How Freight Transportation Supports Rural America

Chapter 3

Chapter 3: How Freight Transportation Supports Rural America

The focus of this study is freight transportation, with an emphasis on agricultural transportation. This chapter places freight transportation in a larger context; it examines how freight transportation supports a strong rural America, including rural manufacturing, and how it sustains economic development and provides adequate and efficient services for rural America.

An efficient transportation system supports rural economic development. In an efficient rural economy, the cost of inputs to agriculture and the cost of living for inhabitants of rural areas decreases, the net price to producers and manufacturers increases, market access and competitiveness increases, and job opportunities are increased. Successful businesses and producers contribute to the quality of life and increase opportunities for rural residents.

In brief, this chapter shows that an efficient system of freight transportation is an important foundation for a vibrant rural economy, including rural manufacturing. Transportation, however, does not stand alone, but is one of several key elements that contribute to a strong rural economy. Many other factors also help create and support a high quality of life in rural communities. In this chapter, we compare some crucial economic and demographic attributes of rural America with metropolitan areas. We also describe variations of rural areas along several other dimensions, in order to explore the implications for the needs, successes, and benefits of freight transportation. The requirements for freight transportation vary.

Figure 3-1: People often choose to live in rural areas for a more relaxed quality of life and closeness to nature.

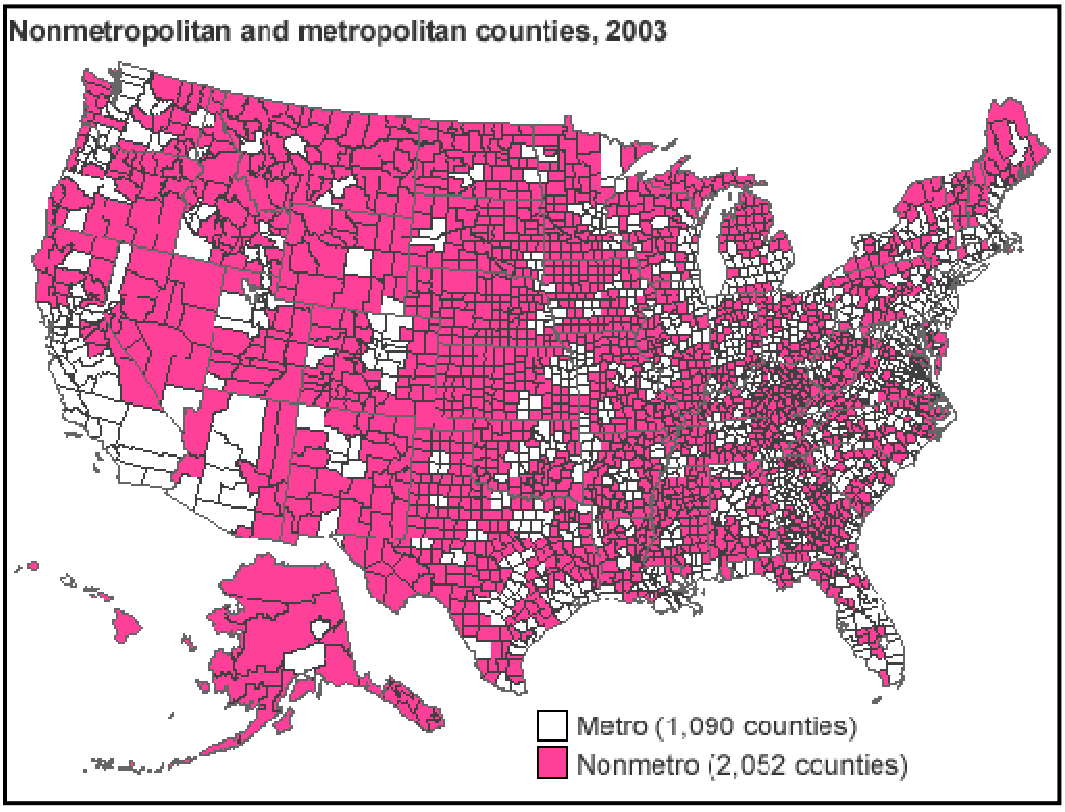
Source: Wikimedia Commons

The economic institutions in rural communities are interconnected. Providing efficient freight transportation for a rural region has positive effects on the businesses served, and indirectly affects most of the other institutions and aspects of the community. The served businesses, whether in agricultural, manufacturing, or other sectors, are able to ship goods and receive inputs more quickly and more cheaply, allowing them to expand operations and add jobs and make purchases from the local economy.

Rural America

One widely accepted and straightforward definition of "rural" is "any county outside a metropolitan area." Using this definition, 2,052 U.S. counties are non-metropolitan, or rural. Rural America constitutes about 75 percent of the nation's land area and 17 percent of its population.[53] See Figure 3-2 for the location of these rural counties.

Figure 3-2: Rural and metropolitan counties



Source: Prepared by ERS using data from the Census Bureau

The defining difference between rural and metropolitan areas is population density. Rural populations are sparse (because land is the major resource of agriculture, economies of scale have caused consolidation of farms and a thinning of population), and metropolitan populations are dense.

