

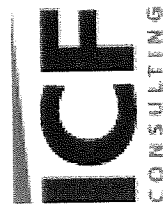


Fifth Planning District Regional Cluster Analysis Final Report

**Prepared For:
Fifth Planning District Regional Alliance,
Roanoke, Virginia**

**Prepared By:
ICF Consulting Economic Strategy Group**

July 1999



**This report reviews the economic performance
and competitiveness of the Fifth Planning
District region**

- 1. The Regional Context**
- 2. Performance of the Roanoke Regional Economy**
- 3. Drivers of Prosperity: Industry Cluster Competitiveness**
- 4. Keys to Competitiveness: Economic Foundations**
- 5. Going Forward: Towards a Collaborative Strategy**

1. The Regional Context

The study defined the region as including metropolitan and non-metropolitan areas

■ Metropolitan (Roanoke MSA) counties and cities

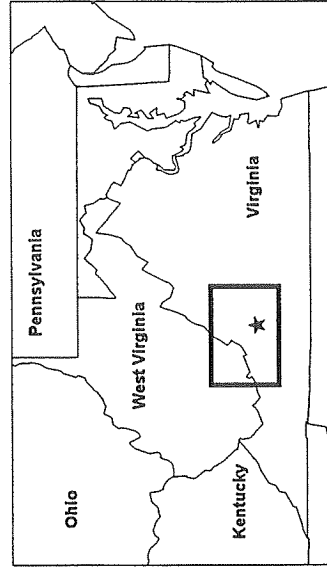
- Botetourt County
- Roanoke County
- Roanoke City
- Salem City



■ Non-Metropolitan counties and cities

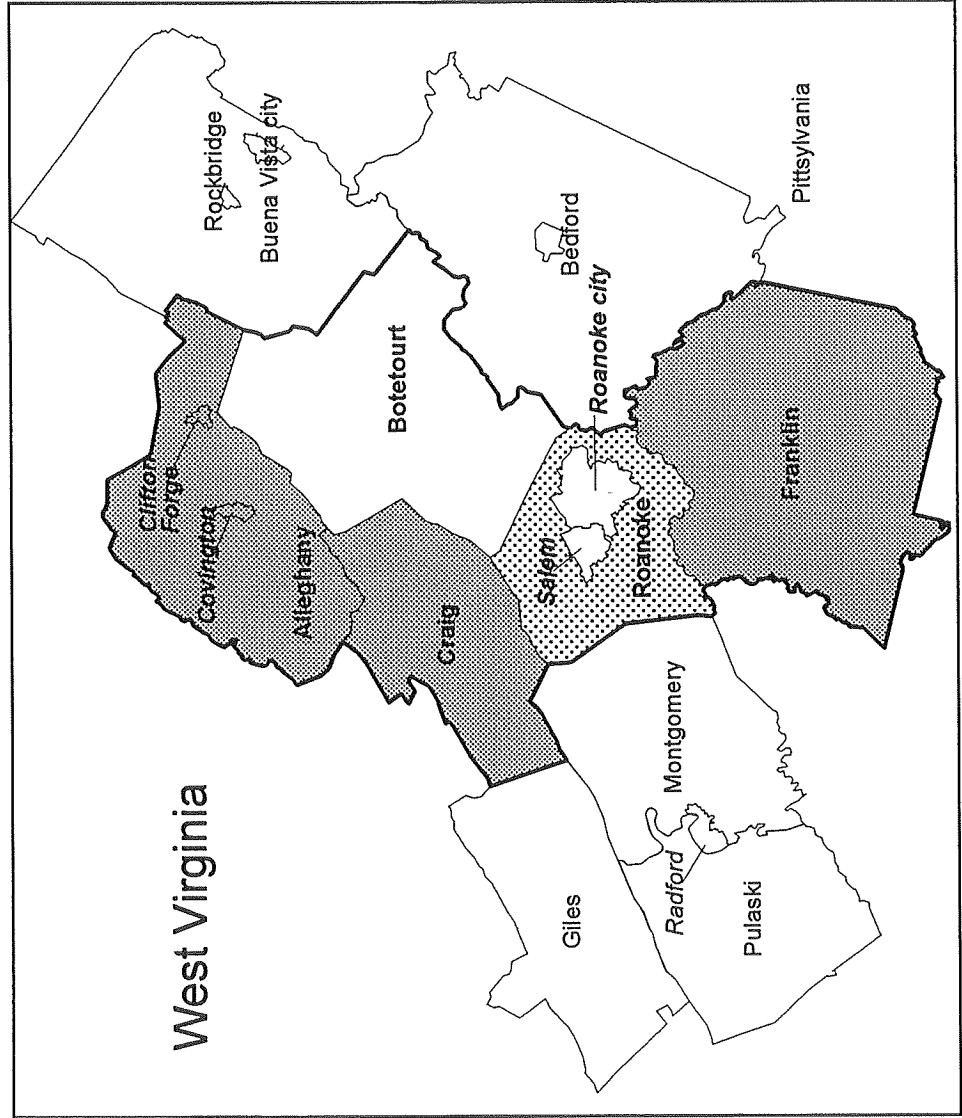
- Alleghany County
- Clifton Forge City
- Covington City
- Craig County
- Franklin County

Fifth Planning District Region = MSA and Non-MSA Areas

Map of the Fifth Planning District region

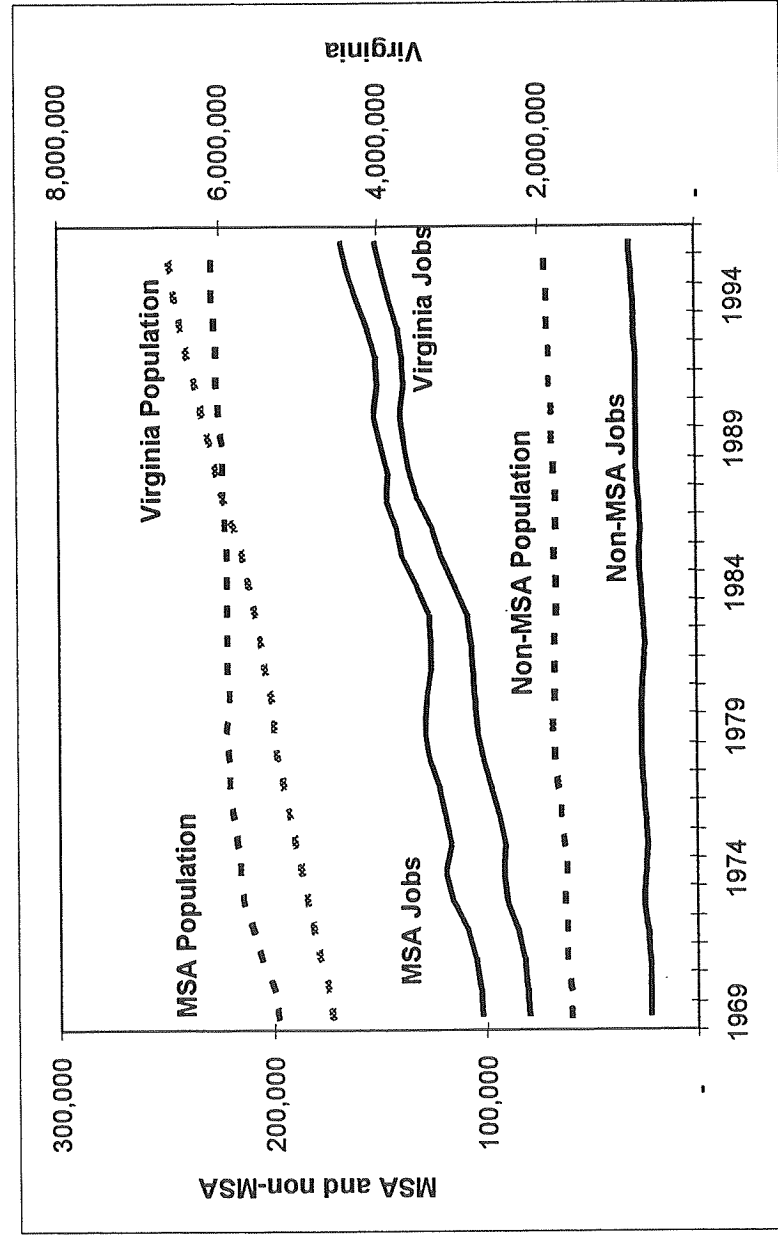


-  Roanoke MSA
-  Non-Metropolitan Areas



2. Overview of The Region's Economic Performance

Population and job growth in the Roanoke MSA, non-metro areas in the region, and Virginia

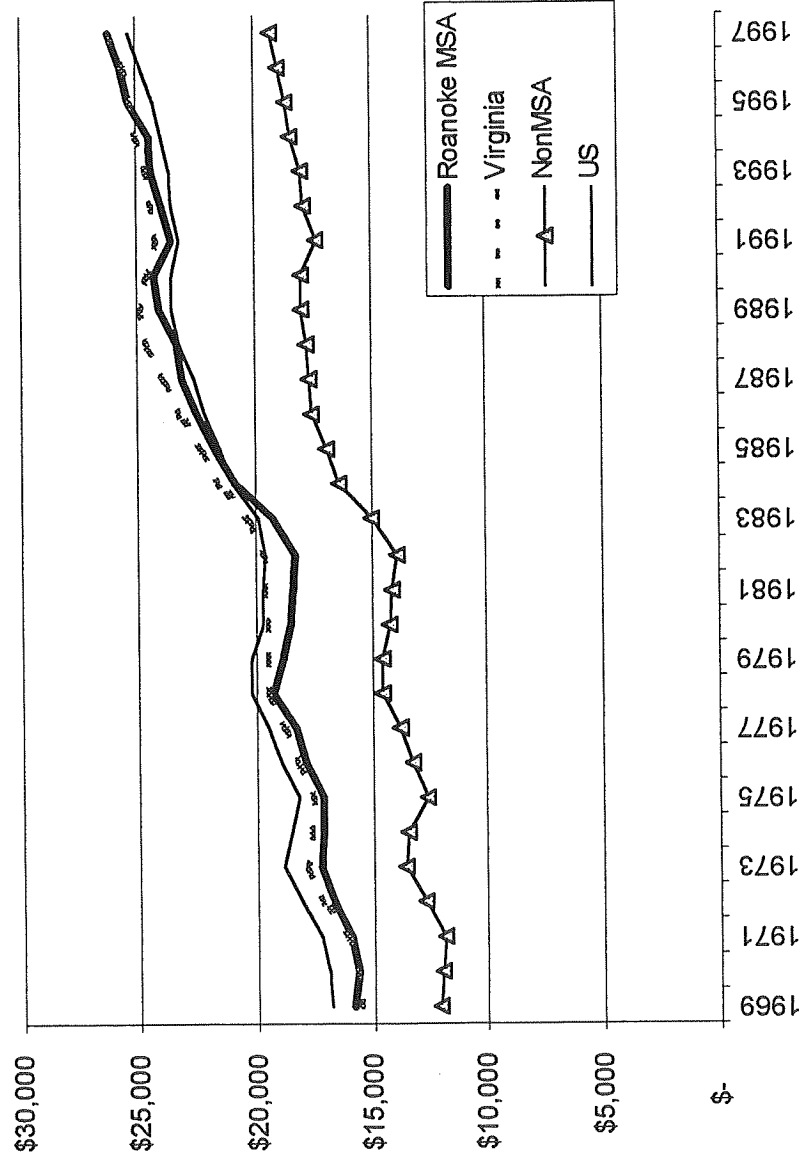


■ Since 1969, job growth in the MSA (1.9% per year) has nearly kept pace with Virginia (2.3% per year); population has grown more slowly. (0.5% in the MSA, 1.4% in Virginia).

■ Non-metropolitan job and population growth has been slower than the State (1.2% job growth, 0.7% population).

Source: Regional Economic Information System (REIS)

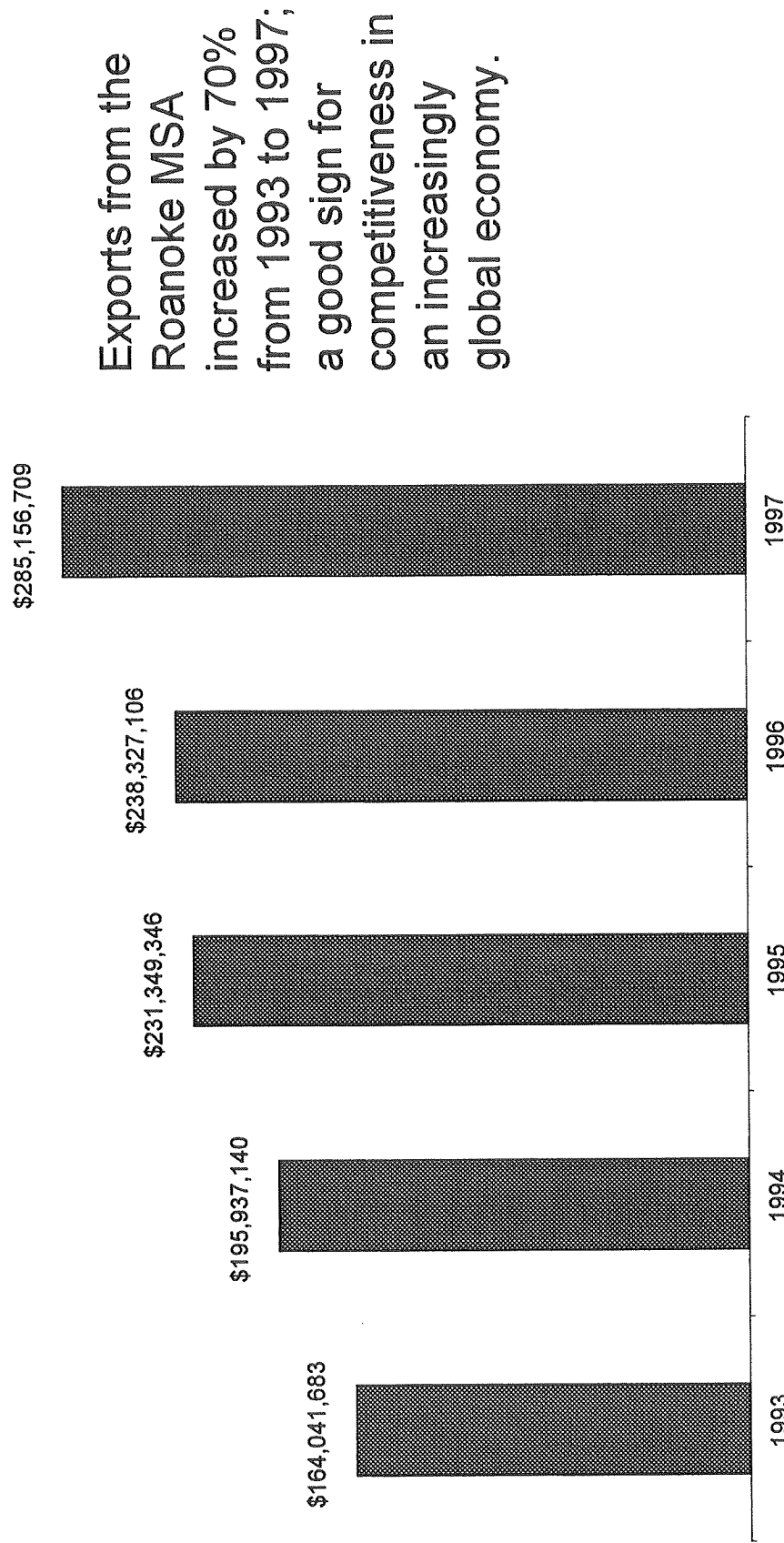
Real Per Capita Income (1997\$) in the metropolitan and non-metropolitan parts of the Region, Virginia, and the U.S.



■ By 1997 Per Capita Income in the Roanoke MSA (\$26,182) had passed both the US (\$25,288) and Virginia (\$26,109).

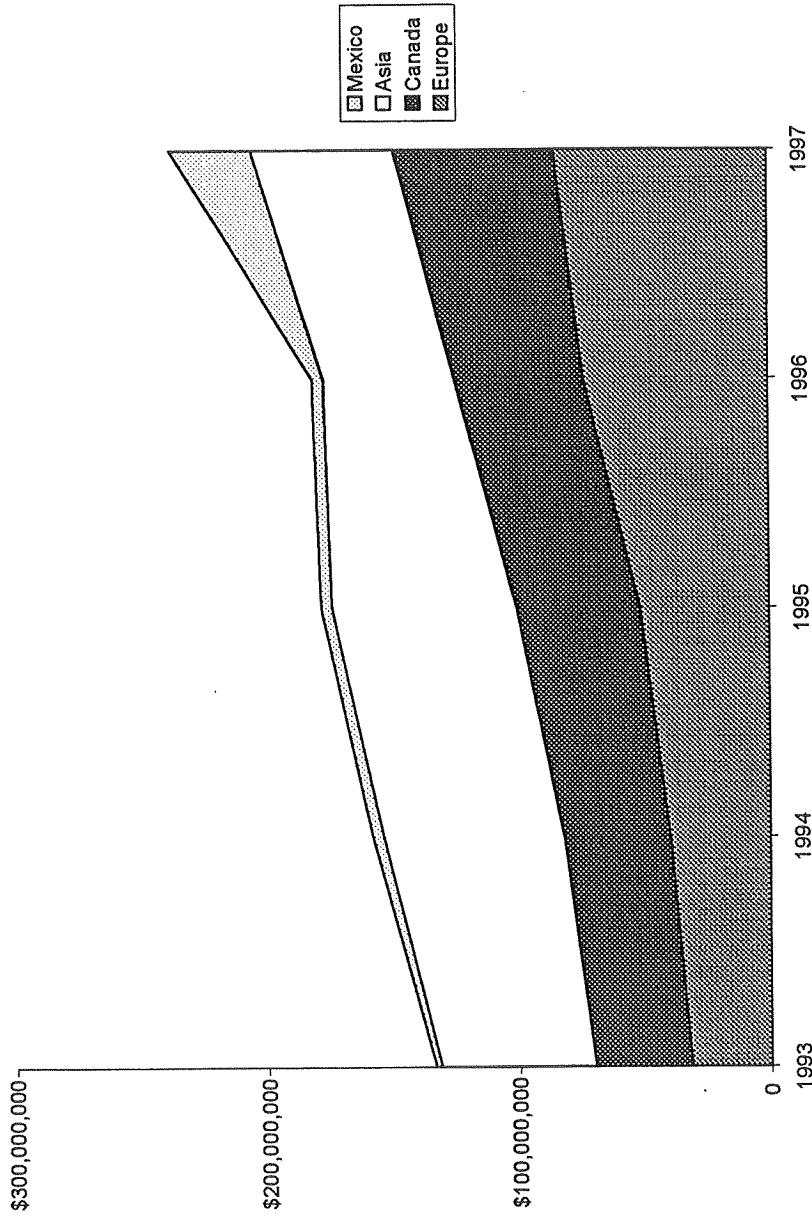
■ From 1990-97, Per Capita Income in the Non-Metropolitan Areas has grown faster (1.0% per year) than in Virginia (0.9% per year).

Roanoke MSA: International exports



Source: Dept. of Commerce - International Trade Administration

Roanoke MSA: Exports by destination

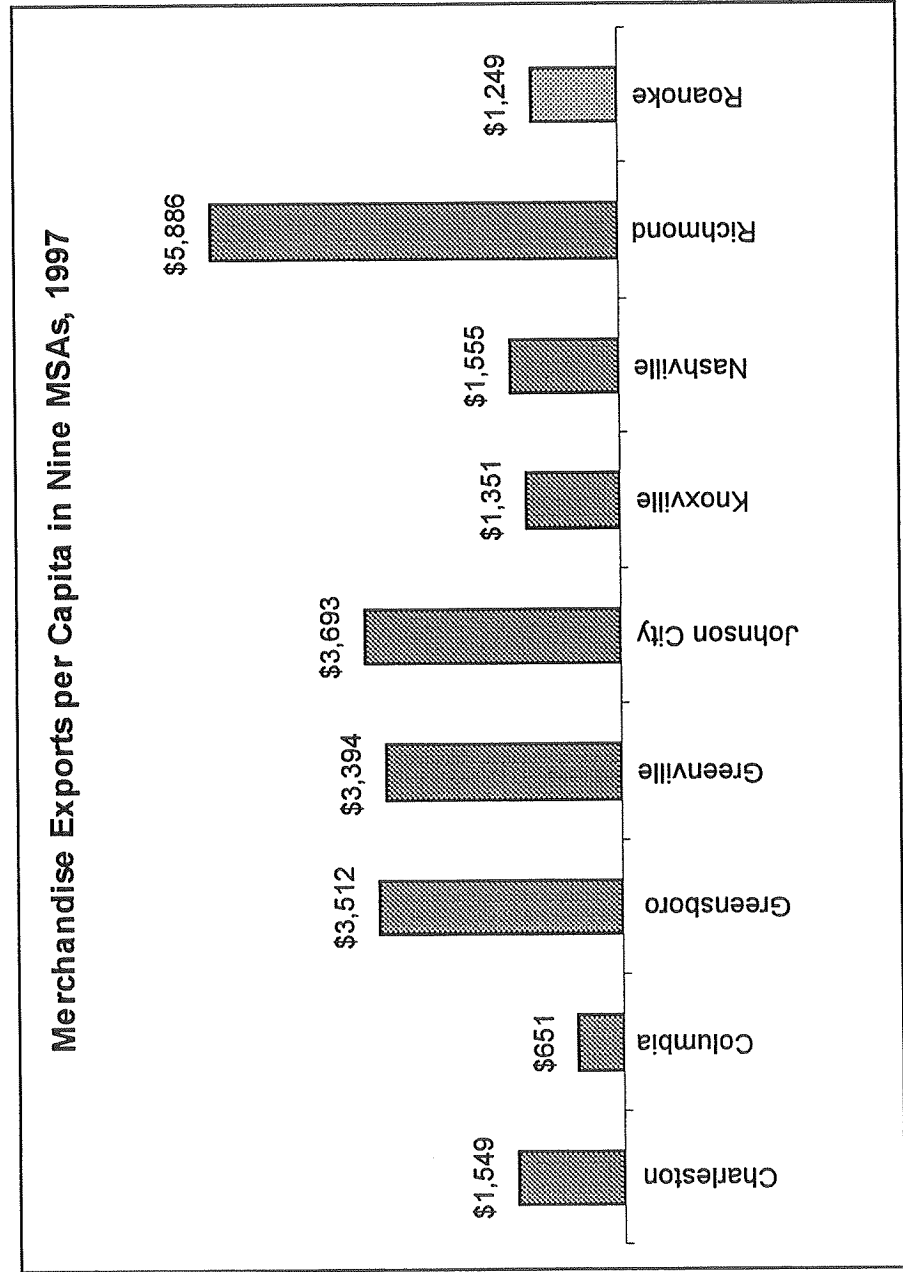


Europe and Mexico are increasingly important export markets for the Region.

