Harrisonburg Rockingham Metropolitan Planning Organization

112 MacTanly Place, Staunton, VA 24401
(540) 885-5174
hrmpo.org

Harrisonburg-Rockingham Metropolitan Planning Organization
Technical Advisory Committee Meeting Agenda
August 6, 2026, 2:00 p.m.

Rockingham County Administration Center
20 East Gay Street, Harrisonburg, VA 22802

1. Call to Order
2. Approval of Minutes of the April 2, 2026, Meeting*
3. Public Comment
4. HRMPO Transportation Improvement Program (TIP) Amendments
5. Stone Spring Road Small Area Study Scope of Work Review (TAC Memo #26-03)
6. Rockingham County Transit Feasibility Study Update (TAC Memo #26-04)
7. Agency Updates
    a. VDOT
    b. DRPT
    c. HDPT
    d. Localities
8. Other Business
9. Upcoming Meetings
    a. August 20, 2026 – Policy Board Meeting, 3:00 p.m., Rockingham County Administration Center
    b. September 3, 2026 – TAC Meeting, 2:00 p.m. Rockingham County Administration Center
10. Adjourn

* Action needed

Harrisonburg Rockingham Metropolitan Planning Organization

112 MacTanly Place, Staunton, VA 24401
(540) 885-5174
hrmpo.org

Harrisonburg-Rockingham Metropolitan Planning Organization Technical Advisory Committee (TAC) Minutes April 2, 2026, 2:00 p.m.

Meeting conducted at Rockingham County Administration Center at 20 E Gay St, Harrisonburg, VA 22802 and virtually via Teams

	City of Harrisonburg		**VDOT**		**Staff**
✓	Tom Hartman, Chair		Adam Campbell	✓*	Paula Melester
	Kyle Lawrence		Don Komara	✓	Garreth Bartholomew
✓	Thanh Dang		Burgess Lindsey	✓	Zach Beard
✓	Gerald Gatobu	✓*	Shane McCabe		**Others**
✓	Jakob zumFelde		**DPRT**	✓	Kayla Dixon
✓	James Polhamus	✓*	Grace Stankus		
	Rockingham County				
	Rachel Salatin		**Non-Voting Members**		
✓	Dylan Nicely, Vice Chair		Kevin Jones, FHWA		
✓	Julia Cottrell		Bill Yates, JMU		
	Town of Bridgewater		Stephen Smiley, DOAV		
✓	Alex Wilmer	✓	Valerie Kramer, JMU		
	Town of Dayton		Lora Grady, FTA		
✓*	Gary Corder				
	Town of Mt. Crawford				
✓	Libby Clark				

***Virtual attendance**

Call to Order

Chair Tom Hartman called the April 2, 2026, meeting of the Harrisonburg-Rockingham Metropolitan Planning Organization (HRMPO) Technical Advisory Committee (TAC) to order at 2:00 p.m.

Minutes

Chair Hartman presented the minutes from the February 5, 2026, TAC meeting.

Mr. Dylan Nicely motioned to approve the minutes, seconded by Mr. James Polhamus. Motion carried unanimously.

Public Comment

Chair Hartman opened the floor for public comment. There were no public comments.

112 MacTanly Place, Staunton, VA 24401
(540) 885-5174
hrmpo.org

FY27-30 Transportation Improvement Program Release for Public Comment (TAC AF #26-04)

Mr. Zach Beard presented the draft Fiscal Year 2027-2030 (FY27-30) Transportation Improvement Program (TIP) and requested TAC recommendation that the Policy Board release the document for a 14-day public comment period. Mr. Beard explained that the TIP documents all highway and transit projects receiving federal transportation funding, requiring federal action, or designated as regionally significant. The current FY24-27 TIP expires September 30, 2026, and the FY27-30 TIP must be approved by May 31, 2026, to take effect October 1, 2026. Following approval, the TIP is incorporated into the Statewide Transportation Improvement Program (STIP) and submitted to FHWA and FTA.

Mr. Beard noted that staff have revised the document format to address readability and version-control problems that developed under the prior structure, in which amendments accumulated within a single document over time. The FY27-30 TIP will be structured as three distinct components: a narrative document containing all required federal and state compliance language, and two standalone spreadsheet appendices for highway and transit projects. Each appendix will display only current project funding figures and be updated as amendments are approved, with prior versions archived on the HRMPO website.

Mr. Beard encouraged members to review the project tables distributed with the meeting mailout and contact MPO or VDOT staff with any corrections prior to publication, as amendments are substantially more burdensome to process after adoption. Mr. Beard noted that transit projects require more frequent amendment than highway projects due to year-to-year transit funding cycles, and that DRPT has moved to broader project category descriptions for this TIP cycle to reduce the frequency of routine amendments.

Ms. Libby Clark motioned to recommend that the Policy Board release the Draft FY27-30 Transportation Improvement Program for a 14-day public comment period; seconded by Mr. Jakob zumFelde. Motion carried unanimously.

Title VI Plan Update (TAC Memo #26-02)

Mr. Ms. Paula Melester provided an update on the CSPDC Title VI Plan and noted that the presentation fulfills the annual Title VI training requirement for TAC members. No TAC action was required.

Ms. Melester explained that Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color, and national origin in any program receiving federal financial assistance, and that MPOs are required to ensure broad public access to the planning process, engage traditionally underserved populations, and equitably distribute transportation benefits and burdens. VDOT conducts a triennial compliance review of each MPO's Title VI plan. The most recent HRMPO review was completed in January 2026. While the plan was not out of compliance during the review period, required corrections must be incorporated by April 24, 2026.

The required changes concern two rescinded Executive Orders. References to Executive Order 12898, including the term "environmental justice," and to Executive Order 13166, including the term "limited English proficiency," must be removed from the plan. Ms. Melester noted that national origin remains

112 MacTanly Place, Staunton, VA 24401
(540) 885-5174
hrmpo.org

protected under Title VI itself independent of the rescinded orders, and that the HRMPO's substantive practices will remain unchanged. At VDOT's direction, "limited English proficiency" is being reframed as "individuals with language access barriers." Staff are also expanding this definition to include individuals with sensory disabilities, including those who are hard of hearing or have vision impairments, and are consolidating the previously separate Title VI plans for HRMPO, SAWMPO, and the CSPDC rural transportation program into a single agency-wide plan covering the full CSPDC region, while maintaining program-specific demographic data and analysis for each area.

The HRMPO Policy Board approved release of the draft CSPDC Title VI Plan for a 14-day public comment period at the March 19, 2026, Board meeting. The comment period opened April 1 and closes April 15, 2026. The Policy Board will consider final approval at its April 16 meeting, followed consideration of CSPDC Board approval on April 20 and submission to VDOT.

FY27 Unified Planning Work Program (UPWP) Update

Ms. Paula Melester and Mr. Garreth Bartholomew presented an overview of the Fiscal Year 2027 Unified Planning Work Program (UPWP). No TAC action was required.

Ms. Melester explained that the UPWP is a federally required annual work program outlining all MPO planning activities and how federal, state, and local funds will be used. Funding comes from PL planning funds from FHWA through VDOT and Section 5303 transit planning funds from FTA through DRPT, supplemented by prior-year carryover. A notable change for FY27 is an increased allocation of approximately $68,000 for local assistance — nearly double the typical amount — reflecting a more intentional approach informed by one-on-one UPWP coordination meetings held with each member locality to identify specific projects where MPO assistance would be most valuable. Total annual MPO funding is approximately $550,000.

Long Range Planning

Mr. Bartholomew described the planned activities by program area. For long-range planning, staff will kick off the 2055 Long Range Transportation Plan (LRTP) in FY27, with a focus on supplementing rather than duplicating existing locality planning efforts. The 2050 Travel Demand Model (TDM) will be completed by the start of FY27, providing the foundational modeling tool for the LRTP. Long-range planning also includes continued support for the Bike the Valley regional multimodal connectivity program. For short-range planning, staff will maintain and administer the FY2027-2030 TIP and scope a small area study in Rockingham County, with additional details forthcoming.

Local Assistance

For local assistance, staff will work with the Town of Dayton on pedestrian and multimodal planning, building on a prior planning effort focused on the Town's historic alleyway network and connectivity to key community destinations. Staff will also work with the Town of Mt. Crawford on pedestrian and multimodal planning in support of a potential Transportation Alternatives Program (TAP) application, and will develop a regional sidewalk and trail planning resource for all HRMPO member localities addressing requirements, cost implications, and funding strategies.

Ms. Melester noted that the expanded local assistance capacity reflects significant staff investment in training and new tools, including AI-assisted visualization, enabling more in-house delivery of planning services. She recognized Mr. Bartholomew's contributions in this area and noted Ms. Kayla Dixon's forthcoming role in supporting public engagement for the LRTP and other MPO work.

Transit

Regarding transit planning, most transit planning funds support HDPT's activities. Ms. Melester noted and Mr. Gatobu confirmed that HDPT's anticipated FY27 transit planning activities are primarily ongoing operational and compliance efforts. Ms. Melester noted that a technical assistance grant application was submitted to DRPT to fund development of a transit service plan for Rockingham County, building on recommendations from a prior feasibility study that identified potential for localized service and a demand-response model in the Bridgewater, Dayton, and Mt. Crawford area. If funded, with notification expected later in the fiscal year, the MPO would facilitate a consultant-led process to translate the feasibility study into current-dollar costs and implementable service models, with results needed before the next grant cycle opens in December.

SMART SCALE Round 7 Pre-application Update and North Mason Street Corridor Study Update

Mr. Garreth Bartholomew provided an update on HRMPO's SMART SCALE Round 7 pre-application submissions, with additional presentations by City of Harrisonburg and Rockingham County staff on their respective applications. No TAC action was required.

Mr. Bartholomew noted that April 1, 2026, was the pre-application deadline. The CSPDC and HRMPO collectively submitted five pre-applications: recommendations from the VDOT STARS study on the Vine Street corridor; project pipeline recommendations for the Route 42/Virginia Avenue corridor; recommendations from the North Mason Street Corridor Study; a resubmission of the Port Republic Road Exit 245 recommendations re-entering the SMART SCALE cycle due to funding changes; and recommendations from the Port Republic Road/Peach Grove study. Mr. Bartholomew noted that the Vine Street and North Mason Street applications were submitted both by the MPO and by the City of Harrisonburg. Because MPO submissions are eligible only for the statewide High Priority Program (HPP) funding pool while City submissions are also eligible for district grant funding, double-submitting allows the City to pursue whichever pool proves more competitive. A decision on which submission to advance will be made before full applications are due.

Vine Street STARS Study

Mr. James Polhamus and Mr. Jakob zumFelde described the Vine Street STARS study corridor from US-11/North Main Street to Route 33/East Market Street. The preferred alternative includes a roundabout at Washington Street; continuous sidewalk on at least one side of Vine Street from North Main to East Market; two crosswalks with rectangular flashing beacons (RFBs) connecting to HDPT bus stops near Leslie Court and Meadowlark; and bike lane ramps at the Washington Street roundabout allowing cyclists to either remain in-lane or transition to a six-foot sidewalk facility around the roundabout. At Old Furnace Road, where a roundabout was considered but presented design challenges, the preferred treatment adds left-turn lanes, replaces signal infrastructure, and adds crosswalks connecting to existing sidewalk.

Route 42/Virginia Avenue Pipeline Study

Mr. Polhamus and Mr. zumFelde described the Virginia Avenue pipeline study corridor from King Street to the city-county line near Harmony Drive. Key improvements include left-turn lanes in both directions at 3rd Street; a short median at 5th Street functioning as a gateway treatment and sight distance improvement; reconfigured turn lanes at Mount Clinton Pike with a sidewalk gap fill to Common Good Marketplace; a median section near Virginia Mennonite Retirement Community (VMRC)/Acorn Drive as a gateway treatment; a sidewalk gap fill near Harmony Square Shopping Center; and approximately 900 feet of new sidewalk from Harmony Drive to Old Windmill Circle, completing a continuous sidewalk along the corridor. Reconfiguration of the Mount Clinton Pike intersection is being pursued separately ahead of SMART SCALE funding.

City of Harrisonburg North End Greenway

Mr. James Polhamus described the North End Greenway application, which proposes connecting the existing North End Greenway via pedestrian and shared-use path improvements along Chicago Avenue and along MLK Jr. Way and East Market Street. The improvements would create sidewalk along MLK Jr. Way over Reservoir Street and upgrade the East Market Street sidewalk to a shared-use path, improving access to the shared-use path being constructed in the median of East Market Street over the railroad and Interstate bridges as part of the ongoing bridge replacement project. Some improvements at Main Street are shared with the North Mason Street application and could be implemented independently if only one project is funded.

Rockingham County Applications

Mr. Dylan Nicely described the County's three SMART SCALE pre-applications: dual left-turn lanes at US-33 and Resort Drive, a recurring application that has been value-engineered to reduce costs over successive cycles; dual left-turn lanes at Stone Spring Road and Reservoir Road, an intersection with documented crash history supported by multiple traffic impact analyses (TIAs); and shoulder widening and intersection signage improvements on the Mayland Road (Route 259) corridor from a recently completed VDOT STARS study addressing road departure crashes.

North Mason Street Corridor Study

Mr. James Polhamus, with input from Mr. zumFelde, presented the draft preferred alternative for the North Mason Street Corridor Study developed with consultant VHB. The preferred alternative establishes one travel lane in each direction for most of the corridor with left-turn lanes at major intersections, new open space where feasible, and a shared-use path on the east side of North Mason Street for most of the corridor length. In the block between East Market Street and Elizabeth Street, a single northbound lane is maintained alongside the existing southbound lanes to accommodate constrained geometry, before transitioning to the standard cross-section north of Elizabeth Street.

At Gay Street, a roundabout is proposed which is larger than the temporary roundabout installed in summer 2025 and is sized to accommodate truck movements and to operate more efficiently than the existing signal. Funded bike lanes on Gay Street would connect into the shared-use path at the roundabout. At North Main Street, the existing traffic signal would be removed, with a reconfigured slip lane and crosswalk improvements. Signals at Wolfe Street and Elizabeth Street will be retained.

Additional elements include new sidewalk on the east side of North Mason Street between East Market and Elizabeth Streets, sidewalk reconstruction in the two blocks south of Wolfe Street, a bus shelter pad for the existing HDPT stop between Elizabeth and Wolfe Streets, and a short bike lane segment north of Wolfe Street connecting to the Federal Street shared-use path. The open house held prior to the pre-application deadline was well attended and allowed the study team to finalize intersection treatment decisions based on community feedback.

Agency Updates

Virginia Department of Transportation (VDOT)

Mr. Burgess Lindsey provided the following updates:

- I-81 Staunton widening project: Virginia State Police installed speed enforcement cameras in the work zone. Warning notices will be issued beginning April 3, 2026, for 30 days, with $100 fines beginning May 2, 2026, near mile marker 224. Similar cameras are anticipated in the I-81 Harrisonburg widening corridor as that project advances.

Mr. Shane McCabe provided the following updates on behalf of Mr. Adam Campbell, who was not in attendance:

- SMART SCALE Round 7 pre-applications were due April 1, 2026. Full applications will open in approximately three months.
- The next Staunton District Spring Meeting is scheduled for April 28, 2026, from 4:00 to 6:00 p.m. at Blue Ridge Community College (BRCC).

Department of Rail and Public Transportation (DRPT)

Ms. Grace Stankus provided an update:

- The draft FY27 Six-Year Improvement Program (SYIP) is expected to be released on approximately April 14, 2026.
- The Virginia Breeze Tidewater Current route will launch April 20, 2026, connecting Harrisonburg to Virginia Beach along the I-64 corridor with intermediate stops. Tickets are available on the Virginia Breeze website.

City of Harrisonburg Department of Public Transportation (HDPT)

Mr. Gerald Gatobu provided the following updates:

- HDPT recently completed installation of a new paratransit scheduling software system and is monitoring performance.
- HDPT is implementing a new Transit Intelligent Transportation System (ITS) system through Avail Technologies, with installation targeted for June–July 2026. The system will include a rider-facing app called MyStop; HDPT plans to coordinate with JMU ahead of the fall semester to promote the new app.
- HDPT is exploring extended evening service hours for city routes through August 2026, as well as increased frequency on select routes through an A/B bus approach piloted during spring break.

- HDPT is preparing for fall semester staffing, with driver recruitment and training underway.

Locality Updates

Rockingham County

Mr. Dylan Nicely reported no updates beyond the SMART SCALE applications discussed earlier.

City of Harrisonburg

Chair Hartman provided the following updates:

- University Boulevard construction is ongoing, with approximately eight months remaining.
- The Port Road projects including Bluestone Drive, and the signal at Bradley Drive are currently out for bid, with a contractor expected to be selected by May or June 2026. The project will involve approximately two years of construction activity on Port Republic Road.

Other Business

Ms. Melester announced that CSPDC is redoing its on-call consultant procurement. The current on-call bench remains in effect through the end of calendar year 2026, with the new solicitation anticipated this summer and new contracts beginning January 2027.

Ms. Melester introduced Ms. Kayla Dixon, who has served as a CSPDC graduate assistant from JMU while completing her Master of Public Administration degree. Ms. Dixon will join CSPDC full-time on July 1, 2026, as an outreach and public engagement planner, with time allocated to the HRMPO and a lead role in public engagement for the 2055 LRTP update.

Upcoming Meetings

Chair Hartman announced the following upcoming meetings:

- April 16, 2026 – HRMPO Policy Board Meeting, 3:00 p.m., Rockingham County Administration Center
- May 7, 2026 – HRMPO TAC Meeting, 2:00 p.m., Rockingham County Administration Center

Adjournment

There being no further business, the meeting was adjourned at 3:06 p.m.

Respectfully submitted,

Zach Beard, Program Manager

Harrisonburg Rockingham Metropolitan Planning Organization

112 MacTanly Place, Staunton, VA 24401
(540) 885-5174
hrmpo.org

TO:	Harrisonburg-Rockingham MPO Technical Advisory Committee
FROM:	Zach Beard, Program Manager
MEETING DATE:	August 6, 2026
RE:	**TAC Memo #26-03: Stone Spring Road and Ridgedale Road Small Area Study Overview**

EXECUTIVE SUMMARY

The HRMPO FY2027 Rockingham County Stone Spring Road and Ridgedale Road Small Area Study will produce a Transportation Master Plan to establish a preferred future transportation network for Stone Spring Road, Ridgedale Road, Greendale Road, address the possible extension of Peach Grove Avenue, and evaluate future development impacts on Ramblewood Road in the City of Harrisonburg. Subject to further TAC review and edits, staff will finalize the Scope of Work and procure a consultant in August 2026. The study will begin in September 2026 and be completed in Spring 2027.

BACKGROUND

Stone Spring Road and Ridgedale Road are within the Rockingham County Stone Spring Urban Development Area (UDA). The County's UDA Plan, last updated with the County's 2024 Comprehensive Plan, identifies a land use vision for compact, mixed-use development, but does not identify a specific future network framework for functional classification, access management spacing standards, intersection control recommendations, capacity or level-of-service analysis, or actual roadway alignments/typical sections.

Developer activity in the study area is increasing. A rezoning for 425 units (Weidig) is under review and recommends changes at the Stone Spring Road / Ridgedale Road intersection, and a developer (Walnut Grove) has begun informal land negotiations along the anticipated Peach Grove Avenue alignment.

Currently, County staff review each development application in the study area without a preferred transportation network framework to reference, which has resulted in inconsistent access management outcomes. The County is need of a Master Plan to help guide development review, rezoning, and access management and proffer decisions.

Additionally, the City of Harrisonburg is interested coordinating the potential impacts of a potential Peach Grove Avenue Extension on City facilities, in particular along Ramblewood Road, and also incorporating any relevant takeaways from the City's Erickson Avenue Area Study (2025), which is adjacent to the Stone Spring and Ridgedale Road area.

SCOPE DEVELOPMENT AND STAKEHOLDER REVIEW

Staff developed the attached draft Scope of Work through coordination with Rockingham County, the City of Harrisonburg, and VDOT Staunton District Planning staff. Key scope elements include:

- A six-task structure covering project coordination, existing conditions, future conditions and forecasting, network alternatives, public engagement, and the final Master Plan.

- A 2050 design-year future conditions analysis using the HRMPO Travel Demand Model, evaluating two land use buildout scenarios developed with the County and City.
- A preferred transportation network alternative addressing Stone Spring Road access management, Ridgedale Road's future function and classification, and the Peach Grove Avenue extension's alignment, right-of-way, and planning-level cost.
- A standalone Ridgedale Road capacity and geometry analysis.
- A public engagement component consisting of an online survey administered by HRMPO.

NEXT STEPS

After the TAC reviews the attached draft Scope of Work, staff will finalize the scope incorporating any comments received and solicit firms from CSPDC's on-call consultant roster. Staff anticipates a kickoff meeting in September 2026, with study completion in Spring 2027.

ATTACHMENT

- FY27 Stone Spring Road and Ridgedale Road Small Area Transportation Plan Draft Scope of Work

Harrisonburg-Rockingham Metropolitan Planning Organization
Central Shenandoah Planning District Commission

Stone Spring Road and Ridgedale Road Small Area Transportation Plan Scope of Work

Study Name	Stone Spring Road and Ridgedale Road Small Area Transportation Plan
Lead Agency	HRMPO / Central Shenandoah Planning District Commission (CSPDC)
Partnering Localities	Rockingham County, City of Harrisonburg
Other Stakeholders	VDOT Harrisonburg Residency and Staunton District Planning
Study Area	Stone Spring Road (Route 280) from Ramblewood Road to Port Republic Road (Route 253); Ridgedale Road (Route 710) and Greendale Road between Stone Spring Road and Ramblewood Road; Peach Grove Avenue Extension corridor
Study Budget	$100,000 (all-inclusive; fee and expenses)
Design Year	2050
Study Type	Transportation Master Plan
Procurement	On-call solicitation to at least 2 pre-qualified firms from CSPDC's on-call consultant roster (not a public competitive RFP)
Solicitation Issue	August 2026
Anticipated NTP / Kickoff	September 2026
Anticipated Completion	Approximately 9 months from September 2026 to May 2027

1. Purpose and Need

The Harrisonburg-Rockingham Metropolitan Planning Organization (HRMPO) is beginning a FY2027 Small Area Transportation Study for the Stone Spring Road and Ridgedale Road corridor in Rockingham County. The study will result in a Transportation Master Plan that will establishes the preferred future transportation network, defines future roadway alignments and typical sections, prescribes an access management framework for Stone Spring Road, evaluates Ridgedale Road capacity and geometry, and identifies implementation priorities. Rockingham County intends to use the Master Plan to guide development review and rezoning decisions within the study area. The County's goal is to incorporate the Master Plan findings into an update to the 2024 Stone Spring Urban Development Area (UDA) Plan.

The Stone Spring UDA was designated by the Rockingham County Board of Supervisors in 2015 and covers the area southeast of Harrisonburg along Routes 253, 280, and US 33. The UDA Plan was adopted in January 2020 and updated in July 2024 with the County's Comprehensive Plan update. The UDA Plan provides a 20-year vision for compact, mixed-use, traditionally patterned neighborhood development and identifies the Peach Grove Avenue extension as a needed infrastructure investment. The Peach Grove Avenue extension is described in the 2024 Comprehensive Plan Transportation Chapter as a new four-lane roadway with wide shoulders and bicycle accommodations connecting Ridgedale/Greendale Road and Stone Spring Road.

The Master Plan is intended to provide a more detailed evaluation of a specific area withing the Rockingham County UDA to address three main issues:

- Development applications have been evaluated in isolation through individual Traffic Impact Analyses, producing inconsistent access management outcomes on Stone Spring Road and deferring fundamental network design questions. Each new rezoning forces the County to make ad hoc access decisions without the benefit of a comprehensive network framework. This study will establish that framework before additional applications arrive.
- Ridgedale Road's future function, classification, and required geometry have never been formally determined. The road is not designed for current traffic volume, and neither the County nor VDOT has established a clear plan for how it should be improved, classified, or funded. This study will resolve that question through a standalone capacity and geometry analysis.
- The Peach Grove Avenue extension, which is the most important new infrastructure investment needed to serve study area growth, has been identified in multiple planning documents but has never been formally studied for alignment, design, or cost. Developer activity is increasing in the area and a developer has begun informal land negotiations along the anticipated corridor. This study will establish the preferred alignment, right-of-way requirements, and typical section for the extension before development activity excludes options or creates conflicts between individual project commitments and the general public interest.

The purpose of the study is to produce a comprehensive document that informs future decision-making for development in the area for Rockingham County. The document should:

- Establish the preferred future transportation network framework for the Stone Spring Road and Ridgedale Road corridors, including the Peach Grove Avenue extension, Ridgedale Road future function, and Stone Spring Road access management;
- Resolve the Peach Grove Avenue extension alignment, right-of-way, and cost to the degree necessary to guide near-term developer negotiations and future applications for VDOT funding programs;

- Coordinate with the City of Harrisonburg on Ramblewood Road conditions, Peach Grove extension impacts, and Stone Spring Road / Erickson Avenue bike and pedestrian facilities to ensure the Master Plan's findings are consistent with the City's planning assumptions;
- Provide Rockingham County with a Master Plan to inform development review and rezoning decisions, including access management and proffer guidance for segments and intersections.

2. Study Area

The study area includes two main corridors in the Rockingham County UDA with segments extending into Harrisonburg. The study mainly addresses Stone Spring Road from Port Republic Road to Ramblewood Road (northern study area boundary); Ridgedale Road from Stone Spring Road to the Grassy Creek Road vicinity (southern study area boundary); and the land area between Stone Spring Road and Ridgedale Road where the Peach Grove Avenue extension will be evaluated.

2.1 Study Area Profile

The study area is divided into geographic segments to reflect shared roadway characteristics. The profiles may be adjusted at the kickoff meeting:

ID	Segment	Locality	Notes
Stone Spring Road (Northern Study Area Boundary)			
A	**Stone Spring Road — Eastern Segment (Stone Port Boulevard to Port Republic Road)**	Rockingham County	Stone Spring Road / Ridgedale Road intersection control evaluation; Stone Spring Road / Port Republic Road eastern study boundary conditions; network-level effects from study area growth. Access management and intersection control focus.
B	**Stone Spring Road — Central Segment (Peach Grove Avenue to Stone Port Boulevard)**	Rockingham County	Primary development access segment. Designation of Peach Grove Avenue and Stone Port Boulevard signal as the two full-movement intersection points; access treatment for all parcels; Stone Spring Road bike lane versus shared-use path in context of 2025 Road Safety Audit. Access management and multimodal focus.
C	**Stone Spring Road — Western Segment (Ramblewood Road to Peach Grove Avenue)**	Rockingham County / City of Harrisonburg boundary	Coordination with City of Harrisonburg specifically. Ramblewood Road / Stone Spring Road intersection is pending signal contingent on Leland Circle buildout; access management west of Peach Grove Avenue. Stone Spring Road bike lane versus shared-use path in context of 2025 Road Safety Audit. Safety and access management focus;
Ridgedale Road and Greendale Road (Southern Study Area Boundary)			
D	**Ridgedale Road Corridor (Stone Spring Road to Grassy Creek Road area)**	Rockingham County	Capacity and geometry deficiencies, sight distance constraints; recommended typical section and functional classification; Grassy Creek Road intersection treatment; access management; policy question of Ridgedale Road severance at Stone Spring Road once M&N Drive is extended to Stone Port Boulevard signal; consideration of Peach Grove Avenue extension. Capacity and geometry focus.

ID	Segment	Locality	Notes
E	**Greendale Road (Grassy Creek Road/Ridgedale Road to Ramblewood Road)**	Rockingham County and City of Harrisonburg	Capacity and geometry deficiencies, sight distance constraints; recommended typical section and functional classification; Grassy Creek Road intersection treatment; access management; consideration of Peach Grove Avenue extension
Ramblewood Road (Western Study Area Boundary)			
F	**Ramblewood Road / Study Boundary**	City of Harrisonburg	Document Ramblewood Road traffic function and crashes for each network scenario; compare projected daily trips to current conditions; indicate whether each alternative reduces Ramblewood Road traffic to address safety.
Development Area			
G	**Peach Grove Avenue Extension Area**	Rockingham County	Feasible alignment evaluation (grade, topography, right-of-way constraints, parcels); preferred alignment recommendation with typical section (four-lane, center median/turn lane provision, shared-use path); planning-level cost estimate; comparison against Ramblewood Road upgrade cost. New infrastructure focus.

The Stone Spring Road segment also includes the following key intersections:

Intersection	Notes
Stone Spring Road & Ramblewood Road	City of Harrisonburg coordination required. Pending signal warrants being met, City would anticipate agreement with developer(s) on their contribution(s) to signal construction, which would lead to evaluation of safety and geometry at the intersection; however, City staff note that currently there is no notable evaluation needed for this intersection at this time.
Stone Spring Road & Peach Grove Avenue	Northern terminus of the proposed Peach Grove Avenue extension. Designated as a full-access intersection in the study area access management framework. Existing four-leg configuration.
Stone Spring Road & Stone Port Boulevard / M&N Drive	Programmed traffic signal. Subject of the M&N Drive extension design. Expected to serve as the primary eastern full-access point on Stone Spring Road for study area development.
Stone Spring Road & Ridgedale Road	Currently unsignalized. Multiple TIAs have flagged this intersection as a constraint. Port Republic Road TIA (2025) recommends modifying to right-in/right-out/left-in on the northbound approach. Intersection control is a primary study question.
Stone Spring Road & Port Republic Road	Eastern study boundary. Full-access signalized intersection. Study documents conditions and evaluates any network-level effects from study area growth.

Key Developments

The following projects are relevant context for this study:

- **The Wentworth (271 units):** A luxury apartment complex completed between Stone Spring Road and Apple Valley Road near the Peach Grove Avenue intersection. Its traffic generation is now part of the existing conditions baseline.
- **Reserve at Stone Port:** An existing multi-family complex along Stone Spring Road. Its internal private road, Channing Drive, is a point of contention in the access management picture for adjacent parcels. A developer's proposal to route traffic from an adjacent development through Channing Drive was refused by the Reserve, contributing to current access constraints on this segment.
- **Weidig Development (425 units proposed):** A proposed rezoning of approximately 44 acres off Port Republic Road. A Traffic Impact Analysis completed for this proposal in early 2025 recommends modifying the northbound approach at the Stone Spring Road and Ridgedale Road intersection and recommends a dual eastbound left turn lane at the Stone Spring Road and Reservoir Street intersection. There is also a planned elementary school and commercial development planned.
- **Walnut Grove (units undetermined):** A development proposal near Greendale Road and Ridgedale Road in active discussion with the City of Harrisonburg over traffic impacts on Ramblewood Road. The developer has been planning around the Peach Grove Avenue extension since the project's inception, has had preliminary discussions with the primary landowner on the anticipated alignment, and has produced a concept plan showing a proposed Peach Grove extension alignment.
- **Other Developments.** There are several other potential developments that the County has approved but are outside the study area. The study team will need to coordinate with the County and City to document other nearby developments that could impact the study at the kickoff meeting. **The** City notes specifically a number of units that could be constructed by-right along Leland Circle - it is zoned for somewhat high-density residential. (Leland Circle is the other side of Ramblewood Road at the Stone Spring intersection.

Map 1. Study Area Map

2.2 City of Harrisonburg Coordination

The City's priority for this study is to coordinate the Peach Grove Avenue extension and potential impacts of that development on nearby City infrastructure, in particular Ramblewood Road, and ensuring the Erickson Avenue Area Study is considered as part of this planning process.

Ramblewood Road is a two-lane City road and is the western portion of the study. Ramblewood Road serves as a north-south connection between Stone Spring Road and Greendale Road and Ridgedale Road. Ramblewood Road has significant physical limitations that include sharp horizontal curves, a narrow cross-section, limited right-of-way at several locations, and a documented crash rate approximately twice the expected rate for a comparable roadway, as identified in the Walnut Grove Traffic Impact Analysis.

Stone Spring Road in Rockingham County becomes Erickson Avenue in the City of Harrisonburg at South Main Street. Development in the study area loads directly onto the City's street network. The Erickson Avenue Area Study (Kimley-Horn, 2025) documented that the South Main Street and Erickson Avenue intersection operates at LOS D with a volume-to-capacity ratio of 0.86 during the PM peak hour, with the westbound left-turn queue exceeding storage capacity. Study area growth will compound pressure on the City's network.

The Erickson Avenue corridor west of the city limit is out of scope. To prevent contradictory findings, the consultant will coordinate with City of Harrisonburg on shared traffic volume assumptions, growth projections, and network scenario designs. Traffic forecasts for the study area should consider conditions documented in the Erickson Avenue Area Study.

3. Tasks and Deliverables

The study is organized into six tasks. Each task description identifies the objective, the activities the consultant will perform, and the deliverables that will be produced. HRMPO/CSPDC's role and any contributions are identified where applicable.

Task 1 – Project Initiation, Management, and Stakeholder Coordination

Objective

Ensure that all stakeholders have a defined role throughout the project, and that the consultant aligns data sources, study assumptions, and schedule with HRMPO, Rockingham County, City of Harrisonburg, and VDOT.

Activities

- Conduct a project kickoff meeting in-person with HRMPO/CSPDC, Rockingham County, City of Harrisonburg, and VDOT Harrisonburg Residency and Staunton District Planning. The kickoff meeting will confirm the study area, schedule, data sources, data request priorities, roles and responsibilities, and deliverable formats. Prepare and distribute a kickoff summary documenting decisions, action items, and confirmed assumptions.
- Establish and facilitate a study group consisting of: HRMPO/CSPDC; Rockingham County; City of Harrisonburg; VDOT Staunton District Residency and Planning, and other HRMPO Technical Advisory Committee (TAC) members. A minimum of three formal study group meetings: 1) existing conditions review; 2) future conditions and alternatives review; and 3) draft Master Plan review.

Prepare agendas and distribute meeting summaries for all study meetings. Additional check-ins via phone or virtual meeting platform are expected as needed, not to exceed 10 check-in meetings. Provide updates via email as necessary.

- Provide monthly progress reports and invoices to HRMPO/CSPDC, summarizing tasks completed in the prior month, tasks anticipated in the following month, percent complete by task, and any schedule or scope issues to flag.

The following coordination requirements are integral to the study scope:

- **Rockingham County Coordination.** Rockingham County is the primary project partner. The County will provide access to rezonings, TIAs, concept plans, and UDA plan materials on request throughout the study. The consultant should plan for close coordination with County planning staff during alternatives development and Master Plan preparation on all aspects of the plan, specifically to understand how the County uses access management standards and transportation network plans in rezoning conditions and proffers, so that Master Plan deliverables support that application.
- **City of Harrisonburg Coordination.** Coordination is required on: Ramblewood Road crash conditions and the City's safety threshold under each network scenario; Peach Grove extension impacts; Stone Spring Road Safety Audit; and traffic forecast consistency with the Erickson Avenue Area Study. The consultant should review the Walnut Grove developer's Ramblewood safety evaluation from the City and coordinate with the City on findings rather than duplicating the safety evaluation.