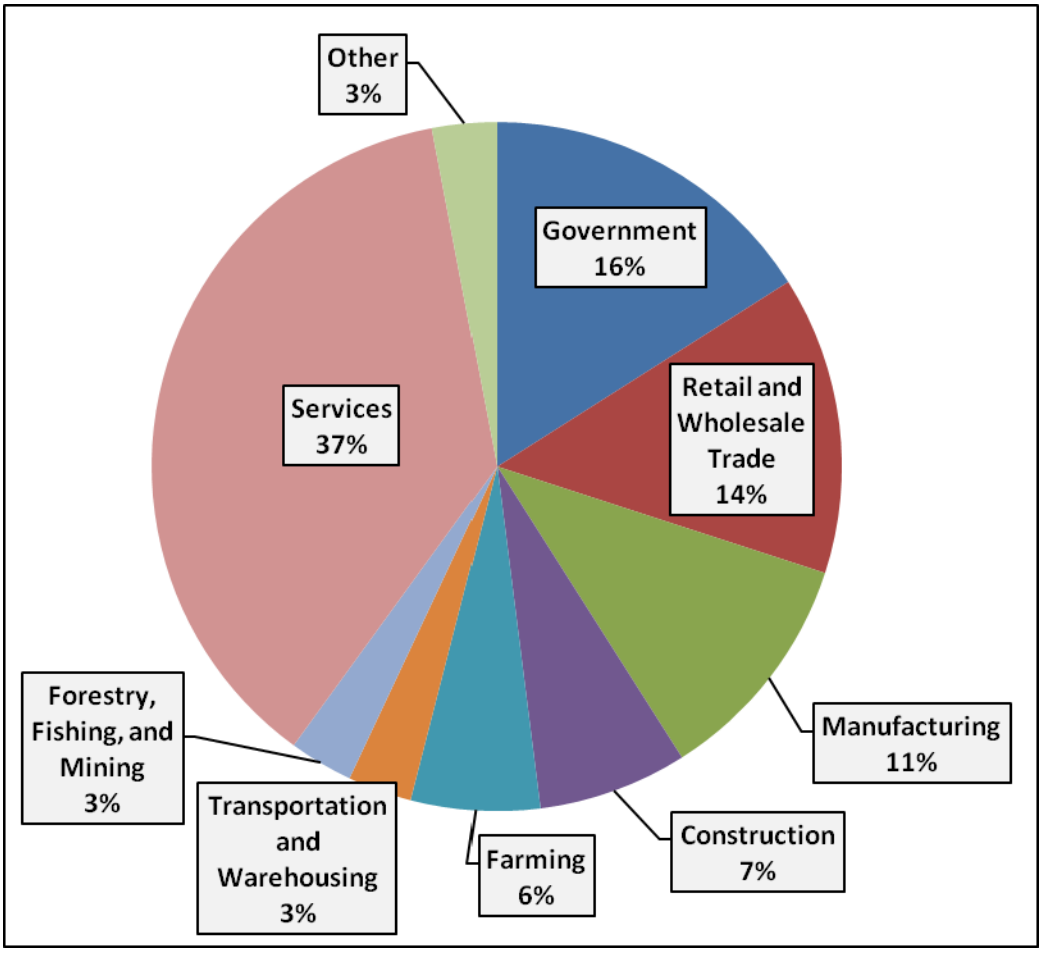
The stereotype of the rural economy focuses on agriculture but, in reality, the picture is more complex. As shown in Figure 3-4, agriculture is far from the largest employer in rural America. Four other economic sectors—services, government, retail and wholesale trade, and manufacturing—comprise 80 percent of rural employment. Agriculture is responsible for less than one in ten rural jobs. However, because agriculture is so capital intensive, the economic activity generated by it is greater than the job opportunities it creates. The interaction of agriculture and the off-farm jobs it supports provides a solid base for many rural communities. A solid transportation system is a critical foundation for success in all the economic sectors of rural America.

Figure 3-3: Rural America depends on trucks to move its products.

Source: USDA

Rural transportation serves a continuum from the countryside of isolated settlements to the urban fringe. Rural production requires farm-to-market or mine-to-power plant movements at one end of the continuum, and the urban fringe requires local distribution of medicines, food, and clothing similar to core urban areas. Rural transportation is becoming more complex all the time.

Figure 3-4: Composition of rural employment*



Source: BEA, 2006

The defining difference between rural and metropolitan areas is population density. Metropolitan America has, on average, fifteen times as many persons per square mile as rural America. Many additional differences exist along economic and demographic dimensions. Some key differences are the higher poverty and unemployment rates in rural areas. Rural America also experiences lower income and lower high school and college graduation rates. Table 3-1 presents these comparisons.

* Employment can be measured by either the residence or the workplace of the employee. The American Community Survey (ACS) uses the residence; the Bureau of Economic Analysis (BEA) uses the workplace. In areas where many employees commute to work from rural to metropolitan areas or vice versa, the rural employment information can be substantially different depending on the approach.

