

Trends in Rural Pennsylvania

May/June 2004

About Trends in Rural Pennsylvania

This fact sheet is the eighth in a series of nine that examines trends in rural Pennsylvania. Each fact sheet focuses on a specific area of interest, and is based on the mandates outlined in the Center for Rural Pennsylvania's enabling legislation (Act 16 of 1987). The areas of interest are agriculture, economic development, local government capacity and fiscal stress indicators, transportation, socio-demographics, health care and human services, the environment and natural resources, education and the condition of existing local infrastructure. For more information on any of the data presented, contact the Center for Rural Pennsylvania.

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The Center for Rural Pennsylvania is a bipartisan, bicameral legislative agency that serves as a resource for rural policy research within the Pennsylvania General Assembly. It was created in 1987 under Act 16, the Rural Revitalization Act, to promote and sustain the vitality of Pennsylvania's rural and small communities.

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Infrastructure Makes It All Work

Infrastructure has many meanings and covers a variety of issues. Elements of the U.S. Department of Homeland Security definition include agriculture and food, water, public health, emergency services, defense industrial bases, telecommunications, energy, transportation, banking and finance, chemical industry and hazardous materials, and postal and shipping. Meanwhile, the American Society of Civil Engineers says infrastructure is comprised of roads, bridges, transit, aviation, schools, drinking water, wastewater, dams, solid waste, hazardous waste, navigable waterways, and energy.

Since many of the above categories have been addressed in other Trends fact sheets and others are abstract systems about which data would be difficult to come by, this fact sheet focuses on the physical infrastructure of water/wastewater and telecommunications in rural Pennsylvania.

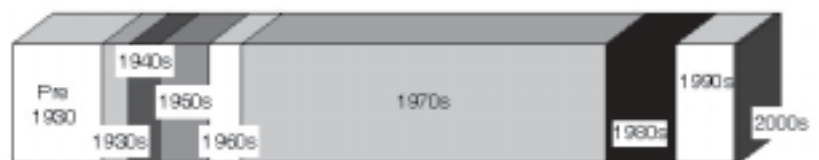
Water

Water is relevant to infrastructure in two areas - the supply of fresh water and the collection and treatment of wastewater and storm water. Nationally, 170,000 public water systems use water from reservoirs, dams, wells, and aquifers. This water travels through treatment facilities, pumping stations, aqueducts, and transmission pipelines to reach users. On the wastewater side, there are 19,500 municipal sanitary sewer systems in the United States with about 800,000 miles of sewer lines.

According to 1990 Census data¹, 58 percent of the total housing units in rural Pennsylvania get water from a public system or private company, 36 percent have individual wells and the balance use "some other source."

For the disposal of wastewater, 49 percent of rural housing units have public sewer, 48 percent have a septic tank or cesspool and the remainder use "other means." The rural situation is a bit different from urban Pennsylvania, where 86 percent of households have public water and 84 percent have public sewer.

Installation Years of Rural Drinking Water Transmission Mains



This bar represents all the feet of transmission main pipeline in rural Pennsylvania.

¹ 1990 data is the most current because the 2000 Census did not ask these questions and no other source has been known to collect this information.

Drinking Water

The Pennsylvania Department of Environmental Protection (DEP) maintains a database of information on drinking water systems in the Commonwealth. Information in this section was extracted from that database in December 2003. Since not all descriptive data are complete for each system component in the state, some data were extrapolated.

The fresh water used in rural Pennsylvania comes from more than 7,000 active system entry points and travels through approximately 1,400 pumping stations, 4,550 treatment plants, 5,900 storage facilities, and 5,300 local distribution systems.

In Pennsylvania's rural counties, there are nearly 10,000 drinking water systems, more than 40 percent of which are inactive. Of the 5,697 active systems, 21 percent are community systems. Sixty-seven percent are transient non-community systems, while 11 percent are non-transient, non-community systems. Seventy percent of rural systems are owned by investors or private individuals as opposed to municipal authorities or governments.

