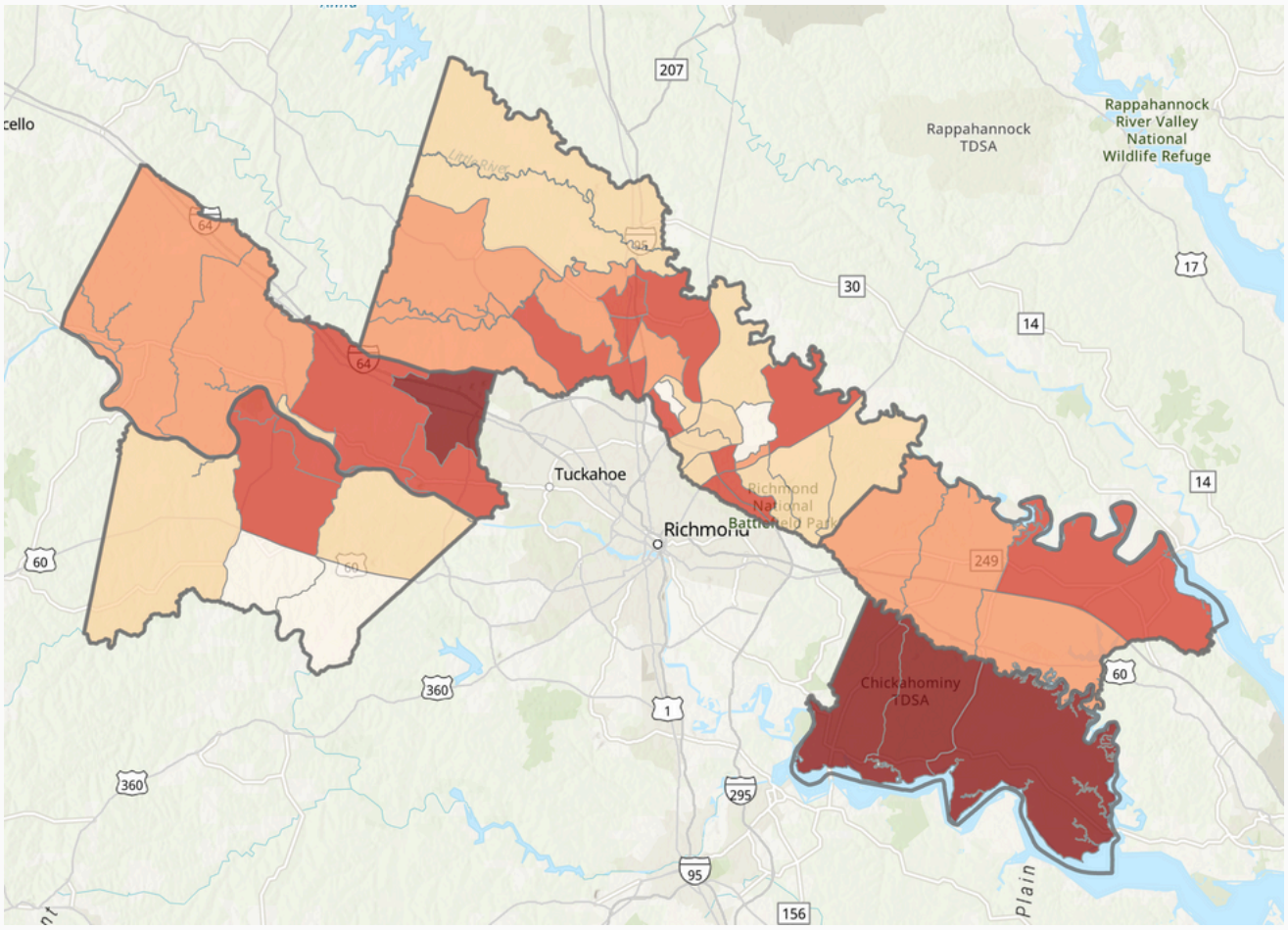

Figure 5. Transit Propensity

Because many of these datasets are reported at a census tract-level, the propensity results are averaged over the full geographical area of that tract. It is for these reasons that, for example, the entirety of Charles City County is indicated as having high transit propensity when most of the County is rural and with very low-density land use and development. This can be a limitation of using the approach described. As such, it can be useful to supplement this analysis with a review of population- and employment-density only. These metrics are some of the most impactful at judging transit potential, and the data is reported at the smaller, census-block-level.

Figure 6 illustrates the results of an analysis of census block demographics by simply summing the population- and employment-densities of each block and normalizing the result. In the figure blocks shown in pink represent those with high employment density, cyan represents those with high population density, and dark blue providing high levels of both population density and employment density.

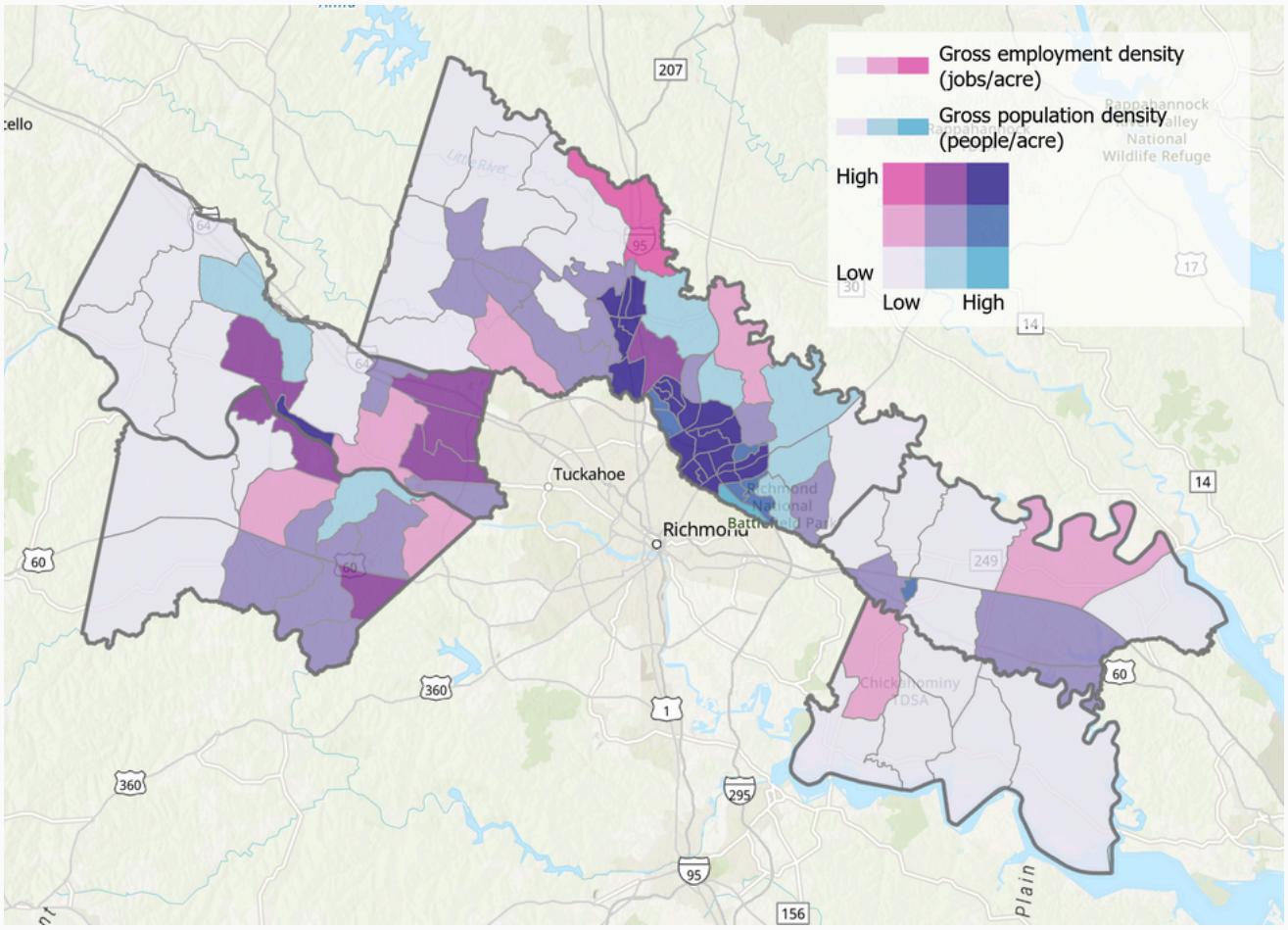

Figure 6. Population and Employment Density

This combined with the Transit Propensity Analysis results in Figure 5 can provide much more granular insights into area of potential transit demand. Keeping with the same example, looking at Charles City County which was determined to have high-transit propensity, we see that there are only limited areas within the County which could be considered to have population densities to support transit services.

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Zoning and Land Use

Zoning is used to regulate land use by designating specific areas for residential, commercial, industrial, agricultural, or mixed-use development, guiding how communities grow and determining where infrastructure and services, like public transit, are most appropriate. An analysis using zoning to inform microtransit recommendations for New Kent and Charles City counties has been deferred to the ongoing Bay Transit Microtransit Study being completed at time of writing.

Hanover

Hanover County's zoning is primarily agricultural, with clusters of residential, commercial, and industrial development concentrated near the Ashland area. While zoning alone does not indicate an immediate need for microtransit expansion, additional data reveals key opportunities. The area west of Ashland, for example, shows high transit propensity but currently lacks LINK service. Additionally, the corridor between Mechanicsville and Ashland exhibits high population and job density, making it a strong candidate for expanded transit access. Hanover DASH provides essential transportation for older adults and individuals with disabilities, but broader coverage through microtransit or other flexible options would help fill gaps for the general public. Expanding service in these areas would improve overall coverage, enhance connections to existing fixed-route services, and support the viability of a future express route.

Goochland

Goochland County's zoning is primarily agricultural, with small pockets of commercial development concentrated in the Goochland and Centerville areas. A notable area of mixed-use zoning surrounds the Hickory Haven park and ride, making it a strong candidate for potential LINK zone service or an express route extension. This area not only aligns with existing infrastructure but also reflects land use patterns that support transit accessibility. Additionally, GRTC has identified the central region of the county for future LINK expansion, which would help address existing gaps in access in the western portion of the county and improve regional connectivity.

Powhatan

Powhatan County's zoning is predominantly agricultural, with residential as the secondary use and small pockets of commercial and industrial development. The most notable area of commercial zoning is located along the eastern section of Route 60, which is also where current LINK microtransit service is concentrated. This corridor presents the greatest potential for transit in the county, as other areas lack the density and land use patterns to support productive service. While additional zoning does not indicate a need for expansion at this time, continued monitoring of development along Route 60 may help guide future transit investments.

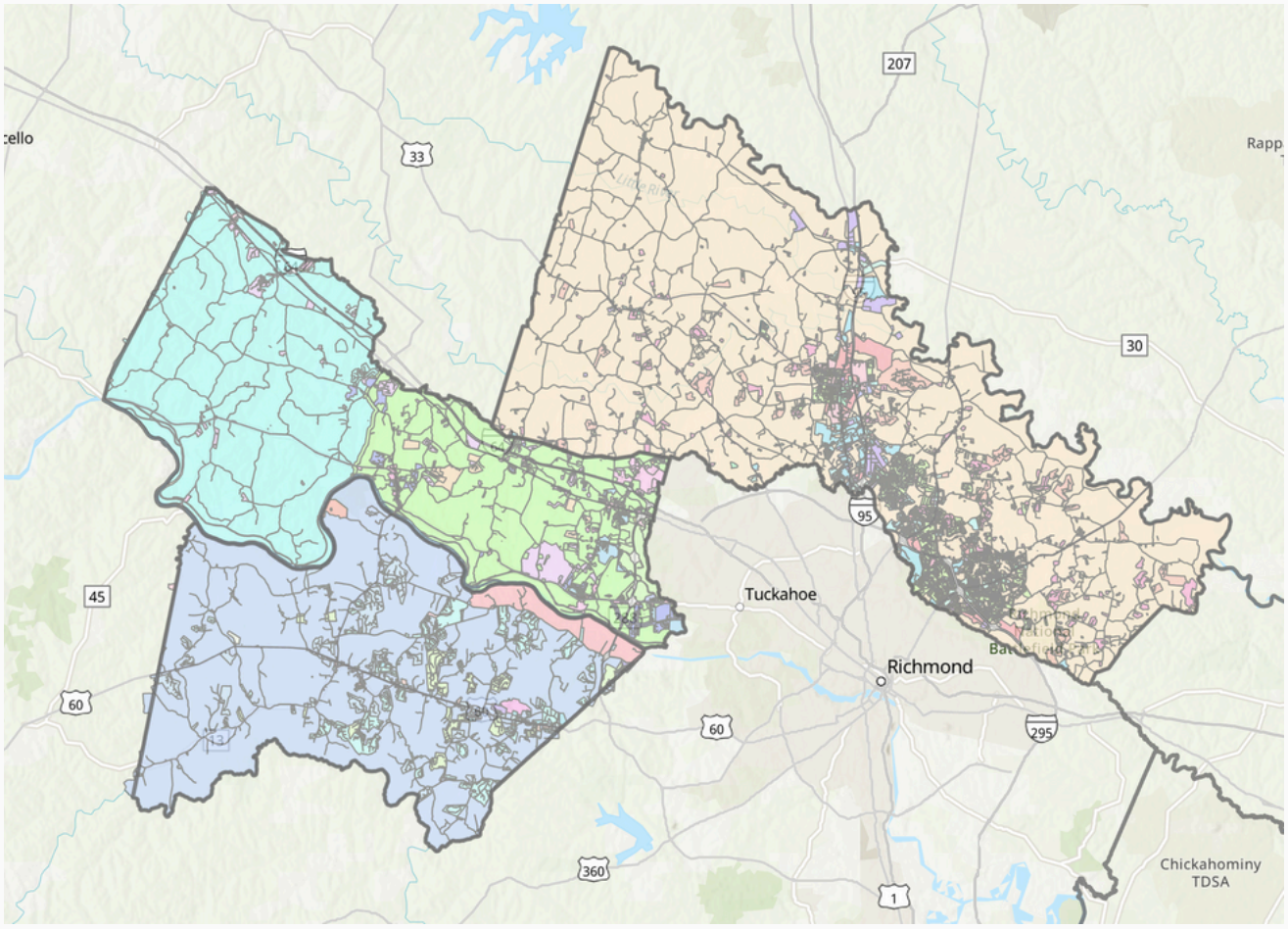

Figure 7. The variety of zoning categories in Powhatan, Goochland, and Hanover counties

Figure 7 depicts the zoning for Powhatan, Goochland, and Hanover counties. Because of varying data sources, their categories by color differ within each county. This map is intended to show the varying degrees of differences among the respective county's zoning, complicating land use and transportation planning.

Charles City County Profile

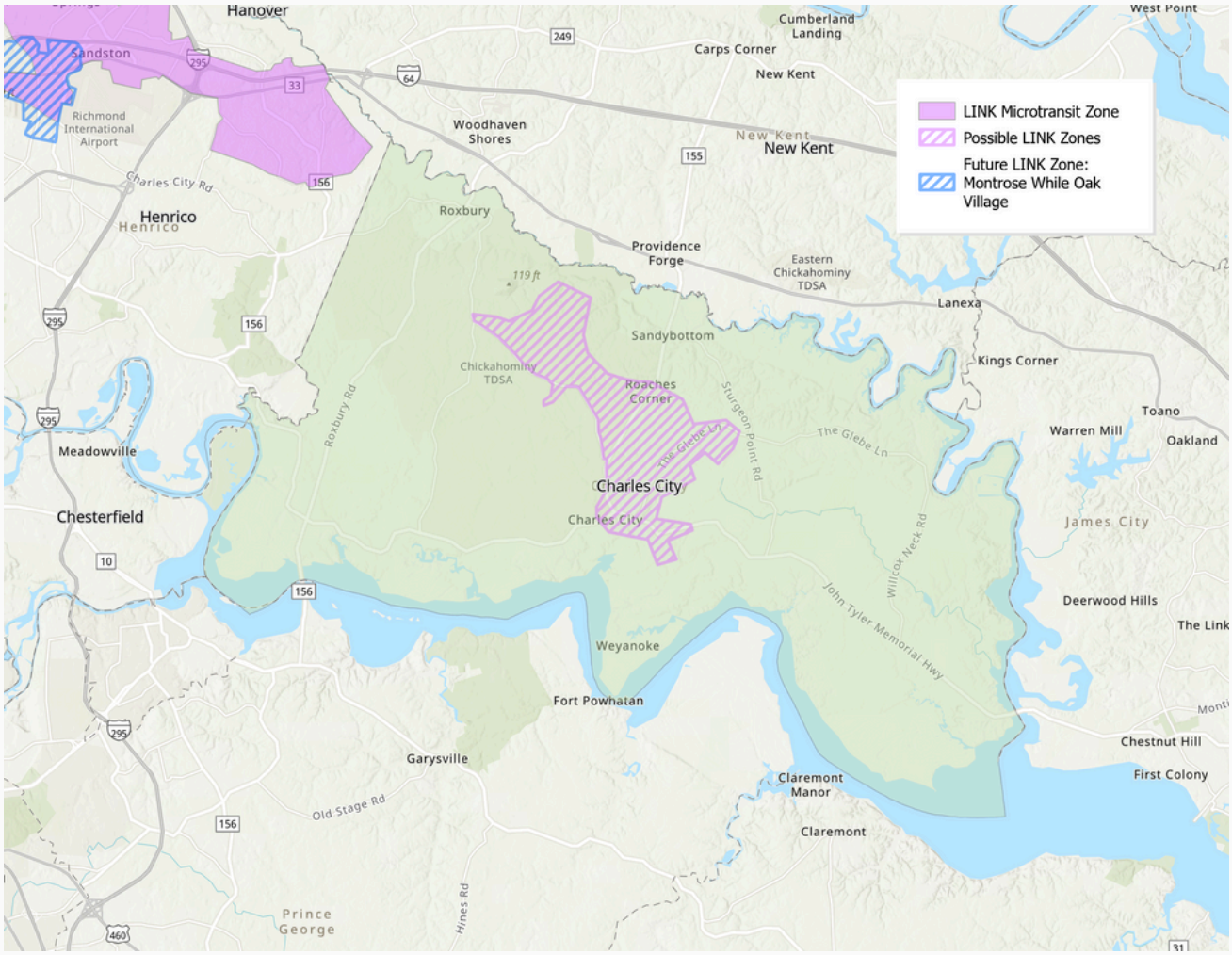

Figure 8. Charles City County overview

Demographics		Transportation	
Square Miles	182	Transit Services	Demand-Response
Population	6,760	Transit Providers	Bay Transit

Transit infrastructure in the county is non-existent.

Bicycle and Pedestrian Infrastructure in the county is moderate due to the Virginia Capital Trail running along the length of Charles City.

Goochland County Profile

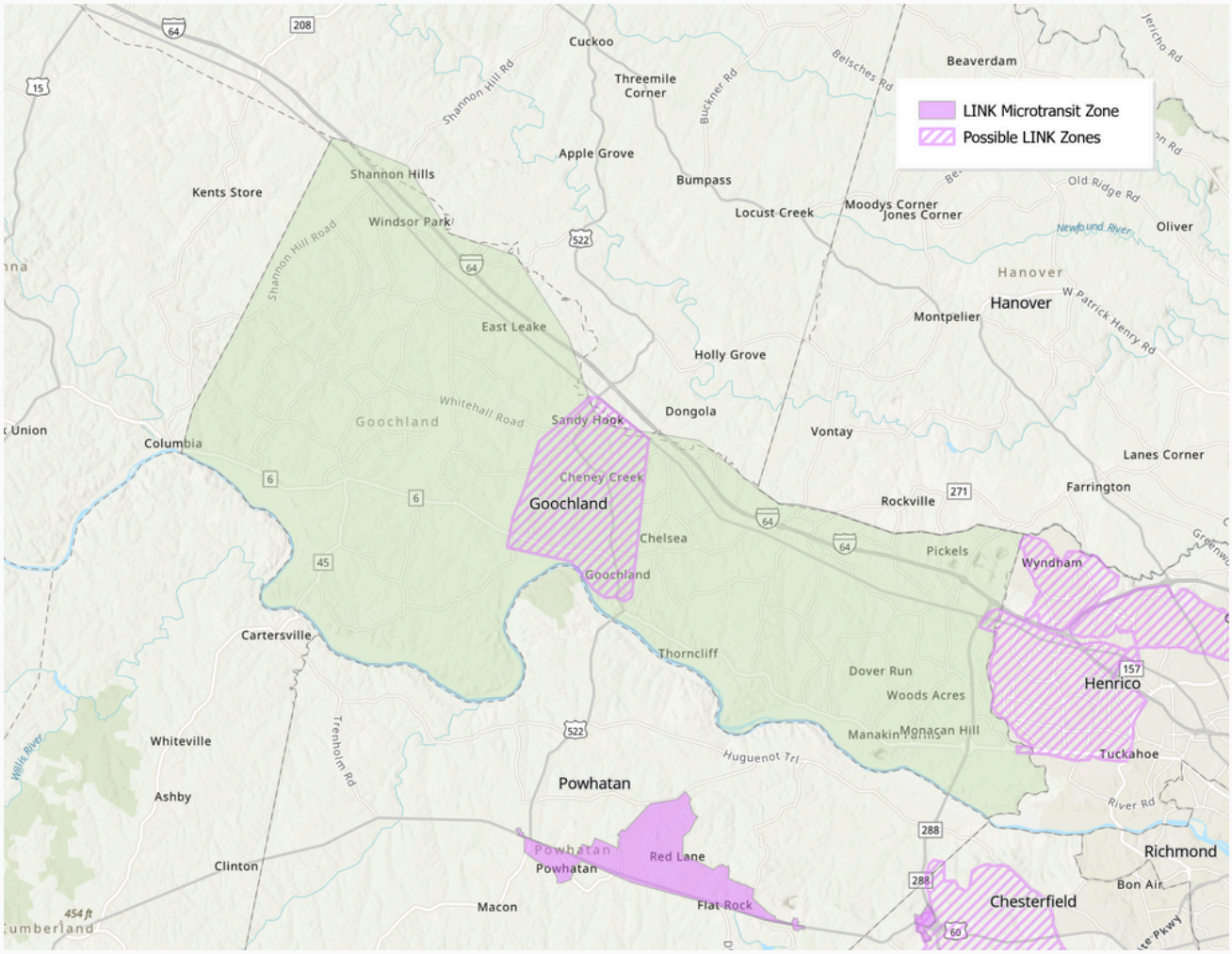

Figure 9. Goochland County overview

Demographics		Transportation	
Square Miles	284	Transit Services	Paratransit, Fixed-Route
Population	24,906	Transit Providers	Goochland Cares, GRTC

Transit infrastructure in the county consists of a few bus stops east of Route 288 and two park and ride lots off of I-64.