Deliverables

- Meeting materials (agendas, presentations, and meeting summaries) for one kickoff meeting and a minimum of three study group meetings.
- Check-in meetings with study team members as needed to coordinate Tasks, not to exceed ten meetings.
- Monthly progress updates and invoices.

Task 2 – Data Collection and Existing Conditions Analysis

Objective

Establish a comprehensive baseline understanding of current conditions across all corridor profiles, drawing on existing data sources where possible and supplementing with targeted field collection.

Subtask 2.1 – Review of Existing Studies, Plans, and Data

HRMPO/CSPDC will provide or assist in obtaining the following reference materials at or soon after NTP:

- Rockingham County Comprehensive Plan (2024 update), including Transportation Chapter and Stone Spring UDA Plan update.
- Stone Spring UDA Plan (adopted January 2020, updated July 2024).
- HRMPO Port Republic Road / Peach Grove Avenue / Neff Avenue Study.
- City of Harrisonburg Erickson Avenue Area Study — Existing Conditions Report (Kimley-Horn, January 2025) and Final Report.
- Walnut Grove TIA and Ramblewood Road safety evaluation (prepared by developer).
- Walnut Grove Peach Grove Avenue extension concept plan.

- Walnut Grove development concept plan.
- Available TIAs from study area development applications, including Middleburg at Stone Spring and Weidig proposals.
- Stone Spring Road Safety Audit (2025).
- HRMPO Bicycle and Pedestrian Plan (2016), which identifies a shared-use path extending along Peach Grove Avenue.
- VDOT crash data from the most recent five years.
- Available VDOT counts and recent turning movement count data for study corridors.
- City of Harrisonburg public utility service extension conditions for study area development.

Subtask 2.2 – Traffic Data Collection

The consultant will compile available VDOT traffic data, recent TIA traffic data, and any City and County data for the study corridors and intersections. The need for additional collection locations and speed data will be confirmed with the study group following the data inventory. The specific count placement and number of locations should be determined based on gaps in available VDOT data. Counts and speed data should be conducted on typical Tuesday, Wednesday, or Thursday weekdays with public schools in session, and not during holiday or unusual-event weeks.

Subtask 2.3 – Safety Analysis

- Conduct a five-year crash analysis using the VDOT crash database for all study corridors and key intersections using the most recent five years of available data. Isolate intersection crashes within a 250-foot radius of each intersection center, consistent with the Erickson Avenue Area Study methodology. Analyze corridor crashes separately.
- Identify crash clusters, PSI intersections and segments, and patterns.
- Compare field observations to crash patterns and document conditions likely contributing to observed crash types.

Subtask 2.4 – Roadway Geometry and Infrastructure Inventory

- Document existing roadway geometry and infrastructure for Stone Spring Road, Ridgedale Road, Greendale Road, Ramblewood Road, and Peach Grove Avenue through desktop review of VDOT and County GIS data, supplemented by field verification, covering: lane configurations and widths; posted speed limits; horizontal and vertical alignment; available intersection sight distance at unsignalized locations; right-of-way width and adequacy; access point locations and types; and existing pavement markings and signage.
- Conduct the Ridgedale Road geometry inventory at higher detail to support a standalone capacity and geometry analysis. Document existing conditions segment by segment from Stone Spring Road to the Grassy Creek Road area, specifically identifying locations with sight distance deficiencies, inadequate curve radius, access conflicts, or right-of-way constraints.
- Address the Stone Spring Road bike lane configuration — including lane widths, pavement markings, and gaps in continuity — in the context of the 2025 Road Safety Audit, which examined the trade-off between retaining bike lanes and installing a two-way left turn lane at access points.

Subtask 2.5 – Multimodal Inventory

- Document existing pedestrian and bicycle infrastructure within the study area: sidewalk presence and continuity on Stone Spring Road and Ridgedale Road; shared-use path locations and gap locations; any planned Harrisonburg Department of Public Transportation (HDPT) routes or stops; existing crosswalk locations and ADA compliance; and the presence or absence of bike lanes on Stone Spring Road.
- Document bicycle and pedestrian facility gaps and connectivity deficiencies along Stone Spring Road and Ridgedale Road through a qualitative inventory of existing conditions, including the presence and continuity of bike lanes, shared-use paths, sidewalks, and crossings. Identify locations where existing infrastructure is absent, discontinuous, or substandard relative to corridor function and anticipated demand.

Subtask 2.6 – Access Management Evaluation

- Conduct a forward-looking access management evaluation for Stone Spring Road documenting the location and type of all existing access points, applying VDOT Roadway Design Manual Appendix F spacing requirements for a minor arterial classification, and identifying existing compliance and non-compliance.
- Develop a prospective access management plan identifying: the designated full-movement intersection locations (Peach Grove Avenue and the Stone Port Boulevard signal) and required minimum spacing between them; the appropriate access treatment for all existing and anticipated driveways between those two full-movement intersections; and the recommended access control strategy for the Stone Spring Road and Ridgedale Road intersection based on the study's intersection control recommendation. This plan should be map-based and suitable for use in development review.

Subtask 2.7 – Existing Conditions Operational Analysis

- Conduct peak-hour field observations at the key study intersections during both AM and PM peak periods. Observations will document traffic operations and queuing, geometric deficiencies and constraints, sight distance issues, posted speed limit compliance, existing access point locations and conditions, pedestrian and bicycle activity, and any conditions not captured by count data. Prepare written field observation notes and incorporate findings into the Existing Conditions Technical Memo.
- Note: Full Synchro-based intersection operational analysis is not required for this study. This study calls for high-level roadway capacity considerations consistent with a planning-level Master Plan. VDOT District Planning will provide Synchro support if the study group determines a specific intersection warrants more detailed operational analysis.

Deliverables

- Draft and final Existing Conditions presentation, including: traffic volume summary tables and maps; traffic volume and speed data; peak-hour field observation notes; five-year crash analysis with tables, charts, and maps; Ridgedale Road geometry inventory; Stone Spring Road access management map; bicycle and pedestrian facility inventory and gap summary; and prior studies review summary. Reviewed at Study Group Meeting 1.
- GIS maps of existing corridor conditions in ESRI-compatible format.

Task 3 – Future Conditions Analysis and Growth Forecasting

Objective

Develop future traffic forecasts for a 2050 design year that account for known and approved development, anticipated future development, and background regional growth using the HRMPO Travel Demand Model.

Subtask 3.1 – Future Land Use Scenario Development

The consultant will develop two land use buildout scenarios for the study area, both representing full buildout and both used as inputs to the HRMPO Travel Demand Model:

- **Scenario A — Moderate Density Buildout:** A buildout scenario consistent with lower-density residential development on parcels south of Stone Spring Road, reflecting single-family and townhome densities similar to recently approved projects. Scenario A represents a plausible conservative buildout given current market conditions.
- **Scenario B — Full UDA Buildout:** A buildout scenario consistent with the full vision of the Stone Spring UDA Plan, including higher-density multifamily residential on Stone Spring Road frontage transitioning to lower-density residential further south on Ridgedale Road. Scenario B represents the maximum anticipated development intensity consistent with the UDA Plan's 20-year vision and should be treated as the primary planning scenario for Master Plan recommendations.

Land use inputs for each scenario will be developed in coordination with Rockingham County and the City of Harrisonburg, referencing current UDA Plan land use designations, existing zoning, and known development applications. The future land use scenarios will be presented to and confirmed by the study group before future conditions analysis proceeds.

Subtask 3.2 – Travel Demand Modeling and Traffic Forecasting

The consultant shall use the HRMPO Travel Demand Model as the primary tool for generating future-year traffic forecasts under both scenarios. The HRMPO Travel Demand Model was updated in June 2026 with a 2050 horizon year and will serve as the study planning horizon. The consultant shall coordinate with HRMPO and VDOT District Planning staff to verify that land use inputs in the model are consistent with the two study scenarios and confirm the model's road network coding is consistent with the network scenarios being evaluated.

The consultant will document the modeling methodology, scenario inputs, and key assumptions in a technical appendix to the Future Conditions Analysis Memo. Where the model's geographic resolution does not adequately differentiate conditions at specific intersections, the consultant shall supplement with planning-level intersection analysis as described in Subtask 3.3.

Subtask 3.3 – Capacity Analysis

The consultant will conduct a capacity analysis using Highway Capacity Software (HCS) at a planning level, evaluating volume-to-capacity ratios and planning-level level of service on study corridors and at key intersections. Full Synchro-based intersection operational analysis is not required for this study. For corridor capacity, the consultant will evaluate whether directional peak-hour volumes exceed the planning-level capacity of the roadway's existing or proposed cross-section, and identify where and under which scenario capacity constraints emerge. Movement-by-movement delay results or Synchro simulation output are not expected.

The two land use scenarios (Scenario A — Moderate Density Buildout; Scenario B — Full UDA Buildout) will each be evaluated against two network conditions: a no-build baseline and a preferred network alternative.

Deliverables

- Future land use scenario descriptions and inputs memo.
- Travel demand modeling methodology documentation and forecast results.
- Capacity analysis results by corridor and intersection under No-Build and Build conditions for both scenarios.

Task 4 – Transportation Network Alternatives Development and Analysis

Objective

Develop, evaluate, and recommend a preferred transportation network for the corridor at a level of detail calibrated to each Corridor Profile. Alternatives should identify which improvements are appropriate for VDOT funding programs, developer proffers, and for County or City capital investment.

Subtask 4.1 – Network Alternatives Identification

Based on the future conditions analysis, the consultant will develop a preferred transportation network alternative and at least one alternative for comparison. Alternatives development will be informed by Study Group Meeting 2. The following elements must be addressed in each alternative, with illustrative typical sections where appropriate:

General

- *Intersection Control Recommendations:* Planning-level intersection control recommendations at: Stone Spring Road and Peach Grove Avenue; Stone Spring Road and Stone Port Boulevard / M&N Drive; Stone Spring Road and Ridgedale Road; Ridgedale Road and Grassy Creek Road; and the Peach Grove extension terminus at Ridgedale Road or Greendale Road.

Stone Spring Road

- *Access Management Plan for Stone Spring Road:* Each alternative will include an access management plan confirming the Stone Port Boulevard signal and the Peach Grove Avenue intersection as the two primary full-movement access points; no additional full-movement or signalized intersections between those two points absent justification; treatment of the Stone Spring Road / Ridgedale Road intersection as a directional or right-in/right-out/left-in access point in conjunction with M&N Drive extension; and future access for parcels between the two primary intersections via internal street connections or shared driveways.
- *Stone Spring Road Active Transportation:* Evaluate whether replacing existing bike lanes with a shared-use path on one side of the road — freeing travel lanes for a two-way left turn lane at access points — represents the preferred treatment. This evaluation must address both the Rockingham County segment and the City of Harrisonburg segment.

Ridgedale Road

- *Ridgedale Road Future Function and Design:* Address the future function, classification, and design approach for Ridgedale Road, including: appropriate classification (collector or minor arterial); typical section for anticipated traffic volumes; geometric improvements at specific segments and intersections; evaluation of the Grassy Creek Road intersection for roundabout, standard

intersection, or realignment treatment; and the policy question of whether severing the Ridgedale Road connection at Stone Spring Road is appropriate once M&N Drive is extended to the Stone Port Boulevard signal. The severance question shall be presented as a policy question for the study working group to decide based on traffic volume analysis, without recommending closure as a study output.

- *M&N Drive Network Integration:* Address the future role of M&N Drive and Autumn Lane in relation to the Ridgedale Road network, including how M&N Drive's extension to the Stone Port Boulevard signal affects traffic patterns on Ridgedale Road and changes the function of the existing Ridgedale Road / Stone Spring Road connection. Specifically evaluate whether Autumn Lane's access to Ridgedale Road should be consolidated into M&N Drive as M&N becomes the primary east-west connector to the Stone Port Boulevard signal, and whether that consolidation is warranted once M&N Drive is extended. Present this as a recommendation to consider based on traffic volume analysis and access spacing.

Ramblewood Road

- *Ramblewood Road Network Scenario Evaluation:* Evaluate how Ramblewood Road's traffic function and safety issues change under each alternative's network assumptions: document projected daily trips on Ramblewood Road under each scenario and network alternative compared to current conditions; note whether the alternative sufficiently reduces Ramblewood traffic to address the City's safety concerns; and address whether Ramblewood Road's through-traffic function remains necessary once Peach Grove is constructed.

Peach Grove Extension

- *Peach Grove Avenue Extension:* Evaluate at least one feasible alignment addressing grade and topography constraints, right-of-way requirements and known ownership constraints (Daly family parcels, residential property at Stone Spring Road), access to adjacent developable parcels, connection point to Ridgedale Road or Greendale Road, and consistency with the Walnut Grove developer's concept plan as a reference. The recommended typical section should include a cross-section informed by the Rockingham County Comprehensive Plan, 2016 HRMPO Bicycle and Pedestrian Plan, and other existing plans such as the HRMPO Port Republic, Neff Avenue, Peach Grove Avenue Plan (2025) to evaluate number of lanes and multimodal facilities. The Walnut Grove developer's concept plan can be used as a reference and starting point, not as the study's alignment recommendation. The study's recommendation must reflect independent evaluation of feasible options.
- *Peach Grove Extension versus Ramblewood Upgrade Cost Comparison:* At least one alternative will include a planning-level cost comparison between constructing the Peach Grove Avenue extension and upgrading Ramblewood Road to a standard adequate to serve as the primary development connector. The comparison shall present order-of-magnitude estimates with clearly stated assumptions to support future funding and policy conversations with Rockingham County and the City of Harrisonburg. Cost estimate methodology will be confirmed with the study group, but would likely include using the VDOT TMPD Planning Level Cost Estimate tool.

Subtask 4.2 – Ridgedale Road Capacity and Geometry Analysis

The consultant will conduct a capacity and geometry analysis of Ridgedale Road from Stone Spring Road to the Grassy Creek Road area and include the following:

- Existing and forecast daily and peak-hour traffic volumes under both scenarios and both network alternatives.
- Existing sight distance constraints by segment, including specific locations of concern and the nature of each constraint (horizontal curvature, vertical curvature, roadside obstructions, vegetation).
- Recommended typical section for Ridgedale Road, including lane widths, shoulder accommodation, and right-of-way requirements.
- Conceptual recommendations for geometric improvements or realignment at specific constrained locations. Where topography and parcel configuration allow, the analysis shall also consider whether a new Greendale Road connector built through future development could serve as an effective replacement for portions of the existing Ridgedale Road alignment, potentially allowing Grassy Creek Road to be realigned or the Ridgedale Road connection at Stone Spring Road to be severed. This alternative network scenario shall be evaluated at a planning level.
- Consider Peach Grove Avenue extension alignment if appropriate.
- Conceptual recommendation for the Grassy Creek Road intersection.
- Access management recommendations for Ridgedale Road, including appropriate spacing for future development access points.
- Address Ridgedale Road severance at Stone Spring Road with supporting traffic volume analysis.

Deliverables

- Alternatives screening summary.
- Transportation network alternatives with maps; preferred alternative recommendation.
- Future Conditions Analysis Memorandum (draft and final) documenting land use scenarios, travel demand modeling methodology and results, capacity analysis approach, network alternatives descriptions, and preferred alternative recommendation. Reviewed at Study Group Meeting 2.
- Ridgedale Road Capacity and Geometry Analysis standalone technical memo.
- Peach Grove Avenue Extension Alignment Analysis, documenting feasible alignment options, right-of-way constraints, preferred alignment recommendation, recommended typical section, planning-level cost estimate, and Peach Grove versus Ramblewood cost comparison.
- Study Group Meeting 2 presentation materials.

Task 5 – Public Engagement

Objective

Provide meaningful public input opportunities appropriate to the scale of the study. The engagement approach should emphasize listening and information sharing on existing conditions and travel patterns, with a focused process for affected property owners on proposed alignments. HRMPO/CSPDC and Rockingham County staff will lead public engagement efforts, and the consultant is expected to provide supporting materials, print outs, and staffing as necessary.

Activities

- **Public Survey.** Following the existing conditions analysis, CSPDC will distribute an online mapping tool (e.g., Social Pinpoint or similar) allowing residents and corridor users to identify problem locations, describe travel behaviors, and share experiences. CSPDC will manage outreach and

promotion (geofenced advertising, social media, locality channels) and provide a summary of results to the study group as an input to alternatives development.

- **Property Owner Notification.** For property owners whose land is crossed by proposed future street alignments identified in the network alternatives, including the Peach Grove Avenue extension corridor, Rockingham County staff will provide written notification letters to be sent describing the study, explaining that a future roadway alignment is being evaluated across or adjacent to their property, and inviting them to contact the County and HRMPO staff with questions or to request a meeting. The consultant will not initiate individual property owner meetings but will be available to meet with respondents if requested. Notifications must be sent prior to the draft Master Plan being made publicly available.
- **Draft Master Plan Public Availability.** At study completion, the consultant will coordinate with HRMPO and Rockingham County to make the final Master Plan publicly available with appropriate public notification. Rockingham County's eventual adoption of the Master Plan into the Stone Spring UDA Plan will have other own public hearing requirements and that process is outside the scope of this study.

Deliverables

- HRMPO will prepare online engagement platform setup.
- HRMPO will provide engagement summary memo.

Task 6 – Transportation Master Plan and Final Deliverables

Objective

Produce a final Transportation Master Plan that serves as a lasting reference for Rockingham County, the City of Harrisonburg, VDOT, and future consultants, and as the foundation for development review, rezoning conditions, and future applications for VDOT funding programs. The Master Plan should be written and formatted for use by planning staff and elected officials; convey technical jargon in an easily-digestible, straight-forward, well-organized manner; have a high-level of production-quality and be suitable for presentation to the Rockingham County Board of Supervisors and for public distribution.

Activities

- Prepare a draft Transportation Master Plan for study group review for Study Group Meeting 3. Distribute the draft to study group members for a comment period. Address all agency comments prior to preparing the final Master Plan.
- Prepare the final Transportation Master Plan incorporating all agency and study group comments from the draft review. Submit in Word and PDF formats.
- Prepare presentation materials and attend one HRMPO Policy Board meeting to present the final Master Plan findings.

The Master Plan will include the following content:

Report Structure

- Executive Summary (suitable for public-facing use and elected official distribution).
- Study Introduction (purpose, need, study area, corridor profiles, prior studies).
- Existing Conditions (data, safety analysis, multimodal inventory, roadway geometry).

- Growth and Future Conditions (land use scenarios, travel demand modeling methodology, capacity analysis results under both scenarios).
- Network Alternatives Analysis and Preferred Recommendations (by corridor profile).
- Peach Grove Avenue Extension Analysis (alignment, typical section, cost estimate, comparison with Ramblewood upgrade).
- Ridgedale Road Future Network Function and Design.
- Access Management Plan for Stone Spring Road (with map-based exhibits suitable for development review use).
- Active Transportation Recommendations (Stone Spring Road bike lane versus shared-use path; Ridgedale Road pedestrian and bicycle accommodation).
- Implementation Priorities (near/mid/long-term) with development trigger conditions and funding pathways.
- Appendices: traffic count data; crash data tables; travel demand model documentation; capacity analysis results; cost estimate detail; public engagement summary.

Format

- PDF format with a summary suitable for non-technical audiences.
- GIS-based maps in ESRI-compatible format.
- One round of consolidated comments from HRMPO/CSPDC, Rockingham County, Harrisonburg, and VDOT will be incorporated.

Deliverables

- Draft Transportation Master Plan for Study Group review at Study Group Meeting 3.
- Final Transportation Master Plan incorporating one round of consolidated comments; submitted in both editable and PDF formats.
- GIS data package: all spatial data produced during the study, to include study area boundary; future roadway alignments; typical section reference locations; access management plan features; crash data summaries; bicycle and pedestrian facility inventory; all map layers used in report figures. Delivered as ESRI shapefiles compatible with Rockingham County GIS.
- HRMPO Policy Board presentation slide deck.
- Consultant will present the final Master Plan at an in-person Policy Board meeting.

4. Exclusions

The following items are explicitly outside the scope of this study and should not be assumed in the consultant proposal. If any of these elements are determined necessary during the project, a change order may be required.

- Engineering design, construction plans, or permitting.
- Right-of-way surveys or appraisals. Right-of-way impacts on conceptual plans will be shown using aerial and GIS data only.
- Environmental review or NEPA documentation.
- Stormwater or drainage analysis.
- Utility identification or relocation planning.

- Independent Ramblewood Road improvement study or safety design. The Walnut Grove developer's safety evaluation has already been conducted and reviewed by the City of Harrisonburg; the consultant should reference and coordinate with that work rather than duplicate it.
- Detailed transit route redesign. HDPT route analysis is out of scope; the consultant will note bus stop locations and connectivity gaps as part of the multimodal inventory only if necessary.
- Greenway or trail engineering or design.
- Analysis of the Erickson Avenue corridor west of the Stone Spring Road / South Main Street city line (addressed through City of Harrisonburg planning processes).
- Stone Spring UDA Plan adoption process. Rockingham County's public hearing process to incorporate Master Plan findings into the UDA Plan is a County-led process outside the scope of this study.
- Presentations to the Rockingham County Board of Supervisors or Harrisonburg City Council beyond the HRMPO Policy Board.

5. Draft Project Schedule

The study should take approximately nine months. The final schedule will be confirmed at the kickoff meeting.

Milestone	Target
Solicitation issued to on-call firms	August 2026
Proposals due / consultant selected	August 2026
Notice to Proceed / kickoff meeting	**September 2026**
Data collection complete; prior studies compiled	October 2026
Study Group Meeting 1 — Existing Conditions	**November 2026**
Public survey	January - February 2027
Future land use scenarios confirmed	January - February 2027
Future Conditions Memo	February 2027
Study Group Meeting 2 — Alternatives review	**February 2027**
Draft Transportation Master Plan to HRMPO / Study Group for review	March - April 2027
Study Group Meeting 3 — Draft Plan review	**March – April 2027**
Final deliverables submitted; public availability coordinated with Rockingham County	May 2027
HRMPO Policy Board presentation	May - June 2027

6. HRMPO / CSPDC Role

HRMPO/CSPDC will provide project management, stakeholder coordination support, and technical input throughout the study. The following are anticipated HRMPO/CSPDC contributions, reducing the corresponding consultant scope:

- Management of the study group process, including meeting logistics and stakeholder communication.
- Compilation of reference documents listed under Subtask 2.1, including prior studies, development TIAs, and UDA plan materials, to the extent obtainable.
- Outreach support for the Task 5 public engagement effort through HRMPO's website and social media channels, and coordination with Rockingham County for County distribution channels.
- Coordination liaison with VDOT Staunton District and the City of Harrisonburg.

Consultant proposals should reflect these contributions and should not duplicate effort in these areas in fee proposals.

Harrisonburg Rockingham Metropolitan Planning Organization

112 MacTanly Place, Staunton, VA 24401
(540) 885-5174
hrmpo.org

TO:	Harrisonburg-Rockingham MPO Technical Advisory Committee
FROM:	Paula Melester, Director of Transportation
MEETING DATE:	August 6, 2026
RE:	**TAC Memo #26-04 Transit Service Plan Technical Assistance Project Overview**

EXECUTIVE SUMMARY

The HRMPO FY2027 Transit Service Plan Technical Assistance project will develop a transit service plan for potential services in the urbanized portion of Rockingham County to include portions of the Towns of Bridgewater, Dayton, and Mount Crawford. This work will build off the Rockingham County Feasibility Study completed by Rockingham County and the Dept. of Rail and Public Transportation (DRPT) in 2024. This service plan will take the recommendation from that study – implementing microtransit in a small, densely populated portion of the County – and develop a realistic plan for implementation. Key objectives of this project include developing an up-to-date cost estimate, identifying potential funding mechanisms for the service, and exploring different operational oversight models.

Project Scope and Working Group

The HRMPO has contracted with consultants from Whitman, Requardt, & Associates (WRA) to complete the work on this project. A stakeholder working group will be assembled consisting of representatives from each member jurisdiction of the HRMPO, planning staff from DRPT, and staff representing each of the two existing transit agencies serving the HRMPO region – Harrisonburg Department of Public Transportation (HDPT) and BRITE Transit.

Consultant staff, supported by the stakeholder working group, will review the 2024 Feasibility Study, analyze existing conditions, prepare a cost estimate for the recommended model of service, explore available funding sources, and identify potential oversight and ownership models for operating the proposed service. Specifically, staff will look at start-up capital costs, annual operating costs, funding considerations, maintenance considerations, technology and dispatching considerations, staffing considerations, and system integration with existing transportation and transit networks within the region.

The deliverable will be a transit service planning document summarizing the conditions identified above. The purpose of this document will be to provide decision makers with all the data necessary to determine whether to pursue implementation of a microtransit service in Rockingham County.

Tasks	Meetings/Presentations	Schedule
Task 1 – Existing Conditions	Working Group Kick-Off Meeting	August
Task 2 – Alternative Analysis	Working Group Meeting	September
Task 3 – Coordination and Documentation	Working Group Meeting	October
Final Deliverables	Draft Report Presentation to HRMPO Policy Board	November

112 MacTanly Place, Staunton, VA 24401
(540) 885-5174
hrmpo.org

NEXT STEPS

HRMPO staff will coordinate with consultants to schedule a working group kick-off meeting. Staff anticipate up to (3) virtual working group meetings to take place between August and November. HRMPO staff and consultants will present the final draft document to the HRMPO Policy Board at their November meeting with planned approval no later than December 2026.

ATTACHMENT

- 2024 DRPT-Rockingham Transit Feasibility Study
- Transit Service Plan Scope of Work

ROCKINGHAM COUNTY TRANSIT FEASIBILITY STUDY

FINAL REPORT

Rockingham County
VIRGINIA

Contents

Overview

Rockingham County recognizes that reliable transportation is critical to the economic prosperity and health of a community. Based on the County's interest in determining the feasibility of introducing public transportation to address perceived transportation challenges, the Virginia Department of Rail and Public Transportation (DRPT), in coordination with Rockingham County, commissioned this transit feasibility study to identify the need for mobility options and recommend potential services. The study combines quantitative assessments of demographic and travel trends with qualitative input from public and community stakeholders to provide a comprehensive overview of transportation needs. This information is then used to evaluate various transit service delivery models to determine which is most appropriate for Rockingham County. Finally, the study provides high-level cost and implementation information that can be used by Rockingham County to move forward with a transit service demonstration.

The study was conducted by Kimley-Horn, in association with Foursquare Integrated Transportation Planning (ITP) and was overseen by a project team consisting of DRPT, Rockingham County, Central Shenandoah Planning District Commission (CSPDC), and Valley Interfaith Action (VIA).

Existing Conditions and Market Assessment

The Existing Conditions Analysis and Transit Market Assessment describes existing public and private transportation services in Rockingham County, identifies trip generators, describes current conditions, analyzes current travel patterns, and discusses the county's population and employment trends.

The Existing Conditions Analysis and Transit Market Assessment (Attachment A) incorporates a variety of different types of data graphics and visualizations to convey this information clearly and concisely, including: (1) maps of market analysis demographics and travel patterns; and (2) summary tables and charts with transit-relevant data for the potential service area. The overall intent is to describe the present transportation landscape and potential for establishing a successful public transportation service in Rockingham County, Virginia.

Key Findings from Transit Market Analysis

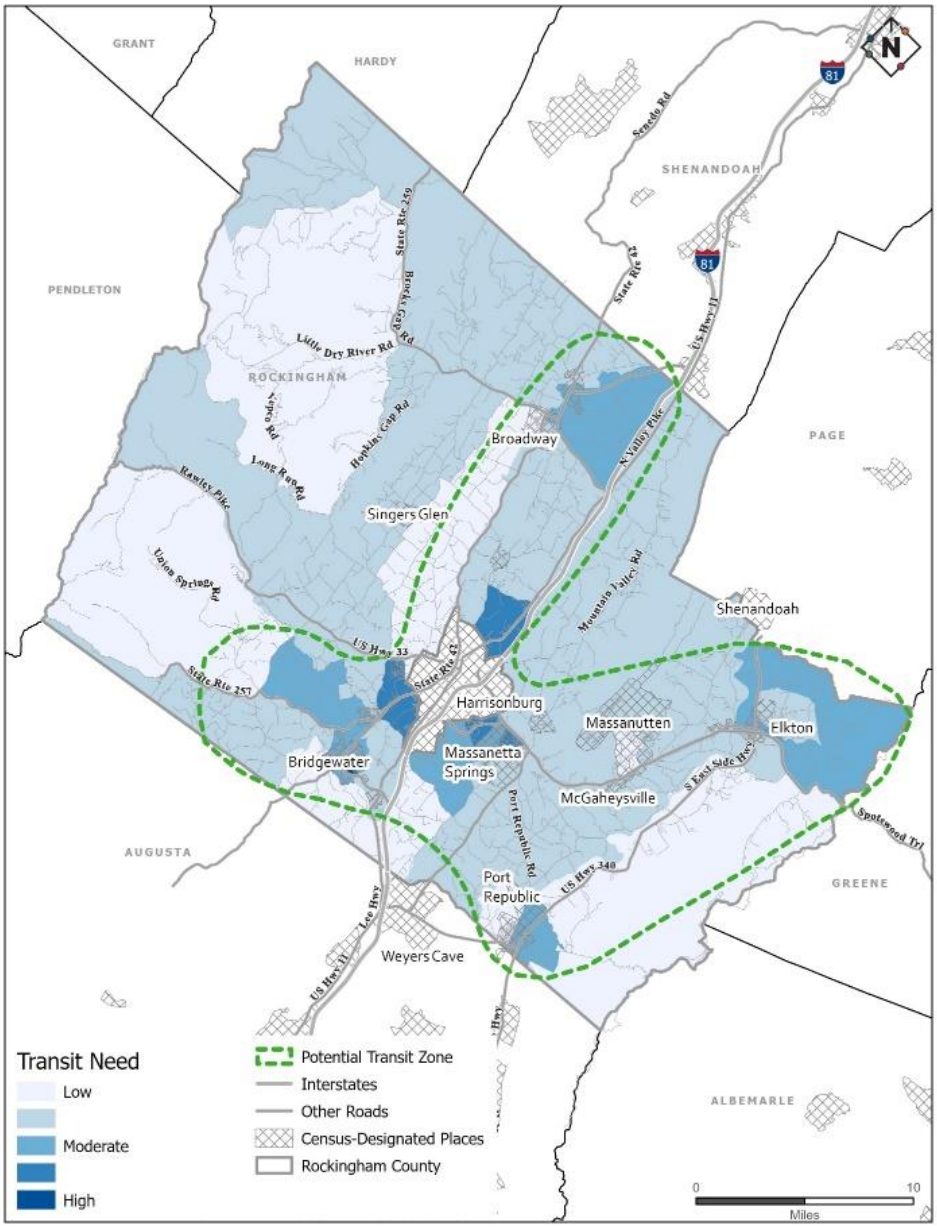
The market analysis for transit in Rockingham County reveals several key findings:

1. **Population and Employment Density:**
    - Population density in the County is generally below the 3,000 people per square mile threshold typically targeted for fixed-route transit services.
    - Nevertheless, some areas, particularly near the southern boundary of the County south of State Route 257, between Harrisonburg and Broadway, between Harrisonburg and Port Republic, and between Harrisonburg and Elkton, show promise for potential transit viability.
    - High combined population and employment levels are indicative of areas with greater potential for transit ridership, with the Interstate 81 corridor (including Bridgewater, Harrisonburg, and Broadway), Massanutten, and Elkton standing out as areas with the greatest potential.

2. Other Indicators of Transit Potential:

- Older adults, persons with disabilities, low-income populations, and households without access to private vehicles depend on public transit for their daily travel needs.
- The distribution of these populations varies across the County, with concentrations in areas surrounding Elkton, Broadway, Harrisonburg, and other regions.
- Minority populations in the County represent a strong market for transit, with concentrations along the I-81 corridor and in Port Republic.
- Limited English Proficiency (LEP) populations can benefit from public transit, and these populations are evident along the I-81 corridor.

Figure 1: Transit-Oriented Population Propensity by Block Group



3. **Transit Propensity:**
    - The study used the Foursquare ITP's Transit Propensity Model to identify populations or areas within Rockingham County with the greatest need for transit.
    - The Transit-Oriented Populations Index, which combines various socio-demographic variables, was employed to assess transit propensity.
    - Transit propensity is highest in block groups surrounding Harrisonburg and high to moderate in and around Broadway, Bridgewater, Port Republic, and Elkton **(Figure 1).** In combination, these areas form an area of highest potential for transit's success in Rockingham County. Areas with the lowest propensity for transit use are in the remaining areas of the County. While transit need does exist in these areas, the need is not as strong as in the areas with the highest propensity.

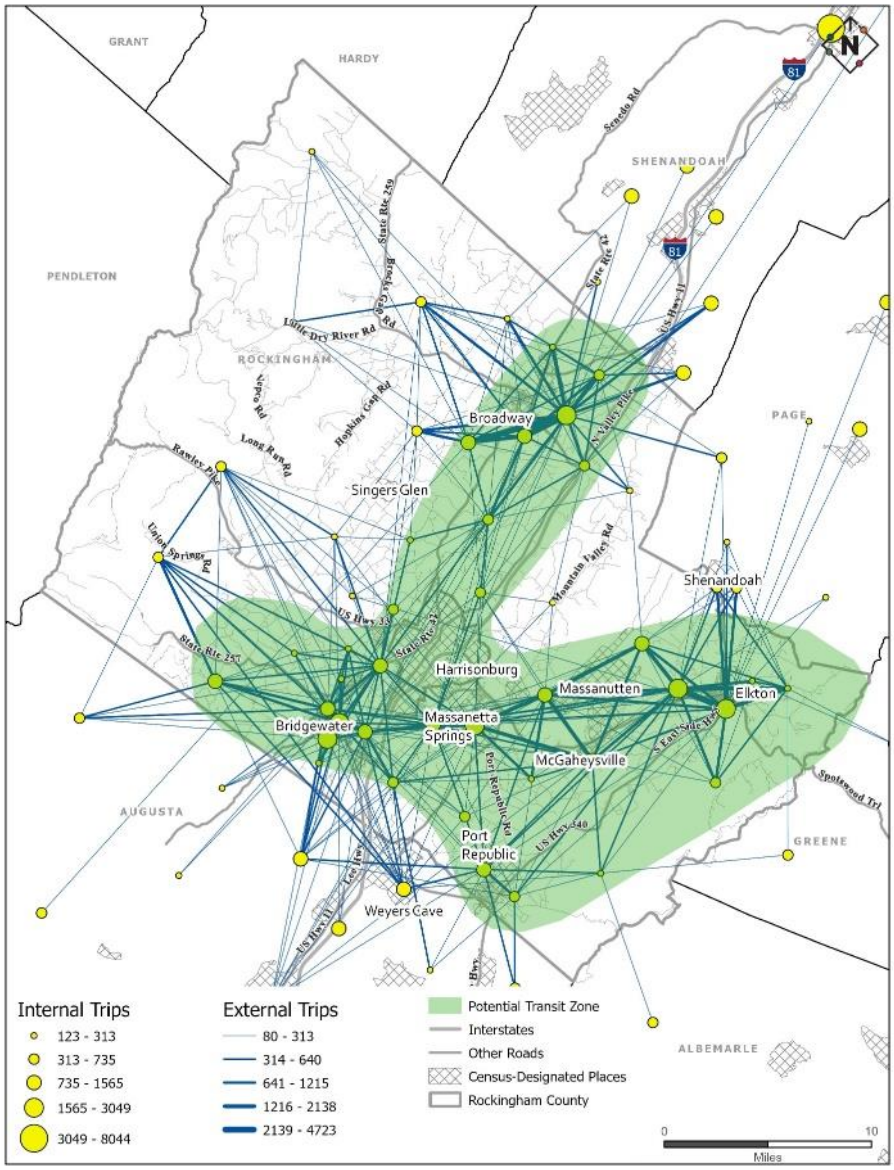
In summary, the Transit Market Analysis suggests that while the overall population and employment density in Rockingham County may not meet the conventional standards for fixed-route transit, there are specific areas with potential for viable transit services. Additionally, demographic indicators such as presence of older adults, persons with disabilities, low-income populations, minority populations, and those with LEP, point to the need for tailored transit services in different parts of the County. The identified "potential transit zone" provides valuable insights for transit service planning and development in Rockingham County.

