

PITTSBURGH ECONOMIC QUARTERLY

Center for Social and Urban Research

FORECASTING THE REGIONAL ECONOMY

Long-range forecasting of the regional economy is a starting point for various public policy issues. Infrastructure and transportation planning in particular are based not only on current needs but also the patterns of growth expected over the next 10-30 years or longer. Many changes in the local economy cannot be predicted over such a long time range, but a baseline forecast of current and anticipated trends is an essential starting point in predicting future growth.

Various sources of regional forecasting are available. The Center for Social and Urban Research utilizes an economic model designed by Regional Economic Models Inc. (REMI) to produce a long-term economic forecast for the region. The results of the current REMI model forecast are presented here, along with

the 2001 baseline forecast of a leading regional economic consulting firm: Woods and Poole, Inc.

These forecasts cover the six-county Pittsburgh Metropolitan region (Allegheny, Beaver, Butler, Fayette,

Washington, and Westmoreland counties). Both forecasts are roughly consistent in predicting flat population growth of under 1% over the next decade.

Both forecasts also predict relatively slow employment

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Highlights:

- Detailed breakdown of migration within the Pittsburgh region.
- State of the Environment in Allegheny County report highlights.
- Local government employment patterns.
- Student migration in Pennsylvania.

Pittsburgh Region: 10 Year Baseline Forecasts

Cumulative Growth Predicted 2000-2010

	Woods & Poole Forecast	REMI Model Forecast
Total Population	0.4%	0.1%
Total Employment	7.2%	5.5%
Agricultural Services	22.2%	19.4%
Mining	4.9%	-18.2%
Construction	8.1%	-0.9%
Manufacturing	-7.9%	-7.0%
Transportation/Utilities	13.3%	3.1%
Wholesale Trade	10.2%	-1.8%
Retail Trade	2.7%	-3.2%
Finance/Insurance/Reas Estate	19.6%	0.6%
Services	10.4%	17.8%
Personal Income*	15.1%	15.2%

* Inflation Adjusted

STUDENT MIGRATION TO PENNSYLVANIA

Pennsylvania ranks high as one of the biggest attractors of out-of-state students enrolling for college. According to recently released data from the Department of Education, almost 25,000 students from other states enrolled as freshmen in Pennsylvania degree-granting institutions in 1998 (see table on page 2). Only New York had a higher number of out-of-state enroll-

ments, and even Massachusetts drew fewer students from outside its borders.

Significant numbers of Pennsylvania students enroll in schools out-of-state. Nationally, it is estimated that one-fifth of freshmen enrollees left their home states to attend college elsewhere. Just over 17,000 Pennsylvania residents enrolled as freshmen in other states in 1998.

The state still ranks high on the list of net-importers of college students. Data from 1998 show that almost 8,000 more students from out-of-state enrolled in Pennsylvania than the number of Pennsylvania students who enrolled elsewhere.

Both the inflow and outflow of students have been increasing in recent years. Pennsylvania students enroll-

ing as freshmen out-of-state numbered 17,057 in 1998, up from 14,742 in 1994. The number of students from out-of-state enrolling in Pennsylvania schools has been increasing as well. In 1998, the total number of students from out-of-state enrolling as freshmen in Pennsylvania was 24,972, up from 21,156 in 1994.

Student enrollment fuels

Continued on page 2

Student Migration Trends (con't)

Continued from page 1

higher education earnings and employment directly in the region. In 1998, 112,068 college freshmen enrolled in Pennsylvania institutions with 24,972 (or 22%) coming from out-of-state. Education other than local public schools was estimated to generate over \$1.2 billion in earnings in the Pittsburgh region during 1999.

Where students attend college is an important part of local workforce development efforts. Many students remain in the region they graduate from after graduation.

Pennsylvania performs significantly better than neighboring states in terms of net migration of students. New Jersey is the largest net exporter of students. Over 20,000 more students enrolled outside of New Jersey than are attracted from out-of-state

to go to school there.

Pennsylvania has made student recruiting and retention a major part of its workforce development efforts. This includes increased spending on advertising and use of targeted scholarship programs for students in Pennsylvania.