Bicycle and Pedestrian Infrastructure in the county is virtually non-existent outside of the courthouse and West Creek areas.

Hanover County Profile

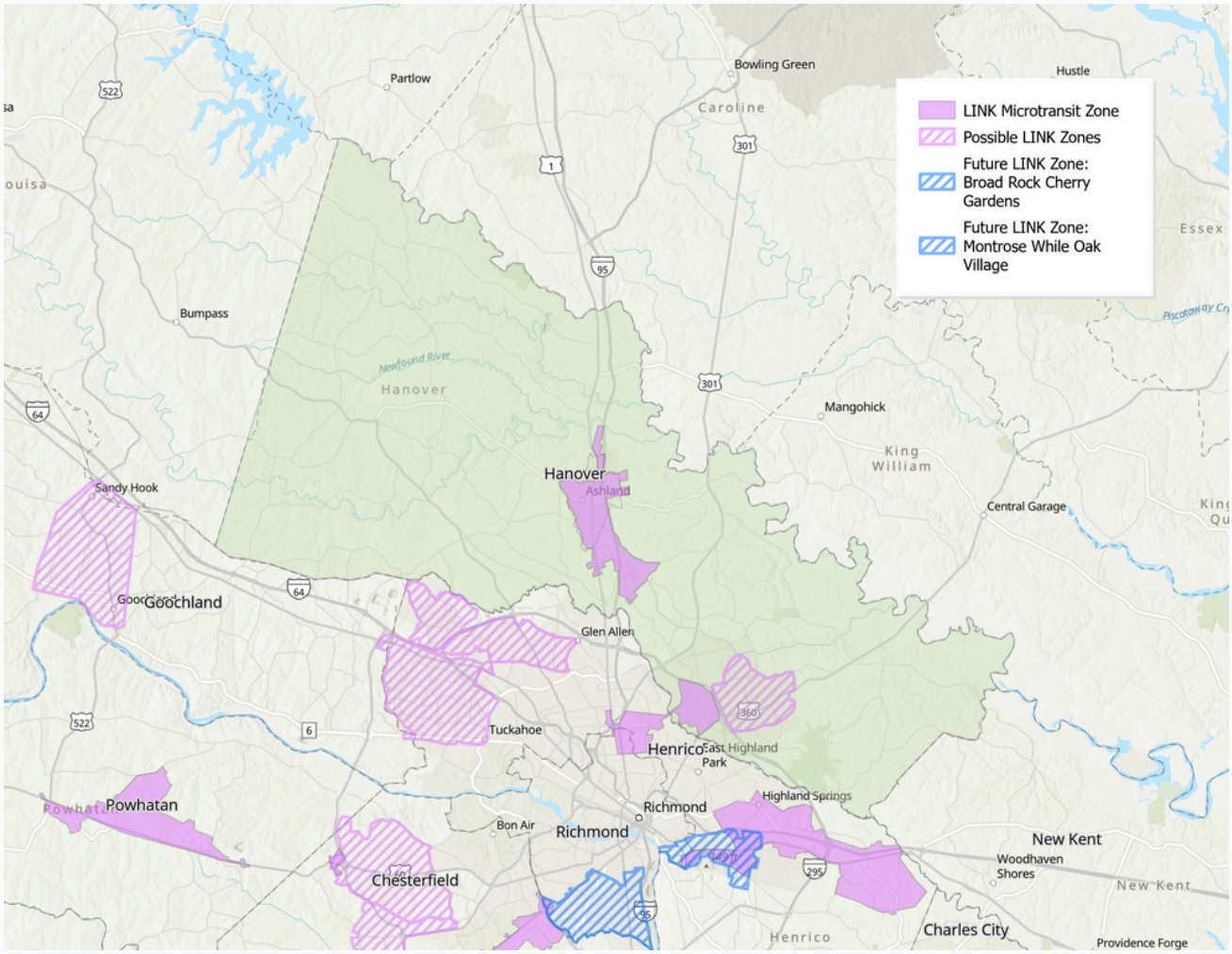

Figure 10. Hanover County overview

Demographics		Transportation	
Square Miles	473	Transit Services	Paratransit, On-Demand
Population	110,513	Transit Providers	DASH, Senior Rides, GRTC

Transit infrastructure in the county consists of an Amtrak station in Ashland and a park and ride lot in Mechanicsville.

Bicycle and pedestrian infrastructure in the county includes a sidewalk network in Ashland, along with scattered sidewalks and bike lanes in the Atlee and Mechanicsville areas. The Fall Line Trail, currently under construction, will serve as a regional active transportation corridor extending south from Ashland through Henrico toward Petersburg.

New Kent County Profile

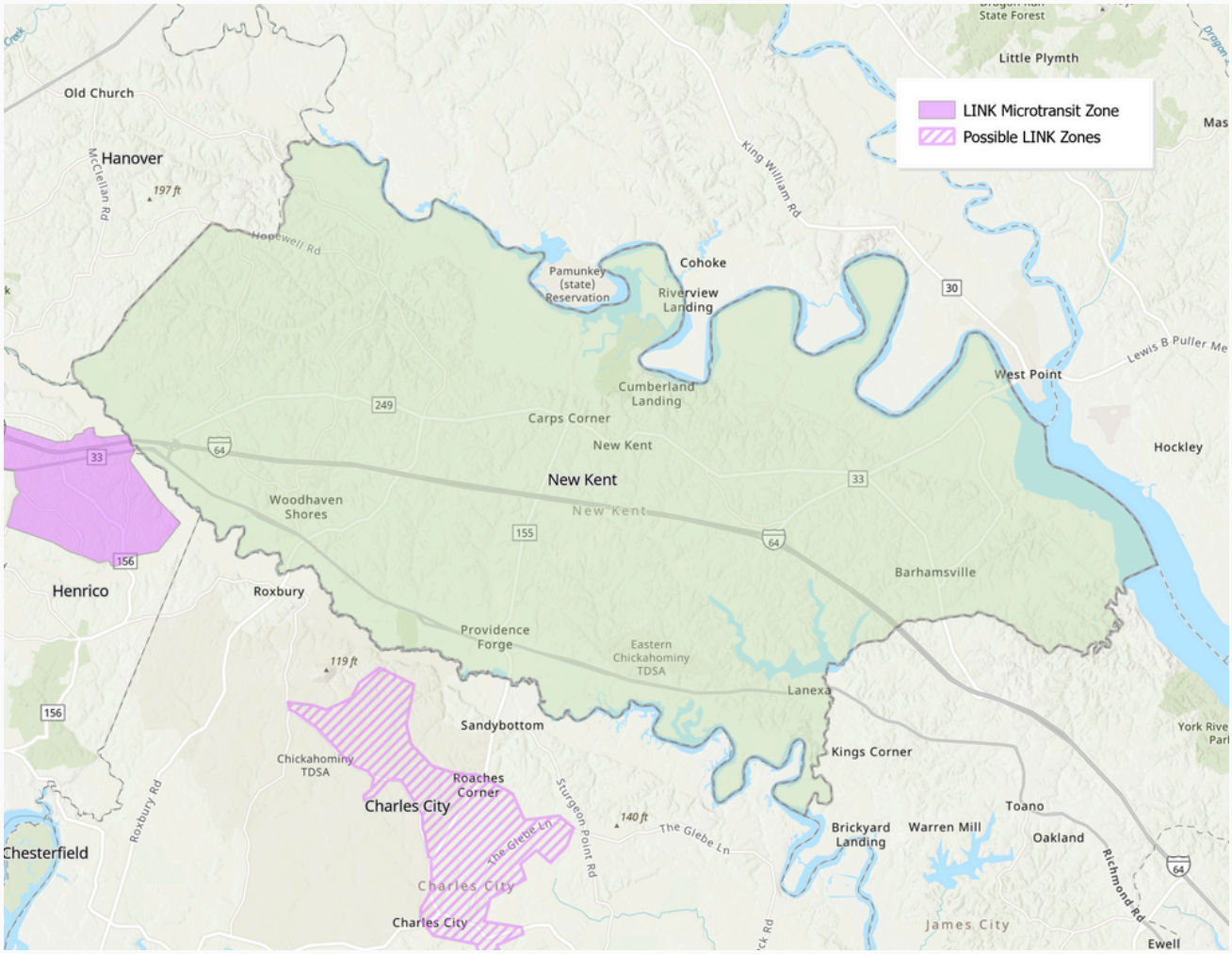

Figure 11. New Kent County overview

Demographics		Transportation	
Square Miles	210	Transit Services	Demand-Response
Population	23,296	Transit Providers	Bay Transit

Transit infrastructure in the county consists of two park and ride lots.

Bicycle and Pedestrian Infrastructure in the county consists of sporadic sidewalks in newer residential developments.

Powhatan County Profile

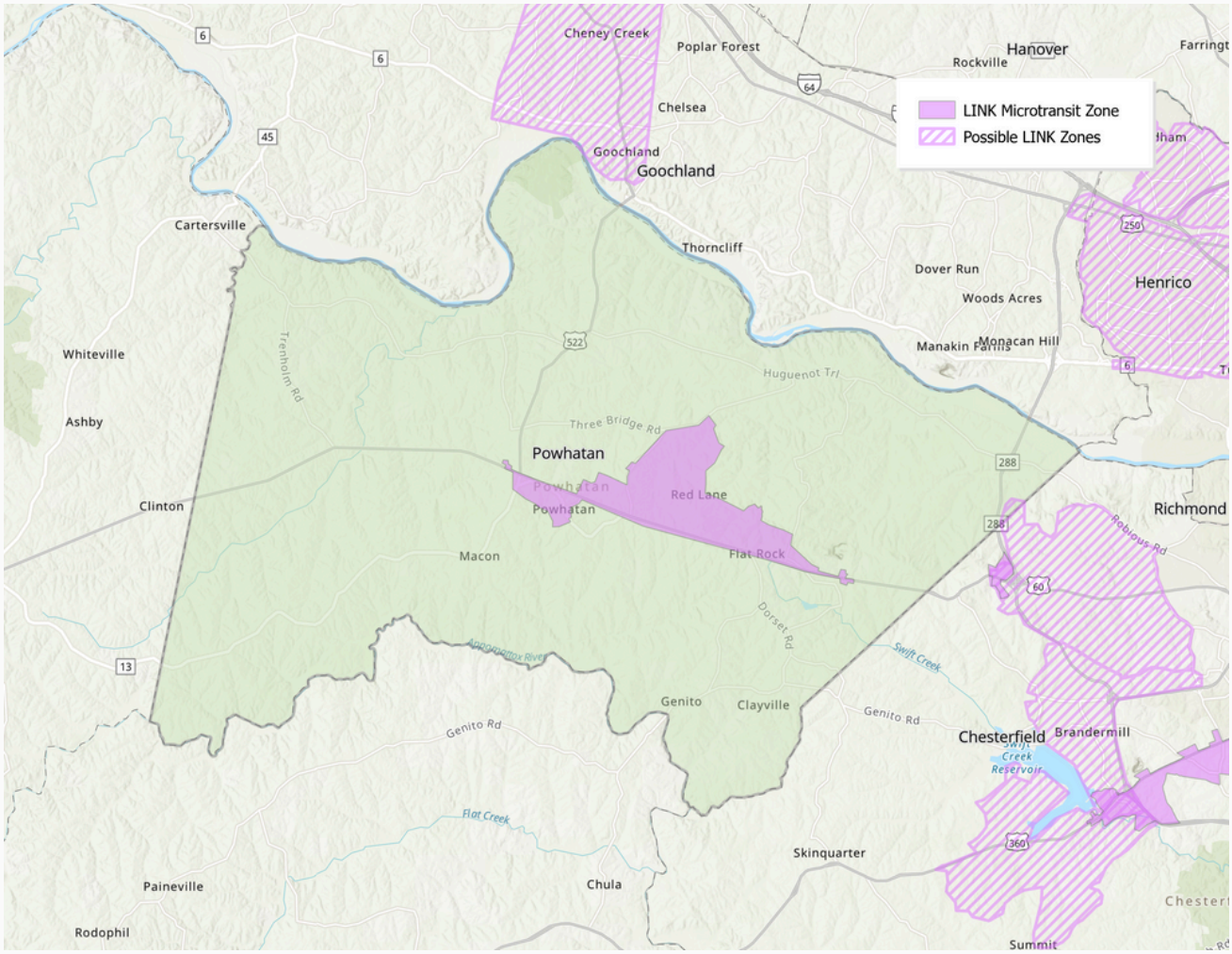

Figure 12. Powhatan County overview

Demographics		Transportation	
Square Miles	261	Transit Services	Paratransit, On-Demand
Population	30,503	Transit Providers	Ride Assist, GRTC

Transit infrastructure in the county is non-existent.

Bicycle and Pedestrian Infrastructure in the county consists of a 1-mile bike lane along Huguenot Trail, a network of sidewalks and nature paths near Powhatan Courthouse, and residential sidewalks in Founders Bridge.

Existing Transportation Services

Bay Transit: A regional public transportation provider offering demand-response and fixed-route services across several counties in the Northern Neck, Middle Peninsula, and Virginia Peninsula, including New Kent and Charles City. Regular service is open to all individuals, but Bay Transit's New Freedom program is provided to people over 60 years of age and people with disabilities.

Goochland Cares: A community organization in Goochland County providing transportation services for residents in need, especially for medical appointments and essential services.

GRTC: The Greater Richmond Transit Company, providing fixed-route bus services in Richmond, Henrico, and Chesterfield along with bus rapid transit (BRT) in Richmond and Henrico. They also provide other transit options throughout the Richmond region, including four express routes, paratransit, and microtransit.

GRTC CARE On Demand: A flexible, on-demand transportation service offered by GRTC for riders with specific mobility needs.

GRTC CARE Plus: A specialized paratransit service under GRTC that provides transportation for individuals with disabilities, meeting ADA requirements.

GRTC LINK: A zone-based, on-demand microtransit service designed to connect residents in select areas with destinations within the zone, including to fixed-route connection points. This service is open to everyone and free of charge, like all GRTC services (with the exception of GRTC CARE On Demand).

Hanover DASH: A demand-response transportation service for seniors and individuals with disabilities in Hanover County, offering rides for medical appointments, shopping, and other essential trips.

Hanover Senior Rides: A volunteer-based transportation service offering rides to seniors in Hanover County for medical appointments, grocery shopping, and other necessary trips.

Powhatan Ride Assist: A transportation service in Powhatan County that provides rides to seniors and residents with limited mobility for medical appointments and essential errands.

Senior Connections: A nonprofit organization offering transportation assistance and other services to older adults in the Richmond region, helping them access healthcare, social services, and essential activities.

Transit Service Providers

Service Area	Organization or Service	Service Type	Eligibility	Service Days and Hours	Trip Types
Region	RideFinders	Rideshare and transportation demand management (TDM) service	All individuals	Mon-Fri 8:00-4:30	Carpool, vanpool, incentives
Region	Senior Connections Ride Connection	Contract, accessible transportation service	Adults 60+ and adults with disabilities	Mon-Fri 8:00-3:00	Medical or pharmacy
Charles City County	Bay Transit	Scheduled, on-demand trips in accessible vehicles	Seniors and persons with disabilities	7 days/wk. Hours vary	Medical (has priority), Social, Recreational, Shopping, Work
Charles City County	Bay Transit New Freedom	Scheduled, on-demand trips in accessible vehicles	Seniors and persons with disabilities	Mon-Fri 6:00-6:00	Medical (has priority), Social, Recreational, Shopping, Work
Goochland County	Goochland Cares	Scheduled on-demand trips in accessible vehicles	Adults 60+, disabled, or below 200% of Federal poverty level	Mon-Fri Hours vary by day	Medical, dental, grocery/food pantry, dialysis, Dept. of Social Services
Hanover County and up to 7 miles outside county	Hanover DASH	Scheduled on-demand trips in accessible vehicles	Hanover residents age 65+, and adults with disabilities	7 days/wk. 6:00 -6:00	Medical appointments, personal business, county government buildings, social and recreational programs

Service Area	Organization or Service	Service Type	Eligibility	Service Days and Hours	Trip Types
Hanover County ZIP Codes 23005, 23059, 23069	Hanover Senior Rides (Ashland)	Scheduled on-demand trips in volunteers' vehicles	Hanover residents age 60+, and adults with disabilities	Not stated 9:00-5:00	Medical appointments, grocery shopping, personal business
Hanover County ZIP Codes 23111 & 23116	Hanover Senior Rides (Mechanicsville)	Scheduled on-demand trips in volunteers' vehicles	Hanover residents age 60+, and adults with disabilities	Not started	Medical appointments, grocery shopping, personal business
New Kent County	Bay Transit	Scheduled, on-demand trips in accessible vehicles	All individuals	Mon-Fri 6:00-6:00	Medical (has priority), Social, Recreational, Shopping, Work
New Kent County	Bay Transit New Freedom	Scheduled, on-demand trips in accessible vehicles	Seniors and persons with disabilities	Mon-Fri 6:00-6:00	Medical (has priority), Social, Recreational, Shopping, Work
Powhatan with trips to Chesterfield and Richmond	Ride Assist Services	Volunteer drivers using their personal vehicles, lift equipped van also available	Adults 60+ and unable to drive	Mon-Fri 9:00-2:00	Medical/dental, personal business, shopping
Various service areas throughout region	GRTC LINK Microtransit	On-demand microtransit operating in zones	All individuals	Varies by zone	All trip types

Figure 13. Transit services in the Richmond region's rural areas.
** Individuals with cognitive disabilities and/or visual impairments who need an on-route that is not served by accessible buses, who have a disability-related condition that prevents them from traveling to/from a boarding/disembarking location. Individuals over the age of 80.*

Infrastructure

In the rural areas of the Richmond region, including Charles City, Goochland, Hanover, New Kent, and Powhatan counties, the transportation infrastructure primarily revolves around roads and automobile traffic, with limited public transportation options or alternative transportation facilities such as sidewalks or bike paths. These areas tend to have fewer public transit options and limited non-motorized transport infrastructure, which affects accessibility for those without personal vehicles.

Rural roads in these counties are often characterized by low traffic volumes but are typically narrow and not always well-maintained. While main thoroughfares are generally in good condition, secondary roads may have less frequent maintenance, leading to safety concerns such as potholes and shoulder erosion in some areas. These roadway hazards combined with inadequate lighting create safety risks for all users, including drivers, cyclists, and pedestrians, and transit users.