Key Findings from Travel Flow Analysis

The Travel Flow Analysis gives insight into how people move around in Rockingham County, including their travel origins, destinations, timing, and reasons for traveling. Understanding travel patterns is crucial for identifying opportunities for new transit services that align with the most common travel needs.

The analysis primarily relies on data from Replica, a platform that uses anonymized cellphone location data to understand travel patterns. This data is enriched with demographic information and travel mode choices for journeys between origin-destination pairs. The findings are summarized at the Census block group level and visual representations are used to illustrate these travel patterns.

Figure 2: All Weekday Trips at the Block Group-Level



1. Total Travel Flows (Except Harrisonburg)

- **Figure 2** shows the daily travel flows made by individuals on a typical weekday in Rockingham County, excluding trips to or from Harrisonburg. The most significant flows occur near Broadway, Bridgewater, Massanutten Springs, and Elkton.
- Many flows occur between adjacent block groups, indicating that a substantial number of trips in the County are short-distance journeys.
- The green-shaded area in **Figure 2** is labeled the Potential Transit Zone, which signifies the region most likely to generate transit trips if such services were to become available in Rockingham County.

2. **Total Travel Flows to and from Harrisonburg:**
    - The highest volumes of trips to and from Harrisonburg originate or terminate in towns and unincorporated areas near the city, such as Bridgewater, Broadway, Massanutten, and Elkton.
3. **Travel Flows for Healthcare Purposes**
    - Most healthcare-related trips are concentrated around Broadway, Harrisonburg, and towns in the southern-central and eastern parts of the County; however, some health care trips also originate in the less-developed, western parts of the County.
4. **Travel Flows by Older Adults**
    - Mapping of travel flows by older adults generally show that their travel patterns generally mirror those of most other people in several important ways, including a preponderance of flows in the vicinity of Broadway, Bridgewater, Harrisonburg, Massanetta Springs, Massanutten, and Elkton and many short-distance trips.

In summary, the Travel Flow Analysis provides a comprehensive overview of travel patterns within Rockingham County. It highlights the greatest potential for a successful transit service in the County's Potential Transit Zone and emphasizes the importance of aligning transit network design with the most common travel needs. Additionally, the analysis offers insights into specific travel purposes, such as healthcare-related travel, and the travel behavior of older adults, which can inform transit service planning and development.

Stakeholder and Public Outreach

Stakeholder and public outreach occurred in two phases and ensured that recommendations were informed by and effective for the community they will serve. Engagement occurred in two distinct phases. Phase 1 included a public survey and stakeholder listening sessions that were designed to gather information about community travel needs that would be fed into the development of a proposed transit network. Phase 2 consisted of a community workshop where residents were invited to learn about and comment on the proposed transit network.

Survey

A public survey was developed by the project team to solicit input from the community on existing mobility challenges, desired destinations for service, and desired characteristics of a potential transit service. The survey was available in digital and paper form October 16th, 2023, through November 6th, 2023. Both digital and paper versions of the survey were available in English or Spanish. Paper surveys were available at the Rockingham County Administration Complex, the Rockingham County Department of Community Development, and each of the seven town halls in the County. The digital version was promoted by Rockingham County on the County website, town websites, and official County social media accounts. More than 1,800 responses were received, 85 percent of which were received online. Full survey results are available in Attachment B, but select findings include:

- Surveys were received from every zip code within Rockingham County, with zip codes 22801 and 22802 providing the highest number of survey responses. These zip codes include the City of Harrisonburg and surrounding portions of Rockingham County.

- When asked about their primary mode of travel, 35 percent of survey respondents indicated they drove their own vehicles, followed by 18 percent of respondents indicating they ride with someone else.
- Ten percent of survey respondents indicated they do not experience any challenges getting around.
- Seven percent of survey respondents indicated that due to Rockingham County's lack of convenient transportation options they must spend extra money to get around their community.
- Most desired trip destinations by survey respondents included shopping centers (370), medical centers (307), and church or religious services (235).
- A majority of survey respondents indicated weekdays from 6:00 AM to 12:00 PM (57 percent) and weekdays from 12:00 PM to 6:00 PM (56 percent) were time periods when they most needed transportation.

Stakeholder Listening Sessions

The project team identified a group of community stakeholders that could speak to a range of community concerns and issues that relate to mobility options. The stakeholders were asked to help distribute the survey to their networks and to attend a virtual stakeholder listening session.

The virtual stakeholder listening sessions were held November 2nd and 3rd, 2023 and featured five participants. Invitees are listed in **Figure 3** with attendees appearing in bold. Key insights that came from the guided discussion were:

- Some poultry companies provide their own transportation services.
- Transportation is a fundamental issue for County employers and employees.
- The three biggest issues facing County residents are transportation, childcare, and housing.
- Older residents are interested in expanded weekend daytime service for social activities in addition to reliable transport for medical appointments.

Figure 3: Community Stakeholders

Stakeholders

- **Valley Program for Aging Services**
- **Rockingham County Department of Social Services**
- **Rockingham County Senior Services**
- **Blue Ridge Community College**
- **Harrisonburg-Rockingham Chamber of Commerce**
- Sentara RMH
- Shenandoah Valley Partnership
- Harrisonburg-Rockingham Community Services Board
- Valley Interfaith Action (VIA)
- Massanutten Resort
- Rockingham Housing Authority
- United Way of Harrisonburg and Rockingham

Community Workshop

A community workshop was held on December 12th, 2023, from 4:00 PM to 6:00 PM at the Rockingham County administration building. The workshop was advertised on Rockingham County's website as well as social media and garnered local television and radio news coverage. Three residents attended the open house-style workshop, where they were presented with information on the study's data analysis, survey results, and proposed transit service. Attendees were asked to provide input as to whether the proposed network would meet their

travel needs and what they would change about the proposed network. Comments received include:

- Travel between microtransit zones should be permitted.
- The system should be financially accessible to low-income individuals.

Transit Service Strategies and Network Development

The results of the Existing Conditions and Market Assessment and input received from the public survey and stakeholder listening sessions were used to evaluate potential types of transit service and develop a proposed transit network.

Mode Evaluation

Different transit modes can be more or less appropriate in a community depending on what the community's stated goals for transit service are. The project team was asked to weigh different measures of success against one another to provide a framework for evaluating different transit modes and network options. This led to the following ranking of goals with 1 being the most important measure of success and 3 being the least important of the three measures of success.

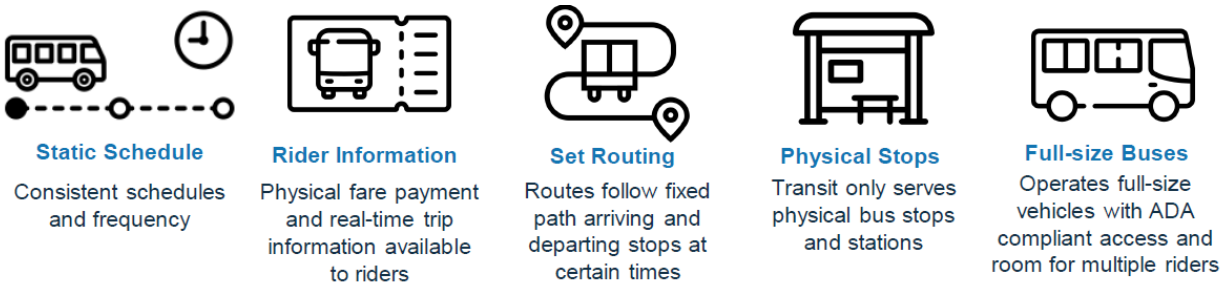
1. Ability to generate ridership
2. Accessibility for disadvantaged populations
3. Cost efficiency

Additionally, the project team discussed trade-offs among coverage, span, and wait-time to help prioritize elements of the transit network. The project team consensus was that a longer span of service was the highest priority, followed by wait-time, then the service's geographic coverage.

There are three potential modes of transit service feasible for Rocking County to implement: fixed route, traditional demand response, and microtransit. Each mode contains different service models such as unique operational elements, service planning, and customer interfacing that make them more or less likely to fit Rockingham County's transit needs. The applicability of each mode and recommendations are outlined in the section below:

Fixed Route

Fixed route transit is what is known to the public as traditional transit services: full-size buses running on a fixed schedule stopping at pre-determined stops along a route. Fixed route service strengths include transporting riders between areas of concentrated high activity such as between multi-family residential and work or shopping destinations. Examples close to Rockingham County include Harrisonburg Department of Public Transit (HDPT) and BRITE in Staunton.



Implementing a fixed route approach would allow some predictability in scheduling and routing for potential riders; however, most areas of Rockingham County do not have the requisite density usually required for regular fixed route. According to the *Transit Capacity and Quality of Service Manual*, published by the Transportation Cooperative Research Program, for local buses a frequency of one arrival per hour requires a minimum residential density of 4.5 dwelling units per acre. Another commonly accepted threshold for fixed route transit service is a population density of at 3,000 people per square mile. Rockingham County's density is below this threshold except in a small pocket of Bridgewater.

Traditional Demand Response

Traditional demand response service provides curb to curb service instead of pickups and drop-offs at establish stops or stations. Trips are often pre-scheduled a week to one day in advance of the requested ride to pair riders with other customers traveling in the same direction.

Traditional Demand Response is similar to the existing service that Valley Program for Aging Services (VPAS) provides through its transportation services that are available for pre-booking. Operations and vehicles are structured to serve individualized or shared destination rides without fixed routing or timetables, fulfilling the needs of individuals making trips to medical appointments which may be during mid-day or time periods where there are not other transportation options. However, traditional demand response service is resource intensive and difficult to scale up and down to meet demand. For this reason, it is often only offered to a subset of the population, such as seniors or individuals with disabilities, as a way to manage demand. Introduction of traditional demand response within Rockingham County that is available to anyone would require either a large financial investment, or an acceptance of a very low level of service (i.e. long wait times and limited trip slots). Since the project team identified ridership as the highest priority for the transit network and since ridership is dependent upon the quality of service provided, traditional demand response service was not proposed for Rockingham County.

Microtransit

Microtransit combines the flexible routing and on-demand service of traditional demand response service and some of the capacity to carry many riders on one trip from fixed-route service into a hybrid service that uses technology to increase the availability of service by using dynamic, efficient trip matching and routing. Microtransit services typically operate by a rider requesting a pickup and drop-off point within a pre-determined zone of operations and a transit vehicle dynamically routing to the requested area to pick up multiple riders heading in the same direction. Riders typically use dedicated smart phone applications to request, pay, and track the vehicle trips, although many providers allow for traditional call-in ride dispatching as well. Unlike traditional demand response service, rides can be prescheduled or requested any time, with the service targeting a maximum wait time, such as 15 minutes from when the trip is requested.

On-Demand

Service responds to rider's requests and is dispatched in real-time

Technology-Enabled

Technology supports real-time requests, ride information, and options to pay electronically

Flexible Routing

Routes are dynamically changed to match needs of riders traveling in similar directions

Virtual Stops

Pickup and drop-offs can occur anywhere within service zone

Shared Ride Vehicles

Operates with smaller ADA compliant vehicles than fixed route to reach areas that full size buses cannot

Based on the findings highlighted in the market assessment section as well as stakeholder feedback, a pilot microtransit service is the most appropriate transit service for Rockingham County. Microtransit service has been used nationwide to serve rural and low-density suburban areas where fixed-route services would not perform efficiently. The scalable nature of microtransit also allows jurisdictions to introduce and test new service concepts without committing to rigid route structures that cannot be changed or grown if ridership demand exceeds available resources. Microtransit also has the ability to serve diverse trip types and times of travel seen in Rockingham County by providing curb to curb service, reduced wait time, real-time trip information, and more direct service for residents, instead of waiting for a traditional transit bus and a pre-determined time.

Service Development

Service Area

The service area geometry for potential microtransit service in Rockingham County was determined by the extents of the accessible road network, location of origin-destination travel flows as well as inclusion of points of interest and trip generators both internal and external to the County. Four proposed zones were developed as shown in **Figure 4**. The four zones each had at least one external drop off point that could be used to access HDPT services or major trip generators. Based on size and estimated passenger demand, each zone would require two vehicles to operate.

Figure 4: Proposed Microtransit Zones

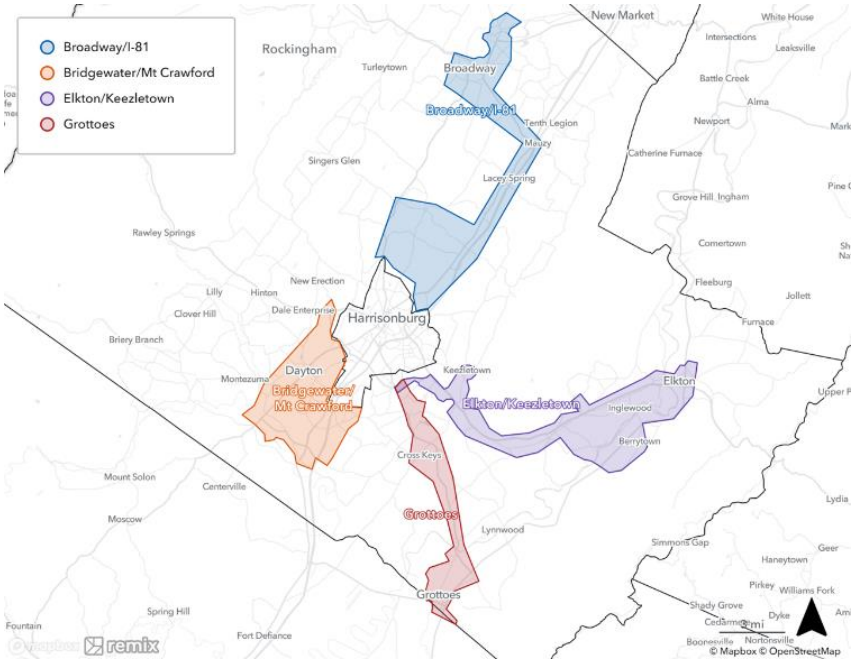


Figure 5: Comparison of Microtransit Zones

Zone	Area (Square Miles)	Vehicles Required	Annual Ridership
Broadway / I-81 Corridor	27.9	2	2,496 – 7,488
Bridgewater / Mt. Crawford	18.8	2	9,204 – 27,664
Elkton / Keezletown	23.5	2	1,144 – 3,380
Grottoes	11.5	2	1,092 – 3,224

Although data indicated unmet transit demand exists within each of the four zones, the project team proposes moving forward with a single pilot zone to demonstrate proof of concept within the community. A single pilot zone will be more likely to effectively compete for DRPT demonstration grant funding than seeking funding for four zones simultaneously. It also gives Rockingham County an opportunity to test and refine implementation of its desired operating model.

High level modeling using the Remix platform indicates that the Bridgewater/Mt. Crawford zone will produce the highest ridership. The zone covers most of the large employment centers south of Harrisonburg along the I-81 and US-11 corridors as well as the Towns of Bridgewater, Dayton, and Mt. Crawford. The project team previously determined ridership to be the most important measure of success, so this zone was selected to be implemented first.

Service Hours and Targeted Wait Time

One of the advantages of microtransit is that service spans through a typical weekday—Saturday and Sunday are not static and can be altered depending on demand. Unlike transit which may be designed to service peak travel during the AM and PM rush-hour with higher frequency service, microtransit can be made available throughout the day at a targeted availability. This targeted availability is represented by the maximum amount of time a rider may have to wait for a rider from their request to pick up. Targeted availability can be lowered by making more vehicles available or changing the service zone.

The service hours and targeted availability for potential microtransit service in Rockingham County was developed to capture both peak travel demand but also to address essential trips to work and mid-day trips to shopping, medical appointments, and other trip purposes that occur during off-peak hours. **Figure 6** shows proposed service hour scenarios that were considered for the Bridgewater/Mt. Crawford zone.

Figure 6: Service Hours Scenarios

Scenario	Weekday	Saturday	Sunday	Annual Ridership[1]
A	5:30 AM - 7:00 PM	N/A	N/A	7,280 - 21,892
B	5:30 AM - 7:00 PM	8:00 AM - 4:00 PM	8:00 AM - 4:00 PM	8,580 - 25,740
C	5:30 AM - 7:00 PM	7:00 AM - 7:00 PM	7:00 AM - 7:00 PM	9,204 - 27,664

[1] Estimated annualized ridership from Remix

Budget and Implementation Plan

Service Model Evaluation

There are a variety of approaches to deliver microtransit service that include varying levels of software, existing service provider integration, branding, customer interfacing, and ultimately cost. The following section introduces the key elements of each microtransit service model and recommends the most applicable model for Rockingham County.

Software as a Service (SaaS)

Software as Service (SaaS) is a service model intended for agencies that wish to operate their own vehicles and provide their own staffing but require a software to schedule and facilitate a microtransit system. A third-party vendor supplies the software to provide dispatching, vehicle operator navigation, and an overall management tool. It also would supply a customer application to request rides, reserve in advance, conduct fare payment, and real-time trip information and service notifications. However, the agency would still be responsible for inputting operator schedules into the software, monitoring performance, hiring drivers, procuring and managing a vehicle fleet as well as responding to customer questions and complaints. The purpose of SaaS would be to provide the software interfacing and the advanced routing programming that would allow an existing fleet of vehicles and operation to be transformed into a seamless, publicly accessible, microtransit service to new customers.

Transportation as a Service (TaaS)

Transportation as a Service (TaaS) provides a more inclusive model than SaaS and is often referred to as turnkey. Under a TaaS model, Rockingham County could contract not only the software, but also the operations, maintenance, and vehicles directly to a third-party provider. The provider would not only be responsible for providing the backend software and the driver and rider-interfacing applications, but also be responsible for the training, dispatching, scheduling, and trip requests as well as the potential customer service aspects of a microtransit service. In this service model, Rockingham County would still monitor performance levels and oversee management of the system; however, the County could decide what aspects of microtransit operations would be delegated to its contractor depending on available resources and cost.

Figure 7: Summary of Service Models

Software as a Service (SaaS)	Transportation as a Service (TaaS)
Agency provides and manages vehicles and drivers	Vehicles and drivers are obtained through a contractor
Agency is responsible for operations and maintenance of fleet	Contractor is responsible for operations and maintenance of fleet
Agency is responsible for day-to-day planning and scheduling	Agency can be responsible for general planning and scheduling
Software is contracted to a third party	Software is contracted to a third party

The following section outlines the varying operational and financial factors to consider for implementation of microtransit in Rockingham County. These evaluation criteria include:

- Ease of Implementation

- Level of Infrastructure Needs
- Upfront Costs
- Ongoing Costs
- Scalability/Ease of Change

Certain microtransit service models offer benefits or drawbacks depending on the agency's existing structure and operations. For example, while SaaS may integrate well with an agency that has existing service because of its ability to use its own vehicles, it would not apply as well as a TaaS model to new service because the agency has to acquire vehicles, operators, and software separately.

Figure 8 assigns a low-high rating for the feasibility based on the benefits and drawbacks for each model for microtransit service in Rockingham County. A low rating indicates poor suitability while a high rating indicates the service model is applicable for the County's needs and existing resources.

Figure 8: Service Model Evaluation Criteria

Criteria	Software as a Service (SaaS)	Transportation as a Service (TaaS)
Ease of Implementation	**Low** Startup of new service with no in-house experience Requires software procurement	**Medium** Contractor facilitates startup More oversight and less control over operations Requires financial and legal oversight of contractor and contract management
Level of Infrastructure Needs	**Low** Requires County to acquire vehicles, train and hire new operators, and maintain facility	**High** Provider supplies all infrastructure and personnel required to operate
Upfront Costs	**Low** High startup costs for training, new vehicles, facilities	**Medium** Initial capital costs paid by contractor and amortized over time
Ongoing Costs	**Medium** County responsible for ongoing vehicle maintenance cost and operational cost risk	**High** County does not pay for direct operation of its own vehicles but pays a higher rate per vehicle hour for contracted service
Scalability/Ease of Change	**Low** Ease of change depends on County ability to acquire more operators and vehicles	**Medium** Ease of change depends on service contractor's ability to add vehicles and operators

In the short-term and to expedite the startup of transit service, Rockingham County should consider a TaaS service model for potential microtransit based on the following key factors:

- Rockingham County does not currently have publicly available transit service or infrastructure to startup operations including vehicles, operators, management, and

operations experience. TaaS provides the ability to scale up these resources for initial services and potential future expansion without Rockingham needing to acquire physical assets to do so.

- Although ongoing costs may be higher for TaaS, Rockingham County does not assume any risk in operations and acquisition of vehicles during a pilot project. The County also does not incur high costs for staffing up if service conditions a change. Rockingham County must negotiate contract terms with a service provider to align with their desired timeline for service, ensuring that there are assumptions for the level of service provided and that there are reporting and monitoring contract fulfilment clauses.

TaaS transit model allows service to be put in place for riders quickly without commitments to capital investment. It also allows Rockingham County to scale services depending on ridership demand. In the long-term, if transit service is successful, Rockingham County may wish to transition to a SaaS model because of the reduced costs (paying only for software) and ability to control their own fleet as a more sustainable operating model.

Costs

Costs were estimated for the service scenarios presented in **Figure 9** assuming a TaaS operating model. Costs are presented in 2023 dollars and assume the first year of operation would be partially funded by a DRPT demonstration grant, requiring a 20 percent local match with the remainder being funded by the grant.

Figure 9: First Year Operating Costs

Scenario	Estimated O&M Cost (Annual)[2]	Start-Up Costs	Estimated Local Match (First Year)
Scenario A **Weekday 5:30 AM - 7:00 PM** No Weekend Service	$737,000 - $948,000	$71,000	$162,000 - $204,000
Scenario B **Weekday 5:30 AM - 7:00 PM** **Saturday 8:00 AM - 4:00 PM** Sunday 8:00 AM - 4:00 PM	$854,000 – $1,100,000	$71,000	$185,000 - $234,000
Scenario C **Weekday 5:30 AM - 7:00 PM** **Saturday 7:00 AM - 7:00 PM** Sunday 7:00 AM -7:00 PM	$912,000 - $1,170,000	$71,000	$197,000 - $248,000

Funding Opportunities

DRPT's MERIT program includes the Demonstration Project Assistance Grant Program that supports innovative investments in public transportation. These grants provide funding for a limited timeframe, typically for 1 to 2 years, to fulfill up to 80 percent of the initial funding needs for new services or technologies. Requirements to submit an application for this funding include

[2] Cost per zone in 2023 dollars

project description, project justification, description of technical and financial capacity to deliver the project, performance measures and thresholds as well as documentation of local support.

Long-term funding for microtransit implementation would come from the Federal Transit Administration's (FTA) section 5311 grant program, which provides funding assistance for rural areas. The program is administered in Virginia by DRPT. Using 5311 funds would require a local match to receive federal and state funds.

Match requirements are different for capital and operating funding. In Virginia, the state portion of operating assistance is awarded based on a formula that takes into account service provided and service consumed. Federal operating assistance is 50 percent. This leaves a local annual match for long-term funding of typically 20 percent to 30 percent.

Capital assistance varies by grant program. Virginia provides a 16 percent match on most capital funding, though funding is competitive and not guaranteed. Most federal grant programs provide an 80 percent match. This leaves approximately four percent of capital costs that would need to be supported by a local match.

Figure 10: Long-Term Funding Breakdown

	Federal	State	Local
Operating	50%	Up to 30%	Remainder (typically 20%-30%)
Capital	80%	16%	4%

Attachments

Attachment A: Existing Conditions Analysis and Transit Market Assessment

Attachment B: Engagement Summary

Attachment C: Implementation Technical Memo

Virginia Department of Rail and Public Transportation

Rockingham County Transit Feasibility Study

Existing Conditions Analysis and Market Assessment

November 6, 2023

Prepared by:
Foursquare ITP

In association with:
Kimley-Horn

Contents

Figures

Tables

1. Introduction

1.1 Organization

This Existing Conditions Analysis and Transit Market Assessment achieves five objectives:

1. It describes existing public and private transportation services in Rockingham County.
2. It identifies trip generators i.n the county.
3. It describes current conditions, including where transit-dependent populations are concentrated.
4. It analyzes current travel patterns in the county.
5. It discusses the county's population and employment trends.

The report incorporates a variety of different types of data graphics and visualizations to convey this information to internal and public audiences clearly and concisely, including: (1) maps of market analysis demographics and travel patterns; and (2) summary tables and charts with transit-relevant data for the potential service area. (The raw data files used to conduct the analysis are available upon request.)

The overall intent is to describe the present transportation landscape and potential for establishing a successful public transportation service in Rockingham County, Virginia. In addition to this introductory section, the report includes several sections that address different aspects of existing conditions and the prospective transit market:

- Section 2, "Transportation Services," describes existing public, private and other transportation services in Rockingham County.

- Section 3, "Transit Trip Generators in the Study Area," discusses how certain travel destinations (e.g., grocery stores, health clinics) are especially critical to serve with transit and classifies 18 such destinations into five categories. It then describes how critical trip generators were identified in Rockingham County using a location-scraping tool and presents the identified locations on a map.

- Section 4, "Transit Market Analysis," explores Rockingham County's existing population and employment density and distribution. This section also analyzes diverse indicators of transit potential, encompassing several demographic categories. These include older adults, persons with disabilities, low-income populations, zero-vehicle households, minority populations, and individuals with limited English proficiency (LEP). Additionally, the section describes "transit propensity" and shows the results of the transit propensity analysis conducted for this study.

- Section 5, "Travel Flow Analysis," examines existing travel patterns, including total travel flows as well as travel flows related to healthcare access and travel flows of older adults.

- Section 6, "Population and Employment Trends," shifts the focus towards the future, presenting insights into how population and jobs may change in Rockingham County in coming decades.

- Section 7, "Key Findings," closes the report summarizing key findings from the transit market and travel flow analyses.

1.2 Overview of the Study Area

The study area for this project is Rockingham County, Virginia. Rockingham County is located in the in the Shenandoah Valley. Nestled between the Blue Ridge Mountains on the east and the Allegheny Mountains on the west, it is the third largest county in Virginia by land area, encompassing 853 square miles of diverse terrain.[1] Large portions of the county fall within the boundaries of Shenandoah National Park to the east and George Washington National Forest to the west. Both areas are subject to development restrictions and thus remain undeveloped for most purposes unrelated to the missions of the federal agencies that manage them. Rockingham County includes seven incorporated towns: Bridgewater, Broadway, Dayton, Elkton, Grottoes, Mount Crawford, and Timberville. Its county seat is the independent (or "county equivalent") City of Harrisonburg. Together, Harrisonburg and Rockingham County form the Harrisonburg Metropolitan Area, with a population of around 136,000 people.[2]

1.2 Institutional Context for the Study

Transportation planning in Rockingham County involves multiple governmental entities. These include Rockingham County itself, the City of Harrisonburg, the Harrisonburg-Rockingham Metropolitan Planning Organization (HRMPO), the Central Shenandoah Planning District Commission (CSPDC), the Virginia Department of Rail and Public Transportation (DRPT), the Virginia Department of Transportation (VDOT), the U.S. Forest Service, and the U.S. National Park Service.

Several governments and governmental agencies are involved in transportation planning in Rockingham County. These include – in addition to Rockingham County itself – the City of Harrisonburg, the Harrisonburg Rockingham Metropolitan Planning Organization (HRMPO), the Central Shenandoah Planning District Commission (CSPDC), the Virginia Department of Rail and Public Transportation (DRPT), the Virginia Department of Transportation (VDOT), the U.S. Forest Service, and the U.S. National Park Service. Of these, only the County, HRMPO, and DRPT are involved in this study.

The Harrisonburg-Rockingham Metropolitan Planning Organization (HRMPO) was established in 2003 and is the federally designated transportation planning organization for Harrisonburg and its environs, including portions of unincorporated Rockingham County. The organization carries out the metropolitan transportation planning process under federal law, including development of a Metropolitan Transportation Plan and programming of federal transportation funds in its planning area.[3] HRMPO supports multimodal transportation programs and projects in the City of Harrisonburg, the Towns of Bridgewater, Dayton, and Mt Crawford, and portions of Rockingham County.[4] All of these governments as well as the Virginia Department of Transportation have voting representation on the HRMPO Policy Board. Non-voting members include DRPT, CSPDC, the Federal Highway Administration, the Federal Transit Administration, James Madison University, and the Virginia Department of Aviation.[5]

[1] https://www.rockinghamcountyva.gov/120/History-of-County
[2] https://www.rockinghamcountyva.gov/120/History-of-County
[3] https://www.ecfr.gov/current/title-23/chapter-I/subchapter-E/part-450/subpart-C
[4] https://hrvampo.org/about-hrmpo/
[5] https://hrvampo.org/board-committees/policy-board/

The mission of the Virginia Department of Rail and Public Transportation (DRPT) is to promote the safe, reliable, cost-effective, and efficient transportation of goods and people throughout the Commonwealth.[6] It works with local, regional, state, and federal governments, as well as private entities to support projects and programs of a variety of different sorts. Its primary areas of activity are rail, public transportation, and commuter services. In the rail area, DRPT oversees programs and initiatives that support investments in infrastructure. It also delivers data-driven planning recommendations and policies for both passenger and freight rail service. In the area of public transportation, DRPT administers funds and planning for 40 bus providers as well as commuter rail, heavy rail, light rail, paratransit, and ferryboat systems. And in the realm of commuter services, DRPT manages investments in local and regional commuter assistance programs that mitigate congestion, manage transportation demand, and promote and encourage the use of transit, vanpools, and carpools.

[6] https://www.virginia.gov/agencies/department-of-rail-and-public-transportation/ and https://drpt.virginia.gov/about-us/our-mission/

2. Transportation Services

2.1 Existing Public Transportation Services

Currently, three distinct public transportation systems operate within Rockingham County (**Figure 1**), providing various types of bus services. (Passenger rail services are not presently available in the county.) The public bus systems serving the area include: (1) service operated by the City of Harrisonburg; (2) service operated by BRITE, which primarily focuses on Augusta County though provides a single fixed route that extends into Rockingham County; and (3) the state-funded Virginia Breeze intercity bus service.

Harrisonburg Department of Public Transportation (HDPT)

HDPT offers a comprehensive transit network including year-round City routes and James Madison University (JMU) shuttles that operate only when the university is in session. While HDPT service operates primarily within the city limits of Harrisonburg, there are a few exceptions. City Route 4 extends into Rockingham County to serve a light industrial area along I-81 including Packaging Corporation of America. Routes 2 and 6 also cross the city line to serve Sentara RMH Medical Center, an important regional healthcare facility. Among JMU routes, the Black and Blue/Purple lines both cross about a block into Rockingham County to serve The Cottages on Port Republic and Redpoint Harrisonburg apartments, respectively. Both properties are popular with JMU students and have contracted with HDPT for direct service. HDPT is currently in the process of updating its Transit Strategic Plan to improve system efficiency and address changing travel and development patterns.

BRITE

BRITE operates several fixed bus routes within its service area including a route that reaches into Rockingham County.[7] The BRCC Shuttle North links various points in Augusta County to the Harrisonburg Department of Public Transportation network and Blue Ridge Community College. Since 2018, this route has been connecting Harrisonburg, Bridgewater, Dayton, Mt. Crawford, Rockingham County, and Staunton on weekdays. Additionally, BRITE operates the Afton Express, a public commuter bus service that connects Staunton, Waynesboro, Fishersville, Charlottesville, and Albemarle County. While the Afton Express does not have a direct connection to Rockingham County, it offers the potential for connections to neighboring cities and counties.

Virginia Breeze Intercity Bus Service

The Virginia Breeze is an intercity bus service funded by the Commonwealth of Virginia, operated by Megabus, and managed by the Virginia Department of Rail and Public Transportation (DRPT). It consists of four routes: the Valley Flyer, the Piedmont Express, the Capital Connector, and the Highlands Rhythm. Two of these routes serve Rockingham County and nearby Augusta County. The Valley Flyer operates daily between Blacksburg and Washington, D.C., with stops in Harrisonburg and Staunton. The Highlands Rhythm operates daily between Bristol and Washington, D.C., including a stop in Harrisonburg.

[7] BRITE service is delivered under contract by a company called Virginia Regional Transit.

2.2 Existing Private Transportation Services

Massanutten Resort

Massanutten Resort offers a private shuttle service primarily catering to its guests. The shuttle operates exclusively within the confines of the resort and operates on a demand-responsive basis. Access to the service requires the payment of a fare, with options including a $2.50 fee for a single-ride (one-way) ticket and $6.50, $14.00, and $20.25 for 1-day, 3-day, and 7-day unlimited passes, respectively.

To use the service, guests must first download the TripShot app from their phone's app store. Subsequently, they should navigate to the "Public System" in the app's menu and select "Massanutten Resort" from the available public transit list. Following this selection, guests can specify their preferred pickup location and destination.[8]

2.3 Other Transportation Services

Department of Rail and Public Transportation (DRPT) Viriginia Transportation Finder

The DRPT Virginia Transportation Finder, also known as the Transportation Navigator, is a statewide directory of transportation services, encompassing public transit, specialized providers, programs, and services. The DRPT is actively working to develop a comprehensive system for human services, mobility management, and transportation-supportive programs and services across Virginia. This initiative focuses on serving all population demographics, with specific attention to individuals with disabilities, seniors, veterans, and individuals with opioid use disorder.

The5rojectt includes updates that will introduce a map-based search service and an app platform, which will incorporate bicycling, ride-sharing, and carpooling options. The Virginia Transportation Finder comprises three branches: the Disability Navigator, Senior Navigator, and Veterans Navigator. Each of these branches provides information and resources related to transportation services, as well as housing, benefits, and other services and programs for Virginia residents.

