Regional Study on Transportation Project Prioritization for Economic Development and Growth

Technical Memorandum 2

Prepared for:

Roanoke Valley Transportation Planning Organization

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TO: Cristina Finch, Wayne Strickland, RVARC
FROM: Peter Plumeau, Naomi Stein, Adam Blair, EDR Group
DATE: January 15, 2018
RE: Technical Memorandum #2

INTRODUCTION

This memo summarizes the findings of Task 2 of the *Regional Study on Transportation Project Prioritization for Economic Development and Growth*, "Regional Economic Profile and Advantages/Disadvantages." This task draws primarily on existing information contained in the Vision 2040 Roanoke Valley Transportation plan and the Roanoke Valley-Alleghany Regional Comprehensive Economic Development Strategy (CEDS) 2017 Annual Update. Where relevant and readily available, it includes other supporting other data, including information from VTrans 2040. This profile synthesizes available information to provide new perspectives that a) reflect the understanding of economic development expressed by stakeholders at the November 29, 2017 stakeholder workshop; b) align with key factors that support business competitiveness, and c) focus specifically on the role of transportation in the context of broader economic development processes.

VISION FOR ECONOMIC DEVELOPMENT

At the November 29, 2017 workshop and steering committee meeting, regional stakeholders participated in a discussion of regional economic development goals and their relationship to transportation needs. This discussion identified and validated an alignment of goals from the region's CEDS and Vision 2040, including:

- **Connectivity**: ensuring adequate connectivity both internally within the region and to outside markets, to support opportunities for people to access jobs, services, and activity centers, and to further facilitate the growth of high-wage industry clusters.
- **Competitiveness**: focusing on how well the transportation system supports business, addressing specific sectors like tourism, and focusing on a diverse business base that includes both large employers and entrepreneurial activity.
- **Maintenance:** the mandate to think as a region about long term care of the system as well as how to get the most value from the assets the region already has.
- **Sustainability:** recognizing the ample natural and cultural resources in the region and seeking to align transportation and economic development strategies to keep the region and its growth sustainable in the long run.

Building on this vision, this memo presents data on economic conditions and trends in the region, as a basis for understanding challenges and opportunities moving forward. It also investigates key regional attributes that are known to affect private sector location and expansion decisions, including non-

transportation factors related to human capital, innovation, and livability, as well as transportation connectivity conditions.

REGIONAL ECONOMIC PROFILE

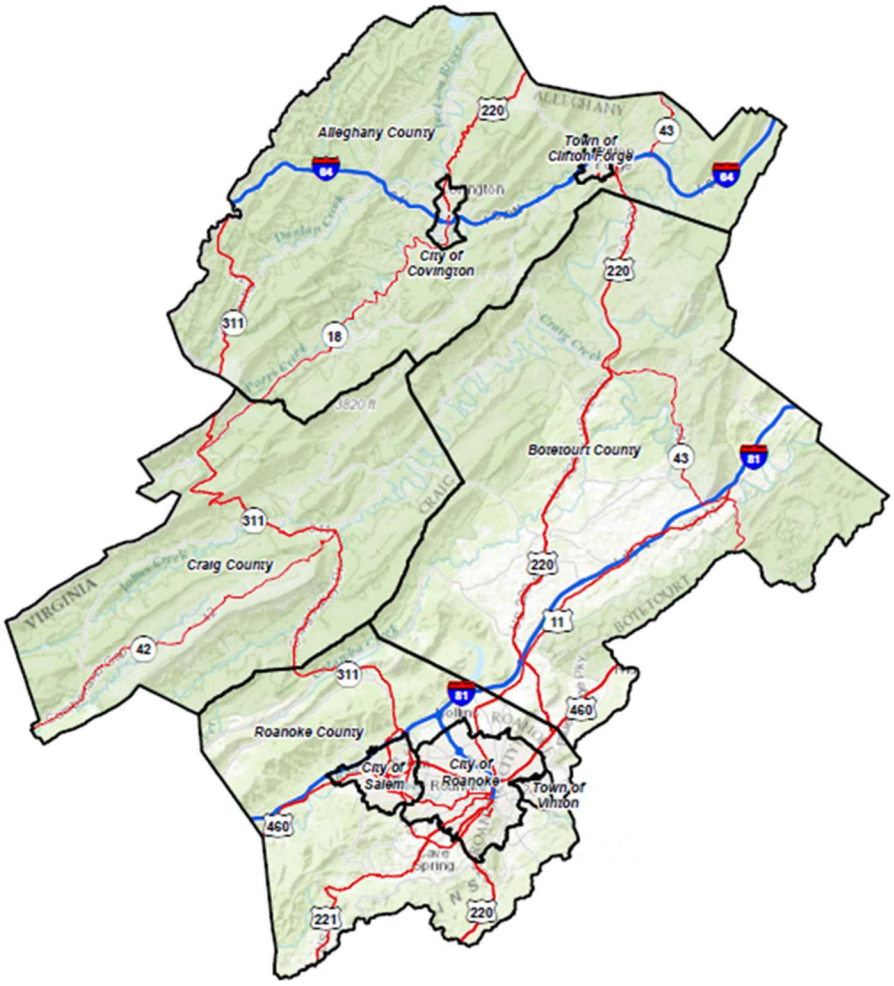
Study Region Definition(s)

This regional economic profile draws on data compiled from a variety of sources that in some cases adopt different, but overlapping, study region definitions. As shown in Figure 1, the CEDS study area includes the counties of Alleghany, Botetourt, Craig, and Roanoke, the Cities of Covington, Roanoke, and Salem, and the Towns of Clifton Forge and Vinton. The Vision 2040 Roanoke Valley Transportation plan, in accordance with federal MPO planning requirements, addresses a smaller geography that includes the census designated Urbanized Area centered around Roanoke and the area that is expected to be urbanized in the next 20 years.[1] The result is that the RVTPO boundary encompasses the Cities of Roanoke and Salem, the Town of Vinton, and the *urbanized* portions of the Counties of Bedford, Botetourt, Roanoke and Montgomery, as shown in Figure 2. Both the CEDS and Vision 2040 represent planning activities of the broader RVARC, which is a Virginia Planning District defined in accordance with state statute. The RVARC boundaries additionally encompass Franklin County and the Town of Rocky Mount as joint members. Figure 3 shows this broader geography and its correspondence with the study region for Vision 2040. Some data is tabulated at the level of the Metropolitan Statistical Area (MSA), which is similar to the RVARC service area expect that it excludes Allegheny County and Covington. Finally, for the purposes of its regional network needs analysis, VTrans 2040 defined the Roanoke Region as including Botetourt County, Roanoke County, the City of Roanoke, and the City of Salem.

Note that while these differing geographic definitions lend nuance to the interpretation of collected data, they also serve to highlight the significant interconnectedness of the broader Roanoke region.