Table 3-1: Comparison of economic and demographic indicators in metropolitan and rural America

Demographic Category	Rural	Metropolitan	U.S. Total
Population Density (per square mile)	18.94	280.45	85.26
Population Change	2.2%	6%	5.3%
Median Household Income	$40,532	$53,066	$51,658
Poverty Rate	15.7%	12.4%	13.0%
Unemployment Rate	5.4%	5.0%	5.1%
High School Graduation Rate	82.0%	85.1%	84.5%
College Graduation Rate	17.7%	29.5%	27.5%

Sources: Population data: U.S. Census Bureau, April 2000-July 2005; Income, poverty and graduation rates: 2007 American Community Survey; Unemployment data: BLS, 2005

Rural America is not homogeneous, so the transportation needs vary, with wide variations occurring across the nation. Rural areas vary along many dimensions. Table 3-2 shows State-to-State comparisons and reveals some of these variations.

Population densities in rural areas differ widely among states. Rural counties in five States (AK, MT, NV, UT, and WY) have fewer than five people per square mile. On the other end of the spectrum, rural areas in three States (CT, DE, and MA) have more than 170 people per square mile. Some rural areas are growing; others are losing population. For instance, the rural areas of three States (DE, FL, and NV) had a growth rate of over 10 percent from 2000 to 2005, while 11 States lost rural population over that same period.

Income differences also vary widely. Four States (CT, DE, MD, and WY) have a recent rural median household income exceeding $50,000, while in five States (AR, KY, LA, MS, and WV) it is less than $35,000. Poverty rates, too, vary widely. In five States (AR, KY, LA, MS, and NM), 20 percent or more of the rural population is below the poverty level; in contrast, in seven States, less than 10 percent of the rural population is below the poverty level.

Local unemployment rates also vary. In December 2005, five States (HI, MA, NE, NH, and WY) had rural unemployment rates of 3.5 percent or less, and three States (AK, MS, and SC) had rates of eight percent or higher.

Education levels also vary across rural America. In Wyoming, over 90 percent of the adult population holds a high school diploma, but six States (GA, KY, LA, NV, TN, and TX) have a rate of less than 75 percent.

Note that, as striking as these differences across rural America are, the differences would be even more dramatic if we were comparing rural counties instead of the rural portions of states.

Table 3-2: Key economic and demographic indicators for nonmetropolitan America, State-by State Breakdown

State	Non-metro Population Density	Non-metro Population Change[3]	Non-metro Median Household Income[4]	Non-metro Poverty Rate[5]	Non-metro Unemployment Rate[6]	Non-metro High School Graduation Rate[7]	Non-metro College Graduation Rate[8]
Units	Per square mile	Percent	Dollars	Percent	Percent	Percent	Percent
AL	43.1	0.9	35,012	19.16	4.4	75.10	15.12
AK[1]	0.4	-0.2	-	12.24	8.9	87.18	21.53
AZ	11.5	9.1	39,311	19.45	6.1	79.31	15.51
AR	30.1	-0.5	32,694	20.00	5.9	77.24	13.39
CA	14.8	5.3	43,789	14.29	6.5	85.38	20.67
CO	8.4	4.8	47,814	13.24	4.6	87.04	28.56
CT	213.1	4.8	63,023	6.10	4.9	88.90	28.30
DE	196.6	12.5	50,976	9.20	3.7	83.50	19.90
FL	56.5	10.7	39,464	15.88	4	77.43	13.80
GE	52.5	5.1	35,936	19.57	5.7	74.91	13.94
HI[1]	64.9	9.9	-	8.80	2.9	88.60	26.50
ID	8.3	4.2	42,372	14.13	4.3	86.03	21.20
IL	47.8	-1.3	41,114	13.81	5.4	84.95	16.52
IN	79.1	0.3	43,567	12.34	5.9	82.74	13.95
IA	30.1	-1.7	43,657	10.92	4.8	88.25	17.51
KS	14.3	-3.0	40,368	12.72	4.5	86.67	21.33
KY	62.2	2.1	32,553	21.81	6.7	73.64	13.71
LA	46.1	-0.6	33,652	23.88	7.8	74.36	13.29
ME	22.0	2.4	39,934	14.24	5.8	88.29	22.40
MD	103.2	6.5	58,430	9.40	4.5	84.89	24.36
MA[1]	171.6	4.8	-	-	3.3	-	-
MI	45.9	2.0	40,975	14.49	7.1	86.84	18.68
MN	23.1	1.7	45,091	10.58	4.5	87.98	19.90
MS	44.5	-0.8	31,262	24.62	8.4	75.60	15.42
MO	31.4	2.2	36,403	16.45	5.7	80.01	15.06

