Illustration by Christina Franusich. *Virginia Tech.*

# Virginia Remote Work Study

## An Analysis of Remote Work Drivers and Remote Worker Attraction Across Virginia Communities

Virginia Tech Center for Economic and Community Engagement

UAP 5774: Spring 2023 Economic Development Studio

# VIRGINIA REMOTE WORK STUDY

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# Executive Summary

The shift away from in-person work to remote and hybrid work is predicted to be one of the long-term impacts from COVID-19 to the nation. As a result, workers are being decoupled from where they work and live, providing an opportunity for communities to attract workers to relocate there, and/or to attract employers to invest in more rural, satellite offices.

The successful retention and attraction of remote workers and remote work can lead a community to be positioned as a place of choice, changing the local environment of that community. Understanding the implications of the remote work boom to communities is crucial to develop proactive and reactive solutions to reach the commercial district revitalization goals for the communities and attract more residents to relocate there.

In this study, The Virginia Tech Economic Development Studio Team (the Team) analyzed drivers and challenges of remote work, categorized the types of remote workers attracted to different communities, and developed recommendations both for different community types as well as for the Virginia Main Street program if it wishes to support these communities in this endeavor. Our proposed remote worker typology examines the dimensions of mobility and motivation to determine potential relocation patterns. Community categories (i.e.,**1. Urban, 2. Suburban/Exurban, 3. Rural Resort, and 4. Rural Perennial**) were identified using a geographic stratification method that combines insights from GO Virginia's (GOVA) regional designations and a place-type categorization schema - Virginia Community Categories - based on the United States Department of Agriculture (USDA) Rural Urban Continuum Codes (RUCC).

The study builds off previous research conducted by Virginia Main Street (VMS), including the VMS 'Remotability Index' and five case studies examined in the 'Work from Home Pilot Program'. The Team conducted a literature review and secondary data analysis in all Virginia localities at the city and county levels, as well as primary data collection via surveys, interviews, and case studies in selected Virginia communities. Survey questions were sent to economic development professionals across the public and private sectors in Virginia to gather insight into the remote work environment in their communities, as well as their attitudes towards remote worker attraction. Case studies were selected from a pool of self-selecting survey participants, following the criteria of our geographic stratification and GOVA regions. We examined one community per GOVA region, with one or more of those communities falling into our four community categories. Interviews were conducted with roughly two economic development professionals per locality, and their insights were combined with secondary data and literature review findings to construct a substantive narrative for each community and develop recommendations for each community category.

**Table ES.1.** provides a summary of recommendations by community category and remote worker typology.

Key findings and recommendations include:

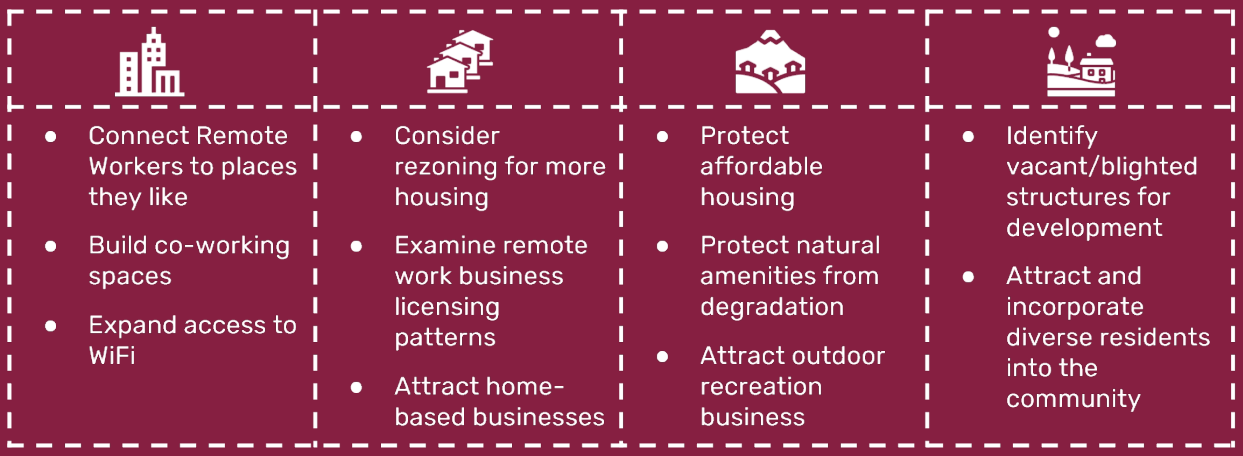
- The remote work share is driven by occupation and by the distribution of occupations within industries. Occupations in the information, finance, professional services, and management industries, termed "skilled scalable services" (SSS), are nearly 80% remote-capable and have led aggregate shifts to remote work. These industries tend to agglomerate around large metropolitan statistical areas.
- Expanding and improving upon remote work infrastructure such as broadband service and ensuring housing affordability/availability are viable methods for attracting remote work and remote workers.
- Building and improving upon place-based diversity and inclusivity may attract more remote workers and alleviate tension between relocating remote workers and existing residents.
- Developing place-based, context-specific methods to connect with and quantify the remote worker population.

**Table ES.1. Summary of Key Findings and Recommendations**

| Community Category | Drivers | Workers Attracted | Challenges | Recommendations |
|---|---|---|---|---|
| **Urban** | • Urban Amenities<br>• Short Commute<br>• Diversity | • Urbanists<br>• Boomerangs<br>• Salary Stretchers | • Housing: High costs<br>• Housing Availability<br>• Smaller City Awareness | • Connect with remote workers<br>• Build public-private partnerships with co-working spaces<br>• Expand access to WiFi in public spaces |
| **Suburban/ Exurban** | • Housing: Relative Affordability<br>• Urban Core Access<br>• Quality of School Systems | • Salary Stretchers<br>• Nature Lovers | • Development Constraints<br>• Accessing Information on Remote Workers | • Consider re-zoning<br>• Examine home-based business licensing patterns<br>• Implement programs to attract home-based entrepreneurs |
| **Rural Resort** | • Recreational Assets<br>• Lifestyle | • Nature Lovers<br>• Boomerangs | • Broadband Availability<br>• Housing: Rural Gentrification<br>• Access to Coworking Spaces | • Protect affordable housing options<br>• Work with agencies to preserve natural amenities<br>• Enhance off-season amenities |
| **Rural Perennial** | • Lower Cost of Living<br>• Small Town Charm | • Salary Stretchers<br>• Nature Lovers<br>• Boomerangs | • Infrastructure<br>• Broadband<br>• Cultural Challenges | • Identify vacant/blighted buildings<br>• Integrating and connecting new and long-term residents |

The study also offered critiques and suggested the following recommendations to VMS:

- Provide resources to boost engagement and attract residents
- Offer marketing and branding tools to advertise these communities to new audiences
- Connect communities with broadband providers and VATI to expand internet access
- Provide grants and grant writing assistance for broadband and housing development



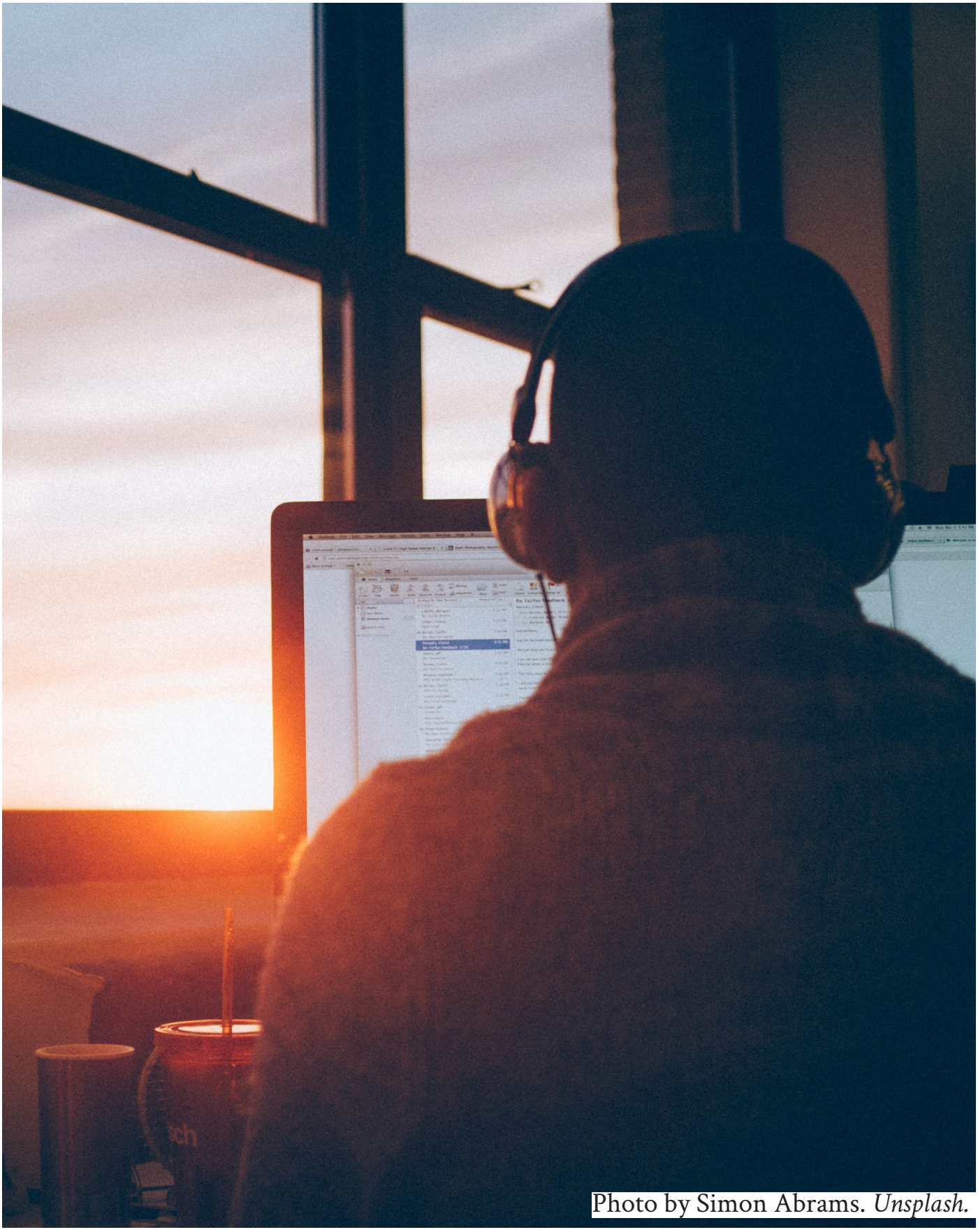


Photo by Simon Abrams. *Unsplash.*

# Contents

# Introduction

## Background

Remote-capable occupations constitute 37% of US jobs but capture 46% of aggregate wages.[1] Remote workers are most prevalent in high-skill, knowledge-work industries – information, finance and insurance, professional services, and management – termed "Skilled Scalable Services" (SSS).[2] The shift to remote work has been associated with geographic reallocation of services from job-dense city centers to residential neighborhoods.[3] The remote workforce is a high-earning population whose residential location decision-making can affect local economic outcomes.

Local economic developers (LEDs) should care about remote worker attraction for the same reasons they care about attracting any other export-oriented enterprise. Essentially, remote workers' labor is exported from their place of residence to their place of employment. It is a locally produced tradeable service; it increases external aggregate demand and generates export income, fueling demand for local, non-tradable services.[4] Having higher-earning, remote workers residing in one's local economy has a significant impact on jobs and incomes as well as local tax revenue.

This study, conducted by The Virginia Tech Economic Development Studio Team (the Team), analyzed drivers for attracting and retaining remote workers across different types of Virginia communities, both those in the Main Street America and Virginia Main Street (VMS) programs and those not. The Team explored the remote work landscape across geographies, and the opportunities and challenges for remote work attraction in different types of places.

## Virginia Main Street & Prior Studies

The Virginia Main Street program is one of the Coordinating Programs in Main Street America, which organizes at the state, county, and city level, coordinating program partners with the National Main Street Center to provide support and training to Main Street America communities across the country. Virginia Main Street Communities include older and historic downtowns and neighborhood commercial districts registered in the Virginia Department of Housing and Community Development (DHCD).

1. Dingel, J. I., & Neiman, B. (2020). How many jobs can be done at home? Journal of Public Economics, 189. https://doi.org/10.1016/j.jpubeco.2020.104235
2. Althoff, L., Eckert, F., Ganapati, S., & Walsh, C. (2022). The geography of remote work. Regional Science and Urban Economics, 93, 103770–103770. https://doi.org/10.1016/j.regsciurbeco.2022.103770
3. Taneja, S., Rockey, J., Matheson, J., Mizen, P., & De Fraja, G. (2022). "Remote working and the new geography of local service spending." Center for Economic and Policy Research. https://cepr.org/voxeu/columns/remote-working-and-new-geography-local-service-spending.
4. Hill, E. (N. (2023). What is economic development? and what is the job of an economic development professional? Economic Development Quarterly, 37(1), 34–48. https://doi.org/10.1177/08912424221147013


The program is a network of over 1,200 Main Streets, both rural and urban, that share a commitment to place and building stronger communities. Both Main Street America and Virginia Main Street are exploring the impacts of remote work and potential for remote worker attraction, as the increase in remote workers has spurred new patterns of migration and space occupancy. Remote work presents an opportunity for previously struggling Main Street communities to market to a new demographic and stimulate a new wave of economic development.

VMS worked with Main Street America in the past to create a 'Work from Home  Pilot Study' and develop a Remotability Index (RI). In the previous study, five communities, listed below, were chosen to analyze strategies to strengthen remote worker attraction efforts and place-based work suitability.

- City of Buena Vista
- Town of Luray
- City of Harrisonburg
- Town of Marion
- Highland County

The selected communities learned to leverage remote work opportunities as a method of creating a downtown revitalization strategy and received a Project Feasibility Report with recommendations. The pilot study not only provided a starting point for the selected communities to continue developing remote work, but also brought up questions for future study and inspired other communities to consider developing a remote worker attraction strategy.

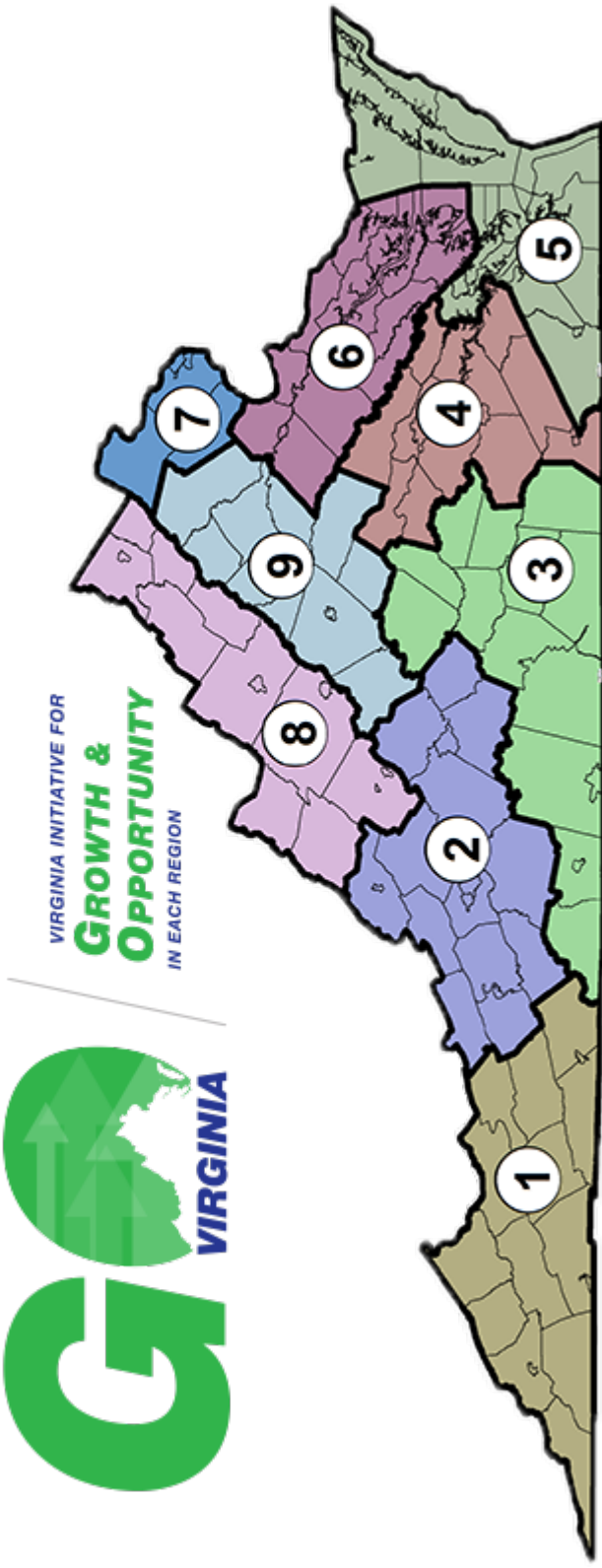
Findings from the pilot study were further developed into a Remotability Index (RI), enabling quantitative assessment of place-based remote work suitability. The VMS RI was constructed using 25 quantitative indicators, categorized into 12 indicator categories. Broadly, the indicators cover factors hypothesized to be the key drivers of remote work: remote work infrastructure (telecommunications and workspace access); housing availability, affordability, and variety; natural, social, and cultural amenity pull-factors; and finally, several transportation and workforce quality indicators suggesting the continued importance of

agglomeration economies and firm-level location decisions in the remote work era.
Analysis of the VMS RI's indicators informed quantitative variable selection for this study.
This study also offers a critique of the index and recommendations for improving quantitative indicator selection, and more differentiation between types of remote workers and types of communities.

# Current Study

Building off the previous study, the Virginia Tech Economic Development Studio Team (the Team) analyzed drivers, challenges, and recommendations for remote worker and remote work attraction across Virginia communities. The following questions were analyzed in this research for both VMS and non-VMS communities across Virginia's urban/rural spectrum:

- What are the drivers of or attractions for remote workers as well as remote employers to different types of communities?
- What are the anticipated challenges to remote work in different types of communities across the urban-rural gradient and throughout the sub-regions of Virginia?
- How can different types of communities capitalize on their existing assets and overcome challenges to attract remote workers and employers, which could maximize their economic wellbeing, address pressing equity issues, and environmental concerns?



# Methods

This study took a mixed methods approach to answer the above research questions. The Team reviewed relevant academic literature and previous studies to develop broad themes for qualitative investigation and to identify indicators for quantitative analysis.

## Geographic Stratification

Quantitative data was collected and analyzed per locality (independent cities and counties) in Virginia. Two levels of geographic stratification were used to analyze quantitative data: Virginia subregions, identified via GO Virginia's (GOVA) regional designations, and a place-type categorization schema - Virginia Community Categories - based on the United States Department of Agriculture (USDA) Rural Urban Continuum Codes (RUCC).

The GOVA regions, presented in **Figure A.1** in **Appendix A**, were used in this study to classify Virginia regions in a way that is well-defined and widely accepted at the state and federal level in economic development.

The Virginia Community Categories are an original contribution of this study. They were created using the United States Department of Agriculture (USDA) Rural Urban Continuum Codes (RUCC), which categorize metropolitan, micropolitan, and rural areas by local and regional population into nine codes. The RUCC codes were further aggregated and re-coded to create four Virginia Community Categories: two metropolitan (RUCC codes 1-3) and two rural (RUCC codes 4-9). The four community categories are **1. Urban, 2. Suburban/Exurban, 3. Rural Resort, and 4. Rural Perennial.**

The metropolitan Virginia Community Category codes are **1. Urban and 2. Suburban/Exurban.** Broadly, independent cities were classified as urban, and counties within metropolitan and micropolitan areas were classified as suburban/exurban. Exceptions were made, however, based on both GOVA regions and built form distinctions. An exception for Community Category code 1 is Arlington, which is a county, but is better represented as urban based on its built environment and location directly adjacent to the metropolitan core jurisdiction of the District of Columbia. Exceptions for Community Category code 2 are the Cities of Chesapeake, Poquoson, Suffolk, and Virginia Beach, which do have a few urban areas, but also have many square miles of protected farmland, forests, wetlands, and green spaces, and thus are better represented as suburban/exurban. The cities of Fairfax, Falls Church, Manassas, and Manassas Park are also exceptions for Community Category code 2. These cities have higher population densities than their surrounding localities; however, they are not directly adjacent to the metropolitan core jurisdiction of the District of Columbia.

The rural Virginia Community Category codes are **3. Rural Resort and 4. Rural Perennial.** This distinction was created based on the level of housing vacancy due to seasonal, recreational, or occasional uses. Rural communities with over 30% vacancy for

those reasons are classified as rural resort, while remaining rural communities are classified as rural perennial.

**Table 2.1** illustrates these Community Categories, and more information can be found in **Appendix A.**

### Table 2.1. Urban-Rural Community Category Codes Table 2.1. Urban-Rural Community Category Codes

| Community Category Code | Community Category | Definition |
|---|---|---|
| 1 | Urban | **Cities** in Metropolitan Areas (RUCC 1-3) |
| 2 | Suburban/Exurban | **Counties** in Metropolitan Areas (RUCC 1-3) |
| 3 | Rural Resort | Non-Metro Areas (RUCC 4-9). Over 30% Seasonal or Recreational Housing Vacancy |
| 4 | Rural Perennial | Remaining Non-Metro Areas (RUCC 4-9) |

**Figure 2.1** shows the distribution of the community categories across the State. There are clusters of certain categories in different parts of the State; for example, GOVA Region 1 (one) in far southwest Virginia has many counties that fall into the rural perennial category. Many communities in GOVA Regions 5 (five) and 6 (six) fall into the suburban/exurban and rural resort typologies.

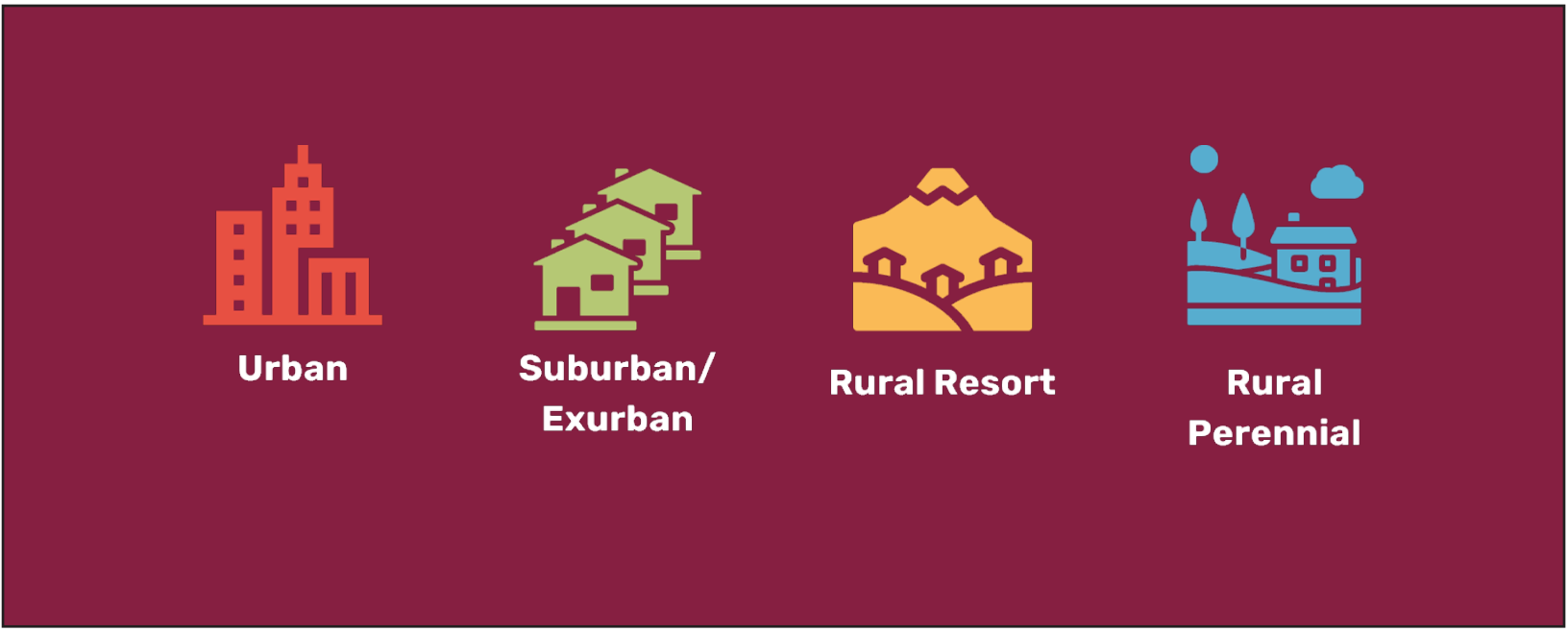
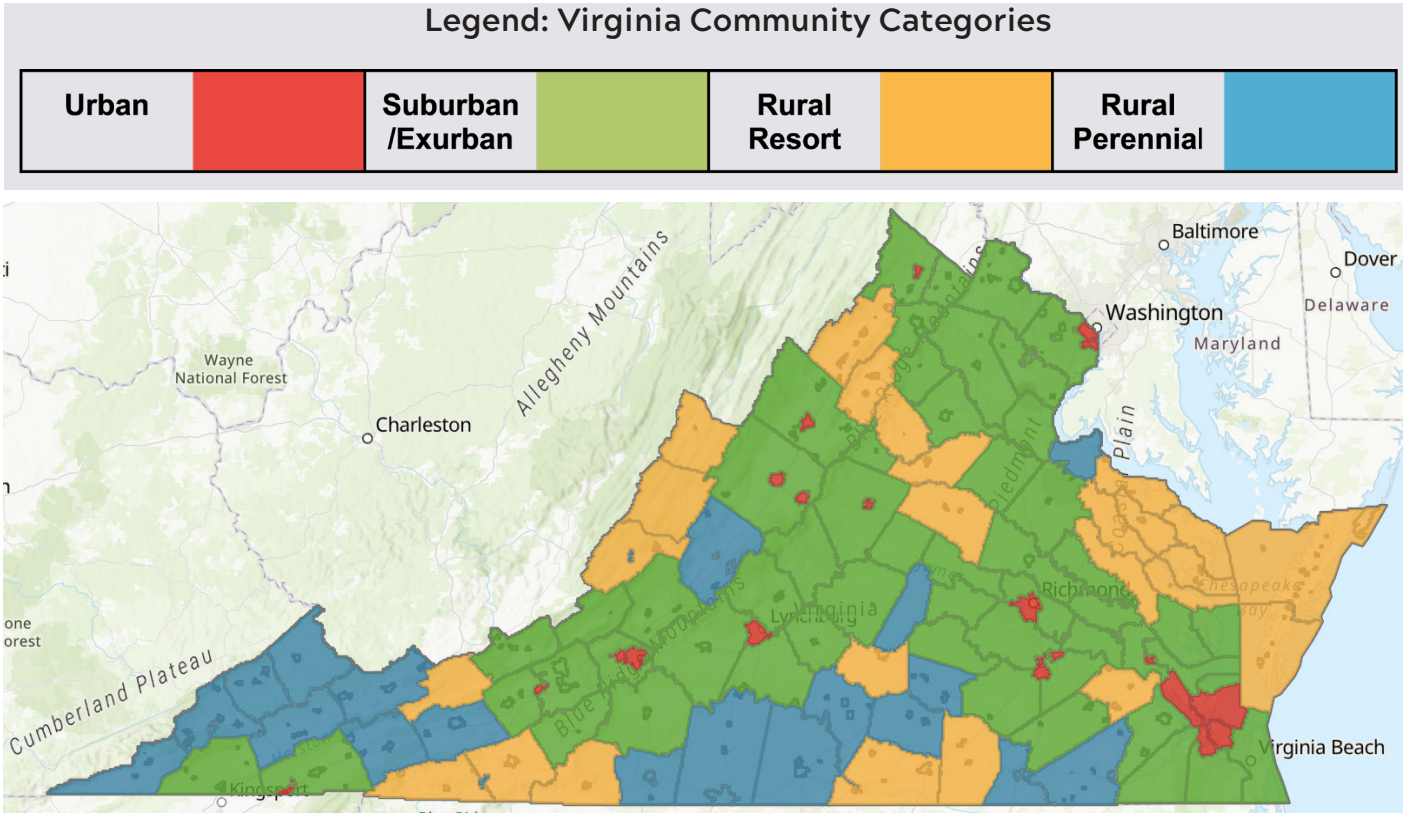


Figure 2.1. Virginia Counties and Cities Classified by Community Category




| | Community Category | Definition |
|---|---|---|
| | **1.** Urban | Metropolitan areas (RUCC 1-3) that are **cities** |
| | **2.** Suburban/Exurban | Metropolitan areas (RUCC 1-3) that are **counties** |
| | **3.** Rural Resort | Non-metro areas (RUCC 4-9). **Over 30%** seasonal and recreational housing **vacancy** |
| | **4.** Rural Perennial | Remaining non-metro areas (RUCC 4-9) |

| Locality Name | Community Typology |
|---|---|
| Marion (Smyth County) | Rural Perennial |
| Vinton (Roanoke County) | Suburban/Exurban |
| Clarksville (Mecklenburg County) | Rural Resort |
| Hopewell (Prince George County) | Suburban/Exurban |
| Isle of Wight County | Suburban/Exurban |
| Gloucester County | Suburban/Exurban |
| Harrisonburg (Rockingham County) | Urban |

## Methods: Research

Lit Review

Secondary Data

Primary Data

# Case Study Selection

Primary data was collected and analyzed to further develop findings from the literature and quantitative data. The Team reached out to economic developers and local officials to learn their point of view on the remote worker landscape in their community.

The team developed a survey based on input from Main Street America and Virginia Main Street, quantitative data, and guidance from economic development specialists and community planners. The survey was disseminated to public and private sector organizations, ranging from small business development centers to consulting firms to regional planning districts, with 160 participants representing 88 Virginia localities. Survey responses provided insights on the potential drivers and challenges for remote worker attraction in their respective community, and to learn if their community currently has any drivers that were also found as important in the literature and secondary data research. A full analysis of survey findings and the questions asked can be found in **Appendix C.**

Survey participants were asked to participate in the interview phase of the qualitative research process. Ultimately, the team conducted interviews with professionals from seven localities, selected by willingness to participate, GOVA region representation, and the geographic stratifications previously described in an attempt to capture the diversity across Virginia communities. GOVA regions seven (Go Northern Virginia) and nine (Piedmont Opportunity Corridor) were omitted due to time constraints and respondent availability.

Case study descriptions were developed for each of the communities interviewed, in a spread of urban, suburban/exurban, and rural communities, and VMS/non-VMS members, as shown in **Table 2.2**, to inform the differences of remote work across different GOVA regions. Detailed case study narratives for each community can be found in **Appendix D**.

*Shenandoah Valley Sunset.* Photo by Scott Pruett. *Unsplash.*

## Table 2.2. Case Study Selection

| Locality Name | GOVA Region | RUCC Designation[1] | Community Categories | VMS Status | County-Level Population Density[2] |
|---|---|---|---|---|---|
| Marion (Smyth County) | 1 | 7 | Rural Non-Resort | AVMS (Pilot Community) | 71 |
| Vinton (Roanoke County) | 2 | 2 | Suburban/Exurban | EMS | 371 |
| Clarksville (Mecklenburg County) | 3 | 7 | Rural Resort | MMS | 47 |
| Hopewell (Prince George County) | 4 | 1 | Suburban/Exurban* | AVMS | 2,071 |
| Isle of Wight County | 5 | 1 | Suburban/Exurban | Non-member | 98 |
| Gloucester County | 6 | 1 | Suburban/Exurban | AVMS | 128 |
| Harrisonburg (Rockingham) County) | 8 | 3 | Urban | AVMS (Pilot Community) | 2,908 |

*While our typology classifies Hopewell as Urban, it was examined within the broader context of Prince George County, which is classified as Suburban/Exurban.

5. We recognize that the USDA typology is imperfect, as it homogenizes counties along the eastern shore/tidewater region. For this reason, we have also included population density as an additional metric to highlight the differences between localities and examined additional factors including population and cultural contexts.
6. Measures people per square mile. The state average density is 203 people per square mile.

# Drivers of Remote Work

## Remote-Capable Industries

Research on remote work suitability by occupation has found that 37% of jobs in the United States can be performed remotely.[7] Due to the distribution of occupations by industry, certain industries have driven aggregate shifts to remote work: Information (NAICS code 51); Finance and Insurance (NAICS code 52); Professional Services (NAICS code 54); and Management of Companies (NAICS code 55). These industries are classified in the literature as "Skilled Scalable Services" (SSS), and nearly 80% of jobs in this industry group are remote- capable.[8] Estimated remote work suitability by industry group is shown in **Table 3.1.**

Data from Virginia confirms these broad findings on the relationship between remote work and SSS. In aggregate, remote work suitability is largely mediated by occupation and by the distribution of occupations by industry (See **Figure 3.1**).

Table 3.1. Remote-Capable Jobs by Industry Group[9]

| Industry Group | NAICS codes | Average Income | Remote Potential |
|---|---|---|---|
| **Skilled Scalable Services** | 51, 52, 54, 55 | $84,000 | 79.6% |
| **Resources & Construction** | 21, 22, 23 | $54,900 | 19.7% |
| **Manufacturing** | 31, 32, 33 | $60,900 | 32.1% |
| **Trade & Transport** | 42, 44, 45, 48, 49 | $40,300 | 22.5% |
| **Education & Medical** | 61, 62 | $48,500 | 50.6% |
| **Arts & Hospitality** | 71, 72 | $22,600 | 14.4% |
| **Other Services** | 53, 56, 81 | $39,400 | 33.9% |

*7.* Dingel, J. I., & Neiman, B. (2020). How many jobs can be done at home? Journal of Public Economics, 189. https://doi.org/10.1016/j.jpubeco.2020.104235
*8.* Althoff, L., Eckert, F., Ganapati, S., & Walsh, C. (2022). The geography of remote work. Regional Science and Urban Economics, 93, 103770–103770. https://doi.org/10.1016/j.regsciurbeco.2022.103770
*9.* Ibid.

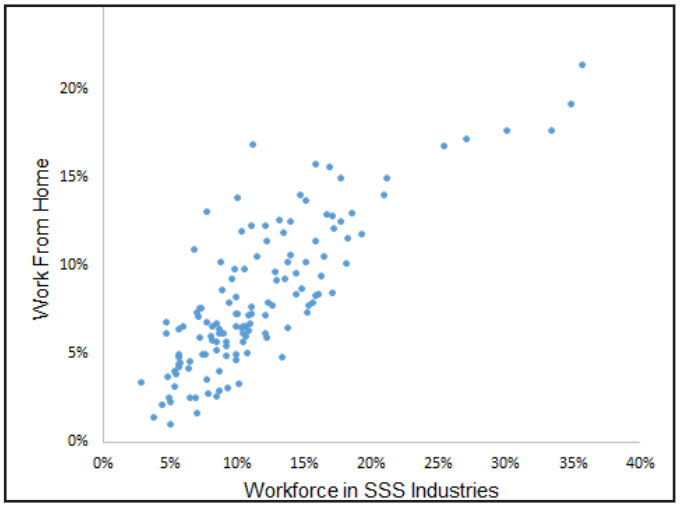



**Figure 3.1. SSS Employment and Work From Home Prevalence by Virginia City/County**

# Agglomeration & Geography of Remote Work

While remote work theoretically enables unlimited geographic distance between workers and their employers, remote-capable employment remains a largely urban phenomenon.[10] In Virginia, both SSS employment and remote work are disproportionately prevalent in urban and suburban/exurban communities – i.e., those within Metropolitan Statistical Areas (MSAs) (See **Table 3.2**). However, while SSS employment and remote work are disproportionately prevalent within MSAs, they are not uniformly distributed *among* MSAs. After controlling for local SSS employment shares, urban density has an insignificant relationship with remote work prevalence.[11] Urban and suburban/exurban communities do not have particular advantages over other community types, given comparable levels of SSS industry agglomeration.

In Virginia, there is wide regional variation in shares of SSS employment and working from home, even between regions with highly urbanized workforces (see **Table 3.3**). For example, 96-100% of the workforce in GOVA Regions 2, 4, 5, and 7 is urbanized. However, across these regions, the percentage of workers employed in SSS ranges from 11-29% and working from home ranges from 8-17%. The SSS industry cluster in Northern Virginia (GOVA Region 7) drives the disproportionate share of remote workers in this region, even over other highly urbanized Virginia regions. In other words, if a metropolitan area already has strong clusters in Information (NAICS code 51); Finance and Insurance (NAICS code 52); Professional Services (NAICS code 54); or Management of Companies (NAICS code 55), there is a higher likelihood that they will have higher proportions of remote workers.

At this early stage in remote work's normalization and expansion, its geography remains highly mediated by SSS industry clusters and limited to particular MSAs. Communities attempting to drive remote work must understand that they will be unable to replicate the endogenous conditions associated with remote work prevalence. Communities attempting to attract remote workers must understand limitations on remote workers' mobility, and broad themes in

10. Eckert, F., S. Ganapati, & C. Walsh. (2020). Skilled Scalable Services: The New Urban Bias in Economic Growth. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3439118
11. Althoff, L., Eckert, F., Ganapati, S., & Walsh, C. (2020). The city paradox: Skilled services and remote work. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3744597

remote workers' residential preferences, discussed in the following sections.

Photo by Chris Montgomery. *Unsplash.*

Table 3.2. SSS Employment and Work From Home by Community Type[12]

| Community Category | Total Workforce | Employed in SSS (%) | Work From Home (%) |
|---|---|---|---|
| **1 Urban** | 893,228 | 18% | 11% |
| **2 Suburban/Exurban** | 2,901,482 | 20% | 12% |
| **3 Rural Resort** | 190,463 | 9% | 7% |
| **4 Rural Perennial** | 234,608 | 8% | 5% |
| ***Virginia Statewide*** | *4,219,781* | *18%* | *11%* |

Table 3.3. SSS Employment and Work From Home by GOVA Region[13]

| GOVA Region | Total Workforce | Workforce in Urban & Sub/ Exurban (%) | Employed in SSS (%) | Work From Home (%) |
|---|---|---|---|---|
| **Region 1** | 144,011 | 27% | 8% | 4% |
| **Region 2** | 364,286 | 98% | 11% | 8% |
| **Region 3** | 150,551 | 9% | 7% | 5% |
| **Region 4** | 651,690 | 99% | 17% | 12% |
| **Region 5** | 804,403 | 96% | 14% | 8% |
| **Region 6** | 249,322 | 82% | 15% | 10% |
| **Region 7** | 1,376,792 | 100% | 29% | 17% |
| **Region 8** | 261,774 | 81% | 10% | 7% |
| **Region 9** | 216,952 | 81% | 15% | 12% |
| ***Virginia Statewide*** | *4,219,781* | *90%* | *18%* | *12%* |

12. US Census Bureau. ACS 2021 5-year estimates, Table S2403.
13. US Census Bureau. ACS 2021 5-year estimates, Table S2403.