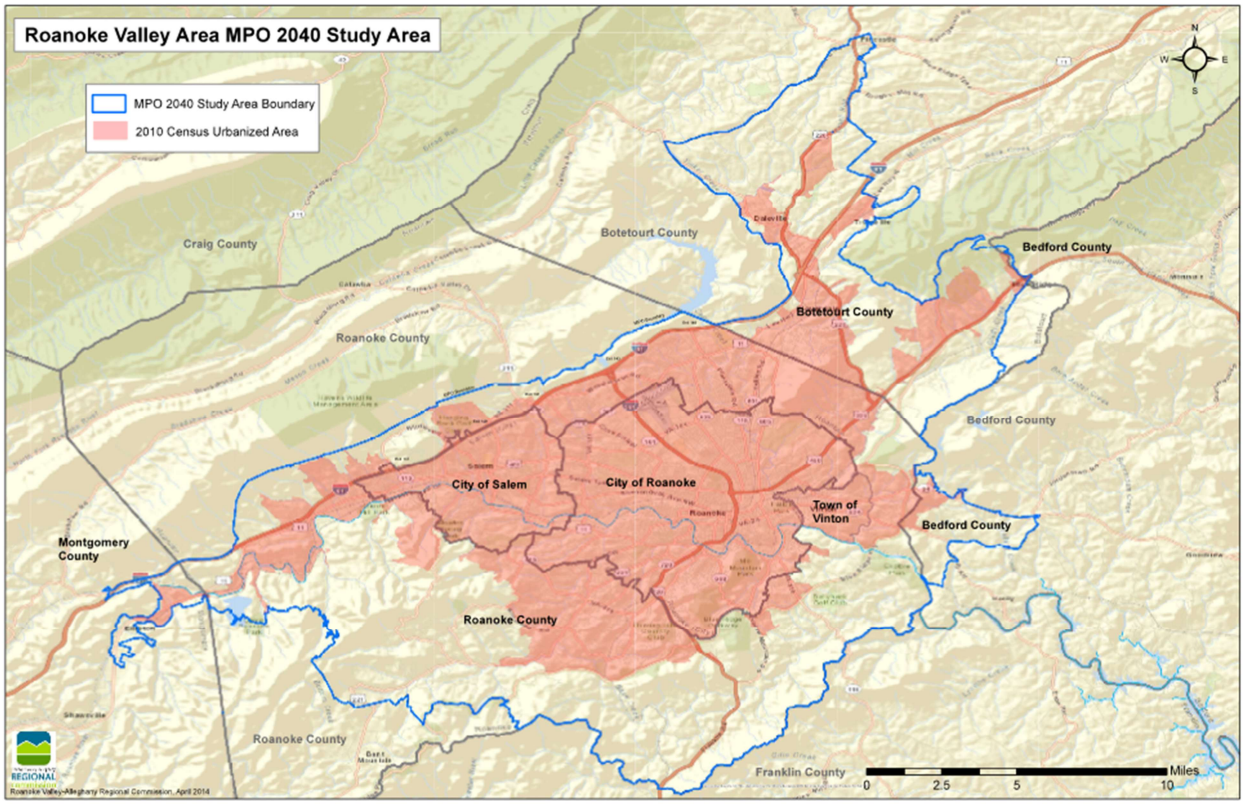
[1] http://rvarc.org/transportation/mpo-urban-transportation/

Figure 1 Roanoke Valley - Alleghany Region (CEDS)



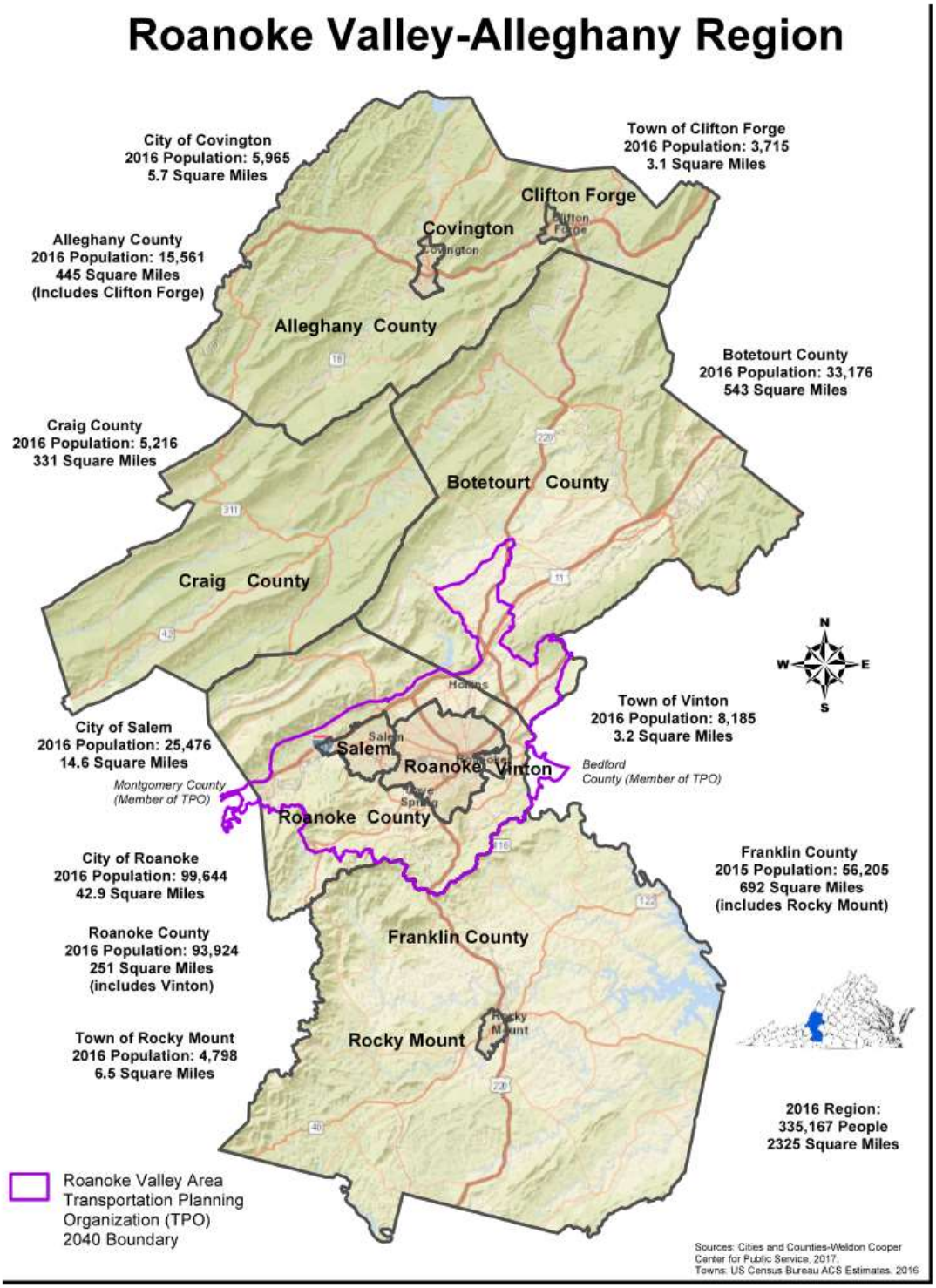
Source: Roanoke Valley-Alleghany Regional Comprehensive Economic Development Strategy 2017 Annual Update (2017 CEDS)

Figure 2 RVTPO Study Area Boundaries



Source: RVARC. http://rvarc.org/wp-content/uploads/2014/04/mpostudyarea.pdf

Figure 3 Roanoke Valley-Allegany Regional Commission (RVARC) Service Area



Source: RVARC. http://rvarc.org/wp-content/uploads/2017/09/pdcbasicpops.pdf

Economic Performance and Trends

The Roanoke Metropolitan Area (MSA) is the fourth largest in Virginia (Table 1). In terms of overall population growth, the Roanoke CEDS region has experienced slower growth in the period from 2000 to 2015 (5.0%) compared to the Commonwealth of Virginia as a whole (16.6%), as shown in Table 2. Within the region, some localities showed relatively strong growth from 2000-2015 (Botetourt County, Roanoke County, the City of Roanoke, and the Town of Vinton), while others lost population in the same period (Alleghany County, the City of Covington, and the Town of Clifton Forge).