Source: Dept. of Commerce - International Trade Administration

Roanoke MSA: Benchmarking exports

Despite the growth in exports since 1993, the Roanoke MSA trails other regions in nearby larger regions - even on a per capita basis.



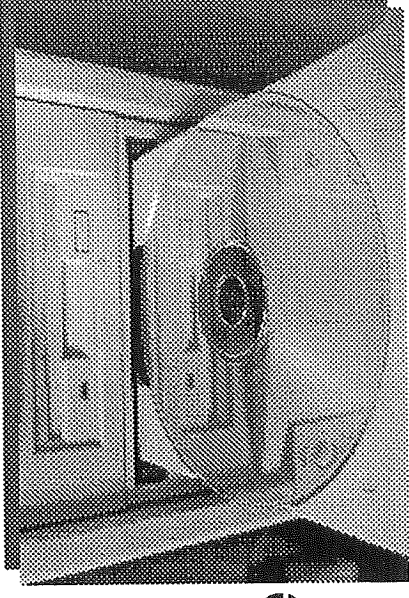
Source: Dept. of Commerce - International Trade Administration / Regional Economic Information System

Summary: The Fifth Planning District Region is an economic success story

- Although population growth has been slow, increases in jobs have kept pace with the rest of the state.
- Per capita income levels are outstanding for the MSA and improving in the non-MSA area.
- Rising exports from Roanoke are a positive sign in an increasingly global economy.
- The region is a healthy growing economy - while growth has been slow, it has been steady, and rising incomes are perhaps the best measure of success.

3. Drivers of Prosperity: Industry Cluster Competitiveness

Since the 1970s, new technology and globalization have changed the rules for economic development.



**Economic Development
in the Old Economy**

- Goal:**
- More jobs the only goal
 - Plant Attraction

Approach: - Tax Incentives

- Regional Marketing / Promotion

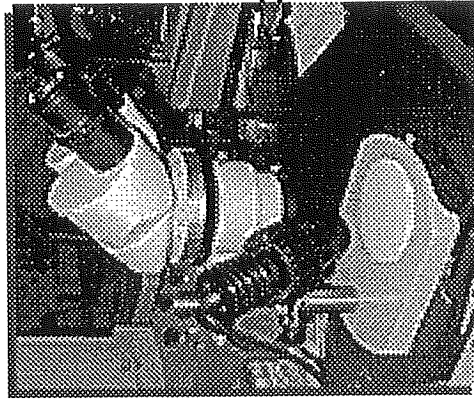
**Economic Development
in the New Economy**

- High Quality Jobs
- Globally-competitive, high-value added companies
- Cluster Development

- Build Specialized Economic Foundations

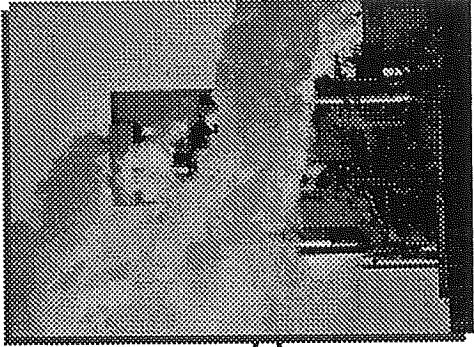
- Comprehensive Economic Strategy

Advanced service industries anchor the production chain and form the core of regional economies



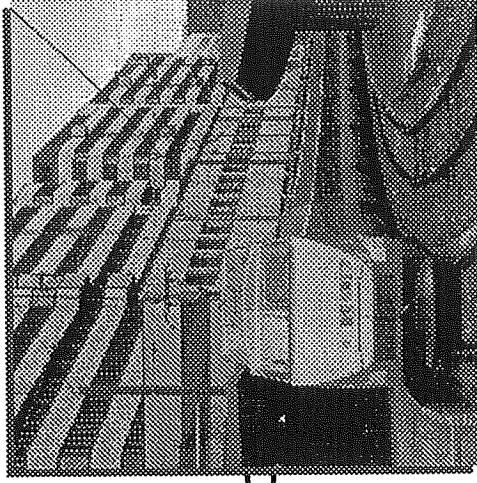
R&D

Design



Basic

Manufacturing



Services

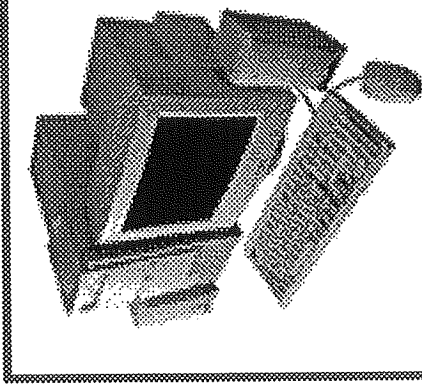
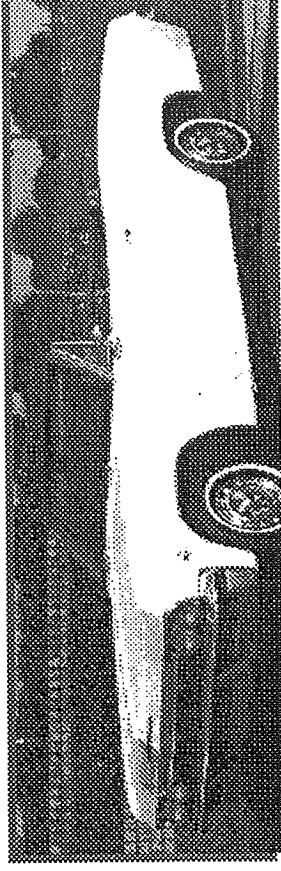
Distribution

**The new economy offers ample opportunity
and profound risks for every city's economy
in every part of the U.S.**

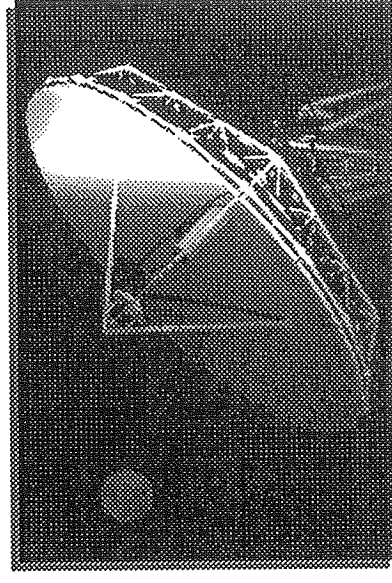
- Some cities have achieved rapid growth on the basis of dynamic new clusters:
 - Austin: Information Technology and Cultural Products
 - Atlanta: Transportation and Financial Services, Media, IT
 - Portland: Electronics, International Trade

Other cities - some with high tech industry - have suffered severe downturns because their clusters failed to adjust to market changes.

**Detroit (1970s):
Automobiles**

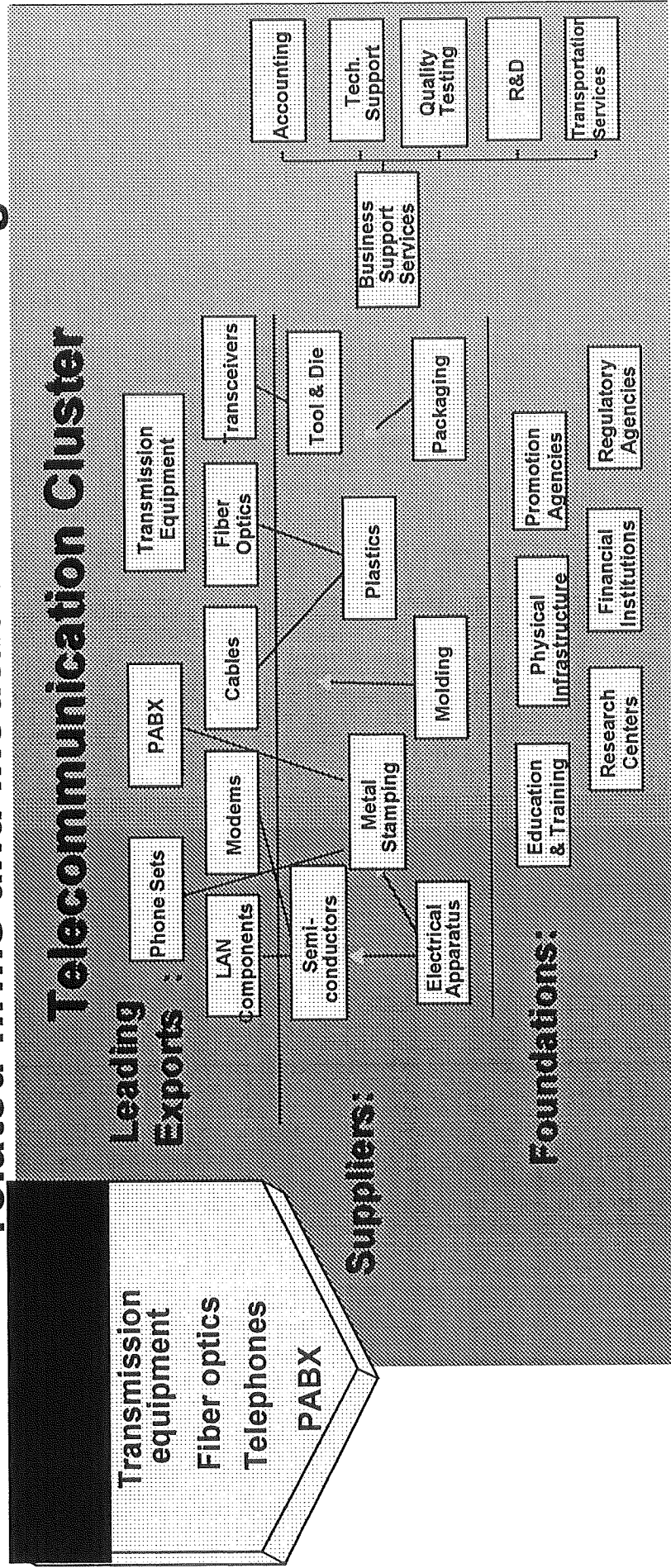


Boston (late 1980s): Mini-computers

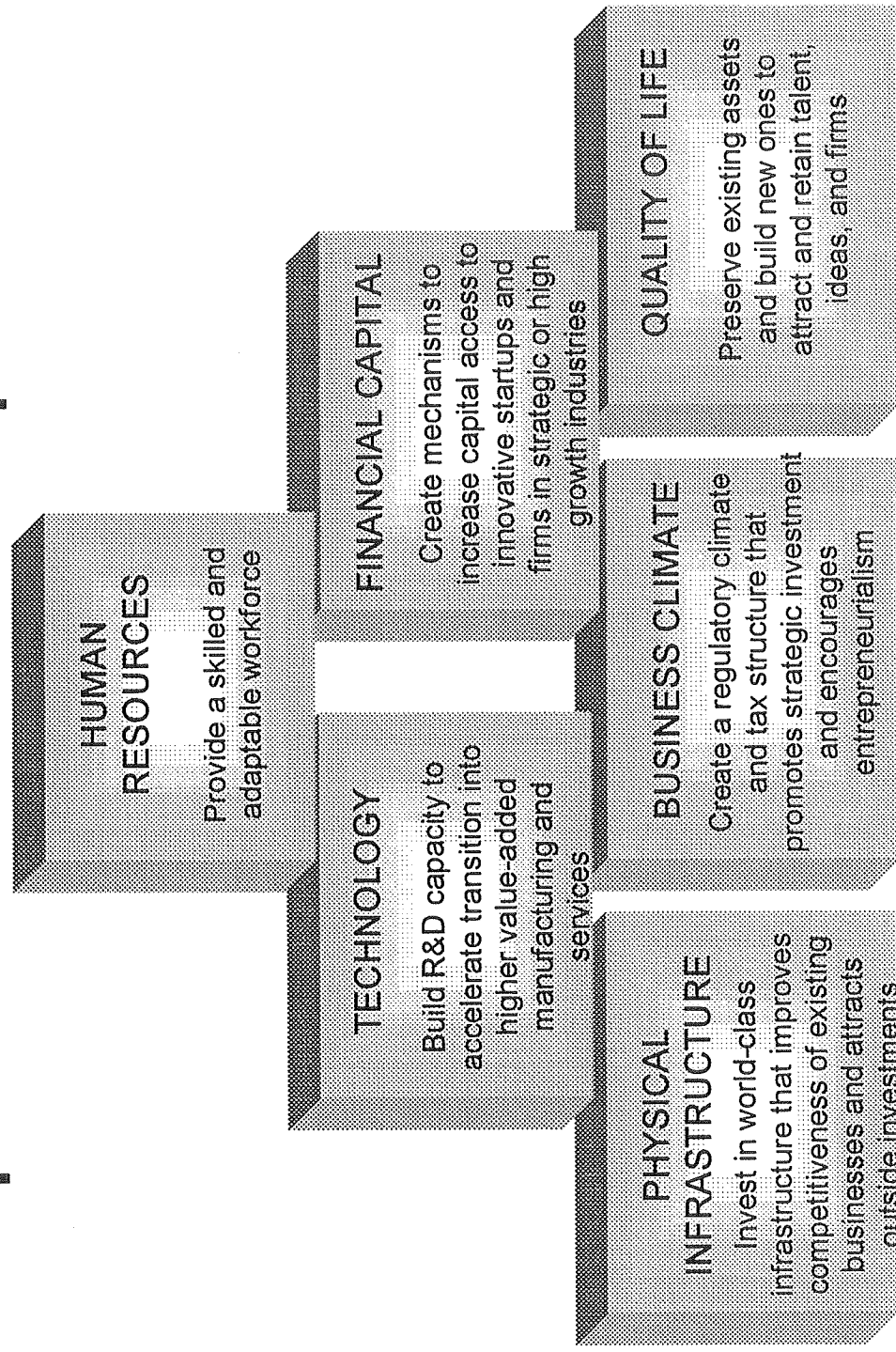


**Los Angeles (early 1990s):
Defense electronics**

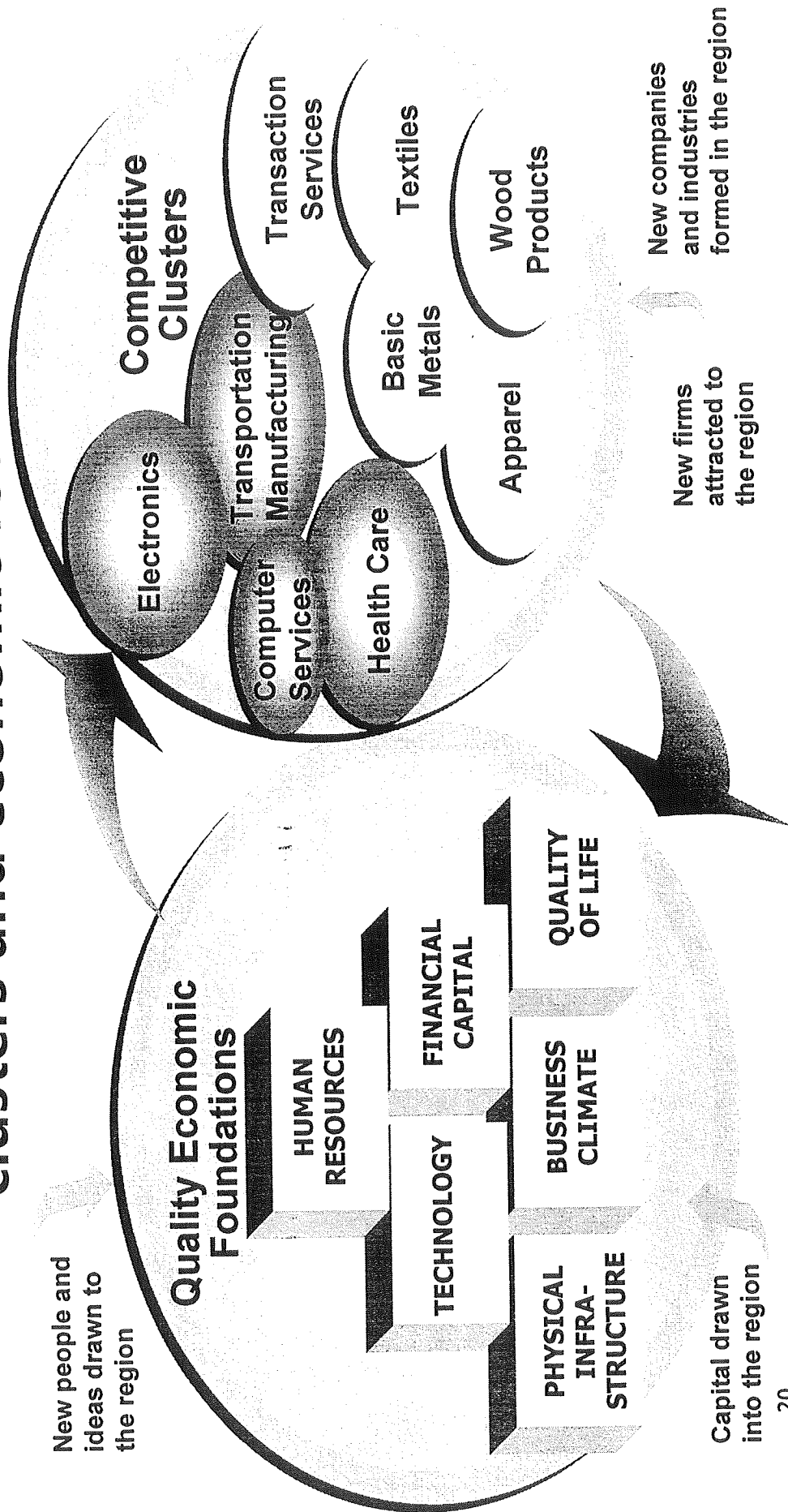
Cluster analysis is valuable because it focuses on improving the *linkages* between key industries and related firms and institutions within a region.



The cluster approach also emphasizes the critical economic foundations that promote cluster development.