Photo by Avi Richards. *Unsplash.*

# Remote Worker Typology

This report develops a typology of remote workers based on two dimensions: **Mobility** and **Motivation**.

**Mobility** depends on the specifics of remote work flexibility: essentially, whether a remote-capable job is performed fully remote, in a hybrid format, or fully on-site. Hybrid work arrangements span the gamut of a couple days of telework per week to a handful of days in the office each month, while fully remote workers can work from anywhere. Based on mobility, remote workers are either **tethered** to their Metropolitan Statistical Areas (MSA) of employment, or they are **mobile**.

**Motivation** reflects what place characteristics the remote-capable workers value. Based on motivations, the Team identified four broad remote worker types: **Urbanists** value proximity to the consumer, cultural, transportation, and economic amenities of cities, as well as the social diversity associated with urban living.

**Salary Stretchers** leverage geoarbitrage to reduce living costs, achieve home ownership, and secure affordable access to public goods, such as high-quality public education.

**Nature Lovers** are driven by access to high-quality natural amenities – a mix of open and forested land; rivers, lakes, and beaches; and dramatic topography – and the recreation facilities associated with these landscapes.

**Boomerangs** value personal connections to a place, which drives their location decision-making.
It must be noted that residential location decisions are complex and that motivations can be numerous and overlapping. Any attempt at classification risks oversimplification and abstraction. The remote worker motivation types were distilled from a large body of research on worker migration patterns. Communities can use this typology to better understand the nature of remote workers' mobility limitations and to design effective attraction programs that match their existing assets with potential in-migrants' residential preferences.

Photo by Microsoft Edge. *Unsplash.*

# Mobility

While remote workers can theoretically work from anywhere, most remote workers have remained within their MSA of employment. Differences in remote work format – whether hybrid or fully remote – are the key determinant of remote worker mobility. Research has shown an inverse relationship between the number of on-site days required and interest in relocation among remote workers.[14] At present, hybrid is the dominant form of remote work: as of March 2023, 52% of remote-capable jobs were hybrid, 28% were fully remote, and 20% were fully on-site.[15] The effects of remote workers' mobility constraints have become evident in the largest MSAs. Nearly two-thirds of remote work-enabled moves have been within

14. Tan, S., Fang, K., & Lester, T. W.. (2023). Post-Pandemic Relocation Preferences of Remote Tech Workers. Findings. https://doi.org/10.32866/001c.73259.
15. Gallup. (n.d.). "Indicators: Hybrid Work." Retrieved April 24, 2023 from https://www.gallup.com/401384/indicator-hybrid-work.aspx

within the same MSA, with researchers noting a "donut effect" as residential demand shifts from the core to the periphery.[16] The donut effect is most evident in the largest MSAs, underscoring the relationship between remote workers' mobility limitations and the geographic distribution of remote work associated with SSS industry agglomeration.

# Motivation

Within their mobility limitations, remote workers make location decisions based on differential valuations of place characteristics. The following remote worker typology is based primarily on the residential location motivations of remote workers who have the ability to relocate.

### *Urbanists*

Younger working-age adults have been more driven by wage levels and job opportunities, and as a result, this cohort has more typically been drawn to high-opportunity urban areas.[17] However, for workers across the selected sectors, the rise of remote work accelerated by the pandemic decoupled job opportunities from urban areas. A majority of remote workers face mobility constraints keeping them tethered to high-productivity, high-cost MSAs. While many of these workers have relocated to the lower-cost suburban periphery, why do so many remain in the higher-cost urban core? Research suggests that certain urban amenities are particularly valuable to skilled workers.[18] Thus, these amenities function as pull factors, even if employment opportunities are no longer place bound. Urban amenities can include cultural offerings, such as concerts, museums, sporting events, and nightlife; social diversity, which encourages acceptance for a broad range of lifestyle choices; infrastructure, as it pertains to convenient transportation; and economic dynamics, which ensure better job prospects.[19]

### *Salary Stretchers*

The technique of leveraging purchasing power differentials between one's place of employment and place of residence is known as geoarbitrage.[20] The growth of remote work has expanded opportunities for workers to apply this technique, securing both private and public goods more affordably. Housing cost in particular has long been a major determinant of location preference.[21] The ability to consume more housing area per household member, and especially to transition from rented to owned housing, has been the most salient application of geoarbitrage, as it relates to remote work.[22]

16. Ramani, A., & Bloom, N. (2021). The Donut effect of COVID-19 on cities (No. w28876). National Bureau of Economic Research
17. Zhang, X. (2022). Linking People's Mobility and Place Livability: Implications for Rural Communities. Economic Development Quarterly, 36(3), 149-159.
18. Arntz, M., Brüll, E., & Lipowski, C. (2022). Do preferences for urban amenities differ by skill?. Journal of Economic Geography.
19. ibid.
20. Holleran, M. (2022). Pandemics and geoarbitrage: digital nomadism before and after COVID-19. City, 26(5-6), 831-847.
21. Zhang, X. (2022). Linking People's Mobility and Place Livability: Implications for Rural Communities. Economic Development Quarterly, 36(3), 149-159.
22. Howard, G., Liebersohn, J., & Ozimek, A. (2022). The Short-and Long-Run Effects of Remote Work on US Housing Markets. Economic Innovation Group. https://eig.org/wp-content/uploads/2022/11/The-Short-and-Long-Run-Effects-of-Remote-Work-on-U.S.-Housing-Markets.pdf

Remote work expansion has been associated with demand for more housing per household member – i.e., larger houses to accommodate home office spaces.[23] A survey of remote-capable workers in the San Francisco Bay Area illustrates this shift: while 65% of respondents currently lived in apartments and only 24% in a detached house, over 50% indicated a preference for detached housing upon relocating.[24]

Transition from rented to owned housing is another major application of geoarbitrage among remote workers. An estimated 4.5% of renters in remote-capable occupations are at the "telework tipping point" for homeownership: their incomes preclude homeownership within their employment metro's core, but enable homeownership at the metro periphery or in a less expensive metro.[25] A 2021 survey found that 52.5% of respondents planned to move to a house that is significantly more affordable than their current home; in other words, movers were twice as likely to be moving to a locale with lower housing costs.[26]

## *Nature Lovers*

Regional Scientists have long understood the importance of natural amenities in migration.[27] Subsequently, the literature includes various ways of quantifying natural amenities. For example, one measure of natural amenities found in the previous research is the percentage of a locality's land that is covered by open water and forest.[28] Another study used a measure of natural amenities that combined land, water, winter sports, climate, and recreation infrastructure and demonstrated a positive relation between them and rural growth.[29] Similarly, a mix of open land and forest, water, and topographic variation were related to inflows of migrations to rural areas.[30] In a web-based survey of remote workers based primarily in the state of Maine, three out of four respondents reported natural amenities as very important in their location decisions.[31] Given the selection bias of polling respondents in a disproportionately rural state, these results may not be generalizable.[32] Nevertheless, it reflects a pattern of

23. Mondragon, J. A., & Wieland, J. (2022). Housing demand and remote work. National Bureau of Economic Research. Working Paper Series, 30041. https://www. nber.org/system/files/working_papers/w30041/w30041.pdf
24. Tan, S., Fang, K., & Lester, T. W.. (2023). Post-Pandemic Relocation Preferences of Remote Tech Workers. Findings. https://doi.org/10.32866/001c.73259.
25. Manhertz, T., & Lee, A. (2022). Renters at the tipping point of homeownership. Cityscape, 24(1), 259-286
26. Ozimek, A. (2020). Remote workers on the move. Available at SSRN 3790004.
27. McGranahan, D. A. (2008). Landscape influence on recent rural migration in the US. Landscape and urban planning, 85(3-4), 228-240.
28. Zhang, X. (2022).
29. Deller, S. C., Tsai, T. H., Marcouiller, D. W., & English, D. B. (2001). The role of amenities and quality of life in rural economic growth. American journal of agricultural economics, 83(2), 352-365.
30. McGranahan, D. A. (2008). Landscape influence on recent rural migration in the US. Landscape and urban planning, 85(3-4), 228-240.
31. Wallace, R. (2019). Three Essays on Remote Work and Regional Development.
32. McGranahan, D. A. (1999). Natural amenities drive rural population change (No. 1473-2016-120765).

mobile remote workers with natural amenity-driven residential preferences choosing to relocate to rural places.

## *Boomerangs*

The literature identifies personal connection as an important motivator in worker location decisions. To this point, data from established Remote Worker Attraction Incentive Programs (RWAIPs) demonstrates the importance personal connection can play in worker location decisions. For example, the Tulsa RWAIP reported that 21% of participants had previously lived in a city, and more than half the participants reported having some type of personal connection with the city.[33] Similarly, a study found that the pandemic caused a significant increase in family-related interstate moves.[34] A growing body of literature has found that migration to rural areas with little scenic value or natural splendor is driven primarily by attachments to place and family ties.[35]

Photo by LinkedIn Sales Solutions. *Unsplash.*

33. Schnoke, M., Yochum, J., Frantz, M., & Figueroa, G. (2022). An Examination of Incentive Programs to Attract Remote Workers.
34. Haslag, P. H., & Weagley, D. (2022). From LA to Boise: How migration has changed during the COVID-19 pandemic. Available at SSRN 3808326.
35. Low, S. A., Rahe, M. L., & Van Leuven, A. J. (2022). Has COVID-19 made rural areas more attractive places to live? Survey evidence from Northwest Missouri. Regional Science Policy & Practice.

# Remote Worker Typology & Community Categories

Table 4.1. Expected Community Preferences of Remote Workers

| Remote Worker Typology | Tethered | Mobile |
|---|---|---|
| **Urbanists** | Urban Core (Employer MSA) | Urban Core (higher-amenity MSA) |
| **Salary Stretchers** | Suburb/Exurb (Employer MSA) | Lower-cost MSA, Rural Perennial |
| **Nature Lovers** | Suburb/Exurb (Employer MSA) | Rural Resort, Rural Perennial |
| **Boomerangs** | Either in their home community or homesick | Any community to which they have a personal connection |

Using this worker typology, we can deduce the expected community category preferences of remote workers based on their motivations and mobility. **Table 4.1** provides an overview of the relationship between remote worker typology and the community categories.

*Galax, Virginia Main Street.* Photo by Cyoung9. *Wikimedia Commons.*

# VA Community Categories

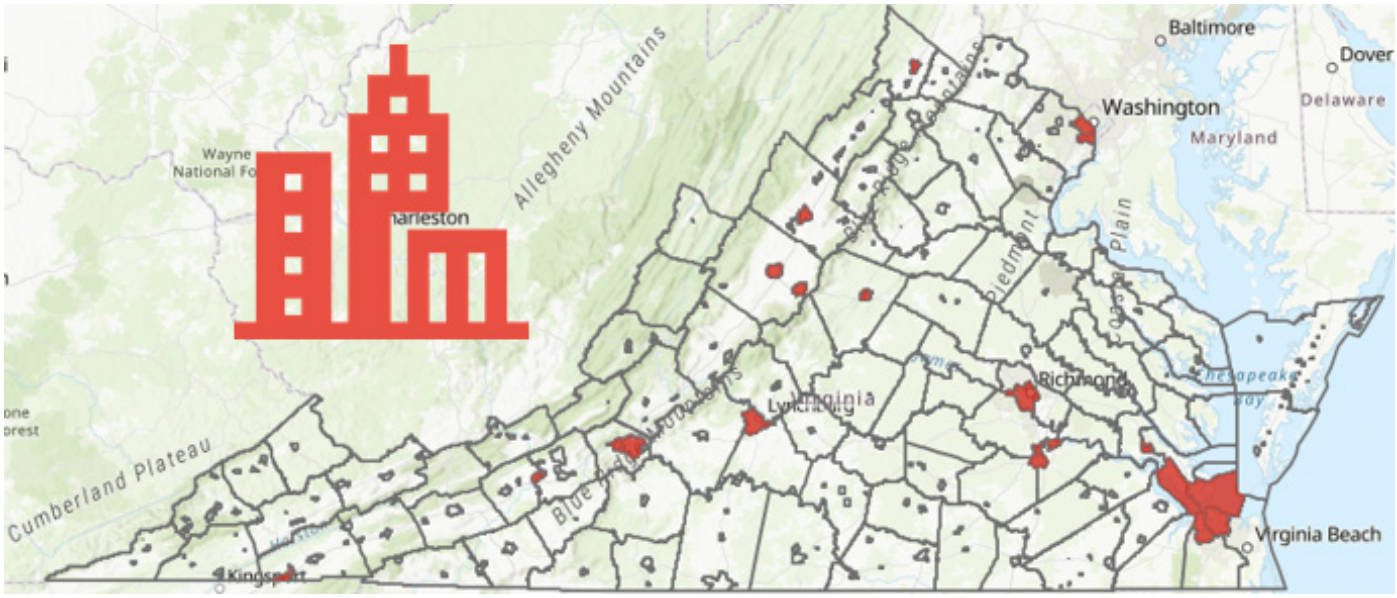
Four Virginia community categories have been defined by this study previously: 1. Urban, 2. Suburban/ Exurban, 3. Rural Resort, and 4. Rural Perennial. The characteristics, drivers and challenges for remote work, remote workers attracted, and recommendations for each of Virginia Community Categories are described in this section.

# Community Category 1: Urban


*A downtown view of Richmond, VA. Photo by Bruce Emmerling, Wikimedia Commons.*

Virginia communities that are categorized as urban are presented in **Figure 5.1**.

**Figure 5.1. Urban Communities in Virginia**




# Drivers for Urban Communities

## *Urban Amenities*

Proximity to consumer and cultural amenities in the urban core is a major driver of residential demand in city centers. Residential preferences for amenity-rich cities over lower-amenity areas with comparable levels of economic opportunity are indicated by higher demand for housing (and higher housing costs) in the former.[36] An interview subject from Harrisonburg identified easy access to urban amenities and activities as a driver of remote work in urban communities. The subject also noted that urban areas with access to rural communities' scenic environments, green spaces, and recreation activities could also drive workers to those urban areas, as they would experience urban life while still having access to spaces common to more rural areas.

## *Shorter Commute*

Proximity to job density in the urban core's central business district (CBD) can be a key driver of remote worker location in urban communities. This is especially true for remote workers tethered to the urban core

36. Brueckner, J., & Sayantani, S. (2022). Intercity impacts of work-from-home with both remote and non-remote workers. CESifo Working Paper No. 9793. https://dx.doi.org/10.2139/ssrn.4137950.

by hybrid-format employment. Commute time is generally conceptualized as a disamenity. Reduced commuting time via reduced physical distance to the urban core is therefore an advantage of CBD proximity.[37]

### *Diversity*

Diverse communities are favored by the "creative class" workers[38] prevalent in the information industry and other highly remote-capable occupations. Diverse populations also help to enable the urban consumer and cultural amenities (such as the availability of global cuisines) that can draw mobile remote workers from higher-opportunity to higher-amenity cities.[39] Diversity has been seen as an asset to urban areas by the Harrisonburg interviewee, who stated it was the main factor that boomeranged them back to Harrisonburg. Having diversity in cultures, backgrounds, and ages in a community is one asset that an urban community has that could specifically interest a remote worker, as they may wish to relocate to an area filled with different people than where they came from. Working remotely offers an opportunity to have more flexibility in day-to-day life and activities outside of work, so living in a community with a diverse population that people can interact and collaborate with outside of work may be an interest of remote workers. Harrisonburg has an International Festival, which celebrates the diversity in the city and was stated in the initial VMS pilot study as an asset to the community. Celebrations such as these festivities are drivers for remote workers, as it shows that the community is inclusive and proud of the local cultures within it.

## Remote Worker Types Attracted to Urban Communities

### *Urbanists*

Urbanists are drawn to clusters of activities, dining and nightlife opportunities, cultural offerings, social diversity, infrastructure such as high broadband capabilities and transportation, and economic dynamics: qualities associated with dense urban places. However, while cities have many common characteristics, they are by no means uniform. Some cities offer higher amenity levels than others, and all else being equal, urbanists may opt to migrate from their current MSA to a city with more numerous and desirable amenities.

### *Salary Stretchers*

Urban dwellers may also leverage geoarbitrage, relocating from their employment MSA to a less expensive city. Unlike the urbanists' inter-city moves, salary stretchers are not driven by the quality and quantity of urban amenities, but by the opportunity to

37. Ozimek, A., & Carlson, E. (2022, September 20). "The uneven geography of remote work." Economic Innovation Group. https://eig.org/the-uneven-geogra-phy-of-remote-work/
38. Florida, R. (2003). Cities and the creative class. City & Community, 2(1), 3–19. https://doi.org/10.1111/1540-6040.00034
39. Brueckner, J., & Sayantani, S. (2022). Intercity impacts of work-from-home with both remote and non-remote workers. CESifo Working Paper No. 9793. https://dx.doi.org/10.2139/ssrn.4137950.

maximize their purchasing power. Rather than living in the poshest neighborhood in a smaller city, this type of worker would opt to move to a neighborhood similar to the one they left but with a bigger apartment and cheaper rent.

### *Boomerangs*

Urban communities may also attract boomerangs. This is especially true for smaller cities or college towns whose transient student populations still form strong personal attachments to place. Harrisonburg shared that the city is interested in attracting families, where the parent figure used to live in the city, moved away, and is now interested in relocating back. Alumni of James Madison University or Eastern Mennonite University would be particular targets, as they have memories and connections to the city from going to school there. The attachment to the place is what drives these individuals to locate there, and Harrisonburg thinks they could utilize that to their advantage to attract people back to the city. The city believes there is an opportunity to bring those individuals back after they have lived in a larger city or in another location, as they can offer a familiar lifestyle to those who may have memories of growing up in their college town.

## Challenges for Urban Communities

### *Housing: High Cost of Family-Sized Units*

One challenge for urban communities is housing affordability and availability. Proximity to employment, services, and amenities has historically been associated with higher housing prices in dense urban areas.[40] As shown in **Table 5.1,** Virginia urban communities have both the highest median and maximum home price per square foot of any

40. Manhertz, T., & Lee, A. (2022). Renters at the tipping point of homeownership. *Cityscape, 24*(1), 259-286.
41. Median List Price per Square Foot from Realtor.com Real Estate Data and Market Trends https://www.realtor.com/research/data/.
42. Weighted by Number of Households: ACS 2021 5-year Estimates from Social Explorer Table A10008. Median Price/Sq Ft was multiplied by number of households by community. The outputs were summed by community category, and each sum was divided by total households by community category.

**Table 5.1. Median Home List Price per Square Foot by Community Category, July 2021[41]**

| Community Category | Median (Weighted Average) [42] | Max | Min |
|---|---|---|---|
| **1 - Urban** | $225 | $445 | $97 |
| **2 - Suburban/Exurban** | $212 | $421 | $113 |
| **3 - Rural Resort** | $164 | $262 | $86 |
| **4 - Rural** | $103 | $185 | $59 |

community category.

### *Housing Availability*

The higher cost of urban housing stock per square foot has implications for the availability and affordability of family-sized units. One interviewee stated that if families are a population of interest for urban communities, the low availability and high cost of family-sized units could deter their relocation to urban communities.

### *Smaller City Awareness*

In an interview with Harrisonburg, another challenge included marketing the area for remote workers, as they may be more drawn to larger metropolitan areas or rural communities, and may not seek out an urban community that may not be as large as cities such as Richmond or those in Northern Virginia. Targeting workers who may seek a slightly slower pace than those major metros but who still desire living in an urban community could resolve that challenge.

## Recommendations for Urban Communities

Although many cities and localities may not have the capacity to hold focus groups or lead a study to find remote workers as Harrisonburg did, accessing workers is an important step to learn what their needs are. If there is a coworking space or a third place where many workers often convene, building public-private partnerships with them to obtain membership numbers can assist in reaching those populations. Connecting with local organizations that may have remote workers involved in it, such as technology councils or civic organizations, could be another method of reaching workers. Being in the community and conducting outreach may be the best way to initially try to find those workers, especially in a larger area where they may be more difficult to track.

Expanding access to WiFi in public spaces such as parks or in downtown areas can also provide more locations for remote workers to work in and increase accessibility of internet services across the city. Hopewell received a grant to bring WiFi across its downtown, expanding access for free. Free internet access is attractive for workers searching for places to work besides home, especially if they are living in an urban area due to the amenities there and places to visit. Internet access at these locations can be beneficial for urban communities.

For smaller urban areas, there can be an opportunity to take advantage of programs and resources through the Virginia Main Street Program to grow the downtown and alleviate challenges. VMS offers numerous grants that can be used for a multitude of activities such as supporting new businesses, growing street festivals, building bootcamps for small scale developers, and reforming alleys downtown. The resources offered by VMS can be beneficial to these smaller cities with the access to additional funds, connections to other VMS communities, and mentorship to improve attraction and development.

VMS could also further develop resources for urban areas; many of the main street communities fall into the other community categories, which limit the amount of resources applicable for urban

areas. Providing resources specific to denser, more populated downtowns to develop amenities, address housing concerns, and create marketing programs can assist these communities in building and promoting places attractive to urbanists and other remote workers.


*Bus Transit Center in downtown Charlottesville.* Photo by Albert Herring. *Wikimedia Commons.*

## Recommendations for Urban Communities

- Connect remote workers to places they like
- Encourage co-working spaces

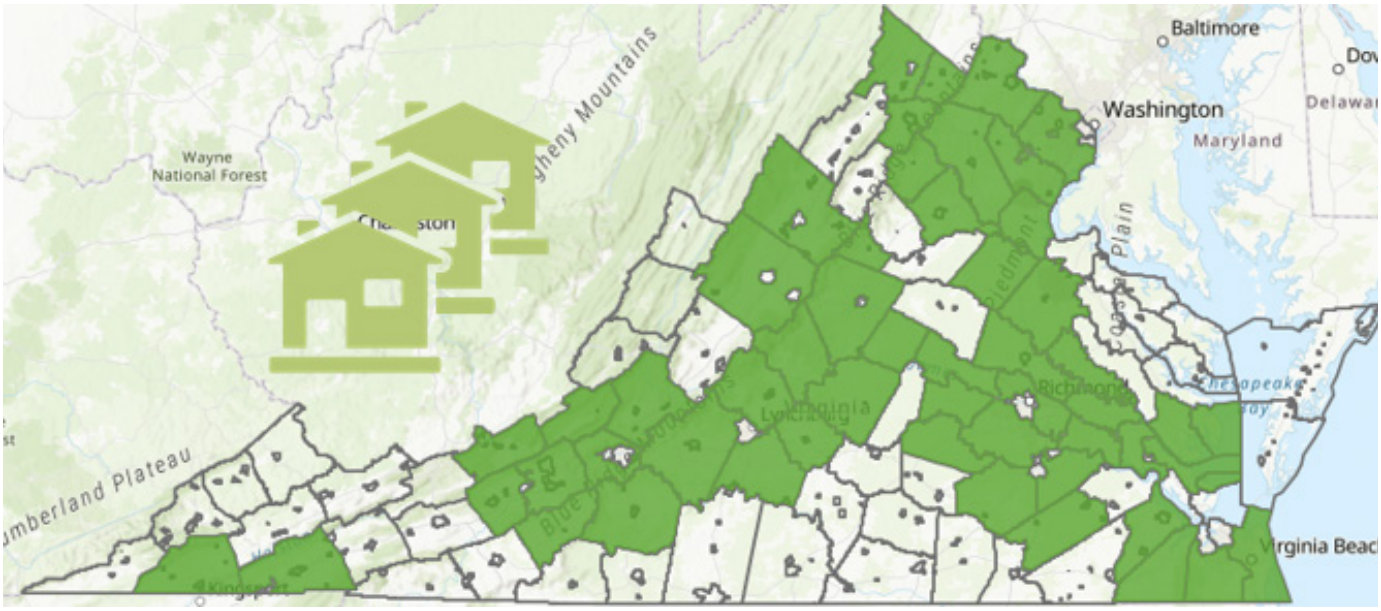
Expand access to WiFi

# Community Category 2: Suburban/Exurban


*Downtown Culpeper, Virginia.* Photo by Nwarner85. *Wikimedia Commons.*

Virginia communities that are categorized as suburban/exurban are presented in **Figure 5.2**.

Figure 5.2. Suburban and Exurban Communities in Virginia




# Drivers for Suburban/Exurban Communities

## *Housing: Relative Affordability*

Affordable home ownership has been identified as a key driver of migration from the metro core to suburban and exurban areas.[43] Furthermore, telework is associated with more housing consumption per household – e.g., larger houses to more comfortably accommodate home working environments.[44] As shown previously in **Table 5.1,** home prices per square foot are lower in suburban/exurban communities than in urban communities.

This advantage of suburban/exurban communities was noted by interviewees from Gloucester, who cited their affordability as a key reason they have been able to attract younger families. These interviewees believed that their community's housing affordability, when compared to nearby urban communities, combined with a revitalized downtown created a desirable community. Prince George County described themselves as a bedroom community, as many workers choose to live in the county due to its affordability but work outside of it.

## *Urban Core Access*

43. Manhertz, T., & Lee, A. (2022). Renters at the tipping point of homeownership. Cityscape, 24(1), 259-286.
44. Mondragon, J. A., & Wieland, J. (2022). Housing demand and remote work. National Bureau of Economic Research. Working Paper Series, 30041. https://www.nber.org/system/files/working_papers/w30041/w30041.pdf

While suburban/exurban workers have longer commutes than their urban counterparts, they still enjoy relatively high access to the urban core. For tethered remote workers located in suburban/exurban communities, the disamenity of a longer commute is balanced by the reduced frequency of commuting under a hybrid format.

Suburban/exurban communities, therefore, offer a balance of urban core access, housing affordability, and quiet residential settings. Interviewees from suburban/exurban communities cited their ability to offer a relaxed and quiet living environment while still enabling access to the urban core. This balance was specifically mentioned by Hopewell and Prince George County, which offer a relaxed lifestyle, but are still located close to Richmond and Washington D.C. within two hours of driving. Isle of Wight also mentioned similar sentiments, as residents in the county can easily access Richmond, Hampton, Norfolk, and the Eastern Shore while still maintaining its rural characteristics.

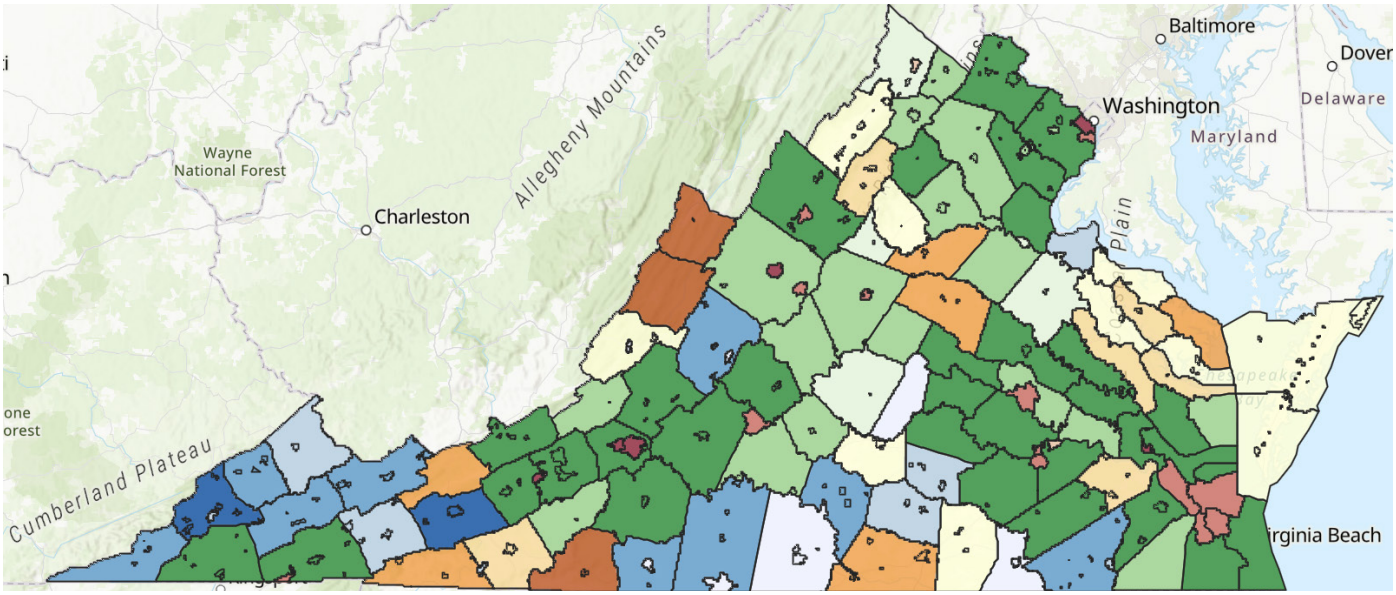
## *Quality of School Systems*

Many families seek homes in suburban areas because they are associated with higher quality schools for their children. Affluent suburbs with higher property taxes have more educational funding. The Department of Housing and Urban Development's School Proficiency Index (SPI) measures the quality of public-school districts based on standardized test scores in reading and math[45]. The SPI then ranks the scores by percentile for each census block served by that school district. **Figure 5.3 and Table 5.2** below show the SPI for each community category. Schools in suburban counties and independent cities have an average SPI of 52.54, roughly ten percentage points higher than the next highest community type, Rural Perennial, with a mean score of 42.58. While the state's urban cores have a below-average SPI compared to the state (with the maximum SPI value for urban places being 71.89), the adjacent suburban counties have above-average SPI scores.


*Main Street in Pulaski, VA.* Photo by Dwayne P. *Wikimedia Commons.*

45. U.S. Department of Housing and Urban Development (HUD). (n.d.). *School proficiency index*. Retrieved May 4, 2023, from https://hudgis-hud.opendata.arcgis.com/datasets/HUD::school-proficiency-index/about

Figure 5.3. County and City-Level School Proficiency Index by Community Type




Legend: HUD School Proficiency Index (SPI)

| HUD School Proficiency Index | Urban | Suburban/ Exurban | Rural Resort | Rural Perennial |
|---|---|---|---|---|
| <25 | | | | |
| 25-50 | | | | |
| 50-75 | | | | |
| 75+ | N/A | | | |

Table 5.2: County and City-Level School Proficiency Index by Community Type

| Community Category | Mean School Proficiency Index Score | Min | Max | Standard Deviation |
|---|---|---|---|---|
| **1: Urban** | 41 | 16 | 72 | 15 |
| **2: Suburban/Exurban** | 53 | 13 | 86 | 19 |
| **3: Rural Resort** | 37 | 5 | 81 | 25 |
| **4: Rural Perennial** | 43 | 1 | 85 | 23 |
| **State Average** | **50** | | | **29** |

## Recommendations for Suburban/ Exurban Communities

- **Consider rezoning for more housing**
- **Examine remote work business licensing patterns**
- **Attract home-based businesses**

Communities such as Prince George County mentioned school systems as an attraction for people to relocate there. Families with remote workers looking to move are going to consider local amenities that are relevant to their children's futures, with the local school systems being a factor.

## Remote Worker Types Attracted to Suburban/ Exurban Communities

### *Salary Stretchers*

Suburban and exurban communities offer a balance between housing affordability, urban core access, and natural amenity access. Workers making high wages at their remote jobs may desire moving to a less expensive location, but still having access to an urban core. Salary stretchers would be attracted to suburban/exurban communities, especially when tethered to the MSA of their employer, as this type of worker wants to use their income to afford a home for their family. Quality school systems are then also important to this worker type, as they want to ensure the community they are moving into has benefits for their children as well.

The suburban communities interviewed were unsure of the type of remote workers they could attract, as they were struggling to find the existing remote workers in their community or did not yet have the necessary infrastructure in place to attract these workers. Communities stated that they imagined a worker would want to move there if they were seeking a more affordable place to live compared to urban communities, which aligns with the salary stretcher worker type.

### *Nature Lovers*

Suburbs and exurbs offer both urban and nature access by being strategically located outside of urban areas, and many times closer to green space or more rural areas at the edge of the MSA. Nature lovers would be attracted to this community type because of the increased access to nature they would experience here, as opposed to an urban area, where people would have to travel much further to take advantage of outdoor amenities. Workers seeking a balance between access to nature and the ability to drive into the city would move to a suburb or exurb. This balance would be of added importance to nature lovers tethered to the MSA of their employer.

## Challenges for Suburban/ Exurban Communities

### *Development Constraints*

One interviewee from Vinton noted that space and zoning codes make constructing new housing and attracting development difficult. The community regards itself as fairly built out and as a result must find creative solutions to increase diversity of housing. **Table 5.3** shows that new housing units permitted per capita is lower in suburban/exurban communities than it is in urban communities. Supply deficits imposed by development constraints risk hindering the growth of suburban/exurban communities, leaving them less well-equipped to accommodate the "donut effect"[46] of MSA-tethered workers leaving

46. Ramani, A., & Bloom, N. (2021). *The donut effect of COVID-19 on cities.* National Bureau of Economic Research. Working Paper Series, 28876. https://www.nber.org/system/files/working_papers/w28876/w28876.pd

urban cores for the metro periphery.

**Table 5.3. New Housing Units Permitted per 1,000 Population, by Community Type**

| Community Type | New Housing Units Permitted (2022) / 1,000 Pop (2021) |
|---|---|
| 1 Urban | 5.3 |
| 2 Suburban/Exurban | 4.6 |
| 3 Rural Resort | 6.0 |
| 4 Rural Perennial | 1.8 |

*Accessing Information about Remote Workers*

Suburban communities have cited that it is difficult to track information about remote workers in their communities; this is a challenge across all community types, but specifically impacts suburban communities in that economic developers may not have as many opportunities to know who the remote workers are. Urban communities may have more opportunities to find remote workers in third places or walking on the street, while in rural small towns, many community members know one another. The culture in suburban/exurban communities differs from the other categories and may result in challenges with accessing information on remote workers. In Prince George County, this is also a challenge due to the military being a major local employer. The rapid expansion of Fort Gregg-Adams in the county has resulted in an influx of newcomers to the area. However, the military shares very little about where their employees are living and what remote capable jobs may exist. This presents a challenge in identifying remote workers and what industries they may work in.

## Recommendations for Suburban/Exurban Communities

The type and cost of housing plays a significant role in a remote worker's decision to relocate. Suburban/exurban communities seeking to attract more remote workers may consider diversifying housing options and implementing mixed-use development to maximize density, improve affordability, and increase availability. Developing more multi-family homes (such as duplexes and townhomes) may provide additional housing, increase density without drastically impacting the suburban character, and also satisfy the demand for detached housing instead of apartment complexes as discussed in previous sections. Re-zoning may need to be considered for these communities so that more diverse options are allowed. Changes to zoning codes and future land use plans, such as height limits and the conversion of

single family to multifamily housing would help create a more diverse array of options and price points for remote workers at different income levels looking to relocate to suburban/exurban communities.

For suburban communities, building an understanding of their remote worker base is important because fewer people commuting into urban cores for work may impact critical infrastructure. These impacts could include additional strain on local broadband service and changes in energy consumption patterns throughout the day, as well as changes in water/sewer use. Many models used by these communities to estimate such patterns were developed with the assumption that most people would commute out of residential areas during the day, thus necessitating a new conceptualization of infrastructure usage. The ability to identify remote workers within a given community may also inform changes in spending patterns and tax revenue retention as fewer people commute. Both Gloucester and Isle of Wight discussed notable upticks in the number of home-based business licenses in their communities, which may be one method to gauge the number of remote workers in bedroom communities. However, this method only captures a small fraction of remote workers (home-based entrepreneurs), failing to account for any other types of remote workers. Difficulty quantifying the number of remote workers within a given locality is not a challenge unique to suburban/urban communities, but viable methods for collecting such data may differ between community types and local contexts.

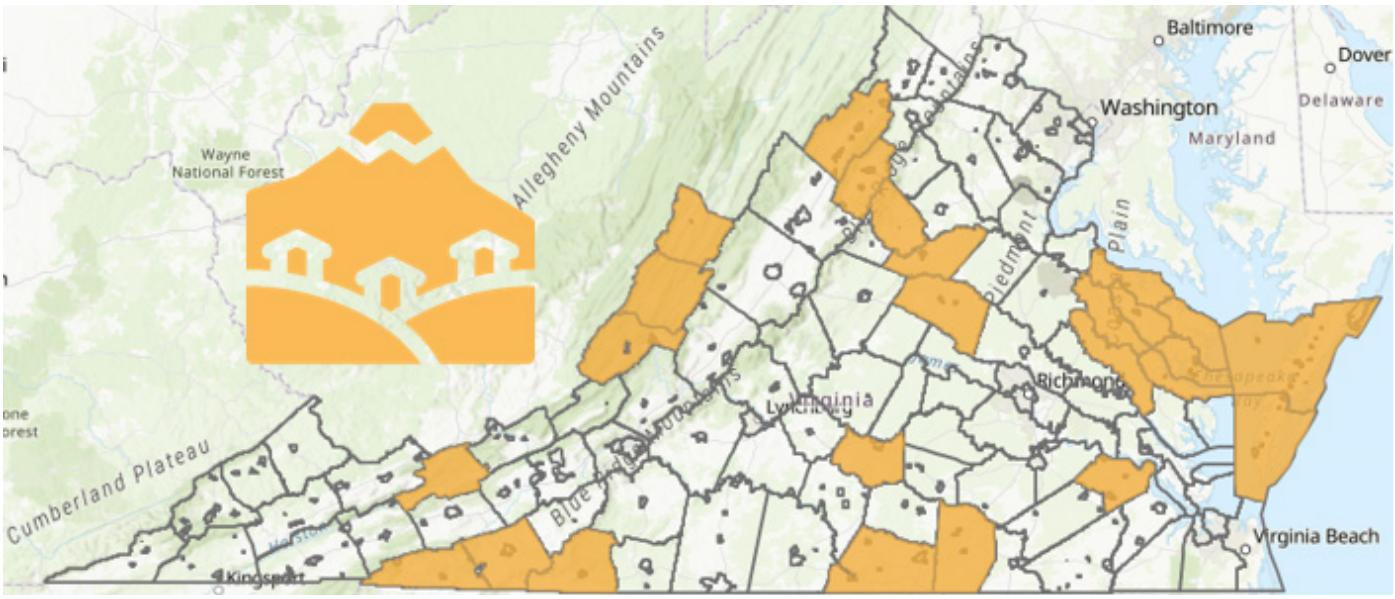
VMS could assist in implementing programs to attract home-based businesses to bedroom communities in an effort to expand upon the existing entrepreneurial ecosystem without the need for brick-and-mortar infrastructure. These regions are more affordable, which is why many in-person workers choose to live in these communities and commute to their place of work to save money on housing costs, as urban cores tend to be more expensive. Attracting workers with a particular focus on home-based businesses to bedroom communities can help retain more spending money within the region and bolster the local residential and business tax bases, rather than these workers spending money and paying business taxes outside of their place of residence. VMS may provide resources specifically for home-based businesses in these communities so entrepreneurs and other home-based workers can successfully operate a business from their house. Such resources may include microloans and grants to assist with startup costs, consulting services and marketing workshops, and mentorship programs with existing businesses within the community.