Human Service Transportation / Section 5310 Program

Human services transportation includes a broad range of service options that are designed to meet the needs of transportation disadvantaged populations.[9] Whereas, by definition, traditional public transportation is open to everyone, human service transportation is open only to people who qualify to use it.[10] Every three to six years, DRPT prepares a plan for human services transportation in Virginia. The plan is called the Coordinated Human Services Mobility Plan (CHSM) and is developed in accordance with the guidance set forth by the Federal transit Administration (FTA). FTA provides funding for human service transportation through its Section 5310 grant program. The program supports capital and operating expenses for transportation provided to seniors (age 65 or older) and individuals with disabilities. Low-income individuals and veterans may also qualify if one of the other criteria are met.[11]

---

[8] https://www.massresort.com/explore/shuttle/

[9] https://www.transit.dot.gov/what-human-service-transportation#:~:text=Human%20services%20transportation%20includes%20a,or%20those%20with%20lower%20income.

[10] https://drpt.virginia.gov/wp-content/uploads/2023/09/2022-Coordinated-Human-Services-Mobility-Plan.pdf, p. 3.

[11] Ibid, p. 3.

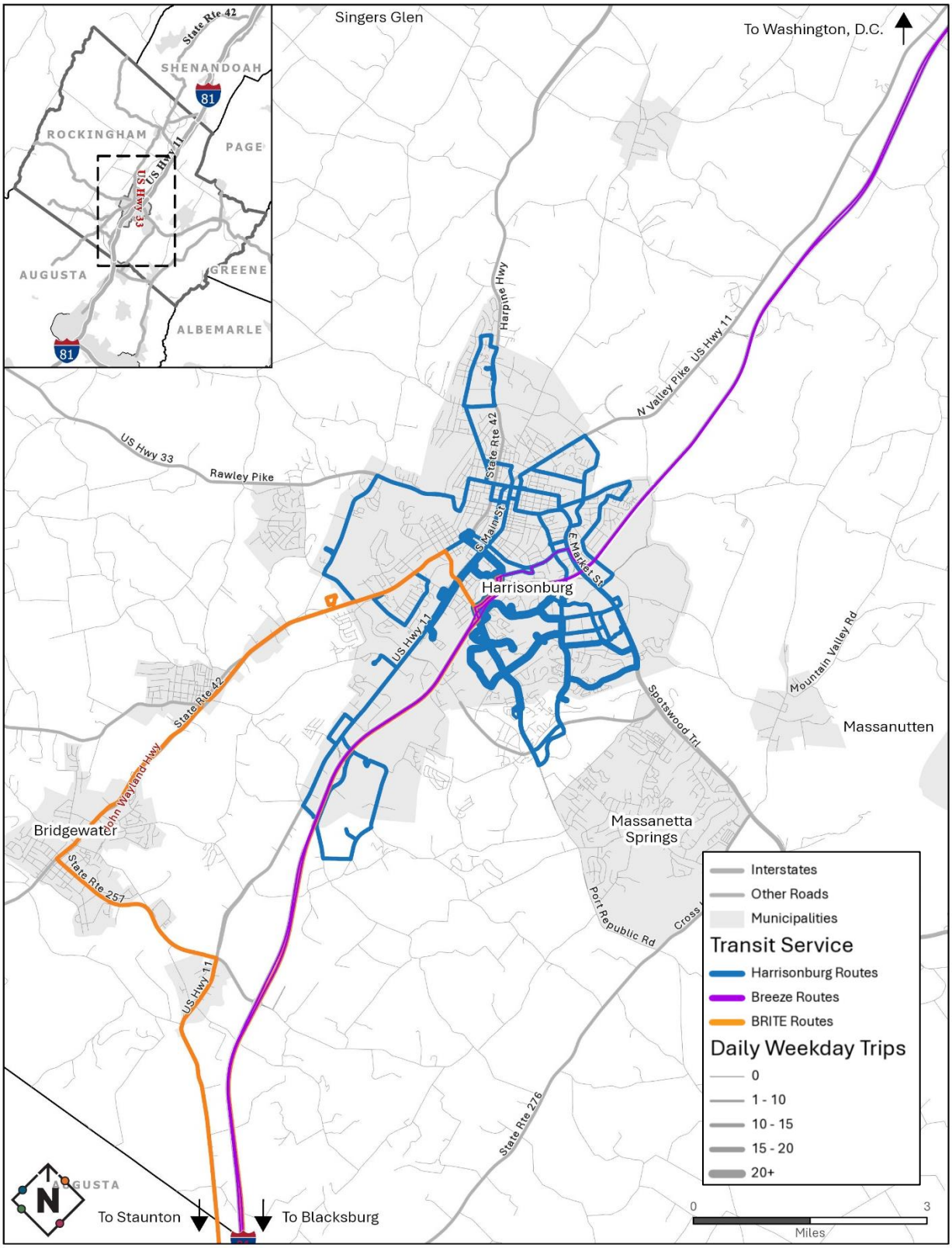
The FTA Section 5310 Program requires that all funded activities must be supported by a Coordinated Human Services Mobility (CHSM) Plan that assesses current services, assesses the transportation needs of seniors and people with disabilities, identifies strategies to address service gaps, and sets priorities for project implementation. The plan undergoes a comprehensive update every six years and a data update every three years. DRPT's 2022 plan was a data update that largely reinforced what was already known from the 2019 (six-year) plan. Specifically, the 2022 update found that human service transportation could better serve several key population groups including "rural seniors, people with disabilities, people with chronic medical conditions, low-income residents, veterans and their families, and jobseekers." It also found that several specific trip types could be better served, including "recurring medical trips, essential non-medical trips, quality-of-life non-medical trips, location-specific medical trips, employment trips, after-hours evening trips, multi-stop trips, and long-distance trips."

DRPT is responsible for the competitive, discretionary award of funds under the Section 5310 program. It administers an annual application process for this purpose. DRPT is also responsible for certifying that all projects selected for funding are included in the CHSM plan.

Travel Demand Management Program / Park-and-Ride Lots

The CSPDC also operates the Thomas Jefferson Planning District Commission's RideShare Transportation Demand Management (TDM) program, which offers ride matching services throughout the region, including Rockingham County. This program involves outreach and promotion activities to reduce single-occupancy vehicle trips, focusing on employer outreach, workforce engagement, universities and colleges, and activities designed to raise awareness of alternative transportation modes. Additionally, the CSPDC operates a Guaranteed Ride Home Program, and there are six rideshare park-and-ride lots serving the Harrisonburg and Rockingham area.

Figure 1: Existing Transit Service in Rockingham County



3. Transit Trip Generators in the Study Area

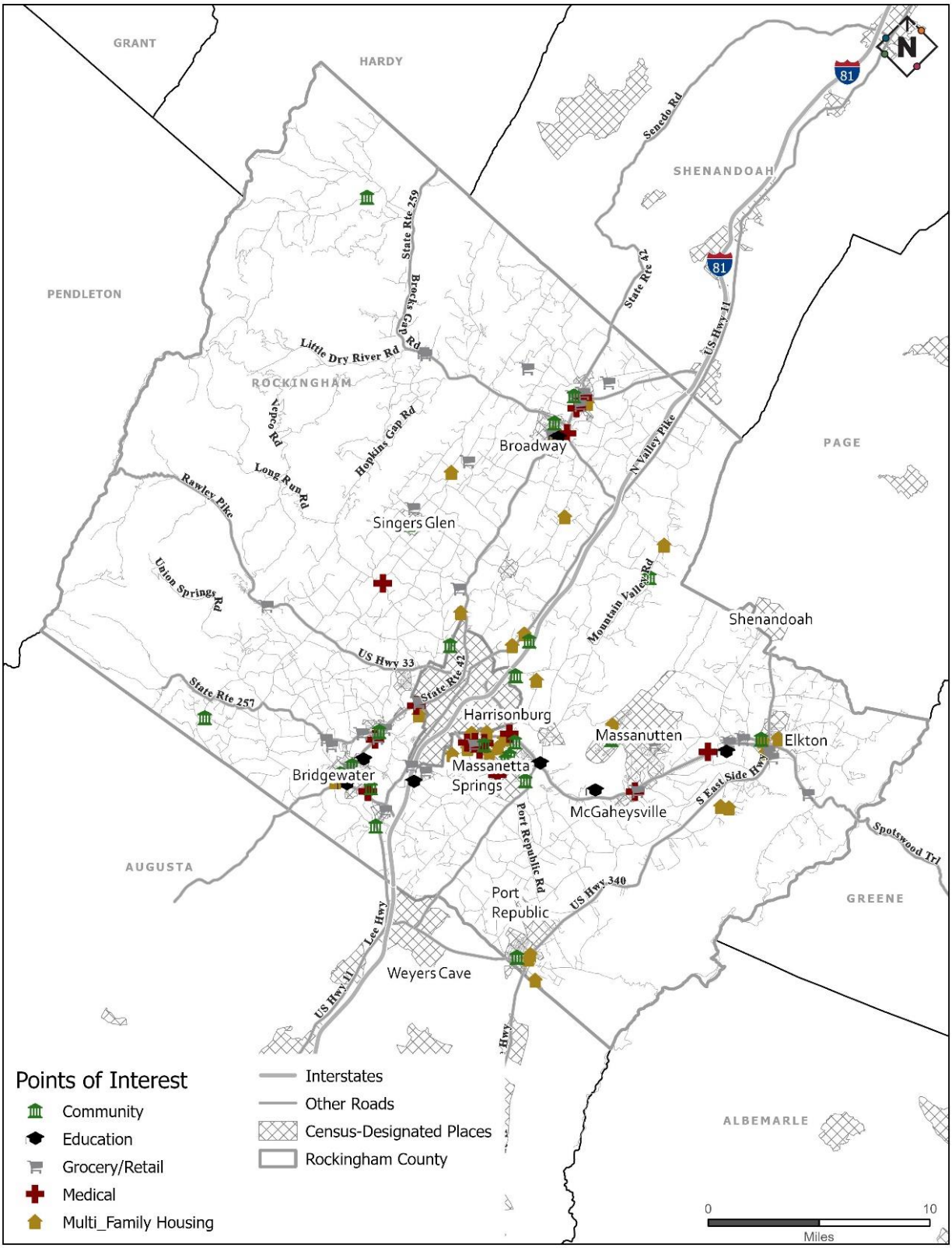
Identifying places within a community that are likely to generate significant numbers of transit trips is crucial for transit service planning. Transit users generally desire access to the same kinds of destinations as people who use other travel modes. However, some places are especially critical for transit users to be able to access. These include grocery stores, apartments, educational institutions, hospitals, health clinics, senior centers, and several others. These places tend to serve as focal points for transit service planning.

Classification of key places into a limited number of trip-generation categories can aid understanding of how potential transit trip generators are distributed throughout a community. For this project, the study team created a list of 18 critical transit trip generators and classified them into five categories: Community, Education, Grocery/Retail, Medical and Multi-Family Housing **(Table 1)**. The team then used a location-scraping tool to identify specific locations in Rockingham County where places in each category currently exist. These are mapped in **Figure 2**.

Table 1: Categories of Major Travel Destinations in the Study Area

■ Community ☐ Recreation Center ☐ Community Center ☐ Social Security ☐ Library ☐ City Hall ☐ Senior Center ■ Education ☐ High School ☐ College ☐ University	■ Grocery/Retail ☐ Grocery ☐ Supermarket ☐ Big Box (Costco, Walmart, Target, etc.) ☐ Mall ■ Medical ☐ Hospital ☐ Clinic ■ Multi-Family Housing ☐ Apartments ☐ Condominiums ☐ Mobile Home Parks

Figure 2: Major Potential Transit Trip Generators in Rockingham County



4. Transit Market Analysis

An in-depth understanding of the transit market is imperative when evaluating the viability of transit services and determining the optimal timing and locations for service implementation or modifications in the short and medium term. This section focuses on assessing the potential transit market in Rockingham County. The analysis aims to identify the residential locations of potential transit riders, their desired destinations and essential travel routes, and the possible evolution of travel patterns over time.

Transit services thrive in areas characterized by high population and employment densities. In regions with lower population and employment densities, traditional fixed-route bus services may not be the most suitable option. Instead, alternative solutions such as micro-transit or human-services transportation may be more appropriate. Moreover, socio-demographic indicators play a significant role in pinpointing transit demand, even in locations where existing land-use and density might not seem to support fixed-route services.

The objective of this section is to evaluate the potential and need for transit services by examining the following market characteristics:

- Population and Employment Distribution
- Other Demographic Indicators
- Transit Propensity

4.1 Population and Employment Density

Population and employment serve as the primary indicators of transit demand. Higher concentrations of people residing and working in proximity along transportation corridors or in specific areas increase the feasibility of transit services.

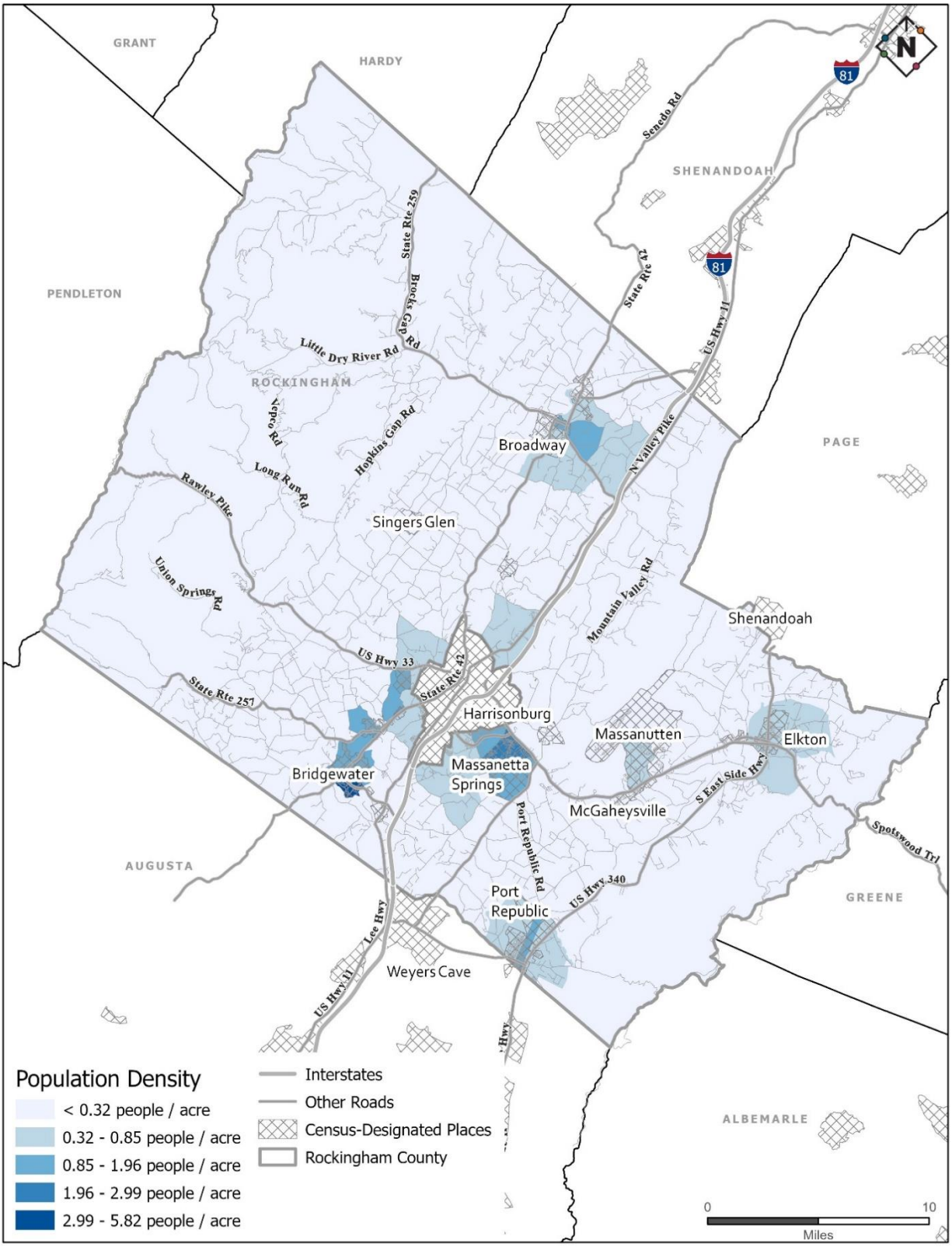
4.1.1 POPULATION DENSITY

The density of population and employment strongly influences transit demand. Areas with a higher population indicate greater potential for transit ridership, especially when transit services connect people to employment, retail, and other opportunities within easy walking distance of bus stops. Typically, fixed-route transit services aim for a population density of at least 3,000 people per square mile. However, in Rockingham County, population densities are generally below this threshold, making fixed-route transit challenging to operate efficiently. Nevertheless, some areas, such as near the southern boundary of the county south of State Route 257, between Harrisonburg and Broadway, between Harrisonburg and Port Republic, and between Harrisonburg and Elkton, show promise for potential transit viability.

In 2022, Rockingham County had a population of just under 85,400, with an average population density of about 100 people per square mile.[12] **Figure 3** shows how Rockingham County's population density varies by Census block group. It is essential to note that the county's low population density doesn't rule out the feasibility of transit services. In fact, indications suggest that certain types of transit services could be viable, even in areas outside urbanized areas.

[12] https://www.census.gov/quickfacts/fact/table/rockinghamcountyvirginia/LND110220

Figure 3: Population Density in Rockingham County by Block Group



4.1.2 EMPLOYERS AND EMPLOYMENT DENSITY

The presence of a variety of large employers in Rockingham County, from prominent pharmaceutical firms to an all-season resort, significantly impacts transit demand. Employment concentrations in specific areas or corridors demonstrate that some travel demand could potentially be served by transit effectively. **Figure 4** is a map of major employers by industry in Rockingham County while **Appendix Table A-1** contains a comprehensive list of the major employers. **Figure 5** maps employment density in Rockingham County by Census block group, while **Appendix Table B-1** maps the distribution of employment by census block group. These figures indicate that the I-81 corridor and the Elkton area stand out as areas with higher employment densities, indicating greater potential for transit to successfully serve commute trips.

Figure 4: Major Employers in Rockingham County by Industry

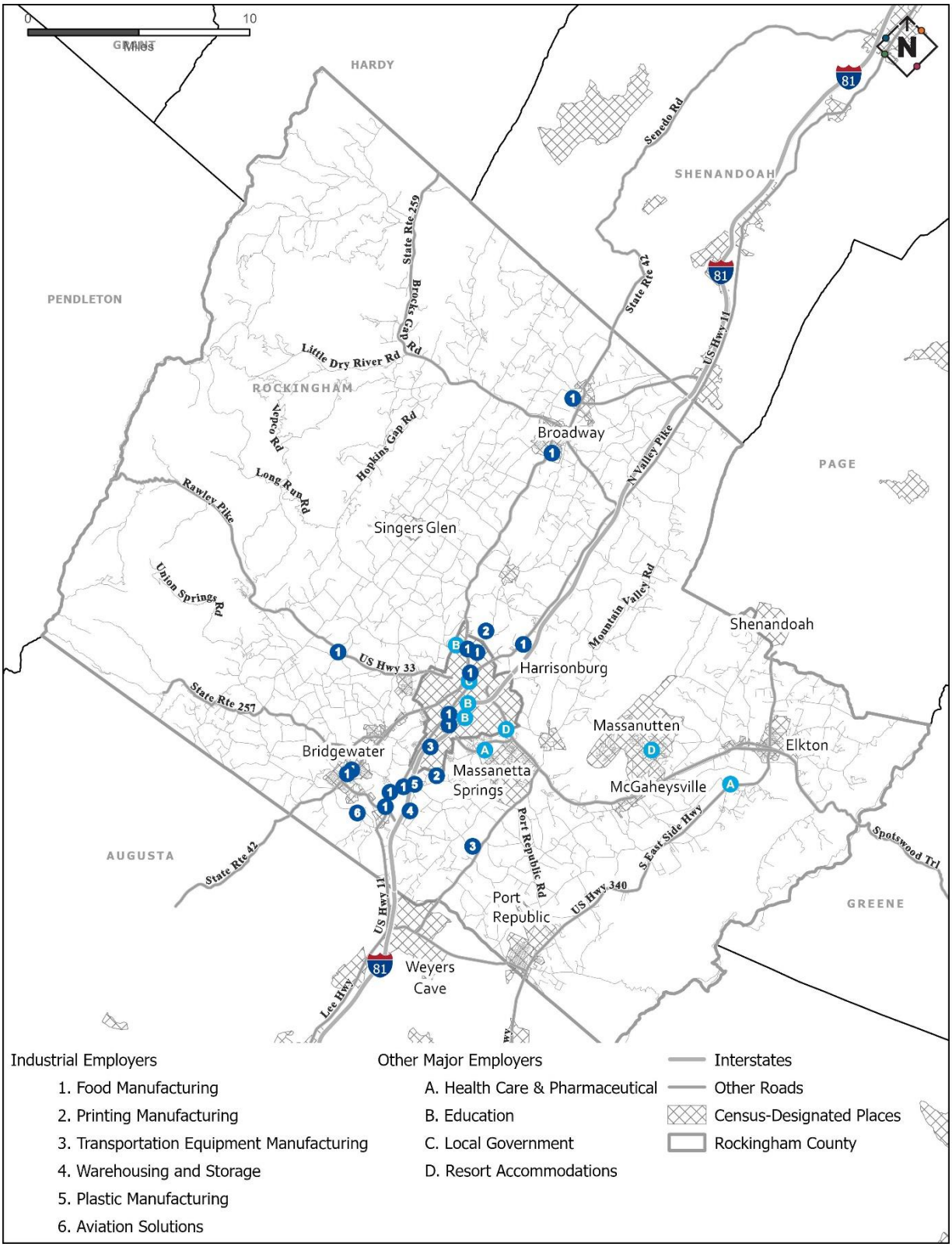
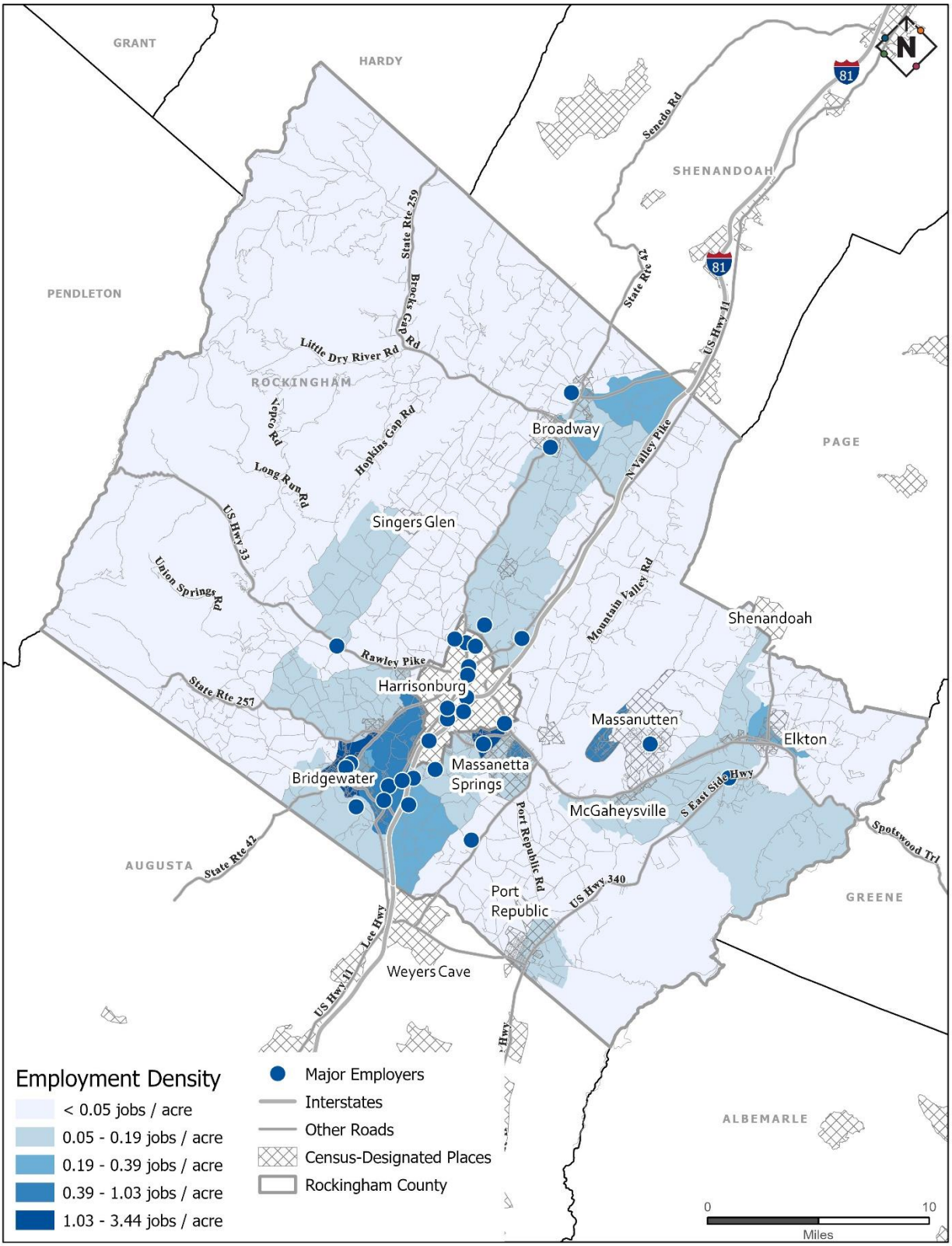


Figure 5: Employment Density in Rockingham County by Block Group

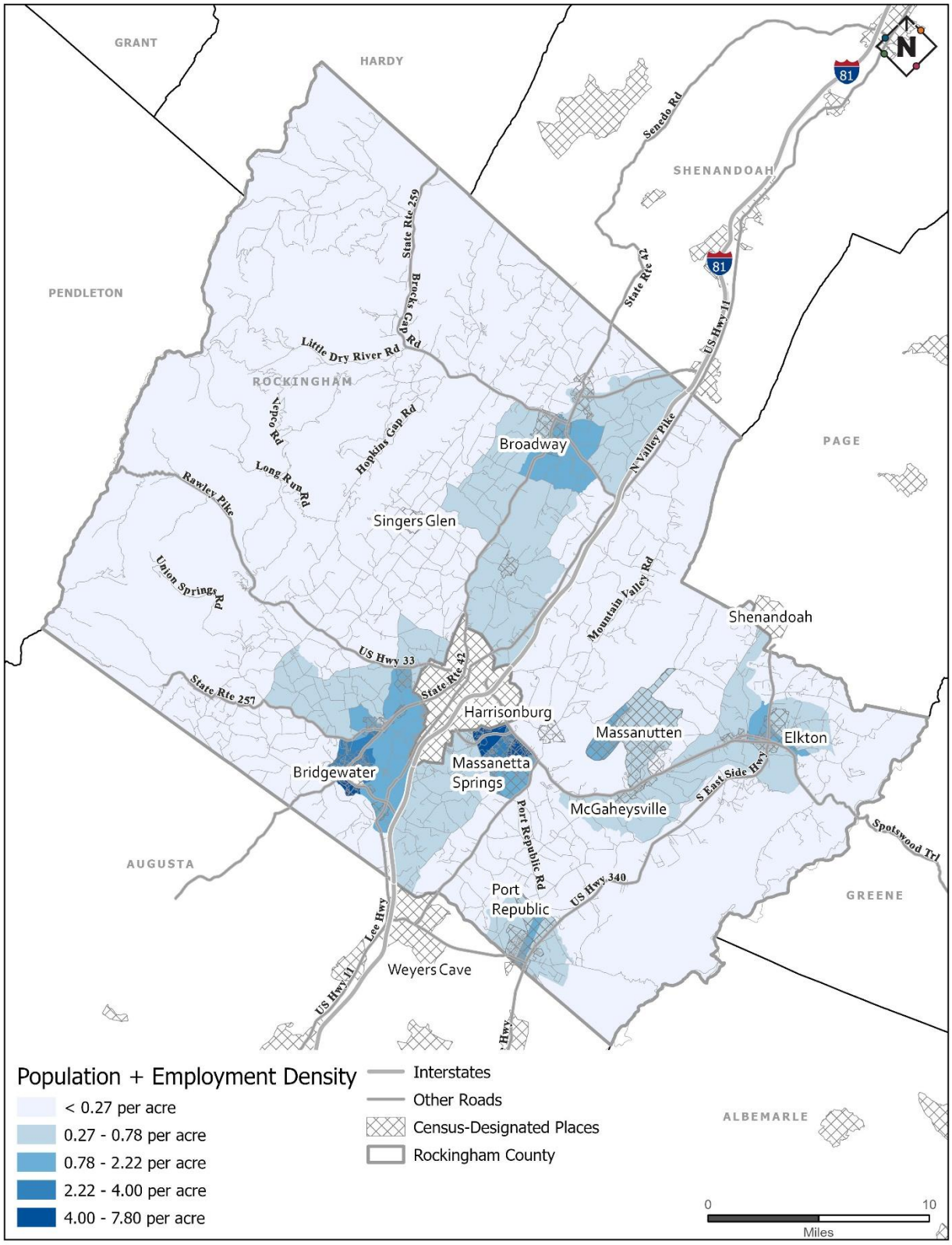


4.1.3 COMBINED POPULATION AND EMPLOYMENT DENSITY

A key measure of transit potential is the combination of population and employment in an area. The sum of these variables provides a solid indicator of the viability of fixed-route services. High combined levels of population and jobs point to a higher likelihood of generating transit ridership.

Figure 6 shows the density of population and employment by Census block group in Rockingham County, while **Appendix Table B-2** shows the sum of population and employment block group. These figures indicate that areas in the Interstate 81 corridor (around Bridgewater, Harrisonburg, and Broadway) and around Elkton have the greatest potential to generate transit trips in the county.

Figure 6: Population + Employment Density in Rockingham County



4.2 Other Indicators of Transit Potential

Several demographic variables are associated with higher rates of transit use, including age, disability status, income, automobile availability, minority status, and limited English-speaking proficiency. These indicators correlate with increased transit need.

4.2.1 OLDER ADULTS

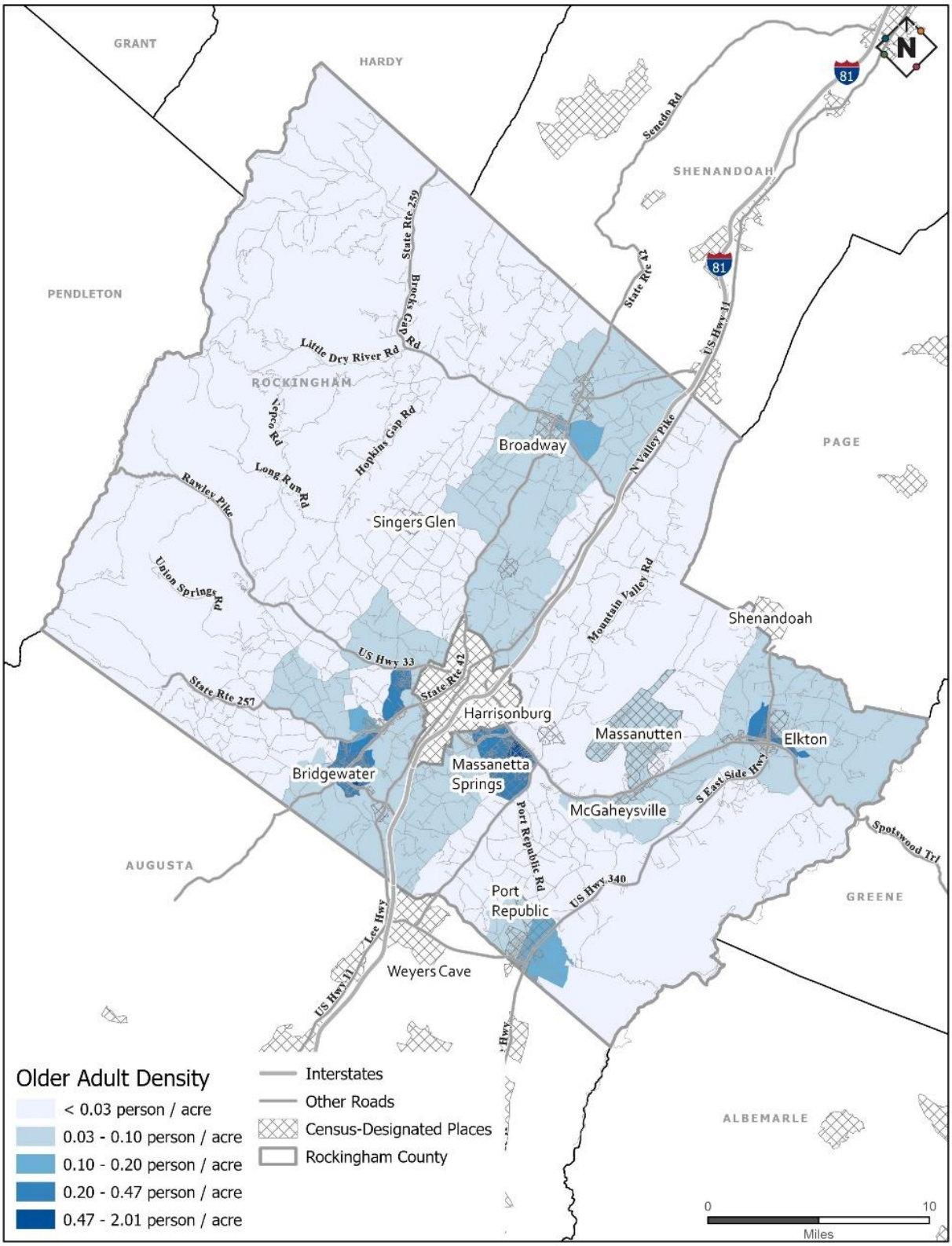
Approximately 21 percent of Rockingham County residents are age 65 or older,[13] and this demographic often relies on public transit for essential travel, as driving may become challenging with age. Transit serves their diverse needs, including accessing healthcare, social activities, and daily necessities. The county's aging population, with a significant increase in the 65+ category,[14] suggests a growing need for transit to support independent living.

Figure 7 shows the population density of older adults by Census block group, while **Appendix Figure B-4** shows the population distribution. While seniors are scattered throughout the county, the highest concentrations are in areas located south of State Route 257 near Bridgewater, between Broadway and Harrisonburg, adjacent to Massanutten Springs in the Sunnyside Retirement Community, just east of Port Republic, and in and around Elkton.

[13] https://www.census.gov/quickfacts/rockinghamcountyvirginia

[14] Today, there are nearly 77 percent more people in this category than 20 years ago.