Table 1 Ranking of Virginia Metropolitan Areas by Population (2016)

Metropolitan Statistical Area	Population
Washington-Arlington-Alexandria, DC-VA-MD-WV Metro Area	6,011,752
Virginia Beach-Norfolk-Newport News, VA-NC Metro Area	1,714,428
Richmond, VA Metro Area	1,258,158
Roanoke, VA Metro Area	**312,891**
Kingsport-Bristol-Bristol, TN-VA Metro Area	307,491
Lynchburg, VA Metro Area	258,062
Charlottesville, VA Metro Area	226,817
Blacksburg-Christiansburg-Radford, VA Metro Area	181,288
Winchester, VA-WV Metro Area	133,125
Harrisonburg, VA Metro Area	130,406
Staunton-Waynesboro, VA Metro Area	119,930

Source: 2012-2016 American Community Survey 5-Year Estimates

Table 2 Population Trends: CEDS Region Compared to Virginia

Locality		2000	2015	Change (2000-2015)
County	Alleghany*	12,926	12,227	-5.4%
	Botetourt	30,496	33,155	8.7%
	Craig	5,091	5,212	2.4%
	Roanoke**	77,996	85,471	9.6%
City	Covington	6,303	5,736	-9.0%
	Roanoke	94,911	98,736	4.0%
	Salem	24,747	25,165	1.7%
Town of Clifton Forge		4,289	3,839	-10.5%
Town of Vinton		7,782	8,162	4.9%
RVAR CEDS Region		**264,541**	**277,703**	**5.0%**
Virginia		**7,078,515**	**8,256,630**	**16.6%**

*Source: 2011-2015 5-Year Estimates, American Community and Survey Demographic and Housing Estimates, 2017 and US Census of Population, 2000, as cited in 2017 CEDS. * Excludes Town of Clifton Forge population. ** Excludes Town of Vinton population.*

From the perspective of growth in overall economic activity, as measured in terms of Gross Domestic Product, the Roanoke MSA grew 6% from 2013 to 2015, which is slightly slower than Virginia (7%) and the US overall (8.1%).

Table 3 Changes in GDP in Roanoke MSA, compared to Virginia and the US

Geography	2013	2014	2015	Change 2013-15
Roanoke MSA	$ 13,658	$ 14,004	$ 14,474	6.0%
Virginia Total	$ 449,502	$ 460,151	$ 481,084	7.0%
US Metro Portion	$ 14,967,434	$ 15,606,598	$ 16,202,029	8.2%
US Total	$ 16,576,808	$ 17,277,548	$ 17,919,651	8.1%

Source: Bureau of Economic Analysis, 2017, as cited in 2017 CEDS.

Median household income is increasing in the majority of localities within the region, as shown in Table 4. The City of Roanoke experienced the strongest income growth in recent years, exceeding that of Virginia as a whole.

Table 4 Median Household Income Trends Compared to Virginia

Locality		2006-2010 5-YR Estimate	2011-2015 5-YR Estimate	Percent Change
County	Alleghany	43,160	45,007	4.3%
	Botetourt	64,725	60,454	-6.6%
	Craig	51,291	44,330	-13.6%
	Roanoke	59,446	60,519	1.8%
City	Covington	35,277	34,746	-1.5%
	Roanoke	36,422	39,930	9.6%
	Salem	48,828	50,068	2.5%
Town of Clifton Forge		34,256	35,769	4.4%
Town of Vinton		42,467	45,271	6.6%
Virginia		61,406	65,015	5.9%

Source: U.S. Census Bureau, American Community Survey, as cited in 2017 CEDS.

Age is one significant variable used to understand labor force trends. Table 5 shows that the population of most of the localities in the CEDS region is on average older than that of the Commonwealth as a whole. According to the US Bureau of Labor Statistics, all localities in the CEDS region have experienced a stagnant or declining labor force in the period between 2012 and 2016, as shown in Table 6. The availability of human capital, therefore, is one of the significant challenges facing the region.

Table 5 Age Distribution as Compared to Virginia

Locality		Median Age	Percent of Population by Age					
			under 5	5 to 19	20 to 34	35 to 54	55 to 64	65 and older
County	Alleghany	47.2	5.0	16.7	14.2	25.9	15.0	23.2
	Botetourt	46.4	4.5	18.7	13.3	28.0	16.4	19.0
	Craig	47.1	5.7	18.9	12.7	28.1	13.8	21.0
	Roanoke	43.5	4.8	18.4	15.9	27.4	14.4	19.0
City	Covington	43.7	5.2	17.9	16.3	28.5	12.7	19.5
	Roanoke	38.0	7.2	16.8	21.9	26.3	13.2	14.7
	Salem	40.5	5.2	19.7	19.4	24.9	13.6	17.2
Town of Clifton Forge		44.9	6.1	18.7	14.8	23.7	14.4	22.3
Town of Vinton		39.3	4.7	21.2	18	26.1	11.7	18.3
Virginia		**37.6**	**6.2**	**19.2**	**21.2**	**27.6**	**12.4**	**13.2**

Source: 2011-2015 5-Year Estimates, American Community Survey Demographic and Housing Estimates, 2017, as cited in 2017 CEDS.

Table 6 Labor Force Trends Compared to Virginia

Locality		2012	2016	Change
County	Alleghany	7,805	6,932	-11.2%
	Botetourt	17,733	17,412	-1.8%
	Craig	2,466	2,399	-2.7%
	Roanoke	49,586	49,360	-0.5%
City	Covington	2,645	2,382	-9.9%
	Roanoke	49,669	49,160	-1.0%
	Salem	12,919	12,953	0.3%
Virginia		4,225,252	4,240,403	0.4%

Source: Bureau of Labor Statistics, 2017, as cited in 2017 CEDS.

Comparative Performance of Roanoke Region with U.S. Metro Areas Nationally

The Harvard University's Institute for Strategy and Competitiveness, through funding provided in part by the U.S. Department of Commerce, Economic Development Administration, maintains an open access data resource for studying the performance of regional economies: the US Cluster Mapping website (http://www.clustermapping.us/). The charts shown in Figure 5 were generated by that system and provide a snapshot of comparative performance and trends for the Roanoke MSA, relative to other regions in the United States. The dots with numbers inside them on each of the charts provide information on the ranking by percentile of the Roanoke MSA among all 917 U.S. metropolitan and micropolitan statistical areas, corresponding to the key shown in Figure 4. This data provides a supplementary understanding of the region's economic profile and performance within the context of the overall national economy:

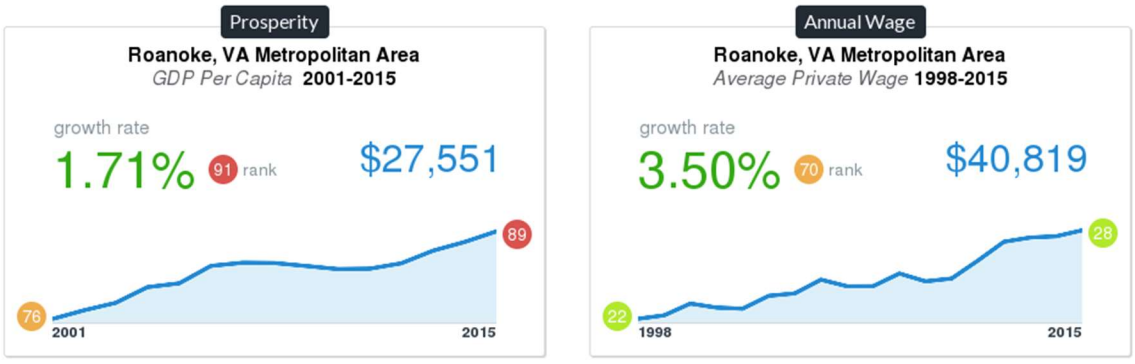
- From 2001—2015, the region gained in GDP per capita but also dropped from the fourth to the fifth quintile of regions, meaning that growth has lagged other regions.