# Community Category 3: Rural Resort Communities


*Gordonsville, VA South Main Street.* Photo by Rutke421. *Wikimedia Commons.*

Virginia communities that are categorized as rural resort are presented in **Figure 5.4**.

**Figure 5.4. Rural Resort Communities with Seasonal Populations**




# Drivers for Rural Resort Communities

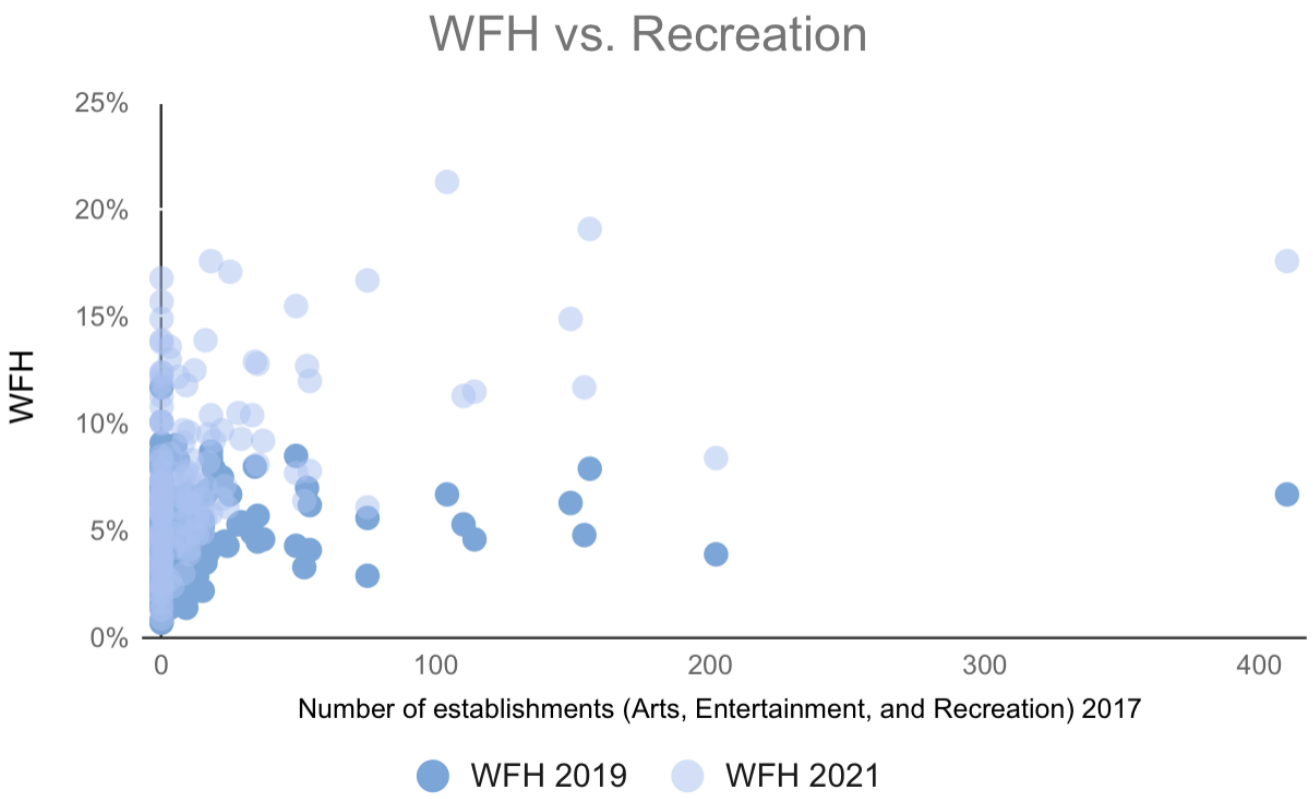
*Recreational Assets*

The main driver for workers to this type of community is the availability of outdoor recreational assets and activities that do not exist in urban communities. Such assets include hiking trails, camping, parks, lakes, and more. The community must consider what residents would want to do when they are not working and prioritize those types of attractions. By using these recreational assets to attract residents, it can have a positive impact on the standard of living, which can improve the community, leading to further attraction.

The Town of Clarksville, for example, is branded as "Virginia's Only Lakeside Town" due to being located along the Roanoke River and Buggs Island Lake. These outdoor amenities make the town attractive to visitors and those seeking recreational opportunities, driving nature lovers to the town.

**Figure 5.5**. shows that the relationship between the number of arts, entertainment, and recreation establishments and the percentage of work from home (WFH) increased from 2019 to 2021. In 2019, as the number of arts, entertainment, and recreation establishments increased, there was a lower increase in the work from home percentage as compared to 2021. This indicates that people valued arts, entertainment, and recreation amenities higher post-COVID than pre-COVID.

**Figure 5.5. Working from Home (%) vs. Number of Recreational Establishments**




*Corner in downtown Lawrenceville, Virginia.* Photo by Taber Andrew Bain. *Wikimedia Commons.*

### *Lifestyle*

Other drivers associated with this type of community include the slower, more relaxed pace of life, as residents can frequently enjoy the local amenities in their downtime. There may be less traffic, especially in off seasons, and locals can take advantage of amenities year-round as opposed to only on vacation. Mecklenburg County mentioned this in an interview; the traffic is light, with some towns in the county only having one stop-controlled intersection, showing how slow-paced the county is. This is attractive to people who wish to live in a community that is less busy than an urban or suburban area.

## Remote Worker Types Attracted to Rural Resort Communities

### *Nature Lovers*

Nature lovers are the primary remote worker type drawn to rural resort communities. Remote work-enabled amenity migration is a pre-COVID phenomenon.[47] Since the pandemic, amenity migration has accelerated, both to existing rural resort communities and to micropolitan "gateway communities" with similar natural amenities.[48] Nature lovers are attracted to living in places that prioritize and promote their natural resources; because they wish to live there longer than just a seasonal visit, they want constant access to these amenities.

### *Boomerangs*

Survey respondents from rural resort communities stated that they thought they could attract families, IT professionals, and younger workers. This aligns with research finding a broad trend of lifestyle-oriented rural migration among high-skill, high-income workers with remote-capable occupations.[49] Younger workers in particular, when moving from high-productivity cities, can be drawn to rural areas offering amenities for their families to enjoy.[50] This is especially true for workers that have personal ties to these locations, such as their family having a second home there while growing up, or they took a trip and grew attached to that location. Boomerangs are attracted to rural resort communities because of these memories they have with the place and may want their families to experience it as well.

## Challenges for Rural Resort Communities

### *Broadband Availability*

Broadband access is a challenge for outdoor rural resort communities. Broadband connectivity may not yet be established in more rural areas, which can be a deterrent for remote workers. Having access to both those outdoor assets, but also being able to work

47. Gosnell, H., & Abrams, J.. (2011). Amenity migration: diverse conceptualizations of drivers, socioeconomic dimensions, and emerging challenges. Geojournal, 76(4), 303–322. https://doi.org/10.1007/s10708-009-9295-4
48. Stoker, P., Rumore, D., Romaniello, L., & Levine, Z.. (2021). Planning and Development Challenges in Western Gateway Communities. Journal of the American Planning Association, 87(1), 21–33. https://doi.org/10.1080/01944363.2020.1791728
49. Haslag, P. H., & Weagley, D. (2022). From LA to Boise: How migration has changed during the COVID-19 pandemic. SSRN 3808326.
50. Zhang, X. (2022). Linking People's Mobility and Place Livability: Implications for Rural Communities. Economic Development Quarterly, 36(3), 149-159.

while visiting them, can improve these communities and make them more attractive to remote workers to both work and play in. In Mecklenburg County, this is currently a challenge. Without full connectivity, it would be difficult to attract remote workers. The median county wide percentage of households in recreation rural communities with a broadband internet subscription is 74%.[51]

Rural areas are 10 times less likely to have broadband access than urban areas. This has large impacts on the economic opportunities of rural residents. Clients have turned down rural job applicants due to poor internet connectivity. This poorly affects economic growth. However, if broadband is established in rural areas, especially adjacent metropolitan areas, that is a huge opportunity for rural income, job, and productivity growth.

Broadband service has increased across the state. The median county percent of the population with a broadband internet subscription increased from 74% in 2019 to 80% in 2021.[52] Between 2019 and 2021, broadband access and WFH rates increased in most areas, with a high correlation between the two. Fairfax City and Fairfax County had the highest broadband access and WFH rates in both years. Falls Church City had the highest increase in both broadband access and WFH rates. However, some areas still had low broadband access and WFH rates, while others had low broadband access but high WFH rates.

Overall, the data suggests that broadband access and WFH rates have increased significantly in Virginia over the past two years, likely due to the COVID-19 pandemic and the shift towards remote work. Many localities across the State are participating in programs to fund extensive broadband expansion to underserved areas, as the State has committed to a $2 billion investment to achieve universal access by 2024[53]. However, there are still areas where access to broadband is low and quality is poor, which may limit the ability of individuals to work from home and participate in remote learning or other online activities.

According to insights provided by the Remote Work Community Survey distributed by the Team, the average community broadband coverage is 63%, with remote rural areas facing substantially lower internet access than rural communities in proximity to urban cores, suburban area and the urban cores themselves, as shown in **Figure 5.6** below. The quality of access is also essential in many communities surveyed, as shown in **Figure 5.7**, with the majority of respondents indicating that their broadband connectivity is just "okay", and prone to lagging during periods of high use. The internet demands of remote work, ranging from the regular use of video conferencing software such as Zoom to remote accessing machines across the country, may influence a remote worker's decision as to where they may relocate based upon the quality of their connectivity. Full quality descriptions are presented in **Appendix B**.

51. United States Census Bureau. (2023) "American Community Survey Table S2801." https://data.census.gov/.
52. United States Census Bureau. (2023) "American Community Survey Table S2801." https://data.census.gov/.
53. Virginia DHCD. (2021). "Governor Northam Announces Virginia Deploys $2 Billion to Achieve Near Universal Broadband." https://dhcd. virginia.gov/governor-northam-announces-virginia-deploys-2-billion-achieve-near-universal-broadband

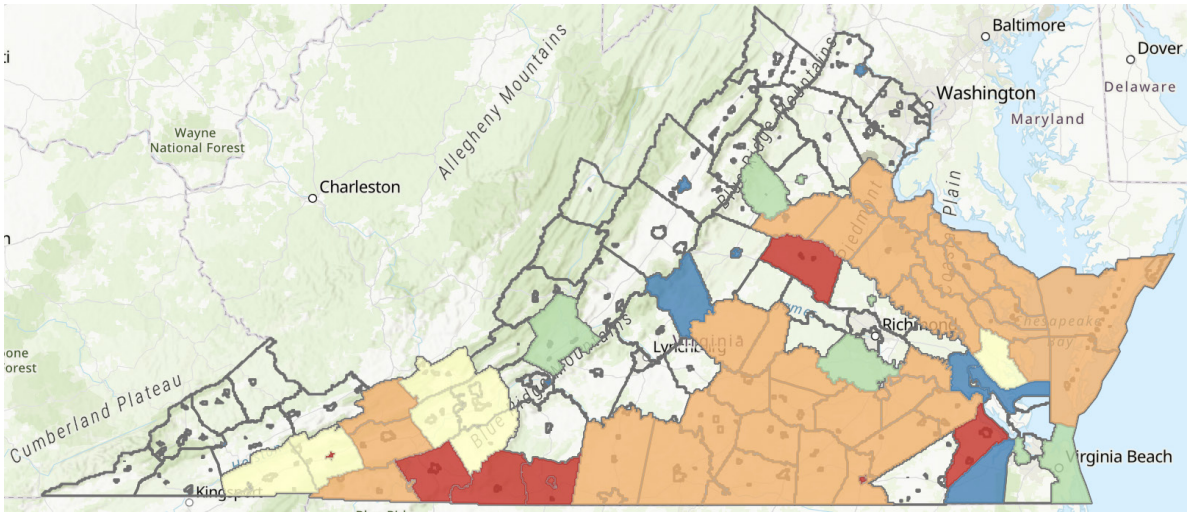
With that said, the reliability of the data collected from survey respondents may indicate a degree of uncertainty regarding broadband coverage and quality, as a large swath of the Northern Neck and other counties within GO Virginia Region 6 indicated they do not have broadband access when both their earlier survey responses as well as quantitative data definitively prove otherwise. The average percentage of households with broadband subscriptions was 80% in 2021, which conflicts with the average estimate of 63% provided by community survey participants. This discrepancy could indicate uncertainty from survey respondents, as well as a potential over-estimation on behalf of quantitative data sources. While broadband may not have previously been an area of concern for economic development professionals, the profound shift to remote work, the associated patterns of migration, and home-based start-up entrepreneurship are heavily associated with broadband access and quality, as indicated in **Figure 5.8**.

Although broadband availability in Virginia has improved significantly in recent years, there are still some areas that lack access to high-speed internet. According to Virginia DHCD, 91% of Virginians have access to 100Mbps broadband, and 86% have access to 1G broadband. These figures indicate that there are still some rural areas that do not have access to broadband or only have access to slower speeds. The availability of broadband is important for attracting people who work from home. A study by the Pew Research Center found that 71% of remote workers say that having a reliable internet connection is essential for their job. Additionally, a study by the National Association of Realtors found that 70% of homebuyers are looking for homes with broadband access. Virginia is taking steps to improve broadband availability throughout the State. In 2021, the state legislature passed the Virginia Broadband Initiative (VBI), which will provide $500 million in funding to expand broadband access. The State is also working to connect rural areas to broadband through the Virginia Telecommunication Initiative (VATI). While there are other grants available from state and federal agencies, and even some private firms, many are income-based. An interviewee stated that the locality applied for such grants, but a handful of upper-middle class households skewed the income statistics in the community, making it difficult to obtain any sort of financial assistance to expand and improve upon the broadband network.

## Recommendations for Rural Resort Communities

- Protect affordable housing
- Protect natural amenities from degradation
- Attract outdoor recreation businesses & develop off-season amenities

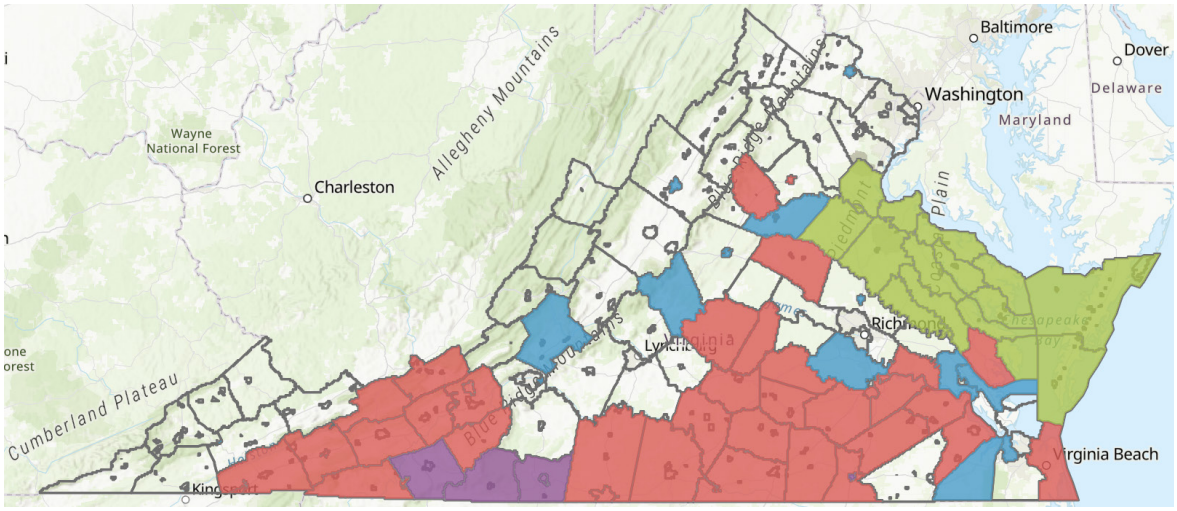
## Figure 5.6. Remote Work Community Survey Respondent Approximations of Broadband Coverage




**Legend: Percent Access to Broadband**

| >85 to 100% | >70 to 85% | >55 to 70% | >40 to 55% | 25 to 40% |
|---|---|---|---|---|

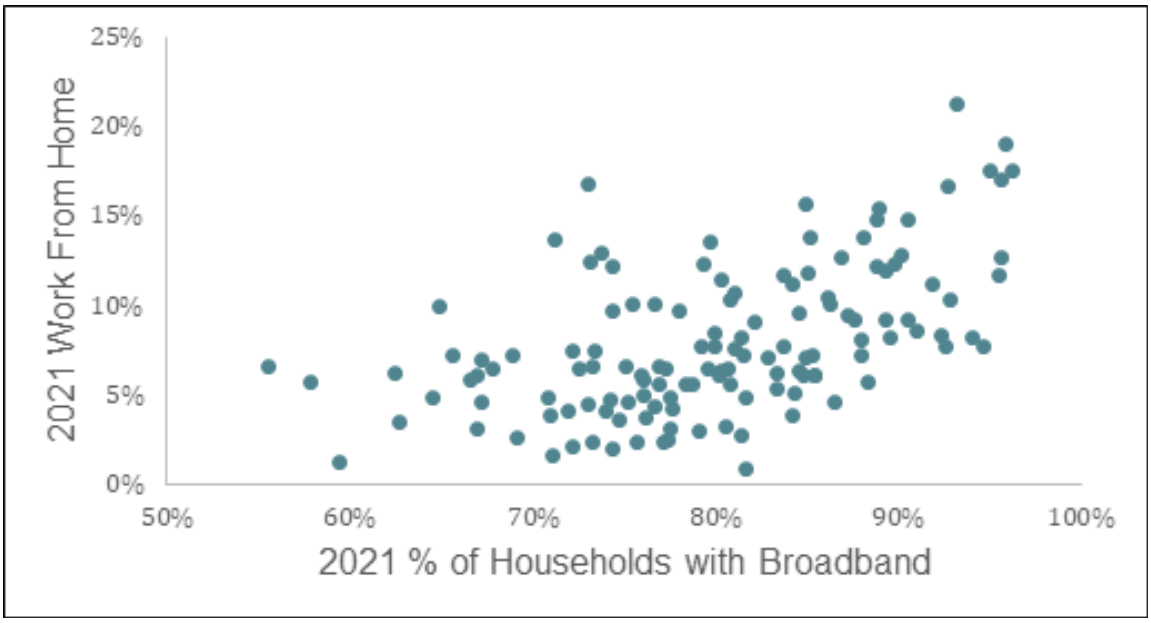
## Figure 5.7. Remote Work Community Survey Respondent Approximations of Broadband Quality




**Legend: Broadband Connection Quality**

| | | | |
|---|---|---|---|
| Connection is **Excellent** | | Connection is **Okay** | |
| Connection is **Slow** | | Community **Does Not Have** Internet/Broadband Service | |

Figure 5.8. 2021 Work From Home % vs. Households with Broadband %[54]




54. United States Census Bureau. (2023) "American Community Survey Tables S2801 and S0801." https://data.census.gov/.

## *Housing: Rural Gentrification*

Housing is a concern in rural as well as urbanized communities. The presence of high-quality natural amenities can drive housing demand and harm housing affordability for longtime residents. Scholars have used the term "rural gentrification" to refer to the rural manifestation of this frequently urban-coded phenomenon, driven by natural amenity migration.[55] One interviewee cited waterfront access as a particular amenity-based driver of housing prices in their community.

Housing cost differences between the two rural community categories are evident in median housing list price per square foot, listed in the previously presented **Table 5.1**. The median home list price per square foot is $164 in rural resort communities, while in rural perennial communities the same quality of housing is over 50% less expensive.

## *Access to Coworking Spaces*

55. Gosnell, H., & Abrams, J.. (2011). Amenity migration: diverse conceptualizations of drivers, socioeconomic dimensions, and emerging challenges. *Geojournal, 76*(4), 303–322. https://doi.org/10.1007/s10708-009-9295-4

Access to coworking spaces or other remote-friendly work sites may be another challenge for this community category. Demand for shared office spaces is relatively novel, especially in rural places, so they do not yet exist. Mecklenburg County had previously conducted research to create a coworking office space for workers, hoping to attract workers from Northern Virginia. However, due to complications such as a lack of interest and other developmental issues, the space was unable to operate. Creating these spaces with broadband availability and other infrastructure improvements can assist in attracting remote workers, when the concept of coworking has become more familiar and acceptable.

## Recommendations for Rural Resort Communities

Infrastructure developments are needed in rural resort communities. Many of these communities have outdoor amenities that are attractive to nature lovers; however, without broadband connectivity, these workers cannot work. Working with broadband providers and the Virginia Telecommunications Initiative (VATI) can assist with addressing this challenge. VATI is focused on extending broadband service to currently underserved areas and funding projects across the State.[56]

For rural resort communities, it is also important to preserve the natural amenities in these communities. One of the main attractions of these communities are the green spaces, trails, and other outdoor activities that exist; if these amenities are not preserved, that would be detrimental to these communities. Working with local land and resource management agencies to protect natural amenities from degradation is necessary.

Protecting affordable housing options in these communities is essential. Communities could utilize not only resources from VMS but also the Virginia Center for Housing Research and Virginia DCHD to research and develop affordable housing options in the community.

VMS could also develop resources for these specific communities to attract outdoor recreation businesses and develop additional outdoor recreation amenities. Marketing these regions as places centered around outdoor activities could also lead to further investment in those amenities to prioritize them within the community. VMS may also work to develop and expand upon existing clubs and groups for outdoor recreation activities to encourage regular participation and maintain enthusiasm throughout off-season months. Such groups may also be a valuable asset in the stewardship and maintenance of recreational amenities and may help reduce the burden of increased usership. VMS may also provide resources for these communities to attract more year-round amenities for residents, such as restaurants and shopping options that would otherwise shut down during the off-season. Another potential way for VMS to support rural resort communities may be to provide assistance and funding to install year-round recreational facilities targeting the residential population, such as bike lanes or indoor recreational centers. This can help these communities promote themselves as a desirable place to live, rather than just a place to vacation.

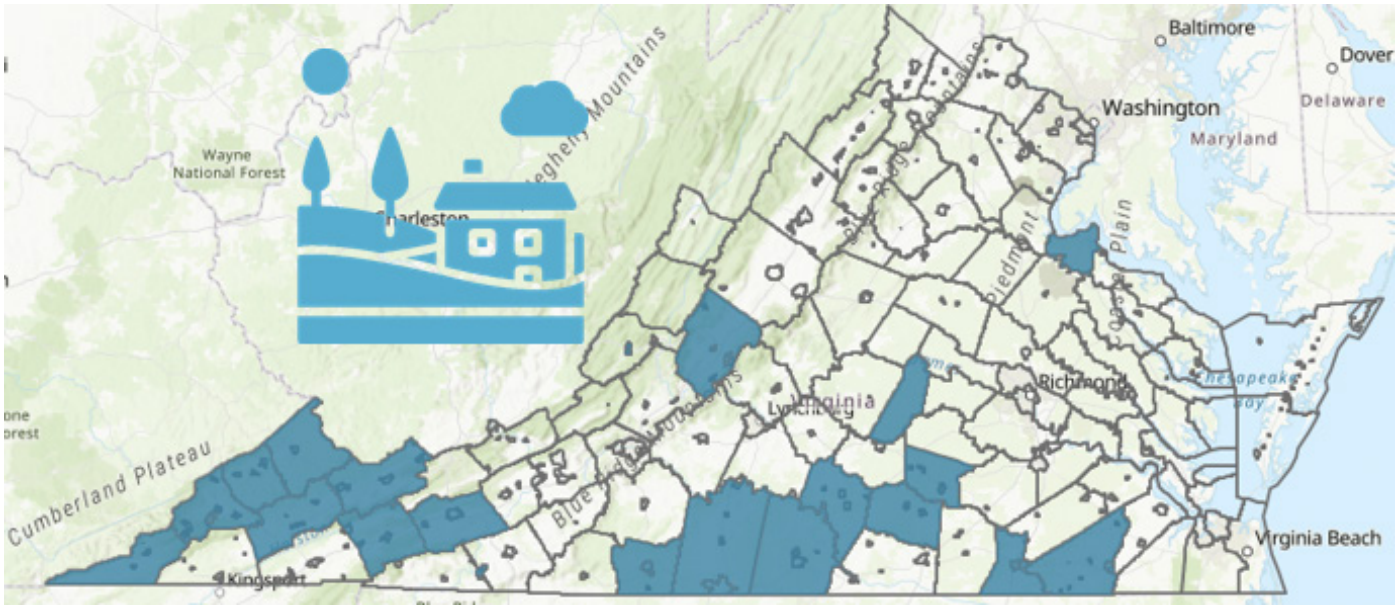
56. Virginia DHCD. (n.d.). "Virginia Telecommunications Initiative." https://www.dhcd.virginia.gov/vati

# Community Category 4:
# Rural Perennial Communities

*Main Street in Covington, VA.* Photo by Jarek Tuszyński. *Wikimedia Commons.*

Virginia communities that are categorized as rural perennial are presented in **Figure 5.9**.

**Figure 5.9. Rural Communities with Perennial Populations**




# Drivers for Rural Perennial Communities

## *Lower Cost of Living*

Lower median housing costs in rural areas can be an attraction for those looking to have a lower cost of living. An interviewee stated that from Smyth County's comprehensive plan, the median home cost is less than half of a comparable home in an urban area such as Northern Virginia. In 2021, Smyth County's median home cost was $108,100, while in Fairfax County the median was $594,500, showing a large difference in home costs between the two regions.[57] This can be a motivator for remote workers to move elsewhere.

## *Small Town Charm*

Many of these rural, small-town communities offer a quality of life that may be attractive for remote workers seeking a slower pace. Amenities that can attract workers include recreational assets that are often found in rural areas such as state parks or hiking trails. Also, interviewees from Marion stated many of these small towns have historical assets that may attract remote workers to have activities outside of work; in Marion, this includes state parks, hiking trails, the Historic Lincoln Theatre, and community events. This environment may be attractive to a worker who has lived in a busier area and is interested in living in a town where people can be

57. United States Census Bureau. (2023). "US Census Bureau. ACS 5-year estimates. Table DP04." https://data.census.gov/

involved with the community and not be faced with high costs of living or high traffic volumes. Research has shown that the high social capital common to rural and small-town communities is a significant attraction for residential location decision-making.[58]

## Remote Worker Types Attracted to Rural Perennial Communities

### *Salary Stretchers*

The lower cost of living in rural perennial communities would attract remote workers looking for a more affordable place to live. Salary stretchers would choose this community type over the suburbs if they are also in search of a small town to live in, with more rural qualities than urban. Geoarbitrage would be a large reason many remote workers would seek out a rural community, especially if that community had unique small-town characteristics.

### *Nature Lovers*

Rural perennial communities may be more affordable places to live than rural resort communities due to the decrease in traffic and people interested in buying second homes in these locations. Therefore, those who want to live closer to nature may choose a perennial community as they would still live near the rural amenities they desire, but for a lower cost.

### *Boomerangs*

Smyth County mentioned that they believed that the type of remote workers that would be most attracted to rural perennial communities would be those who are already well-established in their careers. They believed that younger professionals may not be as attracted to rural communities, as there is "... a lack of networking opportunities, cross-pollination and natural synergies that occur when based in an urban area with a research university." Workers who have already established those professional connections and may be motivated to move due to personal reasons, such as moving back where they grew up or closer to family, would be more likely to relocate to rural areas. Urbanists would be the least likely, as they may want to be near their established client base or where they may find professional advancement opportunities. However, those who are looking to move after developing their careers may seek out a rural place that they were once previously tied to.

## Challenges for Rural Perennial Communities

### *Infrastructure*

The reasons why these small communities may seek new residents with high incomes are also the greatest challenges to attracting them. While scenic beauty, outdoor recreation, and small-town rural charm appeal to many, the lack of adequate infrastructure may deter potential newcomers. Much of the infrastructure in the United States was built around the time of Roosevelt's New Deal and after World War II with waves of suburbanization sweeping across the country. Now, nearly a century later, much of this infrastructure is in disrepair and well beyond its intended lifespan. Small rural towns have been hemorrhaging population (and

58. Zhang, X. (2022). Linking People's Mobility and Place Livability: Implications for Rural Communities. *Economic Development Quarterly, 36*(3), 149-159.

the tax base that comes with it) and cannot afford to improve upon the deteriorating roads, power grids, and sewer systems, and some are experiencing an unfettered influx of remote workers. As mentioned earlier, housing stock is a consistent concern for all types of communities. Housing developments and an influx of new residents place additional stress on already-strained infrastructure. Interviewees from Gloucester discussed that their locality's amenities, such as inexpensive waterfront property, an eclectic downtown, and proximity to several urban cores, have attracted new development, including roughly 1700 new single-family homes. The locality's water and sewer lines were installed in the 1930s, and public works struggles to keep up with ongoing failures. The added stress of these additional homes and new residents was a point of concern for the interviewee, as it is a race against time for the new tax base to generate enough income for the locality to make the necessary repairs and updates before there is a catastrophic failure.

Other infrastructure concerns for rural areas include utilities and plumbing. The percentage of homes lacking plumbing, as well as the percentage of housing units being charged for gas, have been collected and presented in **Figure 5.10** to **Figure 5.11** and in **Table 5.4** to **Table 5.5** per community category.

Lack of plumbing shows less chances of work from home. In both rural community categories at the county and city level, it has the highest plumbing lacking percentage, which could be an indicator of less chance of having remote work capability.


*Main Street in Lexington, VA.* Photo by Zeete. *Wikimedia Commons.*

Figure 5.10. 2021 Plumbing Lacking % vs WFH %

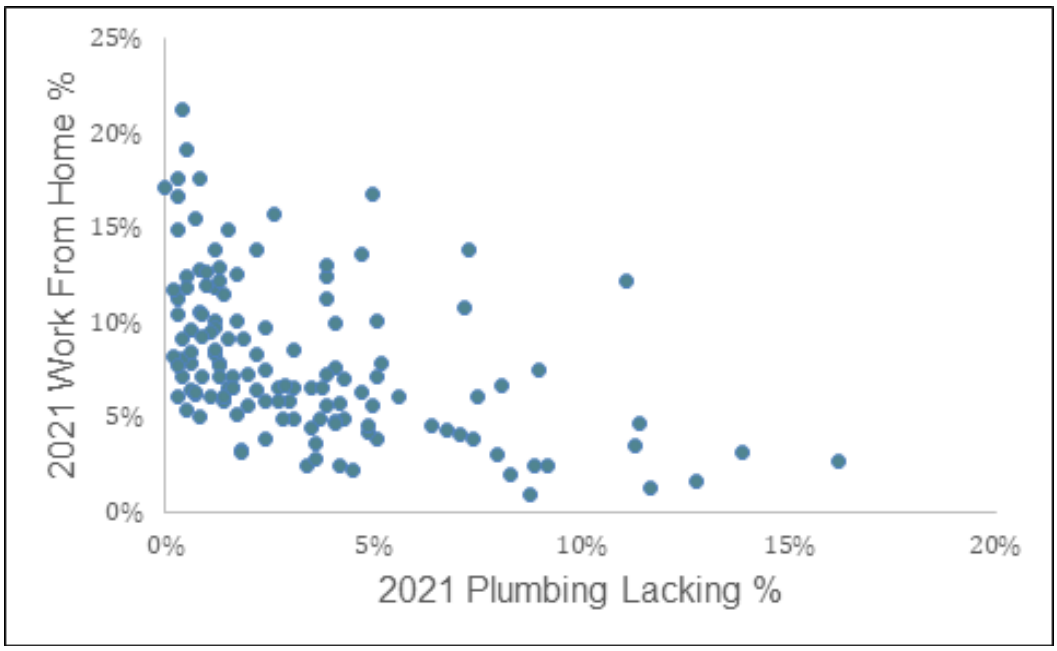



Table 5.4. 2021 Plumbing Lacking % per Community Category

| Community Category | Plumbing Lacking % |
|---|---|
| 1 | 1.1% |
| 2 | 1.1% |
| 3 | 4.1% |
| 4 | 6.1% |

Figure 5.11. 2021 Gas Charged % vs WFH %

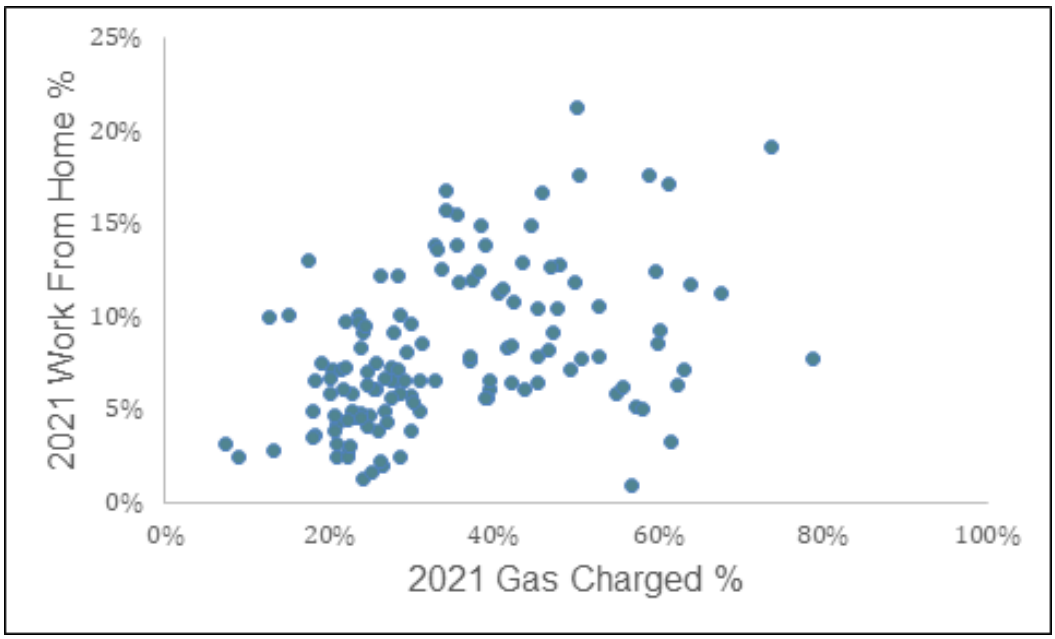



Table 5.5. 2021 Gas Charged % per Community Category

| Community Category | Gas Charged % |
|---|---|
| 1 | 45.7% |
| 2 | 47.8% |
| 3 | 28.0% |
| 4 | 24.9% |

Housing units having gas usage also has a relation to remote work at the county and city level. A higher percentage of housing units with gas connections indicates higher chances of remote work. The urban and suburban/exurban community categories have the higher percentage of housing units using gas, compared to rural areas.

### *Broadband*

Similar to rural resort communities, broadband access is another struggle for rural perennial communities. The median county wide percentage of households in rural perennial communities with a broadband internet subscription is 75%, showing a lack of subscriptions for a quarter of the population.[59] However, improvements are being made across the state to address this challenge, as large amounts of money are being used to improve broadband access and quality. In Smyth County, the goal is by the end of August 2023, broadband will be expanded across the county. Also, Hopewell is one of 15 communities across the country that secured a grant to support WiFi access all throughout downtown for free, improving access to the internet in parts of the community. Some communities are making strides to improve broadband access and taking advantage of available funds to do so, addressing this important challenge many communities are facing.

### *Cultural Challenges*

Interviewees from Marion and Smyth County stated diversity as a beneficial component to a healthy community. However, in many rural communities, there is an unspoken tension between residents who have lived there and those who may be moving there. Indeed, while high levels of social capital may be an attractive feature to many residents, prior research has associated high social capital with a lack of diversity and innovation – place characteristics associated with highly remote-capable, knowledge industry occupations.[60] Current residents desire an economic boost and growth, but do not want the demographic or social changes that may be associated with that. Remote workers relocating to a rural community may have certain expectations of that community; vice versa, existing community members may not be used to seeing people working from home on their computers, rather than in traditional industries. Ensuring there is not a divide between those moving into a community and those who have deep roots in that town is a challenge many communities, especially rural ones, may face with an influx of remote workers.

## Recommendations for Rural Perennial Communities

Rural perennial communities should analyze the available buildings they have to determine how housing could be improved. Conducting a housing survey to identify vacant structures as candidates for adaptive reuse or demolition for future development would be a recommended step to determine where new housing can go. Marion has the Blighted, Abandoned, Unused, and Derelict (BAUD) program

59. United States Census Bureau. (2023) "American Community Survey Table S2801." https://data.census.gov/.
60. Florida, R. (2003). Cities and the creative class. City & Community, 2(1), 3–19. https://doi.org/10.1111/1540-6040.00034

which aims to comprehensively assess areas and buildings in the community that could be improved upon. Buildings that fall within these categories are being purchased and improved so the buildings can be reused, rather than being abandoned. Other localities could develop similar projects to assess the buildings in their communities and determine which could be repurposed for housing to address the lack of housing many of these communities are experiencing. Resources and guidance for conducting such assessments is available through the Virginia Department of Housing and the Virginia Center for Housing Research.