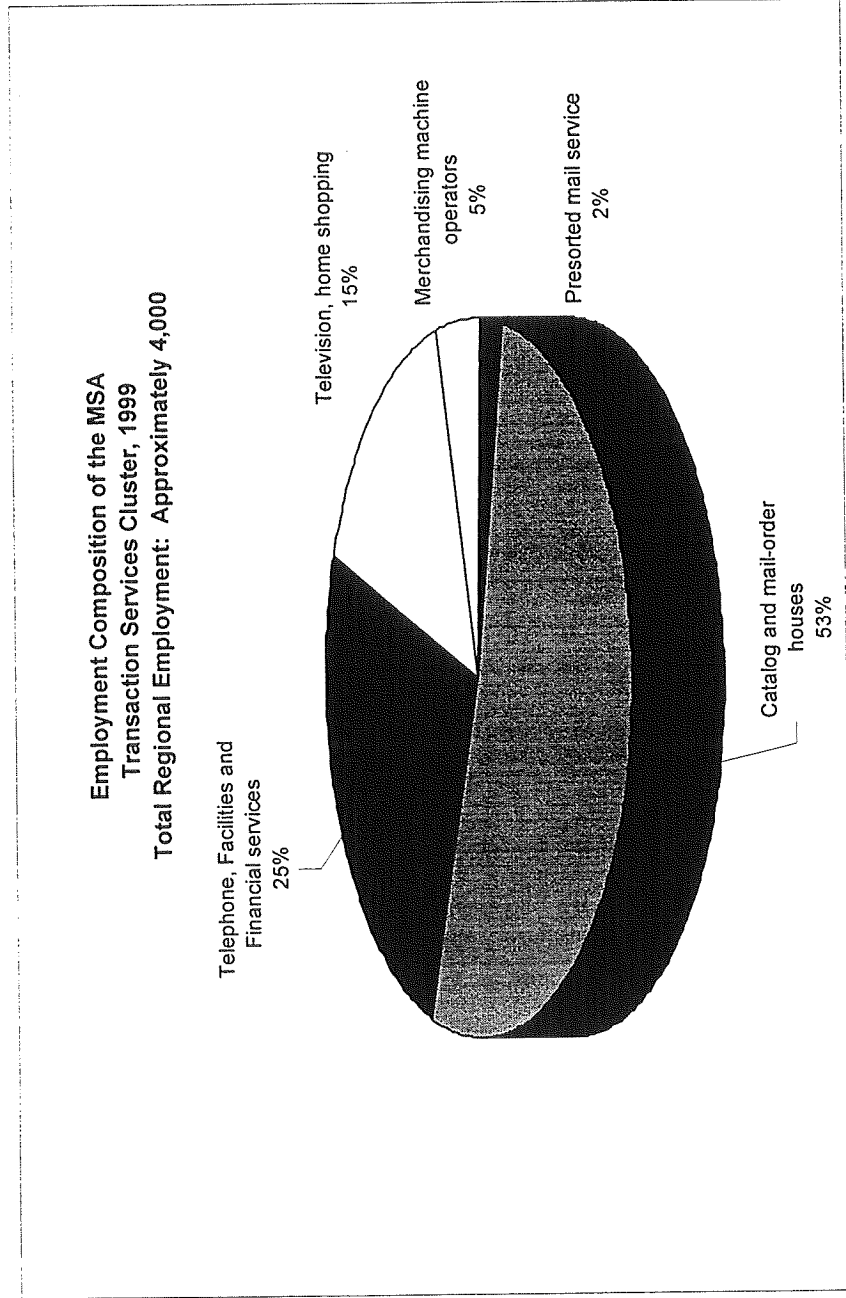
The key to the region's future is developing a "Vital Cycle" between clusters and economic foundations



Dimensions of the cluster analysis

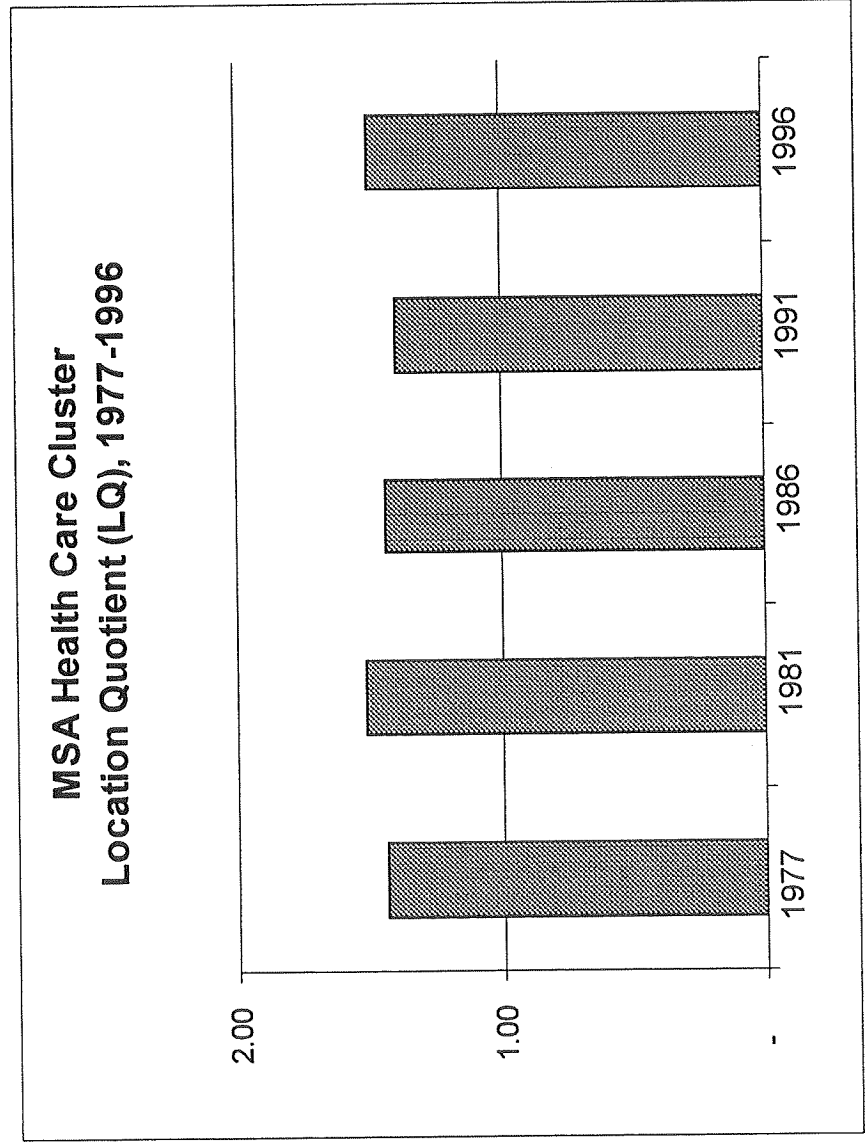
- Clusters are classified as:
 - *Region-wide* when both the Metropolitan and Non-Metropolitan areas have a significant specialization in inter-related industries.
 - Primarily *Metropolitan* when only the MSA has a significant specialization in a group of inter-related industries.
 - Primarily *Non-Metropolitan* when only the Non-Metropolitan areas have a significant specialization in a group of inter-related industries.
- Depending on available data, clusters are defined at the 3, 4, or 8-digit SIC level.

Pie charts indicate the size and structure of the cluster in the region: example shown below



For example, industries in the Transaction Services cluster are related through their reliance on a common set of labor skills infrastructure.

Charts showing location quotients over time indicate shifts in competitiveness: example shown below



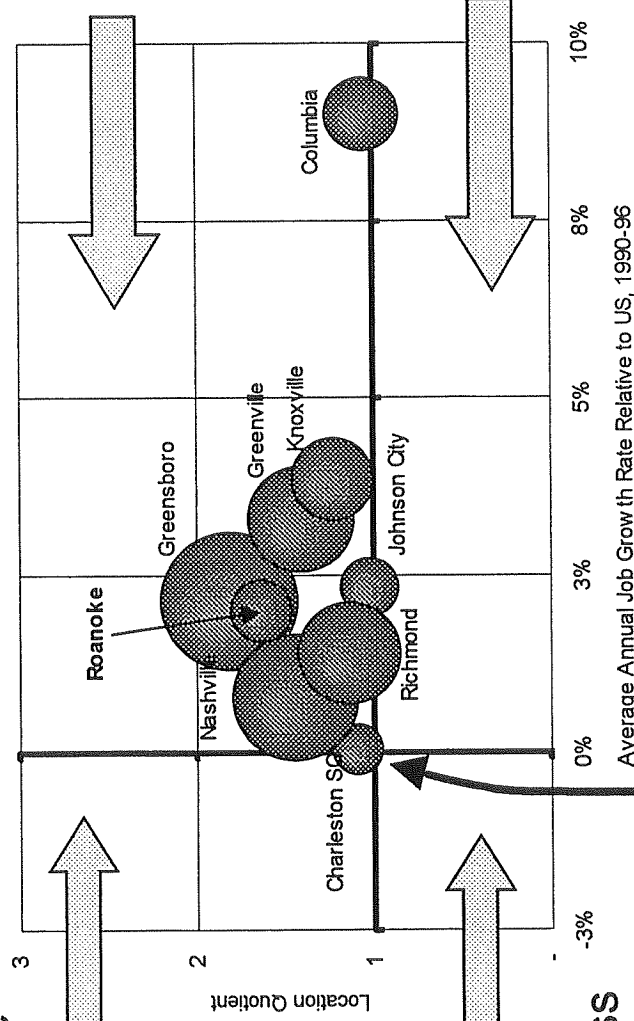
- The location quotient is a measure of regional economic specialization in a cluster.
- Location quotients greater than 1.0 refer to a higher-than-average level of specialization and suggest a cluster exists.
- Tracking location quotients over time gives an indication of how competitiveness has been changing.

“Growth-share matrices” show how the region compares with other MSAs on growth, size, and concentration dimensions: example shown below

Clusters with high concentration, but low growth are established but may be missing emerging opportunities.

Clusters with low concentration *and* growth have clear competitiveness challenges

Transportation Services Growth-Share Matrix:
The Roanoke MSA and Nearby Benchmark MSAs



Clusters with high concentration, and fast growth are clear winners.

Clusters with high growth but low concentration are competitive but need to develop “critical mass”

Bubble diameters indicate relative cluster employment

The region has a strong collection of vibrant clusters containing 53,623 jobs.

■ Regional Clusters (both MSA and non-MSA)

- Apparel and Textiles - 3,805 jobs
- Transaction Services - 4,799 jobs
- Wood Products - 8,251 jobs

■ MSA Clusters

- Basic and Fabricated Metal - 2,348 jobs
- Computer Services - 663 jobs
- Health Care - 21,270 jobs
- Optoelectronics - 2,683 jobs
- Transportation-Related Manufacturing - 5,159 jobs
- Transportation Services - 4,211 jobs

■ Non-MSA Clusters

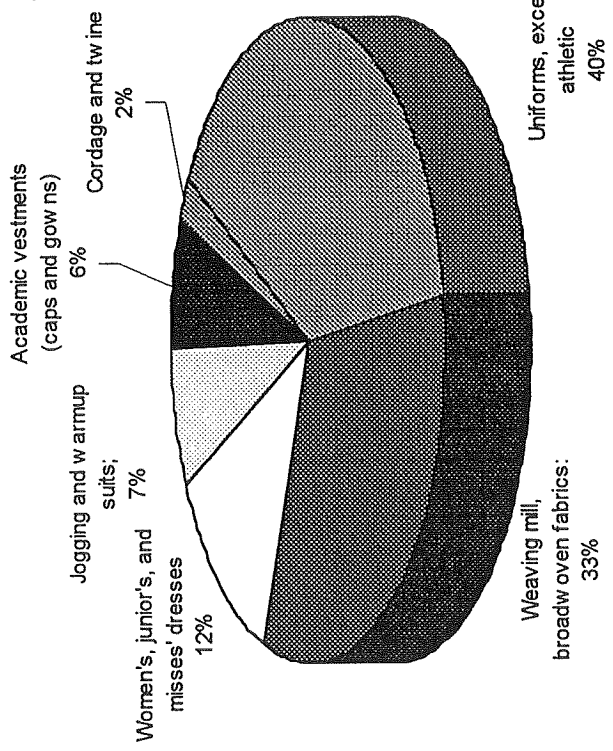
- Chemicals and Paints - 434 jobs - but a significant concentration given the size of the non-metropolitan region

The region-wide Apparel and Textiles cluster includes some major employers in the MSA...

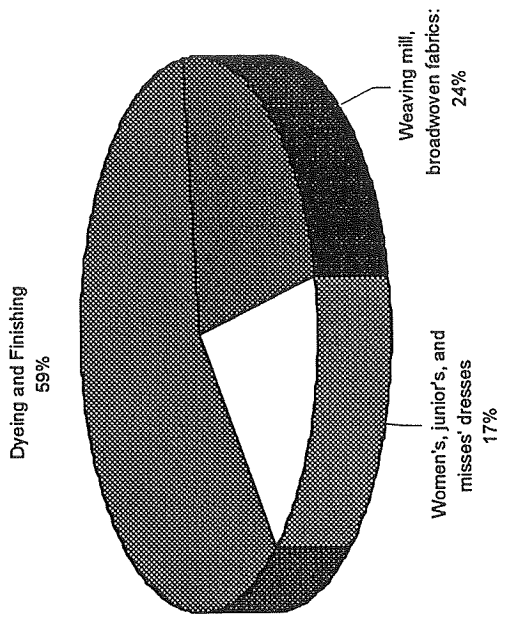
Major employers in the MSA include:

- Maid Bess
- Precision Fabrics

Employment Composition of the MSA Apparel and Textile Cluster, 1999
Total Regional Employment: 3,045

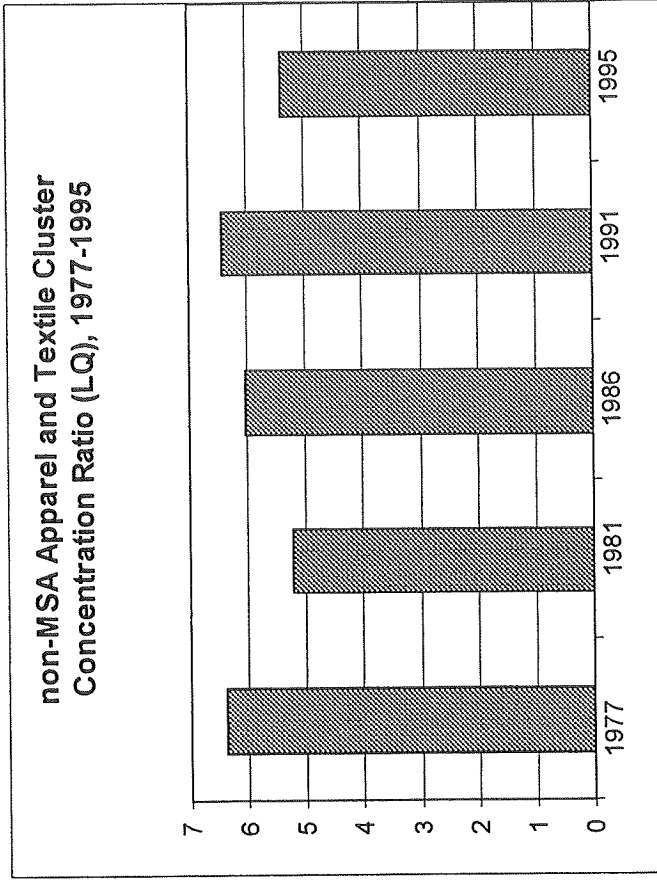
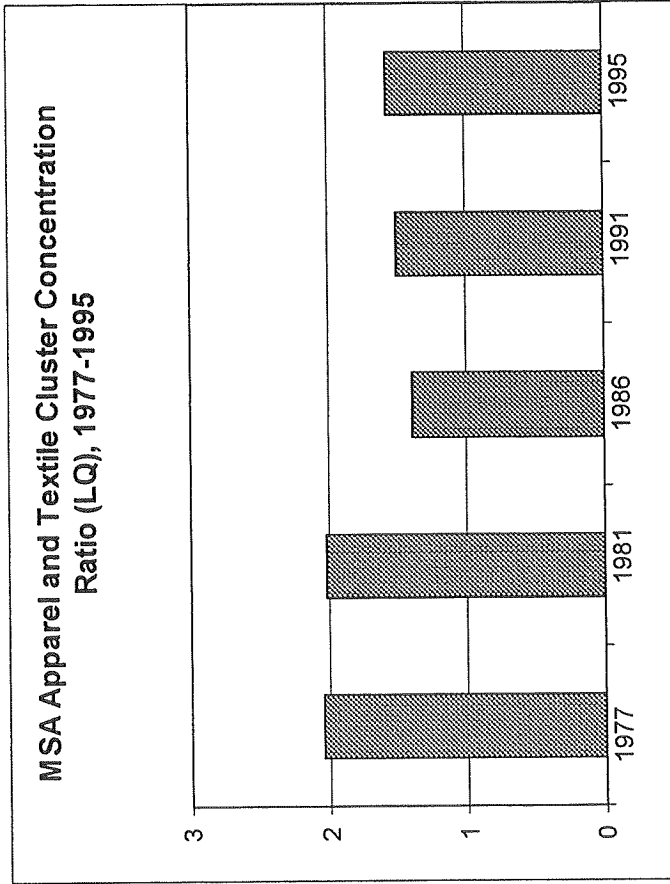


Employment Composition of the non-MSA Apparel and Textile Cluster, 1999
Total Employment: 760



Source: Dun and Bradstreet / Roanoke Valley Economic Development Partnership

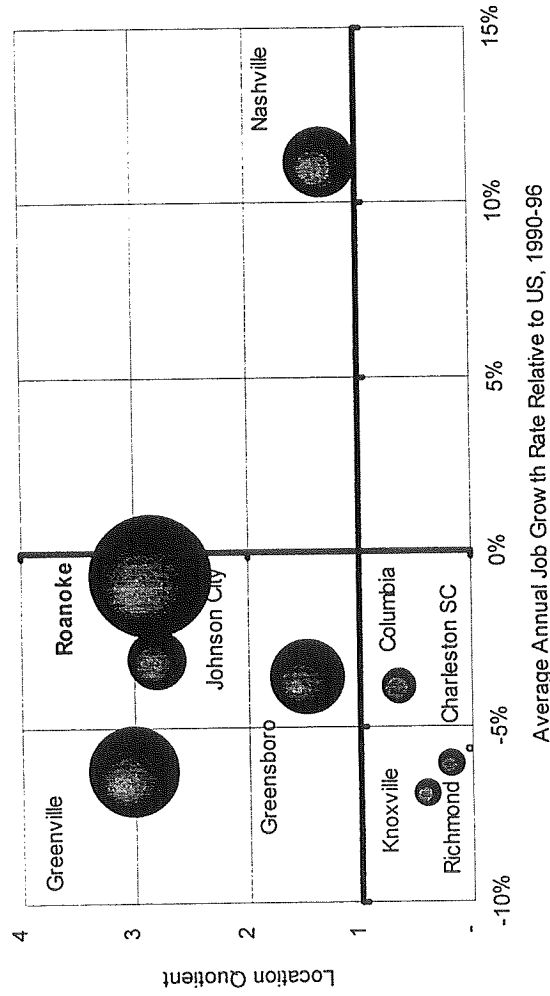
...And has declined in the 1990s as a major source of employment in the non-MSA areas.



Source: Dept. of Commerce - County Business Patterns

Apparel and Textiles growth-share matrix.

Apparel & Textiles Growth-Share Matrix:
The Roanoke Region and Nearby Benchmark MSAs

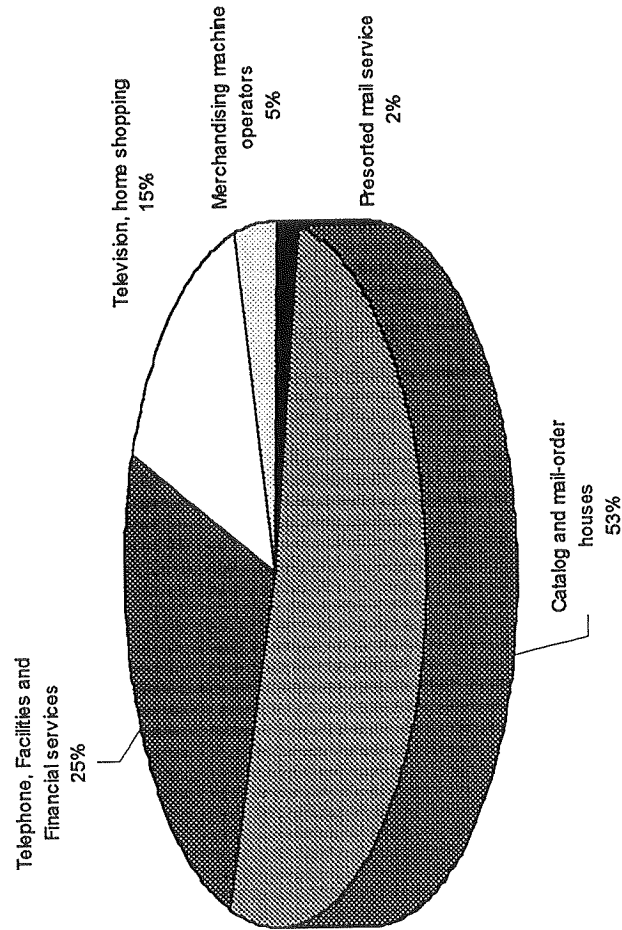


Apparel and Textiles is declining across the U.S., and larger clusters are often losing the most jobs. In more recent years the cluster has significantly declined in the non-MSA areas of the region.

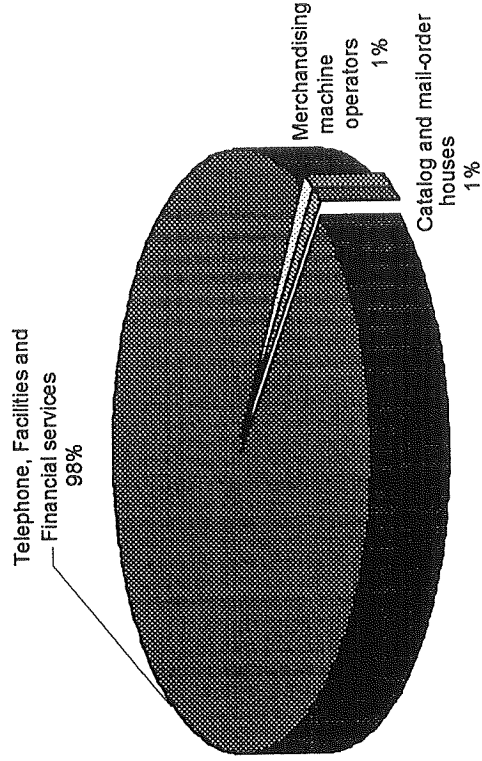
Source: Department of Commerce/Regional Financial Associates

The regional Transaction Services cluster takes advantage of emerging trends in the economy.