One program used by the state to try and retain students graduating in Pennsylvania and to keep them in the state is the Pennsylvania New Economy Technology Scholarship Program. This program encompasses two scholarship programs: the SciTech Scholarship and the Technology Scholarship. Recipients of these scholarships must agree to work full-time in Pennsylvania following graduation, one year for each year that a scholarship award is received.⁹

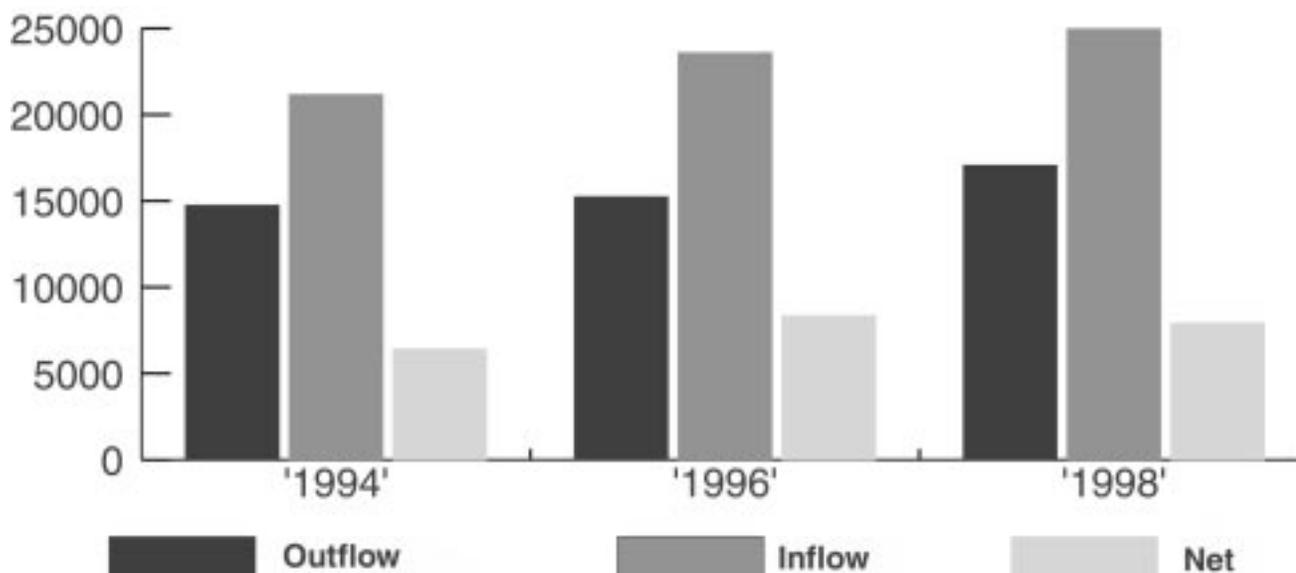
Residence of Freshmen in Degree-Granting Institutions Ranked By States with Highest Out-of-State Enrollment

		Migration of Students by State		
		Out of	Into	Net
1	New York	27,067	27,886	819
2	Pennsylvania	17,057	24,972	7,915
3	Massachusetts	14,329	24,623	10,294
4	Florida	10,106	23,610	13,504
5	California	16,699	23,100	6,401
6	Minnesota	9,691	19,655	9,964
7	Ohio	11,962	15,794	3,832
8	Texas	12,963	14,613	1,650
9	Virginia	9,425	13,835	4,410
10	North Carolina	4,543	13,337	8,794

Residence of Freshmen in Degree-Granting Institutions Ranked By States with Highest Net In-Migration

		Migration of Students by State		
		Out of	Into	Net
1	Florida	10,106	23,610	13,504
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3	Minnesota	9,691	19,655	9,964
4	North Carolina	4,543	13,337	8,794
5	Pennsylvania	17,057	24,972	7,915
6	Indiana	5,786	12,823	7,037
7	California	16,699	23,100	6,401
8	Utah	1,558	7,850	6,292
9	District of Columbia	1,953	7,680	5,727
10	Arizona	2,754	8,411	5,657

Pennsylvania Student Migration Flows Freshmen Enrolled in Degree Granting Institutions



Source: U.S. Department of Education Digest of Education Statistics, 2000

Internal Migration Within the Pittsburgh Region

Recently released data from the Internal Revenue Service (IRS) details migration patterns of population within the U.S. This data covers patterns of migration documented by the IRS from tax records for the period July 1, 1999 through July 1, 2000.