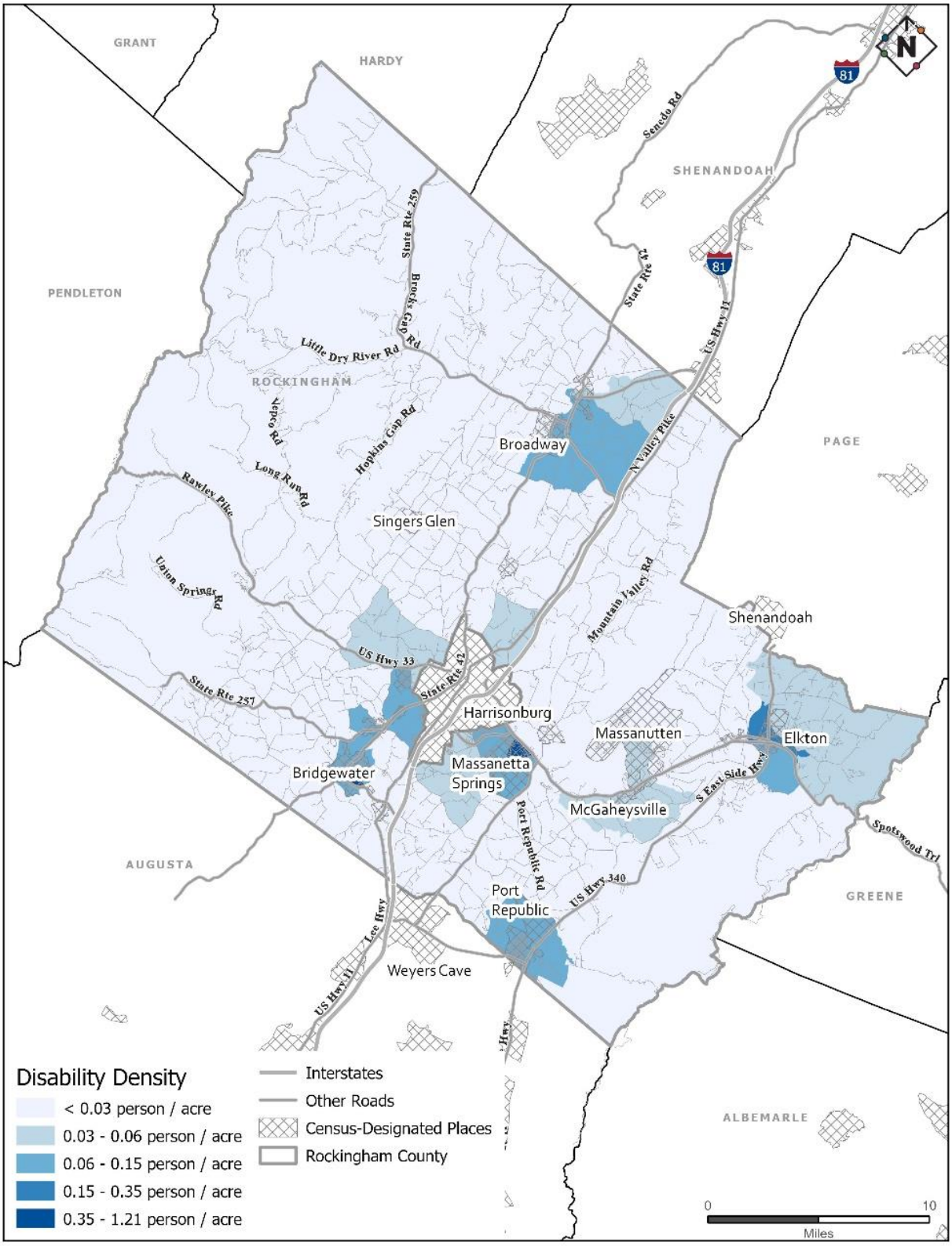
Figure 7: Density of Older Adult Population by Block Group



4.2.2 PERSONS WITH DISABILITIES

Public transit plays a crucial role for individuals with disabilities by providing accessible transportation options for work, medical appointments, and other purposes. **Figure 8** shows the population density of this group across Rockingham County, while **Appendix Figure B-5** shows population by block group. Several Census block groups in the county have notable concentrations of persons with disabilities, including block groups surrounding Elkton, block groups near Broadway, block groups located north of Rawley Pike, and block groups located north of Singers Glen.

Figure 8: Density of Persons with Disabilities by Block Group



4.2.3 LOW-INCOME POPULATION

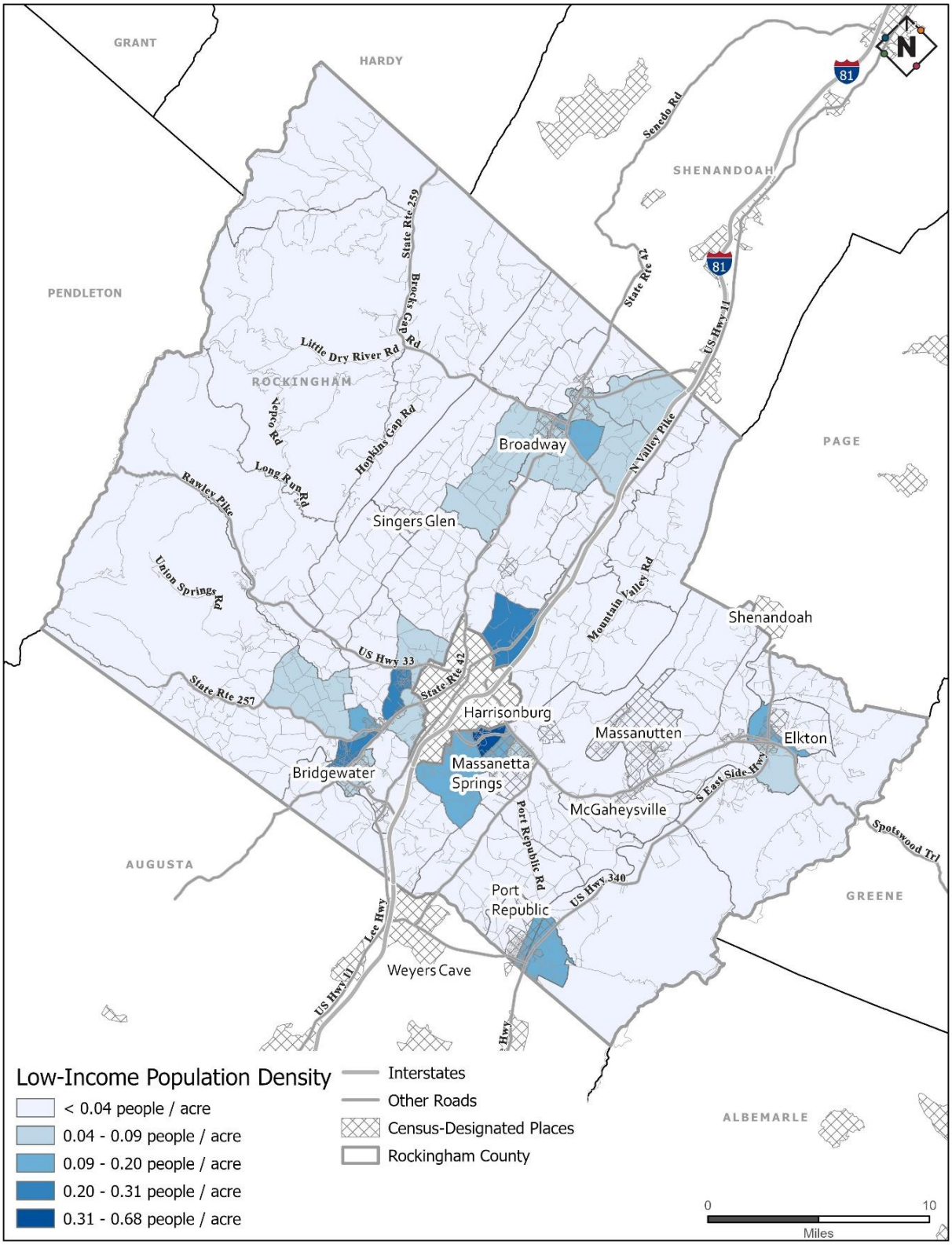
Low-income populations often depend on public transportation due to financial constraints, making it their primary mode of affordable transportation. Public transit alleviates economic disparities by providing affordable access to work, school, and essential services.

Housing and transportation costs consume a substantial portion of household budgets in Rockingham County, making public transit an essential means of affordable travel for low-income populations. Paying rent is especially problematic for low-income populations, so lowering transportation costs can be particularly beneficial for this category of people. Housing affordability and transportation costs should always be considered together, as the two are closely related. According to data compiled by the Center for Neighborhood Technology, housing and transportation costs in Rockingham County consume 27 percent and 28 percent, respectively, of a typical household's budget (for a combined total of 55 percent).[15] For moderate-income households, the combined burden is even greater, with nearly two-thirds (65 percent) of the average budget consumed by housing and transportation costs. Planning and implementing new and expanded public transit services in the county may be one important way to address this problem.

For this report, we have defined low-income populations as people living in households with annual incomes less than 150 percent of the poverty line. **Figure 9** shows the density of the low-income population of Rockingham County, while **Appendix Figure B-6** shows how many people live in each block group. As the figure shows, the distribution of the county's low-income population is similar to that for persons with disabilities. The highest concentrations are in the block groups surrounding Elkton, the block groups north and south of Harrisonburg, the block groups near Broadway, the block group located north of Rawley Pike, and the block group located east of Brocks Gap Road.

[15] https://htaindex.cnt.org/map/. Data summary for Rockingham County, Virginia.

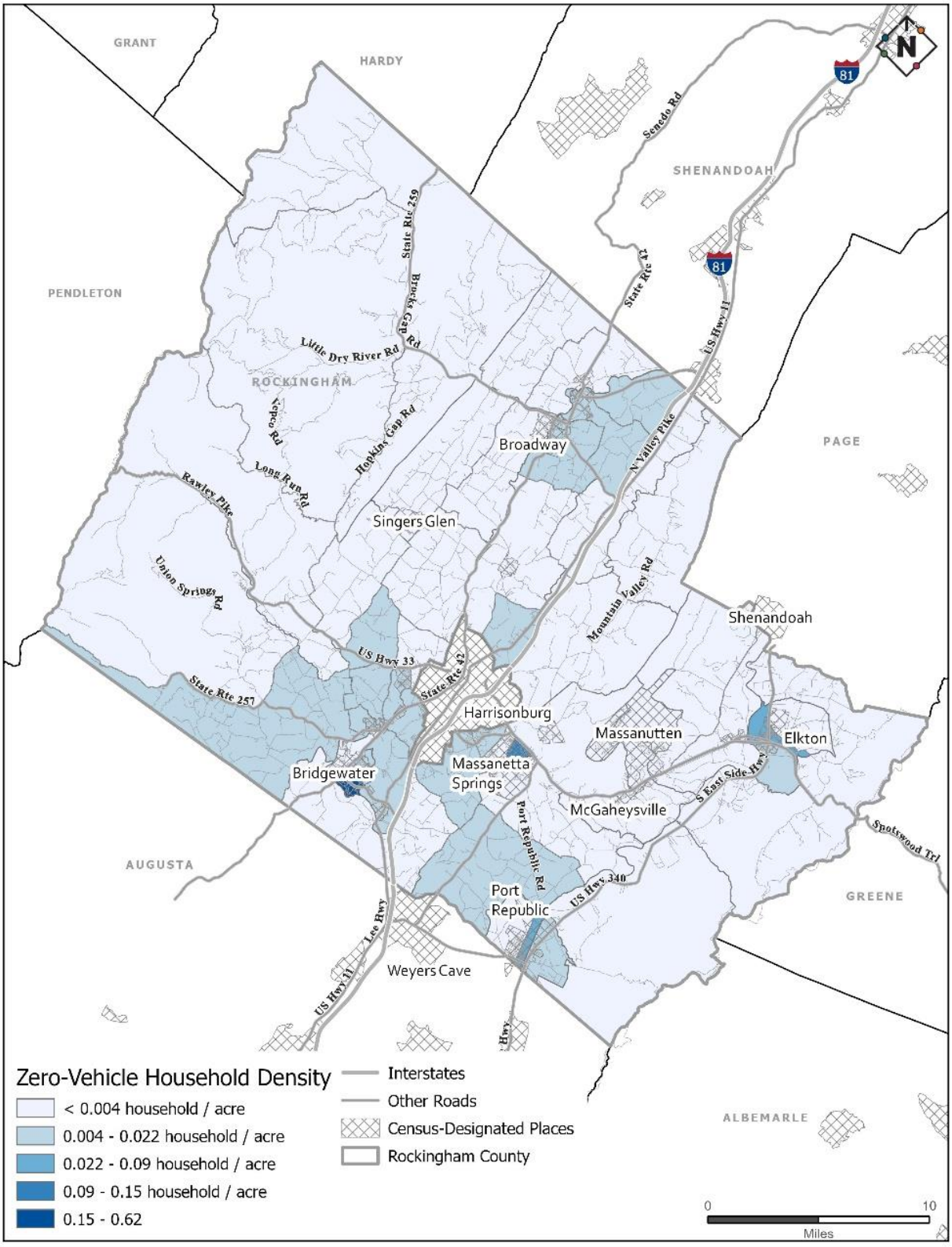
Figure 9: Density of Low-Income Population by Block Group



4.2.4 ZERO-VEHICLE HOUSEHOLDS

Households without access to private vehicles rely heavily on public transit for their daily travel needs, including commuting and accessing essential services. Specific areas in Rockingham County exhibit a higher concentration of zero-vehicle households, highlighting the need for transit service planning in those regions. **Figure 10** shows the distribution and density of zero-vehicle households in Rockingham County, while **Appendix Figure B-7** shows the absolute numbers of zero-vehicle households by census block group. As the data in these figures indicate, areas with the highest concentrations of zero-vehicle households tend to be located to the west, southwest and southeast of Harrisonburg, as well as around Broadway and Elkton.

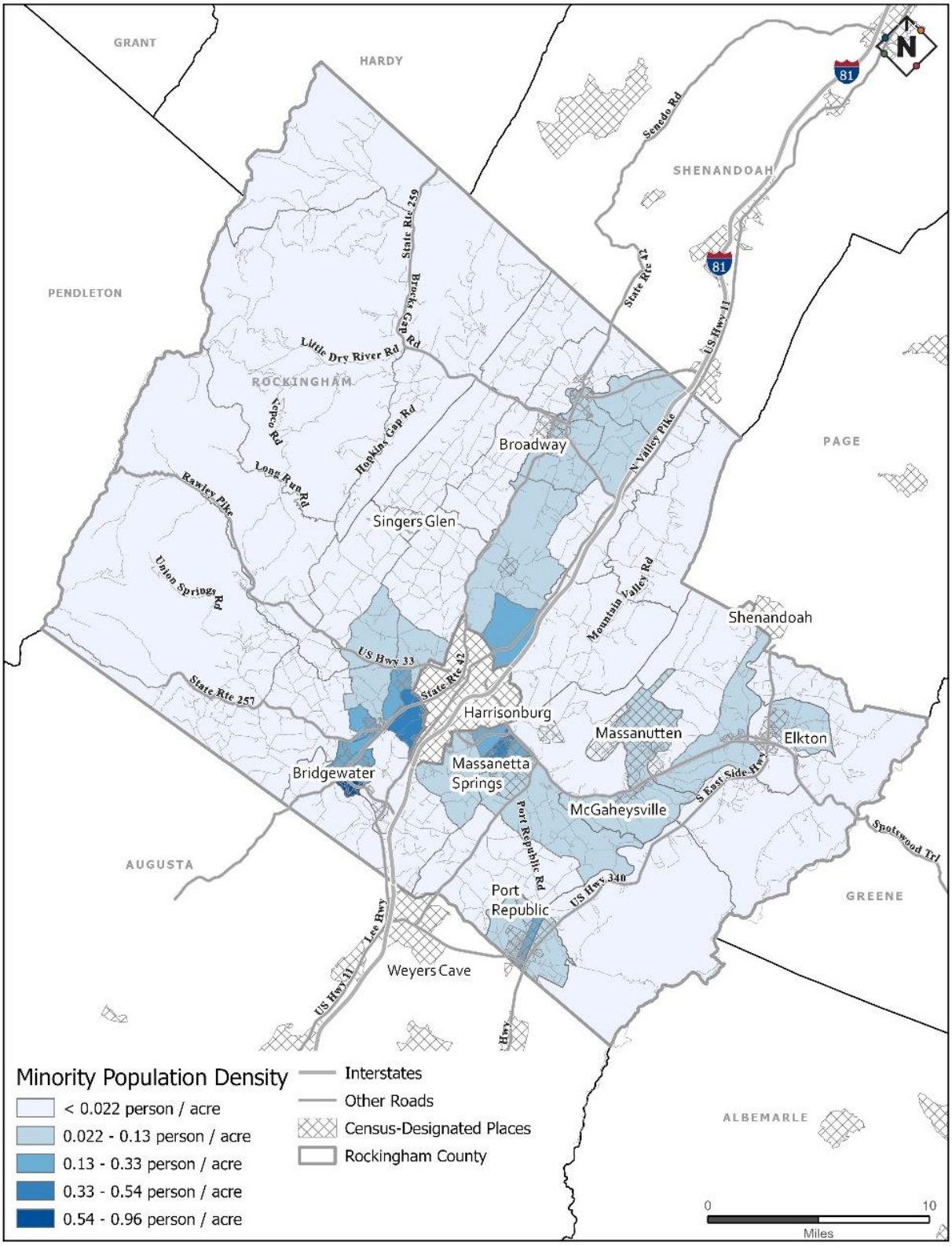
Figure 10: Density of Zero-Vehicle Households by Block Group



4.2.5 MINORITY POPULATION

Minority (non-white or Hispanic) populations disproportionately rely on public transit nationwide, in part due to economic and transportation disparities. For a variety of historical reasons, including redlining and a postwar migration for industrial work, both of which concentrated minority populations in older urban neighborhoods with existing transit access, minority populations represent a strong market for transit. **Figure 11** and **Appendix Figure B-8** show the density and the absolute distribution of the minority population across the study area. Minority population tends to be concentrated in a U-shaped region extending south from Broadway to Bridgewater along the I-81 corridor and from Harrisonburg through Massanetta Springs, McGaheysville and Massanutten to Elkton and Shenandoah. Port Republic also has a cluster of people in this demographic category.

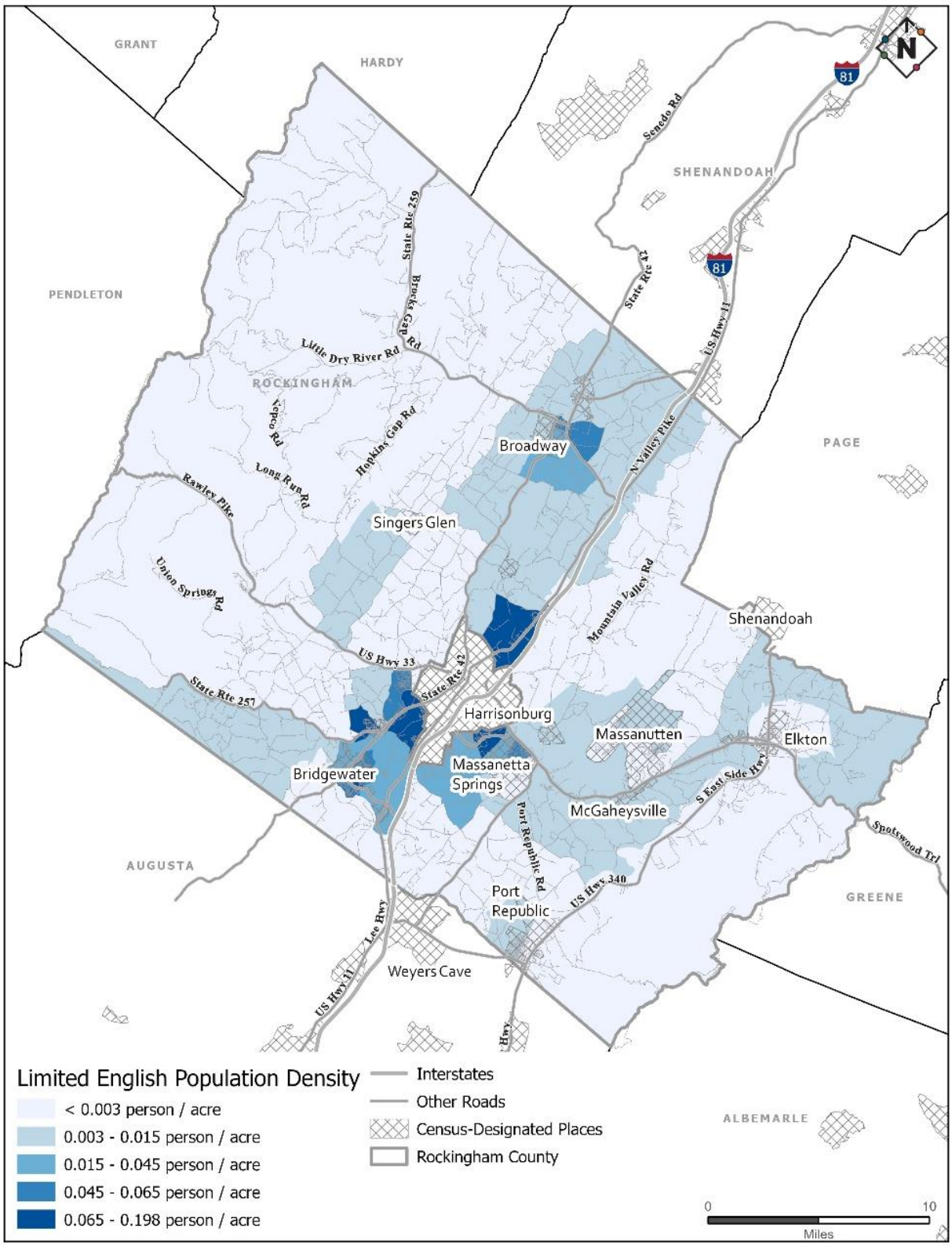
Figure 11: Density of Minority Population by Block Group



4.2.6 LIMITED ENGLISH PROFICIENCY (LEP) POPULATION

While English proficiency may not directly impact transit use, limited English proficiency often correlates with other factors affecting transit use, such as access to a driver's license and cultural familiarity. **Figure 12** and Appendix Figure B-9 show the density and distribution of Rockingham County's Limited English Proficiency Population by Census block group, respectively. Concentrations of limited English proficiency populations are evident along the I-81 corridor especially.

Figure 12: Density of Limited English Proficiency Population by Block Group



4.3 Transit Propensity

Understanding how transit use varies between different sub-populations within a community is crucial to understanding the market for transit. Planners can use a measure called a transit propensity index to identify populations or areas within a community with the greatest need for transit. Transit propensity indices typically combine multiple socio-demographic and other variables to gauge transit demand.

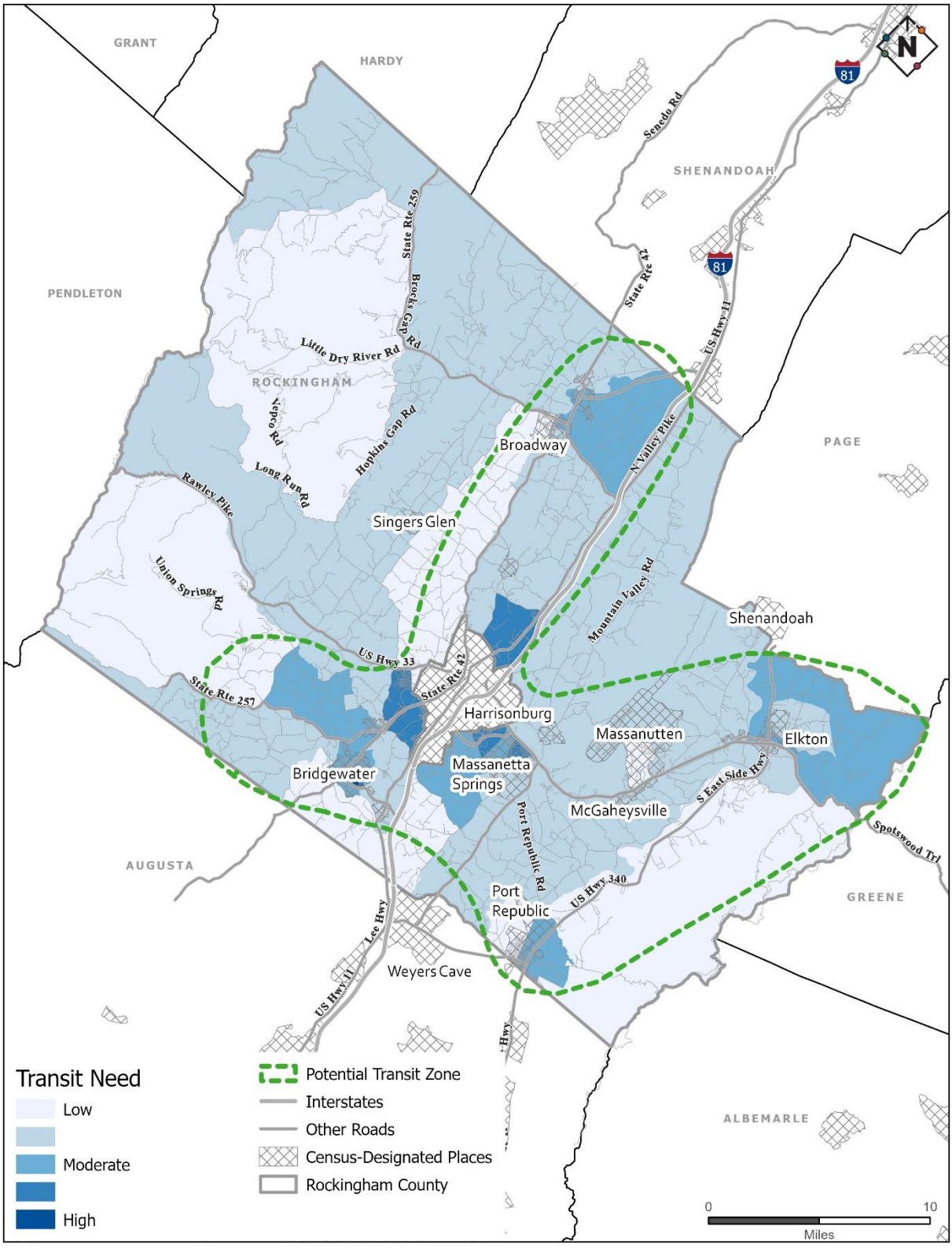
The model we used for this study is Foursquare Integrated ITP's Transit Propensity Model. This model combines a broad array of data sources into indices that identify where the highest propensity for transit use exists. Every Census block or block group receives a unique score in each propensity index and is ranked relative to the study area.

For this study, the study team used one of the indices within the Foursquare ITP model called the Transit-Oriented Populations Index. The team used the index to identify existing populations in Rockingham County who are most likely to use transit service if it becomes available. Variables incorporated in the index include total population, older people, people with disabilities, zero-vehicle households, low-income populations, and limited English-speaking populations. The index combines existing values of these variables to illustrate thematically how transit needs vary between different Census block groups.

Figure 15 shows the results of the transit propensity analysis. As the figure indicates, transit propensity is highest in block groups surrounding Harrisonburg; high to moderate in and around Broadway, Bridgewater, Port Republic, and Elkton; and lowest in the remaining areas of the county. Together, the areas with moderate-to-high propensity form what we have labeled a "potential transit zone" for Rockingham County. This insight provides valuable guidance for transit service planning and development.

For more information on how the Transit-Oriented Populations Index has been applied for this study, please visit **Appendix C**.

Figure 13: Transit-Oriented Population Propensity by Block Group



5. Travel Flow Analysis

Travel-flow analysis provides valuable insights into how people move around within Rockingham County, including their travel origins, travel destinations, trip timing, and motivations behind trip-making. Understanding travel patterns is crucial for identifying opportunities for new transit services. Public transit riders share common destinations with individuals using other transportation modes, and it is essential to ensure that the transit network is designed to facilitate the most prevalent trips.

The information in this section is derived primarily from Replica, a platform that uses anonymized cellphone location data to understand travel patterns. Replica incorporates demographic data and mode choices for trips made between origin-destination pairs. The trips are summarized at the Census block group level. In the maps presented in this report, trips that start and end within the same Census block group are represented as dots, while trips involving travel between block groups are represented by straight lines that connect block-group centroids. The size of the dots and lines is proportional to the number of trips made.

5.1 Existing Travel Flows

5.1.1 TOTAL TRAVEL FLOWS

Figure 14 shows flows of daily trips made by all people on a typical weekday in Rockingham Count, but not including trips made to or from Harrisonburg. The most significant flows occur near Broadway, Bridgewater, Massanutten Springs and Elkton. The heaviest flows often occur between adjacent block groups, meaning that many trips in Rockingham County are short in distance. The area shown in green in **Figure 14** roughly indicates where most travel happens in the county. It is labeled “Potential Transit Zone” because this is the area that would likely generate the most (though not necessarily all) transit trips if transit service were to become available in Rockingham County.

Figure 15 is like Figure 14 except that it shows flows between points in Rockingham County and Harrisonburg, not just flows between points outside of the city. This figure clearly illustrates the fact that the highest volumes of trips to and from Harrisonburg originate or terminate in towns and unincorporated places near the city (e.g., Bridgewater, Broadway, Massanutten and Elkton). While many people make trips between Harrisonburg and block groups located farther away, the volumes of trips they generate are relatively smaller than trips that originate closer to Harrisonburg.

Figure 14: All Weekday Trips at the Block Group-Level

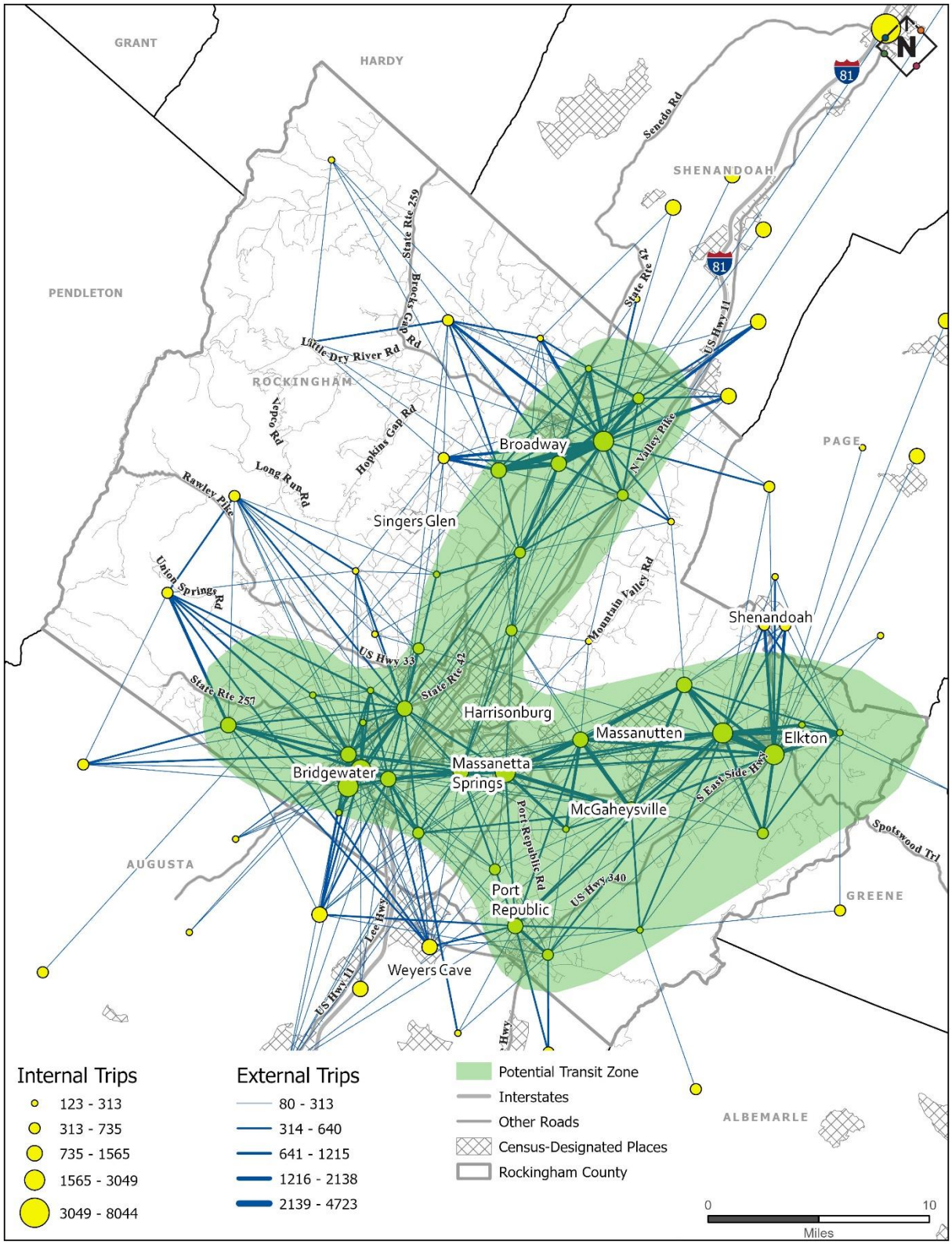
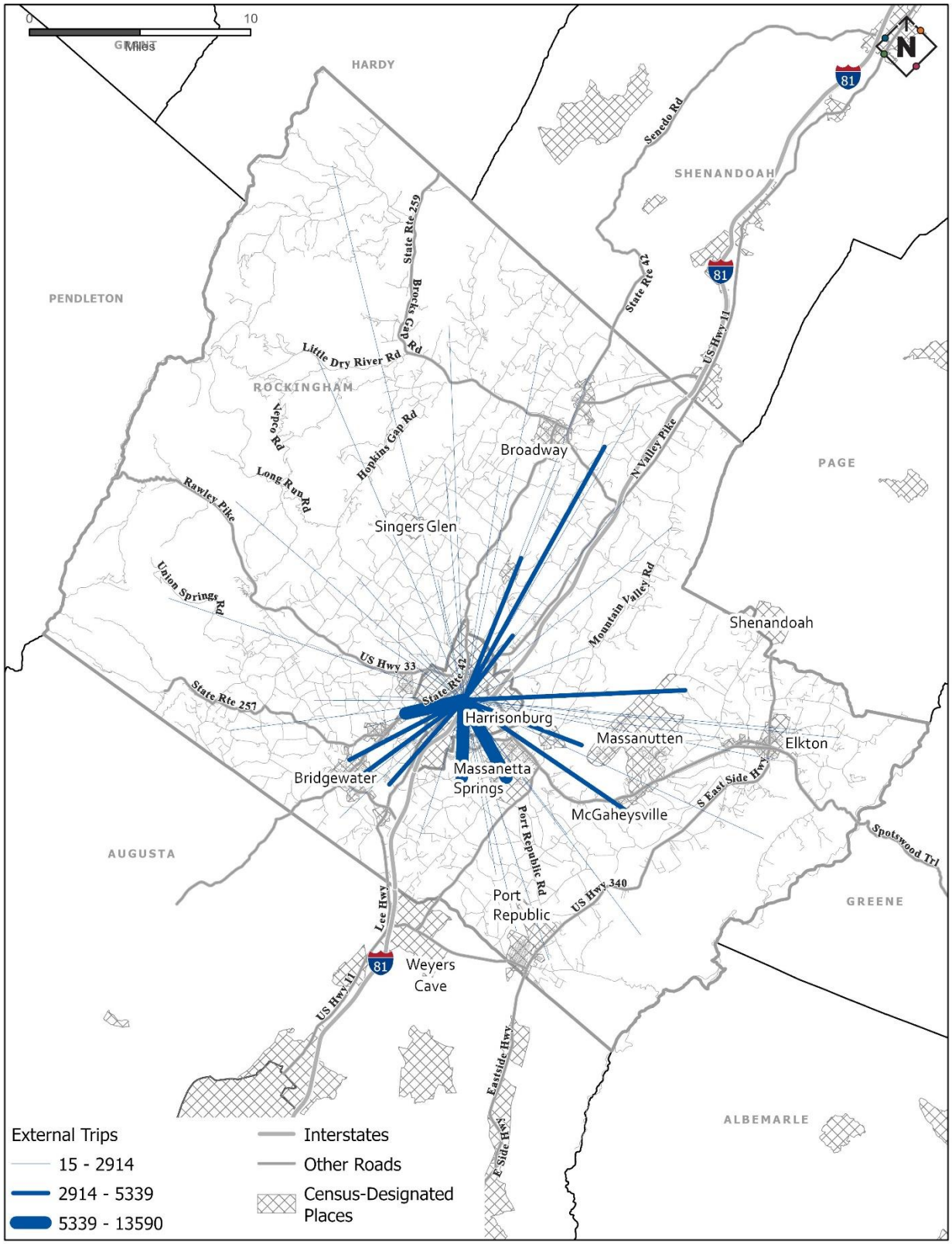