Most rural drinking water systems are very small; half serve fewer than 100 people each, while 12 percent serve more than 500. These systems have between one and 24 sources, with an average of 1.6 per system. Although about 95 percent of these sources draw from ground water, the 5 percent that draw from surface sources have the capacity to yield twice as much water as the ground sources. Rural systems have an average of 1.2 entry points for water coming into the system, and those numbers range from zero to 16. Entry points are almost entirely from ground water, but about 6 percent are from surface water. At most entry points, 92 percent, water is not filtered.

Rural water is transmitted along some 2,500 active transmission mains averaging about 2,000 feet in length for a total of approximately 5.5 million feet of mainlines. The primary construction materials of this pipe are cast iron (26 percent), PVC (23 percent), and ductile iron (22 percent). Copper, steel, and other materials are also used. Rural water mains are also

of various ages. Twenty percent of the pipeline was installed prior to 1950, while 18 percent has been installed since 1980.

Rural Pennsylvania has about 1,400 active pumping stations with about 2,700 pumps. Three-quarters of these pumping stations are above ground and the remainder are in ground. Pumping stations are relatively new, with just 4 percent built prior to 1950 and 65 percent constructed since 1980.

Rural treatment plants have the capacity to treat about 1.5 billion gallons of water per day. About 11 percent of the plants filter the water. Rural plants are relatively new. Just 3 percent were built prior to 1950 and 82 percent since 1980.

Three-quarters of the state's 5,909 active rural water storage facilities are constructed of steel. Fourteen percent are concrete, while a few are fiberglass and other materials.

Construction material is likely dependent, at least in part, on the type of facility. The most common type, 43 percent of all water storage facilities, is hydropneumatic, followed by ground level with no dam at 25 percent. Others are clearwell, dam, elevated, and standpipe facilities. Most rural storage facilities are recently constructed; 70 percent were built since 1980, while 7 percent were built before 1950.

Water is distributed locally through nearly 5,300 active distribution systems with an average length of 7,865 feet and a total of more than 41.5 million feet of pipeline. Construction materials are similar to those for transmission mains. The most common material is PVC, which makes up 31 percent of the total length. Cast iron accounts for 24 percent and ductile iron makes up another 19 percent. Ages of these systems also vary widely with 28 percent built before 1950 and 25 percent built since 1980.

Wastewater and Storm Water

Wastewater utilities collect and treat sewage and process water from domestic, commercial, and industrial sources. Some collect and treat storm water runoff. There is no data available for rural Pennsylvania about storm water since this is handled at the local level through best management practices and is not reported or tracked.

DEP data report nearly 3,300 wastewater systems in Pennsylvania's rural counties. Municipal, or public, sewage systems account for 17 percent of this figure, while non-municipal sewage systems make up the majority or 59 percent. Industrial waste systems are the remaining 23 percent.

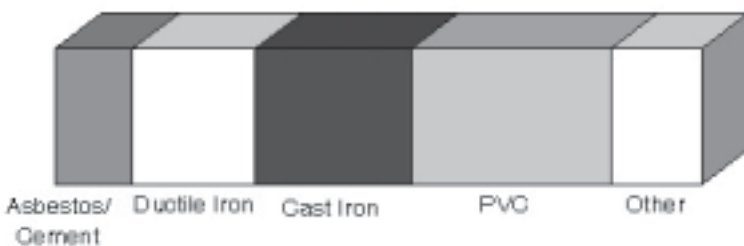
Financing Water/Wastewater Infrastructure

The American Society of Civil Engineers' 2003 Progress Report cites drinking water as one of Pennsylvania's top three infrastructure concerns and notes the following:

- Pennsylvania needs to invest \$5.26 billion over the next 20 years for its drinking water infrastructure.
- Pennsylvania must invest \$6.3 billion over the next 20

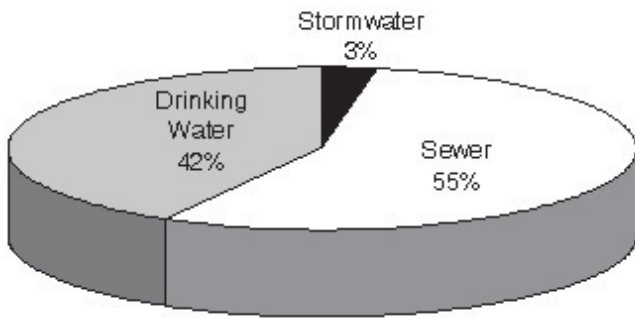
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Construction Material of Rural Drinking Water Distribution Systems Pipeline