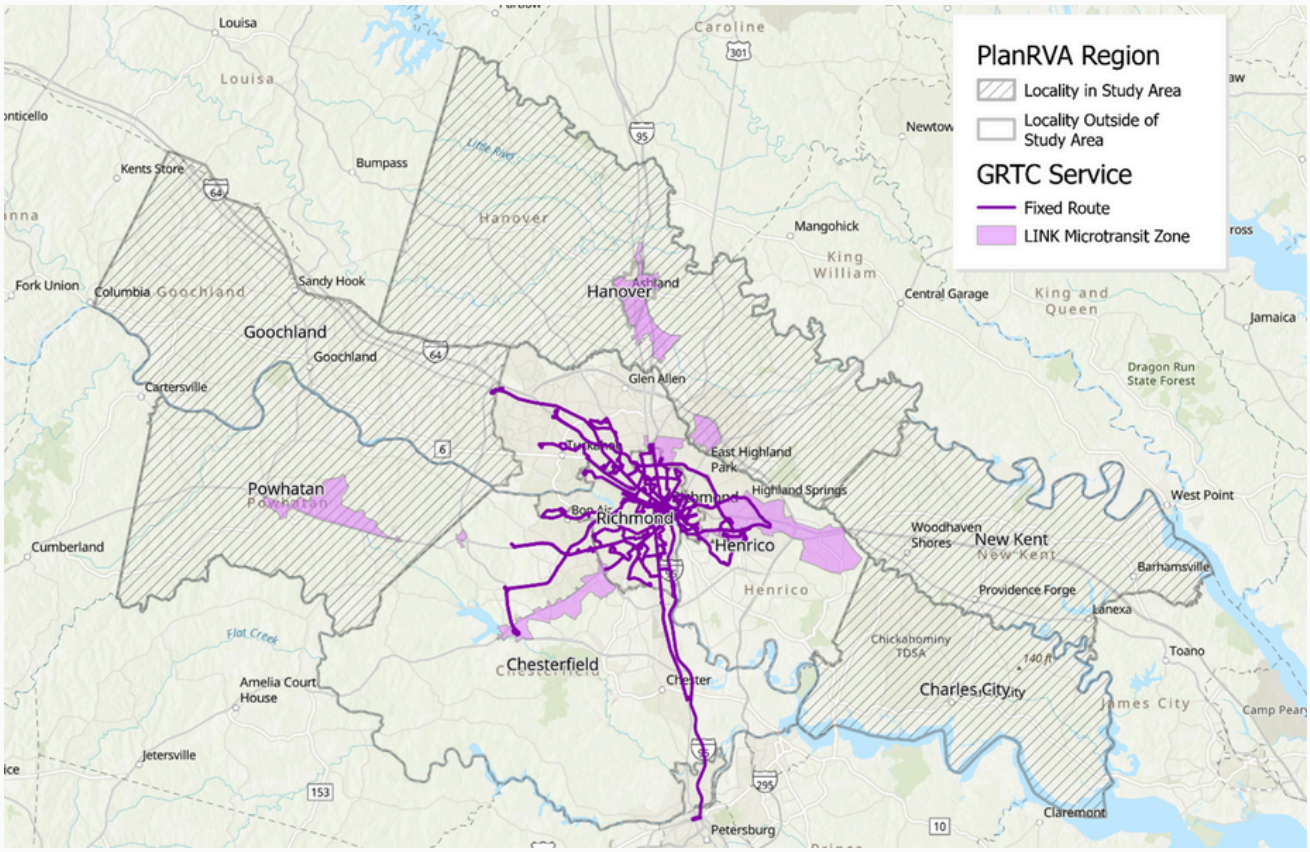

Figure 14. GRTC services in the Richmond region, including fixed route lines and microtransit zones

Although some localized efforts have been made to improve walkability and cycling infrastructure, particularly in more populated village areas or near schools and public amenities, these areas still lack significant active transportation

networks. This absence of sidewalks limits pedestrian movement, especially for those who live close to activity centers but cannot drive. The lack of this infrastructure also poses a challenge for transit, as it often depends on strong pedestrian and cycling networks for access. There is a growing call, as seen in community feedback, for more bike paths and walkways to connect rural neighborhoods with essential services.

Public transportation infrastructure is minimal, with services like GRTC and Bay Transit providing limited coverage through demand-response services or a small connection to GRTC's Route 19 on the county's edge in Goochland. In addition, GRTC has initiated LINK microtransit service with five microtransit zones introduced since November 2023. Displayed in Figure 14, these zones include Azalea, Ashland, Sandston Elko, Clover Dale, and Powhatan.

LINK is an on-demand microtransit service that operates within designated zones in areas where traditional fixed routes may not be as practical. Riders can use an app or make a call to request a ride between two points within the zone. Once paired with an available ADA-accessible LINK vehicle, a GRTC operator will pick up passengers at their requested location and drop them off at their destination.

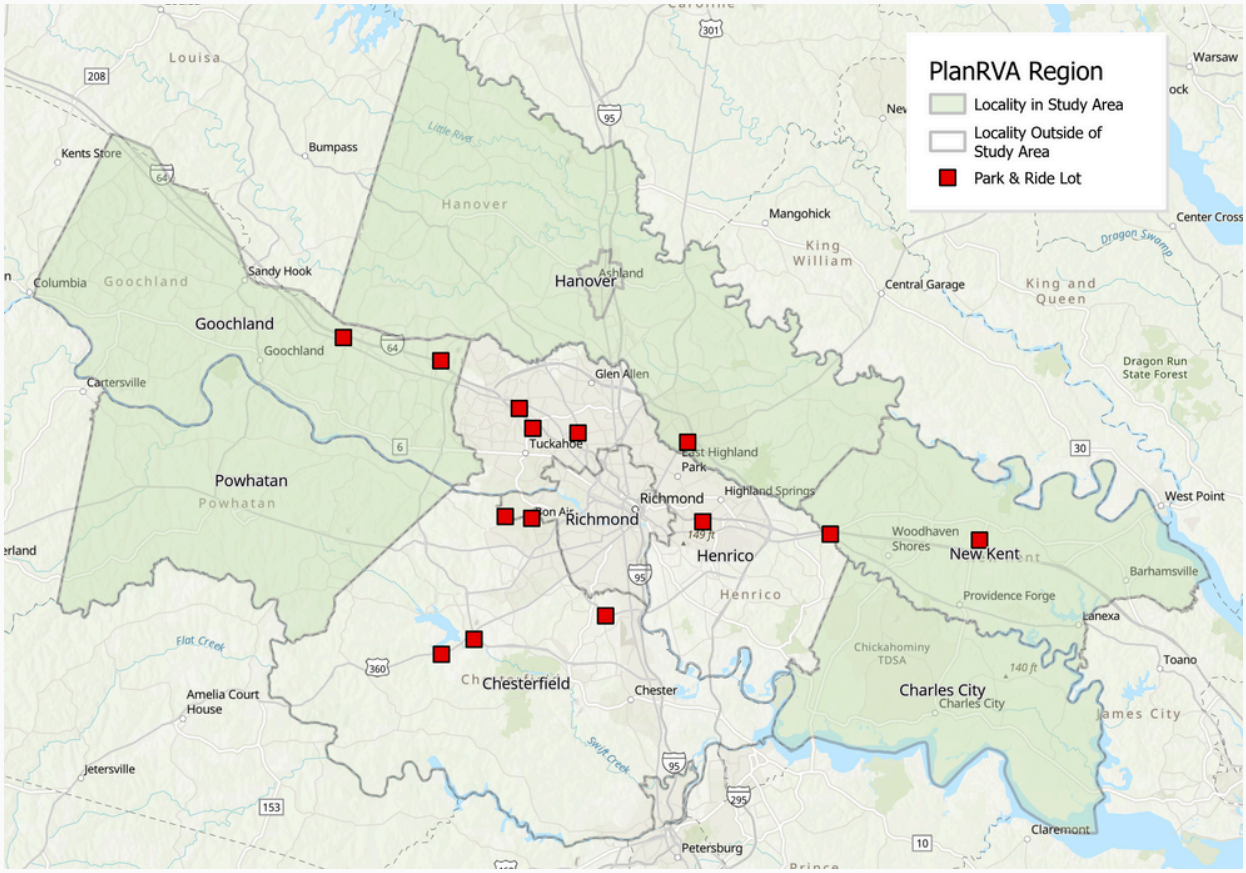

Figure 15. Park and Ride lots in the region

Five park and ride lots are found throughout Hanover (1), Goochland (2), and New Kent (2) and shown in Figure 15. These lots assist primarily carpools and vanpools organized through RideFinders, as no fixed-route buses serve theses areas.

Many areas of the rural region have no public transit service, contributing to transportation barriers for low-income residents, older adults, children, and people with disabilities. Most residents rely on personal vehicles for mobility, and the existing transit facilities are insufficient to meet the needs of those without cars.

Evaluation of Accessibility and Connectivity

The existing transportation network in the rural areas of the Richmond region faces significant challenges in effectively connecting various communities and serving vulnerable populations like older adults and individuals with disabilities. These counties cover a large geographic area with sparse population centers, making effective public transportation difficult to sustain without prioritizing it as an investment. The rural areas are split geographically, with Goochland and Powhatan located to the west of the immediate Richmond metropolitan area, and New Kent and Charles City to the east. This "east/west split" creates distinct challenges for connecting these rural parts of the region. For instance, traveling from New Kent to Powhatan without a personal vehicle is extremely time consuming, would involve multiple modes of transportation, several different providers, and would expose individuals to dangerous road conditions. It is currently not a practical option for most individuals.

Public transportation options, where they exist, are limited and often require long lead times for scheduling, which does not serve the needs of many—including older adults or persons with disabilities. Public transportation services face difficulties in covering large distances across rural, low-density areas. Many vulnerable populations, especially those living further from town centers, lack reliable, accessible transportation options to reach healthcare, groceries, and community services.

Rural Transportation Needs Survey

The first graph shown in Figure 16 displays the age distribution of 321 survey respondents. The largest group of respondents falls in the 55-64 and 45-54 age ranges, indicating strong representation from middle-aged adults. The 65-74 group also shows a significant portion of responses. Fewer responses were recorded from younger adults in the 18-24 range, and very few from those under 18. There is also a small portion of respondents aged 75 or older, and a minimal number of people preferred not to disclose their age. Overall, the survey is heavily represented by individuals aged 35 to 74.

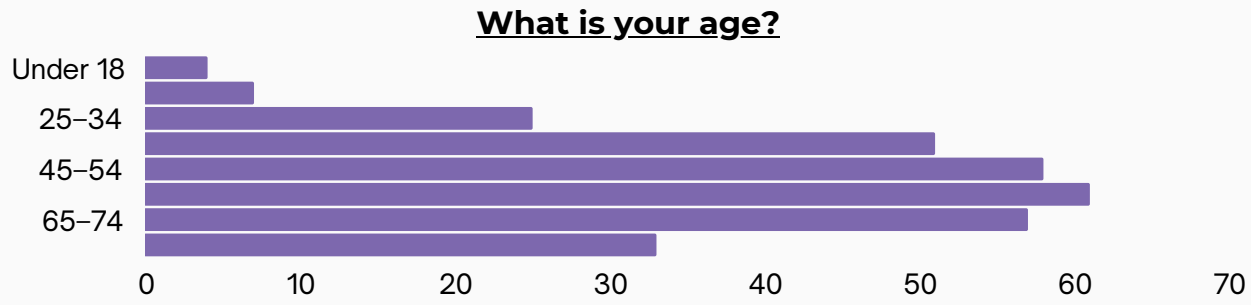

Figure 16. Responses to "What is your age?"

The pie chart in Figure 17 shows the racial and ethnic makeup of survey respondents. The majority of respondents identified as White, while smaller percentages identified as Black or African American, Hispanic or Latino, Asian, and American Indian or Alaska Native. After the survey began, an optional question was added for those identifying as American Indian or Alaska Native, asking them to specify their Tribal affiliation.

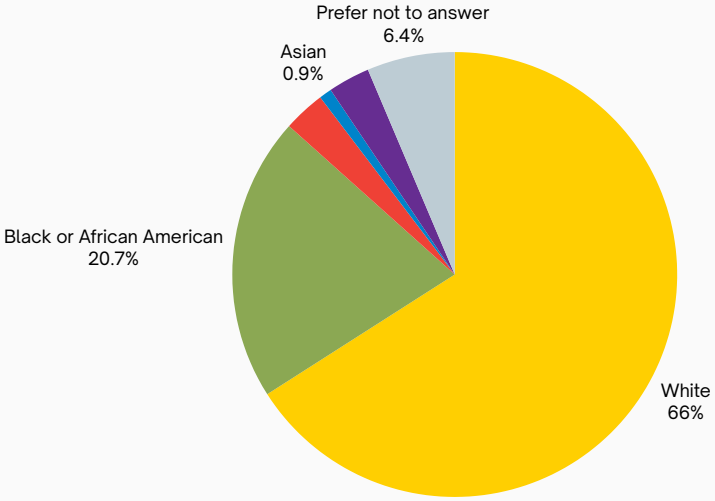

Figure 17. Responses to “What is your race/ethnicity?

Additionally, the option for Other was replaced with Self-Identify to allow respondents more flexibility in describing their race or ethnicity. A new question was also introduced to the "Where do you live?" and "Where do you work?" sections, giving respondents the option to select On Tribal Land, with an additional prompt to specify the Tribal Land, if applicable. This demonstrates an effort to better capture nuanced and inclusive demographic data.

The pie chart in Figure 18 illustrates the distribution of where survey respondents live. The largest segment of respondents is from Powhatan, with a significant portion also residing in Hanover. New Kent and Goochland have moderate representation. A smaller portion of respondents live in Charles City. The Other category is represented by residents outside of the primary counties, includes areas such as Richmond (10 respondents), Chesterfield (6), and Henrico (4), along with a few from James City, Louisa, and King William counties, and Williamsburg. This data highlights the diverse range of locations from which respondents participated, with many living in rural counties but others residing in nearby urban or suburban areas.

The pie chart in Figure 19 shows a distribution of where survey respondents work. The largest segment represents respondents working in 'Other' localities or being retired, with other including a variety of locations such as Richmond, Henrico, Chesterfield, and several others from nearby and distant regions like Williamsburg, Charlottesville, and Louisa County. Among the named counties, Hanover has a notable portion of respondents, while New Kent and Powhatan follow with smaller shares. Goochland County and Charles City County have the smallest representation in terms of where respondents work. This data highlights that many respondents either work in regions outside of their immediate rural area or are retired.

The graph in Figure 20 highlights how survey respondents primarily get around. The overwhelming majority rely on personal vehicles as their main mode of transportation.

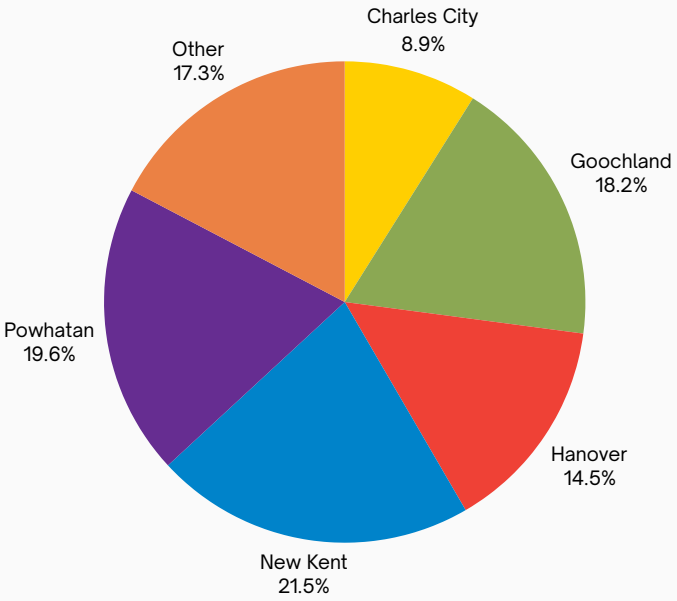

Figure 18. Responses to "Where do you live?"

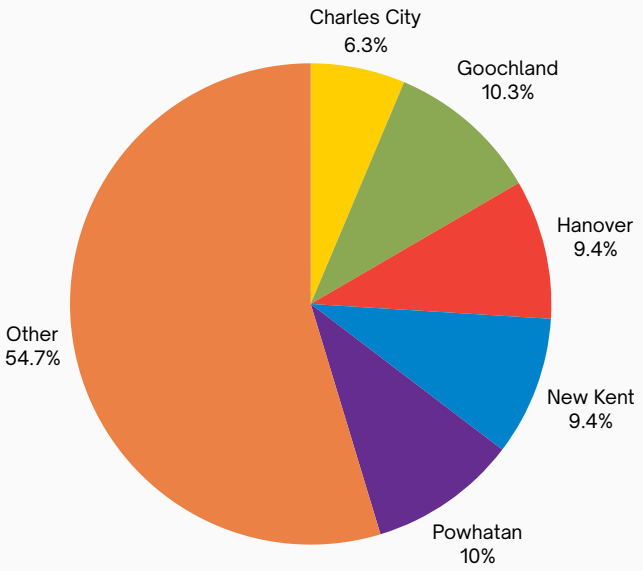

Figure 19. Responses to "Where do you work?"

Other forms of transportation, such as walking or using a mobility device, rideshare services (like Uber or Lyft), and bicycling, are used by a smaller portion of respondents. Even fewer people report using public transit, carpool/vanpool, or paratransit services. This indicates that most respondents depend heavily on personal vehicles for mobility, with alternative forms of transportation being significantly less common.

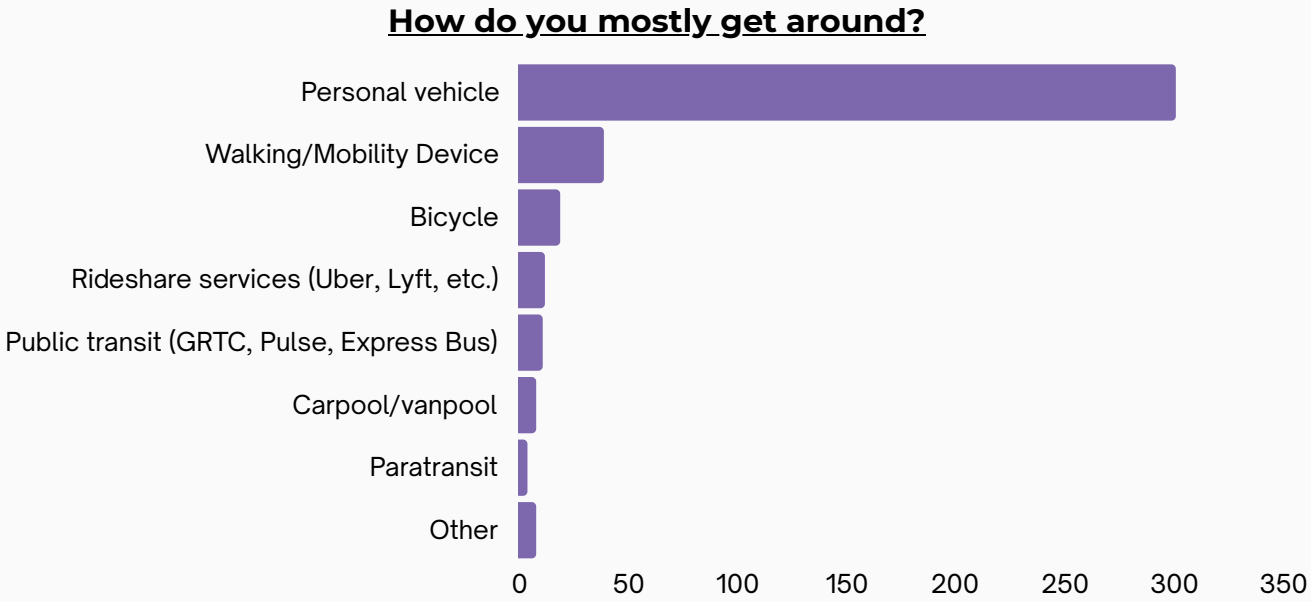

Figure 20. Ways that survey respondents travel

For those who did not choose public transit as an option to the previous question, an optional question asked “What are the reasons you don't use public transportation?”. The answers are shown in the graph in Figure 21.

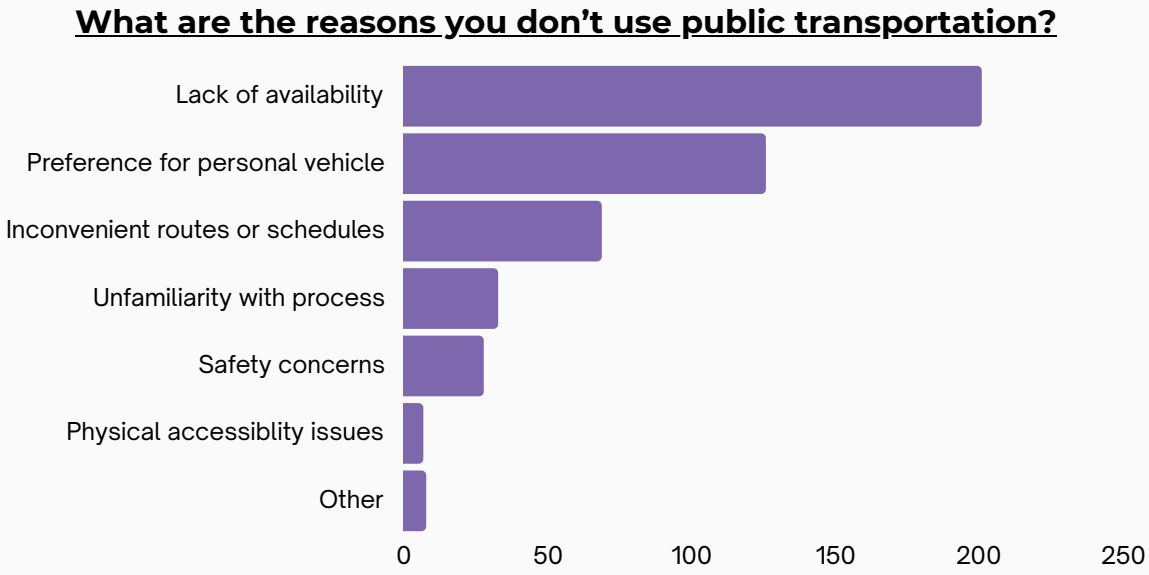

Figure 21. Reasons why respondents don't use public transportation

The most common reason for not using transit is a lack of availability, indicating that public transit services are not accessible in many areas. A significant, but markedly smaller, number of respondents also indicated a preference for personal vehicles. Inconvenient routes or schedules was another notable reason, suggesting that even where transit is available, it may not meet the timing or route needs of users. Other reasons mentioned less frequently include unfamiliarity with the process, safety concerns, and physical accessibility issues. Some respondents selected Other, indicating additional unlisted reasons for not using public transit.

The ranked responses for the questions “What improvements would encourage you to use public transportation more often?” and “What transportation services would you most like to see added or improved in your community?” are displayed in Figures 22 & 23.

What improvements would encourage you to use public transportation more often?