Employment Composition of the MSA
Transaction Services Cluster, 1999
Total Regional Employment: 3,967

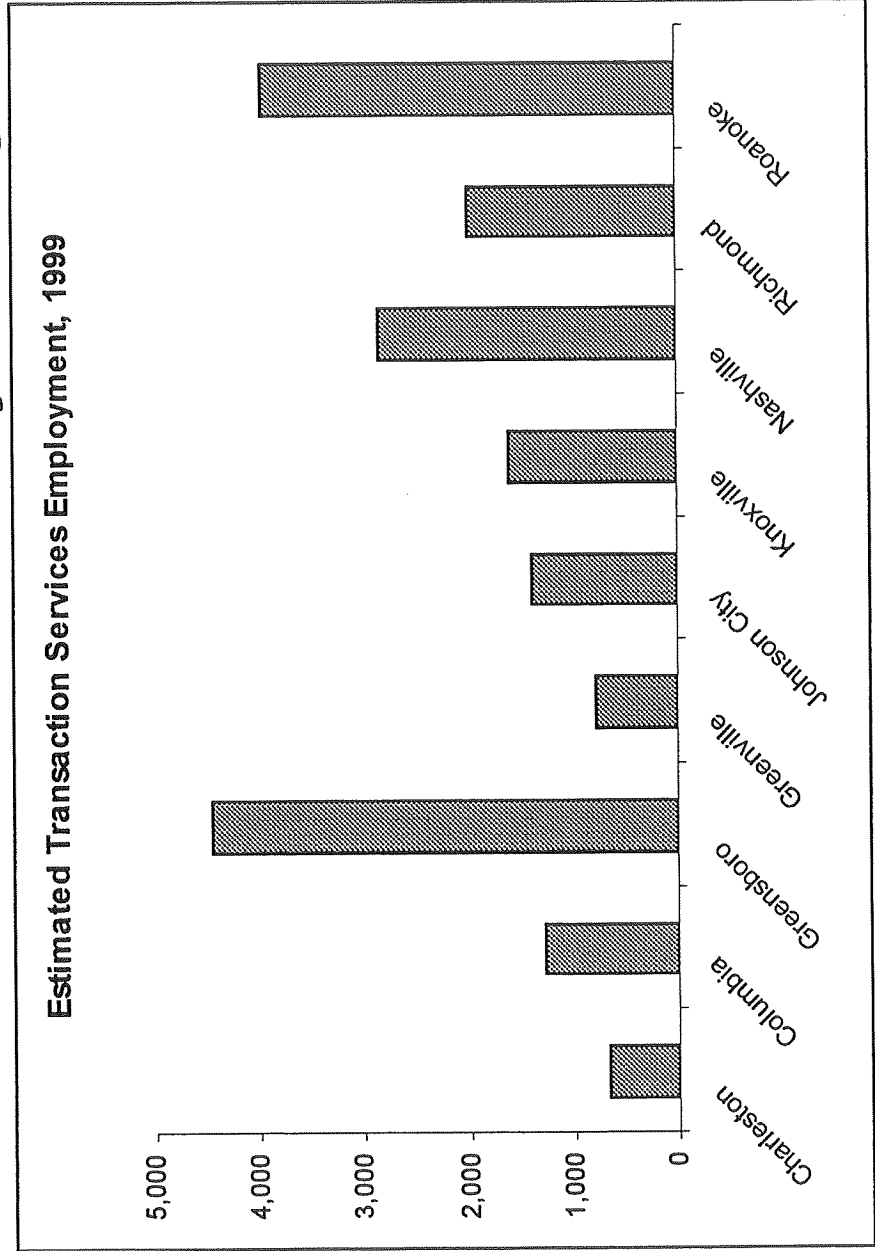


Employment Composition of the non-MSA
Transaction Services Cluster, 1999
Total Employment: 832



Source: Dun and Bradstreet / Roanoke Valley Economic Development Partnership

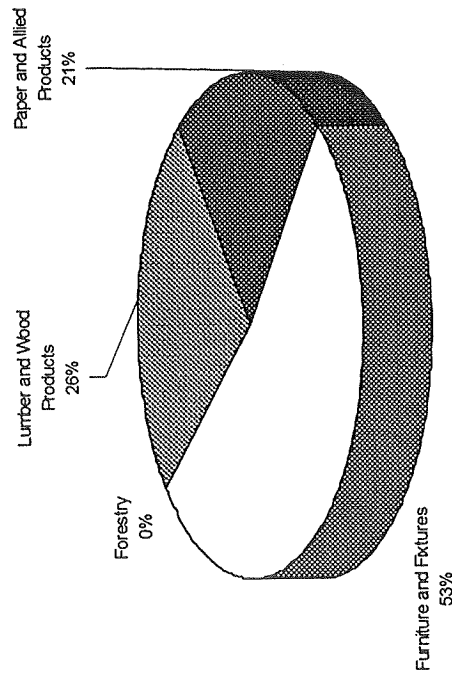
Historical data is unreliable for this cluster, but current data suggests Roanoke is relatively strong.



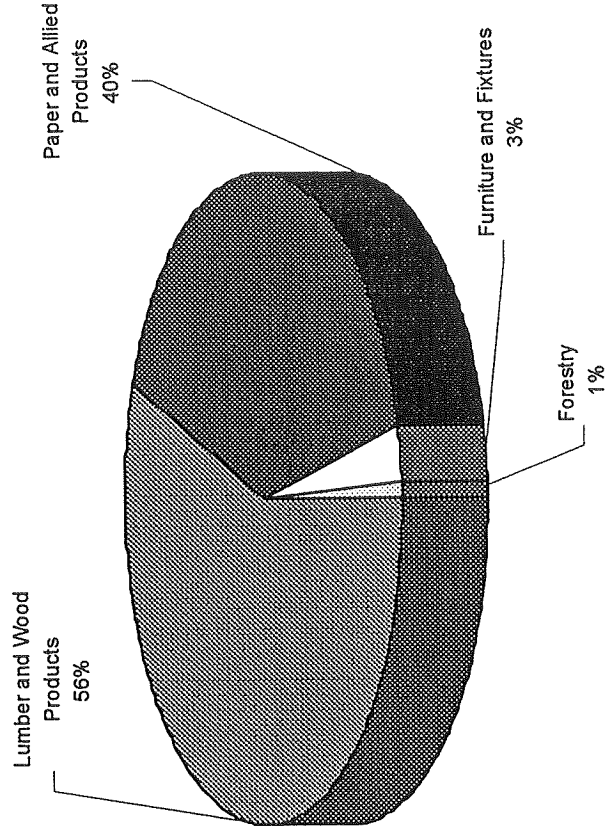
Sources: Dun and Bradstreet / Roanoke Valley Economic Development Partnership

The Non-MSA area is key to Roanoke's Regional Wood Products Cluster.

Employment Composition of the MSA
Wood Products Cluster, 1999
Total Employment: 2,990

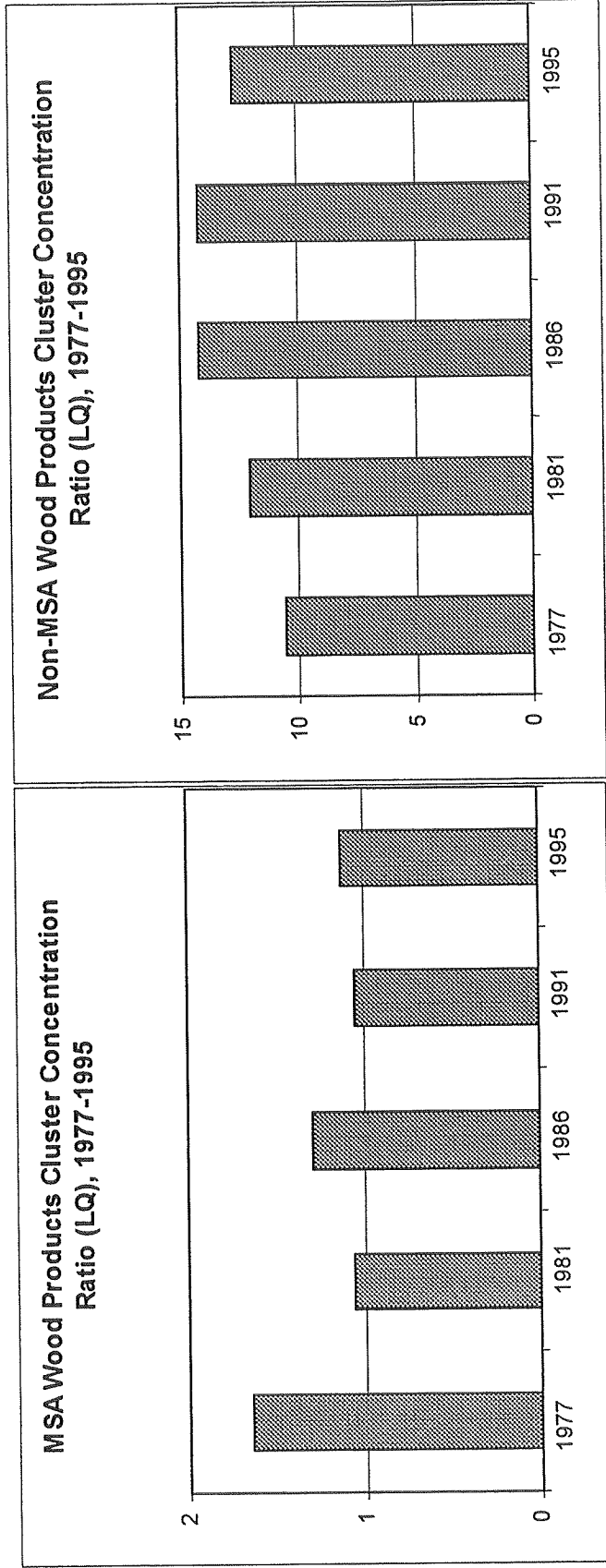


Employment Composition of the non-MSA
Wood Products Cluster, 1999
Total Employment: 5,261



Source: Dun and Bradstreet / Roanoke Valley Economic Development Partnership

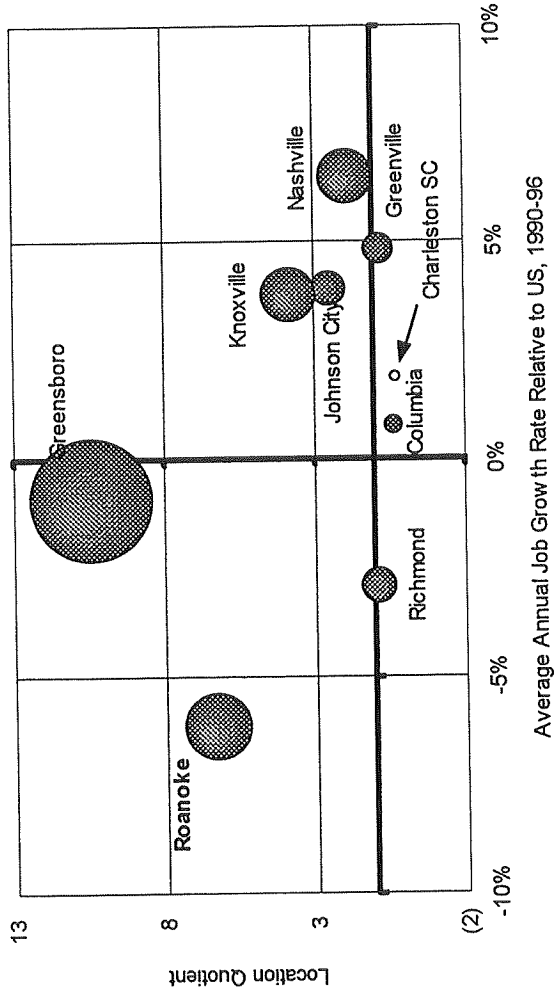
The Wood Products cluster is a more significant employer in the Non-Metropolitan areas.



Source: Dept. of Commerce - County Business Patterns

Losses in the furniture industry have led to slower than average growth for the regional cluster, which maintains a high concentration.

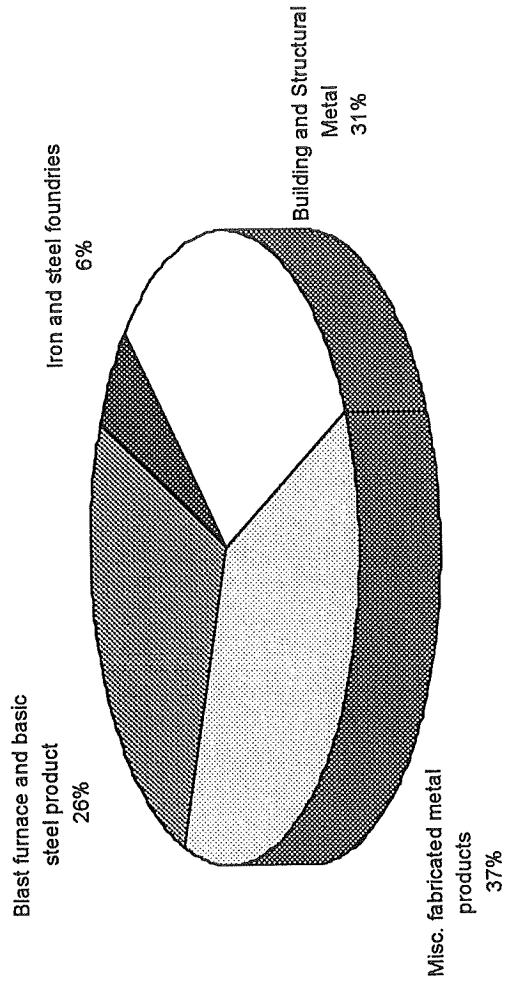
**Furniture and Wood Products Growth-Share Matrix:
The Roanoke Region and Nearby Benchmark MSAs**



Source: Department of Commerce/Regional Financial Associates

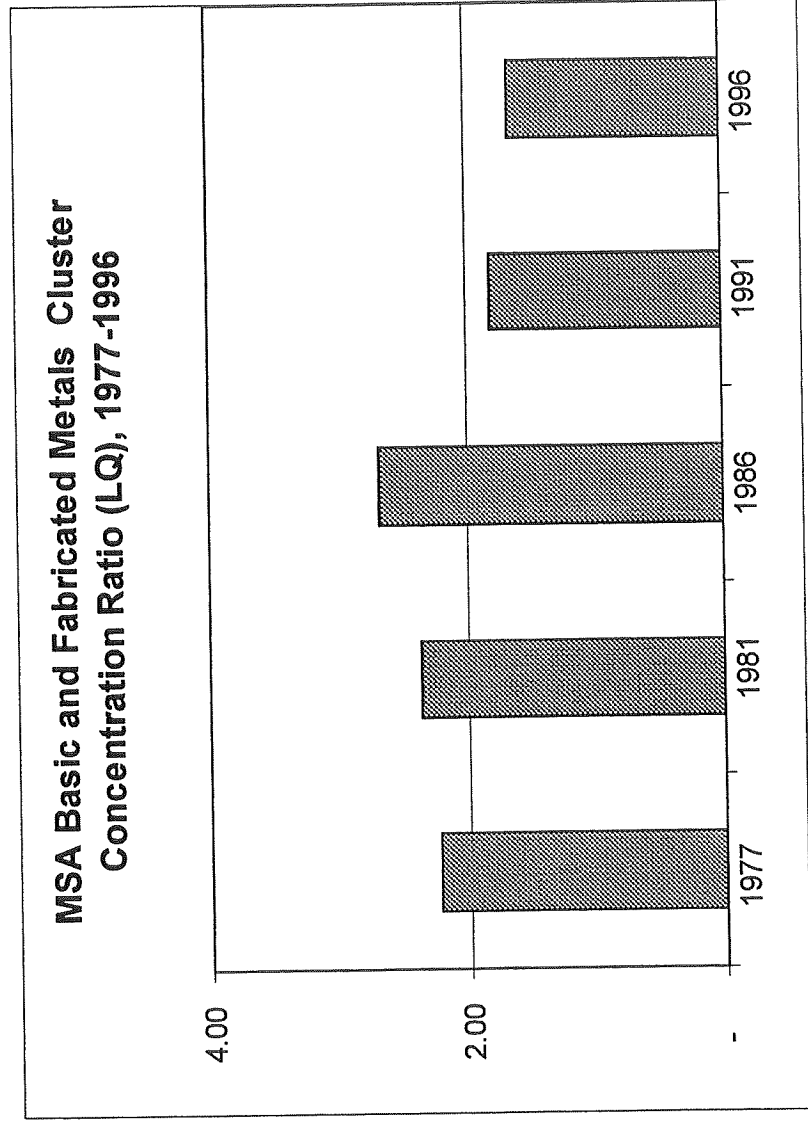
Roanoke's MSA Basic and Fabricated Metal Cluster contains many traditional heavy industries.

Employment Composition of the MSA
Basic and Fabricated Metals Cluster, 1999
Total Regional Employment: 2,348



Source: Dun and Bradstreet / Roanoke Valley Economic Development Partnership

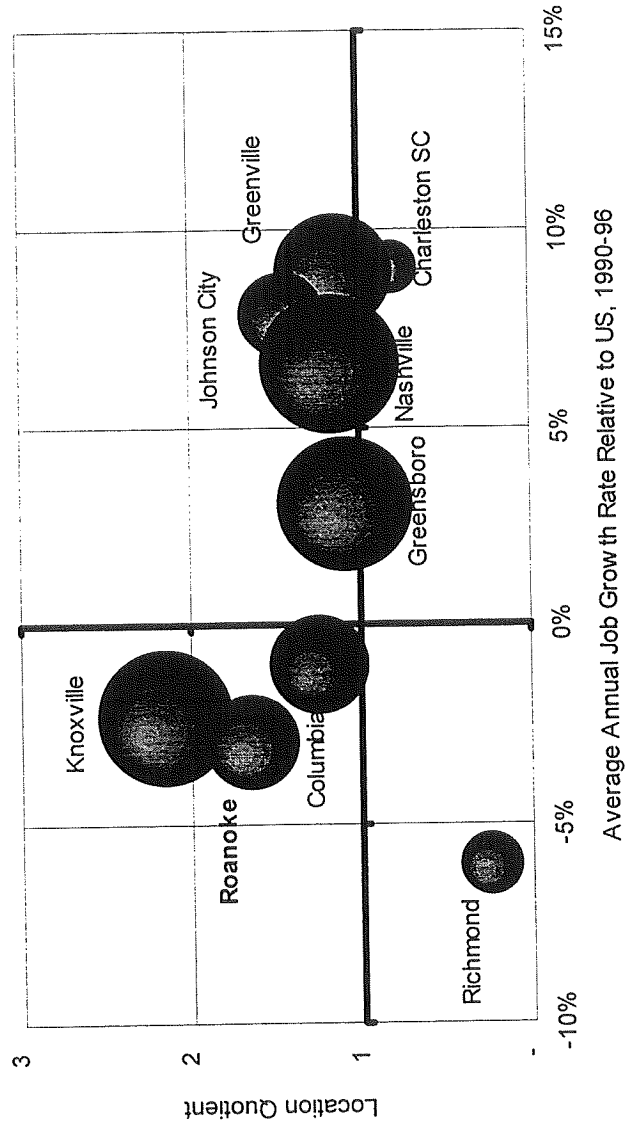
This cluster continues to perform well although there are indications that it may be declining.



Source: Dept. of Commerce - RFA

Like Wood Products and Apparel & Textiles, Basic Metals is a relatively slow-growing cluster.

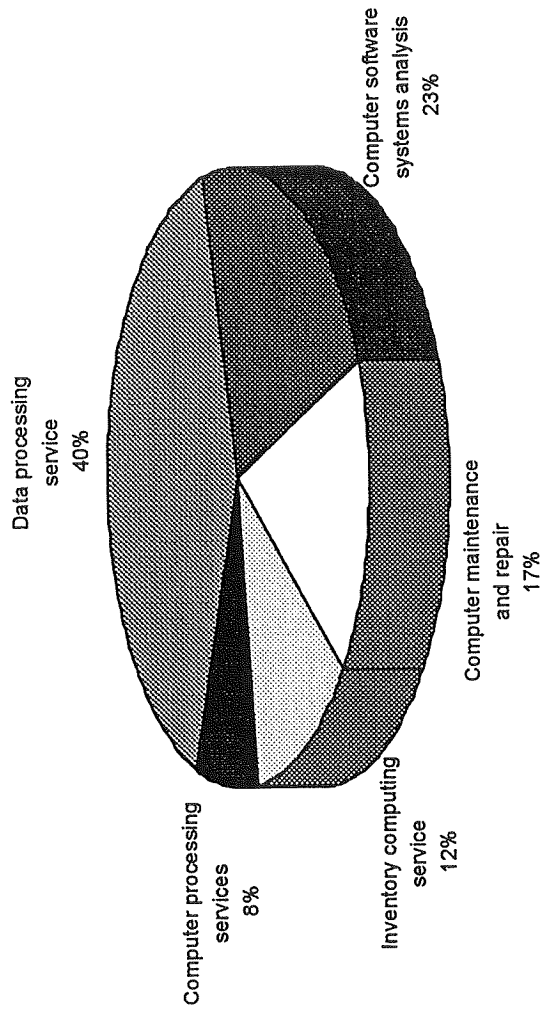
Basic and Fabricated Metals Growth-Share Matrix:
The Roanoke MSA and Nearby Benchmark MSAs



Source: Department of Commerce/Regional Financial Associates

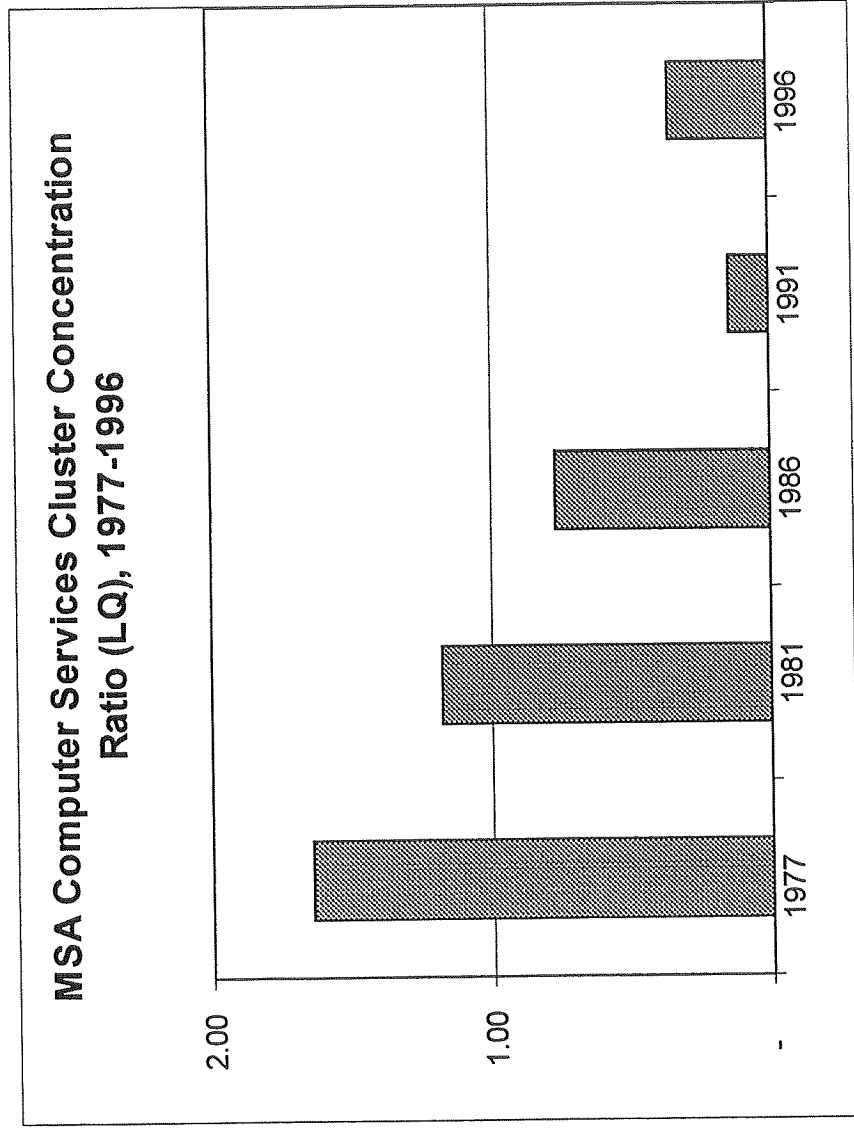
Roanoke's MSA Computer Services cluster is small.....