Out-migration continues to exceed domestic migration for the region. The net difference between inflows and outflows decreased to 7,609, compared to 7,857 over the period 1998 through 1999. Both overall migration flows of in-migrants to the region and out-migrants who are leaving have been steady over the last four years.

Net out-migration from the region continues to hit Allegheny County harder than sub-

urban counties. Out-migration from suburban counties to other regions is offset to some degree by continued migration from Allegheny to the suburbs, although all counties continue to experience overall net out-migration from the region.

Top destinations for people leaving the region continue to be large metropolitan areas near Pittsburgh, including Washington, D.C. and Philadelphia. Internal migration between counties is also dominated by net inflows of people from all counties into Butler County. Detailed county-to-county migration flows within the Pittsburgh region are shown in the table below.

The IRS migration data is not a complete picture of mi-

gration patterns as a source of demographic change. A significant amount of migration in the United States comes from international immigrants. The movement of people into the country, who were not residents needing to file IRS tax returns previously, are not included in these statistics. Thus, the IRS migration statistics are comparable mostly to domestic migration statistics.

The IRS data also does not capture all internal migration in the U.S. Not everyone files a tax return. Seniors, those with a low income, or those who have lost a spouse are some of the populations that may not be captured well by IRS tax filings. The IRS migration data is estimated to

capture 80% of the movement of the population domestically within the U.S. each year.

The IRS data provides the main input to the Bureau of the Census, which each year estimates total net migration for each county in the United States. This is supplemented by estimates for international migration and other sources to come up with a more complete measurement of migration patterns. In normal years, the Census releases these migration statistics in April of each year for the period ending in July of the previous year. Given the recent release of initial data from the 2000 Decennial Census, the release of migration data has been postponed by the Census Bureau.g

Number of Movers Between Counties in the Pittsburgh Region 1999-2000

		Destination County					
		Allegheny	Beaver	Butler	Fayette	Washington	Westmoreland
Originating County	Allegheny		1,438	2,362	418	2,781	3,497
	Beaver	1,346		378	0	92	77
	Butler	1,462	343		0	38	149
	Fayette	360	20	27		388	875
	Washington	1,777	92	73	425		275
	Westmoreland	2,552	81	193	700	335	

Each cell represents the number of total exemptions reported by the IRS

Source: Internal Revenue Service Statistics of Income Division. Compiled by the Center for Social and Urban Research

THE STATE OF THE ENVIRONMENT IN ALLEGHENY COUNTY

In March 2001, UCSUR published its first *State of the Environment in Allegheny County* report. The report is by Dr. Stephen Farber, Director of the Environmental Decision Support Program at the Center for Social and Urban Research, and Research Assistant Jose R. Argueta. The Executive Summary of the report is presented here. Copies of the full report can be obtained by calling the Center for Social and Urban Research at 412-624-5442. The Report is also available online at:
<http://www.ucsur.pitt.edu/publications.htm>

This report is the first of what is expected to be a series of biennial reports on environmental and ecological conditions in Southwestern Pennsylvania. The first report focuses on land use, and water and air quality in Allegheny County. The objective of this report is to provide a baseline of environmental conditions at local levels in Allegheny County.

Land use in Allegheny County is analyzed using remote sensing data from the early 1990s, the most recent available at this local scale. The vast majority, 57%, of land is in some type of tree cover. Urban uses, which include residential, commercial, industrial, and transportation uses, comprise 28% of land use. Agriculture uses 10% of Allegheny County's land area.

The most notable result of the analysis of land use is the clear relationship between land use and water quality. Differences in water quality are significantly related to the extent of forest cover along streams and across townships; increased forest cover is positively correlated with the attainment of Pennsylvania stream water quality standards. This may be attributed to the human activities that

accompany loss in forest cover, but may also be due to the loss of forest itself, as trees play important roles in reducing sediment and nutrient runoff into streams.

Loss of farmland and forests in Allegheny County is just one of many consequences of urban sprawl, in which populations and economic activity migrate from densely to sparsely populated areas. It is clear from the data that population increases are greatest where forested area is highest. This implies that growth areas will face the greatest losses in tree cover, resulting in the loss of free water quality management services previously provided by natural systems. Water quality management will become increasingly costly to these high growth areas unless particular attention is paid to managing human activities in the landscape and maintaining adequate vegetative cover in critical locations within watersheds.