The local tension that may arise due to an influx of remote workers is a difficult, but necessary challenge to address. Integrating these new residents into the community fabric and making an intentional effort to get them involved in community events can assist in making the community feel more welcoming to these individuals. Finding ways to connect long-term residents with new residents can also assist in engaging both groups. Hosting events to celebrate the community and welcome those new to it can build connections between residents.

VMS can assist rural perennial communities by providing grant writing assistance for funding opportunities towards broadband expansion and housing development. An interviewee from Marion stated that the lack of personnel, which many of these rural communities have, makes going after opportunities like grants challenging, as there is a lack of resources to complete the application. There is not a dedicated person to find and complete grant applications, so many communities are unable to apply. Assistance from VMS in applying for grants and distributing funding opportunities, which they may offer, could alleviate the time spent for local officials in trying to find funding on top of their other responsibilities and could provide greater access to funds.

## Recommendations for Rural Perennial Communities

- Identify vacant/ blighted structures for development
- Attract and incorporate diverse residents into the community

## Table 5.6. Summary of Key Findings and Recommendations

| Community Category | Drivers | Workers Attracted | Challenges | Recommendations |
|---|---|---|---|---|
| **Urban** | • Urban Amenities<br>• Short Commute<br>• Diversity | • Urbanists<br>• Boomerangs<br>• Salary Stretchers | • Housing: High costs<br>• Housing Availability<br>• Smaller City Awareness | • Connect with remote workers<br>• Build public-private partnerships with co-working spaces<br>• Expand access to WiFi in public spaces |
| **Suburban/ Exurban** | • Housing: Relative Affordability<br>• Urban Core Access<br>• Quality of School Systems | • Salary Stretchers<br>• Nature Lovers | • Development Constraints<br>• Accessing Information on Remote Workers | • Consider re-zoning<br>• Examine home-based business licensing patterns<br>• Implement programs to attract home-based entrepreneurs |
| **Rural Resort** | • Recreational Assets<br>• Lifestyle | • Nature Lovers<br>• Boomerangs | • Broadband Availability<br>• Housing: Rural Gentrification<br>• Access to Coworking Spaces | • Protect affordable housing options<br>• Work with agencies to preserve natural amenities<br>• Enhance off-season amenities |
| **Rural Perennial** | • Lower Cost of Living<br>• Small Town Charm | • Salary Stretchers<br>• Nature Lovers<br>• Boomerangs | • Infrastructure<br>• Broadband<br>• Cultural Challenges | • Identify vacant/blighted buildings<br>• Integrating and connecting new and long-term residents |

# Main Street America Remotability Index 2.0

This section contains discussion and analysis of Main Street America's Remotability Index, a tool meant to help communities understand their abilities and aptitude to house remote workers. The section covers each indicator or class of indicators in the Index, relating them to findings from the scholarly literature and this report's quantitative and qualitative research findings. When appropriate, we present critiques and offer recommendations which we hope can improve the next iteration of the Index. **Table 6.1** shows the Index's full list of indicators and details on data sources.

## Remote Work Infrastructure

### Technology Infrastructure

The Index measures both the office space and telecommunications infrastructure needed to support remote work. The Index calculates the prevalence of household broadband access and 5G mobile coverage. The relationship between telecommunications infrastructure and remote work capability has been clearly established in this study. Broadband access is an important mediator of a community's remotability.

However, as this study's interviews have found, coverage area on paper can deviate from coverage area as it is experienced by residents and remote workers. Identifying a quantitative proxy variable for broadband quality could add precision to a revised index.

### Physical Infrastructure

This report found strong connections between remote work and certain aspects of primary services physical infrastructure, especially plumbing and gas connections. Lack of adequate physical infrastructure can reduce a community's ability to grow sustainably and equitably. Communities planning for growth – via remote worker in-migration or by any other means – should plan for the concurrent expansion of primary services infrastructure. Adequate physical infrastructure is therefore a key mediator of a community's remotability. A revised Index should incorporate measures of physical infrastructure capacity related to municipal primary services, as this relationship is clearly established in this report.

### Coworking Infrastructure

The Index also calculates the prevalence of coworking spaces as remote-friendly office infrastructure. While 2022 survey data shows that a majority of remote workers preferred working from home, a sizable minority (41%) preferred to work from multiple locations. Furthermore, the most common challenges cited by remote workers included not being able to

unplug (25%) and loneliness (24%).[61] Access to shared work sites can address these challenges and improve a place's remotability.

## Table 6.1. Main Street Virginia Remotability Index

| Types of Metric | Specific Metric | Details on the Metric | Data Source |
|---|---|---|---|
| **Remote Work Spaces** | # Nearby Coworking Spaces | Pulling manually -- Search Google for "coworking" or "co-work space" within 15 minutes of Main Street district | Google Search |
| **Technology Infrastructure** | % Households with Broadband Internet Connections | ACS 2015-2019 -- Used all tracts intersecting each Main Street district | ACS |
| | Number of Broadband Internet Providers Offering Service in the Area | Average count of broadband providers offering >= 35/3 mbps, counting all blocks within the city | FCC |
| | Number of Mobile 5G Providers Offering Service in the Area | Average count of mobile service providers offering 5G service, counting all blocks within the city | FCC |
| **Housing** | % Vacant Housing Units | Took total housing unit vacancy rate for all blocks intersecting each Main Street district -- Note that values in z-standardized column have a flipped sign (ie., lower vacancy rates = higher Z value) | Decennial Census |
| | Net Change in Housing Units | Count of Housing Units in 2020 - Count of Housing Units in 2010, including all census blocks intersecting each Main Street district | Decennial Censuses |
| | Overall housing affordability | Ratio of Median Monthly Rent to Median Monthly Income for all tracts intersecting each Main Street district. A value below 3 would indicate the median household cannot afford the median rental price, if we use the HUD standard affordability threshold | ACS |
| | Diversity of housing types | Simpson's Index of Diversity, applied to types of housing within all tracts intersecting each Main Street district. Values nearer 0 indicate homogeneity; values nearer one indicate a heterogenous balance of housing types | ACS |
| | Diversity of housing affordability | Simpson's Index of Diversity, applied to rental housing rates within all tracts intersecting each Main Street district -- 4 buckets (< $500, $500 - 999, $1000 - 1499, $1500+); values nearer 0 indicate homogeneity; values nearer one indicate a heterogenous balance of rental housing available in the four price buckets | ACS |
| **Third Spaces and Cultural Amenities** | Count of Cafes, Breweries, Wineries, Distilleries, Etc. | Number of PPP loans in NAICS code 72; coded to winery, distillery; or brewery; or including the words "brew" or "coffee" in their business name, per 100 Main Street district residents. | PPP |
| | Count of Arts and Cultural Businesses, Organizations, or Spaces | Number of PPP loans with NAICS codes starting with 711 or 712 (arts spaces and organizations, museums and cultural amenities), per 100 Main Street residents | PPP |
| **Airbnb Listings** | Number of Airbnb listings | Manually searched Airbnb for the community name, then zoomed all the way in (maximum zoom) to the Main Street intersection / centroid, then zoom out seven clicks. Count # of listings for mid-October weeklong stay +/- 7 days | Airbnb Search |
| **Types of Metric** | **Specific Metric** | **Details on the Metric** | **Data Source** |
| **Recreation** | Amount of Park Spaces Nearby | Using ParkServe TPL data, take total park square mileage within 25 mi of the Main Street district | Trust for Public Land |
| | Number of Trails Nearby | Try using Rails to Trails data? What is located within 10 mi of Main Street district | Google Search? Rails To Trails? |
| | Number of Blueways Nearby | Pulling manually for select set -- Search Google for blueways within 10 mi of Main Street district | Google Search |
| | Number of Boat Ramps Nearby | Manually searched Google Maps for boat ramps near the five communities. | Google Search? |
| **Geographic Proximity** | Proximity to large or midsize cities | Score<br>5 points if within one hour of a large or midsize city (100k +)<br>3 points if within two hours of a large or midsize city (100k +)<br>1 point if within three hours of a large or midsize city (100k +) | URCA / Developed for UN |
| | Proximity to major airports | Total number of enplanements within 50 miles of the Main Street district | FAA data |
| **Institutions of Higher Learning** | Presence of colleges or universities | Total number of students at higher ed institutions within 25 miles of the Main Street district | DHS data |
| **Population Changes** | Net change in population | Population in 2020 - population in 2010, including all tracts intersecting each Main Street district | Decennial Censuses |
| | Population of people who are new to the county | Count of residents who newly moved from outside the county and into each tract intersecting a Main Street district | ACS |
| | Change in population who has a four-year degree | Change in proportion of residents living in census tract intersecting the Main Street who have a four-year college degree, between ACS 2016 - 2020 5-year estimates and 2011-2015 5-year estimates | ACS |
| **Remote-Friendly Employment Sectors** | Number of jobs in employment sectors that are conducive to remote work | Proportion of all jobs that are in census blocks intersecting the Main Street district and in Information (NAICS 51); Finance and Insurance (NAICS 52), or Professional, Scientific, and Technical Services (NAICS 54) sectors | LODES |
| **Microventure Density** | Density of nearby microbusinesses | County-level metric of microventure density | GoDaddy Venture Forward |

61. Buffer. (n.d.). "2022 State of Remote Work." Retrieved March 30, 2023, from https://buffer.com/state-of-remote-work/2022

The Index only counts specifically designated coworking or shared office spaces. Certain public third spaces such as coffee shops, while considered primarily leisure amenities, can also serve as remote work sites. More qualitative research is needed to better understand the range of possible remote work sites and whether preferred remote work sites vary by place type. Nevertheless, a revised Index could incorporate broadband-enabled public third spaces as an indicator. Differential weighting could be used to address the relative importance of dedicated shared office spaces, while recognizing the contribution other broadband-enabled public third spaces can make to a community's remotability.

# Housing Market Dynamics

## Affordability, Vacancy & Remote Work

Housing availability and affordability is fundamental to residential location choice, both for remote and non-remote workers.[62] Access to affordable homeownership tends to increase with distance from the metropolitan core, and remote work neutralizes the increased commuting cost associated with increased distance.[63] Finally, remote work – especially working from home – is associated with increased housing demand. Accommodating home work spaces, for example, results in greater housing consumption per household in terms of unit size.[64] The lower cost of housing per square foot in the suburbs and exurbs of metropolitan areas has created a "donut effect" of increased residential demand in metro peripheries.[65]

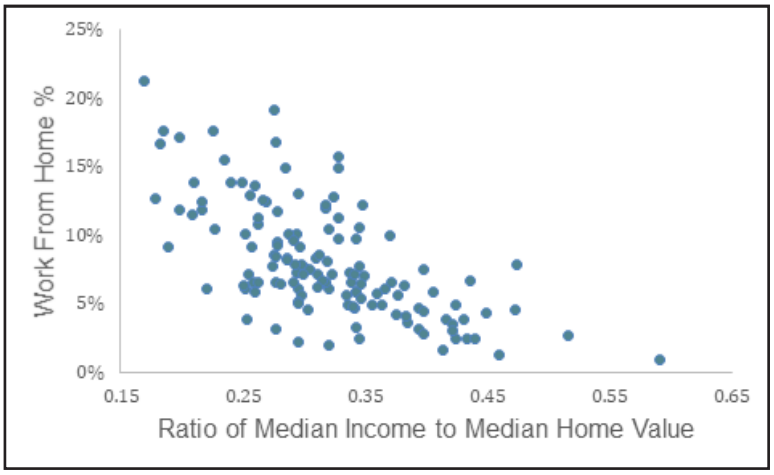
The Index incorporates a housing affordability indicator as well as vacancy rate. A *higher* measure of affordability, and a *lower* rate of vacancy, each increase remotability score. We discuss these indicators below, incorporating findings used to develop our Remote Worker Typology.

### *Affordability*

Interview subjects from across Virginia regions and community categories cited housing affordability as a concern, both in general and as a specific challenge to remote worker attraction. However, among Virginia localities, a lower level of housing affordability, measured as a ratio of median income to median home value, correlates with a higher share of remote work (see **Figure 6.1**).

62. Zhang, X. (2022). Linking People's Mobility and Place Livability: Implications for Rural Communities. Economic Development Quarterly, 36(3), 149-159.
63. Manhertz, T., & Lee, A. (2022). Renters at the tipping point of homeownership. Cityscape, 24(1), 259-286.
64. Mondragon, J. A., & Wieland, J. (2022). Housing demand and remote work. National Bureau of Economic Research. Working Paper Series, 30041. https://www.nber.org/system/files/working_papers/w30041/w30041.pdf
65. Ramani, A., & Bloom, N. (2021). The donut effect of COVID-19 on cities. National Bureau of Economic Research. Working Paper Series, 28876. https://www.nber.org/system/files/working_papers/w28876/w28876.pdf

### Figure 6.1. Housing Affordability and Remote Work[66]



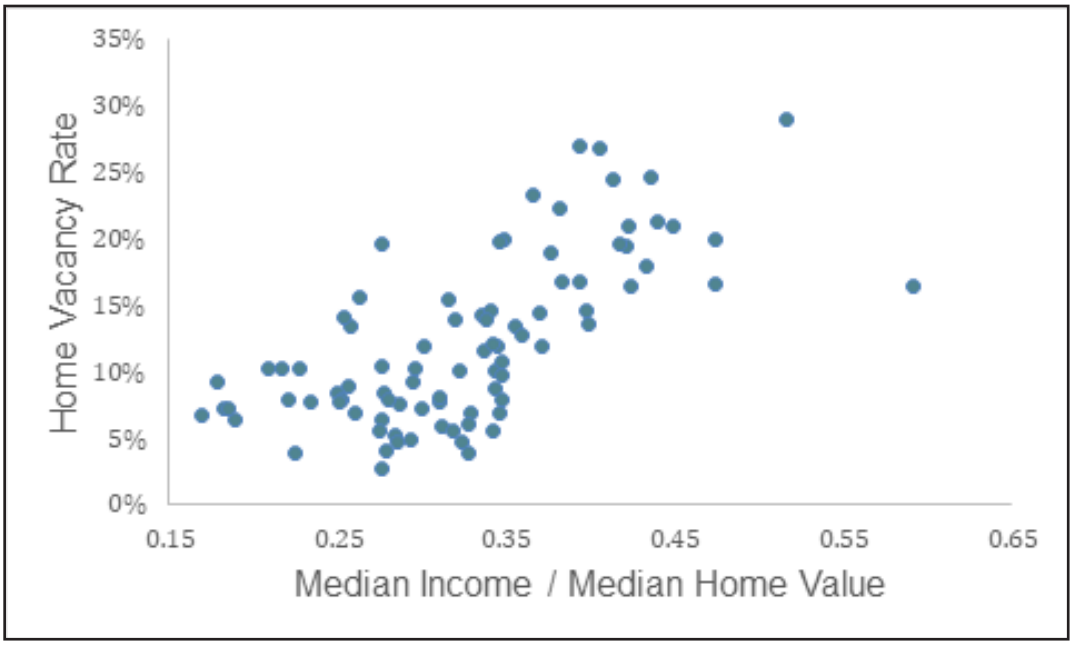

## *Vacancy*

This study finds that a lower rate of vacancy correlates with a higher share of remote workers among Virginia localities, after controlling for communities with high levels of vacancy for recreational occasional use (see **Figure 6.2**). However, this study also finds an inverse correlation between vacancy and housing affordability among Virginia localities (See **Figure 6.3**).

### Figure 6.2. Vacancy Rate and Remote Work[67]


66. US Census Bureau. 2021 ACS 5-year estimates. Tables DP04, S1901, and S2403.
67. US Census Bureau. 2021 ACS 5-year estimates. Tables DP04 and S1901. Counties with over 30% homes vacant for Seasonal, Recreational, or Occasional Use were excluded.
68. United States Census Bureau. (2023) 2021 "US Census Bureau. ACS 5-year estimates. Tables DP04 and S1901" https://data.census.gov/. Counties with over 30% homes vacant for Seasonal, Recreational, or Occasional Use were excluded.

Figure 6.3. 2021 Housing Affordability and Vacancy Rate[68]




*Luray, Virginia.* Photo by Aaron Burden. *Unsplash.*

In the current Index, remotability scores increase with lower housing cost relative to income. While this does not reflect the negative correlation between housing affordability and prevalence of remote work, it is both highly intuitive and supported by qualitative research findings. Additionally, the literature on the role of geoarbitrage in worker migration (see Section 4. Remote Worker Typology) confirms that relative housing affordability is common residential selection motivation.

The current Index also assigns higher remotability scores to communities with lower vacancy rates. While our findings show a correlation between lower vacancy and higher remote work prevalence, they also show a correlation between lower vacancy and lower affordability. Therefore, a revised index should score vacancy differently, either inverting its relationship with remotability score, or removing the indicator. An Index measuring remote work is not necessarily measuring remotability. It is important to disaggregate the factors that most likely influence place-based remotability from the indicators that simply measure where remote work is already prevalent.

## Amenity & Community Pull Factors

The Index measures several natural amenities: park space area, and number of trails, blueways, and boat ramps. Prior research has shown that access to high-quality natural amenities has driven amenity migration from urban to rural areas, particularly among high-skill, high-income workers most likely to work in remote-capable industries.[69]

The Index also includes Airbnb listings as an indicator. While increases in short-term rentals have been associated with housing cost increases, especially among renters,[70] they may also serve as a useful proxy indicator for tourism demand. Analysis in this study used the percentage of homes vacant due to being used as vacation homes, derived from ACS data, as a proxy variable for tourism demand. Doing so may obviate housing market distortions caused by the short-term rental market. Furthermore, using ACS data enables a less labor-intensive, more replicable method for future indices covering larger sets of localities.

Finally, perceptions of higher social capital and community cohesion in rural areas has historically been a driver of urban to rural migration.[71] Quantitative measurement of these concepts without large-scale survey data may not be feasible. The presence of cultural amenities such as arts organizations, sites of leisure consumption such as restaurants, and third spaces such as coffee shops, may function as a proxy indicator for community cohesion.

## Metro Access, Remote-Capable Jobs, & Migration

The remaining indicators include proximity to large metro areas and air transportation; presence of universities and higher learning institutions, and

69. Gosnell, H., & Abrams, J.. (2011). Amenity migration: diverse conceptualizations of drivers, socioeconomic dimensions, and emerging challenges. *Geojournal, 76*(4), 303–322. https://doi.org/10.1007/s10708-009-9295-4
70. Barron, K., Kung, E., & Proserpio, D. (2018). The sharing economy and housing affordability: Evidence from Airbnb. *Proceedings of the 2018 ACM Conference on Economics and Computation.* https://doi.org/10.1145/3219166.3219180
71. Zhang, X. (2022). Linking People's Mobility and Place Livability: Implications for Rural Communities. *Economic Development Quarterly, 36*(3), 149-159.

share of population with a four-year degree; share of workforce already employed in remote work-friendly industries; and migration-driven population growth.

Indicators such as metro area proximity and accessibility, university presence, and educational attainment may be less related to individual worker-level residential location decision making factors and more related to firm-level decision factors such as workforce quality and remote hub location. It may be desirable to disaggregate some of these indicators into separate indices, quantifying location decision factors more salient at either the individual or the firm level. At the level of the individual remote worker, the importance of metro accessibility indicators will be highly dependent upon the worker's mobility constraints. A revised Index could incorporate the distinctions drawn in this report's Remote Worker Typology to refine a remotability metric based on diversity of worker types.

Finally, a revised Index should be cautious about including indicators such as remote-friendly employment share and existing in-migration. These indicators may show where remote work is already occurring, rather than where it *could* occur. Therefore, they may be better as a means of evaluating the Index, rather than serving as indicators themselves.

# Recommendations

This section offers recommendations based on our analysis of Main Street America's Remotability Index and in light of this study's major findings. Broad recommendations are discussed first, followed by a list of specific indicators which should be included, revised, or excluded (see Table 6.2).

## Standardizing Geographies

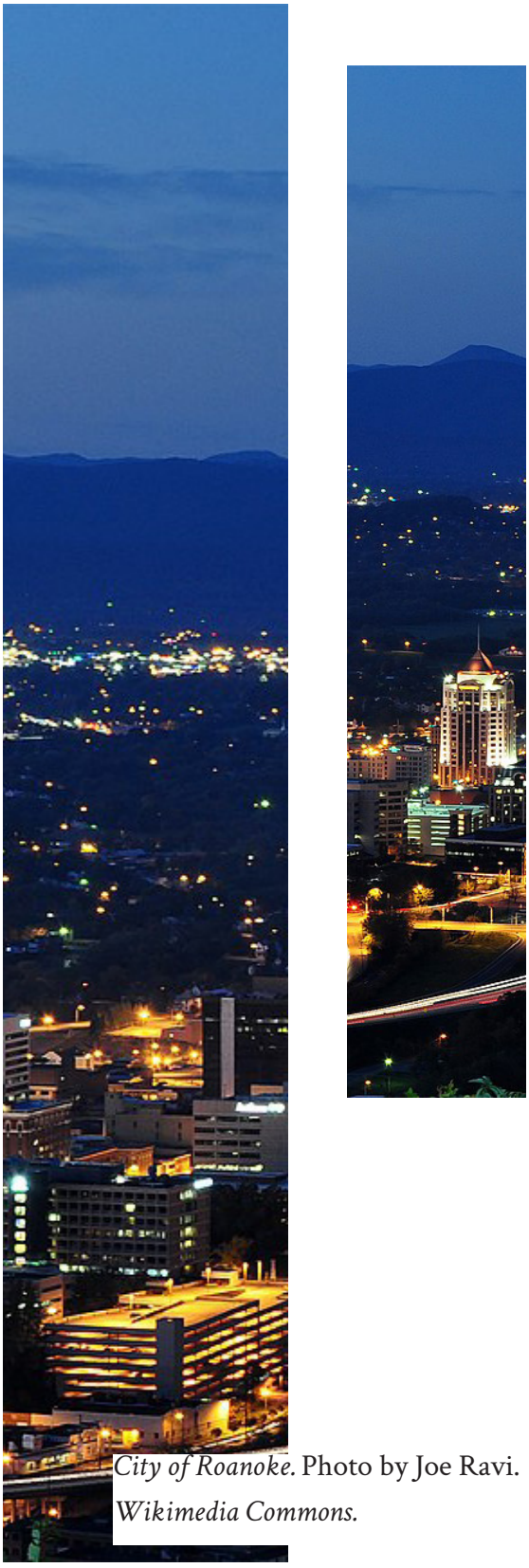
Based on this report's method of quantitative analysis, we were unable to evaluate the Index by conducting a one-to-one comparison between Index score and either remote work prevalence or expansion. The reason for this was our choice of geographic unit of analysis: we conducted quantitative analysis at the locality level, while the Index measures indicators at the tract or even block level. We recognize the value of the Index's high level of geographic granularity, effectively isolating VMS program areas for analysis to the greatest extent possible. However, the replicability and generalizability of the Index's methodology – as well as the uniformity of data by year – would be improved by standardizing and broadening the geographic unit of analysis.

## Incorporating Typologies

The most important findings of this study are the remote worker types and community categories. In developing these people-and place-based typologies, we demonstrate that remote work drivers and remote worker attraction has a high degree of variability among types of workers and types of places. A revised Index could incorporate these insights – that different indicators measure attractions relevant to different worker types – to generate a new scoring system based on the two typologies developed in this report.

## Measuring Remotability vs. Measuring Remote Work

A major challenge of measuring a locality's remotability is parsing out which indicators show remote work suitability and which indicators simply reflect where remote work is already prevalent. Since the latter set of indicators is highly mediated by agglomeration of SSS industry clusters, it is the former set of indicators that is most relevant to localities seeking to benefit from remote worker in-migration. This is not only rural and small-town communities, but also smaller and lower-productivity cities and suburbs without a concentration of SSS industries.



*City of Roanoke.* Photo by Joe Ravi. *Wikimedia Commons.*

# Notes on Specific Indicators

Table 6.2 Remotability Index 2.0: Specific Indicator Recommendations

| Theme | Indicator(s) | Recommendation |
|---|---|---|
| Physical Infrastructure | HHs connected to plumbing and gas | Include indicators on infrastructure related to municipal primary services. |
| Coworking Infrastructure | Number of coworking spaces | Consider the range of potential remote work sites. Also include broadband-enabled public third spaces, but at a lower weight. |
| Housing Affordability | Housing affordability | Reconsider the relationship between affordability and remote work. Our findings suggest it may be an inverse relationship. |
| Housing Vacancy | Vacancy rate | Recognize the correlation between vacancy and affordability. Consider disaggregating vacancy rate by reason for vacancy. |
| Amenity Pull | Airbnb listings | Recognize short term rental effects on housing markets. Consider using seasonal or recreational vacancy rate as an alternative indicator. |
| Amenity Pull | Natural amenities | Consider this study's Remote Worker Typology regarding the variable importance of natural amenity access. |
| Community Quality | Social capital | Consider looking for quantitative metrics that can measure social capital, especially important to Rural Perennial communities as residential destinations. |
| Metro Transport Access | Metro proximity and air transport | Consider Worker Typology distinctions based on mobility. |
| Remote Capable Jobs | SSS industry employment | Better used to evaluate index than as an indicator itself. |

# Conclusions

## Key Findings & Contributions

This study investigated the drivers of remote work, the place characteristics that attract remote workers, the likely challenges communities hoping to attract remote workers should anticipate, and the recommendations for the communities to overcome these challenges, capitalizing on their existing assets and maximizing economic well-being, equity, and sustainability.

Broadly, the Team found that remote work share is driven by occupation and by the distribution of occupations within industries. Occupations in the information, finance, professional services, and management industries, termed "skilled scalable services" (SSS), are nearly 80% remote-capable and have led aggregate shifts to remote work. Furthermore, while remote work theoretically enables one to work from anywhere, the geography of remote work remains deeply mediated by the presence of SSS industry agglomerations and concentrated in particular metro areas.

This study makes a valuable contribution to the scholarship on remote work by dissecting its broad trends and revealing its particular implications for different types of workers and different types of places. The study developed a typology of remote workers based on two dimensions: residential location motivations and mobility constraints. It categorized communities as well, using two levels of geographic stratification: one schema based on an urban-rural community category, and another based on GOVA region. The development of these two typologies – of people and of place – will enable localities to better understand the motivations and constraints of remote workers and to design more targeted and effective remote worker attraction programs.

Remote work is a novel and evolving phenomenon. It expanded rapidly in the wake of the COVID-19 pandemic, growing from a niche to a common mode of work. The question of mobility – whether hybrid or full-remote becomes the dominant format – will be a key determinant of whether remote work remains predominantly tied to a handful of the most economically dynamic MSAs. This proposition is being negotiated currently, across countless organizations and firms, and its resolution will have major implications for the geographic mobility of remote workers and for the many diverse communities where they might choose to live.

# Final Recommendations

## Improving Remote Work Infrastructure

*Urban*

- **Build public-private partnerships with co-working spaces.** By building these relationships, membership numbers could be shared with the users of these spaces so that cities can contact remote workers. Also, the partnerships could assist in improving and creating more co-working spaces in the city.
- **Expand access to WiFi in public spaces such as parks and downtown areas.** With greater internet access, workers are more likely to work in third places if they desire leaving their home to work elsewhere. This can create more places where remote workers can work, leading to greater community-building between workers as they meet in these places.

*Rural Resort & Rural Perennial*

- **Improve broadband availability.** Lack of broadband is a deterrent to remote work, and expanding availability and accessibility in these places would lead to greater interest in working there.

- **Work with broadband providers and VATI to expand internet access.** VATI offers project funding for broadband development, which could be utilized for these regions to expand their connectivity.

*How Virginia Main Street Can Help:*

- **VMS can provide grant and grant writing assistance for broadband and housing development.** Assistance from VMS in applying for grants and even distributing funding opportunities could assist local communities in knowing about available opportunities and how to access them.

Photo by Jason Richard. *Unsplash.*

## Housing Affordability and Availability in All Communities Needs to be Improved

*Suburban/Exurban*

- **Consider re-zoning to allow for more diverse housing options.** Allowing for multi-use development and multi-family options in suburban/exurban communities can increase the types of housing available for workers moving in, making these communities more attractive.

*Rural Resort*

- **Protect affordable housing options.** Raising home prices due to demands in these regions requires affordable options to be maintained so that both current and incoming residents can find adequate housing.

*Rural Perennial*

- **Conduct a housing survey to identify vacant/blighted structures as candidates for adaptive reuse or demolition/future development.** This could be modeled off of Marion's BAUD program to assess the buildings in a community and where improvements and reuse could take place.

*How Virginia Main Street Can Help:*

- **Take advantage of VMS resources and grants to develop amenities and address housing concerns.** Using VMS to assess housing needs in a main street community could help create strategies to improve the housing stock, especially affordable housing
- **Connect VMS and other agencies for resources to grow a network of known available funds that can assist.** Communities could utilize not only resources from VMS but also the Virginia Center for Housing Research and the Virginia Department of Housing and Community Development (DHCD) to research and develop affordable housing options in the community.

## Uncertainty: Communities Need to Find Ways to Reach Their Remote Workers

*Recommendations for All Community Types:*

- **Find remote workers where they work.** If there are third places remote workers frequent, visiting those locations is one method to reach these workers. Connecting with local organizations that may have remote workers involved in them such as technology councils or civic organizations could be another method of reaching workers. Being in the community and conducting outreach may be the best way to initially try to find those workers, especially in a larger area where they may be more difficult to track.
- **Examine business licensing patterns and**

**connect with remote employers.** This can show how many small businesses are based at home; this only captures a small portion of remote work activities, but could offer a starting point.

- **Conduct a survey of residents to determine the prevalence of remote work.** This can assist in quantifying the remote worker population, which can lead to further engagement such as focus groups to learn more about remote worker needs in that specific community.

### *Urban and Suburban/Exurban:*

- **Examine and compare peak hour public transit usership as well as peak hour vehicle traffic in areas with high concentration of jobs.** Localities can also measure parking utilization at business parks and other commercial areas. This information can be used to estimate the prevalence of remote workers.
- **Review data from public utility companies** on energy and water consumption in residential areas to track differences in use patterns from remote workers working out of their homes. This method may be less successful in communities with a higher number of homes with self-contained utilities, such as those communities where most homes rely on well water or where wood stoves are abundantly used.

### *Rural Resort and Rural Perennial:*

- **Examine seasonal vacancy rates** compared to population growth. If seasonal vacancy rates decrease while population increases, this may indicate that remote workers are relocating to rural areas as full-time residents.
- **Analyze Skilled Scalable Service industries** in adjacent counties and metros to identify the magnitude of the potential market for relocating remote workers, as well as the regional competitiveness of a community versus its peers. If proximity to urban cores is not the chief asset, rural communities must leverage other strengths, such as resort amenities or small-town living, to attract potential relocators.
- **Disaggregate telecommuting from other home-based work** by comparing home-based business licensing data with publicly available commuter data sets such as the ACS. Recognizing that rural home-based workers are more likely than their urban counterparts to be engaged in cottage industry rather than telework, mediating commuter data this way could make work from home a more robust proxy indicator of remote work in rural communities.

### *How Virginia Main Street Can Help:*

- **VMS can help to implement programs to attract home-based businesses to "bedroom communities."** Attracting workers to bedroom communities can help retain more spending money within the region, rather than these workers spending money outside of the place that they reside in. VMS could provide resources specifically for home-based businesses in these communities so entrepreneurs and other home-based workers can adequately operate a business at home.

# Improve the Environment and Inclusivity of Places So That Workers Would be More Interested and Willing to Relocate There

*Rural Resort*

- **Work with local land/resource management agencies to protect natural amenities from degradation.** One of the main attractions of these communities are the green spaces, trails, and other outdoor activities that exist; if these amenities are not preserved, that would be detrimental to these communities.

*Rural Perennial*

- **Target diverse residents and make an intentional effort to incorporate them into the community fabric.** Finding ways to connect long-term residents with new residents can also assist in engaging both groups. Hosting events to celebrate the community and welcome those new to it can build connections between residents.

*How Virginia Main Street Can Help:*

- **VMS can work with these communities to attract outdoor recreation businesses and develop additional outdoor recreation amenities.** Marketing these regions as places centered around outdoor activities could also lead to further investment in those amenities to prioritize them within the community.
- **VMS can provide resources to boost engagement and attract residents.** Marketing materials would help communities promote themselves to remote workers and utilize their known drivers to attract workers to their city or locality.

*Great Falls on the Potomac River.* Photo by Leo Leung. *Wikimedia Commons.*

# Limitations and Implications for Future Scholarship

## Proxy Measures of Remote Workers

This study quantified remote workers using commuter data from the 2021 ACS 5-year survey. However, the "work from home" ACS response has limitations as a proxy variable for remote work. Specifically, it might fail to capture the range of hybrid remote work formats. For example, if a worker commutes by bicycle one day per week while working from home four days per week, which will she list as her primary means of transportation to work? Qualitative research into hybrid workers' self-definition as remote workers, as well as revisions to the ACS questionnaire, may be needed to fully grasp the prevalence and variety of remote work formats.

The use of "work from home" as a proxy variable for remote work could be improved with more sophisticated quantitative analysis utilizing the ACS Public Use Microdata Sample (PUMS). Using the PUMS's "work from home" commuters could be cross-referenced with industry and occupation responses in individualized observations to more robustly estimate the number of telecommuting remote workers. The two-level geographic stratified sampling method used in this report could then be employed to estimate the relative prevalence of remote work vs. other types of home-based work across urban-rural and inter-regional differences.

## Geographic Stratification & the RUCC

This study utilized a geographic stratification sampling method to analyze quantitative data on remote work and related indicators. Our Community Category classification system was based on the USDA Rural-Urban Continuum Codes (RUCC). The RUCC's major delineations, however, are between communities within an MSA and those in a micropolitan or rural area, and this study draws additional distinctions between urban and suburban communities, as well as between different types of rural communities. Designations along the urban-rural continuum can be murky, and may not match the qualitative experience of places by their residents. The lack of a standard mechanism for classifying urban, suburban, and rural communities was a major limitation of this study, though by no means is this limitation limited to this study.

# Case Study Development

While developing the case studies, the goal was to have a case study for each GOVA region across the urban-rural community categories created. However, due to time constraints, GOVA Regions 7 and 9 were omitted from this study. Future studies should focus on cities that can be found in those regions such as Charlottesville and Leesburg to provide perspectives from larger cities, as that was limited in this study as well.

# Remote Worker Outreach

An opportunity for future scholarship could include speaking to remote workers and learning what their personal motivations were for choosing where they live and work. A limitation in this study is that the drivers for remote workers were identified via the perceptions of the economic developers contacted through the survey and interviews, as well as literature findings. No remote workers were contacted, so their opinions are unknown. While this study made use of survey data published in academic literature, a broad survey of remote workers was beyond its scope. Contacting remote workers and learning their drivers for choosing where they live, what challenges they face in their community, and what opportunities exist to improve remote work in their community would be a beneficial next step.

Photo by Annie Spratt. *Unsplash.*

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# Appendices

## Appendix A: Urban-Rural Categories

The ERS (Economic Research Service), is a department of the USDA that uses data on non-metro areas, as defined by the OMB (Office of Management and Budget). ERS typology provides a greater number of distinct groups within a typology thus allowing for greater detail and more accurate regional classifications. This includes the ERS county typology codes, which include manufacturing dependent counties, Government dependent Counties, farming dependent counties, and Mining Dependent Counties (USDA ERS).

Three typical frameworks are used to delineate an urban area from a rural area. First is the administrative concept, which simply defines urban areas on their municipal boundaries (Cromartie, 2008). Second is the Land Use concept, based on population density. This method is used by the Census Bureau (Cromartie, 2008). Lastly, the economic method concept incorporates cities' influence on trade, labor, and media markets (Cromartie, 2008).

To define rural areas, Cromartie found the economic model when creating an urban-rural boundary extends an urban area into further commuting zones outside densely populated areas. A population threshold must be established. Most researchers define non-metro areas by a 50,000-person threshold.
Depending on the method chosen, what is urban and what is rural varies widely as shown in Table A.1 below.

Table A.1 - Urban and Rural Definition

| | US total | Census Places (Administrative) Pop less than 2,500 | Census Places (Administrative) Pop less than 20,000 | Census Urban Places (Land Use) Pop Less than 2,500 | Census Urban Places (Land Use) Pop Less than 50,000 | OMB Metro Micro (Economic) Areas with pop less than 10,000 | OMB Metro Micro (Economic) Areas with pop less than 50,000 |
|---|---|---|---|---|---|---|---|
| Population 2000 (Millions) | 280.1 | 87.7 | 138.5 | 59.1 | 89.5 | 19.9 | 48.8 |
| % of Rural defined Pop | N/A | 31.1% | 49.2% | 21% | 31.8% | 7.1% | 17.4% |
| % with College degree | 30.7% | 26.8% | 28.3% | 22.5% | 22.9% | 18.5% | 20.8% |
| Average Household income | $57,000 | $56,000 | $56,000 | $51,000 | $49,000 | $40,000 | $43,000 |

For our framework, the economic concept seems to be the best option. This is because it prioritizes shared economic variables over land use classifications or administrative boundaries. The administrative and land use typology do not consider unemployment, industrial restructuring, or other shared economic issues as a part of their classifications.

To aggregate and categorize the communities in Virginia by its land and population characteristics, we used the Rural-Urban Continuum Codes (RUCC) created by the United States Department of Agriculture (USDA), as shown in Table A.2, and housing vacancy for Seasonal, Recreational, or Occasional Use to define the urban-rural community categories, as shown in Table A.3, based on the following criteria:
For metropolitan areas defined in RUCC codes 1-3 that are cities, they are considered as community category type "urban". For metropolitan areas defined in RUCC codes 1-3 that are counties, they are considered as community category type "suburban/exurban." For the non-metropolitan urban areas defined in RUCC codes 4-7, if the housing vacancy due to seasonal, recreational, or occasional use is more than 30%, it is considered as community category type of "rural resort;" otherwise, it is considered as "rural perennial."