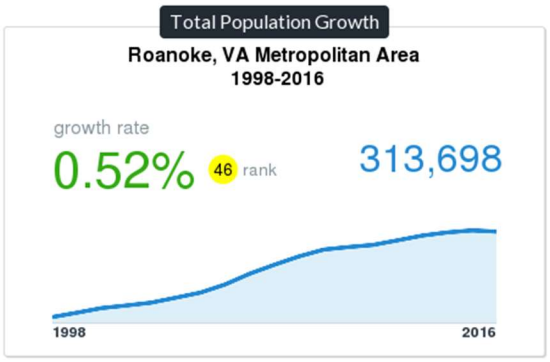
- Average private sector wages in the region also grew by 3.5% from 1998-2015. While this growth lags other regions in the U.S., the region benefited from already being (and remaining) in the top 30% of metro areas.
- Total private non-agricultural employment declined slightly between 1998 and 2015 and total population increased just slightly from 1998 to 2016.
- Nationally, the percentage of young adults (25 to 44) in the total population steadily declined from 1998-2016. However, for Roanoke, this decline has been steeper, and the current regional percentage (23.43%) is lower than the U.S. average (26.35%).
- Poverty increased in the region between 1998 and 2015. However, the region is still in the top 30% of metro areas with the lowest poverty rates and has a lower rate (13.12%) than the US as a whole (14.7%).

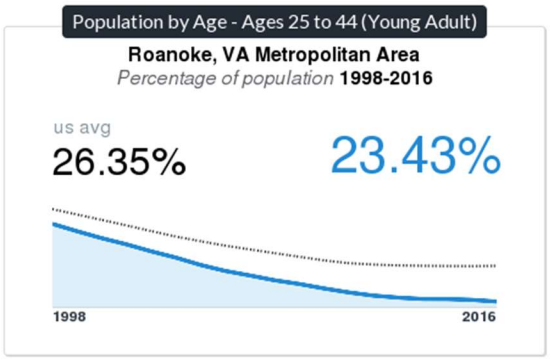
Figure 4 Percentile Key

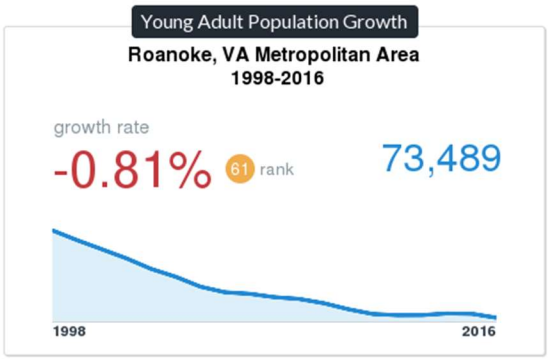
Source: U.S. Cluster Mapping (http://clustermapping.us), Institute for Strategy and Competitiveness, Harvard Business School. Copyright © 2014 President and Fellows of Harvard College. All rights reserved. Research funded in part by the U.S. Department of Commerce, Economic Development Administration.

Figure 5 Economic Performance of the Roanoke MSA Compared to Other Regions in the U.S.









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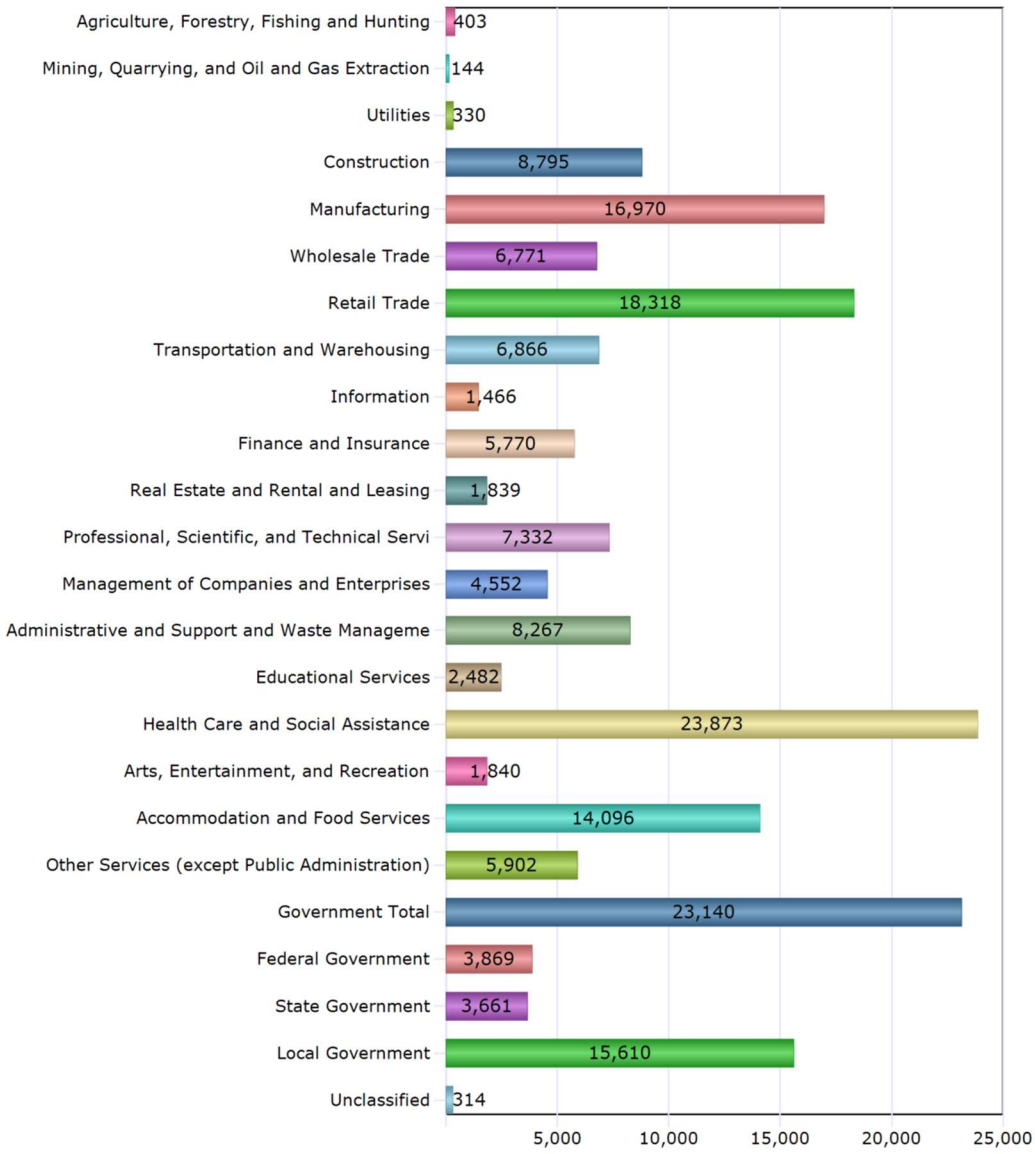
Industry Composition and Clusters

Figure 6 shows the industry composition of employment in the Roanoke Valley Alleghany Region (corresponding to the RVARC service area shown in Figure 3). The largest employment sectors in the region are: Health Care and Social Assistance, Government, Retail, Manufacturing, and Accommodation and Food Services. Some of these are primarily local-serving in that they support the local needs of

regional residents and tend to growth with population. Health Care and Social Assistance and Government industries are classically local-serving.

Figure 6 Employment by Industry - Roanoke Valley-Alleghany RC



Source: Virginia Employment Commission, Economic Information & Analytics, Quarterly Census of Employment and Wages (QCEW), 2nd Quarter (April, May, June) 2017. As cited in Virginia Employment Commission: Virginia Community Profile, Roanoke Valley-Alleghany RC, January 2018. http://virginialmi.com/report_center/community_profiles/5109000305.pdf

Given the importance of tourism in the Roanoke region, businesses in Retail and Accommodations and Food Services are likely to serve a mix of local residents and travelers from elsewhere that visit and

spend money in the regional economy. Manufacturing, on the other hand, is what is sometimes called a "traded" industry. Manufacturing businesses produce goods that are then shipped out to broader markets, thus bringing outside money into the economy. Service sectors like Professional, Scientific, and Technical Services can also be considered traded industries if they serve outside markets.