Only 52% of the roughly 1,400 miles of streams and rivers in Allegheny County have been assessed to determine whether they meet Pennsylvania's water quality standards. The unassessed streams are mostly in the

southeast and northwest areas of the county. Roughly 60% of Allegheny County's assessed streams do not meet Pennsylvania's water quality standards. This compares unfavorably to Pennsylvania as a whole, where 20% of Pennsylvania's assessed streams do not meet these standards. Roughly one-third of U.S. streams do not meet similar standards.

The major causes for not attaining water quality standards in Allegheny County are siltation, nutrients, and metals. Siltation and nutrients each account for roughly 20% of the non-attainment in the county's streams. The major sources of these pollutants include acid mine drainage (AMD), urban runoff and storm sewers, habitat modification, vegetation removal, and land development. A map of the county showing land use and attainment of stream water quality standards illustrates that urbanization of previously rural areas may be a major source of siltation. It is clear from this source-cause analysis that what we do in our landscape can have significant consequences for water quality in the region.

Air quality in Allegheny County has fluctuated over the past decade between attainment and non-attainment of U.S. clean air standards. Ozone has been the major contributor to this pattern. While the county and region are on the brink of attaining the old 1-hour air quality standards, it is clear they will not be in compliance with the more stringent proposed 8-hour standards.

Ozone is typically formed from reactions of volatile organic compounds and nitrogen oxides in the presence of heat and sunlight. These chemicals are emitted from vehicles, chemical plants and refineries, and fossil-fuel fired power plants. Ozone conditions in Allegheny County are of particular concern due to the county's large young and old populations, which may be exposed to ozone. Ozone can cause adverse health conditions, such as respiratory problems in these populations and in populations of otherwise healthy asthmatics. It can also have adverse impacts on growth and health of vegetation.

Average ozone levels in Allegheny County have fallen between 1998 and 1999 for all monitoring sites except the downtown Pittsburgh site. This may be a disturbing pattern as it may reflect the real environmental impacts of increased economic activity and resulting vehicle traffic downtown. Also, increased emissions of ozone causing chemicals may make attaining air quality standards at downwind monitors more difficult. Attainment of air quality standards in the region is complicated by emissions from upwind sources in Ohio and West Virginia. However, it is clear that Allegheny County is itself a major emitter of chemicals that can cause its own ozone problems. Increased ozone levels in the City of Pittsburgh may be a reason why downwind monitors, such as those in Penn Hills, do not meet air quality standards.

ALLEGHENY COUNTY: LAND, WATER AND AIR

The presence of particulates in the air of Allegheny County may be both a present and future problem. Particulates are the result of fuel combustion in vehicles, power plants and industry, as well as from residential fireplaces. While Allegheny County has met standards for coarse particulates, referred to as PM-10, during the period 1997-1999, the Clairton, Glassport, Liberty, Lincoln, and Port Vue sites in the county did not meet these standards in 2000. More problematic for the county, however, may be the

new proposed fine particulate, referred to as PM-2.5, standards. Some monitoring sites in the county have violated the proposed standard, although interpretation of the PM-2.5 data is problematic at this point.