Employment Composition of the MSA
Computer Services Cluster, 1999
Total Regional Employment: 663



Source: Dun and Bradstreet / Roanoke Valley Economic Development Partnership

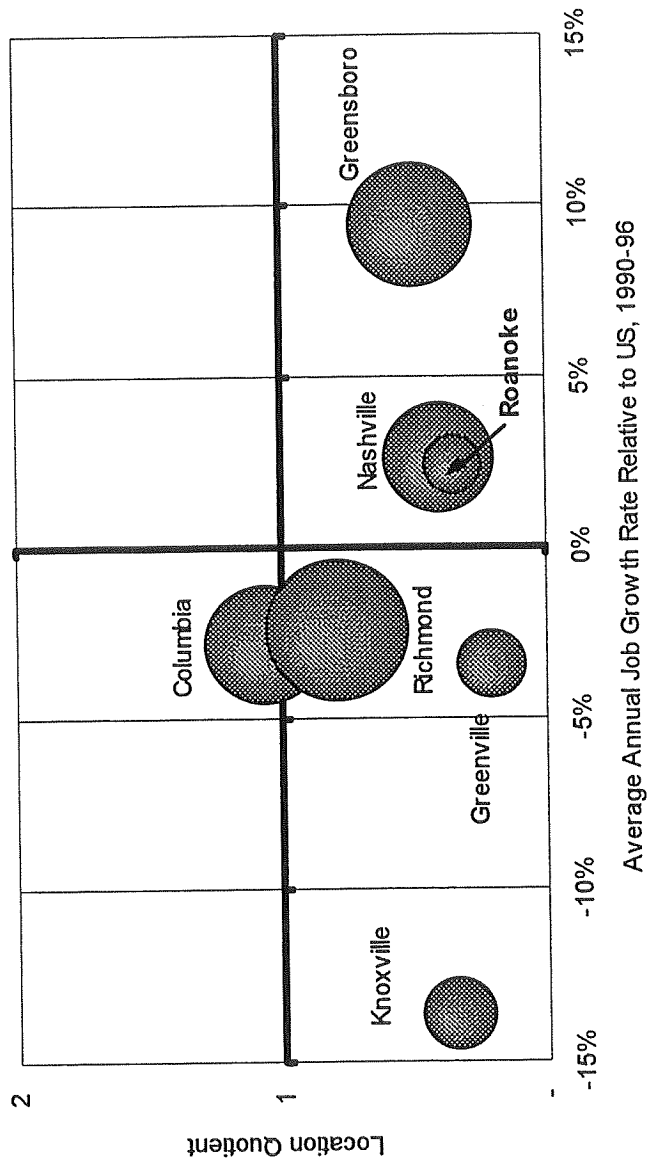
.....But has grown in the 1990s after slower growth in the 1980s.



Source: Dept. of Commerce - RFA

The Region's Computer Services Cluster is growing rapidly, but needs to add critical mass to become significant in the region.

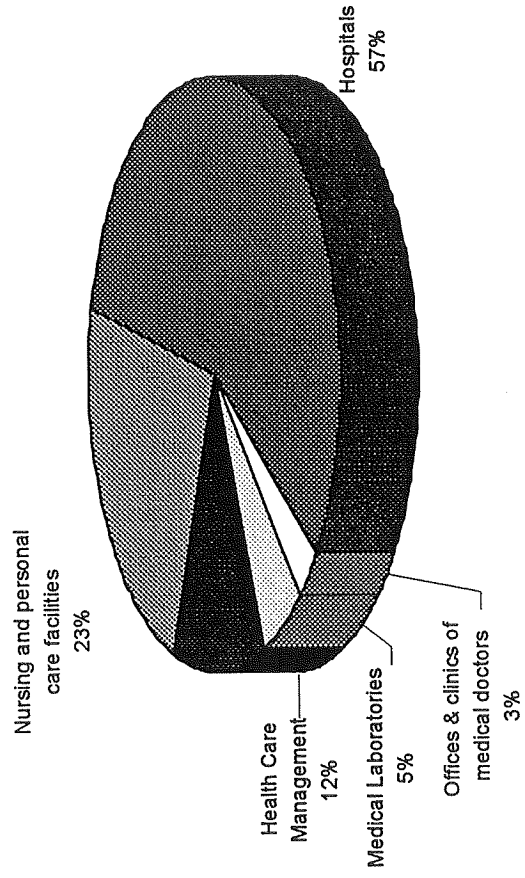
Computer Services Growth-Share Matrix:
The Roanoke MSA and Nearby Benchmark MSAs



Source: Department of Commerce/Regional Financial Associates

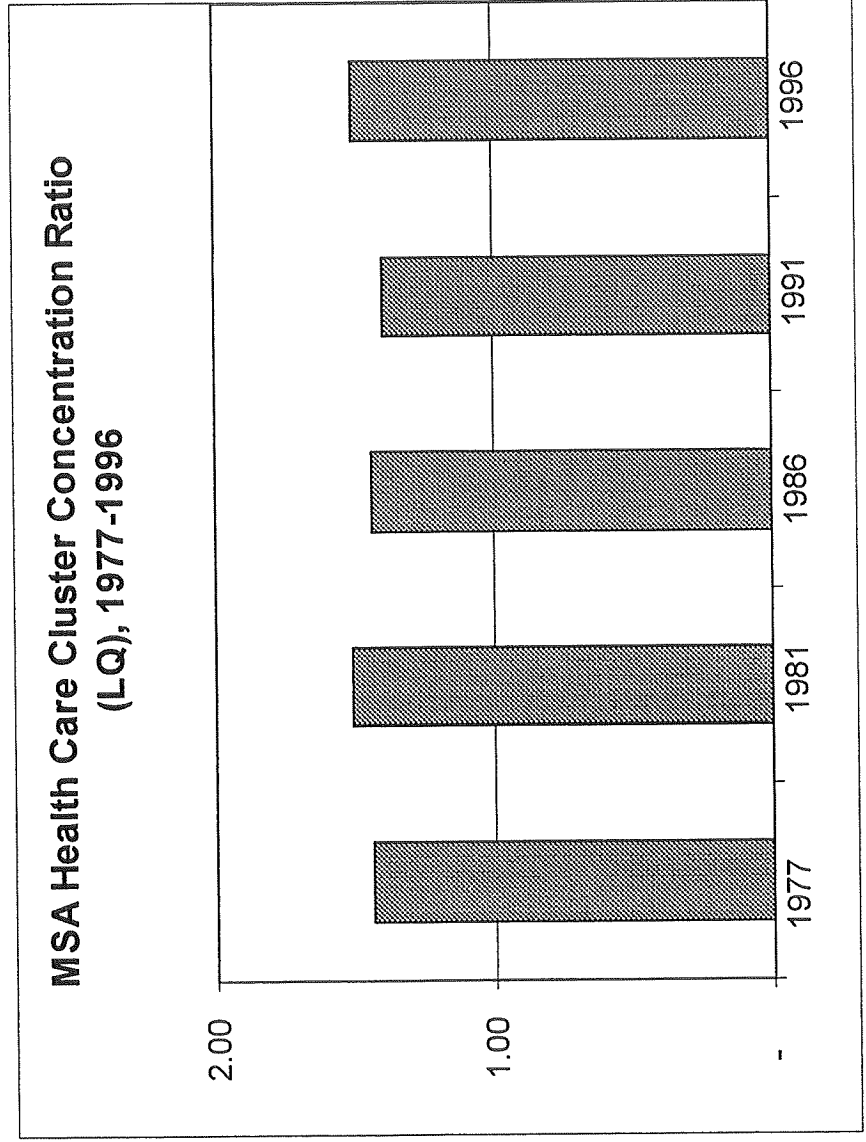
Roanoke's MSA Health Care Cluster is largest of all the clusters.

Employment Composition of the MSA
Health Care Cluster, 1999
Total Regional Employment: 21,270



Source: Dun and Bradstreet / Roanoke Valley Economic Development Partnership

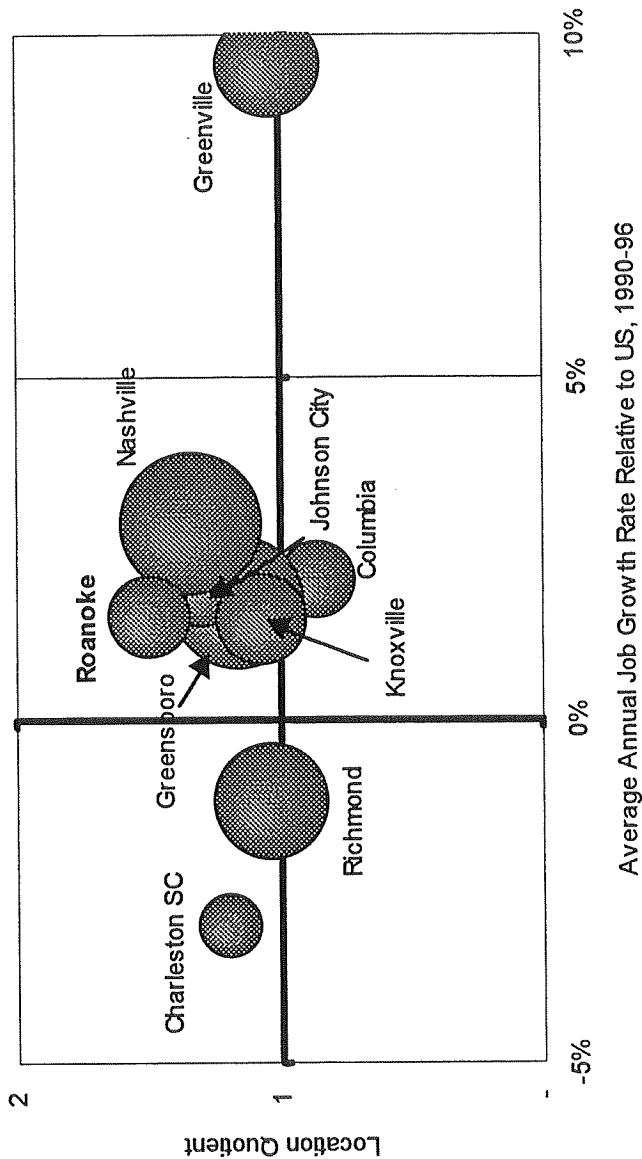
The cluster has maintained its strong specialization over time.



Source: Dept. of Commerce - RFA

Despite its smaller size, the MSA Health Care Cluster is growing as fast as most.

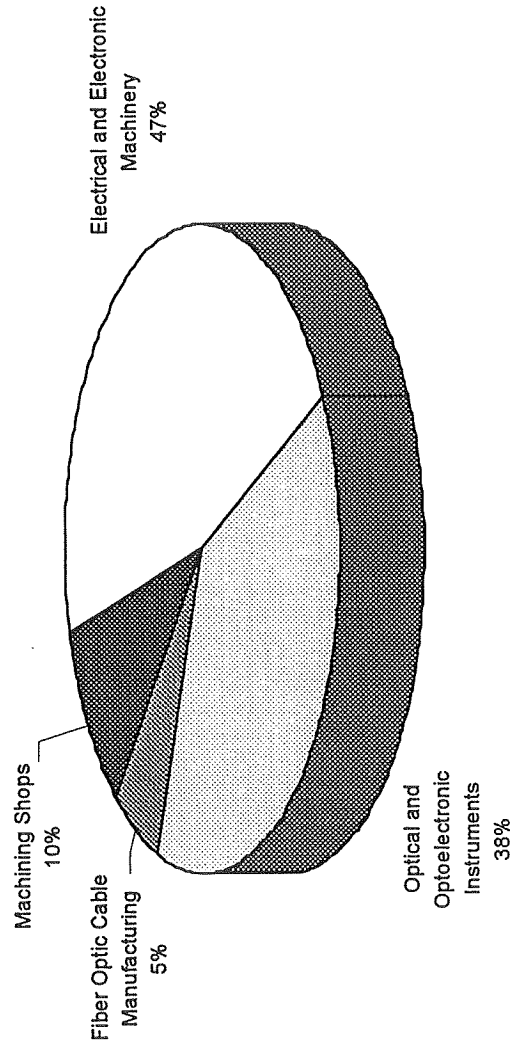
Health Care Growth-Share Matrix:
The Roanoke MSA and Nearby Benchmark MSAs



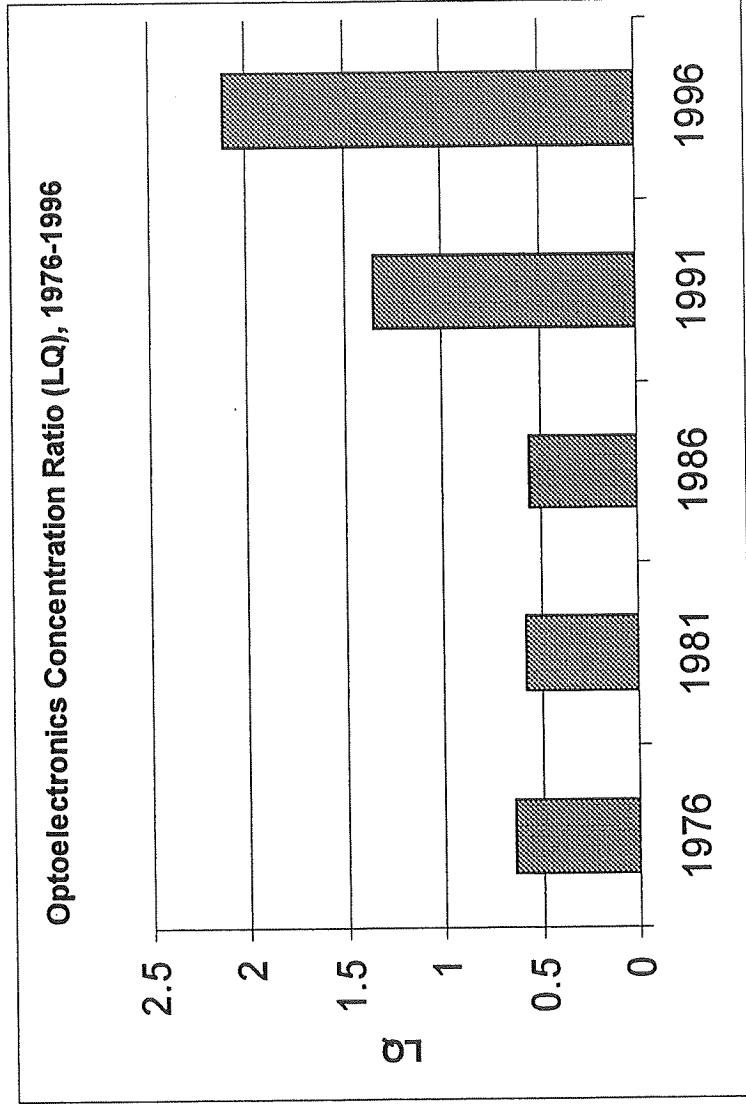
Source: Department of Commerce/Regional Financial Associates

Roanoke's MSA Optoelectronics cluster brings together a number of highly skilled jobs...

Employment Composition of the MSA
Optoelectronics Cluster, 1999
Total Regional Employment: 2,683



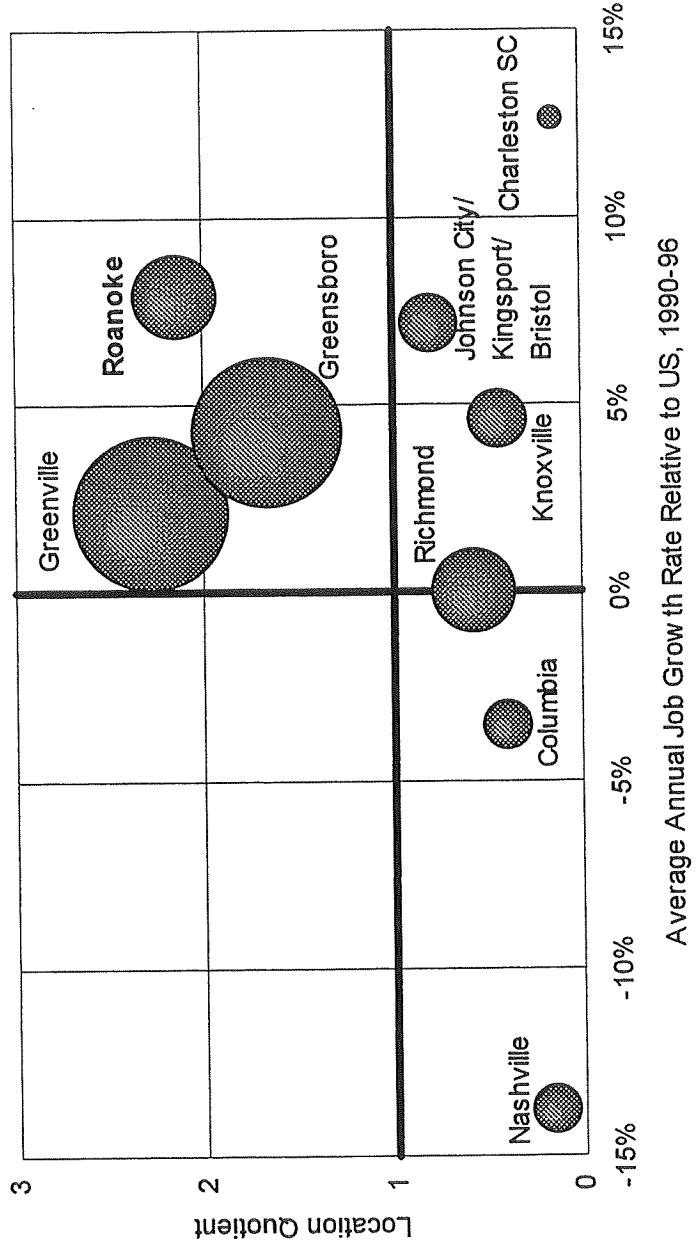
.....And has grown rapidly in the 1990s.



Source: Dept. of Commerce - RFA

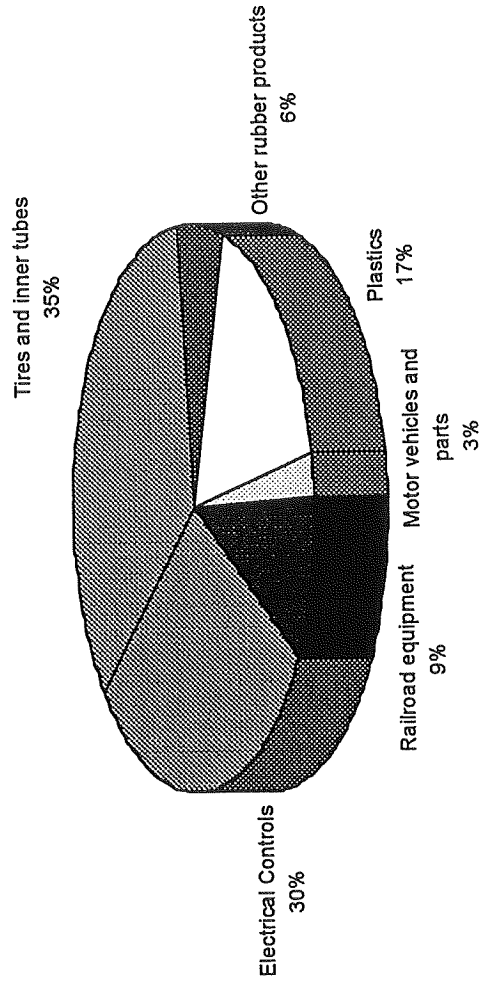
Optoelectronics is smaller in this region than in others, but growth and concentration are strong.

Optoelectronics Growth-Share Matrix:
The Roanoke MSA and Nearby Benchmark MSAs



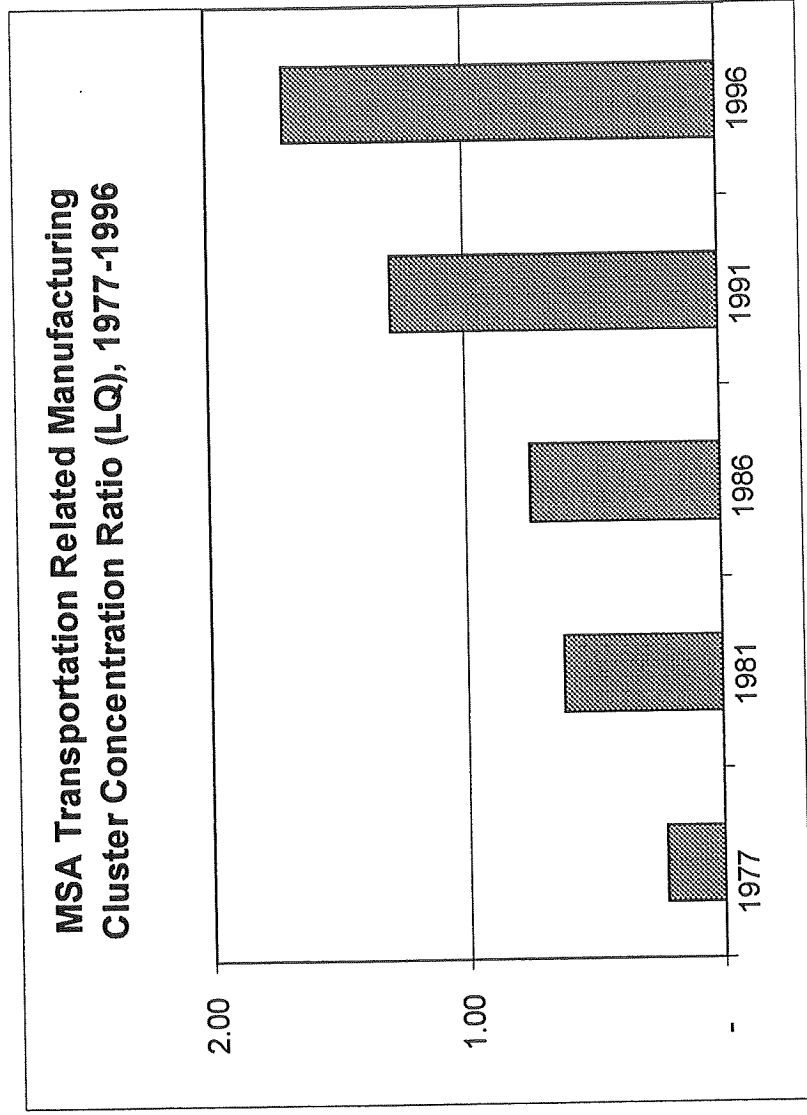
The MSA Transportation-Related Manufacturing Cluster primarily supplies auto manufacturers...