Figure 22. Top responses to improvements question. Other responses include Extended service hours (#4), Improved safety measures (#5), Better accessibility for people with disabilities (#6), Lower cost (#7), and Cleaner vehicles (#8).

What transportation services would you most like to see added or improved in your community?

Figure 23. Top responses to new services question. Other responses include Express bus service (#4), Park-and-ride facilities (#5), Bike-sharing programs (#6), and Carpool/vanpool (#7).

The chart in Figure 24 shows the barriers that survey respondents face in accessing public transportation. The most significant barrier is the lack of public transportation in their area, highlighting a major gap in service availability, especially in rural communities. The second most common barrier is the perception that the public transportation that is available is inconvenient, followed by a lack of information about services, indicating that even when public transit is available, many residents may not be aware of it or find it difficult to access information about it.

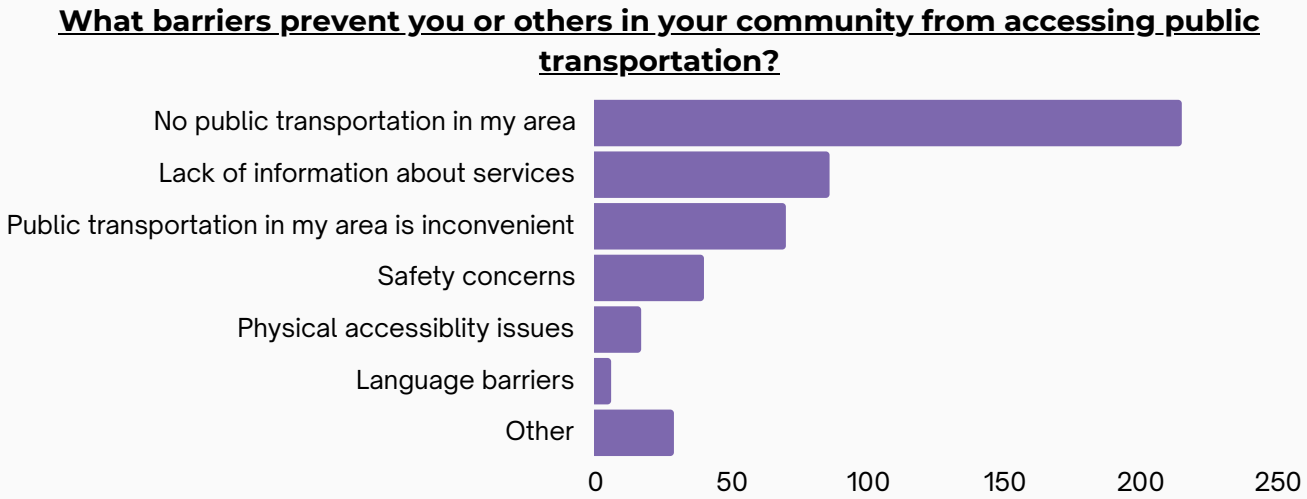

Figure 24. Responses to barriers question

Other barriers include physical accessibility issues, though this affects a smaller portion of the population, and safety concerns, which also rank lower but are still relevant. Language barriers were the least commonly cited issue, suggesting that while there are some communication challenges, they do not represent a widespread problem. The Other category shows that some respondents have unique or additional reasons that weren't captured by the listed options.

This data reveals that service availability is the biggest challenge for most respondents, pointing to a clear need for expanded transit options in the area. Improving awareness and providing better information about existing services could help address the second most common barrier. Additionally, enhancing convenience, safety, and physical accessibility are important factors for a smaller but significant portion of the population, particularly those with disabilities or other mobility challenges.

This pie chart in Figure 25 shows that the majority of respondents (represented by the orange portion) do not have specific mobility needs within their household. A smaller segment (shown in blue) responded Yes, indicating that they or someone in their household requires mobility assistance, such as mobility aids or assistance for visual impairments.

For those who indicated Yes, a follow-up question asked whether reliable transportation was readily available to their household. Of these respondents, 13 said Yes, 5 said No, and 3 selected Other. The Other responses highlight unique transportation challenges, including:

1. Having a modified van but being unable to drive.
2. Needing to arrange paid transportation in advance, which limits spontaneity.
3. Sometimes having access to transportation, but it depends on others' work schedules.

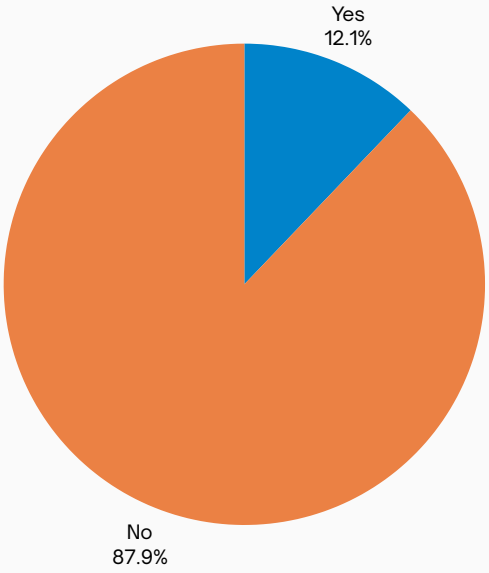

Figure 25. Respondents with mobility needs

This data reveals that while a majority of respondents do not face mobility challenges, there is a significant minority that does, and access to reliable transportation remains inconsistent for those households. Although most respondents with mobility needs have access to transportation, the No and Other responses suggest that even for some of those with transportation, barriers such as affordability, spontaneity, or dependence on others create additional challenges. This indicates a need for more accessible and reliable transportation options for individuals with mobility challenges, particularly in rural areas where services may be limited.

Continued on next page

Open Comments

The final question asked, “Do you have any additional comments or suggestions about public transportation in your community?”. Of the 202 responses to the survey, 86 included a response to this question. The general sentiment of the responses is categorized as positive (61.6%), negative (26.7%), neutral (7.0%), or mixed (4.7%). Tags were applied to each comment based on common themes and terms used. Tags found at least ten times can be found in Figure 26 with an explanation of topics mentioned that prompted a tag.

Tag	Topic Mentioned in Comment	Percent	Count
pro-transit	Desire for expansion, importance of transit	48.84%	42
auto dependency	Reliance on cars for all trips, no transportation choice	29.07%	25
need identified	Need for transit in area/county	25.58%	22
opposition	Opposition to transit expansion, rural transit	23.26%	20
Powhatan	Specifically saying Powhatan, living/working in county	15.12%	13
safety	Roadway safety, vehicle speed, safe crossings	12.79%	11
bicycle	Riding or wanting to ride more, bike infrastructure	12.79%	11
medical	Medical appointments, needs	11.63%	10
sidewalks	Sidewalks, walking paths, place to safely walk	11.63%	10

Figure 26. Common themes and terms found in open comment responses.

The responses reflect a broad range of opinions on public transportation, ranging from enthusiastic support for improved transit services to strong opposition. Many responses voiced a desire for expanded transit options, such as bike paths, sidewalks, and connections to larger activity center, highlighting the need for more accessible transportation for seniors, low-income residents, and people with disabilities.

Some respondents noted the lack of current public transportation options as a major barrier to their ability to travel or reach services. A few mentioned personal mobility challenges, such as being unable to drive due to disabilities, and the difficulty in scheduling existing paratransit services around medical appointments. The was interest in microtransit solutions and partnerships with rideshare services to address the lack of flexible and timely transportation options. Respondents also pointed out that current services are too limited or unreliable, underscoring the need for more efficient, accessible, and affordable transportation options that meet the needs of all community members.

Several comments also touched on the need for infrastructure improvements, such as adding sidewalks and bike lanes, particularly in rural areas where it is currently unsafe to walk or bike. Some suggested that better integrating various public transportation services could better help connect rural residents to essential services. Other respondents felt that public transportation is unnecessary and not suitable for rural areas, perceiving it as underutilized and not worth the investment. These varied perspectives highlight the need for a balanced approach that considers both the benefits and concerns associated with expanding public transportation in rural communities. Some responses also indicate a need for education campaigns and continued engagement to both communicate the benefits of transit and address the myths and misconceptions around transit.

Several individuals expressed apprehension that expanding public transportation might lead to an increase in crime in their neighborhoods, particularly in Powhatan County. However, it’s important to recognize that there is no evidence to support the idea that transit expansion leads to higher crime rates. In fact, studies show that well-designed public transit systems can improve safety by increasing mobility, access to services, and community engagement.

The word cloud shown in Figure 27 emphasizes key words and themes related to the public's thoughts on rural public transportation. Words like "need," "public transportation," "service," and "bike" stand out prominently, indicating that respondents are expressing a strong desire for improved public transit services, infrastructure, and alternative mobility options. Other frequently mentioned words like "sidewalk," "route," and "Powhatan" suggest specific locations and transportation elements (e.g., sidewalks, bus routes) that are important to the community. The recurring focus on "need" highlights the demand for transportation solutions that address access to essential services and community connectivity in rural areas.

Figure 27. Common themes and terms found in open comment responses.

While opinions on public transit vary, there is a clear need for solutions that address community concerns, improve accessibility, and provide reliable and safe transportation options. By engaging with residents and incorporating feedback, the region can develop transit solutions that are both practical and beneficial for all.

Destinations Activity

This heat map shown in Figure 28 shows the density of trip destinations based on responses to a mapping exercise, where participants indicated areas they frequently travel to in and around rural parts of the Richmond region. The map highlights several areas of interest:

- Dense trip activity is concentrated around Richmond, with other significant clusters in areas such as eastern Powhatan, eastern Goochland, and parts of Hanover around Mechanicsville and Atlee, reflecting other popular travel destinations.
- Sparse activity is observed in more rural and less developed areas like New Kent and Charles City, and the counties outside of the courthouses and urbanized areas, indicating fewer common destinations in these regions

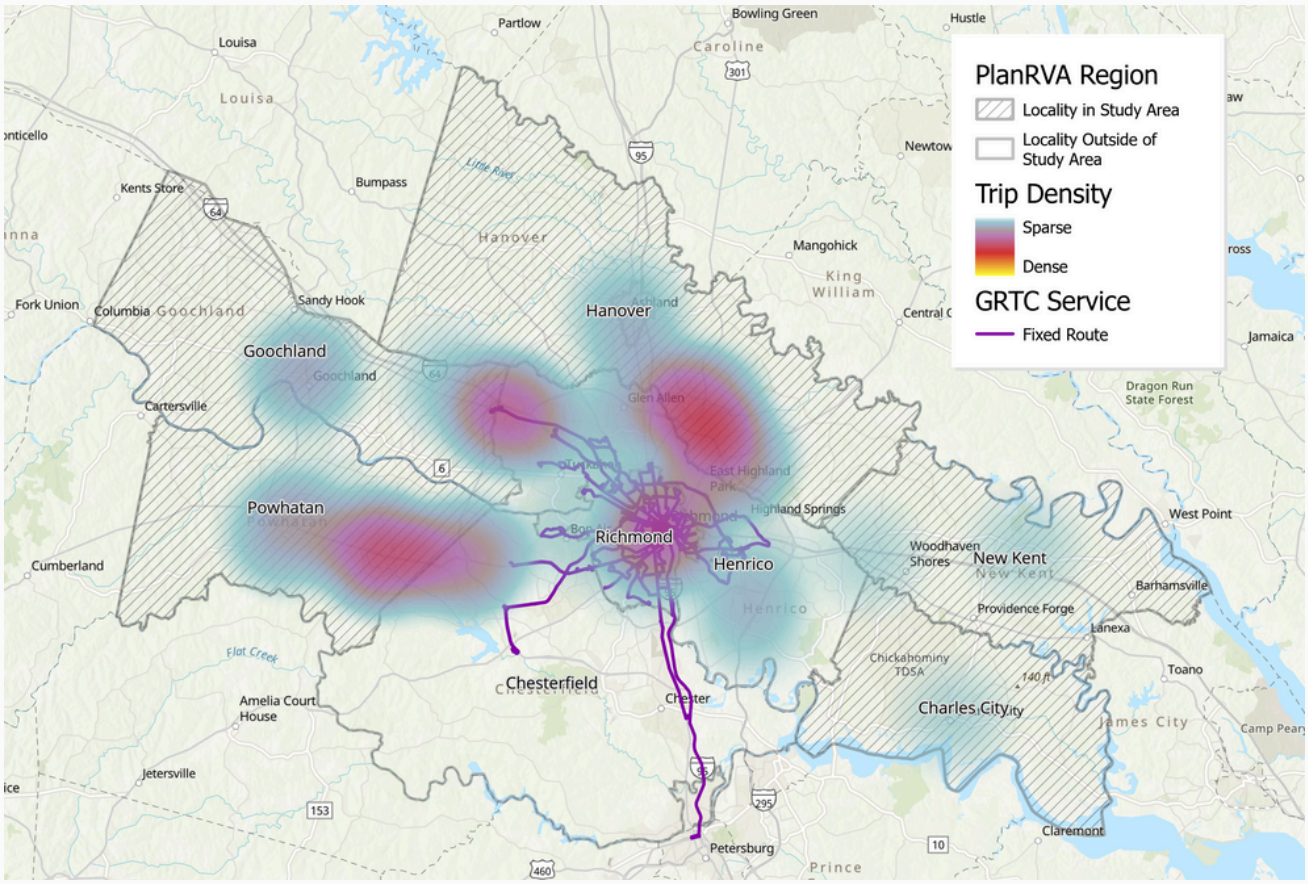

Figure 28. Concentrations of trip destinations from rural transportation mapping activity

This map is useful for identifying key areas that residents of rural counties frequently visit, helping planners understand where public transportation services could be most impactful. The fixed GRTC bus routes are also shown, offering a reference for areas that already have established transit connections.

The open-ended comments from the survey show mixed perspectives but suggest more support for demand-response over traditional fixed-route services. Many respondents emphasized the need for flexible, responsive options, particularly for older adults, people with disabilities, and those living in more remote areas. Microtransit, like GRTC's LINK, was frequently mentioned as a desired service, with calls for expanding coverage and improving its responsiveness. Respondents also highlighted the difficulty of using fixed-route services in rural areas due to low population density and long distances between key destinations.

While there was some support for fixed-route transit, particularly in the form of connections to urban centers or park-and-ride options, the overall sentiment leaned toward demand-responsive services. This aligns with findings in studies such as the Richmond Region Microtransit Study and Transforming Public Transit with a Rural On-Demand Microtransit Project, which underscore the growing importance of microtransit in rural mobility solutions.

Continued on next page

Previous Studies

This is a non-exhaustive list of summaries of studies and reports relevant to the Rural Transportation Analysis. Reports are listed in alphabetical order.

An Active Roadmap: Best Practices in Rural Mobility, Smart Growth America (2023)

The report highlights the critical need for tailored transportation solutions in rural areas, focusing on active transportation, multimodal networks, and smart growth strategies. It discusses common misconceptions about rural communities and details how innovative solutions can improve access to essential services, support economic development, and increase community health outcomes. The report also outlines case studies from various rural areas that have successfully implemented transportation strategies, offering a roadmap for similar rural communities.

Three key takeaways:

1. Multimodal Transport Solutions: Rural areas can benefit from multimodal transportation options, including public transit, bike paths, and walkable infrastructure. These options help connect residents to services and boost the quality of life.
2. Tailored Solutions: Each rural area has unique needs, and solutions must be customized based on specific local conditions, community needs, and economic factors. Strategies such as demand-response transit and complete streets are critical.
3. Economic and Health Benefits: Investment in rural transportation infrastructure not only improves mobility but also drives local economic growth and supports public health by improving access to jobs, healthcare, and other essential services.

Best Practices and Marketing to Increase Rural Transit Ridership and Investment, Transportation Research Board (2018)

This document focuses on identifying best practices for rural transit systems to increase ridership and attract investment. It emphasizes strategies that combine effective service design, community awareness, marketing, and partnerships with local stakeholders. Successful rural transit agencies actively engage their communities, brand their services to increase visibility, and utilize both new technologies and traditional outreach to connect with diverse populations.

Furthermore, partnerships with educational institutions, healthcare providers, and other local entities are essential for expanding services and securing investment. These methods are critical to improving rural mobility, especially in low-density areas where transit ridership faces unique challenges.

Three key takeaways:

1. Community Awareness and Marketing: Effective branding, marketing, and educational outreach are crucial for attracting new riders and increasing the visibility of rural transit systems.
2. Service Design and Planning: Regularly evaluating routes and making service adjustments based on community needs ensures that transit services remain efficient and effective in low-density rural areas.
3. Partnerships and Collaboration: Collaborating with local stakeholders, including healthcare providers and educational institutions, helps rural transit agencies improve operational efficiency and attract funding.

Coordinated Human Services Mobility Plan, DRPT (2022)

This plan identifies key populations such as rural seniors, people with disabilities, veterans, and low-income residents who face significant transportation challenges. It highlights gaps in service like limited hours, routes, and trip types, as well as barriers to accessibility, including vehicle availability and scheduling difficulties. Strategies emphasize enhanced coordination between transportation providers, expanded services, and improved communication to better meet the needs of underserved groups. Recommendations focus on improving personal mobility and access to critical services across the state.

Three key takeaways:

1. Targeted Populations: The plan focuses on improving transportation access for people with disabilities, older adults, low-income individuals, and veterans.
2. Identified Gaps: It highlights existing gaps in human services transportation across Virginia's regions and proposes strategies to address them.
3. Regional Focus: The plan outlines region-specific strategies for addressing transportation challenges, using interactive tools to present data visually.

Continued on next page

Emerging Mobility Technologies and Trends, Energy Systems Network (2019)

This report examines how evolving transportation technologies, such as electrification, automation, and shared mobility, are reshaping the transportation landscape. It highlights how these trends are driving a new mobility paradigm, where transportation is shifting from a vehicle ownership model to a mobility-as-a-service (MaaS) model, enabling more flexibility and access for users. Technologies like connected vehicles, automated driving, and sensor fusion are key components in this shift, offering safer and more efficient transportation options. The report emphasizes the need for an integrated mobility system that leverages these advancements to reduce congestion, pollution, and costs while enhancing accessibility and equity.

Three key takeaways:

1. The adoption of shared mobility and MaaS models, driven by new technologies like electric and automated vehicles, is transforming transportation into a service-based system.
2. Microtransit and other on-demand services enabled by digital technologies have the potential to fill transportation gaps, especially in low-density and underserved areas.
3. The integration of connected and automated vehicles into shared mobility services can improve safety and efficiency but will require careful consideration of equity, accessibility, and regulatory framework.

Greater RVA Transit Vision Plan, RRTPO (2017)

This plan is focused on improving transit access, mobility, and connectivity throughout the Richmond region, including rural counties like Charles City, Goochland, Hanover, New Kent, and Powhatan. The document provides insights into potential transit solutions for areas that have been historically underserved, particularly in rural settings. It highlights the importance of expanding public transit to improve access to jobs, healthcare, and essential services, especially for low-income populations, seniors, and others who rely on public transportation.

Continued on next page

Three key takeaways:

1. Customized Transit Solutions: The Vision Plan suggests demand-responsive transit and microtransit options tailored to rural areas, where population density may not support traditional fixed-route services. This model aligns with the need to adapt transit to the unique geography of rural counties.
2. Economic Development and Connectivity: Expanding transit in rural areas can lead to improved access to employment opportunities and help stimulate local economies. The report emphasizes connecting workers to job centers and supporting businesses with reliable transportation options.
3. Land Use and Transit Integration: Transit-oriented development is a key focus, with recommendations for aligning transit improvements with future land use plans. For rural areas, the plan underscores the potential to shape land use to support more effective and sustainable transit solutions.

A Guide for Planning and Operating Flexible Public Transportation Service, National Academies of Sciences (2010)

This guide explores strategies for implementing and managing flexible transit services, especially in rural and low-density areas where traditional fixed-route services may not be viable. Key findings highlight the potential benefits of flexible services, particularly for senior citizens and persons with disabilities, and emphasize that these services can be more cost-effective than traditional demand-response services in some settings.

Flexible services like route deviation and dial-a-ride can serve key locations such as medical centers and shopping hubs while reducing the costs associated with paratransit. However, these services are generally more expensive per trip than fixed-route transit and require advanced communication and scheduling technology. Importantly, flexible transit solutions can also introduce public transit to new users in suburban or rural areas, offering a valuable connection to fixed-route services.

Three key takeaways:

1. Route deviation is the most common form of flexible public transportation in rural and suburban settings.
2. Flexible services, while costlier than fixed routes, can reduce demand for ADA paratransit services and cater to non-time-sensitive trips like medical appointments and shopping.
3. Effective communication and scheduling technology are critical for ensuring the success and efficiency of flexible public transportation services.

Jaunt Rural Transit Needs Assessment, Small Urban and Rural Center on Mobility (2024)

This assessment provides valuable insights into rural transit needs and gaps relevant to this project. It identifies key areas such as Goochland County, where no transit service currently exists but demand is evident, particularly in its western region. Other counties, including Louisa, Nelson, and Buckingham, show significant gaps in demand-response service, particularly in coverage and hours of operation. Recommendations include the need for extended service hours, increased geographic coverage, and the introduction of microtransit in certain areas. The study also emphasizes the importance of community engagement and stakeholder input in designing effective transportation solutions. These findings can guide the development of transit alternatives in Richmond's rural areas, ensuring tailored, sustainable solutions for each county.