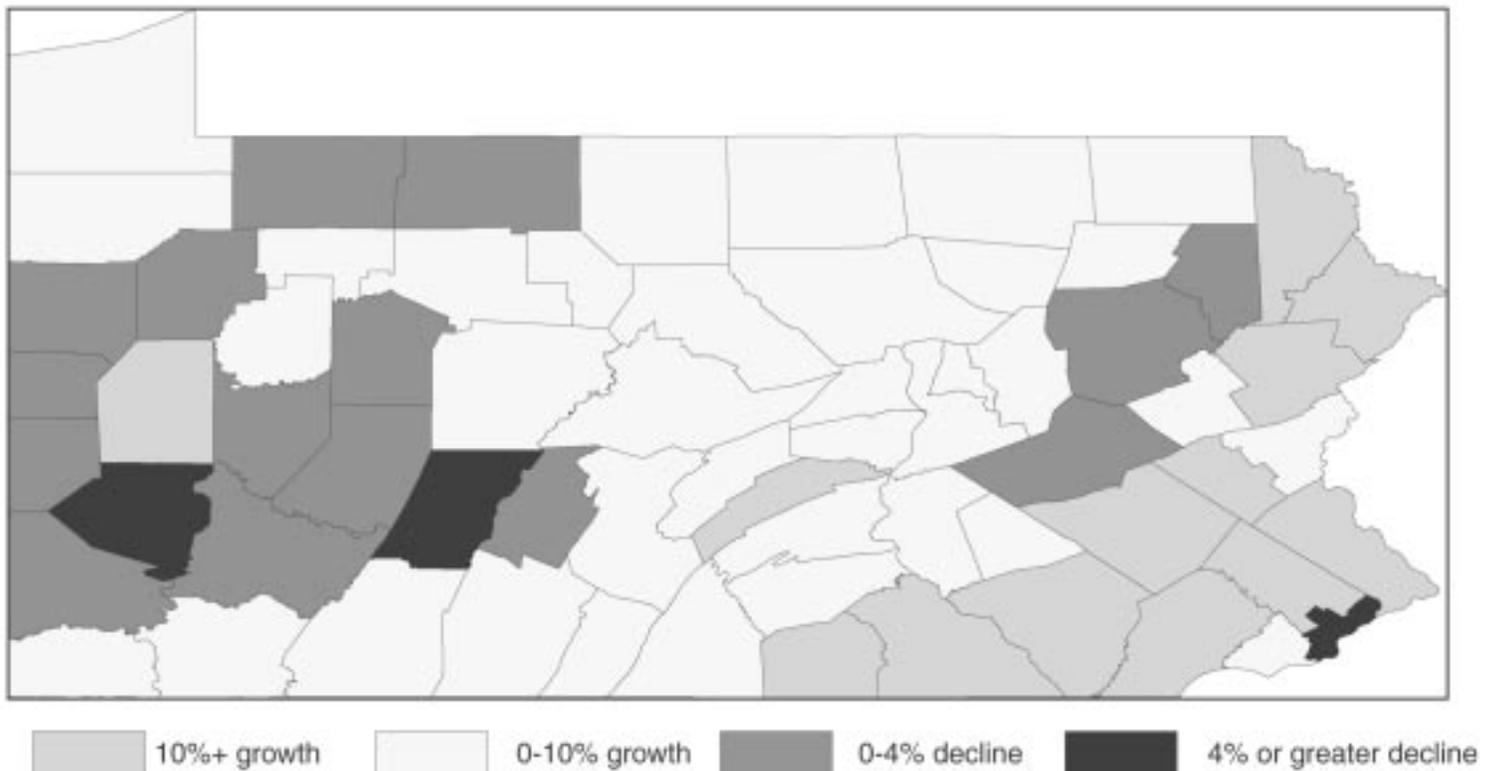
Sulfur dioxide is in the same condition as particulates in terms of meeting air quality standards. While most of the county is well within the range of compliance, the Hazelwood monitoring site violated standards in 2000, and Glassport violated them in 1999. While levels of carbon

monoxide have fallen in Pennsylvania, this has not been the case for the Monongahela Valley Region. However, monitors in Allegheny County have not exceeded standards for this pollutant during the past decade.

The region's greatest challenges appear to be in management of landscapes and ecosystems. These are at great risk from urbanizing activities, as residential and commercial activities spread into previously pristine landscapes. The resulting loss of natural system services, such

as water run-off or soil and nutrient control, will make it only more difficult to attain acceptable water qualities in the region's streams and rivers. While systems are in place for monitoring and managing air quality, this is not the case for landscapes and ecosystems. The region will have to pay increasing attention to what is done on its land, how it is done, and where it is done, if it wants to sustain the quality of ecosystems necessary for future economic vitality and quality of life in the region.g

POPULATION CHANGES IN PENNSYLVANIA 1990-2000



Pennsylvania population grew a total of 3% between 1990-2000. Growth was concentrated in areas surrounding Philadelphia and in the Northeastern corner of the state. Allentown grew by 1.5% over the decade, which allowed it to surpass Erie as the third largest city in the state. Allentown, Lancaster, and many other municipalities in Eastern Pennsylvania experienced sharp increases in Hispanic and Latino populations. Allegheny County experienced a 4.1% decline over the decade, and the Pittsburgh region as a whole declined by 1.5%.g