Employment Composition of the MSA
Transportation-Related Manufacturing Cluster, 1999
Total Employment: 5,159



Source: Dun and Bradstreet / Roanoke Valley Economic Development Partnership

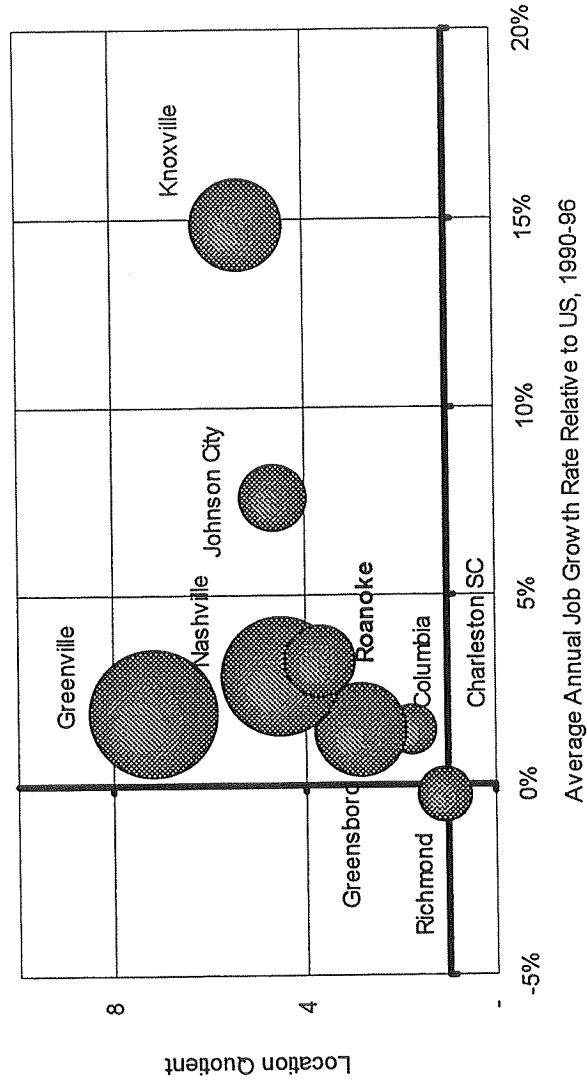
.....And has been steadily growing in importance.



Source: Dept. of Commerce - RFA

The Fifth Planning District is located in a broader region which has attracted auto investment: the Roanoke MSA cluster compares well.

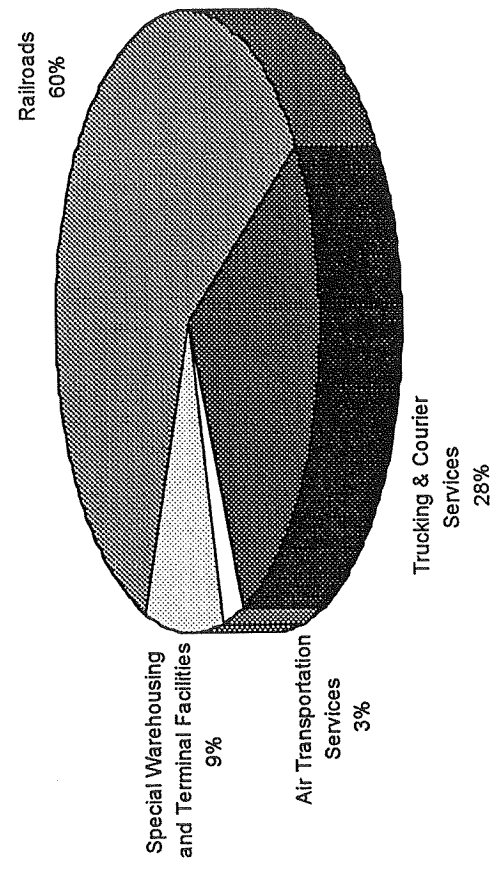
Transportation Related Manufacturing Growth-Share Matrix:
The Roanoke MSA and Nearby Benchmark MSAs



Source: Department of Commerce/Regional Financial Associates

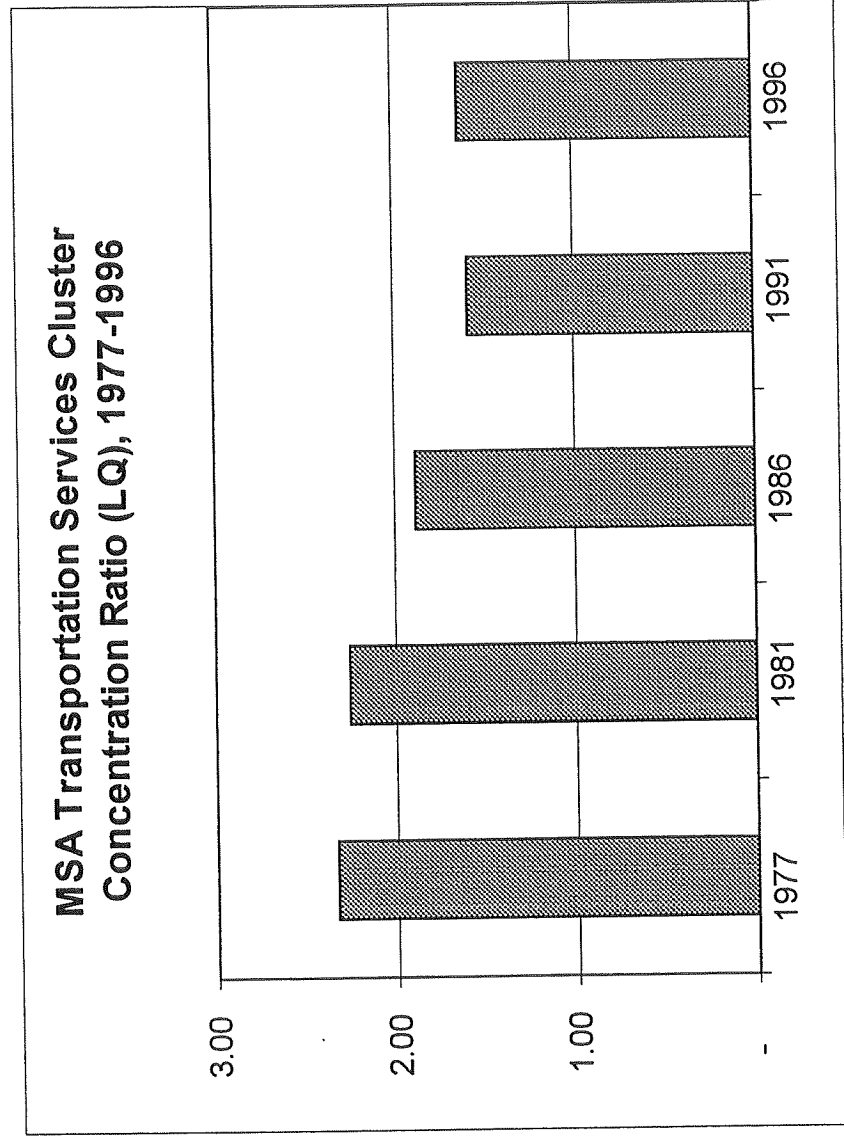
The Transportation Services cluster illustrates the importance of railroads to the region.

Employment Composition of the MSA
Transportation Services Cluster, 1999
Total Regional Employment: 4,211



Source: Dun and Bradstreet / Roanoke Valley Economic Development Partnership

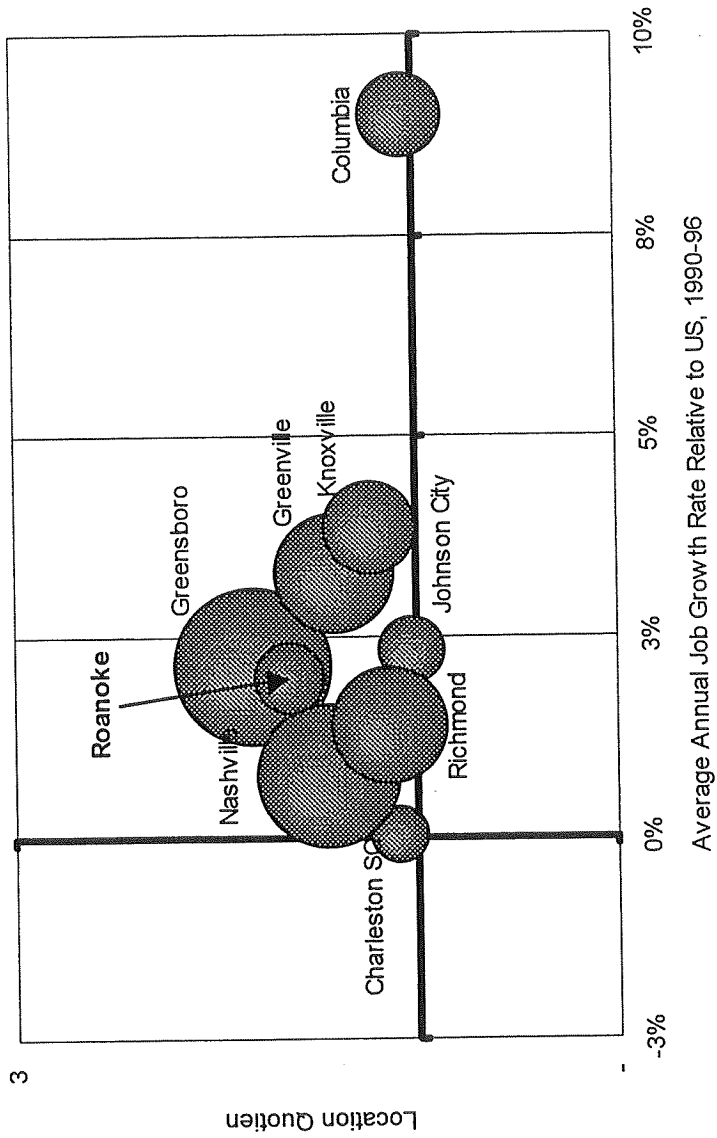
The Cluster Remains Strong, Although Its Concentration Has Declined in the 1990s.



Source: Dept. of Commerce - RFA

The cluster has been successful in finding growth opportunities apart from railroads.

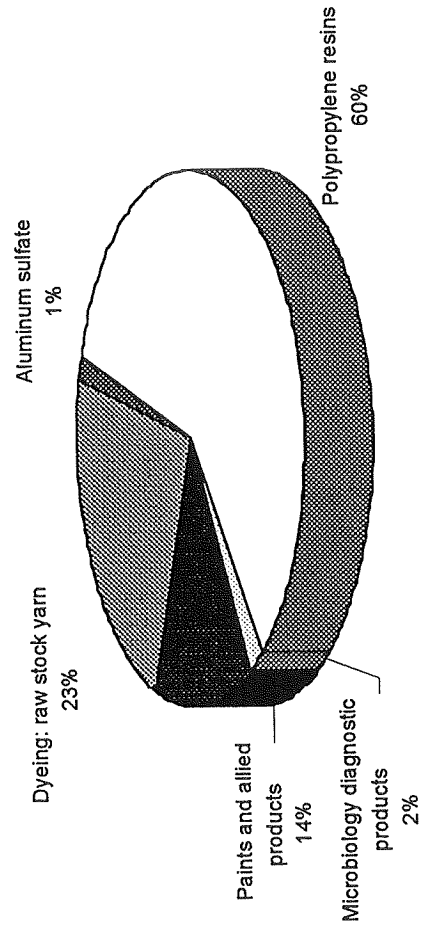
Transportation Services Growth-Share Matrix:
The Roanoke MSA and Nearby Benchmark MSAs



Source: Department of Commerce/Regional Financial Associates

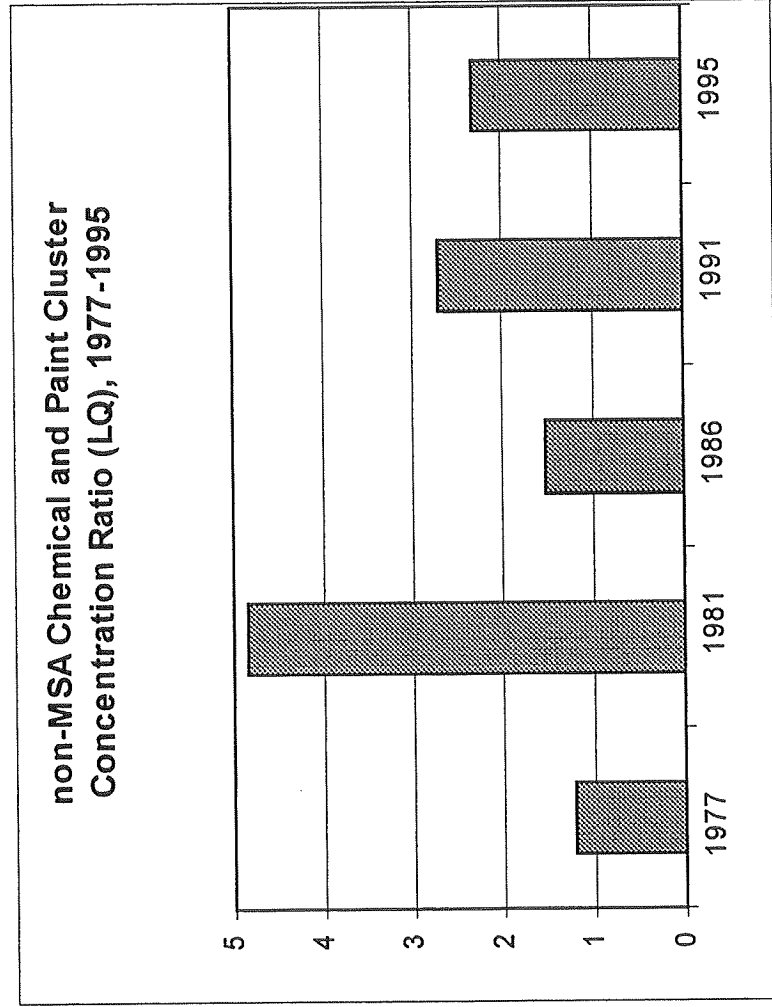
The Non-Metropolitan Chemicals and Paints Cluster is Mainly Resource-Driven

Employment Composition of the non-MSA
Chemical and Paint Cluster, 1999
Total Regional Employment: 434



Source: Dun and Bradstreet / Roanoke Valley Economic Development Partnership

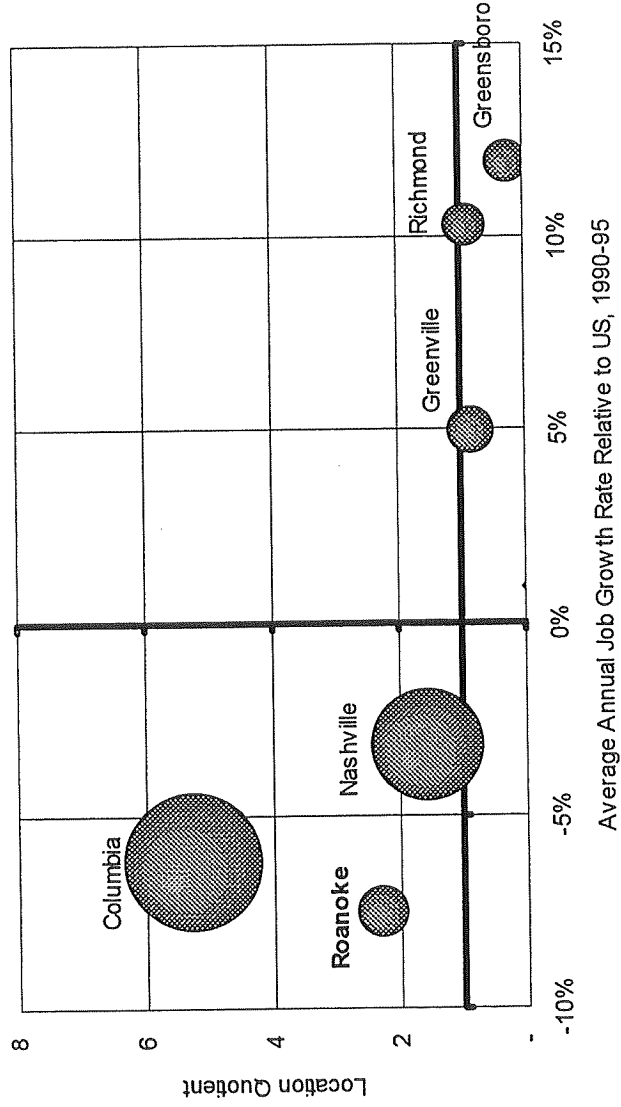
The cluster has fluctuated over time, but has been consistently strong.



Source: Dept. of Commerce - County Business Patterns

This cluster is relatively small and has lagged in growth, but is still significant to the non-metropolitan area economy.

**Chemicals Growth-Share Matrix:
The Roanoke Rural Region and Nearby Benchmark MSAs**



Source: Department of Commerce/Regional Financial Associates

Conclusions of the Cluster Analysis

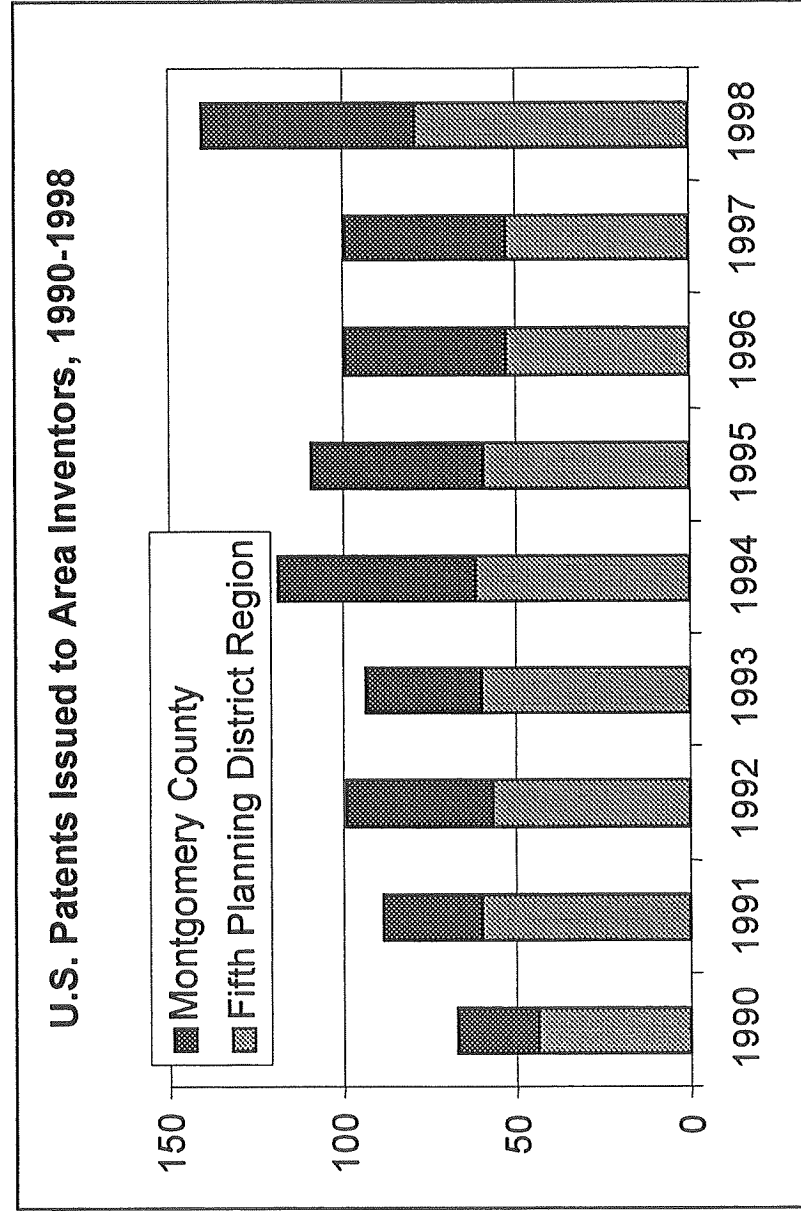
- The region's economic successes are due to the growth of newer clusters dependent on non-traditional sources of competitive advantage: Optoelectronics, Health Care, Transportation-Related Manufacturing, Transaction Services, Transportation Services, and Computer Services.
- Wood products, Metals, Apparel, and Chemicals remain significant to the economy, but the region has lagged the Nation in growth in these clusters.
- Different economic foundations are required for continuing competitiveness in these new clusters.