Three key takeaways:

1. Service Gaps in Rural Areas: There are significant gaps in transit coverage and availability, particularly in isolated rural regions like Goochland County. Addressing these gaps is crucial for improving access to essential services.
2. Microtransit as a Solution: Microtransit is highlighted as a flexible, cost-effective alternative to traditional fixed-route services, making it a viable option for the Richmond region's low-density, rural areas.
3. Targeting High-Need Populations: Older adults, people with disabilities, and low-income residents are the key populations in need of transportation services. Any proposed solutions should prioritize these groups to ensure accessibility and equity.

Richmond Region Micro-Transit Study, GRTC (2023)

This study highlights the potential for microtransit services in the Richmond area, focusing on places where traditional fixed-route services may not be appropriate due to lower population or employment densities. The study analyzes existing transit needs, gaps, and areas with high suitability for micro-transit, particularly in rural and suburban regions such as Charles City, Goochland, Hanover, New Kent, and Powhatan counties. It discusses the operational challenges, cost estimates, and potential benefits of implementing micro-transit services to meet the region's transportation needs.

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Three key takeaways:

1. Microtransit Suitability: The study identifies rural areas like Charles City and Goochland as prime candidates for micro-transit services due to their lower population density but significant transit needs, making traditional fixed routes inefficient.
2. Gaps in Fixed-Route Coverage: The region's existing fixed-route services do not adequately serve many rural and suburban areas, highlighting the need for microtransit solutions to address these gaps.
3. Flexible and Affordable Solutions: Microtransit offers a cost-effective alternative to the traditional fixed-route model, with the potential to enhance service coverage, improve mobility, and support economic development in underserved rural areas of the region.

Rural Microtransit Case Study and Report, DRPT (2023)

This report offers important insights for this project, focusing on the challenges and opportunities of microtransit in rural areas. The report highlights pilot programs like Bay Transit Express and MetGo!, which provide flexible, on-demand transportation for high-need populations such as older adults, individuals with disabilities, and low-income residents. Key findings emphasize how microtransit can replace or complement traditional bus routes, support economic sustainability, and the importance of ongoing community engagement for service improvement and operational success. These insights can guide our region's approach in implementing rural transit solutions tailored to community needs.

Three key takeaways:

1. Microtransit for High-Need Populations: The report outlines how microtransit services can effectively cater to populations with limited transportation options, such as seniors and people with disabilities. These services provide an equitable solution to improve access to healthcare, employment, and social services.
2. Economic Sustainability and Operational Considerations: The report stresses the importance of securing sustainable funding sources, managing costs, and evaluating operational efficiency. This analysis will need to consider these factors when planning for long-term microtransit service in rural counties.
3. Community Engagement and Feedback: Engaging with residents to gather feedback on service design and performance is critical for improving and adapting microtransit services over time. Richmond's project should

incorporate community input throughout the planning and evaluation phases.

Transforming Public Transit with a Rural On-Demand Microtransit Project, FTA Research (2023)

This report details how the City of Wilson, North Carolina, replaced its traditional fixed-route transit system with an on-demand microtransit service called RIDE. The report showcases the implementation of this rural transit service and highlights its ability to improve access to jobs, healthcare, and other essential services, especially for residents in rural areas without personal vehicles. The project also demonstrates how public-private partnerships can drive innovative transit solutions, particularly in areas with low population density where traditional services are less effective.

Three key takeaways:

1. On-Demand Microtransit Success: The success of on-demand microtransit in Wilson shows that similar models can be effective in rural areas with low density, offering flexibility that fixed-route systems cannot provide.
2. Expanded Service Hours and Accessibility: Extending service hours significantly improved access for residents, particularly those needing transportation for work or healthcare. This insight is vital for rural areas where limited service times can hinder accessibility.
3. Public-Private Partnerships: The collaboration between local government, state transportation departments, and private mobility providers can offer innovative solutions for transportation in rural regions, allowing for more efficient and responsive services.

Travel Behavior of Transportation-Disadvantaged Populations, Small Urban and Rural Center on Mobility (2022)

This document focuses on the travel behavior of older adults, people with disabilities, individuals from low-income households, and those living in rural areas. The study analyzes data from the 2017 National Household Travel Survey and compares it to previous data from 2009 and 2001. It highlights significant differences in travel patterns between urban and rural areas, as well as among different demographic groups. For rural areas, the study reveals that residents generally drive more miles but take fewer trips per day, which is partly due to longer travel distances and the lack of alternative transportation options.

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Three key takeaways:

1. Mobility Challenges in Rural Areas: People in rural areas, particularly older adults and those with disabilities, rely heavily on cars and drive longer distances, but they make fewer trips per day. This emphasizes the need for public transportation options to reduce dependence on personal vehicles.
2. Transportation-Disadvantaged Populations: The study shows that transportation-disadvantaged groups, especially in rural areas, have significantly lower trip rates and less access to alternative transportation modes like public transit, walking, and biking.
3. Trends in Transit Use: While transit use remains low in rural areas, there is potential for growth among younger populations and transportation-disadvantaged groups, suggesting that well-targeted services could fill existing mobility gaps.

Transit Strategic Plan (FY 2025–FY 2034), GRTC (2024)

The GRTC Transit Strategic Plan is focused on shaping the future of public transit in the greater Richmond region, including services such as fixed-route buses, bus rapid transit (BRT), and demand-response services. The plan aims to expand transit access and improve service across the region, including the rural areas. Key elements include public and stakeholder engagement, system performance evaluation, and planning for sustainable and equitable service improvements over the next decade. For rural areas, the strategic focus on microtransit services and improved connections could directly inform the Richmond Rural Transportation project.

Three key takeaways:

1. Microtransit Integration: GRTC is exploring microtransit as a flexible, on-demand solution in rural and low-density areas, which is particularly relevant for improving transportation access in these areas.
2. Stakeholder Engagement: Extensive public engagement and feedback mechanisms are incorporated into GRTC's planning, showing the importance of engaging rural communities to ensure the transportation solutions meet their specific needs.
3. Sustainability and Accessibility: GRTC is committed to providing zero-emission transit options and enhancing accessibility for disadvantaged populations. These goals align with ensuring that rural areas benefit from sustainable and equitable transportation solutions.

Lessons Learned from Rural Microtransit Implementation

Now that microtransit services have been active in some parts of the rural Richmond region, several lessons have emerged regarding demand, trip patterns, and service performance:

1. **Demand is steady and essential-trip driven**: While ridership levels are modest, demand is consistent and tied to critical needs. Usage tends to peak mid-day, reflecting usage beyond traditional commuter service.
2. **Origins are dispersed, destinations cluster**: Trip origins are scattered across rural zones, but destinations typically concentrate around key locations. This supports zone-based service models and emphasizes the importance of anchoring services around recognizable hubs.
3. **Reliability and booking ease are top priorities**: Users value on-time service, simple booking processes, and familiarity. Programs with accessible apps and call-in options, paired with visible outreach, tend to perform better.
4. **Coordination opportunities are underutilized**: While programs like Hanover DASH, Bay Transit, and LINK operate in parallel, deeper coordination is still limited. Models from other areas suggest stronger collaboration can increase efficiency and improve user experience.
5. **High costs are justified for target populations**: Microtransit remains costly per trip due to low density and accessibility needs, but the benefits for transportation-disadvantaged populations make the investment worthwhile. Long-term sustainability may benefit from more integration with healthcare and human services funding streams.
6. **Public perception improves with visible success**: Community skepticism has softened as services prove useful. Testimonials and local visibility help build trust and generate support for future expansion, particularly in areas initially resistant to public transportation.

These findings support continued investment in flexible, demand-responsive transit models tailored to rural needs, with a focus on improving access for vulnerable populations and enhancing regional mobility through collaboration.

Interior of LINK vehicle showing accessible lift.

Feedback from Stakeholders

A questionnaire was distributed to key regional stakeholders, including local governments, non-profits, and community groups, to identify transportation challenges, service gaps, and opportunities for improvement in rural areas. Respondents provided insights on community transportation needs, existing service availability, and how residents access essential services and commute.

The feedback highlighted strong interest in solutions such as microtransit, volunteer driver programs, and regional transit coordination to assist vulnerable populations, including older adults and those without vehicles. Many participants described current public transportation as “nonexistent,” “poor,” or “very limited,” indicating that existing options are either inaccessible or insufficient. Some also mentioned a lack of public awareness and the need for better marketing of available services.

The responses underscored significant transportation barriers for low-income residents, individuals with disabilities, and those with limited English proficiency. Additionally, most respondents were unaware of community-led transportation initiatives or reported that none exist, suggesting a lack of implementation or visibility of these efforts.

Overall, the feedback indicates widespread transportation challenges and the need for structural improvements alongside better communication of services. There is a clear call for more equitable and accessible transit solutions to support economic and social inclusion in rural communities.

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Identified Needs in the Study Area

The Rural Transportation Analysis Existing Conditions Report highlights several pressing transportation needs for rural areas in the Richmond region, including Charles City, Goochland, Hanover, New Kent, and Powhatan counties. The list below reflects a review of literature, past plans, and reports on rural transit, incorporating input from the public, stakeholders, and the project advisory group. These needs, summarized in Figure 29 reflect demographic challenges, gaps in service, and infrastructure limitations that hinder mobility, particularly for vulnerable populations.

The study underscores the need for tailored, flexible transportation solutions that can address the unique challenges faced by rural communities. Expanding demand-response services, enhancing pedestrian and bicycle infrastructure, and fostering regional collaboration will be critical to improving mobility. With a focus on addressing gaps for vulnerable populations and providing affordable, accessible transit options, the region can develop a transportation network that promotes equity and sustainability for all residents.

Key Issue	Description of Challenge	Impact of Need
Limited Public Transit Services	Rural areas lack robust transit systems, with limited hours, coverage, and eligibility. Fixed-route transit is not viable in low-density regions, and other services primarily target specific populations.	Isolates residents without vehicles, especially in remote areas, and limits access to essential services.
Geographic Isolation from Essential Services	Residents are often located far from essential services, making access to healthcare, grocery stores, and social services difficult.	Geographic isolation increases dependency on personal vehicles and poses significant barriers to accessing vital resources, impacting quality of life.
Growing Needs for Vulnerable Populations	Increasing demand for medical, social, and other services among vulnerable groups, such as older adults and low-income residents.	Vulnerable populations face heightened mobility challenges, risking missed medical appointments and reduced access to social and community services.

Figure 29. Summary of Key Issues

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Key Issue	Description of Challenge	Impact of Need
Growing Number of Older Populations	The rural aging population continues to increase, leading to greater transportation demands, particularly for healthcare access.	Older adults may lack reliable transportation for critical healthcare, social engagement, and basic needs, impacting their independence and well-being.
Economic Barriers Such as Cost of Vehicle Ownership or Poverty	Many low-income residents cannot afford vehicle ownership or maintenance, or they experience financial strain due to poverty.	Economic barriers restrict access to jobs and essential services, causing economic hardship and limiting opportunities for upward mobility.
Fragmented Regional Connectivity	Regional transit services lack coordination, with disconnected microtransit and demand-response options.	Residents find it difficult to travel across jurisdictions for employment or services, reducing economic opportunities and regional mobility.
Infrastructure and Safety Concerns	Inadequate road conditions, poor lighting, and lack of bike paths or sidewalks make travel unsafe, especially for pedestrians and cyclists.	Poor infrastructure decreases safety and discourages non-vehicle travel, particularly near village centers and public amenities, where transit usually operates.
Limited Transportation Options for People with Disabilities	Paratransit and other mobility services for individuals with disabilities are insufficient and lack optimized coordination.	People with disabilities face severe mobility limitations, affecting their independence and access to essential services.
Inconsistent Volunteer and Demand-Response Services	Volunteer-based and demand-response transportation services are valuable but often face challenges related to scale, sustainability, coverage, and public awareness.	Service limitations and lack of clarity around service availability may leave residents, especially those needing non-emergency medical transport, without consistent and reliable transit options.
Insufficient Pedestrian and Bicycle Infrastructure	A lack of sidewalks, bike paths, and other first-mile/last-mile connections discourages walking and biking while restricting possible access to transit services.	Reduces safety and multimodal access, particularly near village centers and public amenities, discouraging non-vehicle travel.
Dependence on Personal Vehicles	Rural infrastructure prioritizes car ownership, creating challenges for low-income residents who cannot afford vehicles or maintenance or can no longer drive.	Limits access to jobs and essential services, especially for vehicle-limited households, resulting in economic hardship.
Trips from Rural Areas Typically Must Cross Jurisdictional Boundaries	Travel from rural areas often requires crossing county or regional boundaries, complicating coordination and service availability.	Cross-jurisdictional trips are challenging to arrange and sustain, restricting residents' access to regional employment and healthcare services.

Spectrum of Possible Solutions

The spectrum of possible solutions refers to a variety of transportation alternatives designed to meet the unique needs of different communities. In rural areas, these solutions must tackle challenges such as low population density, limited existing services, and the need for flexible, accessible, and affordable options. The goal is to enhance mobility, improve access to essential services, and ensure transportation equity for all residents, including older adults, individuals with disabilities, and low-income households.

These profiles outline the challenges, populations, and potential solutions associated with each prioritized transportation need. They serve as a guide to decision-makers in selecting focused actions to improve mobility and transit access across the study area. A summary is displayed in Figure 30 on page 62.

1. Expand or adjust existing GRTC microtransit service
2. Enhance or expand existing Bay Transit service
3. Coordinate volunteer driving services
4. Introduce new fixed route service
5. Enhanced single locality or sub-regional specialized transit service
6. Initiate new express routes

1. Expand or Adjust Existing GRTC Microtransit Service

Adjust the service area or hours of the GRTC microtransit to better serve rural areas. This could involve expanding geographic coverage, offering more flexible scheduling, or providing additional vehicles to meet demand.

Context: Existing GRTC microtransit zones cover limited areas, leaving gaps in Powhatan, New Kent, and other rural regions. Current services are effective but require geographic expansion to serve more residents.

Populations Impacted: Residents without access to personal vehicles, low-income individuals, and commuters traveling to employment centers in Richmond.

Urgency: High

Potential Impact: High

Reason: Microtransit services offer flexible, on-demand transportation, which suits rural areas with low population density.

Potential Solutions:

- Expand GRTC microtransit zones to cover Goochland and more of Powhatan.
- Improve coordination between microtransit zones for seamless travel.

2. Enhance or Expand Existing Bay Transit Service

Expand the reach or frequency of Bay Transit's services to accommodate more riders or cover underserved areas. This could include adding evening and weekend services or extending current routes to new locations.

Context: Bay Transit primarily offers demand-response services, but coverage is limited, and residents often face scheduling difficulties. An expanded service could better serve rural populations with few alternatives.

Populations Impacted: Older adults, individuals with disabilities, low-income residents, and those needing transportation for essential services.

Urgency: High

Potential Impact: High

Reason: With limited service coverage and responsiveness, enhancing Bay Transit is crucial for residents without personal vehicles. The aging population in Charles City and New Kent would benefit from additional services.

Potential Solutions:

- Increase operating hours and geographic coverage.
- Coordinate with GRTC for more seamless travel between areas.
- Partner with healthcare providers to offer direct medical shuttles.

3. Coordinate Volunteer Driving Services

Partner with local non-profits or faith organizations to coordinate and expand volunteer driver programs. This would offer a cost-effective solution for providing transportation to residents in need, focusing on vulnerable populations and those without personal vehicles.

Context: Volunteer driving programs can fill critical gaps in rural transportation networks. To maximize their impact, these services need better coordination and structure, ensuring volunteers are efficiently matched with ride requests and that coverage reaches remote areas. Drawing from models where local organizations manage volunteer networks with centralized coordination, these programs can provide a more consistent and reliable service.

Populations Impacted: Older adults, individuals with disabilities, and residents without personal vehicles, particularly in remote areas.

Urgency: Medium

Potential Impact: Medium-High

Reason: Volunteer programs offer valuable transportation solutions for seniors and those with limited mobility but require better coordination to increase reliability.

Potential Solutions:

- Establish centralized coordination among non-profits, faith communities, and local governments.
- Recruit additional volunteer drivers and provide training.
- Create a shared scheduling platform to streamline ride requests.

4. Introduce New Fixed-Route Service

Establish new fixed route bus services in areas with a concentration of population or key destinations. This would provide predictable and reliable transportation, supporting routine commutes and essential trips.

Context: Fixed-route services are limited or non-existent in most rural areas, but some higher-density corridors could support them. Introducing limited routes may reduce the need for personal vehicle use.

Populations Impacted: Commuters traveling to urban centers, low-income households, and individuals without vehicles.

Urgency: Medium

Potential Impact: Medium

Reason: Fixed-route service could serve commuter corridors, benefiting residents traveling regularly to Richmond or nearby employment centers.

Potential Solutions:

- Introduce fixed-route services along key commuter corridors.
- Connect new routes to existing GRTC hubs or park-and-ride facilities.
- Explore hybrid routes combining fixed and on-demand services.

5. Enhanced Specialized Transit Services (DASH Model)

Develop a specialized transit service focused on a single locality or large area, similar to Hanover DASH. This service could provide transportation for older adults, individuals with disabilities, or low-income residents, ensuring equitable access.

Context: Specialized services focusing on older adults and individuals with disabilities have proven effective but are limited in availability. Expanding these services to more localities could address mobility challenges.

Populations Impacted: Older adults, individuals with disabilities, and those requiring frequent healthcare access.

Urgency: Medium

Potential Impact: Medium

Reason: Tailored services meet the specific needs of vulnerable populations, improving access to healthcare and essential services.

Potential Solutions:

- Establish similar services to Hanover DASH in other counties.
- Partner with healthcare providers to coordinate medical transportation.
- Offer subsidized fares or free rides for vulnerable populations.

6. Initiate New Express Route

Introduce express bus services that connect key towns or regional hubs with limited stops to reduce travel time. These routes could target peak commuting hours or key event times to maximize usage.

Context: Long commutes to urban centers are common among rural residents. Adding express routes with limited stops can expand mobility and improve access to jobs and essential services.

Populations Impacted: Long-distance commuters, students, people with medical needs, and individuals seeking employment in urban centers.

Urgency: Low-Medium

Potential Impact: Medium

Reason: This option supports long-distance commuters but may have lower ridership due to dispersed populations.

Potential Solutions:

- Create express routes along key highways connected with existing and future park-and-ride lots.
- Coordinate with employers to offer transit benefits to employees.
- Provide early morning and evening services to accommodate different work schedules.

Impact & Urgency Evaluation

The most urgent and impactful transportation needs revolve around **expanding and adjusting existing microtransit services provided by GRTC** and **enhancing Bay Transit's demand-response services**. Both of these options offer flexible, on-demand transportation that is well-suited to the rural, lower-density nature of the study area. These expansions would address critical gaps, particularly in areas with aging populations, limited vehicle ownership, and poor access to healthcare or essential services. Given their adaptability, these services can be scaled relatively quickly to meet immediate needs while supporting future growth.

In parallel, strengthening partnerships with local non-profits and faith communities to coordinate volunteer-based transportation programs would further fill gaps for seniors and individuals with disabilities. Although these

options require moderate effort to implement, they can make a significant difference for vulnerable populations while building off of existing community assets.

Longer-term solutions, such as introducing limited fixed-route services or specialized transit like the Hanover DASH model, would be beneficial but carry relatively lower urgency. Fixed-route services may be viable only in certain higher-density areas, such as Mechanicsville, or commuter corridors, while specialized transit programs could complement broader regional efforts. New express routes connecting rural areas with urban centers like Richmond or Hampton Roads would provide additional travel options, but their impact may be limited given the low density of the study area. These solutions are not immediate priorities, but are worth exploring as the region grows.

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Spectrum of Possible Solutions Summary

Possible Solution	Expand or Adjust Existing GRTC Microtransit Service	Enhance or Expand Existing Bay Transit Service	Coordinate Volunteer Driving Services	Introduce New Fixed-Route Service	Enhanced Specialized Transit Services	Initiate New Express Route
Context	Exsting GRTC MT zones cover limited areas, leaving gaps in the rural region. Current services are effective but require expansion	BT primarily offers demand-response, but coverage and service is limited	Volunteer driving programs can fill critical gaps in rural transportation networks	Fixed-route services are limited or non-existent in most rural areas, but some higher-density corridors could support them	Specialized services focusing on older adults and indv. w/ disabilities have proven effective but are limited in availability	Adding express routes with limited stops can expand mobility and improve access to jobs and essential services
Population Impacted	-Low car HHs -Low income -Commuters	-Older adults -Indv. w/ disabilities -Essential serv.	-Older adults -Indv. w/ disabilities -Low car HHs	-Low car HHs -Low income -Commuters	-Older adults -Indv. w/ disabilities -Healthcare access	-Commuters -Students -Healthcare access
Ugency	High	High	Medium	Medium	Medium	Low-Medium
Potential Impact	High	High	Medium-High	Medium	Medium	Medium
Reason	MT services offer flexible, on-demand transpo, which suits rural areas with low pop. density	Enhancing BT is crucial for residents w/o personal vehicles and the aging pop. in Charles City and New Kent	Volunteer programs offer valuable transportation solutions but require better coordination to increase reliability	Fixed-route service could serve commuters, benefiting regular travelers	Tailored services meet the specific needs of vulnerable populations	This option supports long-distance commuters but may have lower ridership due to dispersed populations
Potential Solutions	Expand GRTC MT zones	Increase operating hours and coverage	Establish centralized coordination	Introduce fixed-route services along key commuter corridors	Establish similar services to Hanover DASH	Create express routes connected with P&R
	Improve coordination between MT zones	Coordinate with GRTC for more seamless travel	Recruit additional volunteer drivers	Connect new routes to existing GRTC hubs or P&R	Partner with healthcare providers	Coordinate w/ employers on transit incentives
		Partner with healthcare providers to offer direct shuttles	Create a shared scheduling platform	Explore hybrid routes	Offer subsidized fares or free rides	Provide early morning and evening services

Figure 30. Possible solutions in detail

Recommended Alternatives

Our team has reviewed community and stakeholder feedback, analyzed travel patterns, and assessed transportation data across Charles City, Goochland, Hanover, New Kent, and Powhatan counties. From this work, we've developed a set of recommended alternatives—different transportation programs or services that are most likely to meet local needs and improve mobility in rural areas.