> CLUSTERS ARE GROUPINGS OF NOT ONLY INDUSTRIES WITH SIMILAR PROCESSES BUT ALSO KEY SUPPLIERS AND OTHER RELATED INDUSTRIES FROM OTHER INDUSTRIAL SECTORS THAT TEND TO LOCATE IN THE SAME GENERAL PROXIMITY AND GAIN CERTAIN ADVANTAGES (SHARED WORKFORCE, KNOWLEDGE TRANSFER, ETC.) FROM DOING SO.
>
> - *Roanoke Valley-Alleghany Regional Comprehensive Economic Development Strategy*

All regional economies share certain commonalities in that they require population-serving businesses to support to local population by providing food, housing, transportation, shelter, etc. Where regions differ is in their developed specialties for goods and services that are exported elsewhere. These specialties can arise for many reasons ranging from proximity to natural resources, to a region's locational advantage with respect to specific global supply chains, or to concentrations of talent and innovation associated with research institutions. Regardless of their underlying initial cause, clustering dynamics tend to be self-reinforcing as businesses derive advantages from colocation with other similar companies, including:

> access to a broad pool of skilled workers with industry- or cluster-specific skills, access to suppliers and business customers, the ability to share ideas face-to-face with others who are working on similar business or technological problems, and access to educational, research, consulting, and engineering services that are specialized in the needs of the industry or cluster.[2]

By identifying industry clusters, economic development strategy can be tailored to support and build upon positive clustering dynamics and regional competitive advantages. Table 7 lists eight industry clusters in the Roanoke region that employ a disproportionately high number of workers relative to their share in the U.S., as indicated by a location quotient (LQ)[3] of greater than 1. For example, Transportation & Logistics and Electrical Equipment and Appliance & Component Manufacturing both account for approximately twice the average national proportion of employment in the region.

The identified clusters all share a significant level of reliance on freight transportation to support access to material input and the ability to move goods to market (with the possible exception of certain more

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[2] Helper, S., T. Krueger, and H. Wial. 2012. Locating American Manufacturing: Trends in the Geography of Production. Metropolitan Policy Program at Brookings. https://www.brookings.edu/wp-content/uploads/2016/06/0509_locating_american_manufacturing_report.pdf

[3] A location quotient (LQ) is an analytical statistic that measures a region's industrial specialization relative to a larger geographic unit (usually the nation). An LQ is computed as an industry's share of a regional total for some economic statistic (earnings, GDP by metropolitan area, employment, etc.) divided by the industry's share of the national total for the same statistic. https://www.bea.gov/faq/index.cfm?faq_id=478

service and research-oriented subsectors within the Life Sciences cluster). However, that is not to say that workforce issues and passenger transportation are irrelevant to these clusters. All parts of the national economy are becoming increasingly knowledge-oriented and dependent on access to skilled labor. Transportation supports the "people side of the equation" by ensuring people can reliably get to work, providing a diversity of mobility options to support quality of life, and by helping companies maintain connections with customers, suppliers, and collaborators through business travel.

Table 7 2012 Industry Clusters – Employment

Industry Cluster Description	Industry Cluster Employment LQ
Transportation & Logistics	2.02
Electrical Equipment, Appliance & Component Mfg	1.92
Glass & Ceramics	1.45
Biomedical/Biotechnical (Life Sciences)	1.28
Transportation Equipment Manufacturing	1.19
Mining	1.15
Chemicals & Chemical Based Products	1.08
Forest & Wood Products	1.03
Total All Industries	**1.00**

Source: US EDA, Innovation in American Regions, http://www.statsamerica.org/innovation/anydata/custom.asp, 2016. Detailed industry cluster definitions can be found at http://www.statsamerica.org/innovation/reports/detailed_cluster_definitions.pdf. As cited in 2017 CEDS.

Human Capital, Innovation, and Livability

Before addressing transportation conditions in the region, this section addresses other facets and inputs to regional competitiveness including human capital, innovation, and quality of life.

Educational attainment—usually described in terms of residents with a college degree—is often used as a proxy for the human capital inputs necessary for a competitive economy. In fact, educational attainment is consistently found to be the strongest predictor of regional employment growth.[4] Table 8 shows the educational attainment of the population that is aged 25 years and over in the region. Note that while conventional wisdom has often focused on attainment of a bachelor's degree or higher, recent research shows that attractive wage and job opportunities exist in STEM (science, technology, engineering, and math) fields for workers with a post-secondary certificate or associate's degree.[5]

[4] Literature supporting this notion is summarized in Edward Glaeser, *Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, Healthier, and Happier*, London, UK: Penguin, 2012.

[5] Jonathan Rothwell, "The Hidden STEM Economy," Metropolitan Policy Program, Brookings, https://www.brookings.edu/wp-content/uploads/2016/06/TheHiddenSTEMEconomy610.pdf

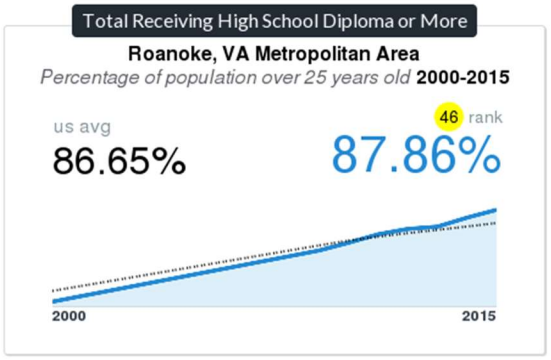
Table 8 Educational Attainment

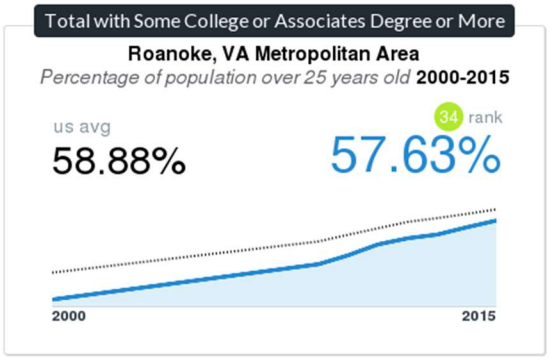
Geography	Population 25 years and over	% High School Degree or Higher	% Associate's Degree or Higher	% Bachelor's Degree or Higher
Alleghany County	11,778	83.6	24.3	15.7
Botetourt County	23,850	91.1	34.7	26.2
Craig County	3,849	89.6	21.5	14.7
Roanoke County	66,877	91.9	44.1	34.2
City of Covington	3,976	83.2	16.9	9.3
City of Roanoke	66,622	84.4	31.5	23.6
City of Salem	16,888	90	38.2	28.4
Virginia	**5,566,313**	**88.3**	**43.7**	**36.3**

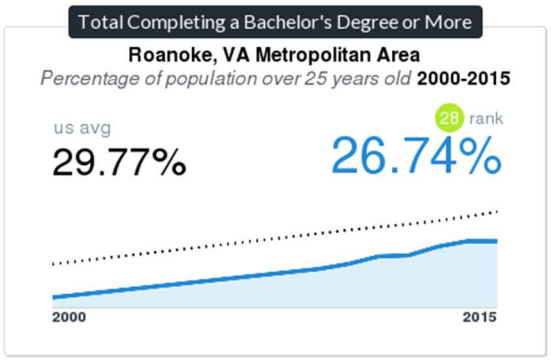
Source: 2011-2015 American Community Survey 5-Year Estimates, as cited in 2017 CEDS.

The red text in Table 8 points to localities in which educational attainment is lower than at the state level. With the exception of Roanoke County, the data show that the region lags the state in educational attainment at the level of an associate's degree or higher. Figure 7 shows a similar comparison of educational attainment in the Roanoke MSA to the rest of the U.S. In the period 2000-2015, Roanoke succeeded in surpassing the national average for those receiving a high school diploma or more. The metro area still lags behind the country in attainment of an associate's and bachelor's degrees (or more) but has nevertheless improved performance over time and ranks in the second quintile of U.S. metropolitan and micropolitan statistical areas.