4. Keys to Competitiveness: Roanoke's Economic Foundations

Roanoke's Economic Foundations are key determinants of long-term competitiveness

- The preceding analysis has shown that Roanoke's mix of clusters have contributed to its strong overall economic performance.
- But how long can this momentum be maintained? Competition today increasingly requires regions to supply a range of high quality economic foundations:
 - Technology Resources -- Quality of life
 - Human Resources -- Business Climate / Cost of Living
 - Financial Resources -- Transportation Infrastructure
- This section examines how Roanoke compares to the competition on these keys to competitiveness.

Technology Resources: Patents over time

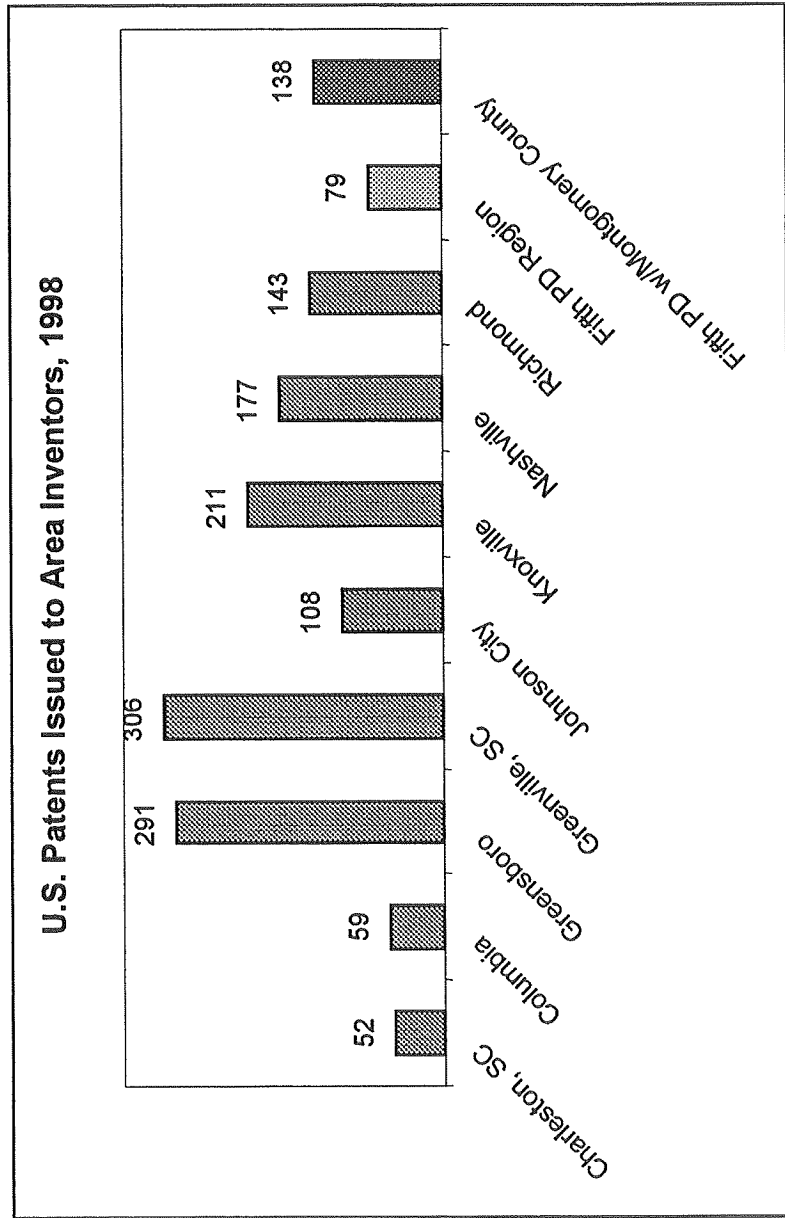


■ Although 1998 was an excellent year, patent activity in the region has largely stagnated during the 1990s.

■ Montgomery County, home to Virginia Tech, is a large and growing source of intellectual capital for the region.

Source: U.S. Patent and Trademark Office
 Note: MSA Information not directly available. Data obtained for each city with population greater than 10,000 in each area.

Technology Resources: Benchmarking Roanoke

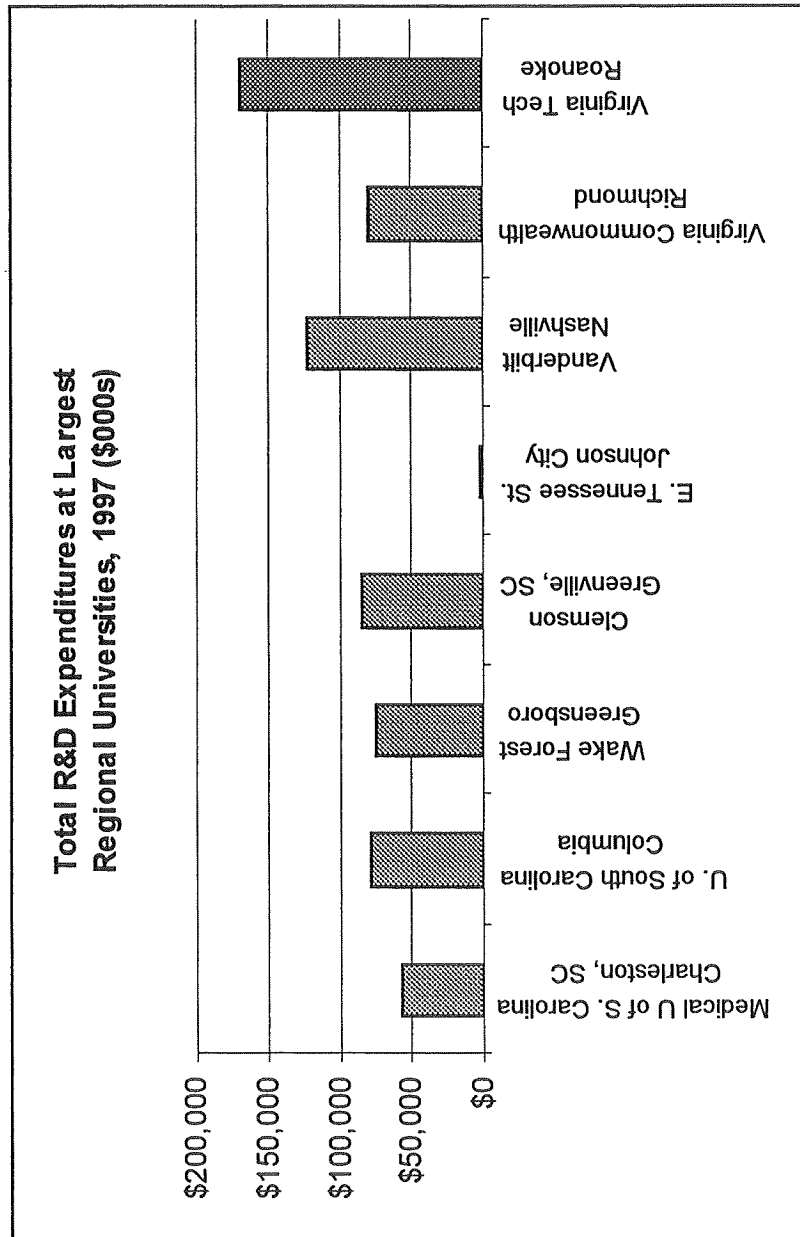


■ The region ranks relatively poorly among competitors in patents by local inventors.

■ Considering Montgomery County as part of the Greater Roanoke Region improves the picture considerably --but many areas still rank higher.

Source: U.S. Patent and Trademark Office
 Note: MSA information not directly available. Data obtained for each city with population greater than 10,000 in each area.

Technology Resources: University R&D

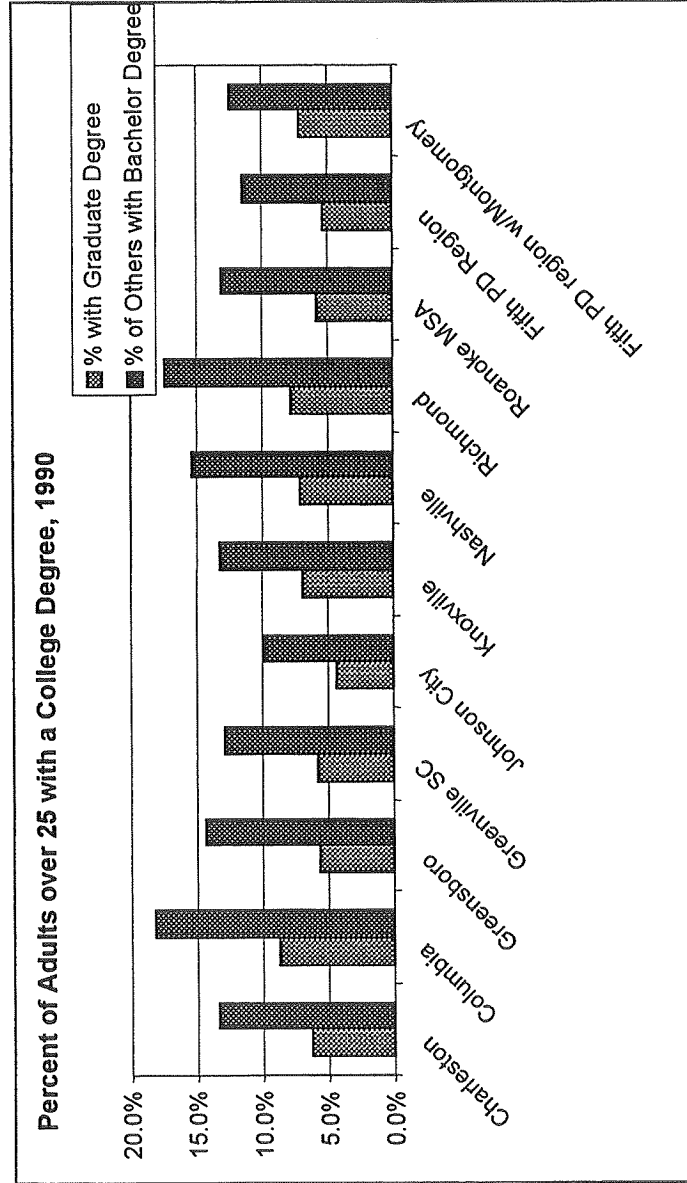


■ Virginia Tech is one of the largest research universities in the country--earning more R&D investment than any university in the benchmark regions.

■ Despite the region's low performance in patent activity, Virginia Tech should be viewed as a strategic asset to develop technology resources.

Source: National Science Foundation

Human Resources: College Education

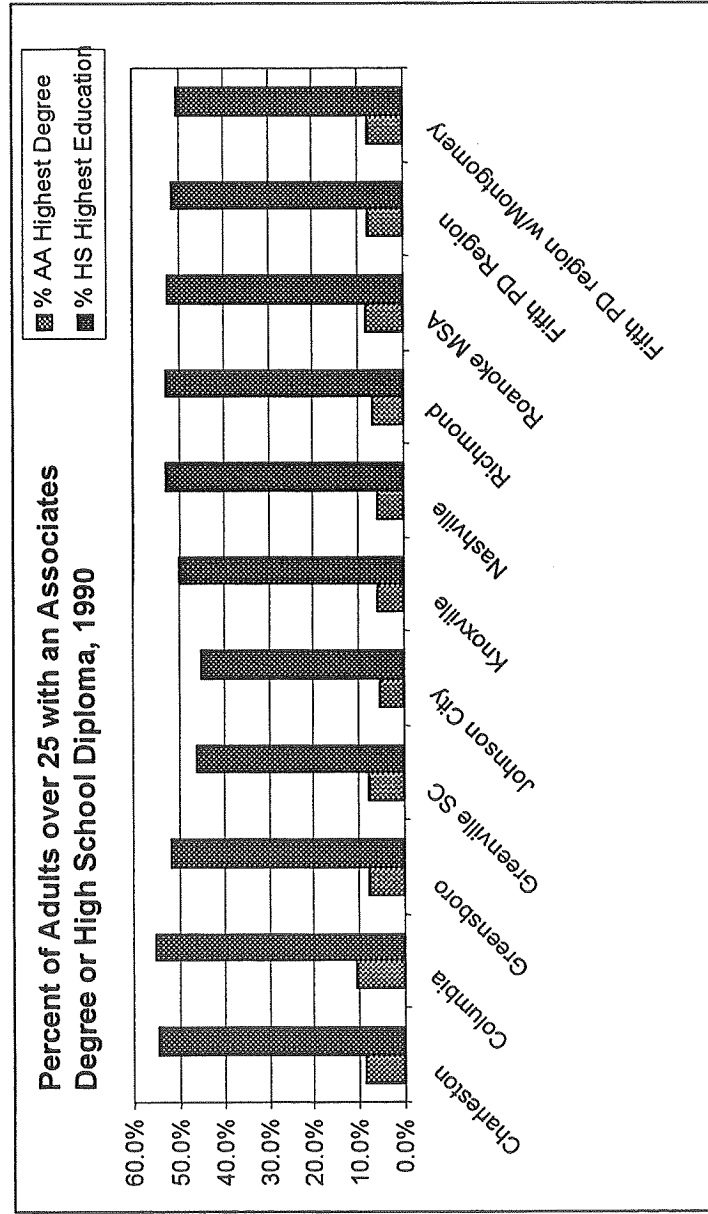


■ The region performs at a below-average level in terms of higher educational attainment.

■ Adding Montgomery County to the region improves the pool of graduate degree holders substantially, B.A. degree holders marginally.

Source: US Census Bureau

Human Resources: Associates Degrees and High School Graduates

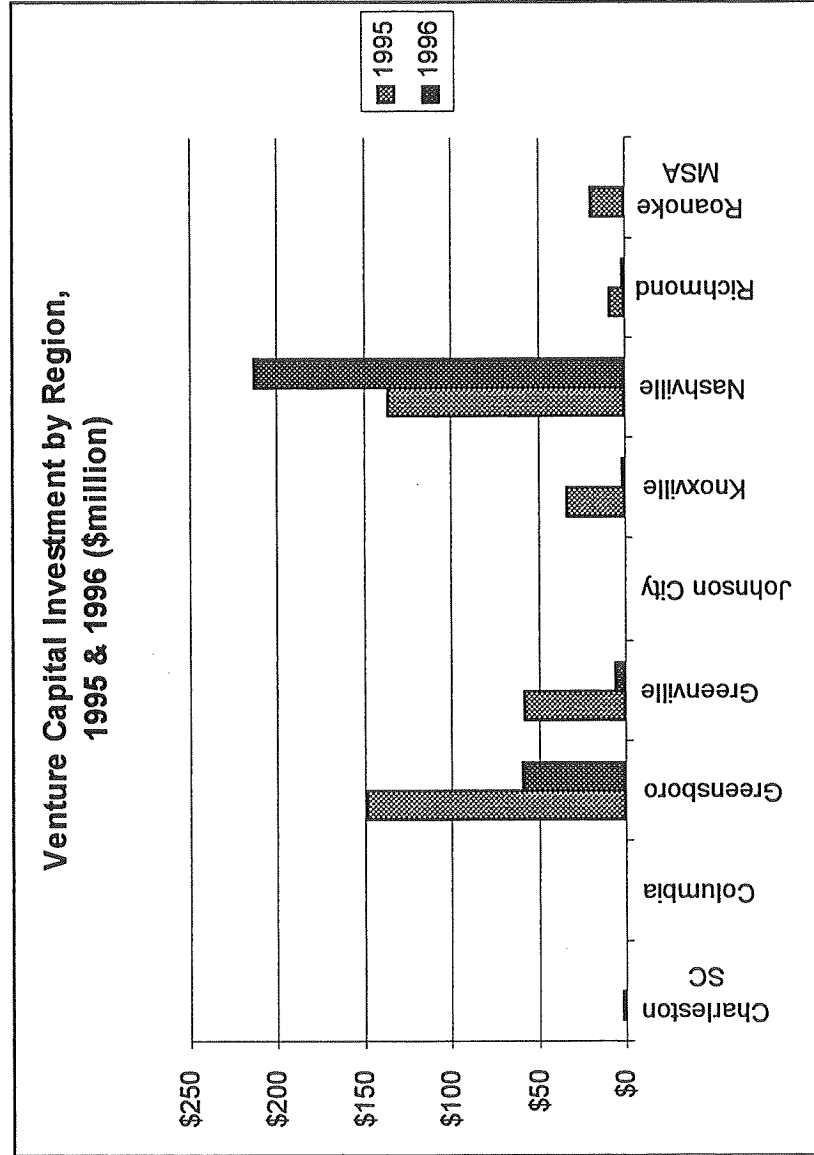


- The region ranks near the middle in Associates degree holders and in the lower half of regions in High School graduates.

- Technical education from Community Colleges is a specialty of the region's Associate-level educational system.

Source: US Census Bureau

Financial Resources: Venture Capital

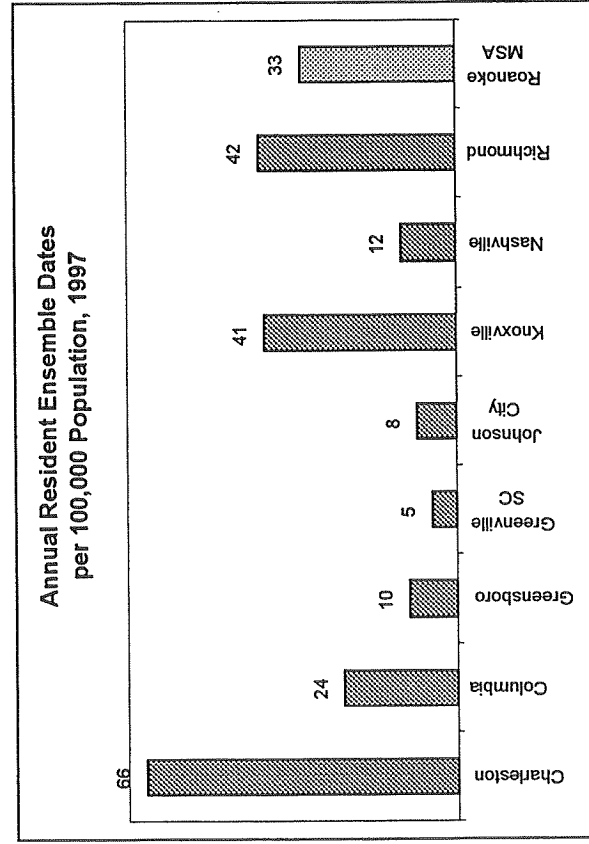


■ Only Nashville and Greensboro / Winston-Salem are substantial recipients of Venture Capital Investment, among the Benchmark regions.

■ \$20 million in VC were invested in the Roanoke MSA in 1995 - none in 1996.

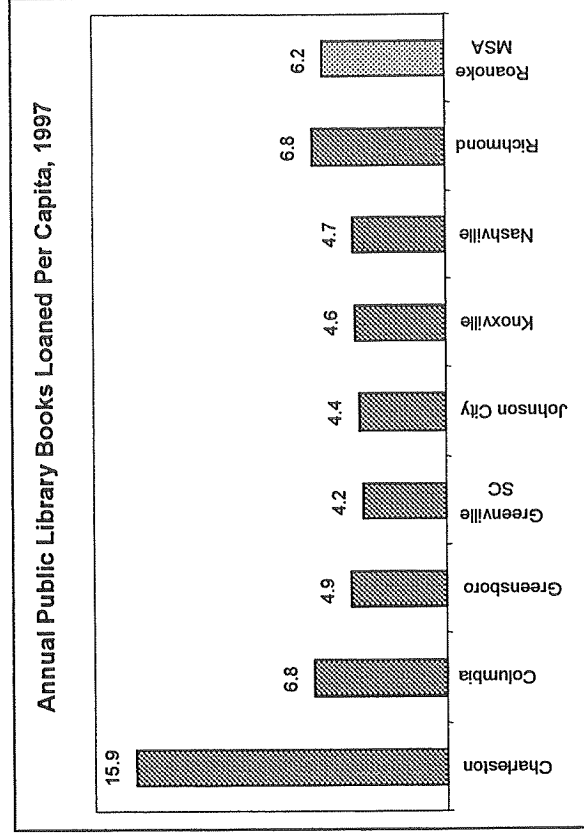
Source: US Census Bureau

Quality of Life: Cultural Amenities



Source: Places Rated Almanac

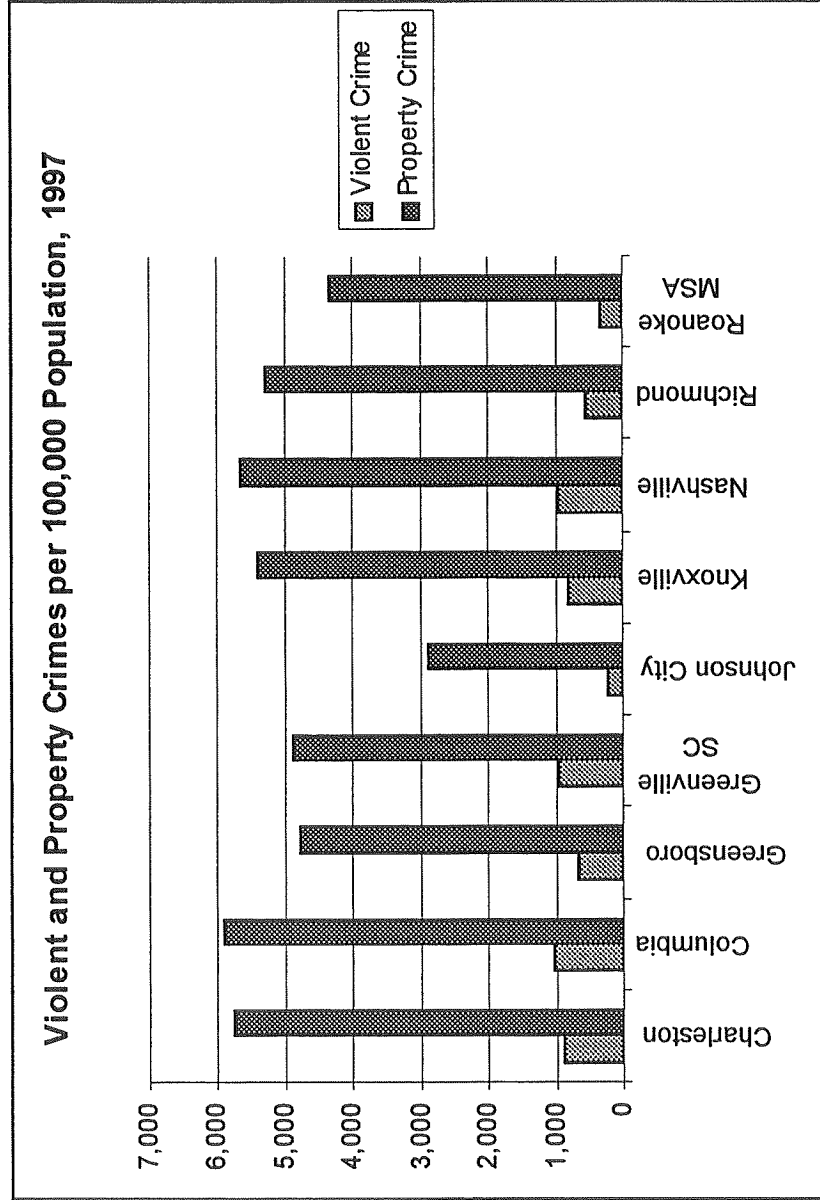
The region has a strong local arts community for a region of its size.