Recommended alternatives are the transportation options we think are most feasible and effective. These include express bus routes, microtransit service zones, and demand-response programs tailored to the unique needs of each locality.

What We've Heard

Survey results and engagement efforts highlighted key challenges for rural residents, including:

- Long travel distances to essential services
- Limited or no access to public transit
- High costs of vehicle ownership
- Mobility barriers for older adults and people with disabilities
- A need for more flexible, reliable, and affordable transportation options

Residents of the rural counties in the PlanRVA region would benefit from additional public transportation services, providing both inter- and intra-county travel. The demographics, population densities, and land use of these counties would make achieving sufficient ridership to support a high-frequency, fixed-route bus network challenging in the near term. However, regular and predictable commuter travel demand between the counties and Richmond provides opportunities for viable transit services for these market sectors
.
According to the rural transportation survey, many residents in these counties commute long distances for work, education, and healthcare, yet lack reliable transit options. An express route would reduce travel costs, help alleviate congestion on highways like I-64 and I-95, and enhance regional connectivity. By linking rural areas to Park & Ride facilities and existing transit networks, express services could improve job access, economic mobility, and overall quality of life for residents who currently have limited public transportation options.

Based on our analysis and stakeholder feedback, the following alternatives have been proposed for each county.

Express Bus Service

GRTC operates four express bus routes (Figure 31) that are designed to provide commuters with weekday, peak-period transportation between downtown Richmond and outlying areas. These services aim to reduce congestion and provide effective alternatives to driving. Each of the existing express routes terminates at a park and ride lot, allowing passengers to park their cars, making the commuter route accessible by a much greater catchment area.

Route	Locality Served	AM In-bound	AM Out-bound	PM In-bound	PM Out-bound	P&R Location
Gaskins Express 29x	Henrico	5	4	3	5	Gaskins Rd
Stony Point Express 64x	Chesterfield	2	2	1	2	Buford Rd
Commonwealth 20 Express 82x	Chesterfield	2	3	3	3	Commonwealth Centre Pkwy
Petersburg Express 95x	Petersburg	2	2	2	2	P'burg Transit Cntr

Figure 31. Existing express bus service by GRTC

These four routes include common service characteristics which provide insight into customer preferences for express bus service in the region, as well as into what types of service are viable. Those common service characteristics include:

1. All express routes terminate at a designated park and ride location. This increases the accessibility of the service for people within a large geographic area.
2. All inbound express routes terminate within the center of Downtown Richmond.
3. GRTC has included the terminal park and ride property in their existing or planned microtransit zones. This provides further access to the commuter route service by those living within the zones who may not have access to a personal vehicle and/or those that would prefer not to drive.
4. Inbound trips generally operate non-stop between the respective park and ride facilities and Downtown Richmond. Outbound trips typically make several local stops within Richmond that are not performed by inbound trips.
5. Each route operates only limited trips in each direction and in each peak period. Three of the four routes only provide two inbound trips during the AM peak period.
6. The span of service of these routes start between 5 AM and 6 AM, with the last outbound trip departing Downtown Richmond between 4:30 PM and 5:30 PM.

Route	Average Daily Ridership
Gaskins Express 29x	86
Stony Point Express 64x	29
Commonwealth 20 Express 82x	43
Petersburg Express 95x	36

Figure 32. Existing GRTC Express Route ridership

The service characteristics and takeaways gleaned from these successful, existing operations will be applied to recommendations for new express routes to develop comparable regional services.

Alternative Express Routes

Based on our analysis and stakeholder feedback, the following alternatives have been proposed for each county (Figure 33). They include routes between key rural population centers and GRTC's frequent transit network, including:

- **Charles City Express** - new service from Charles City to Downtown Richmond
- **Chickahominy Express** - new service from CC & NK to Downtown Richmond
- **Hanover Express** - new service from western Hanover to Downtown Richmond
- **Goochland Express** - extension of Gaskins Express service to Goochland (Hickory Haven Park and Ride)
- **New Kent Express** - new service from New Kent to Downtown Richmond
- **Powhatan Express** - extension of Stony Point Express service to Powhatan (Holly Hills)

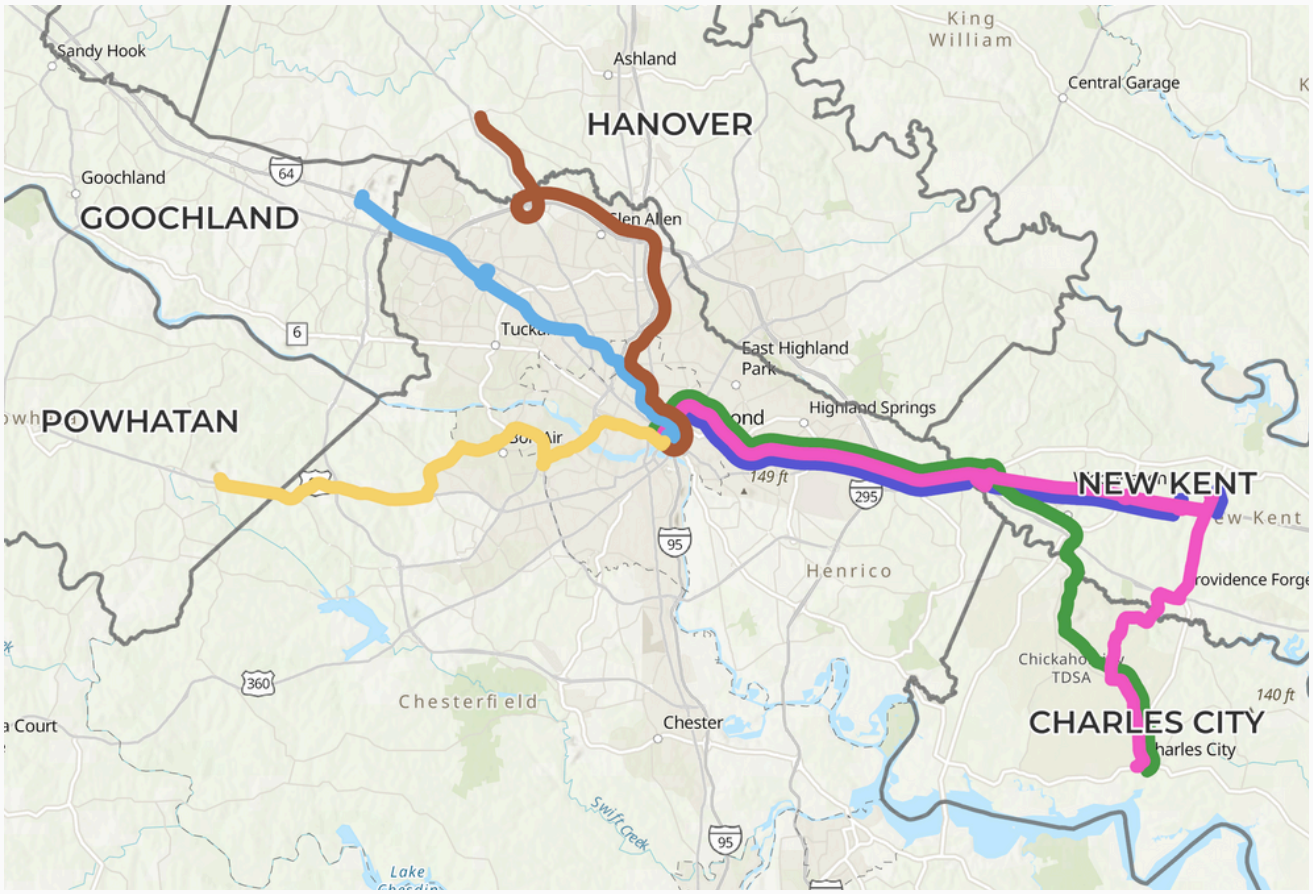

Figure 33. Possible express routes. Clockwise from left: Powhatan Express (yellow), Goochland Express (blue), Hanover Express (brown), Charles City Express (green), Chickahominy Express (pink), and New Kent Express (blue)

Charles City Express

The Charles City Express route (Figure 34) was developed based on significant feedback highlighting a transportation gap between Charles City and downtown Richmond.

- Route: Initiating at the Charles City Department of Social Services (DSS), this route includes a strategic stop at the Bottoms Bridge Park & Ride before continuing directly to downtown Richmond.
- Distance and Travel Time: Approximately 33 miles with an estimated travel time of 40 minutes each way.
- Accessibility and Ridership Potential: Including the Bottoms Bridge P&R facilitates greater ridership potential and enhances the overall accessibility for residents of Charles City and neighboring communities.
- Pilot Service Schedule:
  - AM Peak: 2 inbound (IB) & 2 outbound (OB) trips
  - PM Peak: 2 IB & 2 OB trips

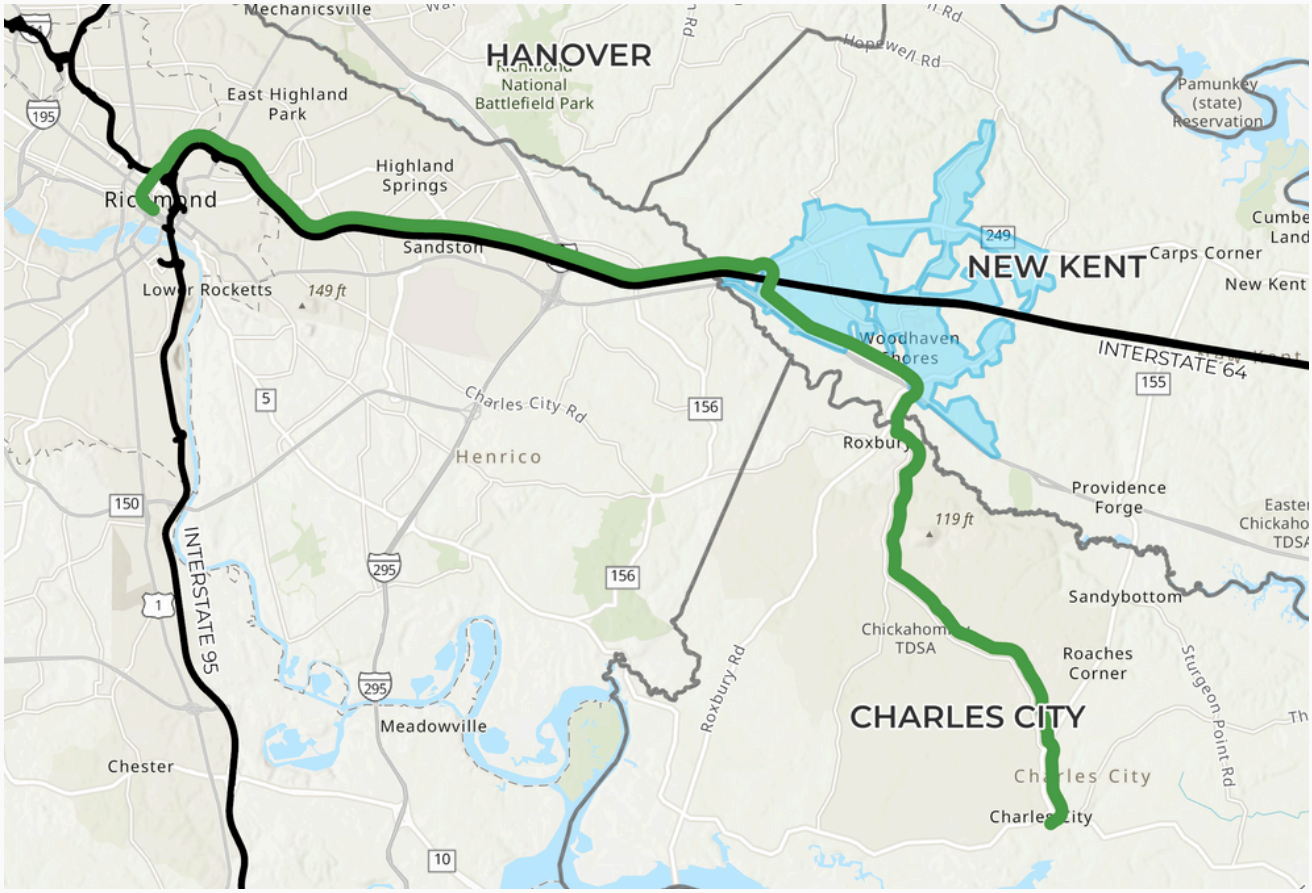

Figure 34. Possible route for Charles City Express bus service; Bay Transit microtransit zone in blue

Charles City County currently lacks a park and ride facility and sufficient transit infrastructure. If GRTC were to introduce an express route serving the county, establishing a new park and ride facility at the Charles City terminus would support the service by expanding accessibility to the service by automobile and via microtransit services. Given that Bay Transit operates a on demand service and plans to operate a microtransit zone in the area, it is recommended that the express route be aligned with this zone to maximize connectivity. The study team developed two potential route alignments to assess the most effective service plan, the Charles City Express (shown here) and the Chickahominy Express. The Charles City Express alignment would connect the Charles City municipal area to downtown Richmond at 9th and Broad, a key hub for existing high-frequency routes.

The project team calculated the total estimated travel time for the 32-mile trip, excluding deadhead, to be 52 minutes per one-way trip, to account for drive time and dwell time at each park-and-ride. Currently, there is no existing park and ride facility at the proposed Charles City County terminus of this alignment. It is proposed that the express route serves the Bottoms Bridge park and ride in New Kent County before continuing to Downtown Richmond. This stop could serve both Charles City residents traveling to Richmond and New Kent residents seeking a direct connection to the city. The express service would benefit from the planned New Kent County microtransit zone which could provide transfers between the service and the express route at the park and ride facility.

New Kent Express

The New Kent Express (Figure 35) addresses identified commuting needs from New Kent County to Richmond, utilizing recently enhanced park-and-ride infrastructure at Bottoms Bridge, which is currently not served by public transit.

- Route: Starting at New Kent Public Works Park & Ride, it stops at Bottoms Bridge Park & Ride before proceeding directly to Richmond.
- Distance and Travel Time: Approximately 28 miles, with an estimated travel time of 33 minutes.
- Accessibility and Ridership Potential: Bottoms Bridge P&R is included to enhance overall convenience and expand ridership.
- Pilot Service Schedule:
  - AM Peak: 1 IB & 1 OB trip
  - PM Peak: 1 IB & 1 OB trip

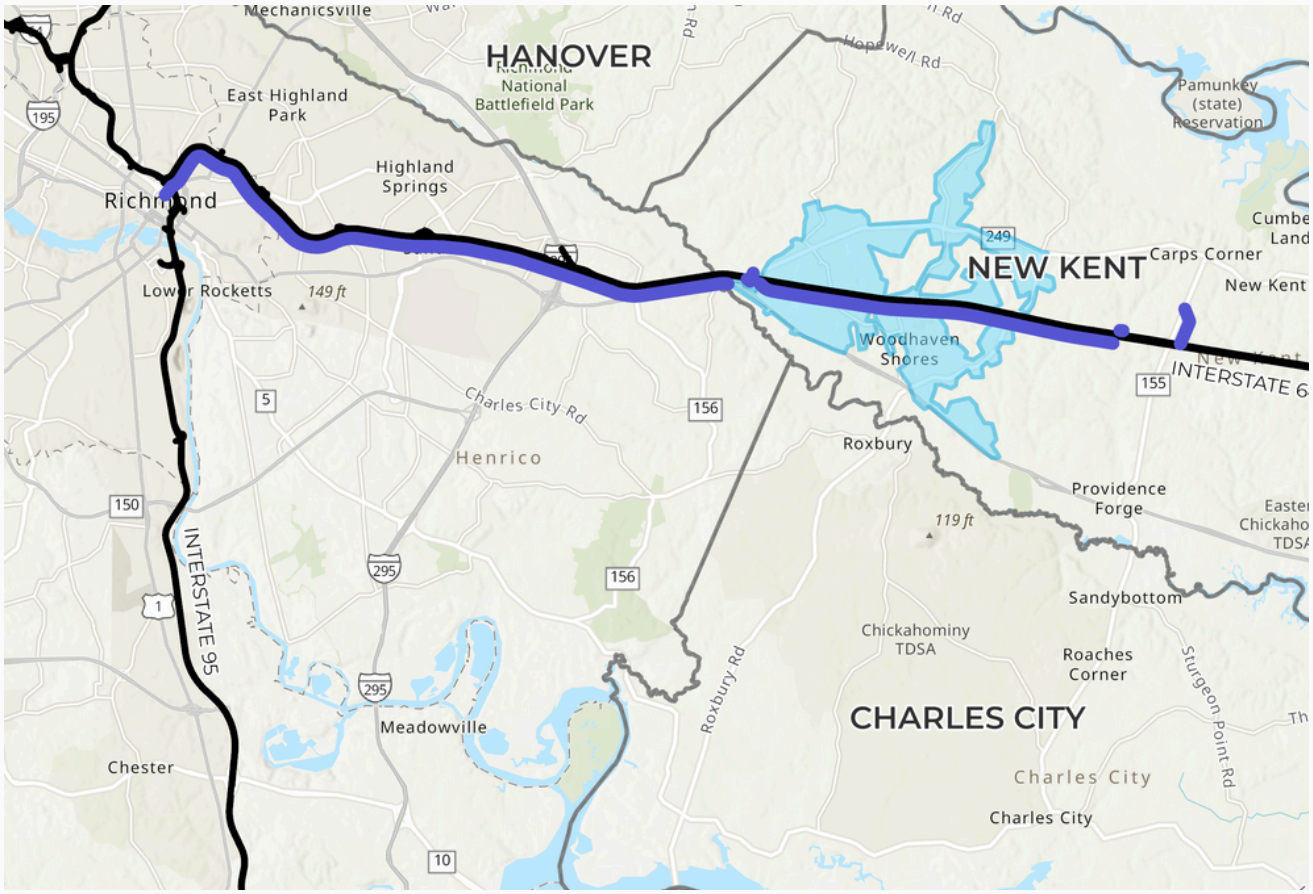

Figure 35. Possible route for New Kent Express bus service; Bay Transit microtransit zone in blue

New Kent County is experiencing rapid population and employment growth with increasing job opportunities and residential developments. Improved transportation access and services can support this expansion while enhancing sustainable transportation options.

Two park and ride facilities exist in New Kent County, located at Bottoms Bridge and the Public Works building. The Bottoms Bridge park and ride facility is currently being expanded due to high demand and frequent overflow. Aligning potential express bus routes such that to take advantage of these facilities and microtransit services can increase accessibility and viability. This route would provide a connection between New Kent and Downtown Richmond at the 9th & Broad express route hub, with a mid-route stop at the Bottoms Bridge park and ride. The trip length for this proposed route alignment is 26 miles, with a one-way-trip travel time of approximately 37 minutes, excluding deadhead.

With the Bottoms Bridge Park and Ride undergoing expansion due to high demand, this route would help alleviate congestion and improve accessibility for both existing transit users and new riders seeking alternatives to driving.

Chickahominy Express

This route (Figure 36) emerged from stakeholder discussions emphasizing the demand for improved inter-county connections, particularly between Charles City and New Kent counties, along with direct connectivity to Richmond's transit network.