Source: American Community Survey, 2007

Table Notes**:** [1] Some data are not reported due to small percentage of nonmetropolitan population; [2] NJ and RI have no nonmetropolitan counties; [3] population percent change in non-metro portions, April 2000-July 2005, U.S. Census Bureau, Population Estimates Program (metropolitan status as of 2005 was used)**:** [4] Median household income in the past 12 months by metropolitan, U.S. Census Bureau, 2007, Micropolitan Statistical Area Status and State, 2007, or American Community Survey, 2007; [5] percent of people below poverty level in the past 12 months (for whom poverty status is determined), Universe**:** population for whom poverty status is determined, Data Set**:** 2007 American Community Survey 1-Year Estimates, Survey**:** American Community Survey; [6] Non-metro Unemployment Rates, 2005, Bureau of Labor Statistics, Local Area Unemployment Statistics; [7] Percent of People 25 Years and Over Who Have Completed High School (includes equivalency), Universe**:** population 25 years and over, Data Set**:** 2007 American Community Survey 1-Year Estimates, Survey**:** American Community Survey; [8] Percent of people 25 years and over who have completed a Bachelor's Degree, Universe**:** population 25 years and over, Data Set**:** 2007 American Community Survey 1-Year Estimates, Survey**:** American Community Survey.

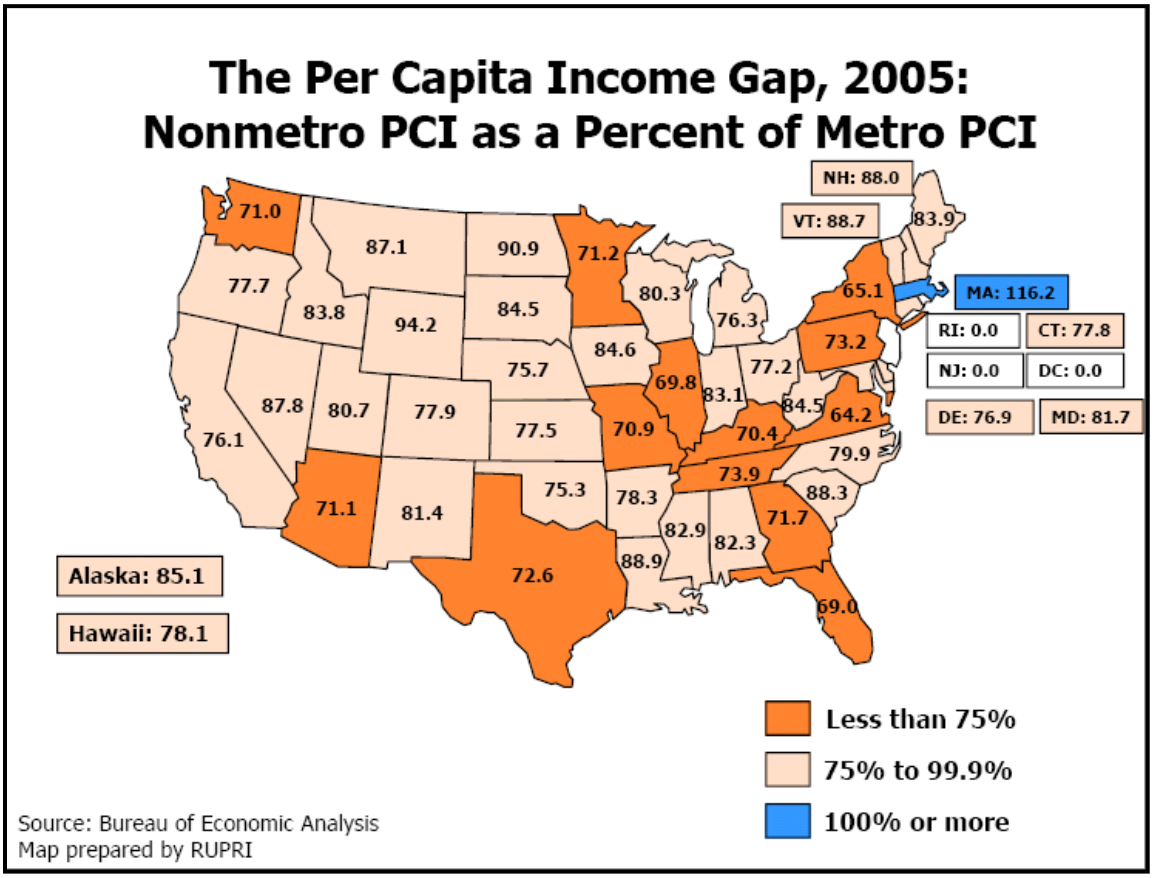
State	Non-metro Population Density	Non-metro Population Change[3]	Non-metro Median Household Income[4]	Non-metro Poverty Rate[5]	Non-metro Unemployment Rate[6]	Non-metro High School Graduation Rate[7]	Non-metro College Graduation Rate[8]
Units	**Per square mile**	**Percent**	**Dollars**	**Percent**	**Percent**	**Percent**	**Percent**
MT	4.6	3.7	42,512	14.96	4.3	89.51	25.83
NE	10.3	-1.4	41,107	12.04	3.5	87.55	19.04
NV[1]	2.8	11.5	-	9.36	4.6	69.12	13.60
NH[1]	70.5	6	-	7.07	3.2	79.63	26.48
NJ[2]		-	-	-	-	-	-
NM	6.7	0.1	36,227	20.68	5.8	79.77	18.56
NY	59.6	0.1	43,056	13.85	5.2	85.60	19.55
NC	95.7	4.3	38,860	16.85	6	78.16	16.23
ND	5.3	-5.2	42,482	11.93	4	86.19	19.86
OH	96.8	0.8	42,138	13.57	6.4	84.61	13.75
OK	24.5	0.6	36,545	18.78	4.4	81.88	18.24
OR	10.6	3.4	40,620	14.75	7.3	85.75	17.90
PA	81.7	1.3	40,955	12.33	5.3	84.54	16.36
RI[2]		-	-	-	-	-	-
SC	70.8	2.6	36,787	19.25	8.5	77.55	17.48
SD	6.5	-1.5	39,722	16.46	4.2	85.74	22.58
TN	64.9	3.7	35,231	18.41	6.9	74.48	11.87
TX	15.4	2.5	37,208	18.52	5.5	74.78	14.36
UT	4.7	5.9	43,980	14.16	4.5	87.87	19.02
VT	51.8	1.8	46,822	11.14	3.6	89.61	31.30
VA	60.2	2.2	39,585	14.85	4.5	76.24	15.92
WA	21.1	6.2	42,952	15.46	6.5	86.47	21.42
WV	48.4	-1.2	33,285	19.33	5.4	77.81	14.16
WI	40.1	2.4	46,041	10.61	5	87.94	18.13
WY	4.1	2.5	53,905	9.43	3.5	`	24.07
U.S. Total	**18.9**	**5.3**	**40,532**	**15.68**	**5.4**	**81.98**	**17.75**