Figure 7 Educational Attainment of the Roanoke MSA Compared to Other Regions in the U.S.







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Looking beyond educational attainment, those interested in economic development have also begun to dive deeper into the dynamics of innovation and entrepreneurships as drivers of overall economic growth. Table 9 compares the Roanoke region to the Commonwealth of Virginia according to two innovation indicators. The first shows that the region has establishments with on average more workers per firm than Virginia. Smaller average firm size is a good indicator of economic health in the long run. The second is a composite index developed by the Indiana Business Research Center for the U.S. Commerce Department's Economic Development Administration "to highlight factors that indicate a region is more or less ready to participate in the knowledge economy." Again, with respect to this measure, the region is ranked behind the State.

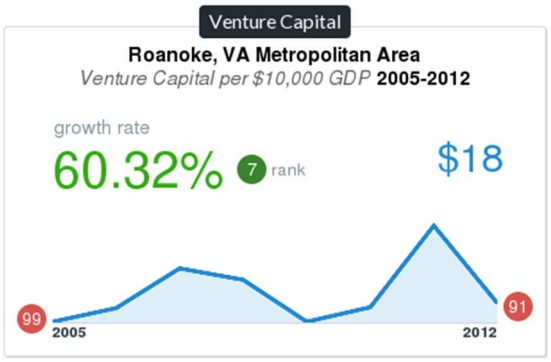
Table 9 Innovation Indicators: Roanoke Valley-Alleghany RC and Virginia

Indicator	Roanoke PDC	Virginia
Average establishment size (workers per firm)*	16.16	14.55
Innovation Index**	89.0	97.9

*Sources: *Virginia Employment Commission: Virginia Community Profile, Roanoke Valley-Alleghany RC, January 2018. http://virginialmi.com/report_center/community_profiles/5109000305.pdf . ** Indiana Business Research Center, for the U.S. Commerce Department's Economic Development Administration. http://www.statsamerica.org/innovation/innovation_index/region-select.html*

Figure 8 presents information on venture capital investment per $10,000 GDP in the Roanoke MSA, compared to other metropolitan and micropolitan statistical areas in the U.S. Venture capital is an important facilitator of the innovation dynamic and can help can drive regional start-up activity. While the data show that Roanoke is currently in the last quintile of U.S. regions with respect to this metric, the growth rate in venture capital investment the region experienced between 2005 and 2012 was the seventh fastest in the country—a promising trend for the regional economy.

Figure 8 Venture Capital Investment in the Roanoke MSA as Compared to Other U.S. Regions



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Another perspective on workforce as a key ingredient to economic development is the increased competition between regions for talent, based on overall quality of life. In this arena, rather than focusing only on attracting businesses, regions are also seeking to compete for the talent upon which those businesses rely. Table 10 reports on an indicator of quality of life—the Cost of Living Index, as computed by the Council for Community and Economic Research. Roanoke's index comes in at 90 (benchmarked against a national average of 100), which compares favorably with other cities. This cost of living index is a composite score which includes sub-indices of housing (89.0), transportation (86.3), misc. goods and services (88.3), grocery items (90.2), utilities (98.5), and health care (93.8).[6]

Table 10 Comparative Cost of Living Index

Region	Cost of Living Index
Roanoke, VA	90.0
National Average	100.0
Charleston, SC	101.0
Harrisonburg, VA	96.9
Charlottesville, VA	103.7
Atlanta, GA	99.9
Raleigh, NC	90.5
Washington, DC	146.8

Source: ACCRA, 2015 Annual Average Data, as cited in Roanoke Regional Chamber Greater Roanoke Virginia Statistical Guide, 2017, http://65.169.107.207/wp-content/uploads/2017/10/2017-Statistical-Guide-Web-Version.pdf

[6] ACCRA, 2015 Annual Average Data, as cited in Roanoke Regional Chamber Greater Roanoke Virginia Statistical Guide, 2017, http://65.169.107.207/wp-content/uploads/2017/10/2017-Statistical-Guide-Web-Version.pdf

TRANSPORTATION CONNECTIVITY CONDITIONS

This section discusses transportation connectivity conditions from two primary perspectives that are of direct relevance to business competitiveness: (1) Intra-Regional Connectivity and Labor Market Access, and (2) Inter-Regional Connectivity with Outside Markets.

Intra-Regional Connectivity and Labor Market Access

Table 11 reports commute times for those living in the Roanoke MSA compared to other metropolitan areas in Virginia that are closest in size to Roanoke. The data suggests that the Roanoke region benefits from relatively short commutes compared to the statewide average—a reflection in part of the lower levels of congestion experienced in the area.

Table 11 Mean Travel Time to Work (2016) for Roanoke and Comparison Regions

Geography	Mean Travel Time to Work
Richmond, VA Metro Area	25.0
Roanoke, VA Metro Area	23.3
Kingsport-Bristol-Bristol, TN-VA Metro Area	22.9
Lynchburg, VA Metro Area	23.7
Charlottesville, VA Metro Area	24.3
Virginia	**28.1**

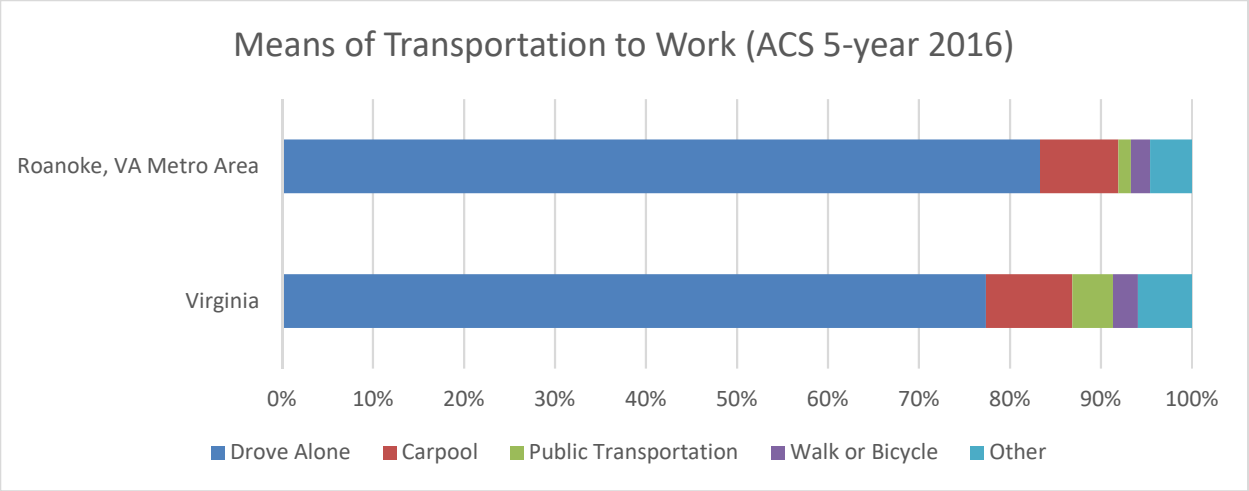
Source: 2012-2016 American Community Survey 5-Year Estimates

With respect to mode share, the Roanoke region is more dependent on personal vehicles for access to work than the state as a whole with 92% of people driving alone or carpooling to work in the region, compared to 87% statewide. Correspondingly its transit, walking, and biking shares are also lower (a total of 3% compared to 7% at the state level). Vision 2040, the region's LRTP, describes an anticipated greater importance of modal options for the future of the region:[7]

> The Roanoke Valley's population has not yet grown to a size where the primary reliance on driving for people or freight mobility has hampered quality of life or business, but with every new land development, it is important to plan for a future with mixed uses and multiple modes.

[7] Vision 2040: Roanoke Valley Transportation.