- Route: The Chickahominy Express connects downtown Richmond directly to Charles City Courthouse, Bottoms Bridge, and New Kent Public Works Park & Rides.
- Distance and Travel Time: Approximately 50 miles each way, with a travel time of about 66 minutes.
- Accessibility and Ridership Potential: Crucially, this route integrates directly with GRTC's Bus Rapid Transit (BRT) Pulse line, significantly enhancing regional accessibility.
- Pilot Service Schedule:
  - AM Peak: 2 IB trips
  - PM Peak: 2 OB trips

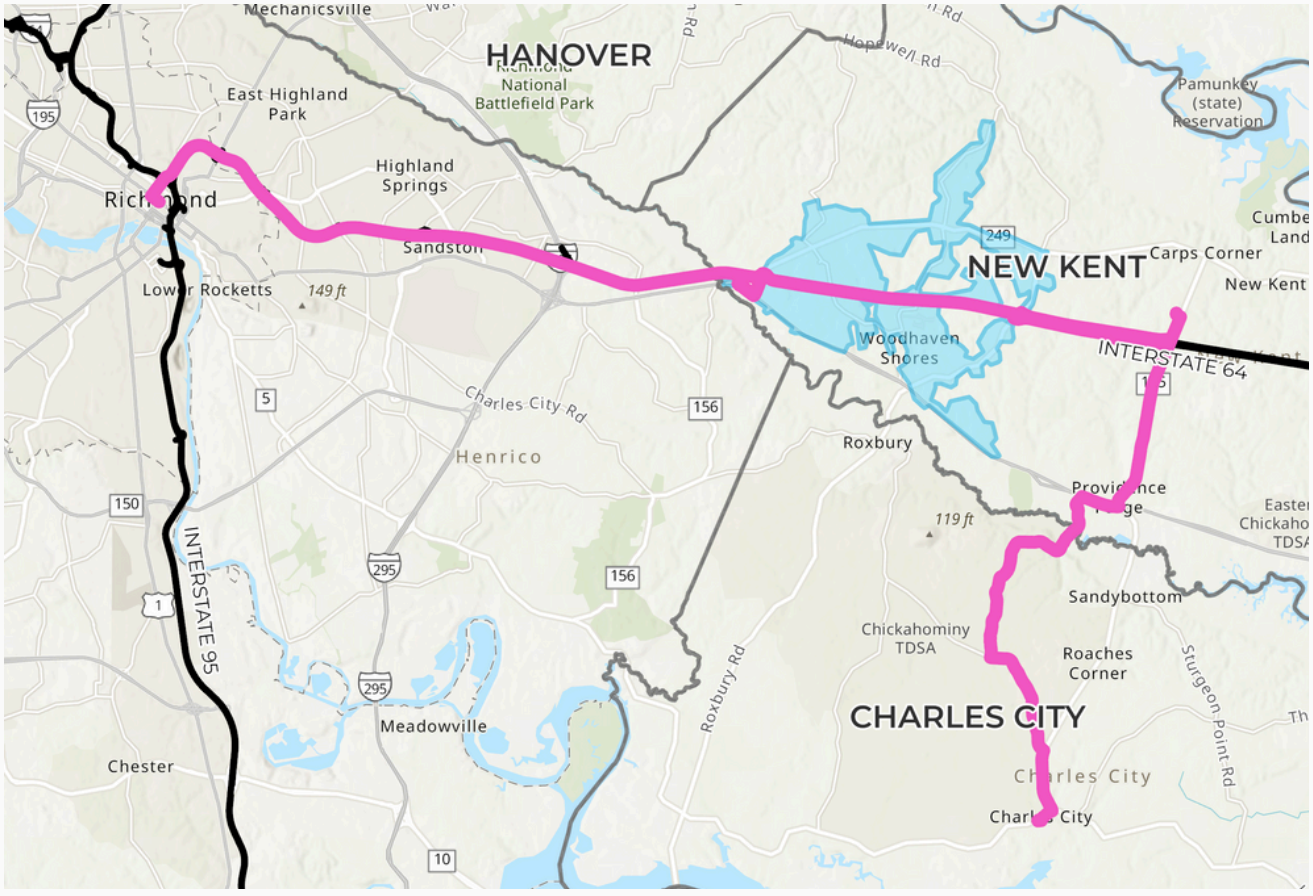

Figure 36. Possible route for Chickahominy Express bus service; Bay Transit microtransit zone in blue

As an alternative to the two recommended express route alignments proposed above, the two routes could be consolidated into a single express route serving Charles City County and the two park and rides in New Kent County. The route would begin in Charles City and make stops at both the Public Works building and the Bottoms Bridge park and rides, and then to Downtown Richmond. The total travel time was estimated to be 55 minutes per trip, covering a distance of 36 miles.

This approach could provide operational benefits (relative to operating two separate routes) by reducing deadhead time and mileage and reducing the vehicle requirements. The reduced fleet requirements may allow those resources for additional trips or be deployed to improve service elsewhere within the GRTC system area.

Goochland Express (Gaskins Express Route Extension)

Building upon existing GRTC services, the Gaskins Express Route Extension (Figure 37) is proposed to address commuter needs from Goochland County to Richmond. This route leverages and enhances current service infrastructure.

- Route: Approximately 7-mile extension of existing GRTC 29x Gaskins Express Route, including an additional mid-route stop at Gaskins Road Park & Ride, the current terminus.
- Distance and Travel Time: Approximately 19 miles total with an estimated travel time of 26 minutes.
- Service Adjustments: Retain current service characteristics, adding an additional bus during each peak to accommodate increased service demand.
- Pilot Service Schedule:
  - AM Peak: 5 IB & 4 OB trips
  - PM Peak: 4 IB & 5 OB trips
- Existing Ridership: Gaskins Express averages approximately 18 riders per trip.

There are two existing park and ride facilities in Goochland County, the Hickory Haven Park and Ride, and the Oilville Park and Ride. Neither park and ride facility is currently served by GRTC fixed-route services. An exiting GRTC express bus route, the Gaskins Express, operates between Richmond and the Tuckahoe area, close to the Goochland border, but does not extend into Goochland County. The Gaskins Express serves the Gaskins Road park and ride facility in Henrico County eight times per day with a 25-minute travel time into downtown.

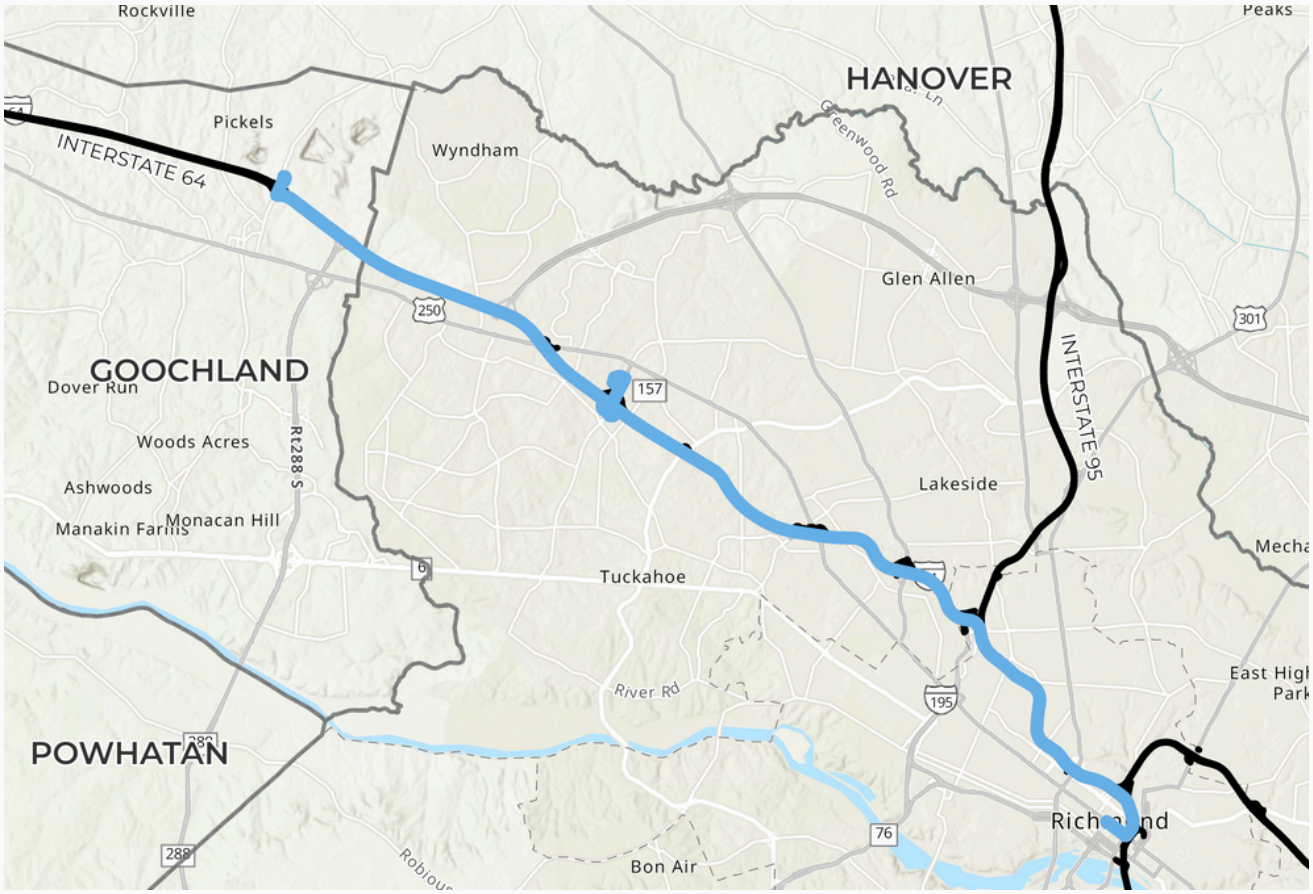

Figure 37. Possible route for Goochland Express bus service

It is proposed that the existing GRTC Gaskins Express bus route be extended to serve the Hickory Haven Park and Ride. The extension would result in an increase in travel time (relative to existing), bringing the total trip time from 25 to 39 minutes, plus 5 minutes for dwell time. The total trip distance would be 19 miles, an extension of 7 miles on for the current distance of 12 miles (excluding deadhead). Notably, the Hickory Haven Park and Ride facility in Goochland County was built in an area that demonstrates high transit propensity characteristics. This suggests that transit services could be successful, although it is not currently served by transit.

Additionally, expanding the planned GRTC LINK zone to serve Wyndham, Tuckahoe, and Glen Allen, to include the Hickory Hills park and ride facility would add further accessibility to this service. Such an expansion would extend the service area of the zone by two miles — a small adjustment with minimal additional cost but significant connectivity benefits.

Hanover Express

The Hanover Express route (Figure 38) addresses commuting needs between Hanover County and downtown Richmond, supporting areas identified in the Greater RVA Transit Vision Plan as suitable for enhanced transit service.

- Route: From Route 33 & Ashland Road directly to downtown Richmond.
- Distance and Travel Time: Approximately 21 miles, estimated travel time of 23 minutes.
- Pilot Service Schedule:
  - AM Peak: 1 IB & 1 OB trip
  - PM Peak: 1 IB & 1 OB trip
- Connection with Existing Service: Improves service further west on Staples Mill Road beyond current GRTC Route 18 to Parham. Vision Plan suggests potential for 15-minute service along Staples Mill to Mountain Road.

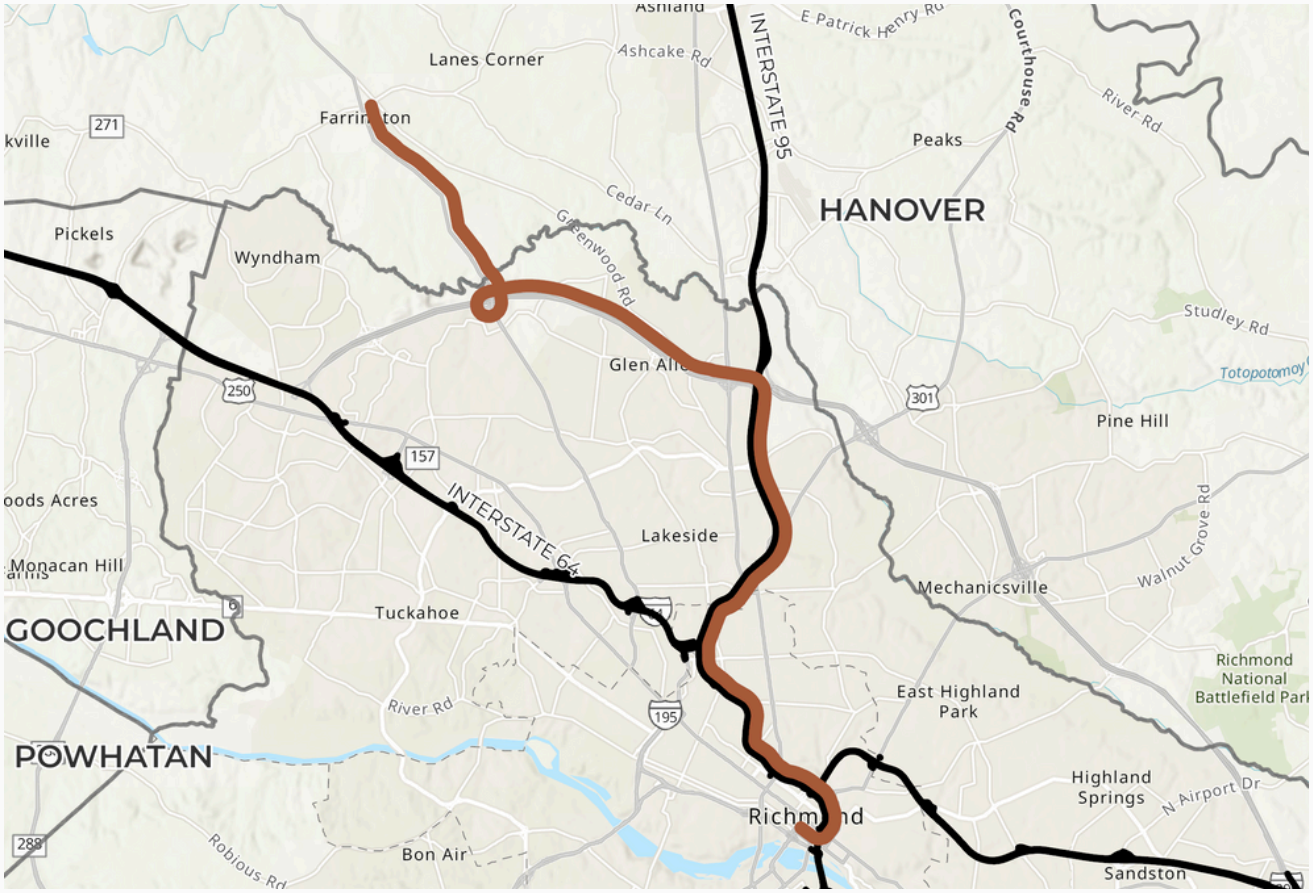

Figure 38. Possible route for Hanover Express bus service

GRTC currently operates two LINK microtranist zones in Hanover County. The Azalea LINK zone serves both Henrico and Hanover Counties and has proven successful in terms of ridership and popularity, demonstrating consistent rider growth since its launch. Although much of the activity is within the Henrico part of the zone. GRTC's Ashland LINK zone serves Ashland and the surrounding area of Hanover County, extending slightly into Henrico. Both zones connect to existing GRTC fixed-route bus routes, which operate with varying frequencies and spans of service and provide transit connections seven days a week.

A potential express route alignment for consideration to supplement these existing services would be one operating between western Hanover near Farrington to Downtown Richmond. Farrington, located in the southwestern part of the county, has generators along State Route 33, including churches, businesses, and a fire station, making it a viable starting point. For estimation purposes, the proposed routing runs from the intersection of State Route 33 and Ashland Road to 9th and Broad in Richmond, with a total travel time of 23 minutes for a 21-mile trip (excluding deadhead).

The express bus service alignments previously described are planned to be anchored at an existing or proposed park and ride facility and within an existing or planned GRTC LINK microtransit zones. No GRTC LINK zones currently exist or are planned that would serve the Farrington terminus of this proposed alignment. The results of the transit propensity analysis of this area suggests that propensity for transit in the western part of the county is high, suggesting that a microtransit zone serving this segment of the county and the proposed express route terminus may be viable.

Capital investment by way of constructing a new park and ride facility at the terminus of this proposed express route is recommended to expand access to the service. Additionally, we recommend that GRTC consider whether the express service and propensity findings suggest that a new LINK zone would be viable. Although the western part of the county is primarily agricultural with scattered single-family residences, transit propensity is found to be high due to existing long commute times and population density relative to the rest of the county. A new LINK zone, similar in size to existing zones, could provide critical first-mile/last-mile connectivity and directly link to the proposed express route, improving overall regional mobility.

Powhatan Express (Stony Point Express Route Extension)

The Powhatan Express extension (Figure 39) is proposed to meet the commuting needs from Powhatan County, expanding upon the existing GRTC 64x Stony Point Express Route.

- Route: A roughly 4-mile extension, adding a mid-route stop at Huguenot United Methodist Church, the current terminus.
- Distance and Travel Time: Approximately 24 miles with an estimated travel time of 43 minutes.
- Service Adjustments: Retains current service characteristics, adding an additional bus per peak to maintain existing frequency and reliability.
- Pilot Service Schedule:
  - AM Peak: 2 IB & 1 OB trips
  - PM Peak: 2 IB & 2 OB trips
- Existing Ridership: Averages approximately 13 riders per trip.

Figure 39. Possible route for Powhatan Express bus service

GRTC currently operates a LINK zone in Powhatan along Route 60 in the center of the county. The zone has experienced stagnant, low ridership relative to other zones in the region, which has prompted GRTC to evaluate the continued viability of the service. GRTC operates the existing Stony Point Express between Downtown Richmond and Bon Air, serving two unofficial park and ride facilities. The route currently operates three times per day, providing a 27-minute travel time. Extending this route into Powhatan County and providing connections to the GRTC Powhatan LINK zone could provide commuter service to the county while potentially generating ridership for the Powhatan Link Zone to connect to the service.

While transit-supportive infrastructure is lacking in the county, the express route could be extended to be anchored at the Route 60 Walmart parking lot. This would well serve the route while also providing another ridership generator for the LINK zone. With this additional stop, the Stony Point Express would have a total travel time of 60 minutes and cover 24 miles (excluding deadhead), improving connectivity for rural commuters in Powhatan County.

Expanded Express Bus Network Summary

The analysis completed in this effort suggests that population density, land use, and transit propensity of most of the PlanRVA study area is not conducive to support traditional fixed-route transit. GRTC has already implemented and planned GRTC LINK microtransit zones within these counties to provide mobility services that are more viable for the characteristics of the rural counties.

Implementing new and/or extended express bus routes can take advantage and leverage these services while providing additional mobility resources. Commuter activity represents a predictable daily demand, providing a limited number of targeted trips to capture some of that demand. It is a lower risk service to pilot to assess its popularity as it is unburdened to run very frequent service, or to operate trips during the midday or off-peak periods. This allows for rapid modification of the service to accommodate the preferences of customers. Connecting these express routes to GRTC Link Zones can also generate additional ridership for these services, while providing transfer opportunities for residents to the express bus routes.

Microtransit

GRTC's microtransit zones have generally received positive feedback, reflecting community satisfaction and effective local engagement. However, the Powhatan microtransit zone is underperforming, prompting further analysis and potential boundary revisions.

Additionally, two new microtransit zones are planned for Goochland and Hanover counties within the PlanRVA study area to expand transit accessibility and coverage. Bay Transit is launching microtransit zones in Charles City and New Kent counties in 2025, indicating ongoing demand and support for such flexible transit solutions in rural areas of the region.

Hanover Microtransit

Significant transit demand has been identified west of Ashland, where there is currently no GRTC LINK microtransit service. This area, along with the corridor between Mechanicsville and Ashland, has demonstrated substantial potential due to relatively higher transit-supportive population and employment density. Expansion into these areas would significantly enhance local coverage, effectively integrate with existing fixed-route services, and support the viability of planned express routes.

The proposed microtransit zone for Hanover County includes:

- Areas of Montpelier, Farrington, and Lanes Corner
- Placement strategically at the terminus of the proposed express route
- Total area coverage of approximately 26 square miles

Figure 40. Proposed Hanover Microtransit Zone

Goochland Microtransit

The Goochland microtransit zone proposal leverages local zoning characteristics, notably the mixed-use area around Hickory Haven Park-and-Ride, to maximize potential transit use. GRTC has specifically targeted the central region of Goochland County for service expansion, aiming to address transit service gaps and enhance accessibility across the county's western areas.

Key features of the proposed Goochland microtransit zone include:

- Centered around Hickory Haven Park-and-Ride
- Extension of existing GRTC microtransit zones
- Total area coverage of approximately 50 square miles with an additional 3 square mile extension

Figure 41. Proposed Goochland Microtransit Zone

Powhatan Microtransit

In Powhatan County, current microtransit service serves the eastern commercial and residential regions along Route 60. However, service effectiveness is challenged by low density land use and predominantly agricultural and scattered residential zoning throughout the county. While the existing zone is under-performing, further pilot programs and potential boundary adjustments are being considered to enhance service effectiveness. Discussions on these modifications focus on improving accessibility, efficiency, and responsiveness to local transit needs.

Charles City and New Kent Microtransit (Bay Transit)

A focused study conducted by WSP specifically addressed Bay Transit microtransit services for Charles City and New Kent counties. The outcome of this study recommended transitioning to a new microtransit service model, allocating one dedicated bus per county. This structure provides each county with dedicated service within a more manageable geographic area.

Demand Response Services

Providing viable transportation services in areas of low density and primarily rural and agricultural land uses, such as those in the majority of the PlanRVA study area, is a challenge. Figure 42 depicts the relative population density of census tracts across the PlanRVA study area and illustrates the low-density nature of much of the study area. However, regardless of relative population densities, some residents of these area may require transportation and mobility services, either occasionally or regularly.