Source: American Community Survey, 2007

Table Notes**:** [1] Some data are not reported due to small percentage of nonmetropolitan population; [2] NJ and RI have no nonmetropolitan counties; [3] population percent change in non-metro portions, April 2000-July 2005, U.S. Census Bureau, Population Estimates Program (metropolitan status as of 2005 was used)**:** [4] Median household income in the past 12 months by metropolitan, U.S. Census Bureau, 2007, Micropolitan Statistical Area Status and State, 2007, or American Community Survey, 2007; [5] percent of people below poverty level in the past 12 months (for whom poverty status is determined), Universe**:** population for whom poverty status is determined, Data Set**:** 2007 American Community Survey 1-Year Estimates, Survey**:** American Community Survey; [6] Non-metro Unemployment Rates, 2005, Bureau of Labor Statistics, Local Area Unemployment Statistics; [7] Percent of People 25 Years and Over Who Have Completed High School (includes equivalency), Universe**:** population 25 years and over, Data Set**:** 2007 American Community Survey 1-Year Estimates, Survey**:** American Community Survey; [8] Percent of people 25 years and over who have completed a Bachelor's Degree, Universe**:** population 25 years and over, Data Set**:** 2007 American Community Survey 1-Year Estimates, Survey**:** American Community Survey.

Figure 3-5 presents a different perspective on a key variation across rural America. The income gap between the rural portion of the state and the metropolitan portion varies widely. In Massachusetts, the rural per-capita income exceeds the metropolitan. On the other hand, in 13 States the rural per capita income is less than 75 percent of the metropolitan income. As policymakers strive to decrease this gap, transportation access to jobs and markets is critical.

Figure 3-5: Per-capita income gap



Rural Vitality

When asked why they live in rural America, residents give a variety of reasons. For example, the responses might be:

"It's a great place to raise my kids!"
"I love living close to the land!"
"The outdoor opportunities are wonderful—fishing, canoeing, and so on!"
"I love the small town atmosphere!"

What remarks like this indicate is that rural quality of life goes well beyond the economy, covering a broad range of factors. The rural economy is critical because it allows people to choose where to live, enabling them to consider other factors that contribute to a high quality of life.

A vital rural community offers more than good jobs and income. Beyond—but part of—economic development, a vital rural community offers personal security for residents, enhances their skills and knowledge, provides adequate income, a good setting, and a strong civic foundation.

A strong economy is a base that allows a successful rural area—one with a high quality of life—to thrive in other qualities, such as a low crime rate, good health care, significant educational opportunities, information access, high environmental quality, and strong civic participation. One of the key qualities is accessibility, reflected in convenient and affordable transportation. See the Rural Quality of Life Index in Appendix 3-1 for more information about aspects of a vital rural community.

Many rural communities find that using a community development process helps improve their conditions or maintain a high quality of life. Community development addresses three key questions:

1. Where are we now?
2. Where do we want to go?
3. How are we going to get there?

Components of community development include community assessment, visioning, and strategic planning. Communities can use their scarce resources more effectively if these resources are all considered in a single coherent plan, and all are aimed at the same target for an improved community. Freight transportation should be an integral component of such a plan.

Rural Manufacturing

The transportation system that contributes to the long-term success of rural agriculture is the same system that supports rural manufacturing. Although the stereotypical view of rural America is dominated by agriculture, it is, in fact, manufacturing that is critical. Manufacturing employs 15 percent of the rural workforce. As a share of total employment, manufacturing is 42 percent more important in rural America than in metropolitan America (Table 3-3).