Table A.2. RUCC Definition

| RUCC Codes | RUCC Definition |
|---|---|
| 1 | Metro - Counties in metro areas of 1 million population or more |
| 2 | Metro - Counties in metro areas of 250,000 to 1 million population |
| 3 | Metro - Counties in metro areas of fewer than 250,000 population |
| 4 | Nonmetro - Urban population of 20,000 or more, adjacent to a metro area |
| 5 | Nonmetro - Urban population of 20,000 or more, not adjacent to a metro area |
| 6 | Nonmetro - Urban population of 2,500 to 19,999, adjacent to a metro area |
| 7 | Nonmetro - Urban population of 2,500 to 19,999, not adjacent to a metro area |
| 8 | Nonmetro - Completely rural or less than 2,500 urban population, adjacent to a metro area |
| 9 | Nonmetro - Completely rural or less than 2,500 urban population, not adjacent to a metro |

Table A.3. Urban-Rural Community Category Codes

| Community Category Code | Community Category | Definition |
|---|---|---|
| **1** | Urban | Metropolitan areas (RUCC 1-3) that are **cities** |
| **2** | Suburban/Exurban | Metropolitan areas (RUCC 1-3) that are **counties** |
| **3** | Rural Resort | Non-metro areas (RUCC 4-9). Over 30% seasonal or recreational housing vacancy |
| **4** | Rural Perennial | Remaining non-metro areas (RUCC 4-9) |

List of Virginia localities defined by community category are shown in Table A.4. The distributions of localities by community category & GOVA Region are presented in Table A.5.

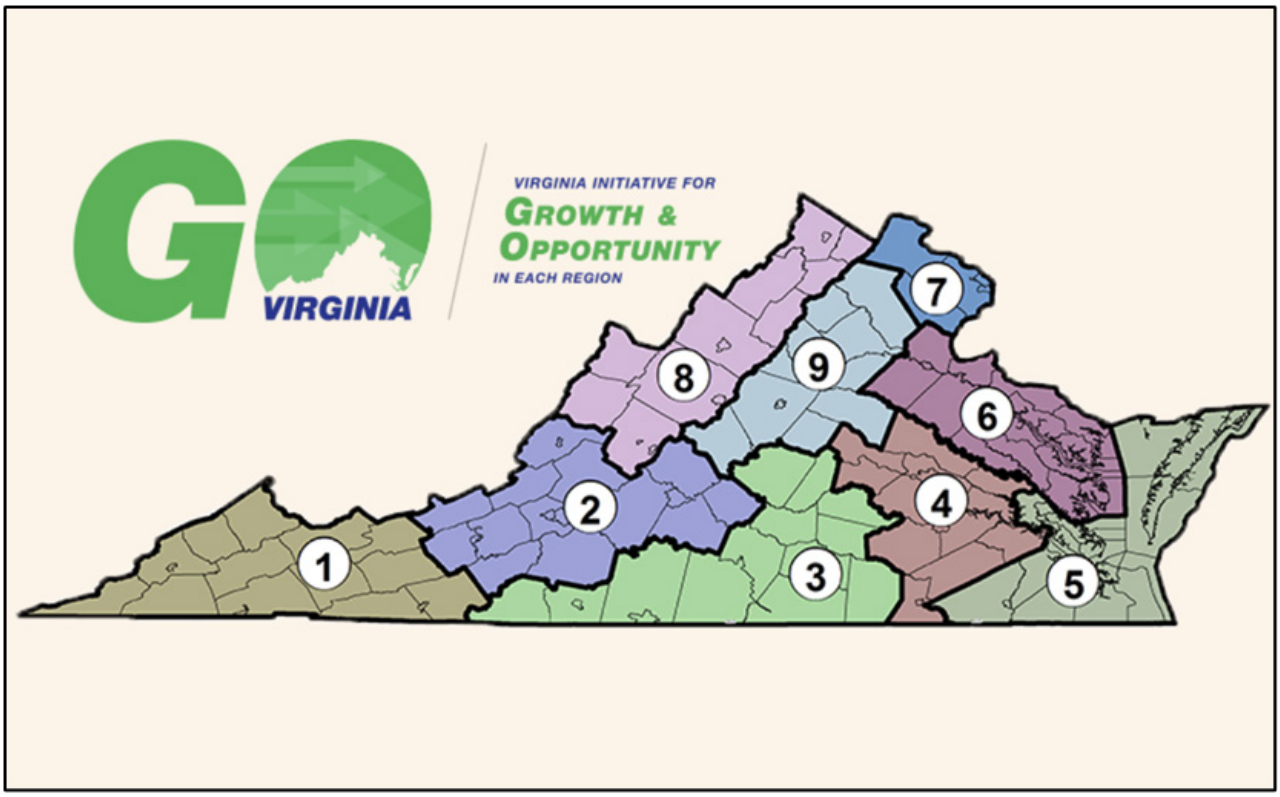
## Table A.4. Virginia Cities and Counties by Community Category

| Urban | Suburban/Exurban | | Rural Resort | Rural Perennial |
|---|---|---|---|---|
| Arlington | Albemarle | King William | Accomack | Buchanan |
| Alexandria | Amelia | Loudoun | Alleghany | Charlotte |
| Bristol | Amherst | Mathews | Bath | Cumberland |
| Charlottesville | Appomattox | Montgomery | Bland | Dickenson |
| Colonial Heights | Augusta | Nelson | Brunswick | Greensville |
| Hampton | Bedford | New Kent | Carroll | Halifax |
| Harrisonburg | Botetourt | Powhatan | Essex | Henry |
| Hopewell | Buckingham | Prince George | Grayson | King George |
| Lynchburg | Campbell | Prince William | Highland | Lee |
| Newport News | Caroline | Pulaski | King and Queen | Lunenburg |
| Norfolk | Charles City | Rappahannock | Lancaster | Nottoway |
| Petersburg | Chesterfield | Roanoke | Louisa | Pittsylvania |
| Portsmouth | Clarke | Rockingham | Madison | Rockbridge |
| Radford | Craig | Scott | Mecklenburg | Russell |
| Richmond | Culpeper | Spotsylvania | Middlesex | Smyth |
| Roanoke | Dinwiddie | Stafford | Northampton | Southampton |
| Salem | Fairfax | Sussex | Northumberland | Tazewell |
| Staunton | Fauquier | Warren | Orange | Wise |
| Waynesboro | Floyd | Washington | Page | Wythe |
| Williamsburg | Fluvanna | York | Patrick | Buena Vista |
| Winchester | Franklin | Chesapeake | Prince Edward | Covington |
| | Frederick | Fairfax | Richmond | Danville |
| | Giles | Falls Church | Shenandoah | Emporia |
| | Gloucester | Fredericksburg | Surry | Franklin |
| | Goochland | Manassas | Westmoreland | Galax |
| | Greene | Manassas Park | | Lexington |
| | Hanover | Poquoson | | Martinsville |
| | Henrico | Suffolk | | Norton |
| | Isle of Wight | Virginia Beach | | |
| | James City | | | |

## Table A.5. Distribution of Localities by Community Category & GOVA Region

| GOVA Region | Total Cities / Counties | 1 Urban | | 2 Sub/Exurban | | 3 Rural Resort | | 4 Rural Perennial | |
|---|---|---|---|---|---|---|---|---|---|
| | | Count | Percent | Count | Percent | Count | Percent | Count | Percent |
| **Region 1** | 16 | 1 | 6.25% | 2 | 12.50% | 3 | 18.75% | 10 | 62.50% |
| **Region 2** | 18 | 4 | 22.22% | 12 | 66.67% | 1 | 5.56% | 1 | 5.56% |
| **Region 3** | 15 | 0 | 0.00% | 2 | 13.33% | 4 | 26.67% | 9 | 60.00% |
| **Region 4** | 17 | 4 | 23.53% | 10 | 58.82% | 1 | 5.88% | 2 | 11.76% |
| **Region 5** | 16 | 5 | 31.25% | 7 | 43.75% | 2 | 12.50% | 2 | 12.50% |
| **Region 6** | 15 | 0 | 0.00% | 7 | 46.67% | 7 | 46.67% | 1 | 6.67% |
| **Region 7** | 9 | 2 | 22.22% | 7 | 77.78% | 0 | 0.00% | 0 | 0.00% |
| **Region 8** | 16 | 4 | 25.00% | 5 | 31.25% | 4 | 25.00% | 3 | 18.75% |
| **Region 9** | 11 | 1 | 9.09% | 7 | 63.64% | 3 | 27.27% | 0 | 0 .00% |
| **Total** | **133** | **21 Urban** | | **59 Sub/Exurban** | | **25 Rural Resort** | | **28 Rural Perennial** | |

Figure A.1. - Go Virginia (GOVA) Geographic Regions[72]




72. https://www.dhcd.virginia.gov/gova

# Appendix B: Selected Additional Tables, Figures and Quantitative Methods

## SSS Employment and Work From Home by Geographic Stratified Sampling Method

The following appendix item describes the method used to calculate SSS employment and WFH shares by Community Code and GOVA Region, and provides a table of Census data used to perform these calculations. Data was collected by locality, and each locality was coded based on the two levels of geographic stratified sampling.

Throughout this report, as a proxy variable for remote workers, we used Work From Home percent for workers 16 and over from the U.S. Census Bureau American Community Survey 5-year Estimates Table S0801. For Industry counts, we used Census Table S2403. We collected counts of Total Civilian Workforce and Workforce by Industry: Information (NAICS code 51); Finance and Insurance (NAICS code 52); Professional Services (NAICS code 54); or Management of Companies (NAICS code 55). Worker counts by selected industry were summed to generate a total SSS worker count by locality. We then used Excel Pivot Tables to create total SSS employment and total WFH.

Total Workforce, SSS Employment and Work From Home counts were summed by each geographic stratification, Community Code and GOVA Region, using Excel Pivot tables. These totals by geographic stratification were used to create percentages by Community Code and by GOVA Region. This data is presented in **Table B.1**.

## Table B.1. Data Used for SSS Employment and Work From Home Calculations by Geographic Stratified Sampling Method

| Cities and Counties, with Community Code (CC) and GOVA Region | | | Workforce and Commuter Data, 2021 ACS 5-Year Estimates | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Total | Workforce Count by NAICS Code | | | | SSS Count | WFH Count | WFH % | SSS % |
| Name | CC | GOVA | | 51 | 52 | 54 | 55 | | | | |
| Accomack | 3 | 5 | 14319 | 38 | 237 | 414 | 2 | 691 | 856 | 6.1% | 4.8% |
| Albemarle | 2 | 9 | 54797 | 766 | 2314 | 6226 | 3 | 9309 | 8348 | 15.5% | 17.0% |
| Alleghany | 3 | 2 | 6350 | 77 | 221 | 118 | 0 | 416 | 150 | 2.4% | 6.6% |
| Amelia | 2 | 3 | 6449 | 135 | 162 | 396 | 0 | 693 | 404 | 6.5% | 10.7% |
| Amherst | 2 | 2 | 15048 | 236 | 501 | 525 | 27 | 1289 | 965 | 6.6% | 8.6% |
| Appomattox | 2 | 2 | 7543 | 21 | 246 | 342 | 0 | 609 | 439 | 5.9% | 8.1% |
| Arlington | 1 | 7 | 146550 | 4577 | 7663 | 40014 | 206 | 52460 | 31539 | 21.3% | 35.8% |
| Augusta | 2 | 8 | 36832 | 474 | 1165 | 1757 | 0 | 3396 | 2039 | 5.6% | 9.2% |
| Bath | 3 | 8 | 1816 | 0 | 27 | 55 | 0 | 82 | 36 | 2.0% | 4.5% |
| Bedford | 2 | 2 | 37159 | 296 | 1767 | 2461 | 16 | 4540 | 2612 | 7.1% | 12.2% |
| Bland | 3 | 1 | 2250 | 38 | 42 | 6 | 0 | 86 | 29 | 1.3% | 3.8% |
| Botetourt | 2 | 2 | 16383 | 281 | 797 | 718 | 29 | 1825 | 1210 | 7.6% | 11.1% |
| Brunswick | 3 | 3 | 6342 | 56 | 134 | 157 | 0 | 347 | 231 | 3.8% | 5.5% |
| Buchanan | 4 | 1 | 6259 | 132 | 268 | 94 | 0 | 494 | 165 | 2.7% | 7.9% |
| Buckingham | 2 | 3 | 6412 | 28 | 204 | 260 | 0 | 492 | 303 | 4.9% | 7.7% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Campbell | 2 | 2 | 26095 | 327 | 670 | 943 | 9 | 1949 | 1253 | 4.9% | 7.5% |
| Caroline | 2 | 6 | 14492 | 82 | 979 | 1148 | 5 | 2214 | 1149 | 7.3% | 15.3% |
| Carroll | 3 | 1 | 12517 | 84 | 192 | 335 | 0 | 611 | 436 | 3.6% | 4.9% |
| Charles City | 2 | 4 | 3285 | 44 | 158 | 150 | 0 | 352 | 191 | 5.9% | 10.7% |
| Charlotte | 4 | 3 | 4709 | 63 | 175 | 173 | 0 | 411 | 280 | 6.1% | 8.7% |
| Chesterfield | 2 | 4 | 183160 | 2438 | 14128 | 12349 | 252 | 29167 | 20542 | 11.3% | 15.9% |
| Clarke | 2 | 8 | 7297 | 205 | 174 | 606 | 0 | 985 | 856 | 11.8% | 13.5% |
| Craig | 2 | 2 | 2036 | 2 | 166 | 106 | 0 | 274 | 91 | 4.7% | 13.5% |
| Culpeper | 2 | 9 | 25646 | 456 | 828 | 1875 | 0 | 3159 | 1477 | 5.8% | 12.3% |
| Cumberland | 4 | 3 | 5059 | 83 | 197 | 265 | 13 | 558 | 326 | 6.6% | 11.0% |
| Dickenson | 4 | 1 | 4268 | 70 | 31 | 199 | 2 | 302 | 66 | 1.6% | 7.1% |
| Dinwiddie | 2 | 4 | 13174 | 127 | 644 | 316 | 0 | 1087 | 745 | 5.7% | 8.3% |
| Essex | 3 | 6 | 4535 | 23 | 261 | 153 | 19 | 456 | 313 | 7.2% | 10.1% |
| Fairfax | 2 | 7 | 610056 | 15579 | 29295 | 137948 | 964 | 183786 | 107544 | 17.6% | 30.1% |
| Fauquier | 2 | 9 | 37276 | 620 | 1405 | 4865 | 67 | 6957 | 4728 | 12.9% | 18.7% |
| Floyd | 2 | 2 | 7617 | 133 | 148 | 392 | 0 | 673 | 768 | 10.1% | 8.8% |
| Fluvanna | 2 | 9 | 13163 | 173 | 377 | 1035 | 14 | 1599 | 1588 | 12.2% | 12.1% |
| Franklin | 2 | 2 | 23767 | 264 | 1098 | 1128 | 28 | 2518 | 2272 | 9.7% | 10.6% |
| Frederick | 2 | 8 | 43926 | 717 | 1506 | 3183 | 28 | 5434 | 3399 | 7.8% | 12.4% |
| Giles | 2 | 2 | 7654 | 79 | 135 | 318 | 0 | 532 | 184 | 2.4% | 7.0% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gloucester | 2 | 6 | 18643 | 207 | 652 | 1106 | 0 | 1965 | 1145 | 6.1% | 10.5% |
| Goochland | 2 | 4 | 11381 | 194 | 1069 | 1085 | 41 | 2389 | 1538 | 13.9% | 21.0% |
| Grayson | 3 | 1 | 6248 | 39 | 105 | 211 | 0 | 355 | 253 | 4.2% | 5.7% |
| Greene | 2 | 9 | 10487 | 276 | 429 | 890 | 0 | 1595 | 1027 | 10.1% | 15.2% |
| Greensville | 4 | 4 | 3605 | 8 | 54 | 145 | 0 | 207 | 154 | 4.3% | 5.7% |
| Halifax | 4 | 3 | 13813 | 167 | 222 | 384 | 25 | 798 | 856 | 6.3% | 5.8% |
| Hanover | 2 | 4 | 57381 | 917 | 4678 | 4196 | 102 | 9893 | 6821 | 12.0% | 17.2% |
| Henrico | 2 | 4 | 175244 | 3100 | 17054 | 16791 | 196 | 37141 | 25580 | 14.9% | 21.2% |
| Henry | 4 | 3 | 20260 | 162 | 327 | 538 | 70 | 1097 | 768 | 3.9% | 5.4% |
| Highland | 3 | 8 | 791 | 30 | 12 | 46 | 0 | 88 | 96 | 12.2% | 11.1% |
| Isle of Wight | 2 | 5 | 18795 | 326 | 888 | 1478 | 22 | 2714 | 1544 | 8.3% | 14.4% |
| James City | 2 | 5 | 34959 | 207 | 1459 | 3226 | 34 | 4926 | 4358 | 12.4% | 14.1% |
| King and Queen | 3 | 6 | 3378 | 0 | 90 | 149 | 0 | 239 | 246 | 7.3% | 7.1% |
| King George | 4 | 6 | 13275 | 86 | 338 | 1699 | 17 | 2140 | 1118 | 8.3% | 16.1% |
| King William | 2 | 6 | 9219 | 155 | 399 | 355 | 0 | 909 | 896 | 9.7% | 9.9% |
| Lancaster | 3 | 6 | 3945 | 56 | 206 | 259 | 0 | 521 | 494 | 12.5% | 13.2% |
| Lee | 4 | 1 | 7135 | 52 | 143 | 148 | 0 | 343 | 456 | 6.7% | 4.8% |
| Loudoun | 2 | 7 | 223287 | 8208 | 12872 | 56366 | 563 | 78009 | 42248 | 19.1% | 34.9% |
| Louisa | 3 | 9 | 17315 | 208 | 1011 | 1020 | 13 | 2252 | 1545 | 9.1% | 13.0% |
| Lunenburg | 4 | 3 | 4661 | 20 | 217 | 79 | 23 | 339 | 264 | 5.8% | 7.3% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Madison | 3 | 9 | 6443 | 131 | 304 | 533 | 12 | 980 | 866 | 13.6% | 15.2% |
| Mathews | 2 | 6 | 3382 | 21 | 89 | 95 | 0 | 205 | 213 | 6.5% | 6.1% |
| Mecklenburg | 3 | 3 | 12580 | 429 | 319 | 499 | 16 | 1263 | 795 | 6.5% | 10.0% |
| Middlesex | 3 | 6 | 4605 | 72 | 136 | 249 | 6 | 463 | 621 | 13.8% | 10.1% |
| Montgomery | 2 | 2 | 45414 | 599 | 788 | 2975 | 22 | 4384 | 4096 | 9.2% | 9.7% |
| Nelson | 2 | 9 | 6797 | 56 | 246 | 461 | 0 | 763 | 1094 | 16.8% | 11.2% |
| New Kent | 2 | 4 | 11529 | 62 | 633 | 1117 | 19 | 1831 | 1799 | 15.7% | 15.9% |
| Northampton | 3 | 5 | 4954 | 65 | 63 | 207 | 6 | 341 | 524 | 10.8% | 6.9% |
| Northumberland | 3 | 6 | 4109 | 198 | 141 | 393 | 0 | 732 | 498 | 12.4% | 17.8% |
| Nottoway | 4 | 3 | 5812 | 26 | 108 | 283 | 0 | 417 | 398 | 7.0% | 7.2% |
| Orange | 3 | 9 | 16973 | 449 | 497 | 1233 | 12 | 2191 | 1606 | 9.6% | 12.9% |
| Page | 3 | 8 | 10989 | 135 | 207 | 377 | 5 | 724 | 477 | 4.5% | 6.6% |
| Patrick | 3 | 3 | 7717 | 99 | 241 | 231 | 0 | 571 | 570 | 7.5% | 7.4% |
| Pittsylvania | 4 | 3 | 26247 | 238 | 650 | 790 | 18 | 1696 | 1058 | 4.1% | 6.5% |
| Powhatan | 2 | 4 | 14834 | 304 | 1265 | 1059 | 9 | 2637 | 2182 | 14.9% | 17.8% |
| Prince Edward | 3 | 3 | 8005 | 59 | 227 | 299 | 0 | 585 | 576 | 7.5% | 7.3% |
| Prince George | 2 | 4 | 16169 | 547 | 563 | 691 | 0 | 1801 | 1285 | 7.2% | 11.1% |
| Prince William | 2 | 7 | 245616 | 4303 | 7562 | 35467 | 280 | 47612 | 29094 | 11.7% | 19.4% |
| Pulaski | 2 | 2 | 15095 | 280 | 490 | 629 | 0 | 1399 | 715 | 4.8% | 9.3% |
| Rappahannock | 2 | 9 | 3525 | 112 | 71 | 338 | 0 | 521 | 478 | 13.9% | 14.8% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Richmond | 3 | 6 | 3143 | 70 | 80 | 95 | 0 | 245 | 407 | 13.0% | 7.8% |
| Roanoke | 2 | 2 | 46588 | 830 | 2717 | 2952 | 39 | 6538 | 4860 | 10.5% | 14.0% |
| Rockbridge | 4 | 8 | 9933 | 158 | 228 | 499 | 0 | 885 | 823 | 8.5% | 8.9% |
| Rockingham | 2 | 8 | 41731 | 477 | 982 | 1881 | 85 | 3425 | 2653 | 6.5% | 8.2% |
| Russell | 4 | 1 | 8875 | 167 | 161 | 364 | 0 | 692 | 304 | 3.5% | 7.8% |
| Scott | 2 | 1 | 8053 | 189 | 331 | 299 | 0 | 819 | 256 | 3.2% | 10.2% |
| Shenandoah | 3 | 8 | 20815 | 403 | 744 | 1027 | 20 | 2194 | 1332 | 6.5% | 10.5% |
| Smyth | 4 | 1 | 12217 | 94 | 173 | 432 | 0 | 699 | 563 | 4.7% | 5.7% |
| Southampton | 4 | 5 | 7800 | 93 | 290 | 394 | 0 | 777 | 383 | 4.9% | 10.0% |
| Spotsylvania | 2 | 6 | 68856 | 1379 | 2721 | 7285 | 30 | 11415 | 7073 | 10.4% | 16.6% |
| Stafford | 2 | 6 | 75318 | 1257 | 2036 | 9151 | 193 | 12637 | 9866 | 12.8% | 16.8% |
| Surry | 3 | 4 | 3185 | 27 | 89 | 46 | 0 | 162 | 68 | 2.2% | 5.1% |
| Sussex | 2 | 4 | 4521 | 32 | 90 | 102 | 0 | 224 | 108 | 2.4% | 5.0% |
| Tazewell | 4 | 1 | 14651 | 283 | 574 | 512 | 0 | 1369 | 422 | 3.0% | 9.3% |
| Warren | 2 | 8 | 19408 | 303 | 753 | 1740 | 5 | 2801 | 1824 | 9.5% | 14.4% |
| Washington | 2 | 1 | 23776 | 286 | 582 | 1145 | 14 | 2027 | 1300 | 5.6% | 8.5% |
| Westmoreland | 3 | 6 | 7139 | 39 | 333 | 619 | 0 | 991 | 728 | 10.1% | 13.9% |
| Wise | 4 | 1 | 12783 | 98 | 630 | 500 | 44 | 1272 | 572 | 4.6% | 10.0% |
| Wythe | 4 | 1 | 12766 | 90 | 323 | 326 | 0 | 739 | 554 | 4.4% | 5.8% |
| York | 2 | 5 | 31260 | 426 | 1005 | 3637 | 52 | 5120 | 3242 | 9.3% | 16.4% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alexandria | 1 | 7 | 96981 | 2216 | 3174 | 19154 | 165 | 24709 | 16469 | 16.7% | 25.5% |
| Bristol | 1 | 1 | 7733 | 37 | 176 | 389 | 0 | 602 | 513 | 6.7% | 7.8% |
| Buena Vista | 4 | 8 | 2974 | 2 | 60 | 25 | 0 | 87 | 98 | 3.3% | 2.9% |
| Charlottesville | 1 | 9 | 24530 | 623 | 930 | 2662 | 0 | 4215 | 3079 | 12.7% | 17.2% |
| Chesapeake | 2 | 5 | 115237 | 2475 | 5471 | 10109 | 102 | 18157 | 9517 | 7.8% | 15.8% |
| Colonial Heights | 1 | 4 | 8592 | 120 | 527 | 533 | 8 | 1188 | 545 | 6.4% | 13.8% |
| Covington | 4 | 2 | 2311 | 12 | 13 | 92 | 0 | 117 | 21 | 0.9% | 5.1% |
| Danville | 4 | 3 | 16937 | 99 | 377 | 447 | 44 | 967 | 796 | 4.9% | 5.7% |
| Emporia | 4 | 4 | 2167 | 0 | 0 | 184 | 0 | 184 | 54 | 2.5% | 8.5% |
| Fairfax | 2 | 7 | 13316 | 322 | 546 | 2703 | 42 | 3613 | 2246 | 17.1% | 27.1% |
| Falls Church | 2 | 7 | 7974 | 136 | 336 | 2168 | 31 | 2671 | 1403 | 17.6% | 33.5% |
| Franklin | 4 | 5 | 3424 | 0 | 55 | 132 | 0 | 187 | 104 | 3.1% | 5.5% |
| Fredericksburg | 2 | 6 | 15283 | 265 | 469 | 1335 | 19 | 2088 | 1400 | 9.2% | 13.7% |
| Galax | 4 | 1 | 2988 | 40 | 97 | 125 | 0 | 262 | 84 | 2.8% | 8.8% |
| Hampton | 1 | 5 | 63255 | 639 | 1845 | 4343 | 86 | 6913 | 4165 | 6.2% | 10.9% |
| Harrisonburg | 1 | 8 | 24879 | 370 | 304 | 1585 | 0 | 2259 | 1469 | 6.1% | 9.1% |
| Hopewell | 1 | 4 | 9672 | 106 | 299 | 489 | 0 | 894 | 514 | 5.4% | 9.2% |
| Lexington | 4 | 8 | 2639 | 28 | 43 | 253 | 0 | 324 | 278 | 11.3% | 12.3% |
| Lynchburg | 1 | 2 | 36957 | 672 | 1057 | 1960 | 0 | 3689 | 2916 | 8.1% | 10.0% |
| Manassas | 2 | 7 | 23002 | 338 | 822 | 2501 | 8 | 3669 | 1862 | 8.2% | 16.0% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Manassas Park | 2 | 7 | 10010 | 16 | 280 | 1244 | 0 | 1540 | 755 | 7.7% | 15.4% |
| Martinsville | 4 | 3 | 5548 | 41 | 155 | 327 | 0 | 523 | 416 | 7.8% | 9.4% |
| Newport News | 1 | 5 | 84152 | 880 | 1610 | 6221 | 75 | 8786 | 5896 | 6.4% | 10.4% |
| Norfolk | 1 | 5 | 102012 | 1598 | 3239 | 7457 | 134 | 12428 | 7947 | 6.1% | 12.2% |
| Norton | 4 | 1 | 1492 | 78 | 35 | 159 | 0 | 272 | 146 | 10.0% | 18.2% |
| Petersburg | 1 | 4 | 14084 | 141 | 591 | 749 | 0 | 1481 | 805 | 5.6% | 10.5% |
| Poquoson | 2 | 5 | 6270 | 54 | 148 | 711 | 17 | 930 | 545 | 8.6% | 14.8% |
| Portsmouth | 1 | 5 | 41532 | 496 | 1044 | 2013 | 0 | 3553 | 2314 | 5.1% | 8.6% |
| Radford | 1 | 2 | 7749 | 55 | 148 | 477 | 0 | 680 | 293 | 3.9% | 8.8% |
| Richmond | 1 | 4 | 119707 | 2050 | 7903 | 11764 | 182 | 21899 | 13511 | 11.5% | 18.3% |
| Roanoke | 1 | 2 | 47811 | 707 | 2797 | 2510 | 37 | 6051 | 3615 | 7.7% | 12.7% |
| Salem | 1 | 2 | 12709 | 127 | 640 | 481 | 27 | 1275 | 900 | 7.2% | 10.0% |
| Staunton | 1 | 8 | 12091 | 232 | 429 | 636 | 7 | 1304 | 590 | 5.0% | 10.8% |
| Suffolk | 2 | 5 | 43912 | 594 | 1413 | 2784 | 25 | 4816 | 3191 | 7.1% | 11.0% |
| Virginia Beach | 2 | 5 | 225943 | 3488 | 12835 | 22253 | 176 | 38752 | 20555 | 8.4% | 17.2% |
| Waynesboro | 1 | 8 | 10776 | 155 | 334 | 402 | 47 | 938 | 670 | 6.3% | 8.7% |
| Williamsburg | 1 | 5 | 6579 | 86 | 104 | 494 | 0 | 684 | 781 | 11.9% | 10.4% |
| Winchester | 1 | 8 | 14877 | 230 | 606 | 884 | 0 | 1720 | 1536 | 10.4% | 11.6% |

# Broadband Tables

Table B.2. Urban Communities % Households with a Broadband Internet Subscription, 2021

| Community | % | | Community | % |
|---|---|---|---|---|
| Arlington | 93% | | Hopewell | 83% |
| Alexandria | 93% | | Waynesboro | 83% |
| Lynchburg | 88% | | Winchester | 81% |
| Charlottesville | 87% | | Newport News | 80% |
| Hampton | 85% | | Richmond | 80% |
| Norfolk | 85% | | Harrisonburg | 80% |
| Salem | 85% | | Roanoke | 80% |
| Williamsburg | 85% | | Petersburg | 77% |
| Colonial Heights | 85% | | Staunton | 76% |
| Portsmouth | 85% | | Bristol | 73% |
| Radford | 84% | | | |

Table B.3. Suburban/Exurban Communities % Households with a Broadband Internet Subscription, 2021

| Community | % | | Community | % | | Community | % |
|---|---|---|---|---|---|---|---|
| Falls Church | 96% | | Fluvanna | 89% | | Augusta | 81% |
| Loudoun | 96% | | Henrico | 89% | | Rockingham | 81% |
| Stafford | 96% | | Culpeper | 88% | | Dinwiddie | 79% |
| Fairfax | 96% | | Goochland | 88% | | Washington | 78% |
| Prince William | 95% | | Prince George | 88% | | Franklin | 78% |
| Fairfax | 95% | | Fredericksburg | 88% | | Campbell | 78% |
| Manassas Park | 95% | | Warren | 87% | | Amelia | 77% |
| Manassas | 94% | | Craig | 86% | | Giles | 77% |
| Spotsylvania | 93% | | Greene | 86% | | Amherst | 77% |
| Chesapeake | 93% | | Roanoke | 86% | | Floyd | 77% |
| Virginia Beach | 92% | | Rappahannock | 85% | | Appomattox | 76% |
| Chesterfield | 92% | | New Kent | 85% | | King William | 74% |
| Poquoson | 91% | | Suffolk | 85% | | Pulaski | 74% |
| Powhatan | 90% | | Gloucester | 85% | | Sussex | 73% |
| York | 90% | | Clarke | 84% | | Nelson | 73% |
| Fauquier | 90% | | Frederick | 84% | | Mathews | 73% |
| James City | 90% | | Bedford | 83% | | Scott | 67% |
| Hanover | 89% | | Caroline | 82% | | Charles City | 67% |
| Montgomery | 89% | | Isle of Wight | 81% | | Buckingham | 65% |

Table B.4. Rural Retreat Communities % Households with a Broadband Internet Subscription, 2021

| Community | % | | Community | % |
|---|---|---|---|---|
| Orange | 85% | | Grayson | 74% |
| Louisa | 82% | | Richmond | 74% |
| Northampton | 81% | | Patrick | 73% |
| Madison | 80% | | Lancaster | 73% |
| Shenandoah | 80% | | Page | 73% |
| Northumberland | 79% | | Prince Edward | 72% |
| Brunswick | 76% | | Surry | 72% |
| Accomack | 76% | | Middlesex | 71% |
| Alleghany | 76% | | Essex | 69% |
| Westmoreland | 75% | | Mecklenburg | 68% |
| Carroll | 75% | | King and Queen | 66% |
| Bath | 74% | | Bland | 59% |
| Highland | 74% | | | |

Table B.5. Rural Non-Retreat Communities 2021 % Households with a Broadband Internet Subscription

| Community | % | | Community | % |
|---|---|---|---|---|
| King George | 90% | | Pittsylvania | 72% |
| Lexington | 84% | | Dickenson | 71% |
| Southampton | 82% | | Henry | 71% |
| Covington | 82% | | Danville | 71% |
| Galax | 81% | | Buchanan | 69% |
| Buena Vista | 81% | | Nottoway | 67% |
| Rockbridge | 80% | | Wise | 67% |
| Martinsville | 79% | | Charlotte | 67% |
| Tazewell | 79% | | Norton | 65% |
| Greensville | 78% | | Russell | 63% |
| Franklin | 78% | | Halifax | 62% |
| Wythe | 77% | | Lunenburg | 58% |
| Smyth | 75% | | Lee | 56% |
| Cumberland | 75% | | | |

# Appendix C: Remote Work Survey

## Survey Approach

A survey was developed using preliminary knowledge and insights gathered from Virginia Main Street and Main Street America staff, economic development specialists and professionals, as well as through identifying gaps in existing research and secondary datasets. The survey was disseminated to contacts of the Virginia Tech Center for Economic and Community Engagement and all Virginia Main Street communities. Respondents were employed by a diverse array of organizations, including local municipal economic development organizations, regional planning district commissions, chambers of commerce, and private consulting firms, and survey participation can be found in **Table C.1**. Participants also had an option to opt into an interview. These responses were used as the basis by which we selected our preliminary pool of case study communities.

The survey was created to capture existing remote worker attraction programs, community interest in attracting remote workers, as well as developing an understanding of the barriers and drawbacks of an influx of remote workers, and how communities have addressed these challenges. Survey participants provided valuable insights as to how different types of professionals across fields are approaching remote workers. This includes existing attitudes within their respective communities, as well as their degree of professional knowledge and understanding on the topic. A complete list of survey questions can be found in the next section of Appendix **C**. **Figure C.1** identifies the communities that responded to the survey (outlined in black), and their corresponding Go Virginia Regions:

Figure C.1. Community Survey Respondents (Outlined in Black) and GOVA Regions

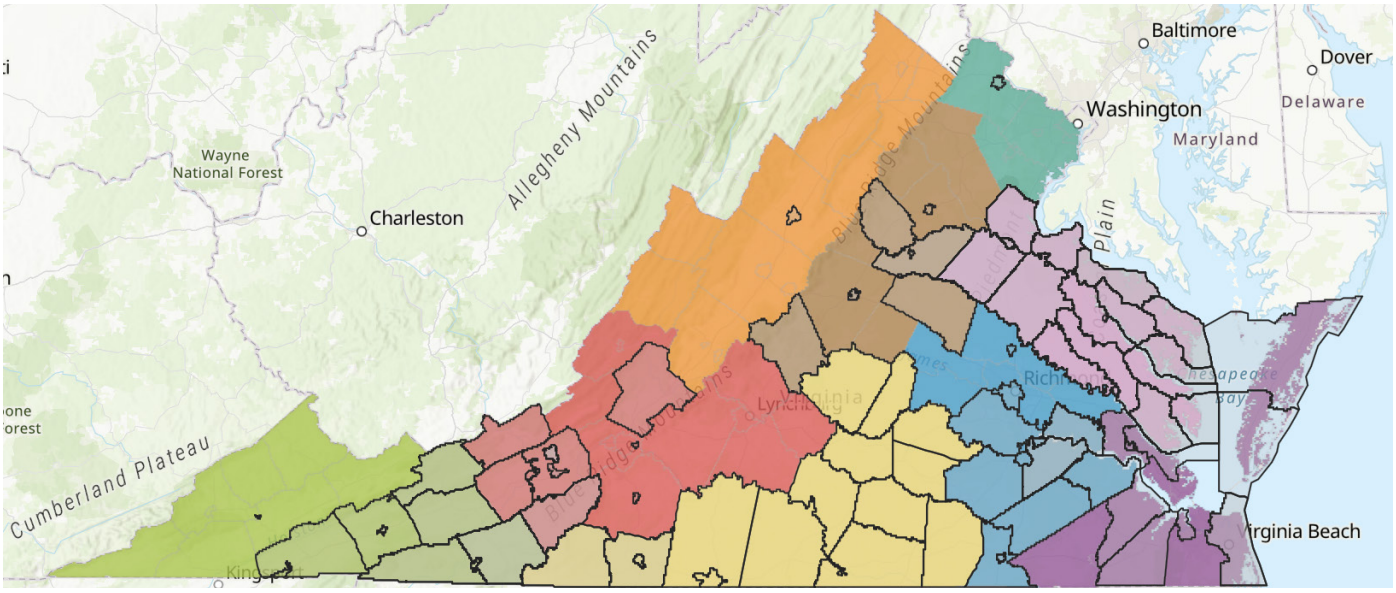



Table C.1 - Survey Participation Statistics

| Survey Participation | Count | Completed / Started |
|---|---|---|
| Completed | 41 | 25.62% |
| Terminates | 0 | |
| Incompletes | 119 | |
| Total Responses | 160 | |
| Viewed | 587 | |

# Survey Questions and Survey Responses

The survey questions are documented below as well as the survey responses in Figure C.2 through Figure C.10.

*The Virginia Tech Economic Development Studio and the Center for Economic and Community Engagement are working with Main Street America and Virginia Main Street to study how communities attract and retain remote workers. We aim to provide recommendations for communities across the urban-rural gradient seeking to attract and retain different types of remote workers while overcoming existing challenges and accommodating sustainable growth. The purpose of this survey is to gather data about remote work in your community, the types of local assets that may attract remote workers and existing/anticipated challenges throughout the remote work transition. It should take you approximately 10 to 15 minutes to complete. Anything you choose to share via this survey will remain confidential and you may withdraw at any time. We sincerely appreciate your input! If you have any questions or concerns, please contact Kit Friedman (kitf420@vt.edu) and Sarah Lyon-Hill, Ph.D. (sarahlh@vt.edu).To see examples of past Studio Courses, see: https://cece.vt.edu/about/studio.html*

What is the name of your organization?

Please enter the name(s) of the locality or localities you serve below:

Please briefly describe the character or 'brand' of your community below:

To what extent is your community concerned with/focusing on attracting and/or retaining remote work and remote workers?

1: Not at all interested
2: Slightly Interested
3: Moderately Interested
4: Very Interested
5: Extremely Interested

To the best of your knowledge, approximately what percentage of your workforce does their jobs remotely?