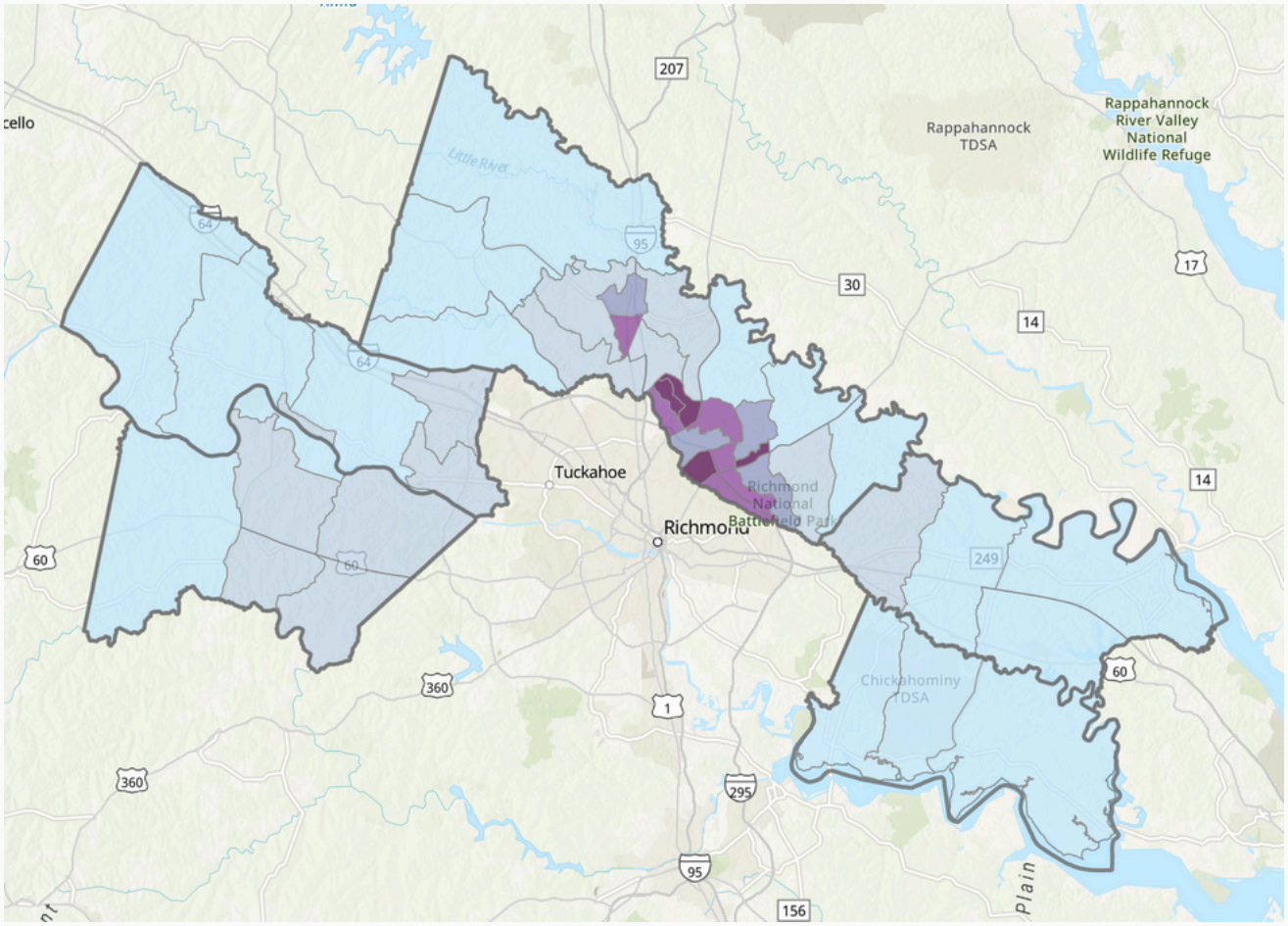

Figure 42. Population Density (darker purple is higher density)

Bay Transit operates on-demand transit services in New Kent County and Charles City County providing access to transportation in low-density portions of those counties. On-Demand service differs from microtransit in several ways. On-demand transit services can cover a much larger service area at low service frequency as does microtransit, which is concentrated in a limited, high-density. The concentration of service provided by microtransit allows for customers to book rides relatively close to their desired pick-up times. Conversely, on-demand

transit typically requires customers to book their trips at least 24 hours in advance, if not longer.

Despite these, on-demand transit can be a public transportation service that provides the wide coverage area necessary to make mobility services available to low density, low ridership areas. Bay Transit is currently operating an on-demand service in New Kent and Charles City Counties that provide county-wide-service coverage at low service frequencies and with booking times of at least 24 hours.

Other peer agencies in the region provide similar services, such as JAUNT in Charlottesville, Virginia. If Bay Transit's service is successful, it as well as services such as JAUNT could serve as models for implementing similar demand-response services in Hanover, Goochland, and Powhatan Counties. The service would be subject to longer wait times and should require residents to book 24-48 hours ahead. Advance booking should also be limited to 2 weeks in advance to prevent people from booking out space on the service too far in advance before their travel needs are confirmed.

A review of a demand-response system was completed of a service provided by a peer agency and within an area that is analogous to that of the PlanRVA system.

Peer Agency/Service Review - JAUNT Service

JAUNT is a regional public transit system that provides demand-response and commuter services in Central Virginia. It serves the Charlottesville, Virginia area and surrounding counties, including Albemarle, Buckingham, Fluvanna, Louisa, and Nelson. JAUNT specializes in rural and suburban transportation, operating a door-to-door service model for residents who may not have access to traditional fixed-route transit.

JAUNT's services are available to all rider types, including commuters, seniors, and individuals with mobility impairments. The agency also operates paratransit services and rural transit fixed routes, connect residents to essential destinations such as medical facilities, employment centers, and shopping areas. It also provides connections to the Charlottesville Area Transit (CAT) fixed-route bus system, enabling greater regional mobility.

JAUNT Bus (source: JAUNT)

JAUNT's model of providing county-wide demand-response service to rural areas with longer booking lead times could provide a model for implementing similar services in the PlanRVA region with larger service areas as compared to the microtransit zones. Implementing a similar system in Hanover, Goochland, and Powhatan Counties could parallel Bay Transit's demand-response service in Charles City and New Kent Counties and increase intra-county mobility services and expand access to transportation services to the entire county. However, demand-response services typically require the highest per-trip-operating cost as any public transportation service. This is due to low ridership, infrequent trip bookings, and high mileage covered by the vehicles and drivers.

Continued on next page

Coordinated Volunteer Drivers

Volunteer driver programs effectively harness existing community assets—such as residents' personal vehicles and local knowledge—to enhance mobility for rural populations. These programs fill in gaps in areas where public transportation is limited or nonexistent, providing essential services like transportation to medical appointments, grocery shopping, and social engagements.

Notable Volunteer Driver Programs and Features

Programs from as *Tri-Valley Transit* in Vermont and *Arrowhead Transit* in Minnesota match volunteers with residents who need rides to medical appointments or essential errands. *Marin Transit* in California empowers riders to recruit friends as drivers, while *ITNAmerica* operates nationally, offering ride credits for volunteer hours.

These services provide flexible, low-cost transportation tailored to community needs. By coordinating volunteer efforts and leveraging existing assets, these programs expand mobility for older adults, people with disabilities, and others with limited transportation options.

- Leveraging Community Assets: Utilizing residents' personal vehicles and local knowledge reduces overhead costs and fosters community involvement.
- Flexibility: Allowing volunteers to set their schedules and choose their service areas increases participation and program sustainability.
- Incentive Structures: Programs with mileage reimbursements provide tangible benefits to volunteers, encouraging ongoing involvement.
- Comprehensive Coordination: Centralized dispatch systems and scheduling software enhance efficiency, ensuring that transportation resources are effectively allocated.
- Diverse Service Offerings: Combining volunteer driver programs with other transportation services, such as microtransit or demand-response options, broadens accessibility for rural residents.

Infrastructure Needs

There are various infrastructure needs for transit, depending on the service types. More rural transit with less frequent service and fewer stops means fewer projects that add up in cost. Factors like sidewalks and bike lanes, which would be considered essential transit infrastructure in urban and most suburban settings, aren't usually expected to reach all surrounding residents in rural area.

Examples of different infrastructure are:

- Park and Ride Lots: Designated parking areas where commuters can leave their cars and connect to express buses or microtransit services
- Bus Shelters and Benches: Covered waiting areas with seating to enhance comfort and accessibility for riders
- Sidewalks and Pedestrian Crossings: Safe, well-marked walkways that improve first-mile/last-mile connections to transit stops
- Bike Lanes and Bike Racks: Basic infrastructure to support multimodal commuting

Left: Park and ride bus shelter in Henrico
Right: Bike parking sign at New Kent lot

County-Specific Infrastructure Recommendations

New Kent County

New Kent requires strategic infrastructure investments to support new commuter and microtransit services. At Bottoms Bridge, ongoing expansion work positions the existing park-and-ride facility to serve commuter buses effectively. Conversely, the Public Works lot currently lacks sufficient infrastructure for bus access, necessitating significant enhancements or the selection of alternative sites.

- Bottoms Bridge Park-and-Ride: Short-term use as-is; long-term expansion based on demand.
- Public Works Lot: Identify alternative locations or invest in substantial access improvements.

Charles City County

Charles City has existing public parking near its courthouse complex, but these facilities lack transit-specific amenities. The county should evaluate existing lots for immediate express bus service and plan for future upgrades.

- Courthouse Complex: Immediate use with minimal modifications; future shelter construction and pedestrian infrastructure enhancements based on demand.

Goochland County

Goochland's Hickory Haven park-and-ride currently has limited infrastructure and faces challenges accommodating bus service. With VDOT's planned Diverging Diamond Interchange (DDI) at Ashland Road, substantial infrastructure improvements and coordination will be essential.

- Hickory Haven Park-and-Ride: Short-term coordination with ongoing DDI redesign for safe bus circulation; long-term relocation or significant lot reconstruction within interchange improvements.

Hanover County

Hanover currently lacks transit-supportive infrastructure in the Farrington/ Ashland Road area, a proposed terminus for express routes. Immediate infrastructure planning is necessary, including securing an appropriate site for a park-and-ride facility.

- Farrington Area: Short-term identification and evaluation of suitable parcels; long-term development of a dedicated transit-oriented park-and-ride facility.

Powhatan County

Powhatan's transit infrastructure needs center around the Holly Hills area, particularly near Walmart and Luck Stone. Given the lack of public infrastructure, establishing temporary arrangements while planning a permanent solution is crucial.

- Holly Hills Area: Immediate negotiation of a lease agreement; long-term development of a dedicated park-and-ride lot based on growing demand.

Powhatan Courthouse Area

Infrastructure Implementation Summary by Service Type

Express Commuter Services will require improvements to park-and-ride facilities across the region. Priority sites ready for short-term implementation include Bottoms Bridge (New Kent) and Charles City Courthouse area. Goochland and Powhatan will necessitate careful coordination due to current site limitations and forthcoming road projects.

- Immediate prioritization of park-and-ride expansions and improvements in high-demand commuter corridors.
- Coordination with VDOT's road projects to integrate transit accessibility.

Microtransit Services rely primarily on existing roadway infrastructure and minimal additional physical investments. Essential improvements will focus on integrating microtransit zones with park-and-ride facilities, enhancing passenger amenities, and ensuring efficient booking and dispatch technologies.

- Minimal infrastructure expansion required beyond technology upgrades and strategic integration points with park-and-ride facilities.

Demand-Response Services primarily require reliable vehicles, administrative coordination, and minimal physical infrastructure. Strategic regional coordination will be key to ensure operational efficiency and maximize resource utilization.

- Enhanced dispatching and administrative facilities for efficient regional demand-response service management.

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Cost-Benefit Analysis

Demographic Trends within the Study Area

Population growth in each county was analyzed from 1970 and projected to 2045 for all 5 counties. The population growth trends in terms of total population growth are illustrated in Figure 43. According to Richmond Regional Transportation Planning Organization's (RRTPO) 2045 Long Range Growth Forecast Analysis, New Kent County is projected to have the highest population growth of 69.9% from 2017 to 2045, followed by Goochland County and Powhatan County at 43.3% and 41.5% respectively. The population growth trends indicated in New Kent County was also confirmed to the team by Advisory Group members. The population growth projections for each county between 2017 and 2045 and the resulting growth rate is summarized in Figure 44.

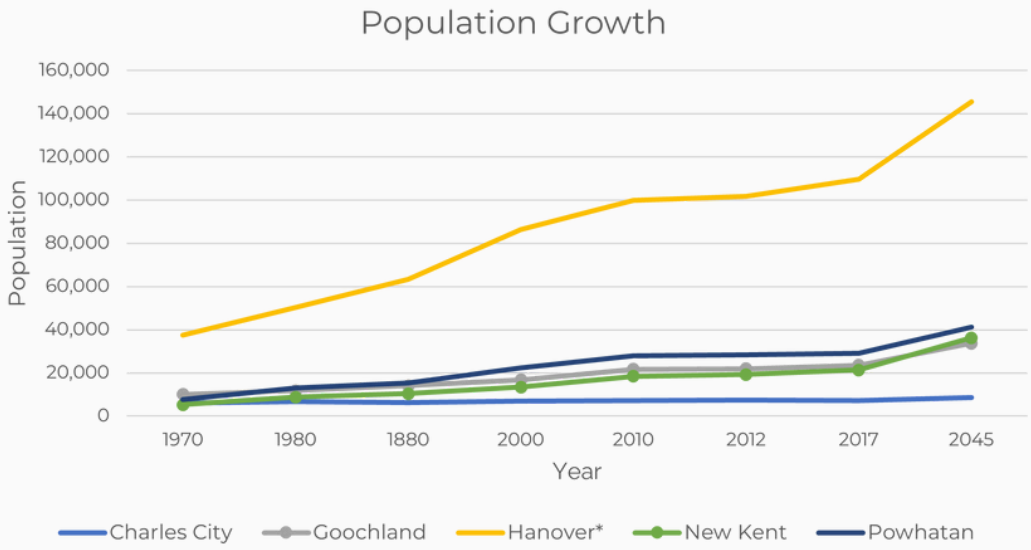

Figure 43 (left): Regional Population Growth 1970 to 2045 by County

Figure 44 (below): Chart of Regional Population Growth 1970 to 2045 by County

Source: 2045 Long Range Growth Forecast Analysis

County	2017	2024 (projected)	Growth Rate (projected)
Charles City	7,126	8,540	19.8%
Goochland	23,536	33,738	43.3%
Hanover	109,595	145,559	32.8%
New Kent	21,347	36,270	69.9%
Powhatan	29,147	41,248	41.5%
Region	**1,091,680**	**1,413,230**	**29.5%**

Similar to population growth, New Kent County is also expected to have the most growth in automobile ownership at 71% from 2017 to 2045, followed by Goochland County and Powhatan County at 44%. Charles City has the highest auto ownership at 3 cars per household, with a 20% growth rate expected. With more cars on the road expected, the number of trips will increase, indicating a growing demand for transit on some of those trips. The projected trends in automobile ownership for each county is depicted in Figure 45.

County	2017	2024 (projected)	Rate
Charles City	8,672	10,391	20%
Goochland	23,485	33,705	44%
Hanover	97,794	127,162	30%
New Kent	21,868	37,365	71%
Powhatan	29,566	42,694	44%
Region	**883,407**	**1,149,111**	**30%**

Figure 45: Projected Auto Ownership by County 2017-2045

Projected Operating Costs for New/Expanded Services

Operating costs for new and extended express bus routes recommended in this study were estimated using projected ridership and operating costs per vehicle revenue mile (VRM) of other GRTC express routes in the service area. Because GRTC reports both fixed-route and express route service as one category to NTD, Maryland Transportation Authority (MTA) was used as a proxy for their express bus service. Their operating cost per VRM is $8.74. This was calculated in to estimate a trip and annual operating cost, assuming 260 days per year of operation for weekday-only service. These results are summarized in Figure 46.

Proposed Route	Daily Trips	Trip Distance (mi)	Estimated Trip Cost	Estimated Annual Operating Cost
Charles City Express	6	32	$280	$436,301
New Kent Express	8	26	$227	$472,659
Chickahominy Express	6	36	$315	$490,838
Hanover Express	4	21	$184	$190,000
Goochland Express	18	7	$166	$735,000
Powhatan Express	7	13	$210	$380,000

Figure 46: Estimated Operating Costs for Proposed Express Routes

Projected Ridership for Express Routes

Ridership estimates were projected for the proposed express routes based on a review of market data and comparison to similar services. Specifically, metrics including population and employment density, zero vehicle households, and low wage workers were summarized for the census tracts within 2 miles of bus stops served by Routes 29X, 64X, 82X, and 95X. This data was then compared between routes to develop a proportional ranking of each metric and its influence on ridership. These rankings were aggregated and compared to existing ridership counts to develop a regional ridership factor. This factor was then applied to metrics within 2 miles of the proposed express bus stops that were developed using the same process resulting in the estimated future ridership.

The resulting average daily and ridership estimates for the express routes included herein are summarized in Figure 47. These projections reflect ridership derived from existing conditions if the services was to launch today and are therefore conservative estimates.

Proposed Route	Anticipated Average Daily Ridership	Anticipated Average Annual Ridership
Charles City Express	8	2,080
New Kent Express	5	1,300
Chickahominy Express	11	2,860
Hanover Express	2	520
Goochland Express	4*	1,040*
Powhatan Express	6*	1,560*

Figure 47: Projected Express Route Ridership Estimates
**Additional riders in addition to existing demand*

Projected Operating Costs for Microtransit Zones

The same process was applied to develop micro-transit ridership estimates by comparing the above metrics of existing micro-transit zones to the existing ridership of each zone. Operating costs for the proposed new and expanded microtransit zones included in this report were projected by estimating vehicle revenue hours (VRH), using GRTC's span of service for their existing LINK microtransit zones, and applying a cost per hour based on GRTC's NTD reporting.

The current span of service is Monday through Friday, with varying spans. Assuming a new zone would operate on a smaller span of service as does existing zones, a 13-hour day was used which is the current span for the Powhatan zone. The total operating cost of each GRTC LINK zone is summarized in Figure 48.

It is important to note that the efficiency/productivity of each zone depends on the size of the zone and the number of vehicles assigned to each zone. The larger the zone, the longer the wait time. Conversely, the more vehicles operated in that zone, the coverage provided, and the shorter the wait time. Marketing and increased awareness of the service can provide further benefits to ridership and productivity.

Annual Cost per Vehicle per Microtransit Zone	
Cost per Hour	$64
Hours per Day	13
Days per Year	260
Annual Cost per Vehicle per Zone	$216,320

Figure 48: Estimated Costs for Proposed Microtransit Zones

Figure 49 and Figure 50 on the following page summarizes the cost of express and microtransit service for each county and includes infrastructure recommendations as short- and long-term solutions.

Ridership for microtransit services is harder to project. Recommended alternatives included in this study are both extensions to existing zones as well as new zones. Ridership for microtransit can be highly variable based on the number of transfers to express bus routes, overall public transportation usage trends, underlying density and demographics, as well as the level of service investment made (i.e. number of vehicles assigned to a zone and the resulting average wait times of customers).

Continued on next page

Express Service

Route	Service Cost Annual (+Daily)	Daily Ridership	Cost-Benefit	Infrastructure (short and long term)
New Kent Express	$472,659 ($1,818)	5	$364 per ride	• Short-term use as is • Long term – access improvements
Chickahominy Express	$490,838 ($1,888)	11	$172 per ride	
Charles City Express	$436,300 ($1,678)	8	$209 per ride	• Short-term use as is • Long term – access improvements, park & ride
Hanover Express	$190,000 ($730)	2	$365 per ride	• Park & Ride
Goochland Express*	$735,000 ($2,825)	4	$705 per ride	• Need access improvements or bus stop to serve with larger vehicles • Potential long-term expansion based on demand/growth
Powhatan Express*	$380,000 ($1,460)	6	$245 per ride	• Short-term lease with Walmart • Potential long term new lot based on demand/growth, or inability to secure lease with Walmart

Figure 49. Express Service Estimated Costs
**Extension of existing express route*

Microtransit Service

County	Service Cost Annual (+Daily)	Daily Ridership	Cost-Benefit	Infrastructure (short and long term)
New Kent (Bottoms-Bridge)	N/A	N/A	N/A	By Others
New Kent (Providence Forge)	N/A	N/A	N/A	
Charles City	$105,300 ($578)	7	$82 per rider	N/A
Hanover	$105,300 ($578)	1	$578 per ride	N/A
Goochland	N/A	Not evaluated	Not evaluated	Not evaluated
Powhatan*	N/A	Not evaluated	Not evaluated	Not evaluated

Figure 50. Microtransit Service Estimated Costs
**GRTC currently evaluating service*

Next Steps for Infrastructure Implementation

Successful implementation of recommended infrastructure improvements will require ongoing coordination with local governments, regional transportation bodies, and VDOT. Securing funding through partnerships and public engagement will also be critical.

Recommended immediate next steps include:

- Coordinating closely with VDOT's current and upcoming infrastructure projects, particularly the DDI at Ashland Road in Goochland.
- Engaging communities and stakeholders regularly to prioritize infrastructure improvements that align with local needs.
- Identifying and pursuing state, federal, and public-private partnership funding opportunities to support essential infrastructure investments.

The Central Virginia Transportation Authority (CVTA) will also play a critical role in implementation by serving as a regional funding conduit and coordination body. CVTA's support can help align infrastructure investments with broader regional mobility goals, facilitate cross-jurisdictional projects, and ensure that rural priorities are considered in the allocation of transportation funds.

Park and Ride lot in Henrico County

Conclusion

In 2025 and beyond, regional stakeholders will continue working together to refine these recommendations, identify implementation steps, and pursue funding opportunities at the local, state, and federal levels. This includes aligning efforts with ongoing studies, upcoming grant cycles, and infrastructure improvements such as park and ride upgrades and microtransit zone expansions.

Each county's needs and service opportunities—ranging from new express routes to demand-response transit—will be further explored with partners like GRTC, Bay Transit, and local governments. As implementation begins, continued community input and collaboration will be vital to ensuring that services are responsive, sustainable, and equitable.

You can keep up to date on this and other projects at **engage.planrva.org**

The summarized Community Guide for the Rural Transportation Analysis can be found at **engage.planrva.org/rural-transportation**

Rural Transportation Analysis

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