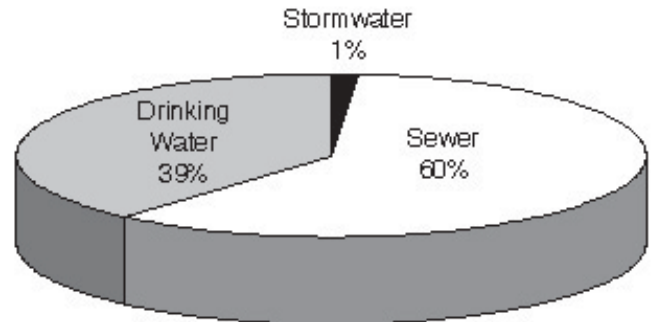


This bar represents all the feet of distribution system pipeline in rural Pennsylvania.

**Rural PENNVEST Projects by Type
1988-2003**



**Rural PENNVEST Project Types
by Funding Amount, 1988-2003**



Since 1988, PENNVEST has funded more than 1,100 infrastructure projects in rural Pennsylvania with average funding of \$1.9 million per project.

years to upgrade its existing sewage treatment plants and lines, including \$4 billion to remedy combined sewer overflows.

- Pennsylvania has 757 high-hazard dams whose failure would likely cause a loss of human life.
- The rehabilitation cost for Pennsylvania's most critical dams is estimated at \$646.2 million.

New or improved water and wastewater infrastructure can be costly for local governments to install. For this reason, the Pennsylvania Infrastructure Investment Authority (PENNVEST) was created in 1988 to service the communities and the citizens of Pennsylvania by funding sewer, storm water and drinking water projects. The funding is usually in the form of low interest loans but can also include grant monies. PENNVEST's board approved funding totaling nearly \$2 billion for rural projects in 2002. This amount represents a 63 percent increase over the 1992 level. In raw numbers, projects increased from 61 in 1992 to 93 in 2002, an increase of 52 percent.

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funding of \$1.9 million per project. Fifty-five percent are sewer projects, which account for 60 percent of the funding.

Telecommunications

The telecommunications industry includes the transfer of voice and data through both public and private systems. Services provided include telephone, radio, television, and Internet access. Without these, communities would be quite disconnected from what is going on in the world.

Telephone

According to the Pennsylvania Public Utilities Commission (PUC), there is no data available about the physical telephone infrastructure, such as miles of phone line, number of poles, or age of the cable. But other information exists.

Telephone service is universally available throughout rural Pennsylvania and most people take advantage of the service. Census 2000 data show that more than 98 percent of rural Pennsylvania households have telephone service available. This figure is about the same as in 1990, when nearly 97 percent of rural households had phones.²

² Comparability between the two censuses is not entirely possible; the wording of the telephone question was changed from having a phone to having phone service available.

Telephone service providers are divided into Incumbent Local Exchange Carriers (ILECs), who have operated in a given area since before the federal competition legislation of 1996, and Competitive Local Exchange Carriers (CLECs), who have entered the market since then. There is normally just one ILEC in any given service area, but there can be many CLECs. In the PUC data in the following paragraph, the term "providers" refers only to CLECs.

As of July 2003, Pennsylvania's rural counties had an average of five providers, compared to 17 in urban counties. Total numbers of providers in rural counties range from zero to 17. In urban counties, the range is between seven and 29. All of these provide service to businesses, but not all serve residential customers. Rural residential providers range from zero to 12 with an average of three per county. In urban areas, providers range from four to 20 and the average is 11. Rural telephone consumers have fewer choices when selecting a phone company.