Pittsburgh Economic Profile 1999

	1996	1997	1998	1999
Personal income (thousands of dollars)	60,346,351	63,414,696	65,697,057	68,977,479
Net earnings	38,270,363	40,153,888	42,188,404	44,664,340
Transfer payments	11,057,491	11,417,351	11,425,886	11,773,986
Income maintenance	896,455	841,111	830,442	872,886
Unemployment insurance benefit payments	340,459	316,227	310,370	317,459
Retirement and other	9,820,577	10,260,013	10,285,074	10,583,641
Dividends, interest, and rent	11,018,497	11,843,457	12,082,767	12,539,153
Earnings by place of work (\$000)	41,221,635	43,256,924	45,387,128	48,136,913
Wage and salary disbursements	31,589,031	33,443,889	35,216,005	37,460,330
Other labor income	4,238,235	3,963,002	3,886,452	3,987,919
Proprietors income	5,394,369	5,850,033	6,284,671	6,688,664
Total full-time and part-time employment	1,291,744	1,308,731	1,332,614	1,354,598
Wage and salary jobs	1,104,423	1,120,059	1,139,402	1,157,436
Number of proprietors	187,321	188,672	193,212	197,162
Average earnings per job (dollars)	31,912	33,053	34,059	35,536

Source: Regional Economic Information System 1969-1999, Bureau of Economic Analysis, Department of Commerce (May 2001)

Forecasting the Regional Economy (con't)

Continued from page 1

expansion with cumulative job growth over the decade predicted to be 7.2% (Woods and Poole) and 5.5% (REMI). Manufacturing employment is predicted to continue its decline with overall employment going down between 7% and 8% in both models. Adjusted for inflation, real earnings and income per capita are expected to grow by approximately 15%.

Retail employment expansion is not predicted to continue at the same rate of recent decades. Overall retail employment is predicted to be only +2.7% by Woods and Poole, and there is even a

slight decline (-3.2%) predicted by the REMI model. Retail employment in particular is tied to the size of the local population.

The Pittsburgh region is unusual in being one of only a few areas in the country with a continuing negative natural population growth. Demographic factors are an important factor in any long-term forecast. The growth rate of the population and changes in its composition have considerable impacts on the labor force, housing demand, and spending across a broad range of industries.

Due to the skewed age

structure, there will be more annual deaths than births in the region through the next decade. Even if net migration in the region is zero over that period, the local population will continue to contract.

In 1960, Edgar Hoover of the University of Pittsburgh produced a detailed four volume analysis of the economy of the Pittsburgh region, which was funded by the Ford Foundation. The report included specific predictions of a future downturn in the local steel industry and other fundamental shifts in the industrial structure of the Pittsburgh region.

Much of Hoover's analysis was based on specific trends that were observed in the industries that were highly concentrated in Pittsburgh. As Pittsburgh's industry structure has become more diverse, economic conditions have converged with national trends. Fifteen years ago, the concentration of heavy industry gave Pittsburgh an unemployment rate that was 50% higher than the national average. By 2000, local and national unemployment levels were comparable.

Long-range forecasts are not meant to be the defining picture as to what the region can expect as it changes over the decade. Unanticipated changes in the national or local economy, or the emergence of new industries, would alter the forecasts. Baseline forecasts such as these can indicate the anticipated path of the local economy if conditions continue as they are now with minimal unanticipated changes.g

Pittsburgh Region Projected Natural Population Growth Births Minus Deaths: 2000-2020

Local Government Employment

Local government employment and earnings make up a large part of the local economy. In 1999, government purchases of goods and services accounted for 17% of the national Gross Domestic Product. Data compiled by the Bureau of the Census breaks down the employment categories of all full-time and part-time workers for all governments in the United States.

The table below breaks

down all county, municipal, special district, and school district employment in the Pittsburgh region for 1997, the latest year comprehensive data is made available by the Census. Federal or state government employees that work in the region are not included in this table.

In the Pittsburgh metropolitan region, the Census counts 858 local governments, including 412 municipal govern-

ments, 106 school districts, and 334 special districts, which include water and sewer authorities, housing authorities, and other types of special purpose governmental organizations.

Education and related jobs account for the large bulk of local government employment. Over 65,000 full-time jobs are counted in local governments, and over two-thirds of that are directly supporting public education. With an additional 19,000 part-time employees of local government, the total monthly payroll is estimated to exceed \$214 million. Other major occupations of local government employees in the region include police officers (3,322), public welfare workers (4,049), transit workers (2,886), and

street maintenance workers (2,405).