1. 0-20%
2. 21-40%
3. 41-60%
4. 60-80%

5. >81%
6. Unsure

To the best of your knowledge, approximately what percentage of your workforce holds remote-eligible jobs (jobs that could be done remotely but are hybrid or in-person)?
1. 0-20%
2. 21-40%
3. 41-60%

4. 60-80%
5. >81%
6. Unsure

Please characterize the industries/business hiring remote workers living in your community, as well as industries/business within your community looking to hire remote workers in the space below:

Does your community offer any ongoing incentive programs or marketing initiatives to attract remote workers?
1. Yes
2. No
3. Yes, but it has not been implemented/rolled out yet

---

IF YES OR YES, BUT IT HAS NOT BEEN IMPLEMENTED/ROLLED OUT YET:

Please briefly describe the program below, and include a link to the program website if possible:
What type of remote workers/new residents is your program targeting? (ie. homesteaders, families, recent graduates, knowledge sector employees, etc.)

How many new residents has your program attracted?

How many new residents are you hoping to attract once the program is implemented?
Are there components/metrics to your program that have been more successful in attracting new remote work residents than others? If so, which ones?

What are the primary reasons why your locality wants to attract remote workers? (ie. expanding your tax base, stimulating the local housing market, etc.)

_____

IF NO:

Why not? Please describe below:

_____

If presented with the opportunity/ability to implement a remote worker attraction program, would you?

1. Yes
2. No
3. Maybe

What might your ideal remote worker attraction program look like? What types of remote workers would you aim to attract to your community? (ie. homesteaders, families, recent graduates, knowledge sector employees, etc.)

What types of challenges does your locality face in attracting/retaining residents?

How is your community addressing, or planning to address these challenges?

Please rank the top 5 (non-work related) qualities that attract new residents to your locality (ie. outdoor recreation, proximity to commercial amenities, etc) beginning with #1 below:

#2

#3

#4

#5

Does your community have co-working spaces available?

1. Yes
2. No
3. Not sure

How many?

To the best of your knowledge what percentage of your community has access to reliable internet/broadband?

How would you describe the quality and speed of internet/broadband connection in your locality?

1. Connection is slow; internet is unreliable/lags
2. Connection is okay; internet can reliably handle basic functions, but may lag during periods of high usage

3. Connection is excellent; internet is consistently reliable even during periods of high usage (ie. multiple people streaming, online gaming, on video calls, etc.)
4. My community does not have internet/broadband service

What are the positive and negative implications of the remote work boom on the environmental and infrastructural conditions in your community ? (ie. energy use changes between commercial and residential areas, more homes installing solar panels, fewer vehicle emissions, etc.)

What are the positive and negative implications of the remote work boom on equity in your community? (ie. expanded tax base provides more robust social services, gentrification, food insecurity, housing, etc.)

What are the positive and negative implications of the remote work boom on economic conditions in your community? (ie. exacerbated income inequality, workforce composition, commercial property values, shift to service economy, etc.)

May we contact you for a brief interview to further discuss how your community is adapting to remote work?
1. Yes
2. No

First Name

Last Name

Phone

Email Address

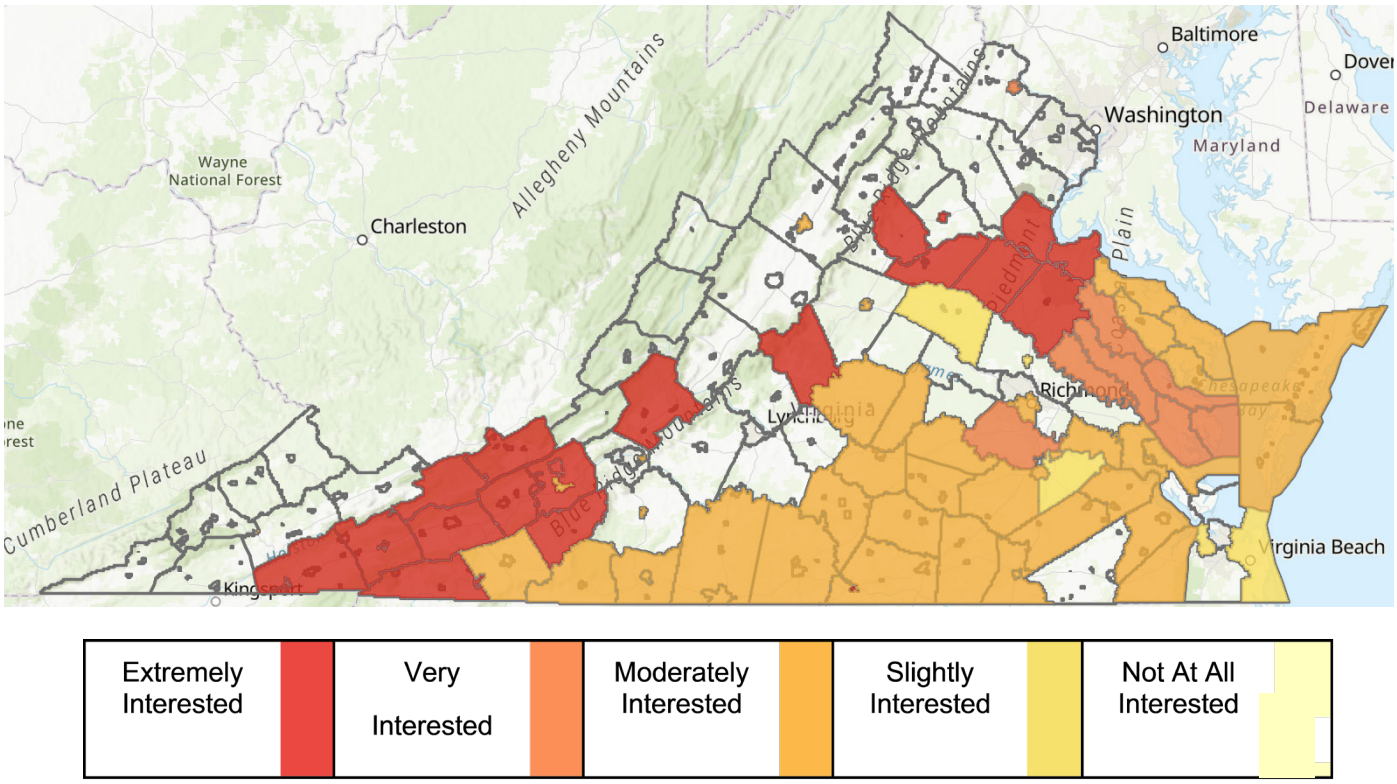



**Figure C.3. Survey Respondent Locality Interest in Attracting Remote Workers**

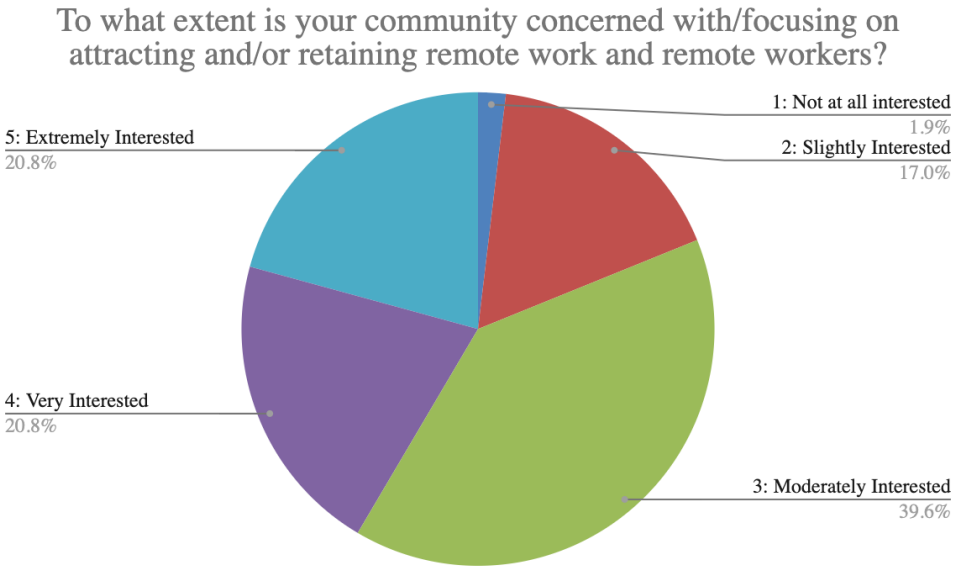


Figure C.4. Survey Respondent Locality Percentage of Remote Workforce

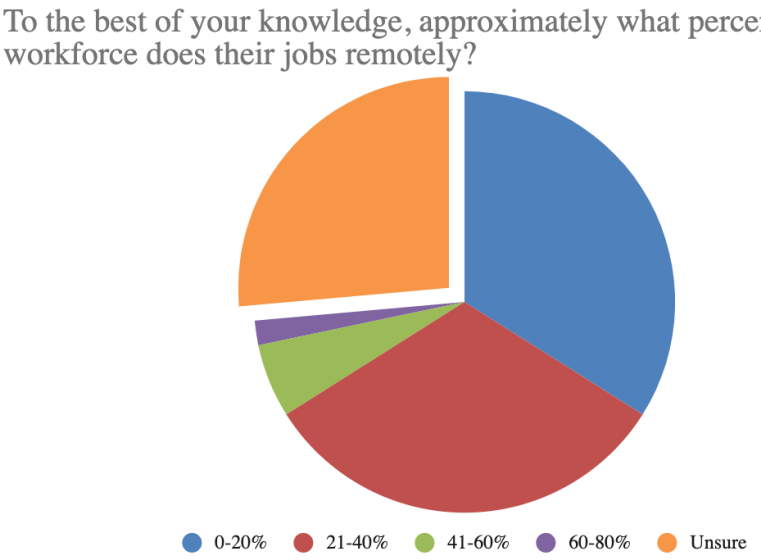
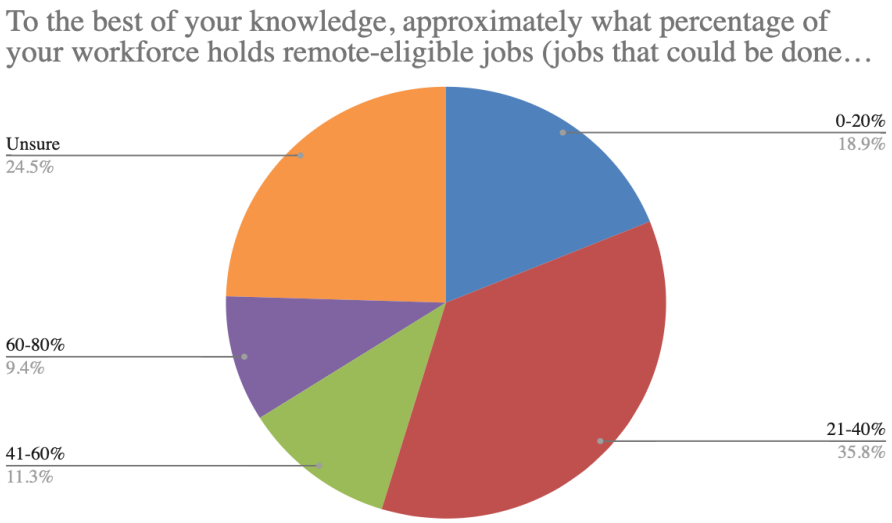
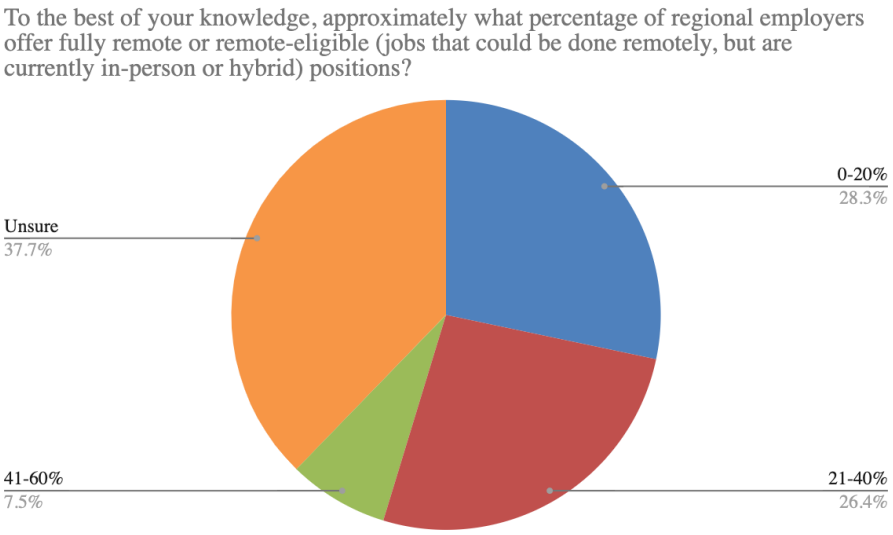


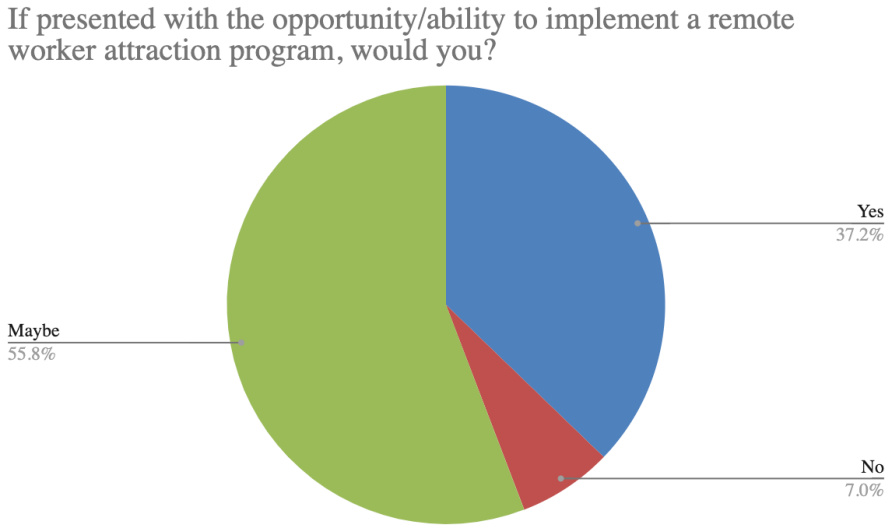

Figure C.5. Survey Respondent Locality Percent Remote-Eligible Jobs



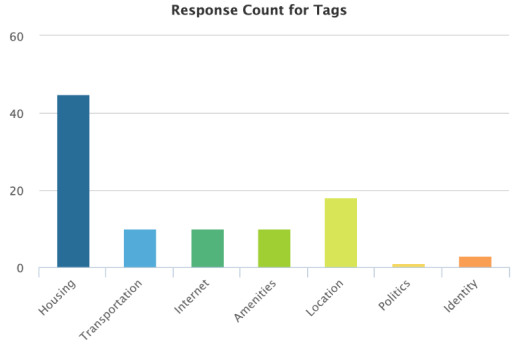
## Figure C.6. Survey Respondent Locality Percent Regional Remote Employers




## Figure C.7. Survey Respondent Interest in Implementing a Remote Worker Attraction Program



## Figure C.8. Survey Respondent Locality Challenges in Attracting/Retaining Residents Textual Analysis




Housing (27) 46 % Delete
**Last Updated on:** Apr 10, 2023
**Keywords:** [housing, real estate, affordable housing, homes, housing market, house, rent, rental, rental units, tenants, tenant, apartment, housing affordability]

Transportation (6) 10 % Delete
**Last Updated on:** Apr 10, 2023
**Keywords:** [transportation, transit, public transit, public transportation, bus, bus system, busses, train, trains, rail, railways, amtrak, light rail, cycling, bicycling, bicycle, pedestrian, walkability, mobility, car, vehicle, roads, road, roadway]

Internet (6) 10 % Delete
**Last Updated on:** Apr 10, 2023
**Keywords:** [broadband, broad band, internet, wireless, wifi, wi-fi, connectivity, connection, cable, cables, high-speed, high speed, bandwidth]

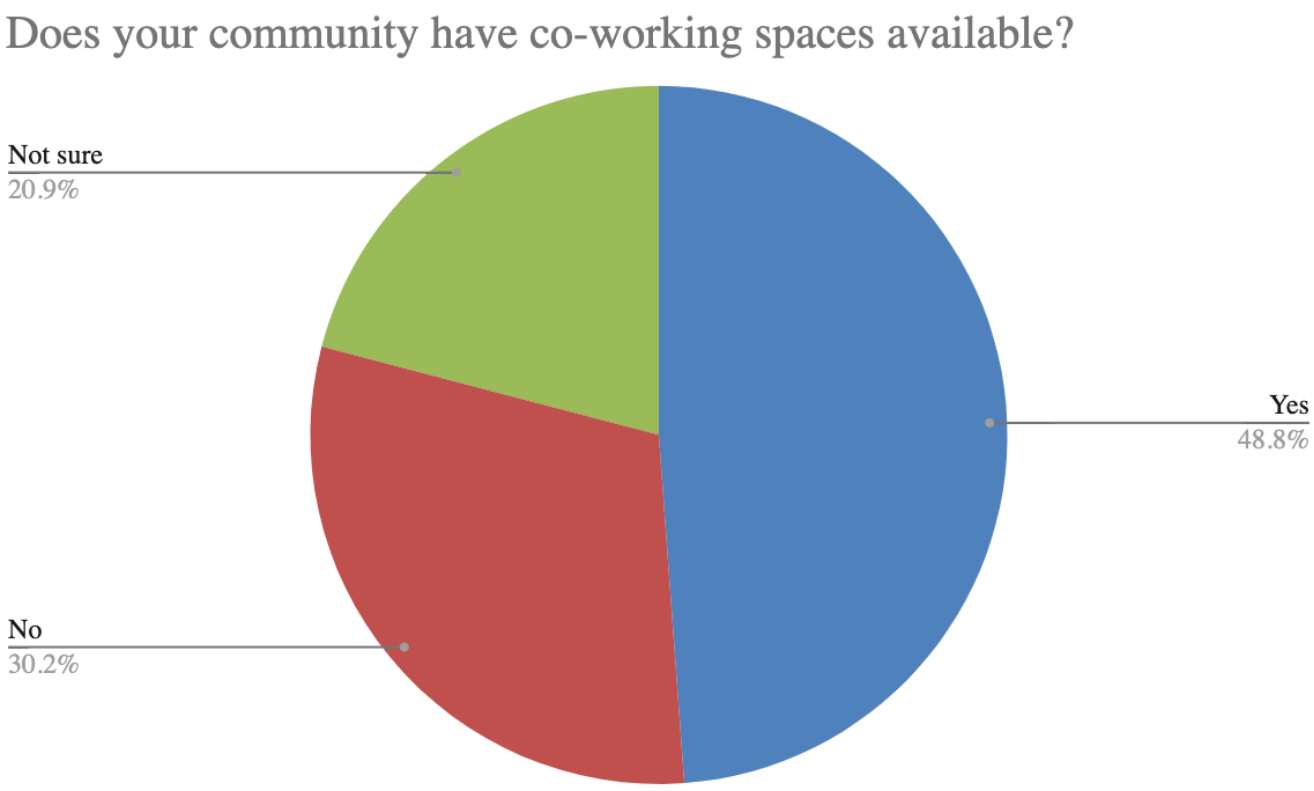
Amenities (6) 10 % Delete
**Last Updated on:** Apr 10, 2023
**Keywords:** [entertainment, shopping, shops, stores, retail, fun, exciting, excitement, boring, dull, commercial]

Location (11) 19 % Delete
**Last Updated on:** Apr 10, 2023
**Keywords:** [city, country, rural, urban, suburban, bedroom community, cities, metro, metropolitan, micropolitan, MSA, far, distance, near, nearby, close]

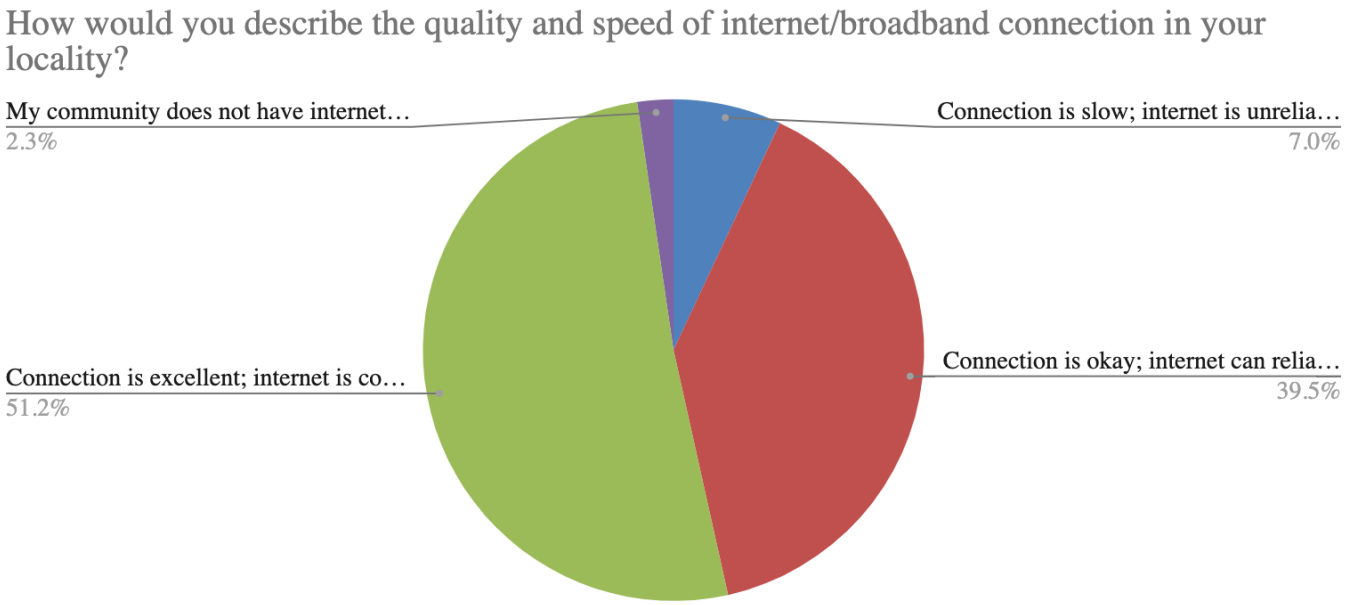
Politics (1) 2 % Delete
**Last Updated on:** Apr 10, 2023
**Keywords:** [liberal, conservative, democrat, democratic, republican, left, leftist, right, left-wing, right-wing, left wing, right wing, politics, political, agenda, party]

Identity (2) 3 % Delete
**Last Updated on:** Apr 10, 2023
**Keywords:** [sexual orientation, queer, lgbtq, lgbtq+, people of color, BIPOC, POC, minority, minorities, marginalized, discrimination, black, african american, hispanic, latino, latina, asian, APIDA, race, racism, racial, ethnicity, ethnic]

## Figure C.9. Survey Respondent Coworking Space Availability



## Figure C.10. Survey Respondent Internet/Broadband Connection Quality



# Appendix D: Case Study Community Narratives

## Case Study Design and Selection

Case studies are a form of qualitative descriptive research that collects and presents information on a particular individual or group, using information from the subjects themselves through primary data collection, to draw conclusions about that specific subject.[73] Emphasis is placed on description and exploring that specific subject. Data is collected through observations, interviews, examinations of records, and other methods to use a mixed-methods approach.

There are many types of case studies; this study uses the illustrative case study framework. These are primarily descriptive and describe what a situation is like; they are used to provide further detail on what is happening. In this study, illustrative case studies will be used to highlight the potential for remote work attraction in nine communities across the state of Virginia, how remote work is different depending on the location of that community and whether it is more urban or rural, and what challenges and opportunities exist for remote work in that community for the future.

Multiple methods were used to conduct the case studies. These methods include interviews, survey results, and data collection through secondary research and literature reviews. The participants for the case studies were selected due to their interest in being further interviewed after completing a survey on remote work. These participants also represent a geographically stratified sample, representing seven GOVA regions and across the urban-rural spectrum. Interview responses will be key components of the case studies to better understand how that community is currently addressing remote work and to answer the research questions proposed.

Brereton et al. (2008)[74] developed a basic case study protocol template to ensure a consistent process when developing case studies. The protocol should include an overview of the case study project, the procedure for choosing subjects, the questions and data collection methods, and a guide to use when writing the report. Applicable parts of the protocol are adopted in this methodology to ensure that case studies are consistent:

- Introduction
- Criteria for case selection, why this locality was selected
- Background
- Identify previous research on the topic, either in general or for this specific locality
- Define the main research question being addressed in the study

73. Colorado State University. (n.d.). Guide: Designing and Conducting Case Studies. Writing@CSU. https://writing.colostate.edu/guides/guide.cfm?guideid=60
74. Brereton, P., Kitchenham, B., Budgen, D., & Li, Z. (2008). Using a Protocol Template for Case Study Planning.

- Data collection
- Identify the data collected
- Survey, interviews
- Secondary data, literature
- Analysis
- Interpretation of survey and interview data
- Utilizing relevant secondary data and literature
- Recommendations and Conclusions

# Case Study Narratives

## *Region 1: Town of Marion, Smyth County*

# *Region 1: Town of Marion, Smyth County*

## *Overview and Background*

The town of Marion is located in Smyth County within GOVA Region 1 in southwest Virginia. In 2021, the population in Marion was 5,817, having a 1.9% increase from 2019, but a 3.6% decrease since 2010.[75] The county population in 2021 was 29,960, experiencing a 7.5% decrease in population since 2010. In 2021, the median income in Marion was $33,250, which is lower than the county's median income of $42,588.[76] The median home value in the county in 2021 was $108,100, which is the lowest out of the case study regions analyzed. In Marion, 50.8% of housing units are rented,[77] with 32.8% of the population paying over 35% of their gross income in rent.[78] The vacancy rate in Marion is 16.4%.[79]

In Marion, 88.2% of the population is white, and 7.2% are black. The population is also 2.7% Hispanic or Latino. Marion has a large older population, with 21.4% of residents being over the age of 65; 27.3% of households also have one or more people under the age of 18.[80] Most of the population has at least a high school diploma, with 82.8% being a high school graduate or higher, and 18.2% having achieved a bachelor's degree or higher.[81]

Marion has experienced a 1.9% increase in working from home since 2019, with 5.2% of the population working from home. For Smyth County, 4.7% of the population works from home, showing a slightly higher WFH percentage in the town. In December 2022, the unemployment rate in Smyth was 2.51%, decreasing from 4.93% five years earlier.[82] Top industries in the county with a higher concentration than the national average include government, manufacturing, administrative support and waste management and remediation services, retail trade, and health care and social assistance.[83]

When asked to describe the brand of their community, survey respondents stated that Marion is a small town known for Song of the Mountains: The Official Television Series of Virginia, the soft drink Mountain Dew, live music festivals, the historic Lincoln Theatre, Hungry Mother State Park, and a vibrant downtown. Marion is a Virginia Main Street community at the Advancing Main Street tier, and was also a selected community for the VMS Remote Work Pilot Study, which aimed to discover the

75. United States Census Bureau. (2023) "American Community Survey Table S0101." https://data.census.gov/
76. United States Census Bureau. (2023). "American Community Survey Table S1901." https://data.census.gov/
77. United States Census Bureau. (2023). "American Community Survey Table S2501." https://data.census.gov/
78. United States Census Bureau. (2023). "American Community Survey Table DP04." https://data.census.gov/
79. United States Census Bureau. (2023). "American Community Survey Table B25002." https://data.census.gov/
80. United States Census Bureau. (2023). "American Community Survey Table S1101." https://data.census.gov/
81. United States Census Bureau. (2023). "American Community Survey Table S1501." https://data.census.gov/
82. Lightcast. (2022). "Regional Overview." https://lightcast.io/
83. Lightcast. (2022). "Regional Overview." https://lightcast.io/

potential of remote work in the town and how the capability for remote work could be improved.

### *Analysis on Marion*

Marion is interested in remote worker attraction mainly due to the trend in population loss many rural counties face. There is interest in reversing that trend, especially due to the county having an aging population. An increase in both workers and services to support those workers are needed.

Smyth County completed a visitor profile which studied leisure and business travelers into the county. The findings concluded that the two main attractions to the area are the scenic natural beauty and the warmth and friendliness of the community. Another driver is cost of living. An interviewee stated that from Smyth County's comprehensive plan, the median home cost is less than half of a comparable home in an urban area such as Northern Virginia. In 2021, Smyth County's median home cost was $108,100, while in Fairfax County the median was $594,500, showing a large difference in home costs between the two regions.[84] This can be a motivator for remote workers to move elsewhere.

The town of Marion believes they have the capability of building on local coffee shops and office spaces to create a plethora of coworking spaces of remote workers. The Henderson Appalachian School has that potential, as there are already office spaces which remote workers utilize and could be expanded. For the region, remote worker attraction can assist in raising the standards of living by bringing more income and higher-wage workers into the region.

Two interviewees stated that there are good amenities that can attract residents in Marion, such as the recreational outdoor assets. The town must consider what people would want to do when they are not working and prioritize those types of attractions, such as state parks, hiking trails, the Historic Lincoln Theatre, and community events. By using these recreational assets to attract residents, it can have a positive impact on the standard of living, which can improve the community, leading to further attraction. An influx of workers can have many positive effects on the town; one interviewee stated:

*"The possibilities are endless. From having a solid tax base, to having children in schools, to soft tangential things such as having folks come for community events and participate in civic and volunteer organizations. In a rural area, you are missing folks in their active years to be running for leadership positions. It is hard to even quantify the positive effect it would have for us."*

Typically, remote workers in Smyth are those who are already well-established in their careers. The interviewee believed that young professionals may not seek out rural places to relocate to as there is a lack of network opportunities, cross-pollination, and natural synergies that occur when based in an urban area with a research university. Workers who may be interested in Smyth are those who have already made those connections in their career and have an established client base, so they prioritize quality of life over professional advancement.

84. United States Census Bureau. (2023). "American Community Survey Table DP04." https://data.census.gov/

However, there is uncertainty around tracking information on remote workers in the county. Interviewees stated that this information is difficult for them to track; they compared it to tracking immigration numbers, as once these residents arrive, it is challenging to track where they end up. The capacity to collect this information at the local level is a challenge for smaller communities due to lack of personnel and resources to access this information. The main method of finding remote workers is to run into them on the street or local events. Hosting events to target remote workers could be one method to build on what Marion already does to connect.

The interviewee also stated remote employers would not necessarily be beneficial for the county, as the top industries in Smyth are agriculture, government, and manufacturing. Not all of those are remote compatible, and not attracting those companies that typically have remote workers such as professional services and information technology may be a challenge for the county. Remote employers are not something the county is prioritizing.

When looking at the overall region, one interviewee stated that rural areas are forgotten in so many cases. The divide between rural and urban regions can have an impact on understanding change, such as adapting to remote work and the infrastructure changes that must come with that. Frustration was expressed around rural areas not taking advantage of programs that exist that are targeting rural areas.

Many different concerns and challenges were discussed. Without improved broadband, remote worker attraction is difficult to achieve; however, Smyth is hoping that by late August 2023, broadband will be expanded to every 911-address in the county. With that, the interviewee stated that in many communities in Region 1, there is a lack of policy officials on staff to work on issues that can improve the overall community, such as broadband or housing. Having the information available and the best practices accessible is important for these communities that may lack the resources to do the research; the National Main Street Program was stated as one such beneficial resource.
Housing is also a concern in Marion. The town has not had new homes built since the 60s or 70s; however, the town is working on a feasibility study to improve housing projects, coworking spaces, and entrepreneurial support within the town. The Blighted, Abandoned, Unused, and Derelict (BAUD) program is another way the town is working to improve these concerns. Homes that fall within these categories are being purchased and improved so the buildings can be used. The town also is working on a Veterans Housing program, which includes younger, recent veterans that could possibly fall into a remote worker category.

The final concern is cultural changes that can result from having an influx of new residents. All three interviews mentioned this as a challenge in Marion. The interviewee stated that in order to have a healthy community, it needs a diverse mix of people and families and to be open to welcoming in new residents. There is an unspoken tension because residents desire an economic boost and growth, but they do not want to change their way of life or see demographic changes with new residents. Ensuring that there is not a divide between those moving into

the community and those who have deep roots in that town is a challenge many communities, especially rural ones, may face with an influx of remote workers.

### *Conclusion*

Participating in the VMS pilot study showed Marion that there is potential for remote work downtown, but challenges must be addressed in order to do so. Due to the rural nature of the community, the cultural challenges are the most unique to Marion compared to the other case study communities. Eliminating the divide between new arrivals and long-time residents will be necessary to create a welcoming environment and greater connection throughout the community. Although other challenges exist such as housing and broadband, the county is making strides to address them. The Smyth County Board of Supervisors has approved a recommendation from the American Rescue Plan Act (ARPA) committee to provide $3,000,000 in funding to spur housing development in the county, which will build approximately 100 new homes to the county.[85] Actions such as this can improve the landscape for remote workers, attracting residents interested in living in a rural area with the necessary infrastructure available to conduct work remotely.

85. Smyth County. (2023). "*Smyth County ARPA Committee and Smyth County Board of Supervisors Approve $3 Million in Funding for Housing in Smyth County.*"

## Case Study Narratives

# *Region 2: Town of Vinton, Roanoke County*


*Downtown Vinton.* Photo by Warfieldian. *Wikimedia Commons.*

# *Region 2: Town of Vinton, Roanoke County*

## *Overview and Background*

The town of Vinton is located in Roanoke County within GOVA Region 2, located outside of the city of Roanoke. In 2021, the population in Vinton was 8,039 having only a 0.5% decrease from 2019, and a 0.4% decrease since 2010, showing little population change.[86] The county population in 2021 was 96,303, experiencing a 5.2% increase in population since 2010. In 2021, the median income in Vinton was $56,829, which is lower than the county's median income of $74,622.[87] The median home value in the county in 2021 was $215,800. In Vinton, 43.9% of housing units are rented,[88] with 24.7% of the population paying over 35% of their gross income in rent.[89] The vacancy rate in Vinton is 7.9%, which is low compared to towns such as Marion and Clarksville.[90]

In Vinton, 89.3% of the population is white, and 3.4% are black. The population is also 3.3% Hispanic or Latino. Vinton has a large population under the age of 18, with 21.4% being under 18 and 30.8% of households having one or more people under 18 years old. This is much higher compared to Clarksville, where only 19.7% of households have one or more people under 18 years old. Also, 18.6% of residents are over the age of 65.[91] Most of the population has at least a high school diploma, with 86.7% being a high school graduate or higher, and 19.3% having achieved a bachelor's degree or higher.[92]

Vinton has experienced a 5.4% increase in working from home since 2019, with 9.4% of the population working from home in 2021. This is almost twice as high as Marion's WFH percentage. For Roanoke County, 10.5% of the population works from home, having the highest WFH population out of the case study communities analyzed. In December 2022, the unemployment rate in Smyth was 2.33%, decreasing from 3.37% five years earlier.[93] Top industries in the county with a higher concentration than the national average include health care and social assistance, government, retail trade, manufacturing, and professional, scientific, and technical services, which can offer opportunities for remote work.[94]

When asked to describe the brand of their community, survey respondents described Vinton as a small urban town in a mountain-metro mix. Industries that may want to hire remote workers in

86. United States Census Bureau. (2023). "American Community Survey Table S0101." https://data.census.gov/
87. United States Census Bureau. (2023). "American Community Survey Table S1901." https://data.census.gov/
88. United States Census Bureau. (2023). "American Community Survey Table S2501." https://data.census.gov/
89. United States Census Bureau. (2023). "American Community Survey Table DP04." https://data.census.gov/
90. United States Census Bureau. (2023). "American Community Survey Table B25002." https://data.census.gov/
91. United States Census Bureau. (2023). "American Community Survey Table S1101." https://data.census.gov/
92. United States Census Bureau. (2023). "American Community Survey Table S1501." https://data.census.gov/
93. Lightcast. (2022). "Regional Overview." https://lightcast.io/
94. Lightcast. (2022). "Regional Overview." https://lightcast.io/

Vinton include tech-based companies as well as some larger financial institutions and other service-based industries, which aligns with the county-level industry data. Vinton has many restaurants, and retail and manufacturing companies, which may not necessarily align with remote work, but having businesses in these industries assists with downtown development as well as places to go for remote workers relocating to the area. A town lacking in restaurants and retail may not be attractive for workers looking to move. Vinton is a main street community at the Emerging Main Street tier.

### *Analysis on Vinton*

Vinton was interviewed to discuss remote work in the Roanoke County region. Vinton is interested in remote work and has noticed how it has become more popular across the country, especially since COVID impacted many businesses. They recognize that it is important to have the assets and infrastructure in place to attract remote workers and be a competitive community in the region and the United States. Despite this interest, the interviewee recognized that in order to invest in those remote work-related assets and infrastructure, there needs to be a need for remote work in Vinton and currently they don't believe there is one. The interviewee stated that they don't have much of a need because they don't have many technology-based businesses or large businesses with employees working at a desk. Primarily, Vinton has some manufacturing, restaurants, retail, and other service-based jobs like health care that involve in-person activities.

In terms of amenities, the interviewee described Vinton as having a charming small-town feeling, nice greenway system, nice downtown and a variety of restaurants, shops, and events that people come to enjoy.

The topic of lack of access to information about remote workers was also discussed. While the interviewee was aware of a daily net flow of -972 people entering and leaving Vinton for work, they were not aware of how many individuals live in Vinton but work remotely during the day.

When asked whether there were any challenges or cultural issues they anticipated would arise from remote work, it was noted that infrastructure becoming overburdened could be a concern. The interviewee also noted that there could be some cultural pushback to remote work and described a balance of having to plan for current residents, future residents, and residents that are children now and will grow up to live in the community. The interviewee noted a unique challenge of Vinton is its small size. Vinton is three square miles in size and its topography can be challenging to work with. They don't have the leisure of having empty greenfields that can be new developments. As a result, redevelopment must be creative, and the balancing of needs of new residents and old residents has to be considered. An example of this is revisiting zoning to increase building height limits and converting housing to multifamily housing. Also, housing has to be built to accommodate aging populations that may be moving from single family housing to other kinds of housing.