Radio and Television

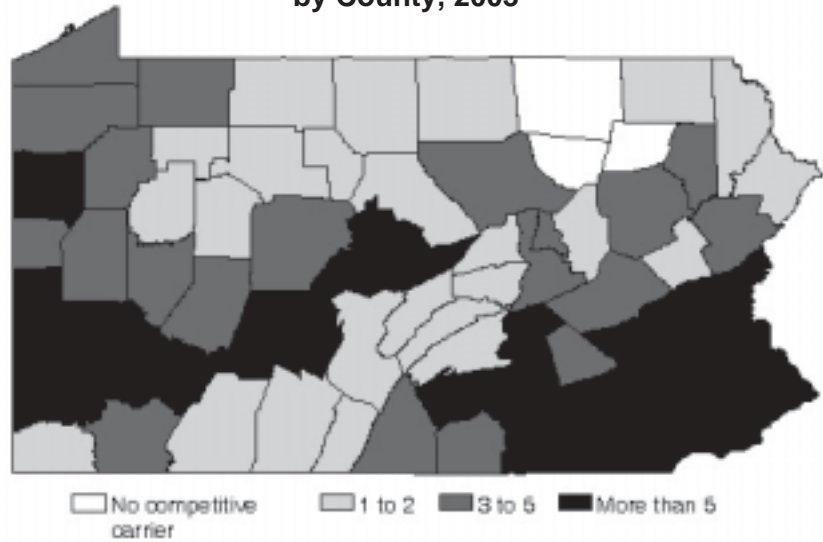
According to *The Pennsylvania Manual*, there are about 200 radio stations located in rural Pennsylvania, 60 percent of which are FM frequencies. Because rural Pennsylvania covers so much area, there are, on average, fewer than six stations per 1,000 square miles. In urban areas, there are more than 15 per 1,000 square miles. In addition, rural Pennsylvania has seven television stations, compared to 44 in urban areas. In rural

counties, this amounts to 0.2 stations per 1,000 square miles compared to 3.7 per 1,000 square miles in urban counties. Five rural counties have no radio or television stations. These figures do not mean, however, that rural Pennsylvania has less access to broadcasts. Radio and television broadcasts are far reaching and for those outside a particular television station's viewing area, a cable connection is usually available. According to the Pennsylvania Cable and Telecommunications Association, more than three-quarters of Pennsylvania households have cable television available.

Internet

The Center For Rural Pennsylvania's recently released report, *Broadband Internet Service in Rural and Urban Pennsylvania: A Common Wealth or Digital Divide*, provides some information about infrastructure for high-speed cable and telephone access to the Internet for computer users. The study found that telephone dial-up access was nearly universally available without

Number of Competitive Local Exchange Carriers (CLECs) by County, 2003



resorting to a long distance connection; however, not all areas had access to a broadband, or high speed, connection. At the time of the research in the fall of 2002, 27 percent of telephone and cable customers in rural counties outside of metropolitan areas (a total of 33 counties) had no provider for a broad-

band Internet connection. Another 56 percent of these customers had limited provider options, making prices and service continuity less dependable. For more information on this issue, request a copy of the report from the Center for Rural Pennsylvania or view it online at www.ruralpa.org/broadband_report.pdf.

Definitions

Rural — Counties with a population density less than the statewide density of 274 persons per square mile.

Source — The place from which water for a public water system originates or is derived, including, but not limited to, a well, spring, stream, reservoir, pond, lake or interconnection.

Entry point — A point acceptable to DEP at which finished water representative of each source enters the distribution system.

System — A group of facilities used to provide water for human consumption including facilities used for collection, treatment, storage and distribution. The facilities shall constitute a system if they are adjacent or geographically proximate to each other and meet at least one of the following criteria:

- (A) The facilities provide water to the same establishment, which is a business or commercial enterprise or an arrangement of residential or nonresidential structures having a common purpose and includes mobile home parks, multi-unit housing complexes, phased subdivisions, campgrounds and motels.
- (B) The facilities are owned, managed or operated by the same person.
- (C) The facilities have been regulated as a single public water system under the federal Safe Drinking Water Act.

Systems are usually of the following three types:

Community water system — A public water system that serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

Non-transient, non-community water system — A public water system that is not a community water system but regularly serves at least 25 of the same persons over 6 months per year.

Transient non-community water system — A public water system which is not a community, non-transient non-community, bottled or vended water system, nor a retail water facility or a bulk water hauling system.

More drinking water system definitions are at www.pacode.com/secure/data/025/chapter109/chap109toc.html