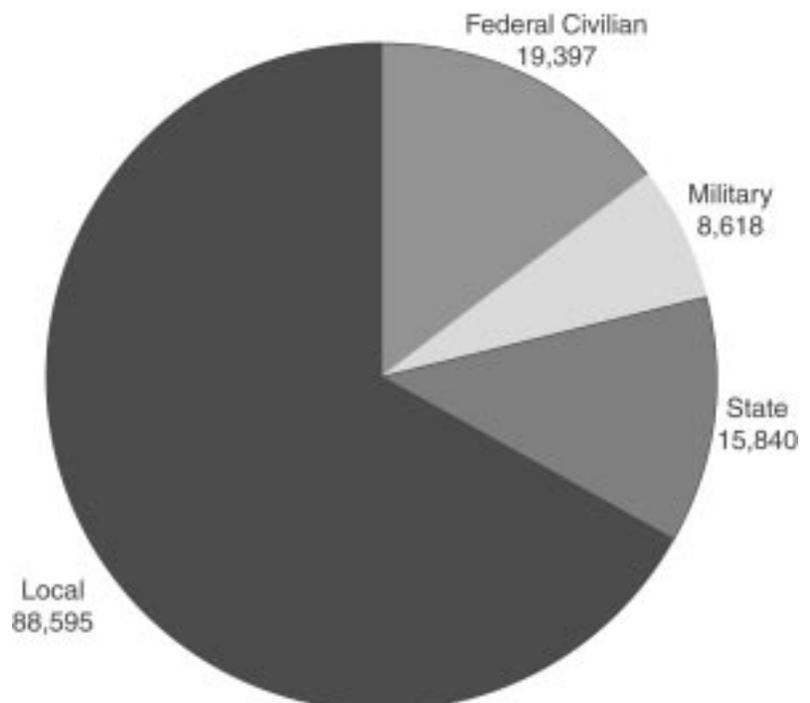
In addition to local government employment, there are estimated to be just under 20,000 federal employees working in the region, 8,618 active-duty military, and 15,618 state government workers.

All state and local governments in the U.S. are surveyed every five years by the Census Bureau. Local governments include counties, cities, townships, special districts, and school districts. The data is compiled in the Census of Governments (COG), which provides data on both employment and finances for all governments. The last complete COG was in 1997, with final data released in 2000.g

**Local Government Employment and Payroll Pittsburgh Region
March 1997**

Function	Full-Time	Part-Time	Monthly Payroll
Airports	457	13	\$1,226,405
Correction	1,311	205	\$3,258,759
Electric Power	9	0	\$35,581
Elementary & Secondary Educ			
Admin/Clerical	3,342	385	\$10,432,427
Bus Transport	608	663	\$1,613,515
Cafeteria	1,610	1,621	\$2,497,694
Health/Rec	350	304	\$1,355,416
Instruction	26,280	4,515	\$103,673,843
Oper/Maint	3,352	776	\$7,997,835
Other Total	9,574	4,573	\$24,944,317
Student (Part-time Only)	0	242	\$28,686
Unallocable	312	582	\$1,018,744
Financial Administration	1,269	465	\$3,134,636
Fire - Other	85	31	\$245,339
Firefighters	1,012	97	\$4,036,938
Health	1,138	160	\$2,893,887
Higher Education - Instl	556	2,184	\$3,331,817
Higher Education - Other	737	1,045	\$2,168,470
Housing & Community Devel	1,340	145	\$3,435,767
Judicial and Legal	2,599	174	\$6,114,219
Local Libraries	90	208	\$303,111
Natural Resources	4	7	\$12,907
Other and Unallocable	1,299	597	\$3,424,745
Other Govt Admin	1,283	1,347	\$3,403,638
Parks and Recreation	698	586	\$1,817,515
Police-Other	576	991	\$1,922,028
Police Protection-Officers	3,322	951	\$12,662,731
Sewerage	996	112	\$3,119,765
Solid Waste Management	345	23	\$823,170
Streets and Highways	2,405	464	\$6,247,737
Transit	2,886	6	\$10,503,043
Water Supply	1,027	139	\$2,884,279
Welfare	4,049	487	\$8,888,510
Totals for Local Govt	65,347	19,525	\$214,513,157

**Breakdown of Government Employment
Pittsburgh Region - 1999**



Source: Bureau of the Census - Census of Governments, 1997

Source: Regional Economic Information System - Bureau of Economic Analysis

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