Table 3-3: Population employed in manufacturing

Area of the U.S.	Manufacturing Sector's Share of Employment
Rural	15.0%
Metropolitan	10.6%
U.S. Total	11.3%

Source: 2007 ACS*

* Employment can be measured by either the residence or the workplace of the employee. The American Community Survey (ACS) uses the residence; the Bureau of Economic Analysis (BEA) uses the workplace.

The importance of manufacturing to the local economy varies from place to place. In six States (AZ, CO, MT, NV, NM, and WY) manufacturing's share of rural employment is less than 5 percent; in five States (AL, IN, OH, TN, and WI) the percentage in manufacturing exceeds 20 percent (Table 3-4).

Table 3-4: Rural population employed in manufacturing by State

State	Percent of Rural Employed in Manufacturing*	State	Percent of Rural Employed in Manufacturing
Alabama	20.44	Montana	4.96
Alaska	9.82	Nebraska	13.38
Arizona	4.11	Nevada	4.64
Arkansas	19.46	New Hampshire	10.47
California	5.22	New Jersey[b]	-
Colorado	4.56	New Mexico	4.31
Connecticut	15.30	New York	12.53
Delaware	10.50	North Carolina	17.08
Florida	6.01	North Dakota	8.11
Georgia	15.82	Ohio	23.03
Hawaii	3.30	Oklahoma	11.23
Idaho	9.79	Oregon	11.72
Illinois	15.82	Pennsylvania	17.39
Indiana	29.04	Rhode Island[b]	-
Iowa	19.39	South Carolina	17.73
Kansas	14.64	South Dakota	9.89
Kentucky	15.41	Tennessee	22.14
Louisiana	10.07	Texas	10.92
Maine	11.47	Utah	8.76
Maryland	6.02	Vermont	10.61
Massachusetts†	-	Virginia	13.42
Michigan	17.77	Washington	8.96
Minnesota	16.73	West Virginia	9.53
Mississippi	17.61	Wisconsin	21.44
Missouri	15.03	Wyoming	4.68
		U.S. Total	**14.99**

Source: 2007 ACS*

* GCT2404. Percent of Civilian Employed Population 16 Years and Over in the Manufacturing Industry
Universe: Civilian employed population 16 years and over
Data Set: 2007 American Community Survey 1-Year Estimates
Survey: American Community Survey

† Data are not reported due to small percentage of rural population.

The composition of the manufacturing sector also varies across rural America. For instance, textile and apparel firms provide about 25 percent of all manufacturing jobs in the South, but less than 10 percent in each of the other regions (Table 3-5). Such differences result in different demands for freight transportation. Studies have shown that the availability of rail, air, and highway services is one of the most commonly cited requirements of manufacturing and commercial establishments.

One of the benefits of transportation is that it enables specialization in the production and manufacture of goods. Since communities and regions vary in characteristics, the ability to produce or manufacture items will also vary. A region that specializes in one type of product can often produce it at a lower cost, giving it a competitive advantage.

Even more dramatic place-to-place differences in composition of the local manufacturing sector would be shown if comparisons were made across States or counties.

Table 3-5: Rural manufacturing employment by sector in 1996

Item	Nonmetro region[1]			
	Northeast	Midwest	South	West
	Percent			
Manufacturing's share of total employment[2]	15.1	17.1	18.3	8.1
Manufacturing sector shares:[3]				
Food and tobacco	6.2	13.0	11.7	18.3
Textiles and apparel	9.3	3.4	24.9	2.4
Lumber, furniture, paper, wood products	18.7	12.7	19.1	32.8
Chemicals, petroleum, rubber, plastics	8.8	10.1	10.0	5.8
Metal products, equipment, instruments	42.6	48.6	28.6	25.5
Other manufacturing	14.3	12.2	7.5	15.2
Total	100.0	100.0	100.0	100.0

[1]Census regions.
[2]Source: ERS analysis of Bureau of Economic Analysis, Regional Economic Information System.
[3]Source: ERS analysis of Claritas, Inc., Enhanced County Business Patterns 1996 data. Sector classfications are groupings of two-digit Standard Industrial Classification (SIC) categories.
4 Employment can be measured in terms of A) the residence of the employee; or B) the workplace of the employee. The American Community Survey (ACS) uses approach "A." The Bureau of Economic Analysis (BEA) uses approach "B."

* Employment can be measured by either the residence or the workplace of the employee. The American Community Survey (ACS) uses the residence; the Bureau of Economic Analysis (BEA) uses the workplace.

Manufacturing's Contribution to Rural Vitality

Manufacturing wages and benefits are generally higher than wages and benefits in other economic sectors. Average weekly earnings in manufacturing are more than 20 percent higher than in other non-farm private economic sectors.[54] Income and benefits are a key foundation for a strong rural community, so manufacturing jobs created by access to markets from rural areas are major contributors to sustained development and quality of life. It is not just another job; it is a particularly attractive job.