*Conclusion*

Vinton has unique challenges that other case study communities may not face. The small size of the town while also being located in the larger Roanoke metro area may require the town to consider creative solutions regarding new developments and accommodating an influx of remote workers. Without a current demand to accommodate remote workers, the necessary infrastructure may not be in place. The town is interested in being competitive in remote worker attraction, and with a high population in Roanoke County already working from home, the town can take advantage of techniques already used within the county to not only attract workers but also provide them with the necessary infrastructure to do their work. Although Vinton may not have high employment in remote-compatible jobs, ensuring support industries such as retail and service industries are well-established can help attract remote workers to the area, as they can see the employment landscape is strong and there are many things to do in Vinton. There is great potential for remote work in Vinton, once the plan is set into motion.

## Case Study Narratives

# *Region 3: Town of Clarksville, Mecklenburg County*


*Clarksville Welcome Sign.* Photo by Idawriter. *Wikimedia Commons.*

# *Region 3: Town of Clarksville, Mecklenburg County*

## *Overview and Background*

The town of Clarksville is located in Mecklenburg County within GOVA Region 3. The town is located along the Roanoke River and Buggs Island Lake, which attracts visitors and tourists to Clarksville for the outdoor amenities.[95] In 2021, the population in Clarksville was 1,542, making it the smallest town analyzed, experiencing an 11% increase in population since 2019. The town had a 26.4% population increase since 2010, experiencing massive growth for a small town.[96] The county population in 2021 was 30,347, experiencing a 7.4% decrease in population since 2010. Interestingly, the town experienced much larger growth than the overall county. In 2021, the median income in Clarksville was $48,125 which is higher than the county's median income of $46,378.[97] The median home value in the county in 2021 was $146,200. In Clarksville, 29.7% of housing units are rented, which is significantly lower than Marion and Vinton.[98] The vacancy rate in Clarksville is 24.4%, with 66.5% of that being vacant for seasonal, recreational, or occasional use, showing the impact seasonality has on the housing market.[99] The county has the highest vacancy rate for seasonal use out of the case study communities analyzed, at 65.7%, as Mecklenburg is the only community analyzed that falls into the resort town, rural category.

In Clarksville, 79.2% of the population is white, and 17% are black. The population is also 2.15% Hispanic or Latino.[100] In Clarksville, 19.7% of households have one or more people under 18 years old, which is lower than the other two towns analyzed.[101] Clarksville has the highest percentage of the population with a bachelor's degree out of the towns analyzed at 34%.[102]

Clarksville has experienced a 5.2% increase in working from home since 2019, with 12.9% of the population working from home in 2021. This is the highest WFH percentage out of both the towns and counties analyzed. For Mecklenburg County, 6.5% of the population works from home, showing a large difference between those working from home in the county and those working from home in the town. In December 2022, the unemployment rate in Mecklenburg was 3.17%, decreasing from 4.84% five years earlier.[103] Top industries in the county with a higher concentration than the national average

95. Clarksville, Virginia. (2023.) "The History of Clarksville Virginia." https://clarksvilleva.org/the-history-of-clarksville-virginia/#/
96. United States Census Bureau. (2023). "American Community Survey Table S0101." https://data.census.gov/
97. United States Census Bureau. (2023). "American Community Survey Table S1901." https://data.census.gov/
98. United States Census Bureau. (2023). "American Community Survey Table S2501." https://data.census.gov/
99. United States Census Bureau. (2023). "American Community Survey Table B25002." https://data.census.gov/
100. Data.io. (2022). "Clarksville, VA." https://datausa.io/profile/geo/clarksville-va#demographics
101. United States Census Bureau. (2023). "American Community Survey Table S1101." https://data.census.gov/
102. United States Census Bureau. (2023). "American Community Survey Table S1501." https://data.census.gov/
103. Lightcast. (2022). "Regional Overview." https://lightcast.io/

include health care and social assistance, government, retail trade, accommodation and food services, and manufacturing.[104]

When asked to describe the brand of their community, survey respondents described Clarksville as a rural small town and Virginia's only Lakeside Town. Clarksville provides a hometown feel with many outdoor parks, events, and water sports. This description of the town may be attractive to remote workers seeking amenities and outdoor recreation opportunities. Clarksville is a Mobilizing Main Street community, the only one analyzed at this tier.

### *Analysis on Clarksville*

Mecklenburg County was interviewed to discuss the potential of remote work for the larger county. The town was not interviewed due to time constraints, but Mecklenburg provided a regional perspective on interest in remote worker attraction. Overall, remote work is not something the county is prioritizing. It was stated that the county would not be interested in remote worker attraction in the near future, as it would be such a small number of people they would attract. If the town of Clarksville was interested in remote worker attraction, the county would support it, but the technical knowledge on how to do so is limited in the county. The county's priority is attracting larger groups of people, not just one or two remote workers. Likewise, tracking information on these populations is unknown to the county. If a survey was proposed, how would the county administer it? The county believes this would be difficult, and the results may not be large enough to be useful.

The county is also not interested in recruiting remote employers. Industrial manufacturing is a top industry in Mecklenburg, which would be challenging to have remote workers employed in. The county also requires a certain percentage of employees to be in-house workers. The county wants to make sure they live in the community, pay taxes; they are not in favor of a large percentage being remote workers.
The attraction to Mecklenburg and Clarksville for remote workers includes the slower pace of life. The traffic is limited, with some towns having only one stop light. There are amenities like the lake, trails, camping, four wheeling, and other activities you can't do in an urban area.

A main challenge in the county is broadband access. Full connectivity in the county will not be completed for another 3-5 years. Housing is the other concern; Microsoft came in 2010, and since then housing has been an issue. The county previously conducted research to create a back office for remote workers to come and work. They wanted to draw people from Northern Virginia, but it did not work. There wasn't enough people in the DC area who wanted to uproot and move there, so the project failed.

The county closed by stating:

*We are happy to have anyone move, but I don't know how you find them, other than a broad marketing campaign that says come here! If they do move, how would you even know they did it?*

104. Lightcast. (2022). "Regional Overview." https://lightcast.io/

*Conclusion*

One weakness of this case study is that the town of Clarksville was unable to be interviewed, resulting in only a county-level perspective. Although the county expressed minimal interest in remote work attraction at this time, they would be interested in supporting the town, if that is something they are interested in. The town expressed via survey that they are in the investigation phase for remote worker attraction; by developing this interest further and drawing on the amenities located in Clarksville, remote workers may be interested in the town. The town already has a high percentage of workers working from home, so by further expanding broadband access and other infrastructure needs, Clarksville has potential to attract remote workers who are amenity seekers.

## Case Study Narratives

# *Region 4: City of Hopewell, Prince George County*

*The "Big H." Gateway to the City of Hopewell.* Photo by Floyd Lark. *Wikimedia Commons.*

# *Region 4: City of Hopewell, Prince George County*

## *Overview and Background*

The independent city of Hopewell is located in Prince George County in GOVA Region 4, located at the confluence of the Appomattox and James Rivers. Hopewell and Prince George County are within the Richmond Metropolitan Statistical Area, just a twenty-minute drive from the capital. This area is unique in that it is characterized by the rural, small-town nature of the community, while also being very near to Richmond and the Hampton Roads area. In 2021, the population in Hopewell was 23,020, having a 2.5% increase from 2019, and a 2.3% increase since 2010.[105] The county population in 2021 was 42,170, experiencing a 20% increase in population since 2010, the largest increase out of the case study communities analyzed. In 2021, the median income in Hopewell was $44,209, which is lower than the county's median income of $78,895.[106] The median home value in Hopewell in 2021 was $127,300, which is comparatively lower than the other case studies, while Prince George County has a median home value of $231,000. In Hopewell, 50.2% of housing units are rented,[107] with 42.1% of the population paying over 35% of their gross income in rent.[108] The vacancy rate in Hopewell is 10.8%.[109] The vacancy rate in the county is low, at 5.6%. Hopewell itself is largely a bedroom community, supplying just over 8,000 jobs to its over 23,000 residents.

In Hopewell, 47.4% of the population is white, and 44.3% are black. The population is also 8.6% Hispanic or Latino. The population in Hopewell is one of the most diverse out of the case study communities. Hopewell has 14.6%% of residents being over the age of 65, while 31.1% of households also have one or more people under the age of 18.[110] Most of the population has at least a high school diploma, with 85.2% being a high school graduate or higher, and 11.4% having achieved a bachelor's degree or higher.[111]

Hopewell has experienced a 3.5% increase in working from home since 2019, with 5.4% of the population working from home. For Prince George County, 7.2% of the population works from home, showing a slightly higher WFH percentage than the independent city. In December 2022, the unemployment rate in Prince George County was 3.23%, decreasing from 4.42% five years earlier.[112] Top industries in the county with a higher concentration than the national average include government, transportation and warehousing, accommodation and food services, retail trade, and construction.[113]

105. United States Census Bureau. (2023). "American Community Survey Table S0101." https://data.census.gov/
106. United States Census Bureau. (2023). "American Community Survey Table S1901." https://data.census.gov/
107. United States Census Bureau. (2023). "American Community Survey Table S2501." https://data.census.gov/
108. United States Census Bureau. (2023). "American Community Survey Table DP04." https://data.census.gov/
109. United States Census Bureau. (2023). "American Community Survey Table B25002." https://data.census.gov/
110. United States Census Bureau. (2023). "American Community Survey Table S1101." https://data.census.gov/
111. United States Census Bureau. (2023). "American Community Survey Table S1501." https://data.census.gov/
112. Lightcast. (2022). "Regional Overview." https://lightcast.io/
113. Lightcast. (2022). "Regional Overview." https://lightcast.io/

When asked to describe the brand of their community, survey respondents stated that Hopewell is a smaller city with most jobs being in government work. Prince George County was described as having a growing population, a growing industrial base, and being strategically located off of Interstate 95 with low unemployment. It is a growing bedroom community with good schools, but needs improved infrastructure.

### *Analysis on Hopewell*

For Hopewell, the city is interested in attracting remote workers because they are trying to revitalize the downtown. One interviewee stated that from being a member of the VMS program, they have learned that there are benefits to aggregating remote workers into downtown areas as they will contribute to the vitality of the downtown. This will then in turn attract more people into the downtown. Hopewell has an advantage being within the Richmond MSA; the city is located near a major growing area that is receiving a population influx, and Hopewell can gain spillover effects from having an increase in visitors and relocating residents as well.

Those who live in a congested metropolitan area oftentimes aspire to live in a more rural area, one interviewee said. Many people move to Prince George due to the quiet enjoyment of life, school systems, and housing affordability. The issue is once they arrive, many times they desire the amenities they were used to back in their urban areas, which can be an initial challenge for rural communities. There is a perception that remote workers desire urban amenities even after they move away from urban areas; Hopewell aims to find a way to market to those who aren't the typical urbanite and who maybe once moved away from the region and are looking to return. Surrounding areas such as Danville or Salem are marketing to them, and Hopewell hopes to do the same. The largest demographic in Hopewell is younger families; 31.1% of households in Hopewell have one or more people under the age of 18.[114] There is a desire to plant roots in the city and benefit from being on the waterfront and having a more affordable cost of living than Richmond. Marketing this can be an opportunity for the city to attract remote workers with families.

The attractions of moving to Prince George County and Hopewell largely include quality of life, strategically located two hours from D.C., beaches, and mountains, as well as low real estate and property taxes compared to the state. The school system, local history, rivers, and parks are other attractions. Hopewell is one of 15 communities across the country that secured a grant to support WiFi all throughout downtown for free, as well as in some arts organizations and reduced income housing. Accessibility of broadband, once implemented, would also make the city attractive for remote workers. But, one interviewee stated that the data from FCC on broadband connectivity is not entirely accurate. As opposed to the statistics, which state that 83.3% of the county has broadband subscription, the interviewee estimated that 70% of the county is covered while 30% is unserved and underserved. Understanding this data

114. United States Census Bureau. (2023). "American Community Survey Table S1101." https://data.census.gov/

and recognizing that availability is not accessibility was a key point motioned, as the data can be misleading without a local situational understanding.

Similar to Marion, the interviewee suggested that there may be cultural challenges due to a perception that those who work remotely may be more introverted and less interested in joining local organizations and being involved in the community. The cultural differences between locals and those moving in may be difficult to navigate. They stated that if you have attracted remote workers who are not engaged, then it will have little benefit to the community. Likewise, having a political environment where some citizens accept growth and others oppose change can be a challenging climate to navigate; the balance of rural conservation and growth is key. However, this is only a perception, and the opposite could be true: if you are working remotely, you may have more flexibility and interest in being involved. Hopewell relies on civic engagement and volunteerism, so ideally if residents are moving in, they can be incorporated into city activities. In fact, one study from the Brookings institute suggests otherwise. In a survey of over 1200 Tulsa Remote participants–Tulsa, Oklahoma's remote worker attraction program–researchers found that incoming remote workers are 21.9% more likely to participate in volunteer service, 17.6% more likely to engage with local organizations, 8.7% more likely to patronize small businesses, and 8.9% more likely to engage in conversations about discrimination[115].

Reasons mentioned in interviews on how remote workers can positively contribute to Hopewell include not burdening the roads due to less commuting, as well as the potential upskilling of residents due to new occupations or training that previously did not exist in the city. This would eventually create greater awareness of these types of jobs to existing residents. One interviewee stated that Hopewell is unique in that it is an approachable, welcoming community with a variety of residents, which can be attractive to those relocating there. Also, there could be greater potential to have people living in Hopewell and working elsewhere, rather than living outside of the county and commuting in, capturing greater revenue and taxes.

The community has also suffered from brain drain; one goal of Hopewell is to reduce that trend and ensure there is both a balance of people and resources for them. When trying to target a certain demographic, the repercussions on the larger community must be considered. Housing and gentrification are huge risks that may come from this, especially as the region is currently facing a deficiency in housing quantity and affordability. Capacity issues in infrastructure are also prohibiting growth in housing. Cost of doing business with labor and materials is an additional challenge. Also, having spaces that can be used for coworking spaces and meeting spots is a challenge, but one the city is addressing. Building incubators and flexible spaces has been an interest, but a lack of density decreases the need for a quantity of spaces.

115. Choudhury, P., Starr, E., & Teodorovicz, T. (2022, September 15). *Work-from-anywhere as a public policy: 3 findings from the Tulsa Remote Program.* Brookings. Re-trieved March 30, 2023, from https://www.brookings.edu/research/work-from-anywhere-as-a-public-policy-three-findings-from-the-tulsa-remote-program/

Fort Gregg-Adams, a large army base, is also located in Prince George County; the rapid expansion of the base over the last five years has resulted in an influx of newcomers to the area. The presence of Fort Gregg-Adams is an opportunity for industry to attract remote workers. There are existing contractors at the base; however, an interviewee stated that the military shares very little about where their employees are living and if they are allowing remote work. With tracking remote workers, one recommendation was a survey to each residence or a business roundtable to familiarize the county with the needs of workers.

Hopewell is a VMS community at the Advancing Virginia Main Street level, the highest level, and is thoroughly involved with the program. The city has used a downtown investment grant to build bike racks and murals downtown, and is now working on an industrial revitalization fund. The city has acquired numerous grants from VMS to support new businesses, street festivals, bootcamps for small scale developers, and reform alleys downtown. The resources offered by VMS can be beneficial to these smaller cities with the access to additional funds, connections to other VMS communities, and mentorship to improve attraction and development.

## *Conclusion*

Hopewell has many assets to offer remote workers, and has already taken advantage of VMS resources to advance its downtown. Issues that must be addressed include housing, infrastructure, and broadband, which is a reminder that availability of these services does not equate to accessibility and many parts of the community may still be lagging behind. Continuing to advance downtown, as Hopewell has been doing, can offer opportunities to attract more people there, especially if the surrounding county is experiencing substantial population growth. Advancing the resources necessary to support remote workers could draw them into Hopewell where they can have access to urban amenities downtown, as well as recreational activities surrounding the city.

# Case Study Narratives

## *Region 5: Isle of Wight County*

*Main Street in Smithfield, VA.* Photo by Corvokarasu. *Wikimedia Commons.*

# *Region 5: Isle of Wight County*

## *Overview and Background*

Isle of Wight County is within GOVA Region 5 located in the Hampton Roads region. In 2021, the population in Isle of Wight was 38,301, having a 4.6% increase from 2019, but a 10.2% increase since 2010.[116] The county has experienced significant growth.

In 2021, the median income in Isle of Wight was $84,673, which is the highest median income out of the case study communities analyzed.[117] The median home value in the county in 2021 was $280,600, which is also the highest out of the case study regions analyzed. In Isle of Wight, 22.1% of housing units are rented,[118] with 33% of the population paying over 35% of their gross income in rent.[119] The vacancy rate in Isle of Wight is 7.6%.[120]

In Isle of Wight, 72.6% of the population is white, 23% are black, and 1.1% are Asian. The population is also 4.2% Hispanic or Latino. Isle of Wight has a large older population, with 19.8% of residents being over the age of 65; 31.1% of households also have one or more people under the age of 18.[121] Most of the population has at least a high school diploma, with 91% being a high school graduate or higher, the highest percentage out of the case study communities, and 29.1% having achieved a bachelor's degree or higher.[122]

Isle of Wight has experienced a 4.4% increase in working from home since 2019, with 8.3% of the population working from home. In December 2022, the unemployment rate in Isle of Wight was 2.64%, decreasing from 3.8% five years earlier.[123] Top industries in the county with a higher concentration than the national average include manufacturing, government, accommodation and food services, retail trade, and health care and social assistance.[124]

When asked to describe the brand of their community, survey respondents stated that Isle of Wight is rural both in history and overall "flavor," but is also growing as a choice suburban location within the Hampton Roads Region. Isle of Wight is the only case study community that is not a Virginia Main Street community.

## *Analysis on Isle of Wight*

The county has not implemented specific remote-worker attraction programs, but existing marketing

116. United States Census Bureau. (2023). "American Community Survey Table S0101." https://data.census.gov/
117. United States Census Bureau. (2023). "American Community Survey Table S1901." https://data.census.gov/
118. United States Census Bureau. (2023). "American Community Survey Table S2501." https://data.census.gov/
119. United States Census Bureau. (2023). "American Community Survey Table DP04." https://data.census.gov/
120. United States Census Bureau. (2023). "American Community Survey Table B25002." https://data.census.gov/
121. United States Census Bureau. (2023). "American Community Survey Table S1101." https://data.census.gov/
122. United States Census Bureau. (2023). "American Community Survey Table S1501." https://data.census.gov/
123. Lightcast. (2022). "Regional Overview." https://lightcast.io/
124. Lightcast. (2022). "Regional Overview." https://lightcast.io/

initiatives target a broader demographic of newcomers seeking a more rural, relaxed lifestyle, but with easy access to Richmond as well as the large shipyards in the Hampton Roads area, which is a large employer of local residents. Existing marketing the county does is on existing businesses and uplifting them, giving them support to show how employers can successfully do business within Isle of Wight. However, the county is interested in using social media to continue to market the region as a great place to live. The large military presence in the region, with Fort Gregg-Adams and the Norfolk Naval Station nearby, provide Isle of Wight with a large pool of potential residents to market to. According to one interviewee, many current and former military members pursue entrepreneurial enterprises independent of their service. Isle of Wight markets to this demographic and other small entrepreneurs, as the county's economic development organization provides many services to small businesses and start-ups with the assistance of local small business development centers.

Isle of Wight is another case in which the local officials are unclear on the remote work/remote worker composition. The only reliable source of information is small business licenses registered to residential households, but this only captures a small portion of all remote work activities. The interviewee stated that in the future, they should request people who are completing a business license to answer whether they are a home-based business or not, to capture more of those who are working from home. Also, it is possible that the state treasury and Internal Revenue Service could provide localities with data regarding work modalities. However, even this method is imperfect, as many workers are hybrid or partially remote or working for corporations headquartered outside of the region or even the state. The interviewee noted that a survey of residents could be conducted, but that the locality doesn't have the resources or manpower to create, disseminate, and analyze such data.

Broadband access poses another challenge to Isle of Wight's remote worker attraction, but a partnership with a local service provider has guaranteed that affordable broadband will be available county-wide within the next year and a half. This is a vital infrastructure project for the county, especially if there are a large number of business licenses that are home-based. Providing this infrastructure across the county would make remote work more feasible.

The county's close proximity to urban cores including Richmond, Hampton, Norfolk, and other eastern shore metros have placed the county in a unique position when it comes to attracting new residents. One interviewee noted that, while many of these urban cores are declining in population, the housing market in Isle of Wight cannot keep up with demand and has several thousand new units "in the pipeline." Without these new units, residents will use more of their disposable income just to live there; more available units can assist with stabilizing prices on rentals and make Isle of Wight a competitive place to live.

The county currently does not have a large technical focus in the sciences, but there are a large number of workers in the technical side of design, such as CAD workers in the shipyard, which could be done

remotely. The sciences could be an area of growth in the future to target remote work. Although industries in Isle of Wight are heavily focused in manufacturing or in the shipyards, there could be potential for remote work opportunities in those technical roles.

## *Conclusion*

Isle of Wight is an interesting case study due to its locations, key industries, and it being the only community not in the VMS program. However, the county is marketing itself as a place to live and do work in and is coming up with creative methods to track work from home that other localities could use as well. The expansion of broadband and housing are important issues to address to prepare the region for future growth. With this infrastructure in place, the county will be able to target entrepreneurs and small business owners working from home and attract them to the region.

## Case Study Narratives

# *Region 6: Town of Gloucester, Gloucester County*

*Gloucester, VA.* Photo by Matthew King. *Wikimedia Commons.*

# *Region 6: Town of Gloucester, Gloucester County*

## *Overview and Background*

The county of Gloucester, which contains the unincorporated town of the same name, is within GOVA Region 6 in the Hampton Roads region. While Gloucester is technically located within the Richmond Metropolitan Statistical Area, its relatively low population density and agricultural/aquacultural economy more closely resemble those of rural, low-income areas than the wealthier suburbs of the state capital. In 2021, the population in Gloucester was 38,586, having a 3.7% increase from 2019, but a 5.4% decrease since 2010.[125] In 2021, the median income in Gloucester was $77,733.[126] The median home value in the county in 2021 was $242,100, which is the second highest, followed by the other Hampton Roads community, Isle of Wight. In Gloucester, 20.3% of housing units are rented,[127] with 32.6% of the population paying over 35% of their gross income in rent.[128] Gloucester has the lowest percentage of renters out of the case study communities. The vacancy rate in Gloucester is 12.2%, with 39% being vacant for seasonal, recreational, or occasional use.[129]

In Gloucester, 87.9% of the population is white, and 7.9% are black. The population is also 4.1% Hispanic or Latino. Gloucester has a large older population, with 20.4% of residents being over the age of 65; 25.3% of households also have one or more people under the age of 18.[130] Most of the population has at least a high school diploma, with 89.4% being a high school graduate or higher, and 25.3% having achieved a bachelor's degree or higher.[131]

Gloucester has experienced a 1.6% increase in working from home since 2019, with 6.1% of the population working from home. In December 2022, the unemployment rate in Gloucester was 2.51%, decreasing from 3.28% five years earlier.[132] Top industries in the county with a higher concentration than the national average include government, retail trade, health care and social assistance, accommodation and food services, as well as agriculture and aquaculture.[133]

The Gloucester Village, an unincorporated but vital area to the county, is a small downtown and an Advancing Main Street community. Upon the establishment and subsequent partnership of the

125. United States Census Bureau. (2023). "American Community Survey Table S0101." https://data.census.gov/
126. United States Census Bureau. (2023). "American Community Survey Table S1901." https://data.census.gov/
127. United States Census Bureau. (2023). "American Community Survey Table S2501." https://data.census.gov/
128. United States Census Bureau. (2023). "American Community Survey Table DP04." https://data.census.gov/
129. United States Census Bureau. (2023). "American Community Survey Table B25002." https://data.census.gov/
130. United States Census Bureau. (2023). "American Community Survey Table S1101." https://data.census.gov/
131. United States Census Bureau. (2023). "American Community Survey Table S1501." https://data.census.gov/
132. Lightcast. (2022). "Regional Overview." https://lightcast.io/
133. Lightcast. (2022). "Regional Overview." https://lightcast.io/

Main Street Preservation Trust and Gloucester Main Street Association, the organizations dually administer the programs and goals of the Virginia Main Street Program and have successfully revitalized and modernized the downtown into an attractive and unique asset to the local community. As of the tenth anniversary of Gloucester's designation as a Virginia Main Street community in 2016, approximately $120,000 in resources and services have been provided to the Village and businesses there. One interviewee noted that much of Gloucester Village remained open and operational throughout the early days of the Covid-19 pandemic and currently boasts a storefront vacancy rate of just 8%. Despite the low vacancy rate, new businesses have not been deterred from setting up shop in Gloucester. One interviewee discussed a spike in home-based business licenses across the county–over 100 of them in the last month.

## *Analysis on Gloucester*

Gloucester County is an attractive place for remote workers, but the local infrastructure may not be able to effectively support an influx of new residents, nor a shift in existing residents working from home, as their broadband service is still lacking. While 85% of residents have access to broadband service, one interviewee noted that the quality is poor and it is too expensive to be accessible. While the county has made great strides in improving accessibility, much of the current availability relies on satellite and cellular service, which are notoriously slow and have spotty coverage even when users pay for subscriptions.

The physical infrastructure is another challenge, as much of the water, sewer, and stormwater management systems are deteriorated. Interviewees discussed that their locality's amenities, such as inexpensive waterfront property, an eclectic downtown, and proximity to several urban cores, have attracted new development, including roughly 1700 new single-family homes. The locality's water and sewer lines were installed in the 1930s, and public works struggles to keep up with ongoing failures. A long maintenance backlog means that these critical infrastructure systems are being held together by "band-aids", as one interviewee put it as they discussed the potential added stress of new housing developments currently being constructed along the primary arterial roadway, Route 17. As a coastal waterfront community with valuable wetland habitat, implementing climate-resilient infrastructure to mitigate and minimize the impacts of sea level rise and other impacts of climate change will be vital to the survival of this community, especially if they are seeking to attract more residents.

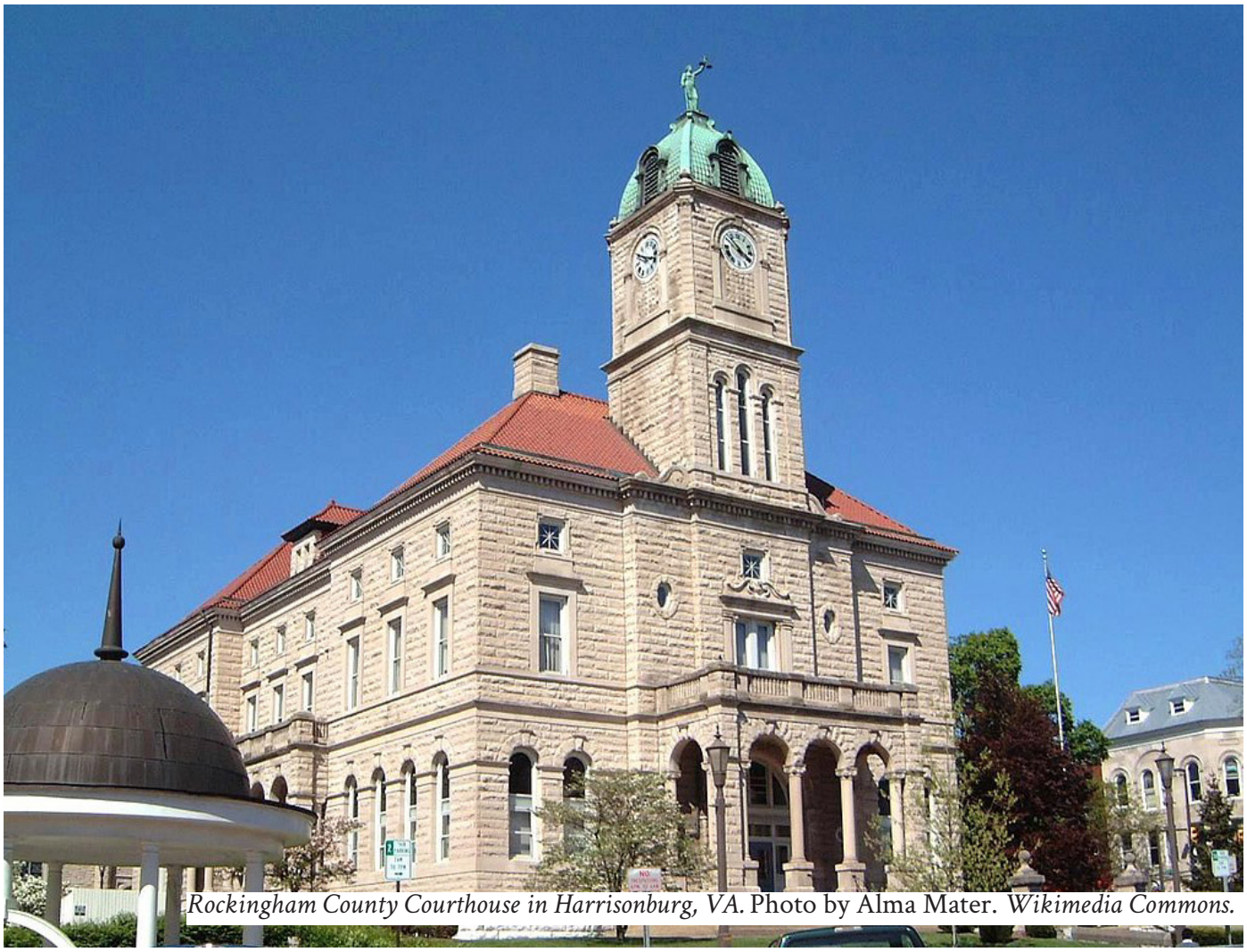
## *Conclusion*

While Gloucester is a county on the rise, thanks to its affordable waterfront property, abundant outdoor recreation opportunities, proximity to Richmond and Hampton Roads, charming downtown, and unique community atmosphere, they are in a unique position. As broadband access and quality of service improve, the county will be a ripe location for remote workers to relocate. Without attracting remote workers, the county cannot afford to upgrade its infrastructure, but attracting remote workers means additional stress on that infrastructure. Climate change adds an additional urgency to these infrastructural issues, especially given Gloucester's heritage and continued reliance on

the blue economy (including crabbing, oyster farming, and fishing). Regardless of their plans to attract remote residents, the county must examine ways to adapt to climate change. While attracting remote residents is an effective way to bolster the county tax base, they must spend those new tax dollars wisely to ensure the community's survival over the long term.

## Case Study Narratives

# *Region 8: City of Harrisonburg, Rockingham County*



*Rockingham County Courthouse in Harrisonburg, VA.* Photo by Alma Mater. *Wikimedia Commons.*

# *Region 8: City of Harrisonburg, Rockingham County*

## *Overview and Background*

Harrisonburg is an independent city in Rockingham County in GOVA Region 8. Some aspects of its economic development activities, especially surrounding tourism, are conducted in partnership with Rockingham County and other Shenandoah Valley jurisdictions. The city has major universities such as James Madison University (JMU) and Eastern Mennonite University (EMU), which attract a larger younger population to the city.

In 2021, the population in Harrisonburg was 52,062, having a 2.3% decrease from 2019, but a 9.8% increase since 2010.[134] Harrisonburg is the largest community analyzed. The county population in 2021 was 80,284, experiencing a 10.9% increase in population since 2010. In 2021, the median income in Harrisonburg was $51,055, which is lower than the county's median income of $67,484.[135] The median home value in the county in 2021 was $231,800, which is only slightly higher than the city's median home value of $231,300. In Harrisonburg, 60.5% of housing units are rented,[136] with 39.4% of the population paying over 35% of their gross income in rent.[137] The vacancy rate in Harrisonburg is 7.9%, with 59.1% being vacant for seasonal, recreational, or occasional use.[138]

In Harrisonburg, 73.2% of the population is white, and 7.2% are black, with 3.1% being Asian. The population is also 20.5% Hispanic or Latino, which is much higher than the other case study communities. Harrisonburg does not have a large older population, with 9% of residents being over the age of 65; 29.1% of households also have one or more people under the age of 18.[139] Most of the population has at least a high school diploma, with 83.4% being a high school graduate or higher, and 34.5% having achieved a bachelor's degree or higher.[140]

Harrisonburg has experienced a 1.8% increase in working from home since 2019, with 6.1% of the population working from home. For Rockingham County, 6.5% of the population works from home, showing a slightly higher WFH percentage.
In December 2022, the unemployment rate in Rockingham was 2.19%, decreasing from 3.22% five years earlier.[141] Top industries in the county with a higher concentration than the national average include manufacturing, health care and social assistance, government, transportation and

134. United States Census Bureau. (2023). "American Community Survey Table S0101." https://data.census.gov/
135. United States Census Bureau. (2023). "American Community Survey Table S1901." https://data.census.gov/
136. United States Census Bureau. (2023). "American Community Survey Table S2501." https://data.census.gov/
137. United States Census Bureau. (2023). "American Community Survey Table DP04." https://data.census.gov/
138. United States Census Bureau. (2023). "American Community Survey Table B25002." https://data.census.gov/
139. United States Census Bureau. (2023). "American Community Survey Table S1101." https://data.census.gov/
140. United States Census Bureau. (2023). "American Community Survey Table S1501." https://data.census.gov/
141. Lightcast. (2022). "Regional Overview." https://lightcast.io/

warehousing, and construction.[142]

When asked to describe the brand of their community, survey respondents stated that Harrisonburg is a family friendly college town that is a basecamp for outdoor recreation and a hub of unique locally owned small businesses, including Virginia's first culinary district. Harrisonburg's Main Street program is implemented by Harrisonburg Downtown Renaissance. This organization has been working since the early 2000s to achieve downtown revitalization, with great success in reducing downtown commercial vacancy. Harrisonburg is an Advancing Main Street community and was also a selected community for the VMS Remote Work Pilot Study, which aimed to discover the potential of remote work in the town and how the capability for remote work could be improved.

### *Analysis on Harrisonburg*

Harrisonburg was one of the participating communities in the Virginia Main Street Pilot Study. The interviewee said that prior to the pilot study pre-COVID, remote worker attraction was not a huge interest of the city. The interviewee stated that a remote worker may not generate the same fiscal revenue that a traditional worker would generate, so it would cost more to have that type of worker in the community than not. The interviewee was not in favor of remote worker attraction as an economic development strategy due to the perception that the worker would exacerbate the fiscal impact for a locality.

However, due to the impacts of COVID-19, Harrisonburg had a greater interest in remote worker attraction due to a growing trend in working from home. The city believed that it would either participate or be left behind in the process.

Virginia Main Street worked with Harrisonburg Downtown Renaissance and led focus groups on how the community viewed Harrisonburg and how piloting a remote worker program could be achieved. One finding that the interviewee noted as important was that the International Festival held in the city was seen as an asset. Diversity was seen as an asset to Harrisonburg and could be one attraction for remote workers. The interviewee stated that from personal experience, it was a factor that drew them back to Harrisonburg after living somewhere else and boomeranging back.

Other attractions for remote workers to move include seeking a slower pace of life and a more scenic environment, but still having access to urban amenities, which makes Harrisonburg a contender for remote workers. There is a balance between outdoor recreation nearby and the urban downtown. However, the interviewee mentioned that in the pilot study, one negative result discovered was the proximity to other large metro areas. Being located two hours from both D.C. and Richmond, the interviewee did not understand that remark, but from a statistical standpoint, it may be a weakness.

For Harrisonburg, workers in technology-related industries are a primary target. The city targets that sector and seeks to build a cluster of technology workers. An influx of remote workers could contribute to that target industry and grow the sector

142. Lightcast. (2022). "Regional Overview." https://lightcast.io/

overall. Harrisonburg currently has one coworking space and is developing a second so that they can continue to attract that type of worker. The city hosts Valley Tech-Con, a tech conference that attracts technology companies to connect and present. The focus of the upcoming conference is on technology remote worker attraction to learn more about how Harrisonburg can orient itself towards attracting remote workers in the industry and what challenges may exist. Both this conference and the pilot study will support the city's marketing effort.

However, a challenge Harrisonburg currently faces that could limit remote worker attraction is the density of population and employers in the city. The interviewee felt that employers may be hesitant to locate in the city when they could go to a larger metro such as Richmond or Northern Virginia where there would be a greater availability of workers. They feel there is a misconception in the city that it is not dense and has rural amenities, so it could not also be urban, so employers go elsewhere; they fear remote workers would have the same mindset. Harrisonburg is focusing the next fiscal year from a marketing standpoint to target those major metropolitan areas such as Northern Virginia or Baltimore to attract remote workers living in these urban areas to offer a slower version of that lifestyle. Improving the storytelling of the city can lead to an increase in attracting workers.

Housing is another challenge the city faces, especially in affordability. Prices are not much lower than in other urban areas, especially with single family homes. There is a lack of supply as well for the demand. The city is interested in targeting families in their attraction strategy, which also makes the lack of housing a challenge. The interviewee stated that the quality of life in Harrisonburg is attractive to families, likely more so than it is to recent graduates at JMU and EMU. The interviewee was not in favor of using resources to retain students, as many are more likely to relocate to a larger city post-graduation. There is a greater opportunity in targeting boomerangs who may be interested in moving back to Harrisonburg with their families. But Harrisonburg is partnering with JMU to improve on an internship program, as there may be greater chances of those students staying in the region if they build those connections while they are here.

Regarding the uncertainty around remote workers, the pilot study assisted Harrisonburg in finding where those remote workers are located. Although many cities or localities may not have the capacity to host focus groups and lead a pilot study of their own, finding ways to connect to those workers at events targeting them is a recommendation. If there is a coworking space or a third place many workers often work in, getting those membership numbers or visiting those spaces can assist in reaching those populations as well. If there is a local technology council, such as the Shenandoah Valley Technology Council in Harrisonburg, using that resource to tap into the remote worker community could be helpful, as their work may align with the industries remote workers work in as well. From an economic development perspective, simply being out in the community and finding the workers yourself may be the best method to reach them.

*Conclusion*

The participation in the VMS Pilot Case Study program initially showed Harrisonburg what they had to do in order to promote remote work in the city. The development of a marketing strategy to specifically target the population they are seeking, younger families who may be boomerangs, is a great next step to work towards attracting more remote workers to the city. The interest in technology workers specifically aligns with other city priorities, such as the Valley Tech-Con, which is a strategy other cities can learn from to focus industry growth efforts on worker attraction as well. The benefits of speaking to community members in focus groups in the pilot case study, as well as throughout the upcoming conference, is another lesson other communities can learn from to reach their remote workers. Target them where they may be, and involve oneself in the community in order to find them.