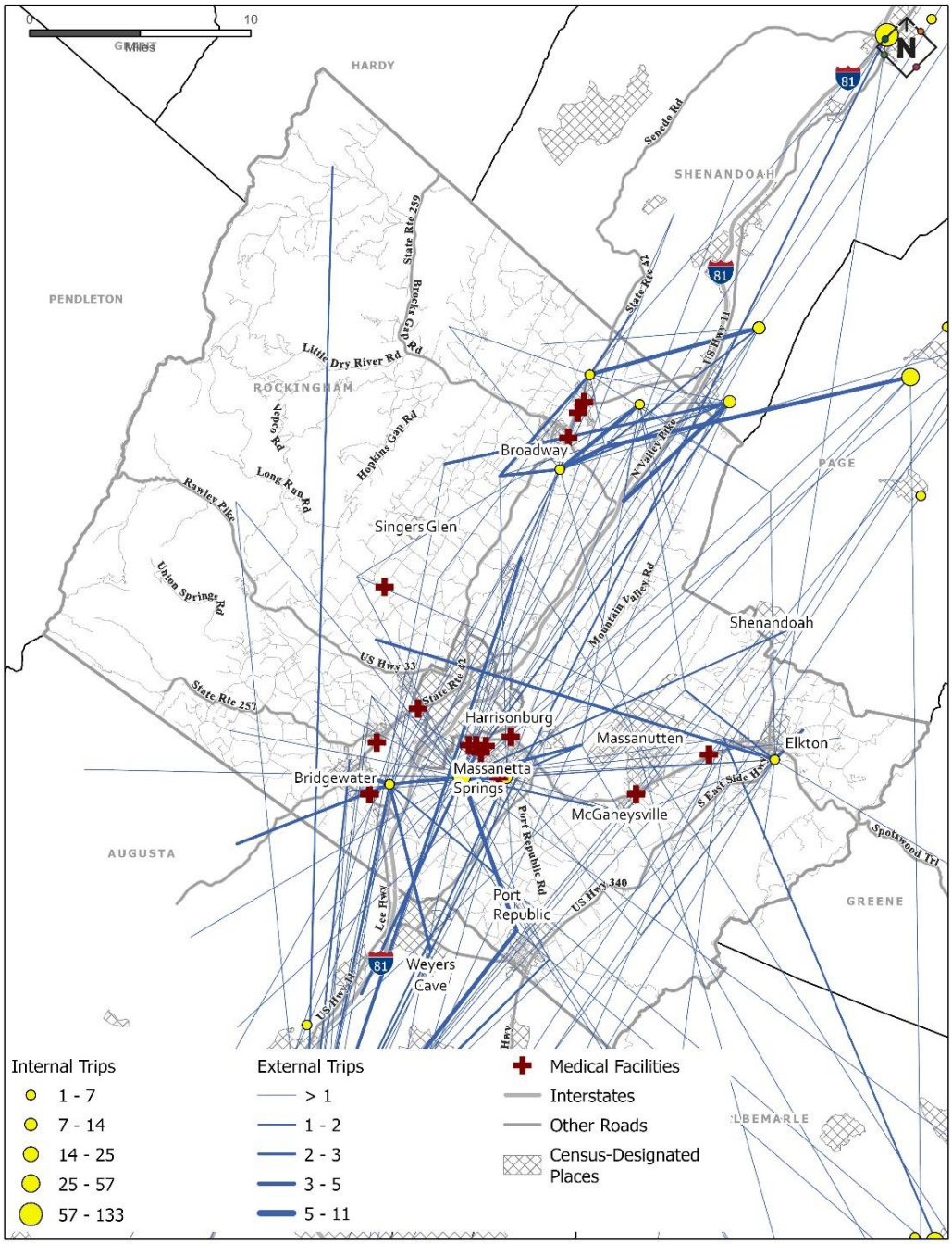
Figure 15: All Weekday Trips To/From Harrisonburg at Block Group-Level



17.1.3 TRAVEL FLOWS BY TRIP PURPOSE (HEALTHCARE)

By controlling for trip types and building uses, Replica allows for display of travel flows for specific travel purposes. **Figure 16** shows healthcare-related travel flows and locations of major healthcare destinations in the county. As the patterns in this figure indicate, most healthcare-related travel originates and terminates in the Broadway area, around Harrisonburg, and around towns in the south-central and eastern parts of the county. However, some healthcare trips do originate in the more eastern parts of the county.

Figure 16: All Weekday Healthcare Trips at the Block Group-Level



17.1.3 TRAVEL FLOWS BY DEMOGRAPHIC (OLDER ADULTS)

Figure 17 shows the volume and pattern of weekday trips generated by older adults for travel solely to and from places in Rockingham County, while **Figure 18** shows similar patterns for trips to and from Harrisonburg. What these figures show is that trip-making by older adults tends to mirror overall travel patterns. The most significant flows in the area are near Broadway, Bridgewater, Massanutten Springs and Elkton and are often between adjacent block groups, meaning that a high volume of trips are short in length.

Figure 17: All Weekday Trips by Older Adults (Block Group-Level)

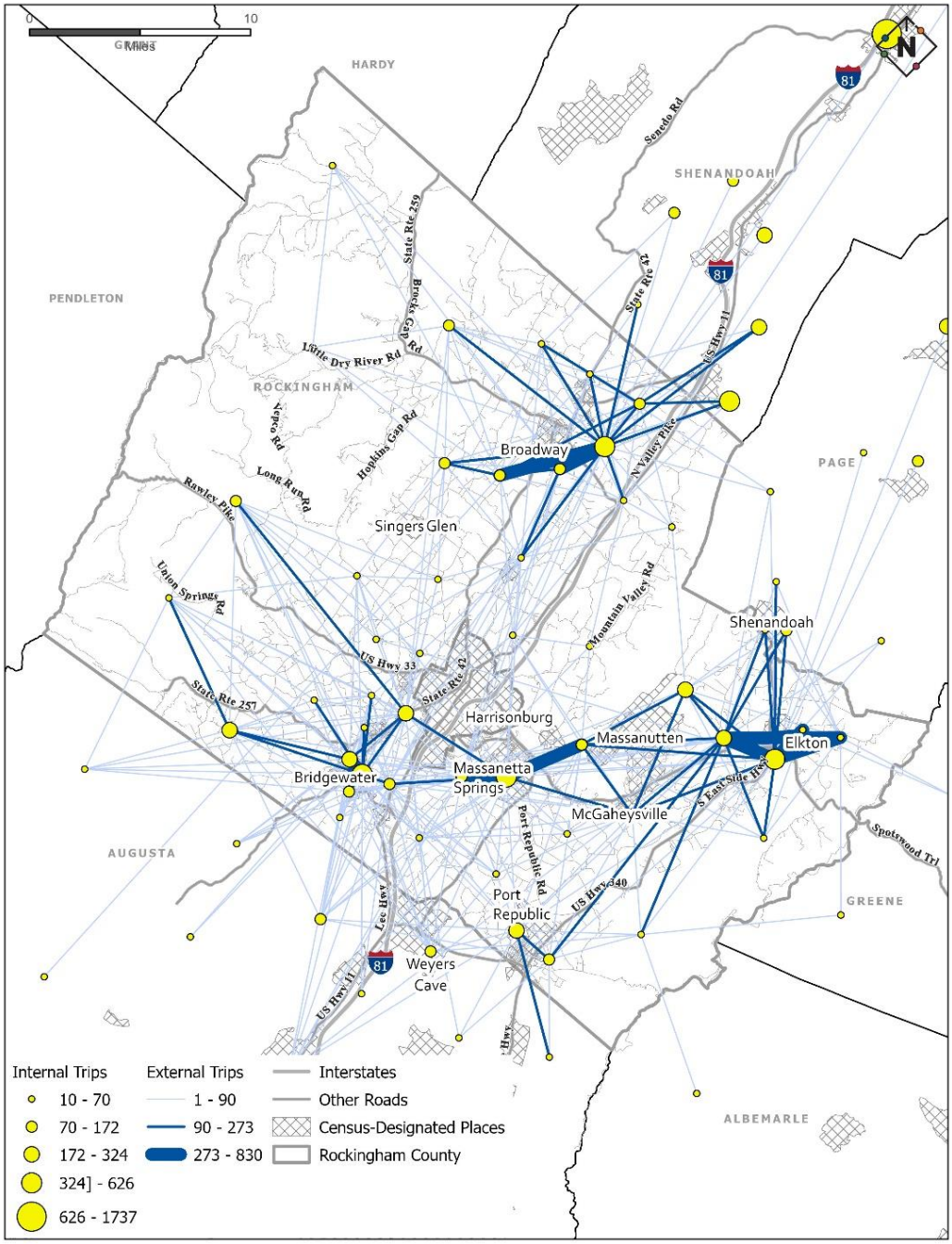
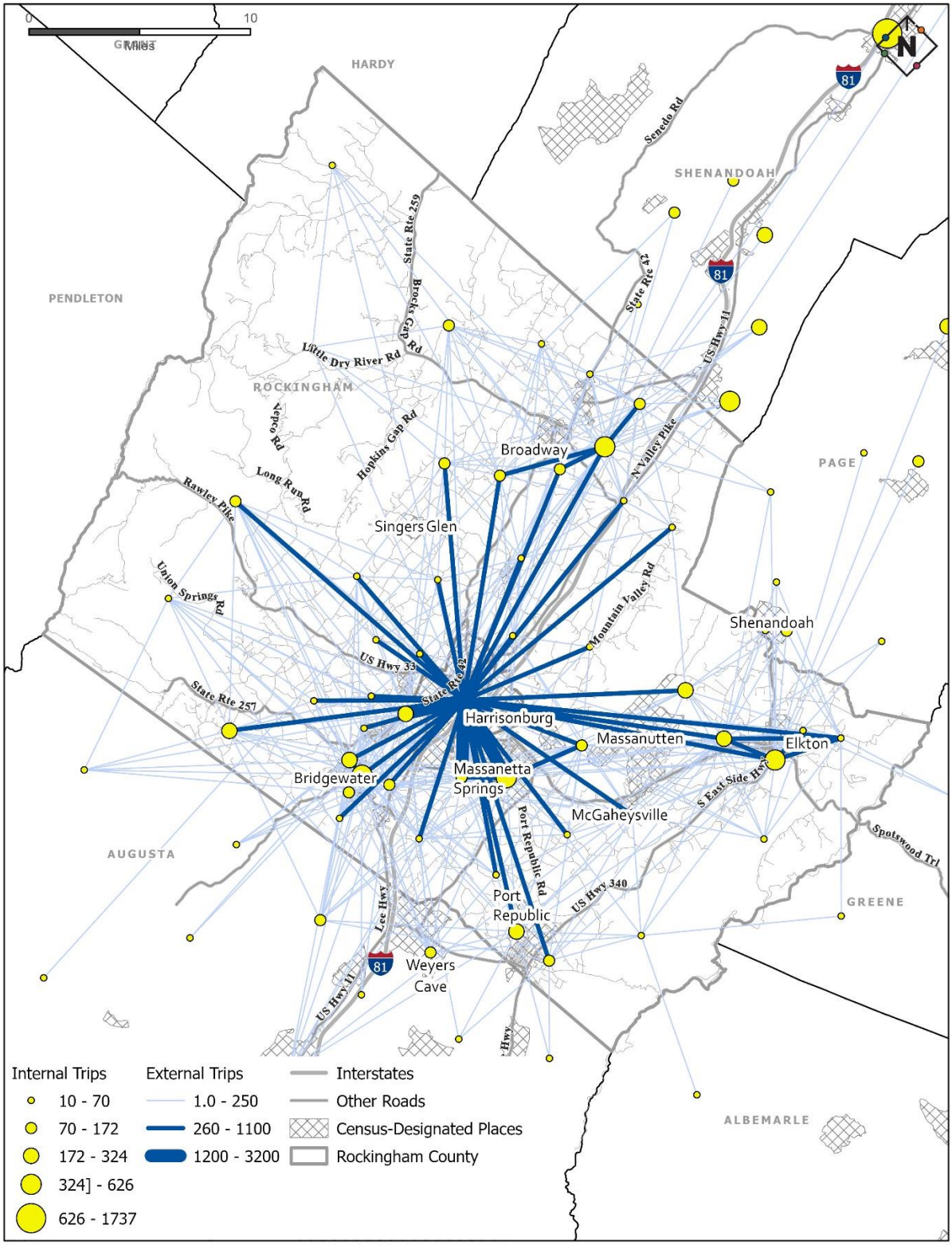


Figure 18: All Weekday Trips by Older Adults, Including Trips To/From Harrisonburg (Block Group-Level)



6. Population and Employment Trends

Understanding how Rockingham County's population and employment will evolve over time is essential for identifying future transit needs. Of particular interest for transit planning purposes is understanding how growth might vary by location within the county and how the composition of the county's population and employment will change over time.

6.1 Present and Future Population

U.S. Census Bureau data shows that, between 2010 and 2020, the population of Rockingham County grew by 9.8 percent – from 76,314 in 2010 to 83,757 in 2020. The Census Bureau estimates that the county's population since the start of the COVID-19 pandemic has grown by about 1,600 people. **Table 2** shows the Census Bureau's estimates for how the population changed between April 1, 2020 and July 1, 2022. As the numbers in this table indicate, most of the population increase was due to in-migration. In fact, the net natural change in population – i.e., births minus deaths – was negative.

There are many reasons for why the population of Rockingham County is growing through in-migration. As the authors of Rockingham County's draft Comprehensive Plan Update have noted, the county "is the largest agricultural producer in Virginia and ranks in the top fifty Counties nationwide for agricultural production." Its economy "is also enriched by the manufacturing, logistics and distribution, and tourism industries" and has numerous institutions of higher education that "help attract younger residents to the area and provide local industries with a well-educated, highly qualified workforce." Significantly, many families from elsewhere in Virginia have been attracted to the county, "seeking a high quality of life coupled with a low cost of living."[16]

Table 2: Recent Population Change in Rockingham County (2020 to 2022)

TOTAL POPULATION CHANGE[1]	VITAL EVENTS			NET MIGRATION		
	Natural Change	Births	Deaths	Total	International[2]	Domestic
1,638	-234	1,901	2,135	1,840	341	1,499

Source: U.S. Census Bureau, Population Division, Annual and Cumulative Estimates of the Components of Resident Population Change for Counties in Virginia: April 1, 2020 to July 1, 2022 (CO-EST2022-COMP-51)

Notes from the Census Bureau: "Total population change includes a residual. This residual represents the change in population that cannot be attributed to any specific demographic component." See Population Estimates Terms and Definitions at https://www.census.gov/programs-surveys/popest/about/glossary.html. Also, net international migration "includes the international migration of both U.S.-born and non-U.S.-born populations. Specifically, it includes: (a) the net international migration of the non-U.S. born, (b) the net migration of U.S. born to and from the United States, (c) the net migration between the United States and Puerto Rico, and (d) the net movement of the Armed Forces population between the United States and overseas."

[16] See p. 25 of https://www.rockinghamcountyva.gov/DocumentCenter/View/17983/Chapter2-People-and-Places.

The draft Comprehensive Plan Update outlines a vision for Rockingham County and provides additional information about how its population might change over the next three decades.[17] It notes that the county's population "is projected to continue growing due to high rates of in-migration", with much of the growth being concentrated primarily near the City of Harrisonburg, the seven incorporated towns, and designated development areas. It cites data from the Weldon Cooper Center for Public Service showing that, while growth rate may diminish somewhat between 2020 and 2030 due to a statewide decline in birth rates, it may accelerate in future years due to potentially high rates of continued in-migration.

The authors of the Comprehensive Plan Update note that the County has a "longstanding policy to concentrate population growth" around the seven towns that has "created a 'town and country' land use pattern in which the Towns effectively act as service and cultural nodes for the surrounding rural areas, thereby protecting agricultural heritage and land use while offering modern amenities that enhance quality of life."[18] It is worth noting in the context of the present study that such clustering of population (and economic activity) within towns strongly supports delivery of efficient transit service, which tends to be most successful in places where travel origins and destinations can be easily served with minimal travel circuity, the least amount of stopping and starting of transit vehicles, and the largest possible aggregations of individual person trips into the smallest possible number of vehicles.

6.2 Present and Future Employment

Industry and employment growth also has an impact on the need for transit service. According to the Central Shenandoah Planning District Commission, the top three employment sectors within the sub-region of Harrisonburg and Rockingham County include manufacturing, educational services, and health care and social assistance. It is significant to note that Rockingham County is the largest producer of agricultural products in Virginia and has a strong agritourism industry with 2,026 farms in the sub-region.

As stated in Rockingham County's Comprehensive Plan, educational attainment is lower than the statewide averages, likely due to multigenerational farming vocations and out-migration of young adults. The County seeks to enhance its economic diversity and protect agricultural productivity by supporting farmland and concentrating development in defined geographic areas. Further, the County aims to support partnerships with workforce development programs offered through Massanutten Technical Center, Blue Ridge Community College, and James Madison University. The top employers represent educational, health care, manufacturing and distribution, and other related industries. The top employers in the County include the Rockingham County School Board, Sentara Healthcare, Walmart, Cargill Meat Solutions, and Merck & Company.

[17] https://www.rockinghamcountyva.gov/866/Comprehensive-Plan-Update-2022-2024
[18] Ibid, p. 27.

6.3 Population and Employment Summary

Table 3 summarizes estimates and projections of present and future employment and population in Rockingham County and Harrisonburg for the period from 2020 to 2050. As the data in this table indicate, the county is anticipated to grow to have over 100,000 residents by 2050. Additionally, employment levels in Rockingham County and Harrisonburg are also anticipated to grow, with a projected employment of around 122,000 by 2050.

Table 3: Employment and Population Projections (2020 to 2050)

	2020	2030	2040	2050
Total Population (Rockingham County Only)[1]	82,346	89,893	96,465	104,481
Total Population (Rockingham + Harrisonburg)[1]	134,021	143,823	155,189	168,878
Total Employment (Rockingham + Harrisonburg)	89,355	101,031	111,573	121,983

[1] Source: University of Virginia Weldon Cooper Center

7. Key Findings

7.1 Key Findings from Transit Market Analysis

The market analysis for transit in Rockingham County reveals several key findings:

1. **Population and Employment Density:**

   - Population density in the county is generally below the 3,000 people per square mile threshold typically targeted for fixed-route transit services.
   - Nevertheless, some areas, particularly near the southern boundary of the county south of State Route 257, between Harrisonburg and Broadway, between Harrisonburg and Port Republic, and between Harrisonburg and Elkton, show promise for potential transit viability.
   - High combined population and employment levels are indicative of areas with greater potential for transit ridership, with the Interstate 81 corridor (including Bridgewater, Harrisonburg, and Broadway), Massanutten, and Elkton standing out as areas with the greatest potential.

2. **Other Indicators of Transit Potential:**

   - Older adults, persons with disabilities, low-income populations, and households without access to private vehicles depend on public transit for their daily travel needs.
   - The distribution of these populations varies across the county, with concentrations in areas surrounding Elkton, Broadway, Harrisonburg, and other regions.
   - Minority populations in the county represent a strong market for transit, with concentrations along the I-81 corridor and in Port Republic.
   - Limited English Proficiency (LEP) populations can benefit from public transit, and these populations are evident along the I-81 corridor.

3. **Transit Propensity:**

   - The study used the Foursquare Integrated ITP's Transit Propensity Model to identify populations or areas within Rockingham County with the greatest need for transit.
   - The Transit-Oriented Populations Index, which combines various socio-demographic variables, was employed to assess transit propensity.
   - Transit propensity is highest in block groups surrounding Harrisonburg and high to moderate in and around Broadway, Bridgewater, Port Republic, and Elkton. In combination, these areas form an area of highest "potential" for transit's success in Rockingham County. Areas with the lowest propensity

for transit use are in the remaining areas of the county. While transit need does exist in these areas, the need is not as strong as in the areas with the highest propensity.

In summary, the transit market analysis suggests that while the overall population and employment density in Rockingham County may not meet the conventional standards for fixed-route transit, there are specific areas with potential for viable transit services. Additionally, demographic indicators such as presence of older adults, persons with disabilities, low-income populations, minority populations, and those with limited English proficiency, point to the need for tailored transit services in different parts of the county. The identified "potential transit zone" provides valuable insights for transit service planning and development in Rockingham County.

7.2 Key Findings from Travel Flow Analysis

The Travel Flow Analysis gives insight into how people move around in Rockingham County, including their travel origins, destinations, timing, and reasons for traveling. Understanding travel patterns is crucial for identifying opportunities for new transit services that align with the most common travel needs.

The analysis primarily relies on data from Replica, a platform that utilizes anonymized cellphone location data to understand travel patterns. This data is enriched with demographic information and travel mode choices for journeys between origin-destination pairs. The findings are summarized at the Census block group level, and visual representations are used to illustrate these travel patterns.

1. **Total Travel Flows (Except Harrisonburg):**

    - **Figure 14** shows the daily travel flows made by individuals on a typical weekday in Rockingham County, excluding trips to or from Harrisonburg. The most significant flows occur near Broadway, Bridgewater, Massanutten Springs, and Elkton.

    - Many flows occur between adjacent block groups, indicating that a substantial number of trips in the county are short-distance journeys.

    - The green-shaded area in **Figure 14** is labeled the "Potential Transit Zone," which signifies the region most likely to generate transit trips if such services were to become available in Rockingham County.

2. **Total Travel Flows to and from Harrisonburg:**

    - **Figure 15** reveals that the highest volumes of trips to and from Harrisonburg originate or terminate in towns and unincorporated areas near the city, such as Bridgewater, Broadway, Massanutten, and Elkton.

3. **Travel Flows for Healthcare Purposes**

    - **Figure 16** focuses on healthcare-related travel flows and the locations of major healthcare destinations in the county. Most healthcare-related trips are concentrated around Broadway, Harrisonburg, and towns in the southern-central and eastern parts of the county; however, some health care trips also originate in the less-developed, western parts of the county.

4. Travel Flows by Older Adults

- **Figure 17** shows travel flows by older adults in Rockingham County only, while **Figure 18** shows flows by older adults to and from Harrisonburg. These figures generally show that the travel patterns of older adults generally mirror those of most other people in several important ways, including a preponderance of flows in the vicinity of Broadway, Bridgewater, Harrisonburg, Massanetta Springs, Massanutten and Elkton and many short-distance trips.

In summary, the Travel Flow Analysis provides a comprehensive overview of travel patterns within Rockingham County. It highlights the greatest potential for a successful transit services in the county's "Potential Transit Zone" and emphasizes the importance of aligning transit network design with the most common travel needs. Additionally, the analysis offers insights into specific travel purposes, such as healthcare-related travel, and the travel behavior of older adults, which can inform transit service planning and development.

Appendix A

Major Employers in Rockingham County

Table A-14: Major Employers in Rockingham County Ranked by Size

COMPANY	INDUSTRY	ESTIMATED EMPLOYMENT
Sentara RMH Medical Center	Health Care	2500-5000 employees
Cargill Meat Solutions	Food Manufacturing	1500-2500 employees
Pilgrim's Pride Corporation	Food Manufacturing	1500-2500 employees
Merck & Co.	Pharmaceutical Manufacturing	1000-1500 employees
Massanutten Resort	Recreational Resort	1000 and over employees
James Madison University	Higher Education	1000 and over employees
Harrisonburg City Schools	Education	1000 and over employees
R.R. Donnelley and Sons Company	Book Printing	1000 and over employees
Great Eastern Resort Management	Resort Accommodations	1000 and over employees
Marshalls Distribution Center	Warehousing and Storage	600-1000 employees
LSC Communications	Printing Manufacturer	500-1000 employees
Walmart Distribution Center	General Merchandise Stores, Warehousing, Storage, and Distribution	600-999 employees
City of Harrisonburg	Local Government	500-999 employees
County of Rockingham	Local Government	500-999 employees
Aramark Campus LLC	Food Services	500-999 employees
Tenneco Automotive Operations	Transportation Equipment Manufacturing	500-999 employees
George's Foods	Food Manufacturing	500-999 employees
Stellar Management Grouping	Administrative and Support Services	500-999 employees
Beam Brothers Trucking	Truck Transportation	500-999 employees
Virginia Poultry Growers Cooperative	Food Manufacturing	500-999 employees
Eastern Mennonite University	Higher Education	500-999 employees
Perdue Farms, Inc.	Food Manufacturing	600-900 employees
Dynamic Aviation	Aviation Solutions	500-750 employees
DanoneWave	Food Manufacturing	300-600 employees
Intrapac, Inc.	Aluminum Products Packaging	300-600 employees
Molson Coors Beverage Company*	Beverage Manufacturing	300-600 employees
Sysco Food Service	Food Distribution	300-599 employees
InterChange Group	3PL, Distribution, Logistics Provider	300-500 employees

COMPANY	INDUSTRY	ESTIMATED EMPLOYMENT
Ply Gem	Building Supply Manufacturing	250-500 employees
Shenandoah Growers	Food Manufacturing	250-500 employees
WhiteWave Foods	Food Manufacturing	250-499 employees
Fairfield and Sons, LTD (Fairfield Language Technologies / Rosetta Stone)	Publishing Industries	250-499 employees
MillerCoors	Beverage Manufacturing	250-499 employees
Virginia Mennonite Retirement	Nursing and Residential Care Facilities	250-499 employees
Food Lion	Food and Beverage Stores	250-499 employees
Bridgewater College	Higher Education	250-499 employees
Great Eastern Resort Corporation	Real Estate	250-499 employees
Sunnyside Presbyterian Home	Nursing and Residential Care Facilities	250-499 employees
Bridgewater Home, Inc	Nursing and Residential Care Facilities	250-499 employees
Tenneco Packaging	Paper Manufacturing	250-499 employees
Riddleberger Brothers, Inc	Specialty Trade Contractors	250-499 employees
ComSonics	Electronics Manufacturing	100-300 employees
Shenandoah Valley Electric Cooperative	Electric Utility Company	100-300 employees

Source: http://www.yesrockingham.com/About-Us/Major-Employers.aspx and https://theshenandoahvalley.com/why-shenandoah-valley/leading-employers/