As manufacturing moves from region to region, the demands on the transportation system shift from region to region as well, either before the shift, or to support the shift. Without adequate transportation, such shifts will not occur or, if they do occur, the shift will be constrained.

Table 3-6 shows results from a study conducted in 1996 that found "quality of available labor" was listed as the most pressing problem of rural manufacturers, with 34 percent describing it as a "major problem." Other problems identified as major by more than 20 percent of rural manufacturers were "State and local taxes" and "environmental regulations." Four transportation factors were cited, but each was identified as a "major problem" by fewer than 10 percent of rural manufacturers, suggesting the current system was providing adequate service.

A substantial example of the effect of transportation on economic opportunity and development is the impact of the Appalachian Regional Commission, whose charge was to foster and promote the economic and social development of the Appalachian Region. A study by Wilbur Smith and Associates found economic efficiency increased by the planned and partially implemented, 3,440-mile network of highways.[55] The constant dollar economic return was 7.87 percent and the benefit cost ratio was 1.18. For economic development results, the economic return was 8.29 percent and the benefit cost ratio was 1.32 percent. This study projected that the investment will yield 16,279 jobs in 1995 and 42,190 in 2015. Wilbur Smith states, "These jobs occurred because the new highway system had made the Region a better place to invest, live, and work."

The location strategy of manufacturing plants has evolved over recent decades

Manufacturing has traditionally located in rural areas to take advantage of lower labor and land costs. Since the late 1980's, some manufacturers, competing based on low-cost production, shifted their production overseas. Other manufacturers took advantage of new technologies and management practices and began to compete based on product quality. This shift resulted in a need for more highly skilled labor, so manufacturing moved to rural areas with better schools and fewer high school dropouts.

Such changes in strategy were reflected in a shift in the location of manufacturing employment. Manufacturing jobs grew by about 7 percent in low-education counties during the 1980's, reflecting the search for lower labor costs. In the 1990's, the pattern reversed and low-education areas lost jobs, as manufacturers sought a more highly skilled labor pool. Areas with high rates of high school completion are found largely in the Great Plains and parts of the rural West and these areas have been most attractive to employers. Areas with the lowest rates of high school completion are found throughout the rural South.[*]

[*] ERS, Amber Waves, Feb 2003.

Table 3-6: Major factors affecting rural manufacturers

Local factors[1]	Any problem[2]	Major problem
	Percent	
Human resources		
Quality of available labor	74.9	34.3
Attractiveness of area to managers and professionals	47.5	14.8
Quality of primary and secondary schools	36.6	10.2
Access to training courses	44.9	8.9
Local cost of labor	36.4	7.3
Local management-labor relations	27.0	3.7
Transportation infrastructure		
Access to airport facilities and services	44.1	8.9
Interstates and major highways	26.4	6.8
Railroad access	20.7	6.4
Local roads and bridges	30.2	5.6
Access to:		
Material suppliers	39.5	6.5
Major customers	36.9	6.4
Market information	33.7	5.3
Equipment suppliers	34.2	5.0
Financial institutions	23.6	4.1
Business services	19.9	1.4
Physical plant		
Cost of facilities and land	38.4	8.2
Water and sewer systems	31.2	7.9
Government		
State and local tax rates	64.1	22.4
Environmental regulations	57.5	21.4
Police and fire protection	17.2	1.6

[1]Ordered within categories by proportion of rural respondents indicating factor is a major problem. [2]Major or minor problem.
Source: ERS Rural Manufacturing Survey, 1996.

Wide variations occur even within regions. A study of rural counties in the South found that counties with substantial manufacturing employment are less likely to have high poverty rates.[56]

Freight Transportation's Role in Supporting Rural Vitality

As has been discussed previously, freight transportation plays a significant role in supporting the vitality of rural communities, but the economic core varies across rural America. In some places, agriculture is the primary economic sector. Elsewhere, manufacturing or services may be central, so freight transportation's role varies from place to place. Manufacturing and agriculture both need transportation—for inputs, to move output, and to find and access markets. The same transportation system can serve both, thus increasing the development possibilities and opportunities.

Even in places that appear to be similar, the freight transportation situation may turn out to be different. For instance, just knowing that an area's economy is heavily dependent on agriculture is not sufficient. An agricultural county in the Midwest may concentrate on producing grain, perhaps with a heavy dependence upon barge and rail transport to ship the product. Another county in the same state may focus almost exclusively on the production of corn for ethanol, with truck transportation needed for assembly of the corn feedstock for a nearby ethanol plant. Another agricultural county (perhaps in California or Pennsylvania) may concentrate on high-value perishable fruits and vegetables, relying largely upon air transport and overnight trucking to ship to domestic, European, and Japanese metropolitan markets.

It is worth noting that a strong freight transportation system is able to serve changing economies. Thus, an agricultural region served effectively and efficiently by truck and rail transport will be able to make a smooth transition to more manufacturing, since the transportation infrastructure is in place and ready to accommodate the new composition of the local economy.