# Appendix E: Post Pandemic Population Trends

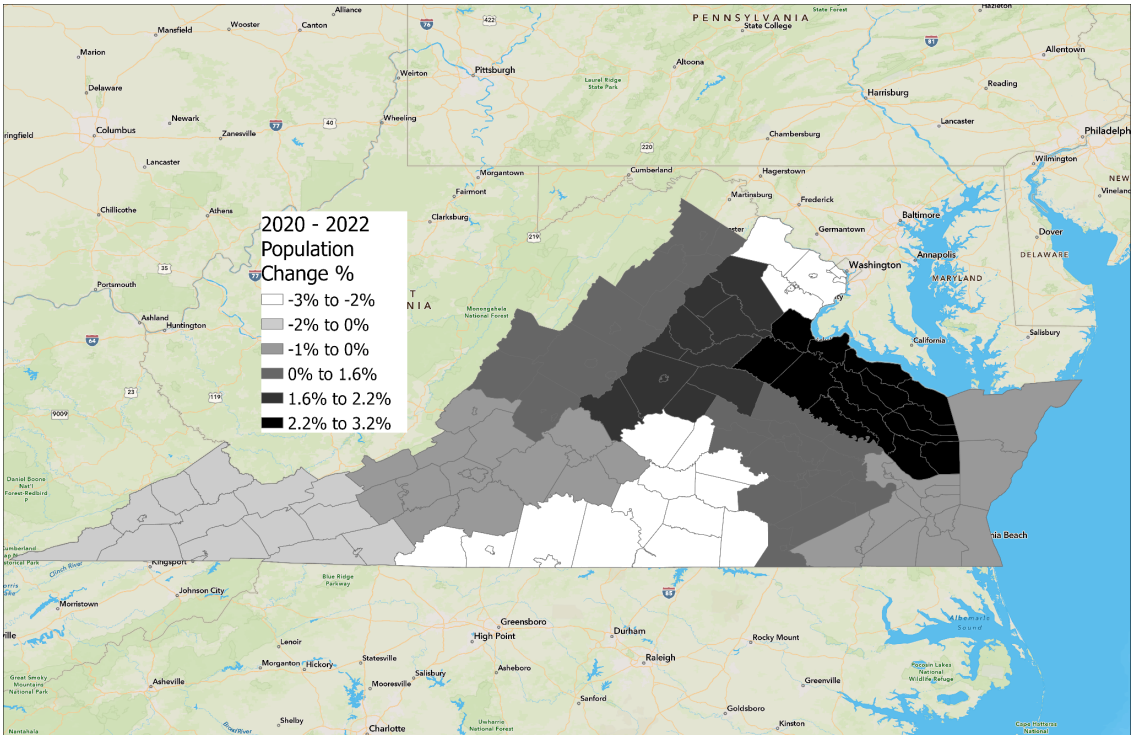
Post pandemic population changes offer insight into drivers of remote worker attraction. With many jobs switching to remote work during the pandemic, people gained newfound freedom to relocate to new areas. From 2020 to 2022 regions 4 and 6 had the highest raw population growth, and regions 6 and 9 had the highest percent population growth. These areas of Virginia could be attractive to remote workers as they offer lower costs of living compared to Northern Virginia but still offer similar amenities such as quality schools, attractive neighborhoods and access to nature. **Table E.1** and **Figure E.1** show the population changes across the state.

Table E.1. 2020 to 2022 GOVA Region Population Change[143]

| GOVA Region | 2020 - 2022 Population Change | 2020 - 2022 Population Change % |
|---|---|---|
| 1 | -3,891 | -1.0% |
| 2 | 413 | 0.1% |
| 3 | -954 | -0.3% |
| 4 | 21,325 | 1.6% |
| 5 | 1,270 | 0.1% |
| 6 | 17,052 | 3.2% |
| 7 | -4,996 | -0.2% |
| 8 | 7,171 | 1.3% |
| 9 | 9,758 | 2.2% |

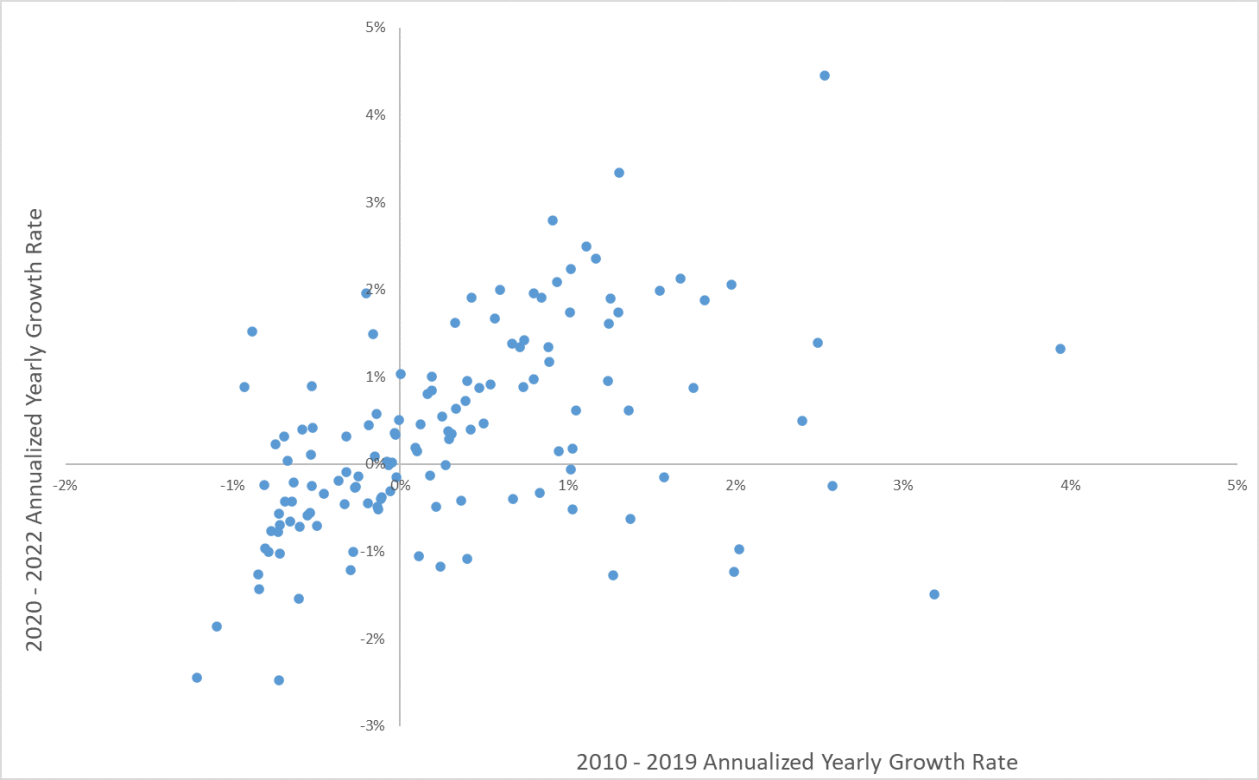
143. United States Census Bureau. (2023). "County Population Totals and Components of Change: 2020-2022." https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-total.html

Figure E.1. 2020 - 2022 Population Change % By GOVA region




During the pandemic many dense urban areas in Virginia lost population and have not yet recovered to pre-pandemic levels. Much of the population growth has been occurring in suburban localities. Most of the counties across Virginia that were growing from 2010 to 2019 continued to grow from 2020 to 2022. Also, most of the counties that saw population declines from 2010 to 2019 saw population declines from 2020 to 2022. The counties that were growing from 2010 to 2019 but declined from 2020 to 2022 are located in more highly urbanized areas. Most of the counties that were declining in population from 2010 to 2019 but grew from 2020 to 2022 are located in more rural areas across the State where there are a lot of parks and opportunities for outdoor recreation in the tidewater, piedmont, and mountainous areas. **Figure E.2** and **Figure E.3** show the county growth trends from 2010 to 2019 plotted against the growth from 2020 to 2022. **Table E.1** lists the population change percentage per locality from 2020 to 2022.

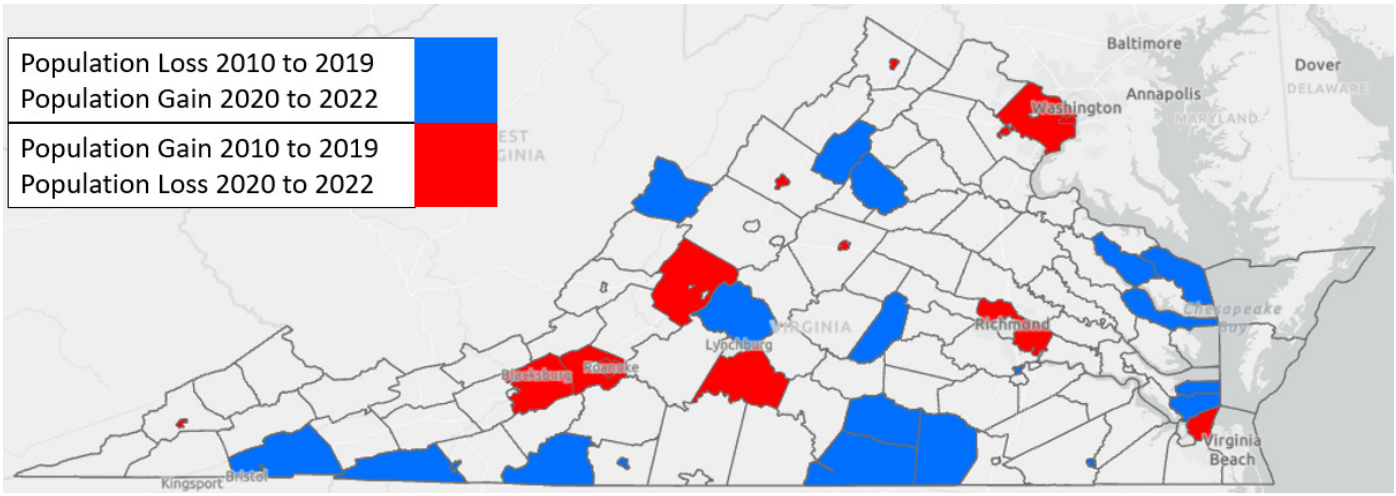
## Figure E.2. Pre-Pandemic (2010 - 2019) vs. Post Pandemic (2020 - 2022) Annualized Growth Rates[144] [145]




144. United States Census Bureau. (2023). "County Population Totals and Components of Change: 2020-2022." https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-total.html.

145. United States Census Bureau. (2023) "American Community Survey Table S0101." https://data.census.gov/.

## Figure E.3. County Growth Patterns Pre and Post Pandemic[146]




146. United States Census Bureau. (2023). "County Population Totals and Components of Change: 2020-2022." https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-total.html.

## Table E.1. 2020 to 2022 Virginia City/County Population Change[147]

| R1 | | R2 | | R3 | | R4 | | R5 | | R6 | | R7 | | R8 | | R9 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grayson | 0.4% | Radford | 3.8% | Martinsville | 1.8% | New Kent | 8.1% | Suffolk | 4.1% | Spotsylvania | 4.3% | Fairfax | 2.7% | Frederick | 3.5% | Louisa | 6.1% |
| Galax | 0.2% | Appomattox | 3.7% | Amelia | 1.4% | Goochland | 5.1% | Isle of Wight | 3.7% | Northumberland | 3.9% | Loudoun | 2.2% | Clarke | 3.1% | Orange | 4.4% |
| Washington | 0.1% | Bedford | 1.6% | Buckingham | 0.9% | Chesterfield | 3.5% | James City | 3.5% | King George | 3.9% | Prince William | 0.9% | Highland | 2.7% | Fluvanna | 3.2% |
| Carroll | 0.0% | Botetourt | 1.5% | Cumberland | 0.8% | Powhatan | 3.5% | Williamsburg | 2.9% | Stafford | 3.6% | Manassas | -0.1% | Waynesboro | 2.4% | Culpeper | 3.1% |
| Scott | -0.5% | Franklin | 1.1% | Mecklenburg | 0.8% | Hanover | 2.5% | York | 1.6% | Caroline | 3.3% | Falls Church | -0.6% | Rockingham | 1.9% | Rappahannock | 2.5% |
| Lee | -0.6% | Floyd | 1.0% | Lunenburg | 0.7% | Richmond | 1.1% | Franklin | 1.2% | King William | 3.2% | Fairfax | -0.9% | Lexington | 1.9% | Greene | 2.4% |
| Wythe | -0.7% | Amherst | 0.9% | Brunswick | 0.6% | Dinwiddie | 1.0% | Chesapeake | 1.1% | Middlesex | 3.1% | Arlington | -2.0% | Warren | 1.6% | Fauquier | 2.3% |
| Smyth | -1.1% | Salem | 0.5% | Patrick | 0.3% | Colonial Heights | 0.6% | Poquoson | 0.9% | Fredericksburg | 2.7% | Alexandria | -2.3% | Shenandoah | 1.6% | Albemarle | 1.8% |
| Russell | -1.2% | Lynchburg | 0.4% | Prince Edward | 0.1% | Prince George | 0.2% | Hampton | 0.6% | Gloucester | 2.0% | Manassas Park | -2.7% | Augusta | 0.6% | Madison | 1.0% |
| Tazewell | -1.4% | Roanoke | 0.0% | Nottoway | -0.5% | Petersburg | 0.0% | Southampton | -0.1% | King and Queen | 2.0% | | | Staunton | 0.4% | Nelson | -0.6% |
| Bland | -1.7% | Pulaski | -0.3% | Charlotte | -0.6% | Henrico | -0.1% | Accomack | -0.6% | Richmond | 1.8% | | | Page | 0.3% | Charlottesville | -2.4% |
| Wise | -1.8% | Craig | -0.6% | Pittsylvania | -0.7% | Hopewell | -0.2% | Virginia Beach | -0.9% | Westmoreland | 1.1% | | | Rockbridge | -0.2% | | |
| Bristol | -1.9% | Montgomery | -0.6% | Halifax | -0.8% | Surry | -0.4% | Newport News | -0.9% | Essex | 0.3% | | | Winchester | -0.3% | | |
| Norton | -1.9% | Campbell | -0.9% | Danville | -0.8% | Sussex | -1.0% | Portsmouth | -0.9% | Mathews | -0.4% | | | Buena Vista | -0.5% | | |
| Dickenson | -2.5% | Covington | -1.1% | Henry | -1.8% | Greensville | -1.4% | Norfolk | -2.0% | Lancaster | -1.3% | | | Harrisonburg | -1.1% | | |
| Buchanan | -4.4% | Giles | -2.0% | | | Charles City | -2.1% | Northampton | -2.5% | | | | | Bath | -3.3% | | |
| | | Roanoke | -2.0% | | | Emporia | -4.0% | | | | | | | | | | |
| | | Alleghany | -2.3% | | | | | | | | | | | | | | |

147. United States Census Bureau. (2023). "County Population Totals and Components of Change: 2020-2022." https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-total.html.

# Appendix F: Virginia Statewide Trends

Over the last decade Virginia has experienced high job growth. From 2010 to 2022, over 590,000 new jobs were added in the State. However, nearly half of those jobs were located in Northern Virginia. Looking at Virginia regionally broken down by GOVA region, there are stark disparities in job growth as shown in table F.1. Growing regions such as GOVA region 7 (comprising most of what is considered Northern Virginia) experienced 16.4% job growth over the last decade while GOVA regions 1 and 3 (located in the far-southwest of the state) experienced a job loss of 9.2% and 1.2%, respectively. The Virginia absolute and percentage job growths by GOVA region can be found in **Table F.1**. The regions that experienced the greatest job growth (those along the Interstate 95 and 64 corridors, including Northern Virginia, Richmond, and Hampton Roads) also lead the state in remote-capable jobs. The growth in remote capable jobs is shown using three different methodologies are shown in **Table F.2** to **Table F.4** below. The regions that experienced highest housing unit permits per capita are GOVA regions 4 and 7, while least is GOVA region 1, as shown in **Table F.5**, and **Table F.6**.

**Table F.1. Virginia Percentage Job Growth by GOVA Region 2010 - 2022[148]**

| NAICS | Description | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 11 | Agriculture, Forestry, Fishing and Hunting | -11.7% | -9.4% | -14.4% | 0.6% | -25.5% | -18.4% | -7.8% | -6.3% | -9.2% |
| 21 | Mining, Quarrying, and Oil and Gas Extraction | -54.7% | -37.4% | -31.3% | -22.4% | -33.1% | -30.9% | -32.1% | -42.9% | -31.2% |
| 22 | Utilities | 12.0% | -27.3% | -9.5% | 3.8% | -12.5% | 1.8% | 3.6% | -1.7% | 18.4% |
| 23 | Construction | -33.4% | 6.8% | -0.8% | 27.7% | 10.8% | 20.8% | 17.5% | 15.5% | 12.2% |
| 31 | Manufacturing | -7.6% | 10.4% | -3.6% | 1.6% | 7.8% | 22.4% | 6.4% | 2.5% | 25.4% |
| 42 | Wholesale Trade | -23.5% | -3.7% | -6.7% | 2.6% | -9.6% | 0.4% | 0.9% | 24.9% | 13.8% |
| 44 | Retail Trade | -1.6% | 0.2% | -0.1% | 10.6% | 5.9% | 24.4% | 8.4% | 6.7% | 16.5% |
| 48 | Transportation and Warehousing | 28.5% | 46.3% | 36.7% | 137.1% | 79.0% | 160.5% | 137.0% | 96.4% | 110.1% |
| 51 | Information | -45.4% | -32.1% | -25.7% | -21.9% | -19.7% | 13.2% | -3.6% | -27.3% | -15.9% |
| 52 | Finance and Insurance | -8.1% | 1.5% | -6.7% | 26.0% | 21.9% | 41.5% | 31.9% | 34.8% | 37.5% |
| 53 | Real Estate and Rental and Leasing | -6.4% | 11.4% | -3.1% | 43.4% | 24.1% | 33.2% | 27.7% | 9.9% | 28.3% |
| 54 | Professional, Scientific, and Technical Services | -2.6% | -0.1% | 12.8% | 22.8% | 8.9% | 25.2% | 11.4% | 9.1% | 18.7% |
| 55 | Management of Companies and Enterprises | -0.2% | -5.7% | 7.3% | 4.8% | 28.9% | 47.4% | 17.1% | 62.4% | 13.9% |
| 56 | Administrative and Support and Waste Managem | 6.1% | -5.6% | -5.4% | 33.1% | 11.6% | 57.6% | 16.2% | 11.8% | 36.4% |
| 61 | Educational Services | -4.9% | 35.4% | 6.0% | 2.6% | 3.8% | 48.9% | 5.7% | 23.5% | 25.0% |
| 62 | Health Care and Social Assistance | -10.1% | 16.5% | 7.8% | 15.6% | 19.8% | 27.4% | 30.8% | 17.3% | 19.8% |
| 71 | Arts, Entertainment, and Recreation | -8.7% | 27.4% | -12.6% | 36.2% | 21.7% | 20.5% | 25.8% | -9.5% | 5.7% |
| 72 | Accommodation and Food Services | -2.3% | 9.3% | 1.2% | 20.6% | 5.8% | 24.4% | 16.8% | 9.4% | 18.3% |
| 81 | Other Services (except Public Administration) | 1.1% | 12.9% | 14.0% | 19.3% | 8.9% | 31.4% | 2.5% | 9.1% | 17.4% |
| 90 | Government | -8.4% | -7.7% | -15.1% | -4.1% | -11.6% | 1.3% | 4.8% | -1.2% | 41.6% |
| | | | | | | | | | | |
| | **Total** | **-9.2%** | **6.1%** | **-1.2%** | **18.1%** | **6.6%** | **26.5%** | **16.4%** | **12.1%** | **23.9%** |

148. Lightcast Economic Modeling, estimates from Quarterly Census of Employment and Wages.

## Table F.2. Virginia Absolute Remote Capable Job Growth 2010 - 2022 (Canada Methodology)[149]

| NAICS | Description | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 11 | Agriculture, Forestry, Fishing and Hunting | - | - | - | - | - | - | - | - | - |
| 21 | Mining, Quarrying, and Oil and Gas Extraction | -921 | -44 | -22 | -50 | -63 | -29 | -86 | -69 | -37 |
| 22 | Utilities | 10 | -50 | -10 | 20 | -44 | 2 | 19 | -2 | 47 |
| 23 | Construction | -749 | 341 | -13 | 2,413 | 1,097 | 617 | 2,935 | 548 | 395 |
| 31 | Manufacturing | -451 | 1,391 | -213 | 174 | 1,449 | 702 | 471 | 266 | 674 |
| 42 | Wholesale Trade | -221 | -103 | -59 | 143 | -455 | 5 | 51 | 344 | 118 |
| 44 | Retail Trade | -80 | 22 | -3 | 1,756 | 1,295 | 1,353 | 2,505 | 479 | 789 |
| 48 | Transportation and Warehousing | 358 | 1,406 | 506 | 6,249 | 4,511 | 2,285 | 12,806 | 2,340 | 986 |
| 51 | Information | -694 | -1,099 | -300 | -1,887 | -2,170 | 201 | -1,350 | -807 | -455 |
| 52 | Finance and Insurance | -335 | 199 | -262 | 10,277 | 6,077 | 3,378 | 15,040 | 2,350 | 2,129 |
| 53 | Real Estate and Rental and Leasing | - | - | - | - | - | - | - | - | - |
| 54 | Professional, Scientific, and Technical Services | -100 | -14 | 411 | 8,796 | 4,245 | 2,290 | 28,134 | 708 | 2,391 |
| 55 | Management of Companies and Enterprises | -3 | -315 | 77 | 885 | 2,246 | 515 | 3,488 | 1,136 | 249 |
| 56 | Administrative and Support and Waste Managem | 152 | -396 | -159 | 4,747 | 2,044 | 1,497 | 5,347 | 419 | 1,094 |
| 61 | Educational Services | -49 | 970 | 37 | 69 | 133 | 218 | 440 | 368 | 207 |
| 62 | Health Care and Social Assistance | -958 | 548 | 106 | 928 | 1,287 | 292 | 2,594 | 344 | 259 |
| 71 | Arts, Entertainment, and Recreation | -20 | 106 | -16 | 378 | 274 | 54 | 564 | -33 | 23 |
| 72 | Accommodation and Food Services | -37 | 18 | 1 | 64 | 31 | 21 | 109 | 14 | 19 |
| 81 | Other Services (except Public Administration) | 31 | 397 | 194 | 1,161 | 588 | 524 | 360 | 186 | 345 |
| 90 | Government | - | - | - | - | - | - | - | - | - |
| | | | | | | | | | | |
| | Total | -4,068 | 3,377 | 275 | 36,122 | 22,543 | 13,926 | 73,426 | 8,592 | 9,232 |

## Table F.3. Virginia Absolute Remote Capable Job Growth 2010 - 2022 (BLS Methodology)[150]

| R1 | | R2 | | R3 | | R4 | | R5 | | R6 | | R7 | | R8 | | R9 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Washington | 93 | Roanoke | 377 | Danville | 229 | Chesterfield | 3,233 | Norfolk | 1,208 | Spotsylvania | 1,652 | Loudoun | 2,330 | Frederick | 657 | Albemarle | 927 |
| Carroll | 82 | Montgomery | 370 | Mecklenburg | 225 | Richmond | 2,649 | Virginia Beach | 1,197 | Stafford | 759 | Arlington | 2,160 | Rockingham | 655 | Louisa | 417 |
| Grayson | 44 | Campbell | 227 | Halifax | 118 | Henrico | 2,386 | Chesapeake | 834 | Caroline | 270 | Fairfax | 1,685 | Winchester | 259 | Culpeper | 306 |
| Wythe | 38 | Lynchburg | 211 | Buckingham | 100 | Hanover | 564 | Suffolk | 669 | Westmoreland | 217 | Prince William | 1,616 | Augusta | 255 | Fluvanna | 289 |
| Scott | 25 | Bedford | 168 | Prince Edward | 87 | New Kent | 356 | Isle of Wight | 514 | Fredericksburg | 183 | Alexandria | 1,490 | Shenandoah | 175 | Orange | 260 |
| Lee | 18 | Franklin | 152 | Nottoway | 86 | Goochland | 325 | Newport News | 393 | Gloucester | 171 | Falls Church | 872 | Page | 169 | Charlottesville | 214 |
| Smyth | 14 | Roanoke | 114 | Pittsylvania | 74 | Surry | 218 | James City | 243 | King George | 161 | Manassas | 79 | Warren | 160 | Fauquier | 203 |
| Russell | 11 | Appomattox | 107 | Amelia | 73 | Powhatan | 216 | York | 211 | King William | 127 | Fairfax | 22 | Waynesboro | 117 | Greene | 113 |
| Buchanan | 11 | Amherst | 92 | Cumberland | 54 | Prince George | 161 | Accomack | 207 | Lancaster | 68 | Manassas Park | 8 | Clarke | 93 | Nelson | 70 |
| Galax | 9 | Botetourt | 83 | Brunswick | 40 | Petersburg | 118 | Hampton | 125 | Northumberland | 63 | | | Staunton | 70 | Madison | 61 |
| Dickenson | 9 | Pulaski | 63 | Patrick | 32 | Dinwiddie | 84 | Northampton | 121 | Middlesex | 45 | | | Rockbridge | 66 | Rappahannock | 40 |
| Tazewell | 7 | Salem | 35 | Lunenburg | 25 | Sussex | 32 | Portsmouth | 106 | Essex | 41 | | | Harrisonburg | 55 | | |
| Wise | 6 | Radford | 30 | Henry | 25 | Charles City | 21 | Southampton | 64 | King and Queen | 37 | | | Bath | 13 | | |
| Bland | 6 | Giles | 30 | Charlotte | 16 | Hopewell | 19 | Williamsburg | 46 | Richmond | 26 | | | Highland | 10 | | |
| Norton | 0 | Floyd | 19 | Martinsville | 2 | Greensville | 15 | Poquoson | 28 | Mathews | 23 | | | Lexington | 5 | | |
| Bristol | 0 | Craig | 14 | | | Colonial Heights | 6 | Franklin | 0 | | | | | Buena Vista | 3 | | |
| | | Alleghany | 8 | | | Emporia | 5 | | | | | | | | | | |
| | | Covington | 3 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| Total | 373 | Total | 2,103 | Total | 1,186 | Total | 10,408 | Total | 5,966 | Total | 3,843 | Total | 10,262 | Total | 2,762 | Total | 2,900 |

149. Statistics Canada. (2020). "Percentage of workforce teleworking or working remotely." https://www150.statcan.gc.ca/.
150. U.S. Bureau of Labor Statistics. (2022). "Telework during the COVID-19 pandemic." https://www.bls.gov/opub/mlr/2022/article/telework-during-the-covid-19-pandemic.htm.

## Table F.4. Virginia Absolute Remote Capable Job Growth 2010 - 2022 (Althof et al. Methodology) [151]

| NAICS | Description | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 11 | Agriculture, Forestry, Fishing and Hunting | - | - | - | - | - | - | - | - | - |
| 21 | Mining, Quarrying, and Oil and Gas Extraction | -921 | -44 | -22 | -50 | -63 | -29 | -86 | -69 | -37 |
| 22 | Utilities | 10 | -50 | -10 | 20 | -44 | 2 | 19 | -2 | 47 |
| 23 | Construction | -749 | 341 | -13 | 2,413 | 1,097 | 617 | 2,935 | 548 | 395 |
| 31 | Manufacturing | -451 | 1,391 | -213 | 174 | 1,449 | 702 | 471 | 266 | 674 |
| 42 | Wholesale Trade | -221 | -103 | -59 | 143 | -455 | 5 | 51 | 344 | 118 |
| 44 | Retail Trade | -80 | 22 | -3 | 1,756 | 1,295 | 1,353 | 2,505 | 479 | 789 |
| 48 | Transportation and Warehousing | 358 | 1,406 | 506 | 6,249 | 4,511 | 2,285 | 12,806 | 2,340 | 986 |
| 51 | Information | -694 | -1,099 | -300 | -1,887 | -2,170 | 201 | -1,350 | -807 | -455 |
| 52 | Finance and Insurance | -335 | 199 | -262 | 10,277 | 6,077 | 3,378 | 15,040 | 2,350 | 2,129 |
| 53 | Real Estate and Rental and Leasing | - | - | - | - | - | - | - | - | - |
| 54 | Professional, Scientific, and Technical Services | -100 | -14 | 411 | 8,796 | 4,245 | 2,290 | 28,134 | 708 | 2,391 |
| 55 | Management of Companies and Enterprises | -3 | -315 | 77 | 885 | 2,246 | 515 | 3,488 | 1,136 | 249 |
| 56 | Administrative and Support and Waste Managem | 152 | -396 | -159 | 4,747 | 2,044 | 1,497 | 5,347 | 419 | 1,094 |
| 61 | Educational Services | -49 | 970 | 37 | 69 | 133 | 218 | 440 | 368 | 207 |
| 62 | Health Care and Social Assistance | -958 | 548 | 106 | 928 | 1,287 | 292 | 2,594 | 344 | 259 |
| 71 | Arts, Entertainment, and Recreation | -20 | 106 | -16 | 378 | 274 | 54 | 564 | -33 | 23 |
| 72 | Accommodation and Food Services | -37 | 18 | 1 | 64 | 31 | 21 | 109 | 14 | 19 |
| 81 | Other Services (except Public Administration) | 31 | 397 | 194 | 1,161 | 588 | 524 | 360 | 186 | 345 |
| 90 | Government | - | - | - | - | - | - | - | - | - |
| | | | | | | | | | | |
| | **Total** | **-4,068** | **3,377** | **275** | **36,122** | **22,543** | **13,926** | **73,426** | **8,592** | **9,232** |

151. Althoff, L., Eckert, F., Ganapati, S., & Walsh, C. (2020). The city paradox: Skilled services and remote work. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3744597.

## Table F.5. 2022 Housing Units Permitted by GOVA Region [152]

| R1 | | R2 | | R3 | | R4 | | R5 | | R6 | | R7 | | R8 | | R9 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Washington | 93 | Roanoke | 377 | Danville | 229 | Chesterfield | 3,233 | Norfolk | 1,208 | Spotsylvania | 1,652 | Loudoun | 2,330 | Frederick | 657 | Albemarle | 927 |
| Carroll | 82 | Montgomery | 370 | Mecklenburg | 225 | Richmond | 2,649 | Virginia Beach | 1,197 | Stafford | 759 | Arlington | 2,160 | Rockingham | 655 | Louisa | 417 |
| Grayson | 44 | Campbell | 227 | Halifax | 118 | Henrico | 2,386 | Chesapeake | 834 | Caroline | 270 | Fairfax | 1,685 | Winchester | 259 | Culpeper | 306 |
| Wythe | 38 | Lynchburg | 211 | Buckingham | 100 | Hanover | 564 | Suffolk | 669 | Westmoreland | 217 | Prince William | 1,616 | Augusta | 255 | Fluvanna | 289 |
| Scott | 25 | Bedford | 168 | Prince Edward | 87 | New Kent | 356 | Isle of Wight | 514 | Fredericksburg | 183 | Alexandria | 1,490 | Shenandoah | 175 | Orange | 260 |
| Lee | 18 | Franklin | 152 | Nottoway | 86 | Goochland | 325 | Newport News | 393 | Gloucester | 171 | Falls Church | 872 | Page | 169 | Charlottesville | 214 |
| Smyth | 14 | Roanoke | 114 | Pittsylvania | 74 | Surry | 218 | James City | 243 | King George | 161 | Manassas | 79 | Warren | 160 | Fauquier | 203 |
| Russell | 11 | Appomattox | 107 | Amelia | 73 | Powhatan | 216 | York | 211 | King William | 127 | Fairfax | 22 | Waynesboro | 117 | Greene | 113 |
| Buchanan | 11 | Amherst | 92 | Cumberland | 54 | Prince George | 161 | Accomack | 207 | Lancaster | 68 | Manassas Park | 8 | Clarke | 93 | Nelson | 70 |
| Galax | 9 | Botetourt | 83 | Brunswick | 40 | Petersburg | 118 | Hampton | 125 | Northumberland | 63 | | | Staunton | 70 | Madison | 61 |
| Dickenson | 9 | Pulaski | 63 | Patrick | 32 | Dinwiddie | 84 | Northampton | 121 | Middlesex | 45 | | | Rockbridge | 66 | Rappahannock | 40 |
| Tazewell | 7 | Salem | 35 | Lunenburg | 25 | Sussex | 32 | Portsmouth | 106 | Essex | 41 | | | Harrisonburg | 55 | | |
| Wise | 6 | Radford | 30 | Henry | 25 | Charles City | 21 | Southampton | 64 | King and Queen | 37 | | | Bath | 13 | | |
| Bland | 6 | Giles | 30 | Charlotte | 16 | Hopewell | 19 | Williamsburg | 46 | Richmond | 26 | | | Highland | 10 | | |
| Norton | 0 | Floyd | 19 | Martinsville | 2 | Greensville | 15 | Poquoson | 28 | Mathews | 23 | | | Lexington | 5 | | |
| Bristol | 0 | Craig | 14 | | | Colonial Heights | 6 | Franklin | 0 | | | | | Buena Vista | 3 | | |
| | | Alleghany | 8 | | | Emporia | 5 | | | | | | | | | | |
| | | Covington | 3 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| **Total** | **373** | **Total** | **2,103** | **Total** | **1,186** | **Total** | **10,408** | **Total** | **5,966** | **Total** | **3,843** | **Total** | **10,262** | **Total** | **2,762** | **Total** | **2,900** |

## Table F.6. 2022 Housing Units Permitted Per Capita by Gova Region[153] [154]

| R1 | | R2 | | R3 | | R4 | | R5 | | R6 | | R7 | | R8 | | R9 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grayson | 2.8 | Appomattox | 6.8 | Mecklenburg | 7.3 | Surry | 33.8 | Isle of Wight | 13.9 | Spotsylvania | 12.3 | Falls Church | 60.9 | Winchester | 9.3 | Louisa | 11.4 |
| Carroll | 2.7 | Campbell | 4.1 | Buckingham | 5.9 | New Kent | 16 | Northampton | 10.2 | Westmoreland | 12.1 | Alexandria | 9.4 | Rockingham | 8.1 | Fluvanna | 10.8 |
| Washington | 1.7 | Roanoke | 3.8 | Danville | 5.6 | Goochland | 13.8 | Suffolk | 7.3 | Caroline | 8.8 | Arlington | 9.1 | Frederick | 7.5 | Albemarle | 8.5 |
| Galax | 1.4 | Montgomery | 3.8 | Nottoway | 5.6 | Richmond | 11.6 | Accomack | 6.4 | King William | 7.5 | Loudoun | 5.7 | Page | 7.1 | Orange | 7.1 |
| Wythe | 1.3 | Amherst | 2.9 | Amelia | 5.6 | Chesterfield | 9.3 | Norfolk | 4.9 | Lancaster | 6.4 | Prince William | 3.5 | Clarke | 6.4 | Culpeper | 5.9 |
| Scott | 1.1 | Franklin | 2.7 | Cumberland | 5.5 | Powhatan | 7.4 | Southampton | 3.6 | Fredericksburg | 6.3 | Manassas | 1.9 | Waynesboro | 5.2 | Greene | 5.7 |
| Bland | 0.9 | Craig | 2.7 | Prince Edward | 3.8 | Henrico | 7.2 | Chesapeake | 3.4 | King George | 6 | Fairfax | 1.5 | Highland | 4.5 | Rappahannock | 5.4 |
| Lee | 0.8 | Lynchburg | 2.6 | Halifax | 3.4 | Hanover | 5.3 | James City | 3.2 | King and Queen | 5.3 | Fairfax | 0.9 | Shenandoah | 4 | Nelson | 4.7 |
| Dickenson | 0.6 | Botetourt | 2.5 | Brunswick | 2.4 | Prince George | 4.2 | York | 3.1 | Northumberland | 5.2 | Manassas Park | 0.5 | Warren | 4 | Madison | 4.6 |
| Smyth | 0.5 | Bedford | 2.1 | Lunenburg | 2 | Petersburg | 3.8 | Williamsburg | 3.1 | Stafford | 5.1 | | | Augusta | 3.4 | Charlottesville | 4.5 |
| Buchanan | 0.5 | Pulaski | 1.8 | Patrick | 1.8 | Charles City | 3 | Virginia Beach | 2.7 | Gloucester | 4.6 | | | Bath | 3.1 | Fauquier | 2.9 |
| Russell | 0.4 | Giles | 1.8 | Charlotte | 1.3 | Dinwiddie | 2.9 | Poquoson | 2.3 | Middlesex | 4.2 | | | Rockbridge | 2.9 | | |
| Tazewell | 0.2 | Radford | 1.7 | Pittsylvania | 1.2 | Sussex | 2.9 | Newport News | 2.2 | Essex | 3.7 | | | Staunton | 2.8 | | |
| Wise | 0.2 | Salem | 1.4 | Henry | 0.5 | Greensville | 1.3 | Portsmouth | 1.1 | Richmond | 2.9 | | | Harrisonburg | 1 | | |
| Norton | 0 | Roanoke | 1.2 | Martinsville | 0.2 | Emporia | 0.9 | Hampton | 0.9 | Mathews | 2.6 | | | Lexington | 0.7 | | |
| Bristol | 0 | Floyd | 1.2 | | | Hopewell | 0.8 | Franklin | 0 | | | | | Buena Vista | 0.5 | | |
| | | Alleghany | 0.5 | | | Colonial Heights | 0.3 | | | | | | | | | | |
| | | Covington | 0.5 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| **Median** | **0.7** | **Median** | **2.6** | **Median** | **3.4** | **Median** | **4.8** | **Median** | **3.2** | **Median** | **5.3** | **Median** | **3.5** | **Median** | **4.0** | **Median** | **5.7** |

152. U.S. Department of Housing. (2023). "State of the Cities Data Systems." https://www.huduser.gov/portal/datasets/socds.html
153. U.S. Department of Housing. (2023). "State of the Cities Data Systems." https://www.huduser.gov/portal/datasets/socds.html
154. United States Census Bureau. (2023) "US Census Bureau. ACS 5-year estimates. TableS0101." https://data.census.gov/.

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