Appendix B

Population and Employment Distribution Maps

Figure B-1: Population Distribution by Block Group

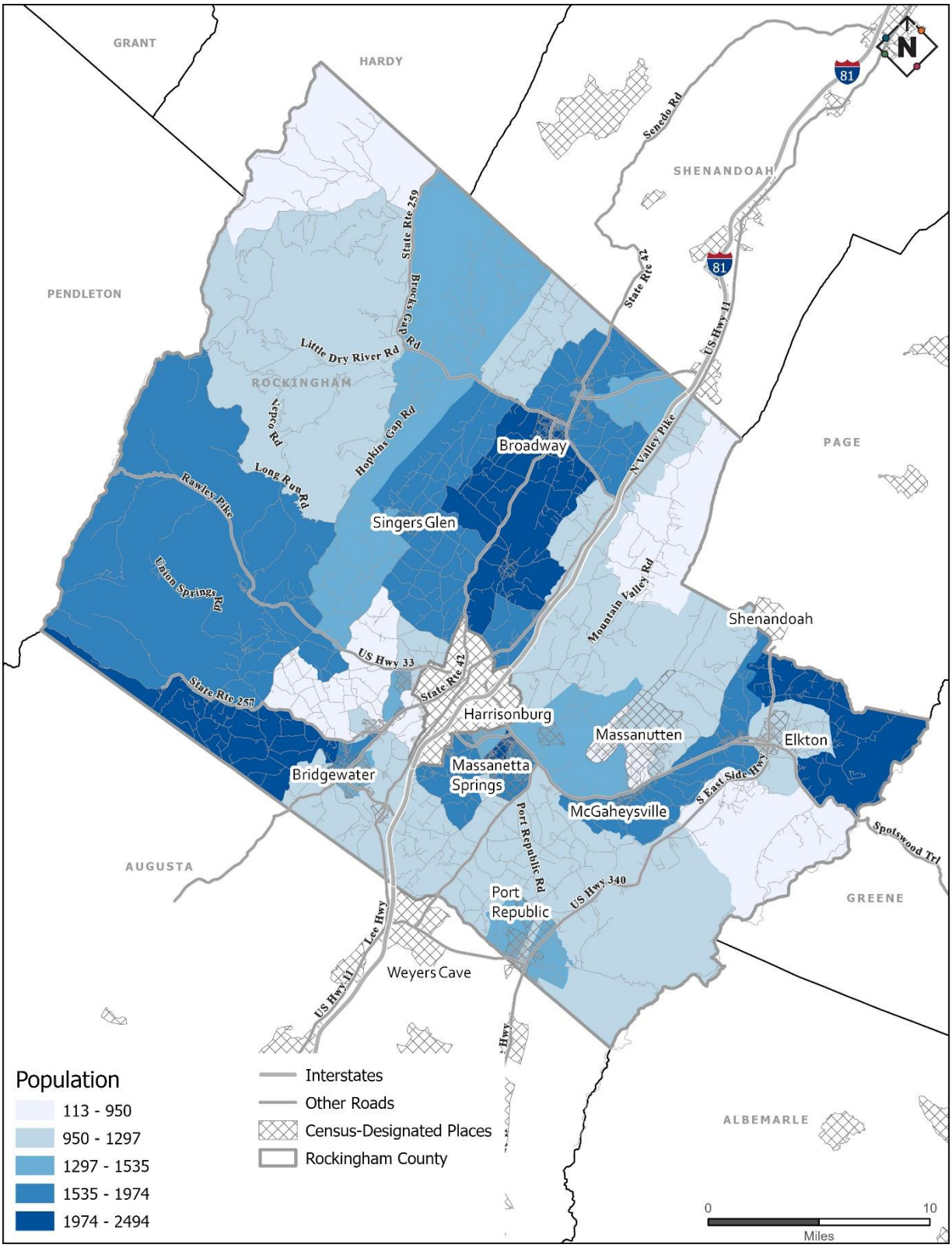


Figure B-2: Employment Distribution by Block Group

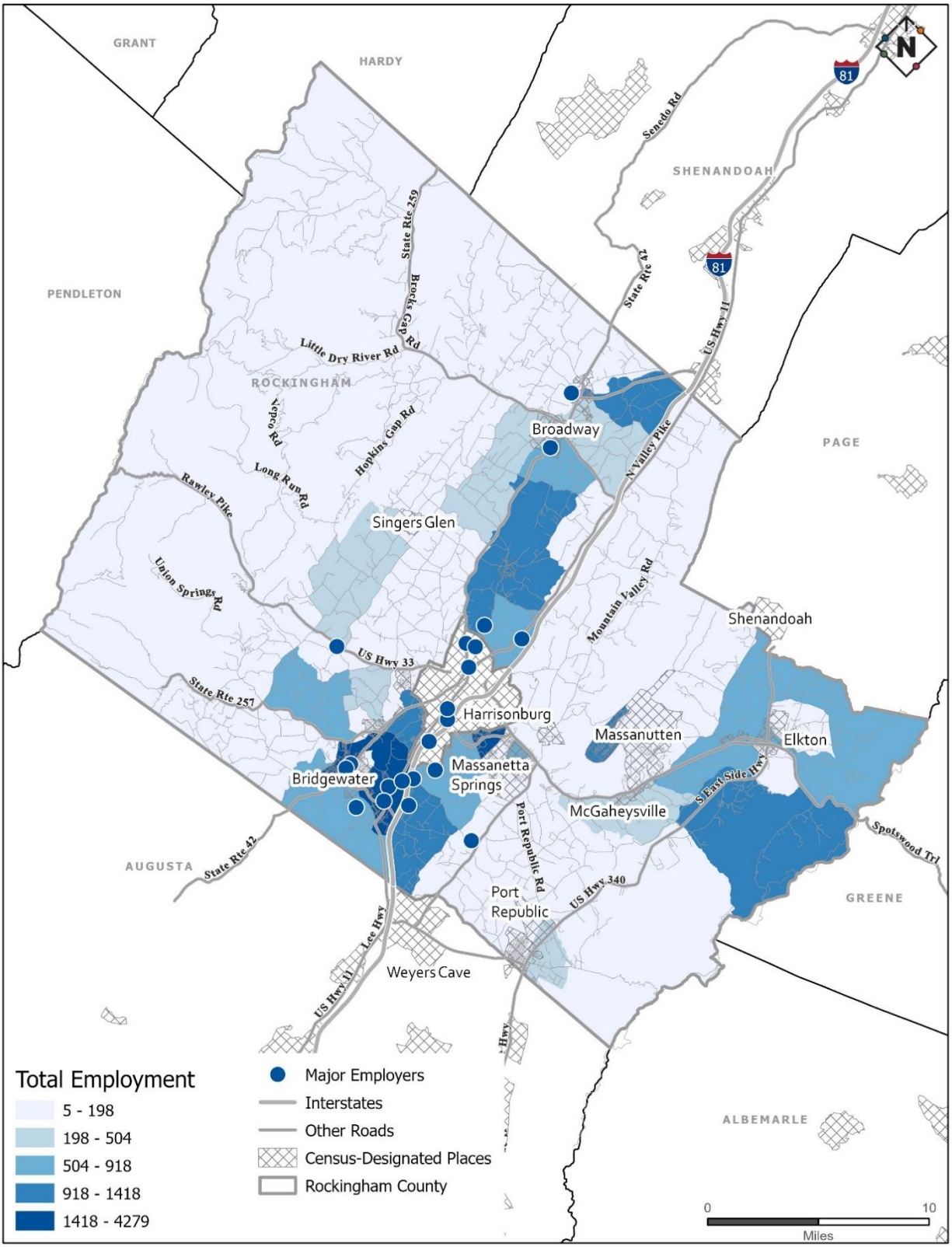


Figure B-3: Population + Employment Distribution by Block Group

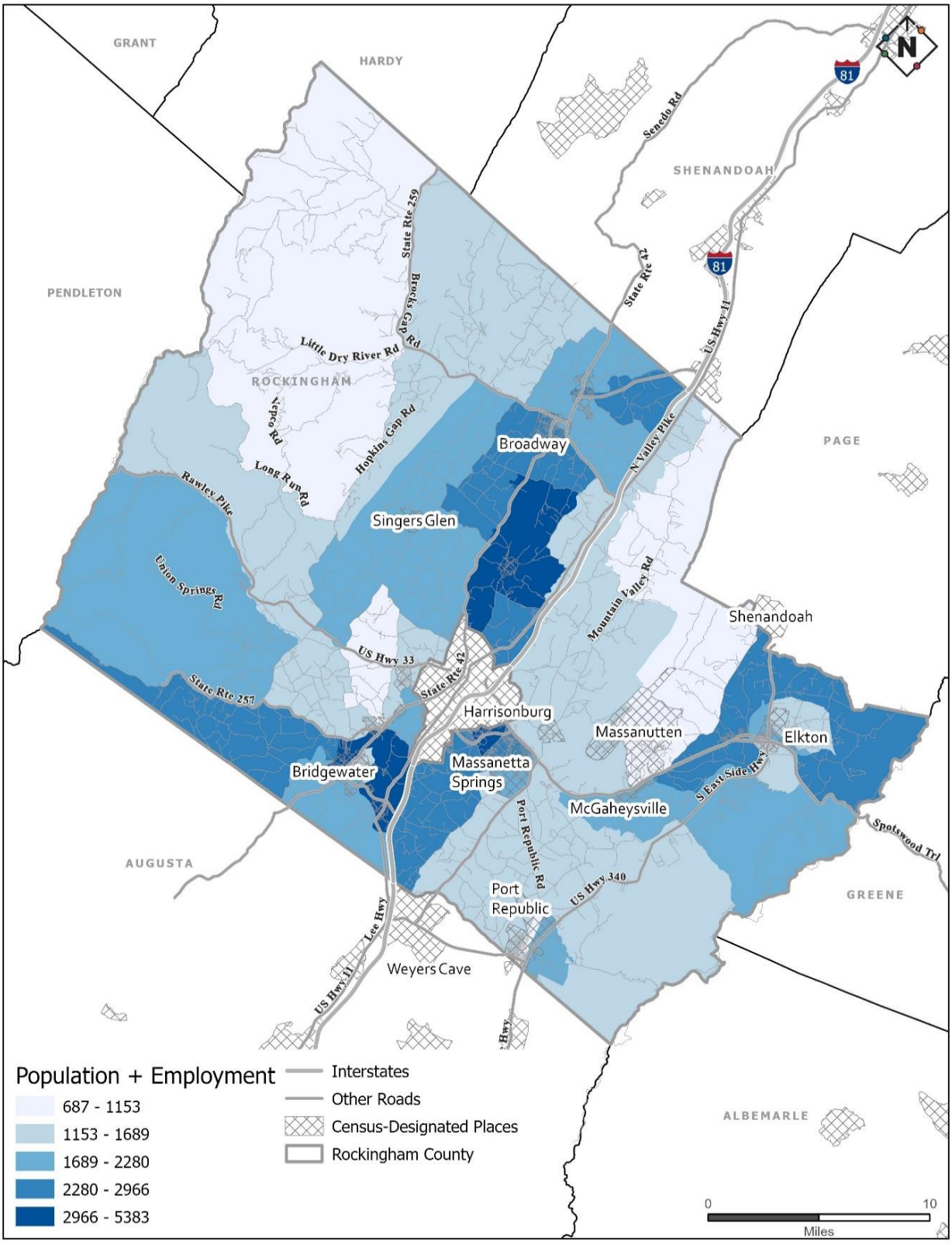


Figure B-4: Older Adult Population Distribution by Block Group

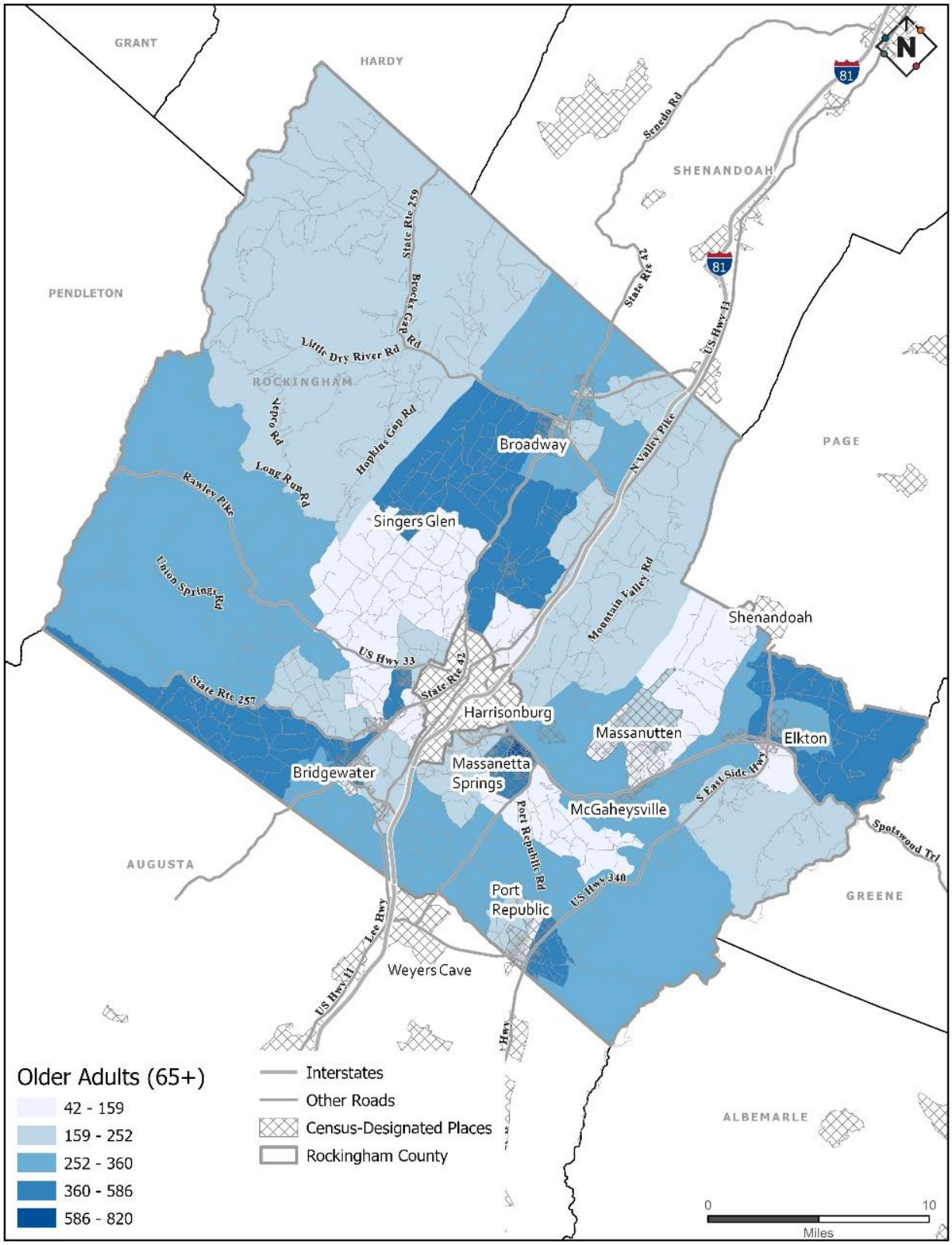


Figure B-5: Persons with Disabilities Population by Block Group

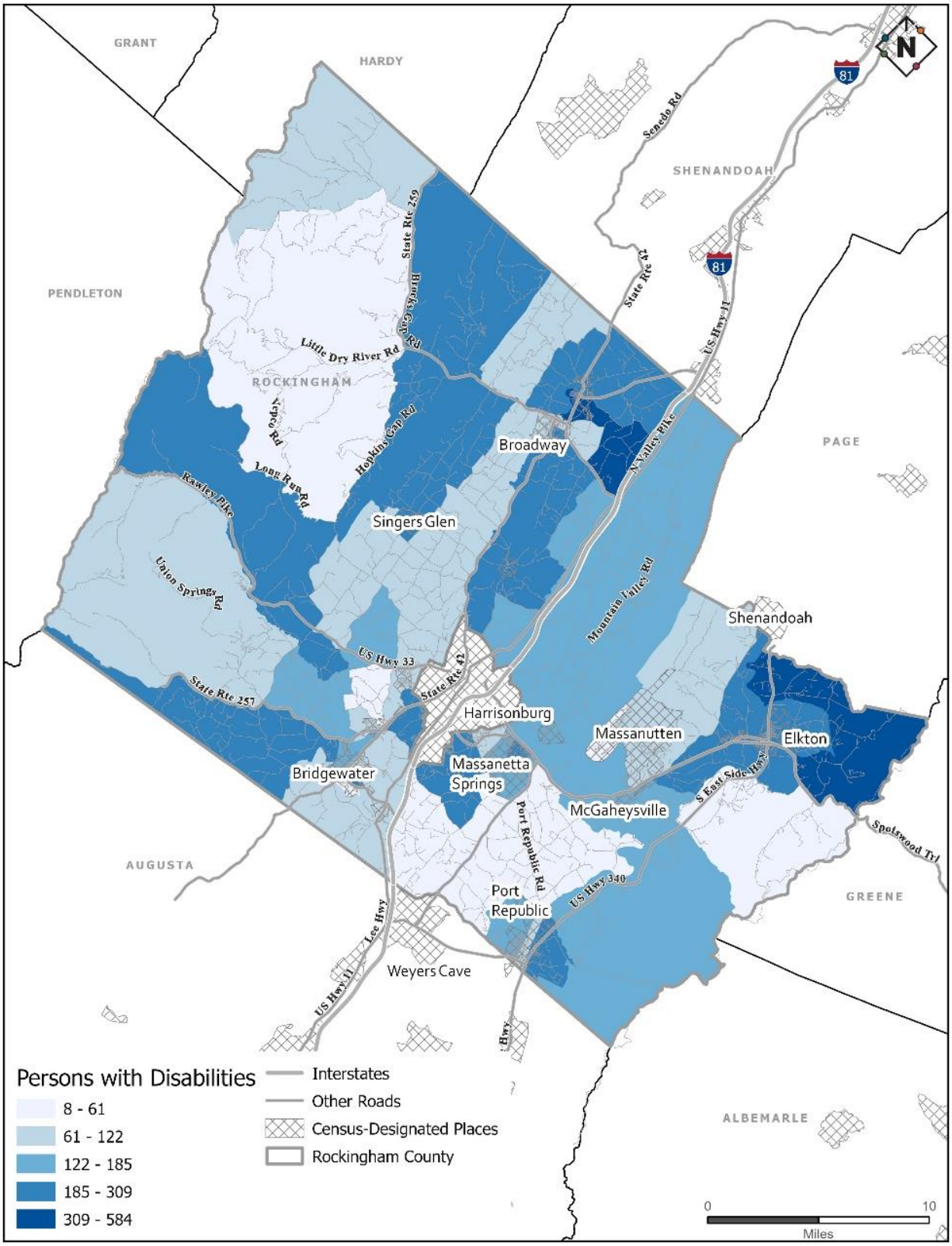


Figure B-6: Low-Income Population Distribution by Block Group

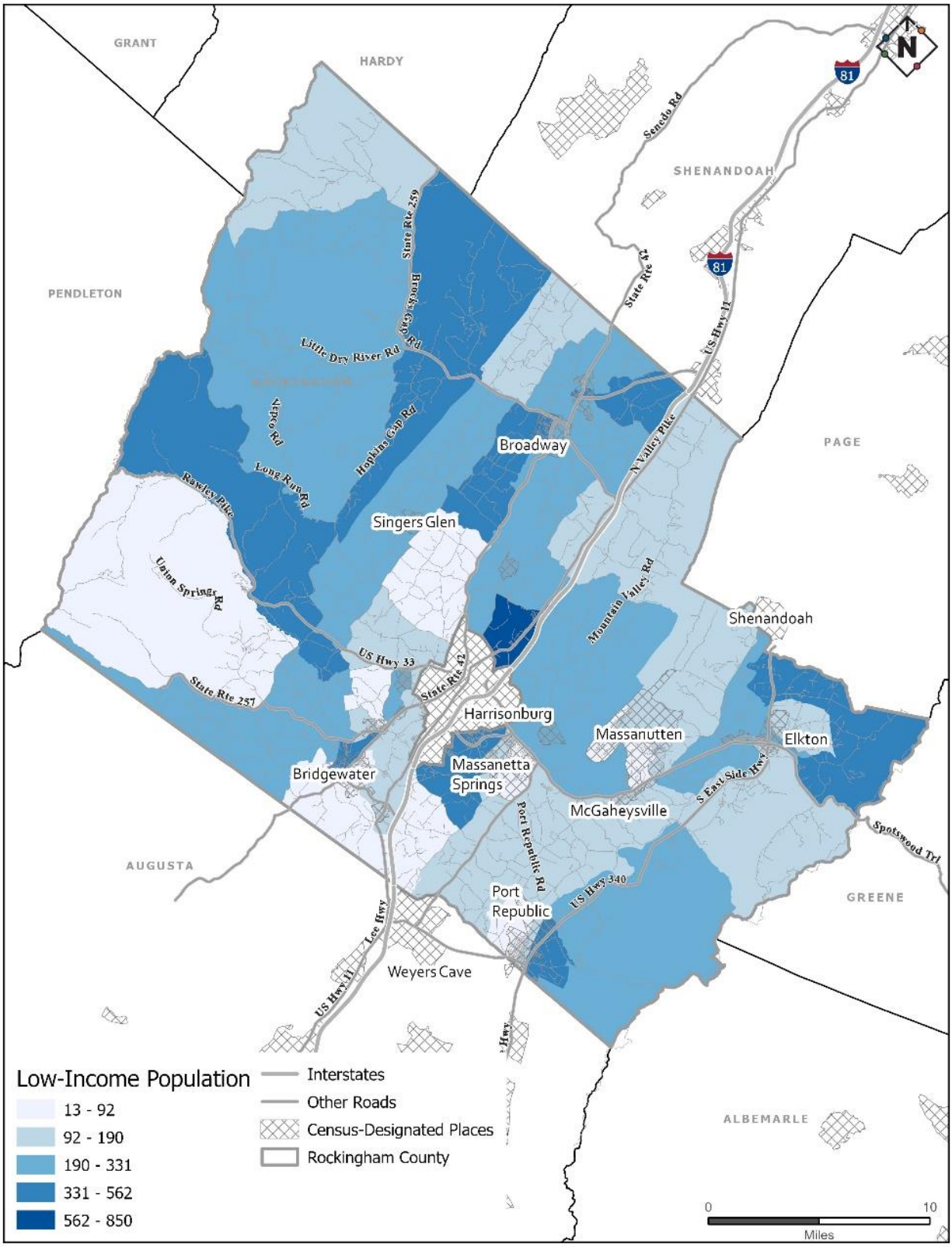


Figure B-7: Zero-Vehicle Households by Block Group

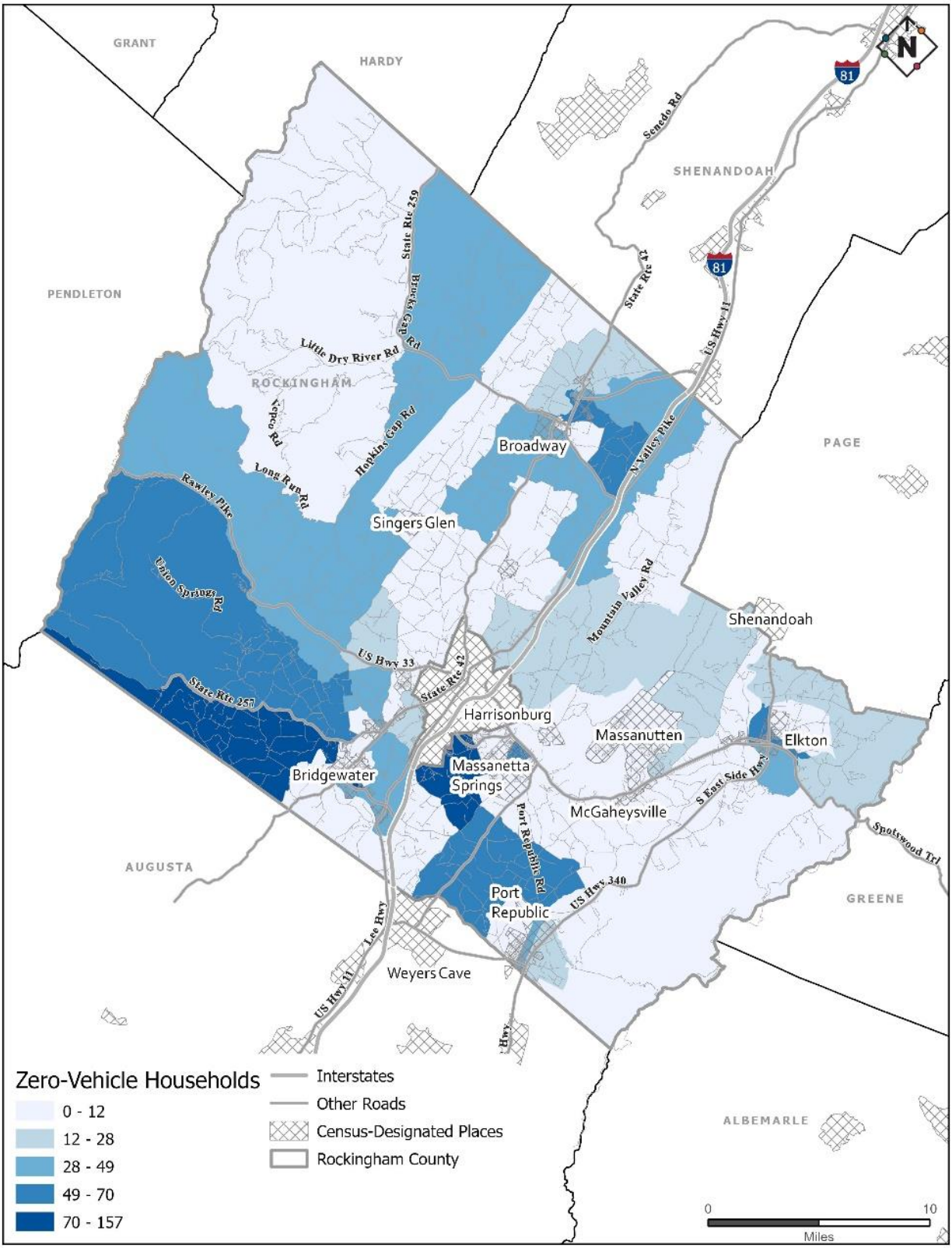


Figure B-8: Minority Population Distribution by Block Group

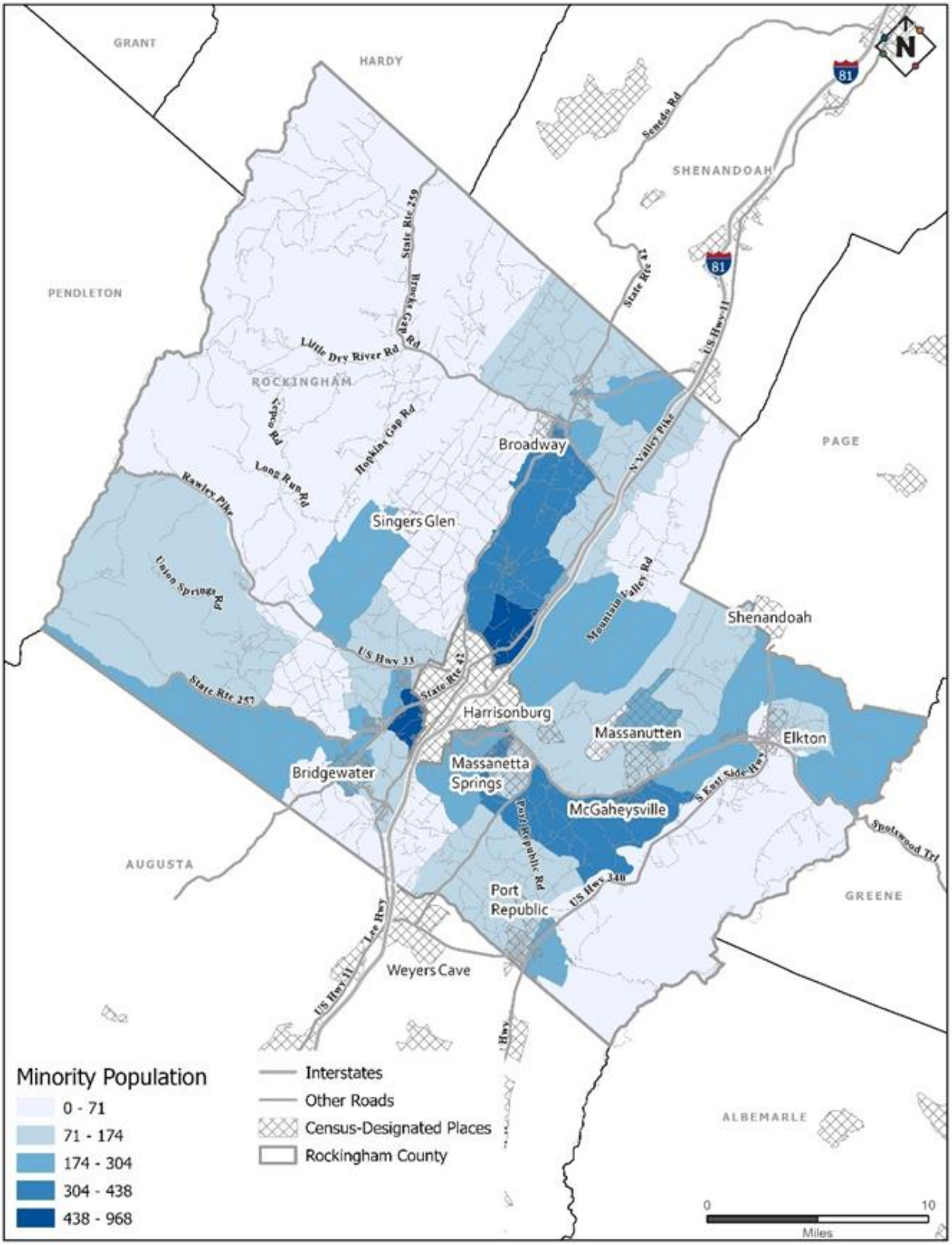
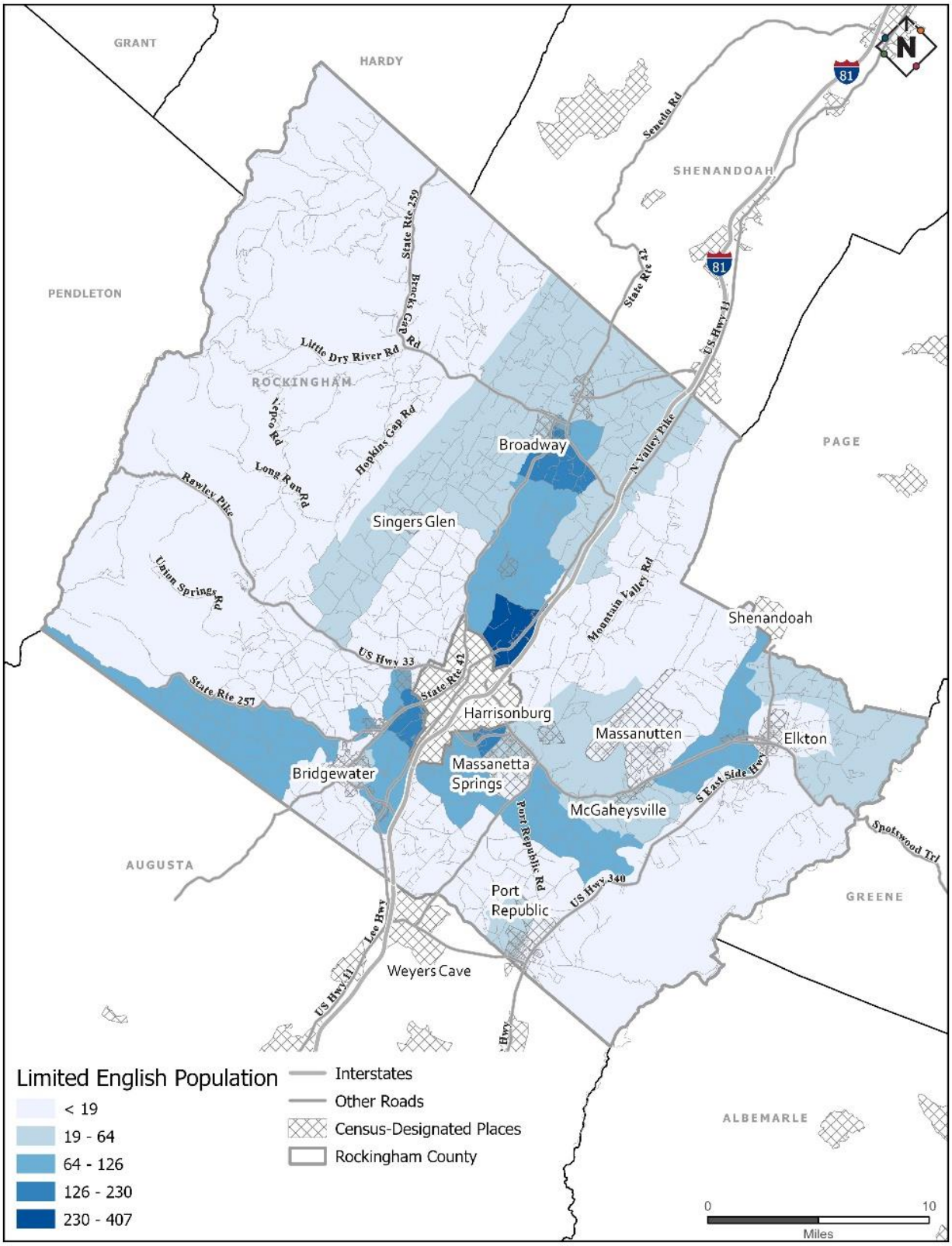


Figure B-9: Limited English Proficiency Population Distribution by Block Group



Appendix C

Weights for Transit Propensity Analysis

The map shown in **Figure 13** (page 34) is based on information on total population plus five transit-oriented population categories in Rockingham County: seniors, persons with disabilities, zero-vehicle households, low-income populations, and limited English-speaking populations. The study team combined information on these variables to create a single composite Transit Propensity map (also called a Transit Need map). The process involved assigning a weight to each category for each Census block group in the county. The weighting system involved distributing 300 points between the six demographic categories, with the final breakdown of scores being that shown in Table B-1.

Table B-1: Individual Scores Assigned in the Propensity Model

DEMOGRAPHIC	WEIGHT
Population	90
Seniors	50
Low-Income Population	60
Zero-Car Households	50
Persons with Disabilities	50
Total	300

The Transit Potential analysis highlights areas within Rockingham County that possess the necessary population densities to sustain transit service. On the other hand, Transit Propensity is a relative measure that gauges the demand for transit compared to other block groups. It is important to note that there is not a specific Transit Need Index score or value that serves as a definitive threshold for supporting fixed-route service. Instead, it is advisable to consider Transit Need in conjunction with Transit Potential. In situations where two areas exhibit similar and adequate Transit Potential, priority should be given to the one with a higher Transit Need. Conversely, in certain locations, even if there is a relatively high density of transit-dependent population groups (Higher Propensity), if the overall population and/or employment density remains low, the potential for generating significant fixed-route transit ridership will also be limited.

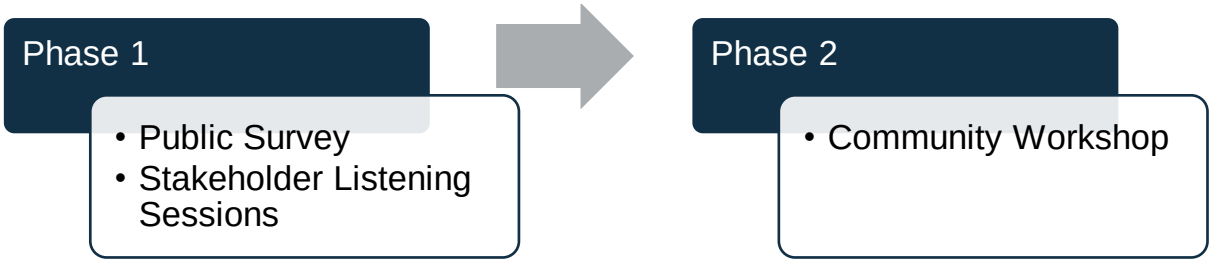
ROCKINGHAM COUNTY TRANSIT FEASIBILITY STUDY

Engagement Summary

Rockingham County
VIRGINIA

Overview

Stakeholder and public outreach occurred in two phases and ensured that recommendations were informed by and effective for the community they will serve. Engagement occurred in two distinct phases. Phase 1 included a public survey and stakeholder listening sessions that were designed to gather information about community travel needs that would be fed into the development of a proposed transit network. Phase 2 consisted of a community workshop where residents were invited to learn about and comment on the proposed transit network.



Survey

A public survey was developed by the project team to solicit input from the community on existing mobility challenges, desired destinations for service, and desired characteristics of a potential transit service. The survey was available in digital and paper form October 16th, 2023 through November 6th, 2023. Both digital and paper versions of the survey were available in English or Spanish. Paper surveys were available at the Rockingham County administration complex, the Rockingham County Department of Community Development, and each of the seven town halls in the county. The digital version was promoted by Rockingham County on the County website, town websites, and official County social media accounts. 1,824 responses were received, 85% of which were received online.

The English version of the survey instrument is shown below for reference.

Rockingham County Transit Study

Rockingham County
VIRGINIA

Rockingham County is evaluating the demand for public transit in your community. We need your input to help us understand travel needs and barriers that you and others face as you go from place to place in Rockingham County and the surrounding area. If you would like to be entered into the drawing for a chance to win a $50 Visa Gift Card, provide your name and preferred contact information (e-mail, address, or phone number): _____

Questions – Please consider your typical travel patterns and transportation needs when answering the following questions

1. Home Zip Code: _____

Do you live in the City of Harrisonburg? ☐ Yes ☐ No

2. How do you travel most often in Rockingham County? (Please choose only one.)

- ☐ I drive my own personal motor vehicle
- ☐ I ride with someone else in their vehicle (friend, family, volunteer)
- ☐ I ride in a taxi
- ☐ I use Uber, Lyft, or other on-demand services
- ☐ Motorcycle
- ☐ Bicycle
- ☐ Walking
- ☐ Other (please explain) _____

3. Do you experience any challenges getting around in your area? (Please choose all that apply.)

- ☐ I am not able to drive
- ☐ Driving and owning a personal vehicle is too expensive
- ☐ The days and times when I need to travel are not always convenient for the people who give me rides
- ☐ Destinations are too far away for me to walk or ride a bicycle
- ☐ Public transportation is not available to me
- ☐ Uber, Lyft, taxi, and other on-demand services are too expensive
- ☐ I can't travel alone at night (for any reason)
- ☐ I must travel at night to get to my job
- ☐ I do not experience any challenges getting around in my area
- ☐ Other (please explain) _____

4. How does a lack of convenient transportation options affect you?

- ☐ I spend extra money to get around my community
- ☐ I spend extra time traveling in my community
- ☐ I must walk or bike far distances
- ☐ It is harder to get to work
- ☐ It is harder to find a job
- ☐ It is harder to access medical or social services
- ☐ It is harder to go grocery shopping
- ☐ It is harder to take my children to childcare services or school
- ☐ It is harder to visit friends and family
- ☐ I am not affected by a lack of convenient transportation options
- ☐ Other (please explain) _____

5. What time(s) of day do you most need transportation? (Select all that apply.)

Weekday (Mon - Fri)
- ☐ 6AM – 12PM
- ☐ 12PM – 6PM
- ☐ 6PM – 10PM
- ☐ After 10PM

Weekend (Sat/Sun)
- ☐ Before 6AM
- ☐ 6AM – 12PM
- ☐ 12PM – 6PM
- ☐ 6PM - 10PM
- ☐ After 10PM

6. Where and how often do you travel to/from (or within) in Rockingham County? (Please choose all that apply and check a number range next to each place to indicate roughly how many trips you make there per month.