The manufacturing process, just like production agriculture, takes inputs and then transforms them, using labor and machinery, to produce an output. Freight transportation plays a critical role in getting the inputs to the manufacturing facility and in moving the outputs from the manufacturing plant to their next destination. Strong transportation facilities make a rural area more attractive for manufacturing plants, but a range of other community attributes that contribute to a high quality of life and business success also influence manufacturing location. A rural community interested in retaining or attracting manufacturing will consider its ability to serve the freight transportation needs of these manufacturers but also pay careful attention to these other factors.

Freight transportation requirements vary from one manufacturer to the next. Smaller, lighter, more perishable or more expensive inputs and outputs are likely to require air transportation; larger, heavier, less perishable, and less expensive inputs and outputs are likely to require ground transportation. In most instances, having more than one transport mode readily available will result in better service and rates; rural development is often enhanced by the availability of competitive and complementary transportation modes.

Given the variations in community characteristics and manufacturing plants, there is no universal answer to the question of what freight transportation infrastructure is required to support rural manufacturing effectively.

Regardless of its economic composition, a rural community will do better by integrating its consideration of freight transportation into the larger picture, thinking about how freight transportation, in conjunction with other aspects of the community, can best support the community's overall strategic plan. For example, truck transportation requires a highway with sufficient capacity; but if this is the same highway that will be used by tourists coming into town, then the community will need to think about tourism as well as freight transportation needs in deciding preferences for the route and design specifications of the state highway into town. The wide, straight road best for big trucks is not the scenic, winding road most attractive to tourists.

Transportation infrastructure is largely regional rather than local. For instance, the rail line that links western Nebraska with Denver serves many communities, not just one. Single communities or rural counties will be more successful if they join other communities in a regional approach to freight transportation.

Combining these two principles (thinking broadly and thinking regionally), the most effective way for a rural community to approach freight transportation's role in supporting rural vitality is via a regional and comprehensive approach.

Conclusions

An efficient transportation system supports rural economic development. In an efficient rural economy, the cost of inputs to agriculture and the cost of living for inhabitants of rural areas decreases, the net price to producers and manufacturers increases, market access and competitiveness increases, and job opportunities are increased. Successful businesses and farmers contribute to the quality of life and increase opportunities for rural residents.

The economic institutions in rural communities are interconnected. An efficient system of freight transportation is an important foundation for a vibrant rural economy, including rural manufacturing. Transportation does not stand alone but is one of several key elements that contribute to a strong rural economy; many other elements work with transportation to support a high quality of life in rural communities.

Rural communities are unique and different from one another, and their needs for freight transportation vary. An efficient transportation system is defined by the needs of each community.

Appendix 3-1

Rural Quality of Life Index

Economy

Economic vitality: The community can generate revenue from several economic sectors.
Entrepreneurship: Business creation and expansion is widespread, supported, and celebrated.
Business ownership: The community's economy is substantially under local ownership.
Natural resources: Natural resources are valued and effectively managed to assure the community's continuing economic well-being.
Income: Most workers in the community earn enough to sustain a family and receive good benefits, and most non-workers have enough income to live above the poverty level.

Personal Security

Food: Almost everyone has easy access to sufficient nutritious food.
Shelter: Almost everyone lives in safe, clean, uncrowded, and affordable housing with basic utilities.
Crime: Persons and property are safe.
Health: Almost everyone is in good health, and those that aren't have access to good health care.
Safety net: Effective services are available for those in personal or financial jeopardy.
Dependent care: The vulnerable (children and dependent adults) have access to high-quality, affordable care.

Skills and Knowledge

Education: Community schools provide high-quality K-12 education for all children.
Skills development: Job and skills training is up-to-date, supports viable economic development strategies, and is readily available.
Information access: Most persons have access to a variety of modern, rapid, and affordable information sources.

Setting

Accessibility: Important services are easily reached regardless of a person's mobility or income, either by being nearby or by use of convenient and affordable transportation.
Environmental quality: The air is clean, the ground is uncontaminated, drinking water is pure, and waterways can be used for recreational purposes.
Appearance: The community looks good, and almost everyone helps keep it attractive.

Civic Foundation

Civic participation: Social, artistic, cultural, religious, and recreational opportunities are readily available, and most persons have the time and resources to participate in them regularly.
Decisions: Decisions on key community issues generally reflect a consensus, arrived at through serious and open discussion of new and time-tested ideas, and involving a broad spectrum of participants.
Can-do attitude: Discussions focus on opportunities, not problems, with the belief that the community's future is largely in its own hands.
Reality check: Most key institutions regularly conduct both internal and external assessments.
Diversity: All persons are accepted and well integrated into the community, including in leadership positions.
Gathering places: The community has easily accessible and frequently used gathering places where key community activities and events occur.
Migration choice: Most persons live in the community by choice; they feel it is a good place and is moving in the right direction.
Regional integration: The community acts as part of a larger region, generally collaborating with nearby communities.

Source: USDA, presentation to International Society of Quality of Life Studies, Annual Conference, November 2004.