Figure 9 Commuting mode split, Roanoke MSA and Virginia

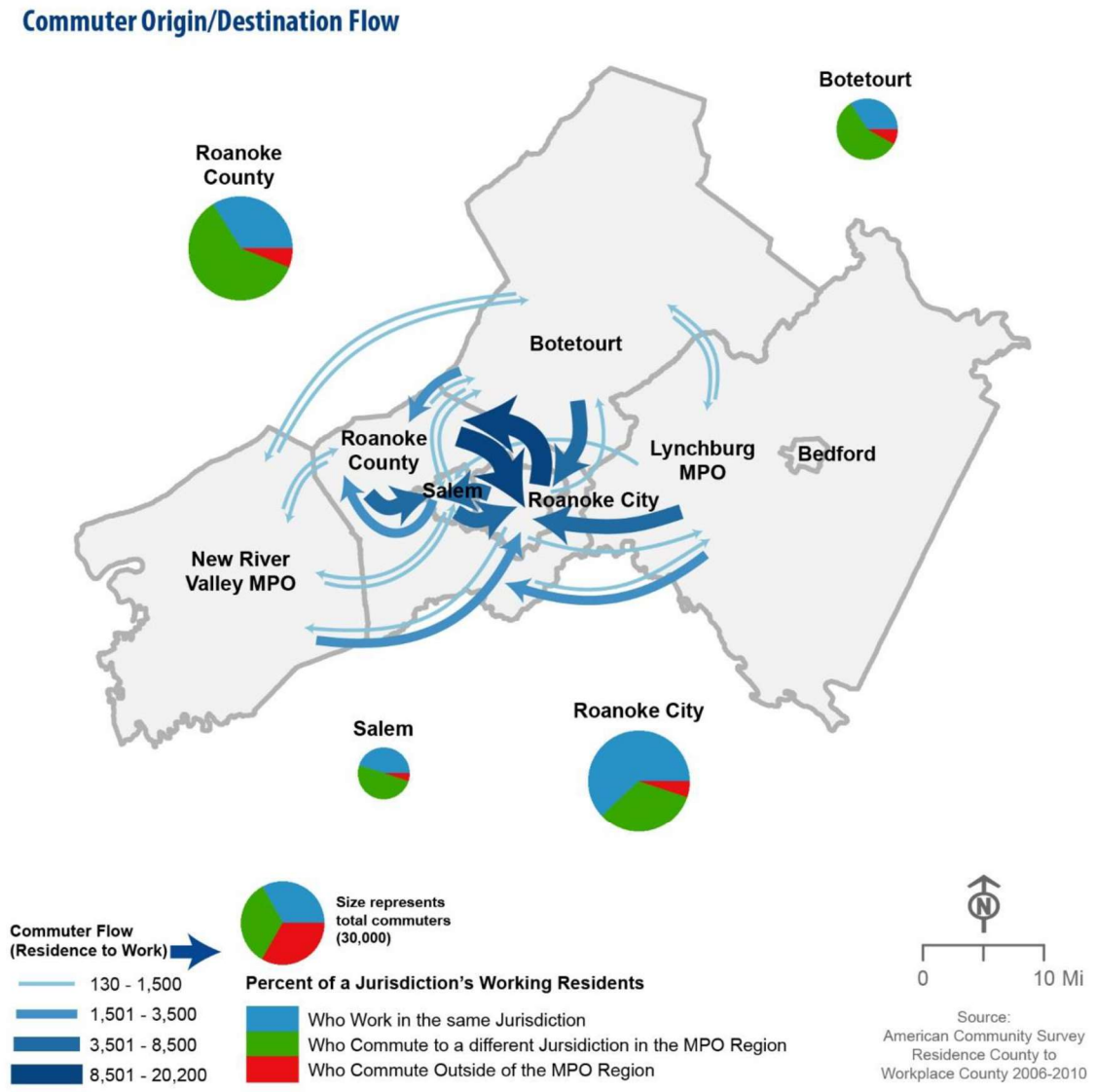


Source: 2012-2016 American Community Survey 5-Year Estimates

Figure 10 depicts regional commuting patterns in the Roanoke region. This graphic shows that the City of Roanoke is a major destination for workers, including from other neighboring MPO areas. It also shows that nearly 66% of those working in the City of Roanoke also live within the City limits. Overall, the labor market contains about 334,000 people located within a 40-minute drive of downtown Roanoke.[8]

[8] Estimates from ESRI Business Analyst Online.

Figure 10 Regional Commuting Patterns



Source: VMTP 2025 Needs Assessment, Roanoke Region, September 2015.

Inter-Regional Connectivity with Outside Markets

Businesses in the Roanoke region rely on the highways, rail network, and airports to maintain connections with outside markets. In fact, the VTrans Roanoke regional needs assessment highlighted connections to Lynchburg, to the east, and Blacksburg/ Christiansburg, to the west, as key to ensuring local economic success.[9] As a proxy for the overall scale of the buyer-supplier or one-day truck-delivery

[9] VMTP 2025 Needs Assessment, Roanoke Region, September 2015.

market, there are 3.38 million employees (an indicator of economic activity) located within a 3-hour drive of Roanoke.[10]

Table 12 reports annual enplanements at all commercial service airports in Virginia. Roanoke-Blacksburg Regional airport served approximately 305,000 enplanements (boardings) in 2016, up 2% from the previous year. The airport is the fifth busiest passenger airport in the state and the 156th nationally. The airport serves eight non-stop destinations with more than 40 scheduled flights daily.[11]

Table 12 Enplanements at Virginia Commercial Service Airports

Airport in Virginia	CY 16 Enplanements	CY 15 Enplanements	% Change	National Rank
Ronald Reagan Washington National	11,470,854	11,242,375	2%	23
Washington Dulles International	10,596,942	10,363,974	2%	26
Richmond International	1,777,648	1,740,391	2%	66
Norfolk International	1,602,631	1,515,200	6%	70
Roanoke-Blacksburg Regional/Woodrum Field	305,212	300,181	2%	156
Charlottesville-Albemarle	295,930	274,767	8%	158
Newport News/Williamsburg International	199,421	202,104	-1%	183
Lynchburg Regional/Preston Glenn Field	75,465	75,824	0%	249
Shenandoah Valley Regional	5,442	5,536	-2%	443

Source: FAA CY 16 Enplanements at All Commercial Service Airports (by Rank).
https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/

Rail service has historically been and continues to be a key face of the region's inter-regional connectivity. Roanoke lies at the convergence of multiple corridors owned by freight railroad Norfolk Southern. CSX also serves the region. Norfolk Southern has a "Thoroughbred Bulk Transfer Terminal" in Roanoke that provides rail-to-truck and truck-to-rail bulk transfer and distribution services. At present, the region does not have an intermodal container rail transfer terminal, although one has been proposed and analyzed near the intersection of two major Norfolk Southern (NS) freight corridors (Heartland and Crescent). The region is, however, within the service area of other existing intermodal terminals, and is close enough to the Port of Virginia for trucking to be more cost effective than rail at that distance.[12]

The introduction of new passenger rail to Roanoke is a key development in supporting the region's connections to outside markets. As of late 2017, Roanoke is the new end of the line for the Northeast Regional train.

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[10] Estimates from ESRI Business Analyst Online.

[11] http://www.roanokeairport.com/

[12] http://rvarc.org/wp-content/uploads/2015/09/Western-Virginia-Intermodal-Study-Final_RoanokeReport_LessAppendices-Final-Report-06-25-2015.pdf

Finally, inter-regional connectivity is important to the Roanoke region because of its role in supporting tourism and associated economic activity. According to estimates by the U.S. Travel Association developed for the Virginia Tourism Corporation, $751 million in spending by domestic visitors to the Roanoke region directly supported 7,037 jobs in 2016. This is 10% higher than in 2012 (Table 13). The regional CEDS associates an increase in tourism in part with the "advent of the new regional identity for tourism – 'Virginia's Blue Ridge.'"