Source: Places Rated Almanac

The region's Public Libraries are comparatively well-utilized by residents.

Quality of Life: Crime



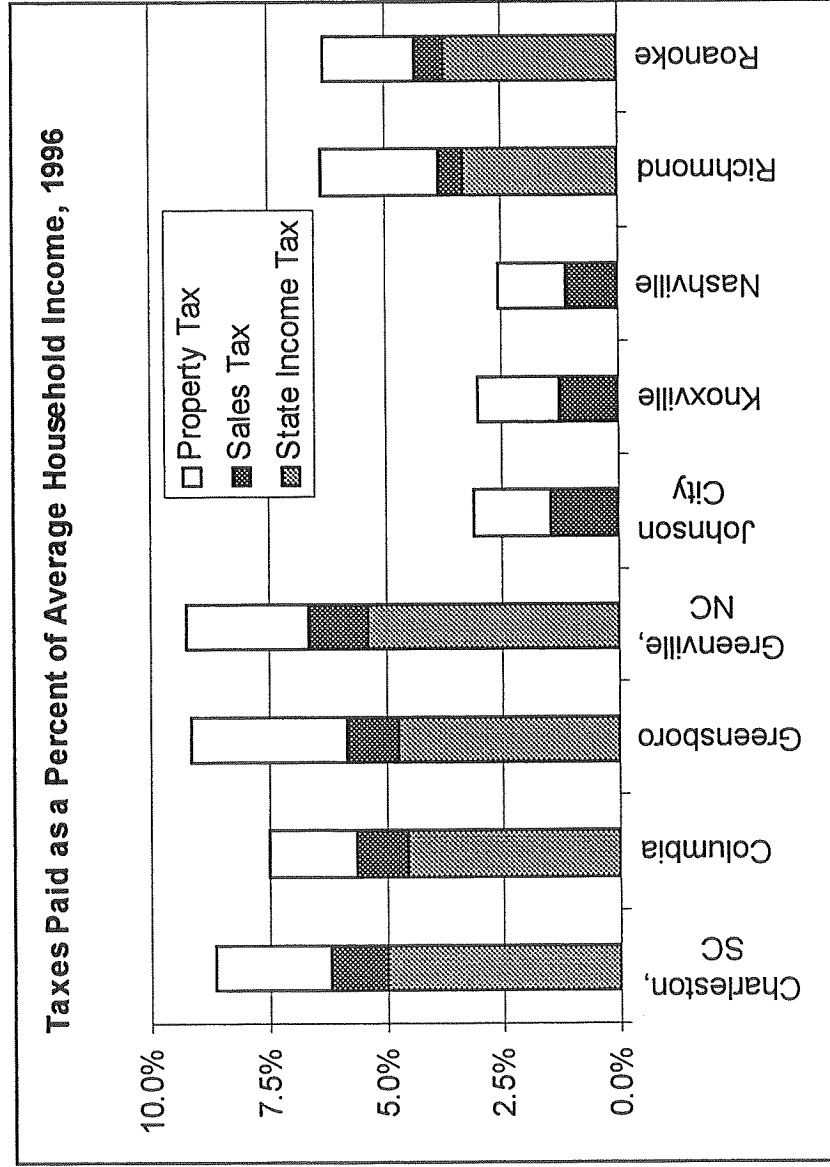
■ Only the Johnson City MSA has a lower crime rate than the Roanoke MSA.

■ However, as of 1997 the region's crime rate was trending upward-- against a national trend.

Source: FBI / Places Rated Almanac, 1997

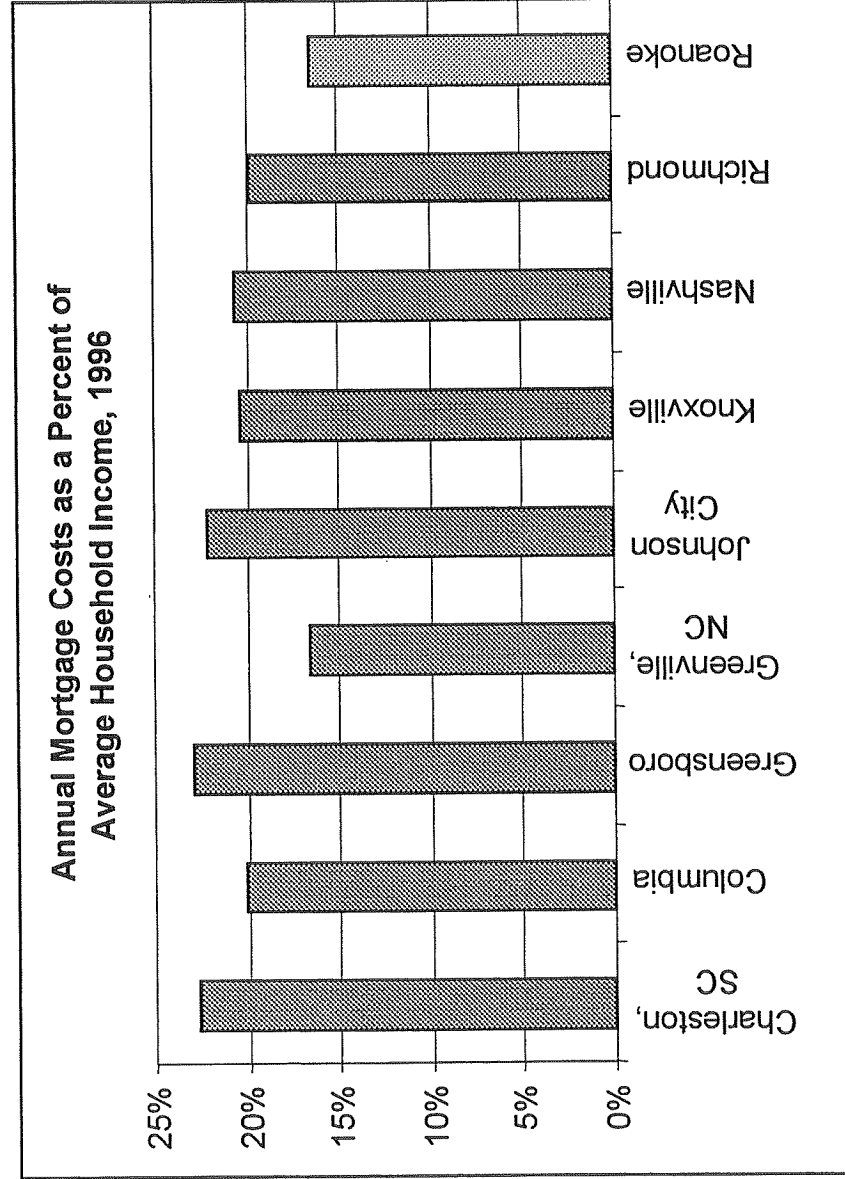
Business Climate / Cost of Living: Taxes

Taxes are lower in the Roanoke MSA than in regions in the Carolinas, but Virginia regions cannot compete with Tennessee regions on low taxes.



Source: Places Rated Almanac, 1997.
 Note: Taxes are calculated based on average paid in each region by a two-earner, two-child household earning \$60,000 per year paying property taxes on a home costing the regional average.

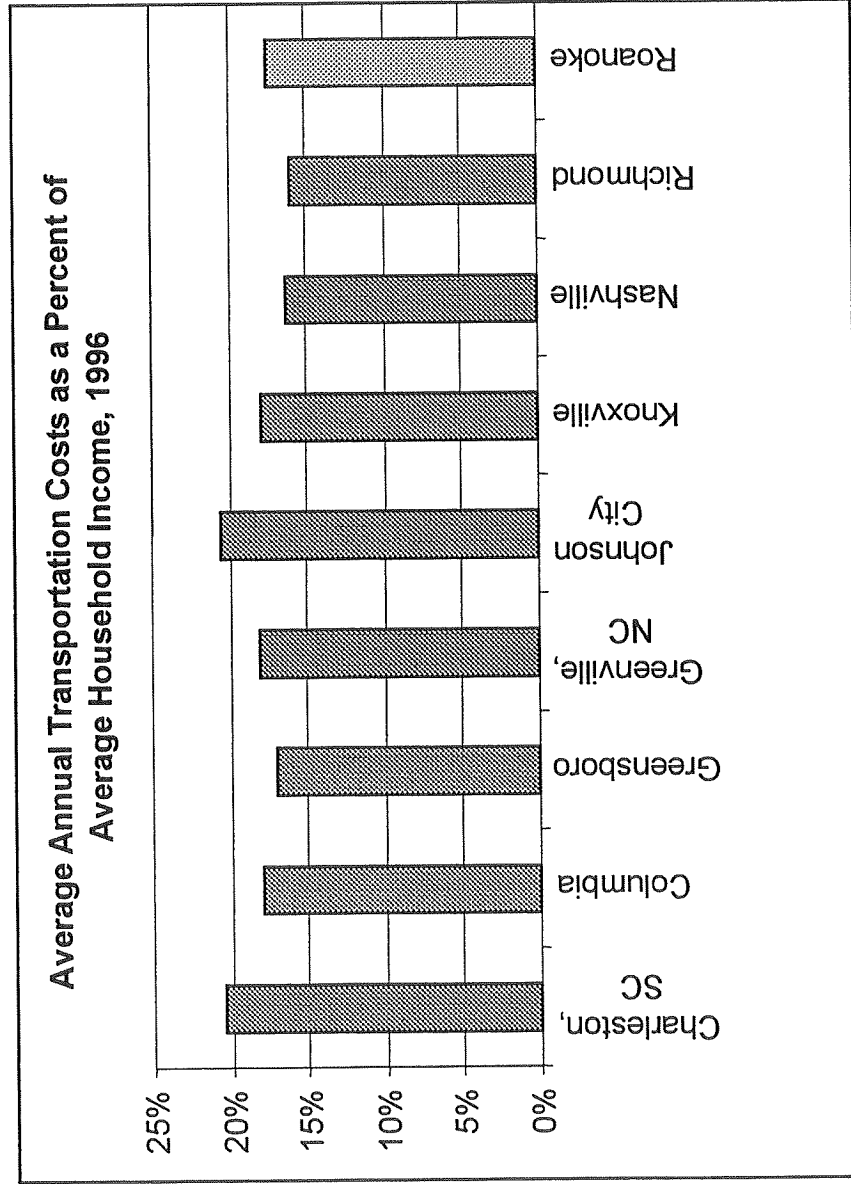
Business Climate / Cost of Living: Housing



The region has the most affordable housing among any of the benchmark regions.

Source: ICF Consulting calculations based on Places Rated Almanac, 1997.

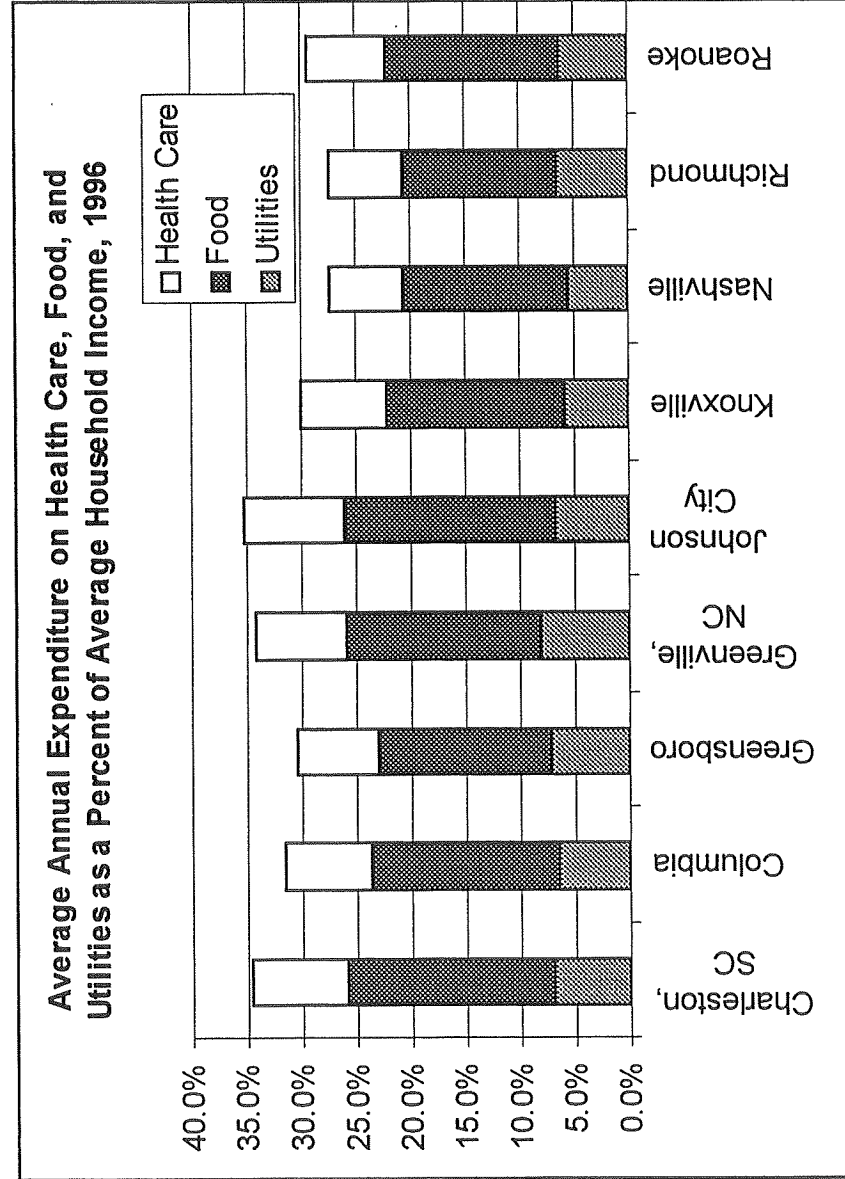
Business Climate / Cost of Living: Transportation



Only Richmond and Nashville area residents spend less of their income on transportation than people in the Roanoke MSA.

Source: ICF Consulting calculations based on Places Rated Almanac, 1997.

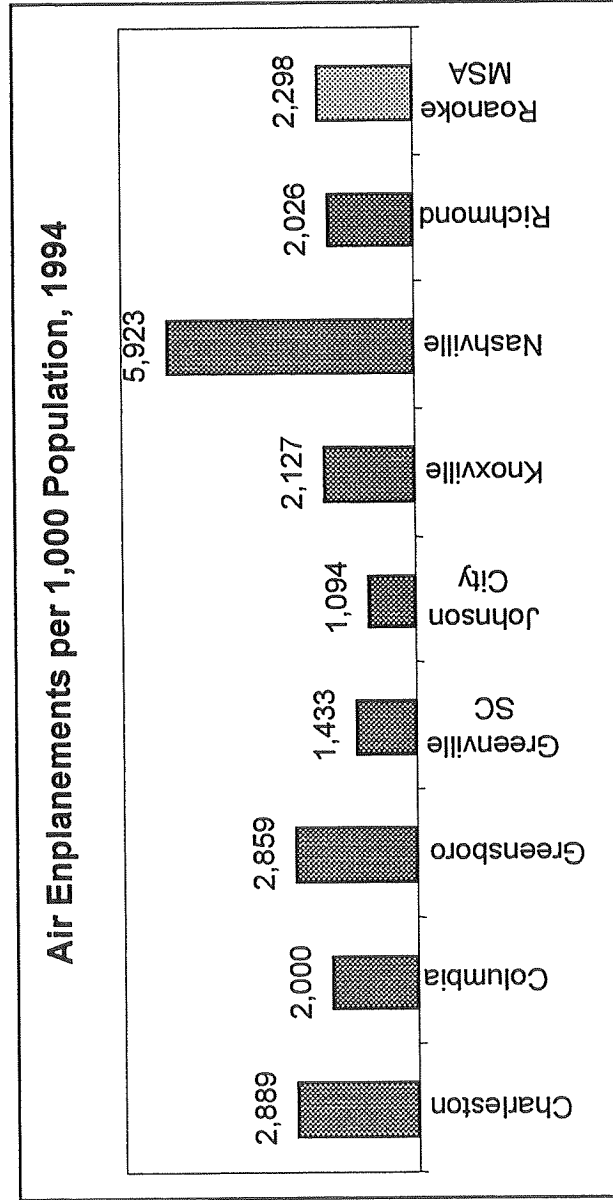
Business Climate / Cost of Living: Other Key Consumer Expenditure Items



Residents in the region pay relatively little for key consumer items like Utilities, Food, and Health Care.

Source: ICF Consulting calculations based on Places Rated Almanac, 1997.

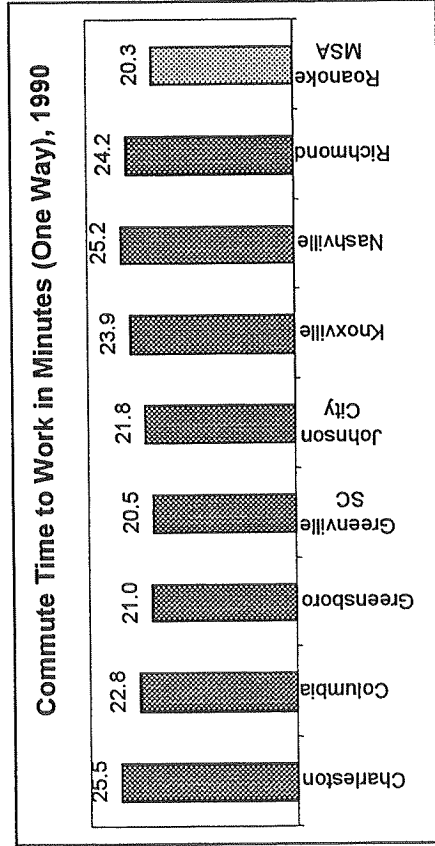
Transportation Infrastructure: Air Travel



While not a major hub, the region has relatively good air travel access for a region of its size.

Source: FAA

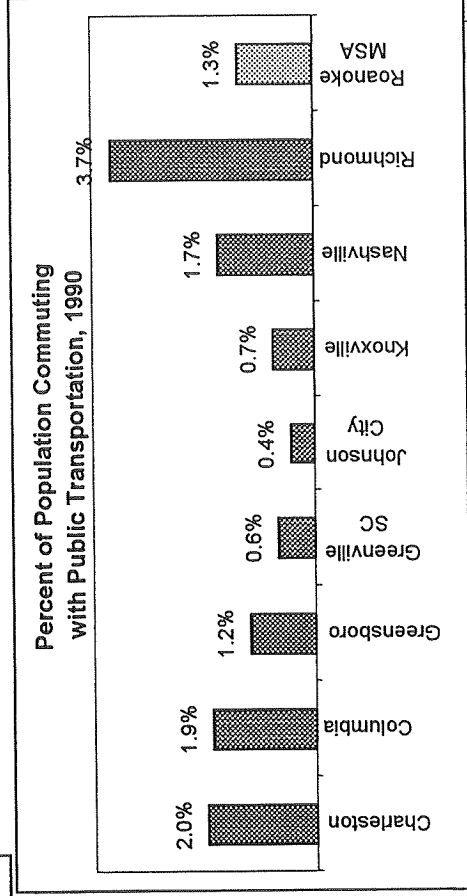
Transportation Infrastructure: Transit and Commute Time



Source: U.S. Census Bureau

Usage of transit by Roanoke commuters is average compared with the Benchmark regions. However rising congestion may require further coordination to improve transit in the region.

As a smaller region, Roanoke has a lighter commute than most of the Benchmark regions. However, evidence suggests commute times have worsened in the 1990s.



Source: U.S. Census Bureau

Summarizing Roanoke's Economic Foundations

- Although Roanoke's economy and clusters have performed well, there are weak spots in the economic foundations.
- Roanoke is strong in more traditional factors like cost of living and transportation infrastructure. However to support a knowledge-based economy, Roanoke needs to improve:
 - Technology resources by better leveraging Virginia Tech
 - Human Resources by broadening training opportunities.
 - Financial Resources through more risk capital.
 - Marketing of its admirable Quality of Life to attract professionals.

5. Going Forward: Towards a Collaborative Strategy for the Roanoke Region

Ensuring Another Generation of Prosperity

- Improving Roanoke's economic foundations to sustain competitiveness and prosperity will require a new approach to economic development in the region.
- Foundations improve when public and private parties work together, around the cluster concept.
- Doing this requires a collaborative approach to strategy which will promote a shared view of problems and a common commitment to making progress.

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