	1-5	5-10	10-20	more than 20
Harrisonburg				
James Madison University				
Bridgewater				
Dayton				
Broadway				
Timberville				
Elkton				
Massanutten				
Mt Crawford				
Grottoes				
Blue Ridge Community College				
Other:				

7. What type of destination(s) do you travel to/from in Rockingham County? (Check all that apply.)

- ☐ K-12 Schools
- ☐ College/University
- ☐ Medical Centers
- ☐ Shopping Centers or Malls
- ☐ Manufacturing Plants/ Distribution Centers
- ☐ Parks or Recreation Areas
- ☐ Community Centers
- ☐ Social Services
- ☐ Church or Religious Services
- ☐ Other (please explain) _____

8. Do you use Harrisonburg Department of Public Transportation buses?

☐ Yes ☐ No

9. Do you use the Blue Ridge Community College (BRCC) shuttle bus?

☐ Yes ☐ No

10. Do you have a smart phone with data access?

☐ Yes ☐ No

11. Please include any additional thoughts you would like to share or elaborate on about your travel needs?

_____

_____

_____

12. Optional: Provide us with your email to be entered to win a $50 Visa gift card for completing this survey.

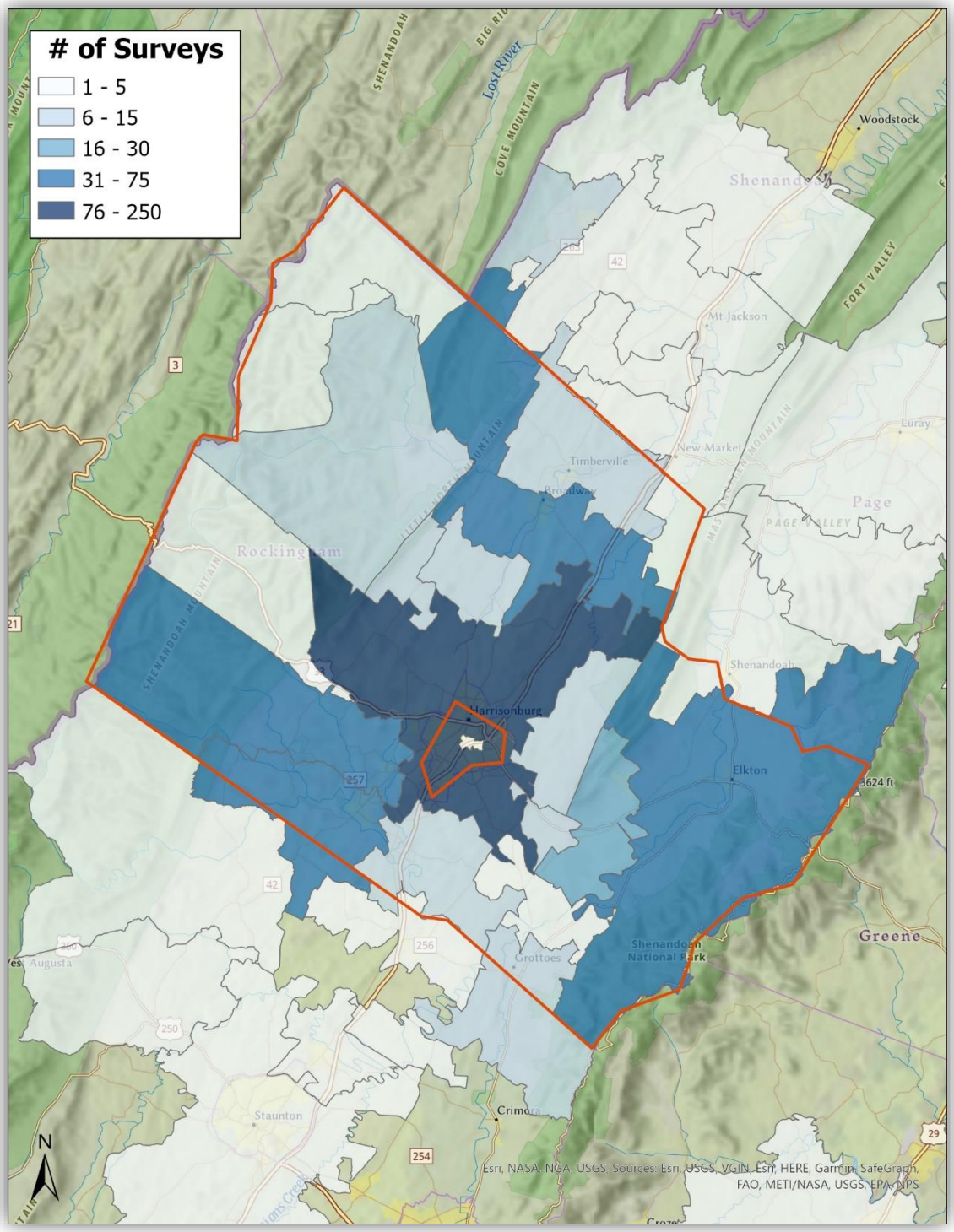
_____

Surveys can be returned to the following locations through November 6, 2023:

- Rockingham County offices (20 E. Gay St.)
- Bridgewater Community Center (201 Green St.)
- Broadway Town Hall (116 Broadway Ave.)
- Dayton Town Hall (125 Eastview St.)
- Elkton Town Hall (173 W. Spotswood Ave.)
- Grottoes Town Hall (601 Dogwood Ave.)
- Mt. Crawford Town Hall (779 S. Main St.)
- Timberville Town Hall (392 South Main St.)

Results from each survey question are summarized below.

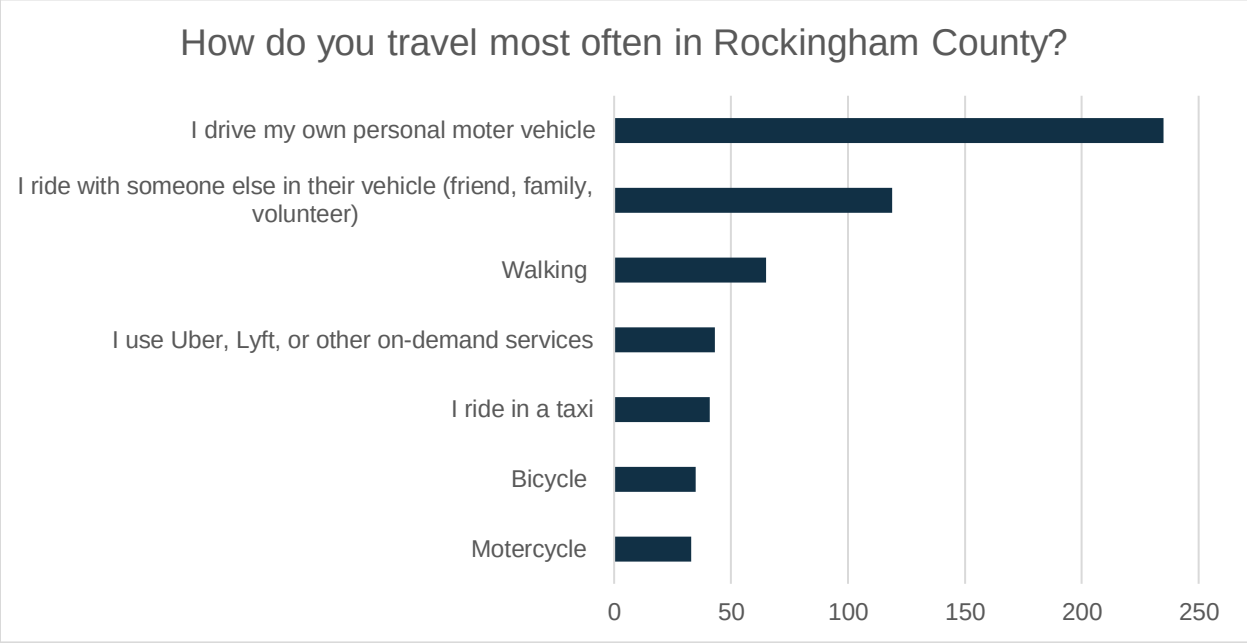
Question 1: Home Zip Code



Approximately 26% of respondents live in zip code 22801 or 22802. These zip codes cover the City of Harrisonburg; however, they also cover large portions of Rockingham County, making it difficult to separate County residents from City residents.

In response to this issue, a question was added to the survey after it was already live asking respondents if they were Harrisonburg residents. This question was answered 347 times and 70% of those respondents indicated they were Harrisonburg residents. Since the 347 responses represent less than 20% of the overall number of survey, it was not possible to reliably cross-tabulate survey results for County residents.

Question 2: How do you travel most often in Rockingham County?

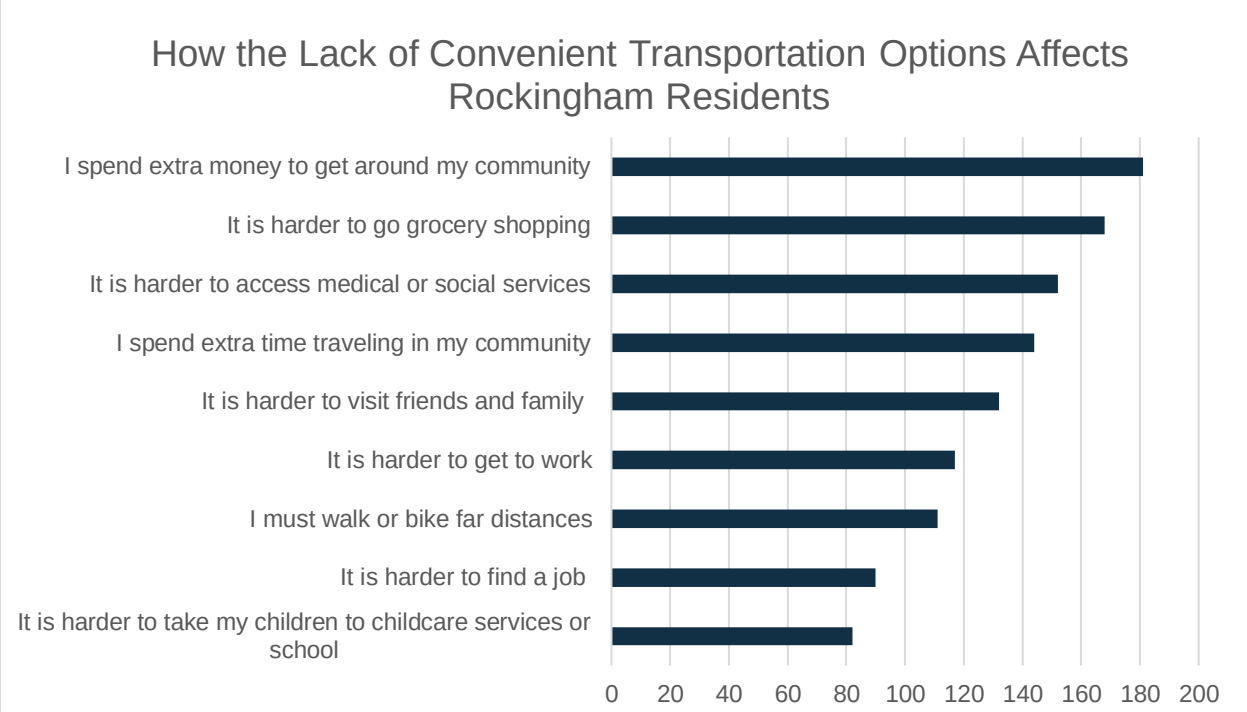


Write in answers to this question included taking paratransit service, using Harrisonburg transit, and scooter.

Question 3: Do you experience any challenges getting around in your area?

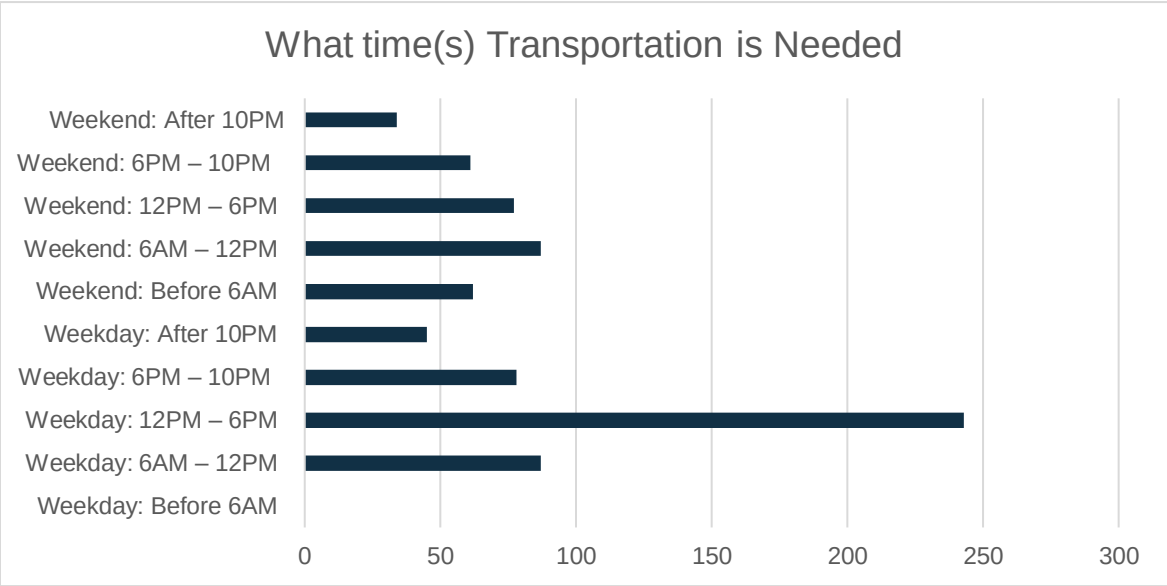
After the survey was live, concerns were raised by the project team about respondents not being able to express that they don't experience any challenges getting around. In response to this concern an additional response option was added to allow respondents to select that they do not experience any challenges getting around their area. 59 respondents selected this option. However, this number likely does not accurately reflect the proportion of respondents that would select this answer since it was not available in the first few days that the survey was live.

Question 4: How does a lack of convenient transportation options affect you?

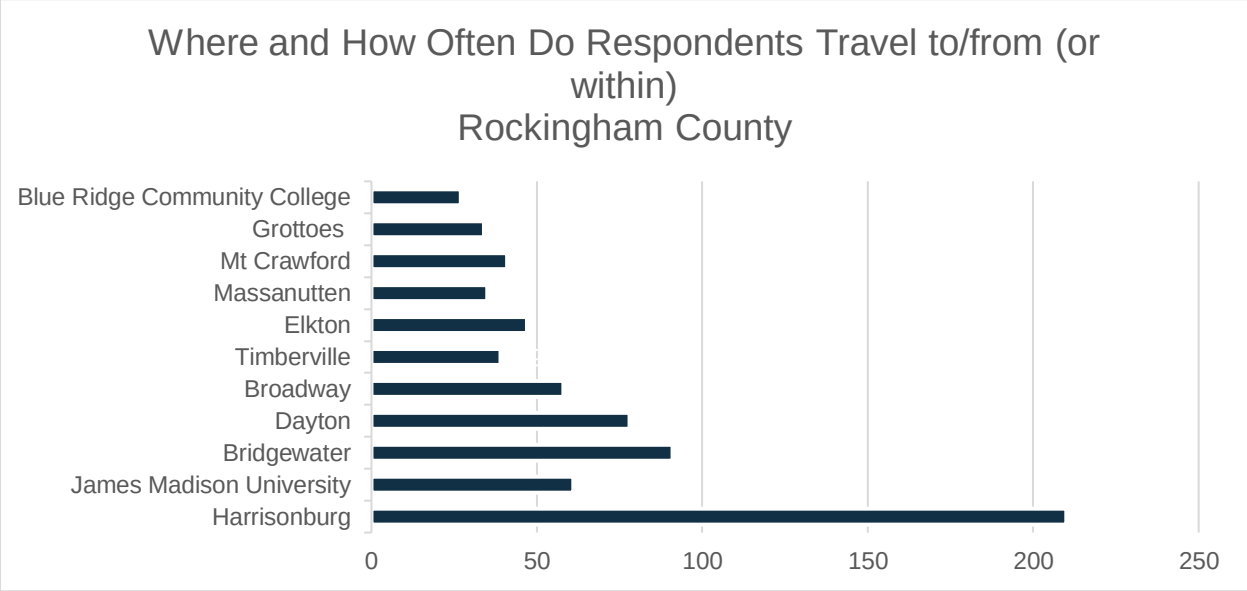


After the survey was live, concerns were raised by the project team about respondents not being able to express that they are not affected by lack of convenient transportation options. In response to this concern an additional response option was added to allow respondents to select that they are not affected. 69 respondents selected this option. However, this number likely does not accurately reflect the proportion of respondents that would select this answer since it was not available in the first few days that the survey was live.

Question 5: What time of day do you most need transportation?

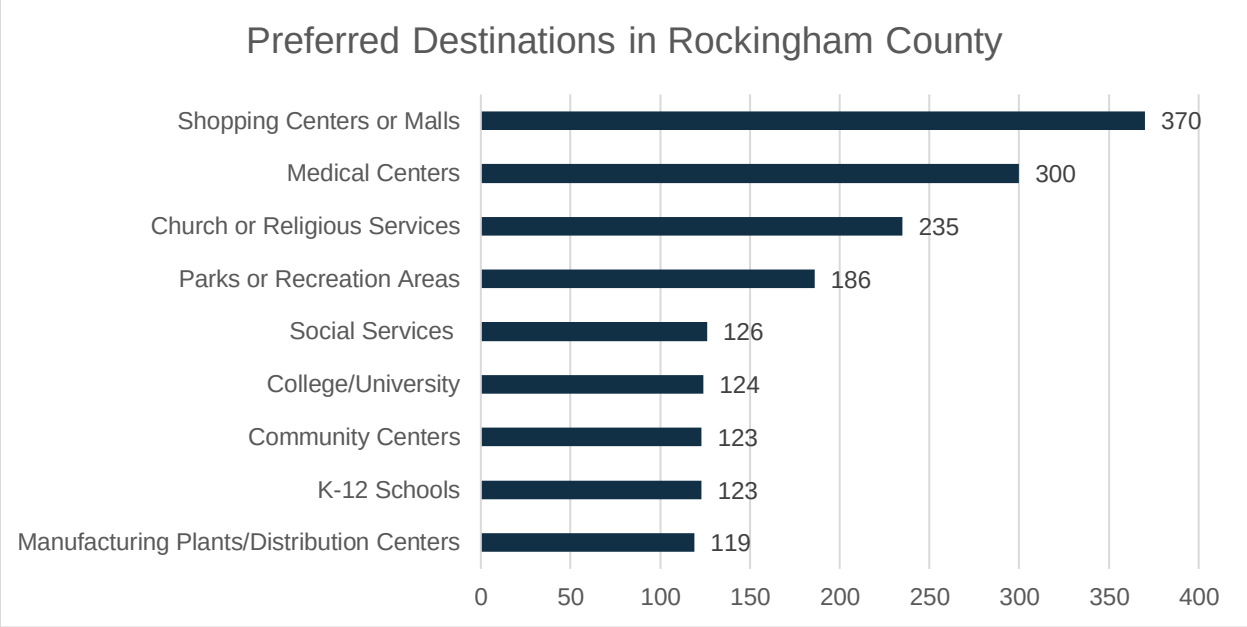


Question 6: Where and how often to you travel to, from, and within Rockingham County?

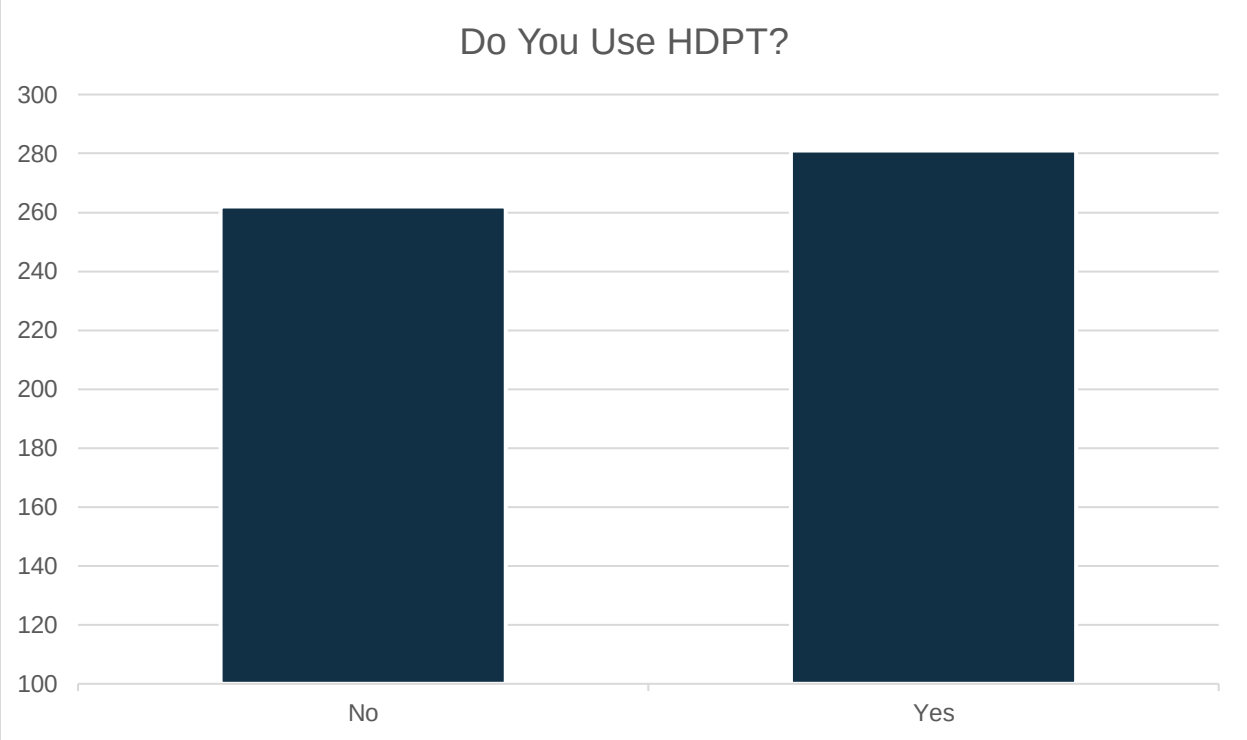


Harrisonburg was the most selected destination, which is to be expected as it is the largest urban area within Rockingham County.

Question 7: What types of destinations do you travel to/from in Rockingham County?



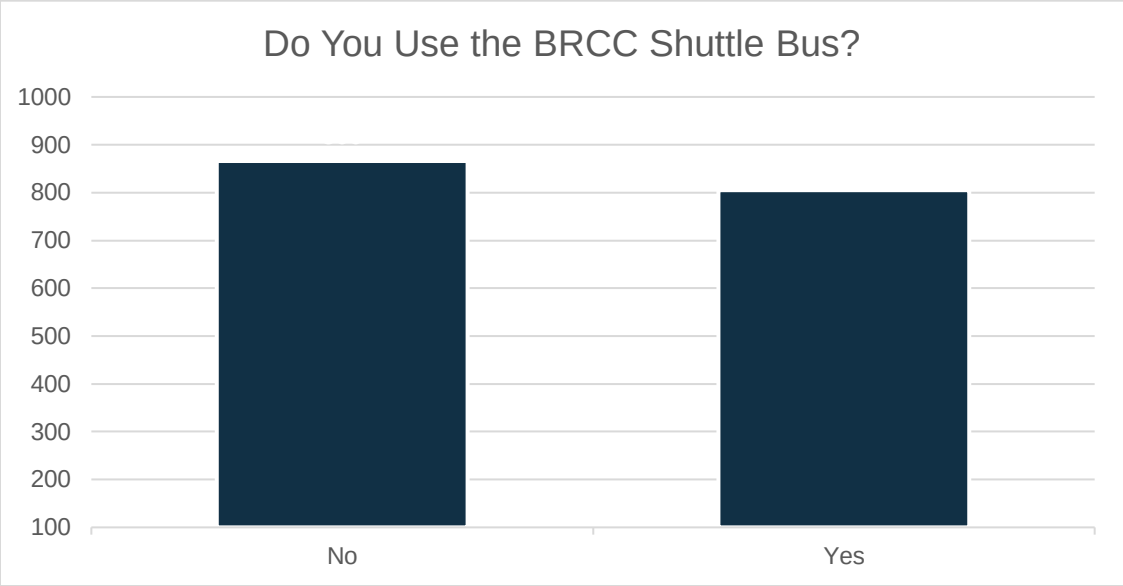
Question 8: Do you use Harrisonburg Department of Transportation buses?



Only 543 survey takers responded to this question, indicating a low-response rate. The breakdown between those who have used HDPT service and those who have not is somewhat

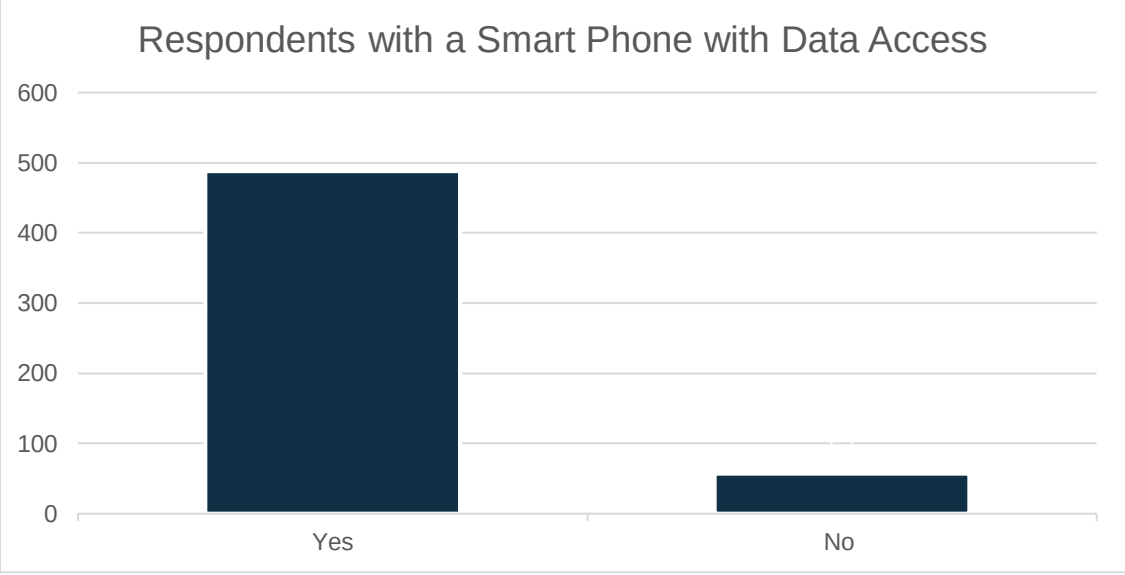
even (48% vs. 52%). This indicates high penetration of the service in the public consciousness, though without knowing how regularly respondents use the service we cannot infer respondents' reliance on it.

Question 9: Do you use the Blue Ridge Community College Shuttle?



52% of respondents to this question indicated that they have not used the BRCC shuttle. This indicates high penetration of the service in the public consciousness, though without knowing how regularly respondents use the service we cannot infer respondents' reliance on it.

Question 10: Do you have a smartphone with data access?



90% of respondents to this question indicated they have a smart phone with data access. Although this is high, the percentage of survey takers that answered this question was only

30%. Thus, we cannot say with certainty what percentage of survey takers have a smart phone with data access.

Stakeholder Listening Sessions

The project team identified a group of community stakeholders that could speak to a range of community concerns and issues that relate to mobility options. The stakeholders were asked to help distribute the survey to their networks and to attend a virtual stakeholder listening session.

The virtual stakeholder listening sessions were held November 2nd and 3rd, 2023 and featured five participants. Invitees are listed in **Figure 3** with attendees appearing in bold. Key insights that came from the guided discussion were:

- Some poultry companies provide their own transportation services.
- Transportation is a fundamental issue for County employers and employees.
- The three biggest issues facing County residents are transportation, childcare, and housing.
- Older residents are interested in expanded weekend daytime service for social activities in addition to reliable transport for medical appointments.

Figure 1: Community Stakeholders

Stakeholders

- **Valley Program for Aging Services**
- **Rockingham County Department of Social Services**
- **Rockingham County Senior Services**
- **Blue Ridge Community College**
- **Harrisonburg-Rockingham Chamber of Commerce**
- Sentara RMH
- Shenandoah Valley Partnership
- Harrisonburg-Rockingham Community Services Board
- Valley Interfaith Action (VIA)
- Massanutten Resort
- Rockingham Housing Authority
- United Way of Harrisonburg and Rockingham

Community Workshop

A community workshop was held on December 12th, 2023 from 4:00 PM to 6:00 PM at the Rockingham County administration building. The workshop was advertised on Rockingham County's website and social media and garnered local television and radio news coverage. Three residents attended the open house-style workshop, where they were presented with information on the study's data analysis, survey results, and proposed transit service. Attendees were asked to provide input as to whether the proposed network would meet their travel needs and what they would change about the proposed network. Comments received included:

- Travel between microtransit zones should be permitted.
- The system should be financially accessible to low-income individuals.

Participants were asked to place dots next to the zones they most preferred; however, only two of the three attendees completed the exercise. The project team determined that this low sample size did not provide enough data points to determine the community's preferences for the four zones.

Heading 1

Heading 2

Heading 3

Normal

Heading 4

Normal

- List Bullet 1

Bold

Italic

Bold Italic

ROCKINGHAM COUNTY TRANSIT FEASIBILITY STUDY

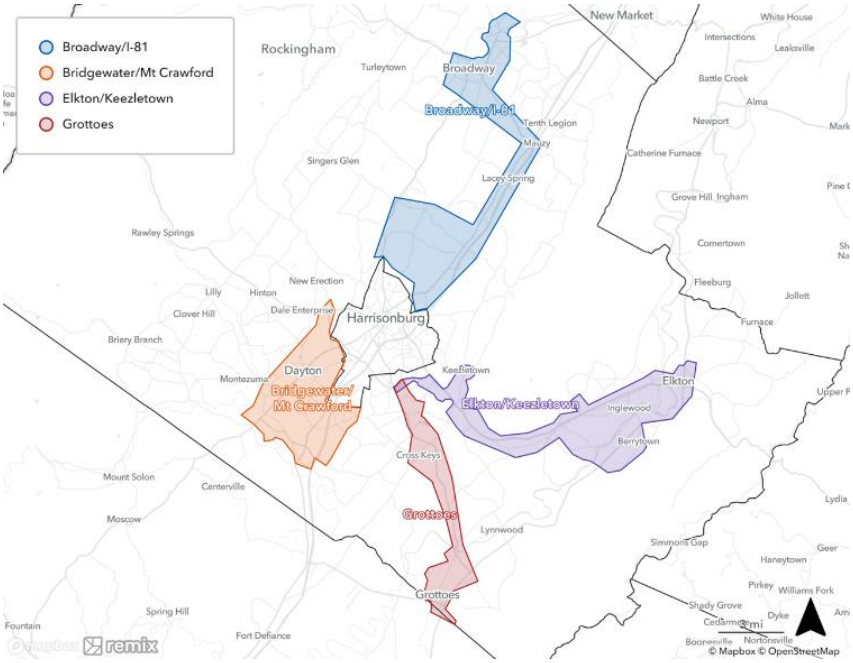
IMPLEMENTATION TECHNICAL DOCUMENTATION

Rockingham County
VIRGINIA

Microtransit Zones

The service area geometry for potential microtransit service in Rockingham County was determined by the extents of the accessible road network, location of origin-destination travel flows as well as inclusion of points of interest and trip generators both internal and external to the County. Four proposed zones were developed as shown in **Figure 1**. The four zones each had at least one external drop off point that could be used to access HDPT services or major trip generators. Based on size and estimated passenger demand, each zone would require two vehicles to operate.

Figure 1: Proposed Microtransit Zones



High level modeling using the Remix platform indicates that the Bridgewater/Mt. Crawford zone will produce the highest ridership. The zone covers most of the large employment centers south of Harrisonburg along the I-81 and US-11 corridors as well as the Towns of Bridgewater, Dayton, and Mt. Crawford. The project team previously determined ridership to be the most important measure of success, so this zone was selected to be implemented first.

Figure 2: Comparison of Microtransit Zones

	Broadway	Bridgewater	Elkton	Grottoes
Size (SqMi)	27.9	18.8	23.5	11.5
Vehicles	2	2	2	2
Ridership	2,496 – 7,488	9,204 – 27,664	1,144 – 3,380	1,092 – 3,224
Zone Population	6,000	10,700	5,100	4,900
% in Poverty	15%	7%	6%	8%
% Minority	25%	19%	13%	14%

Given that the project team also placed an emphasis on equitable access for disadvantaged individuals, it is also worth noting the potential differences in low-income and minority

populations residing in each zone. The Remix tool uses 2020 Census data to estimate the percentage of individuals living under the poverty line and the percentage of non-white or Hispanic individuals residing within the zone. These estimates are shown in **Figure 2**. For comparison, in the 2020 Census 10.5% of Rockingham County residents were under the poverty line and 13.9% classified themselves as non-white or Hispanic. The Broadway/I-81 zone had a higher proportion of low-income and minority residents, but the ridership estimates were much lower than the Bridgewater/Mt Crawford zone.

Costs

Costs were estimated for the service scenarios presented in **Figure 3** assuming a TaaS operating model. Costs are presented in 2023 dollars and assume the first year of operation would be partially funded by a DRPT demonstration grant, requiring a 20 percent local match with the remainder being funded by the grant.

Figure 3: First Year Operating Costs

Scenario	Estimated O&M Cost (Annual)[1]	Start-Up Costs	Estimated Local Match (First Year)
Scenario A **Weekday 5:30 AM - 7:00 PM** No Weekend Service	$737,000 - $948,000	$71,000	$162,000 - $204,000
Scenario B **Weekday 5:30 AM - 7:00 PM** **Saturday 8:00 AM - 4:00 PM** Sunday 8:00 AM - 4:00 PM	$854,000 – $1,100,000	$71,000	$185,000 - $234,000
Scenario C **Weekday 5:30 AM - 7:00 PM** **Saturday 7:00 AM - 7:00 PM** Sunday 7:00 AM -7:00 PM	$912,000 - $1,170,000	$71,000	$197,000 - $248,000

Start-up costs were developed based on pricing Kimley-Horn solicited from a nationwide SaaS and TaaS microtransit provider in late 2023. Costs are based on a single zone operating with two vehicles and are inclusive of a base software and support package with no premium add-ons. NTD reports, daily/weekly/monthly KPI reports, and a data dashboard are included as part of the base package, so no additional costs related to fulfilling reporting requirements were assumed.

Operations and maintenance costs were developed using cost calculations embedded within the Remix platform. Costs represent the Remix estimated number of hours required to operate the service as scheduled multiplied by a low ($70/hour) and high ($90/hour) hourly rate to generate a range of expected annual operating costs. Costs were expressed as a range to reflect the high-level nature of this study's implementation planning.

Capital Costs are not included because it assumed that with a turn key TaaS model, these costs would be factored in to the negotiated operational costs.

[1] Cost per zone in 2023 dollars

Transit Service Plan Development
Scope of Work

The Harrisonburg-Rockingham Metropolitan Planning Organization (HRMPO) will engage a consultant to prepare a service plan for a previously identified microtransit zone encompassing the Dayton, Bridgewater, and Mt. Crawford area of Rockingham County. This planning-focused and advisory effort is intended to provide the HRMPO and Rockingham County with objective analysis, documented alternatives, and implementation-ready information to support future decision-making. The consultant's role is to evaluate existing conditions, develop and assess options, and prepare clear technical deliverables.

This task builds on prior planning work that established the geographic focus of the zone and does not include service area definition or feasibility. The purpose of the service plan is to outline how microtransit service in this zone could be implemented, should partners choose to move forward.

The plan will define an operational service concept, including hours of operation, vehicle types, baseline operational parameters, and identify opportunities for points of connection to existing transit service in the neighboring City of Harrisonburg and to the south along the Route 11 corridor. The consultant will then assess multiple service delivery and management models, including:

- service provided by an independently procured microtransit provider,
- a locally managed service, operating independently from the existing regional system, and
- integration into an existing system framework

For each model, the plan will describe administrative and staffing requirements, along with potential barriers that could affect implementation. The consultant will develop detailed implementation steps, including administrative, governance, procurement, and operational considerations. The analysis will include comparative cost estimates, distinguishing capital, startup, and ongoing operating costs, and will document operational and administrative requirements for each scenario. The plan will also identify and define the technical specifications for software and technology requirements necessary to support service delivery, performance monitoring, and data reporting, including considerations for National Transit Database reporting and key performance indicators.

The consultant will synthesize all findings into a clear, stand-alone service plan that outlines implementation pathways, decision points, and resource considerations, providing local partners with a reference document to guide potential future service decisions.

The stakeholder group for this project will be comprised of the HRMPO Technical Advisory Committee, which includes members from the City of Harrisonburg, Rockingham County, the Towns of Bridgewater, Dayton, and Mt. Crawford, along with representatives from state agencies such as Virginia Department of Transportation and the Department of Rail and

Public Transportation. Professional planning staff from the Central Shenandoah Planning District Commission (CSPDC) also staff the HRMPO. CSPDC transportation planning staff will coordinate with the consultant and facilitate the stakeholder group meetings. Additional stakeholders will be included as necessary. As the service plan is based on a previously completed Microtransit feasibility study and the zone and service parameters remain unchanged from that plan, no additional public engagement is scheduled for the development of this transit service plan unless determined necessary by the project stakeholder working group.

The HRMPO seeks to complete this project by December 2026 so that any recommendations may inform the FY28 grant funding cycle.