Table 13 Jobs and Sales Supported by Domestic Visitors to the Roanoke Region (dollars in millions)

Locality		2012		2016		% Change	
		Jobs	Expenditures	Jobs	Expenditures	Jobs	Expenditures
County	Alleghany	352	$35	361	$36	3%	3%
	Botetourt	433	$51	462	$57	7%	11%
	Craig	46	$4	48	$4	4%	5%
	Roanoke	1,530	$151	1,742	$175	14%	16%
City	Covington	55	$5	54	$5	-2%	1%
	Roanoke	3,419	$373	3,616	$405	6%	9%
	Salem	682	$61	754	$68	11%	13%
Region Subtotal		**6,517**	**$680**	**7,037**	**$751**	**8%**	**10%**
Virginia		**210,020**	**$21,214**	**229,259**	**$23,700**	**9%**	**12%**

Source: Prepared by the U.S. Travel Association for the Virginia Tourism Corporation.
http://web.yesvirginia.org/localspending/localspending

Transportation-Related Insights from the CEDS SWOT Analysis

In support of identification of regional competitive advantages and disadvantages, Table 14 summarizes insights from the CEDS SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis that are directly or indirectly related to transportation. Of particular interest are the issues raised that relate to workforce availability and the influence of lifestyle, vibrancy, and image on the region's ability to attract and retain young professionals. Transportation can play a supporting role in addressing this challenge as there is growing evidence that young professionals (and to some extent retirees as well) are seeking communities that feel more urban and that are more supportive of transit, walking, and biking.

The CEDS SWOT analysis also notes a planning related regional weakness: "Lack of common vision, territorialism, fragmented governments, tunnel vision, we think small (risk-averse)," all of which points to a desire for more regional big-picture thinking.

Table 14 Transportation Related Insights from CEDS SWOT Analysis

Strengths	Weaknesses
• Geographic strengths – Mid Atlantic location, good road and rail access • Transportation overall (airports, roadways, railroad) – great airport • Vibrant downtowns and village centers • Amtrak service	• Changes in airline industry (number of flights, fares, destinations, cancelled flights, lack of reliability) out of Roanoke • Children grow up and leave (looking for employment, lifestyle) • Inadequate supply of talent in region to meet current and future workforce demand. • Lack of perceived "coolness" and vibrancy
Opportunities	**Threats**
• Leverage research and medical initiatives, including Virginia Tech Medical School and Research Institute • Expand the tourism sector (including medical conferences, agri-tourism) • Amtrak related services and businesses • Retention of students and young professionals, marketing to millennials, and focusing on economic and community development (e.g. infrastructure, housing, quality of life) • Redevelopment, repurposing, reuse • I-73* and Rail Intermodal Facility Concepts**	• Workforce availability • Aging infrastructure • Changing economy: technology shifts, corporate restructuring

*Source: Adapted from 2017 CEDS. *I-73 is a very long-term concept – partial preliminary engineering is the RVTPO's vision list, labeled long term. **The Western Virginia Intermodal Study found mixed evidence regarding this proposal and also offered alternative freight-oriented strategies.*[13]

Recap of Stakeholder Defined Needs

Table 15 displays draft regional transportation needs that can be traced to the region's understanding of desired economic development. These were developed by members of the project Steering Committee at the November 29, 2017 meeting and subsequently refined and presented at the RVTPO Policy Board meeting on December 14, 2017.

Beyond this preliminary identification of needs and priorities, the steering committee also revealed a consensus opinion that the region wishes to get better at *'thinking big by thinking regionally'* and to put more concerted effort into developing strong regional transportation concepts that address economic

[13] http://rvarc.org/wp-content/uploads/2015/09/Western-Virginia-Intermodal-Study-Final_RoanokeReport_LessAppendices-Final-Report-06-25-2015.pdf

development goals and can be effectively marketed or advocated. This is in alignment with the CEDS identified weakness of "lack of common vision" identified above.

Table 15 Draft Needs/Priorities

Category	Details
Draft Priority Transportation Needs/Problems	• Lack of travel time reliability between Roanoke/Blacksburg which is essential due to increasing worker/student flow • Lack of connectivity between the Roanoke-Blacksburg Regional Airport and Downtown Roanoke • Vehicle congestion on Route 460 East between Downtown Roanoke and Alternate 220 • Vehicle congestion on Route 220 South between Clearbrook and Route 419 due to people commuting toward Downtown Roanoke • Lack of transit access for residents in the City of Roanoke to jobs in surrounding areas • Lack of connectivity from transit to final destinations • Lack of trails/bikeways between destinations *(lower priority since region is already successful in getting funding)*
Other Possible Regional Transportation Priorities	• Lack of walkable mixed-use places throughout the region – i.e. "placemaking" environment. • Increasing vehicle congestion on Route 220 North between I-81 and Greenfield • Insufficient flight options at affordable prices from ROA.

Fiscal Environment

Vision 2040 highlights how the role of regional planning and transportation investment at RVTPO is changing and will continue to change, in response to the fact that:

1. SMART SCALE encourages greater regional decision-making, rather than more fragmented local decisions
2. "The vast majority of anticipated future funding will be used for maintenance rather than new construction. This will likely mean that very few large-scale new terrain transportation projects will be built in the future. Rather, many transportation projects will be smaller incremental improvements."

SYNTHESIS OF COMPETITIVE ADVANTAGES AND DISADVANTAGES

This memo has assembled available data information on the Roanoke Region, addressing (1) economic and demographic trends, including special attention to labor force trends; (2) key industries, with distinctions between population-serving and traded industries and consideration of clustering dynamics; (3) human capital, innovation, and livability; and (4) transportation conditions focused on intra- and inter-regional connectivity conditions that support business needs (e.g., the need to access quality labor,

move goods, and facilitate tourism). The data and information reviewed suggest the following observations about the region's competitive advantages and disadvantages:

- While the region is growing and has made meaningful gains in prosperity, it is still lagging Virginia and the nation with regard to certain indicators of overall economic development, including young adult population growth.
- The largest employment sectors in the region are: Health Care and Social Assistance, Government, Retail, Manufacturing, and Accommodation and Food Services. Manufacturing is key to bringing outside money into the economy, as are the sub-portions of Retail and Accommodations and Food Services that support tourism activity.
- The Roanoke region is competitive in several industry clusters, including: Transportation & Logistics; Electrical Equipment, Appliance & Component Manufacturing; Glass & Ceramics; Biomedical/Biotechnical (Life Sciences); Transportation Equipment Manufacturing; Mining; Chemicals & Chemical Based Products; Forest & Wood Products.
- One of the primary challenges facing the region is human capital—both in scale of the available workforce and in educational attainment. In particular, the region has struggled with attracting and retaining young people. Transportation can play a supporting role in addressing this challenge as there is growing evidence that young professionals (and to some extent retirees as well) are seeking communities that feel more urban and that are more supportive of transit, walking, and biking.
- While the region still lags according to various indicators of innovation and entrepreneurship, there are positive signs of changes in their realm, including a rapid increase in recent years in venture capital investment in the Roanoke metro area.
- The Roanoke region competes well with other locations in terms of cost of living, which is a major component of livability.
- The region at present benefits from relatively low levels of congestion. However, the region is cognizant of the need to ensure that future growth does not erode this strength—by planning "for a future with mixed uses and multiple modes."
- Connectivity to surrounding regions, particularly the Blacksburg/Christiansburg area, is key to the continued competitiveness of the region and may require targeted improvement strategies.
- Amtrak passenger rail service is a new strength for the region that may present new opportunities.
- The region's growing tourism industry presents new opportunities for strengthening the economy.
- The region is faced with a planning paradigm in which fiscal limitations mean very few large-scale transportation projects are likely to be built in the future, but big-picture regional decision making is nevertheless increasingly key to success. This may point to transportation strategies that focus on key corridors or forms of connectivity as a framework within which incremental improvements can be made over time.