A COMPREHENSIVE APPROACH TO IMPROVING UTILITY AND TRANSPORTATION INFRASTRUCTURE IN PENNSYLVANIA

by

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> *"[W]ith an aging infrastructure and inadequate funding for maintenance and upgrades, the Keystone State is crumbling."*[1]

Introduction

Since the early 1900's, public utility services and our modern transportation system have both been essential to our way of life in the United States and in Pennsylvania. We take it for granted that the lights will come on at the flick of a switch, that tap water will be safe to drink, that we will hear a dial tone when we lift a telephone receiver, and that natural gas will flow to heat our homes. Similarly, as we go about our daily lives, we assume that our transportation system of roads, bridges, and mass transit will take us to work, and to play, in an efficient, safe manner.

The general public does not give much thought to the infrastructure over which these utility and transportation services are provided -- the complex systems of pipes, wires, treatment plants, roads and bridges, generating stations, and other facilities. Unfortunately, it often takes a breakdown of service, such as a power outage, or a proposal to construct new infrastructure, which induces a "not-in-my-backyard" local response, to make most of us aware of infrastructure.

It is self-evident that the quality of utility and transportation services depends on the quality of the infrastructure over which the services are provided. Taking this a step further, it is indisputable that preventing deterioration of this infrastructure should be a high priority in our society. In fact, in many cases, simply preserving the infrastructure will not be enough to satisfy our increasing expectations. For example, we want our drinking water to meet ever-higher standards of purity, we expect high-speed broadband service to be available over the telephone network, and we want congested highway conditions to be relieved. These service improvements require either upgrading or building new infrastructure.

Despite the obvious importance of maintaining and improving our utility and transportation infrastructure, in many instances we have allowed it to deteriorate. This is true both in the United States generally, and in Pennsylvania

[1] American Society of Civil Engineers, *Report Card for Pennsylvania's Infrastructure,* 2005, available at www.asce.org.

specifically. In 2005, the American Society of Civil Engineers ("ASCE") issued a "report card" on infrastructure in the United States, assigning an overall grade of "D."[2] Individual states were graded as well, and Pennsylvania's infrastructure also received a "D."[3] While the categories of infrastructure evaluated by ASCE do not match precisely those discussed in this report (see footnotes 2 and 3), there is enough overlap to make the ASCE analysis useful here.

Developing solutions to these infrastructure problems should be a top priority of the federal government and of state government in Pennsylvania. Some of these solutions will involve finding and committing the resources to maintain current infrastructure, and others will involve building new infrastructure. Given the scope of infrastructure needs, innovative approaches such as public-private partnerships should also be considered.

The purpose of this report is to call attention to these infrastructure problems and to suggest a different approach to addressing them – an approach that focuses on infrastructure as a comprehensive topic that transcends the various industries, instead of considering it in a piecemeal fashion as one component of transportation issues, one component of drinking water issues, one component of electricity issues, etc. As explained below, a comprehensive approach to addressing infrastructure issues could help to overcome the obstacles that have created the current situation in which infrastructure is often neglected.

The remainder of this report will discuss infrastructure problems and issues within five categories or industries: electricity, natural gas, water and wastewater, telecommunications, and transportation (roads, bridges, and transit systems). The report will then discuss the rationale for a comprehensive approach, and conclude with a discussion of alternatives that would move in this direction.

Electricity

> *"America's electric system, 'the supreme engineering achievement of the 20th century,' is aging, inefficient, and congested, and incapable of meeting the future energy needs of the Information Economy without operational changes and substantial capital investment over the next several decades."*[4]

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[2] ASCE, *2005 Report Card for America's Infrastructure.* The overall grade was derived from grades assigned to fifteen categories of infrastructure: aviation, bridges, dams, drinking water, energy (electric transmission), hazardous waste, navigable waterways, public parks and recreation, rail, roads, schools, security, solid waste, transit, and wastewater. These categories differ somewhat from those covered in this report – electricity, natural gas, water and wastewater, telecommunications, and transportation (roads, bridges, and transit systems).

[3] See footnote 1 above. The cumulative grade for Pennsylvania was based upon individual grades for nine categories of infrastructure: aviation, bridges, dams, drinking water, navigable waterways, rail, roads, transit, and wastewater.

[4] U.S. Department of Energy, *Grid 2030: A National Vision for Electricity's Second 100 Years,* July 2003.

There is growing concern among policymakers that our nation's electricity infrastructure is deteriorating in some respects, and not improving enough in others. The electricity infrastructure can be divided into three categories: generation, transmission, and distribution. After the restructuring of the electric industry in some areas of the country, including the northeast and mid-Atlantic states, generation is a competitive service subject to federal jurisdiction over wholesale markets. The federal government also has jurisdiction over most (but not all) aspects of regulating transmission, and the states continue to regulate distribution.

However, this compartmentalized view of the industry for analytical and jurisdictional purposes does not change the physical reality that the entire electric system must be operated in a coordinated manner to prevent the system from collapsing. In the area of the country that includes almost all of Pennsylvania, this coordination function is performed by PJM Interconnection, L.L.C.[5], an independent system operator that is subject to the oversight of the Federal Energy Regulatory Commission ("FERC"). Among other things, PJM dispatches generating plants, operates day ahead and hourly markets for energy, and conducts transmission planning.

To varying degrees, there are concerns in the industry regarding all three types of infrastructure -- generation, transmission, and distribution. With regard to generation, the most significant problem may be how to encourage investment in new generating plants, especially baseload plants, despite investors' uncertainty over the future course of (1) wholesale market rules, which have been controversial and in flux since the abuses of Enron and other generators in California several years ago raised questions about the competitiveness of these markets, and (2) environmental policy, especially whether (and, if so, how) carbon emissions will be regulated to address climate change.

In New England and some other sections of the country, under-investment in generation is beginning to threaten the reliability of service.[6] This is not the case in the PJM region, because PJM has sufficient generating capacity to protect reliability. However, there are concerns even within PJM over whether current policies provide enough incentive to build generation designed to meet peak demands in certain areas. For example, a recent report prepared for the Team Pennsylvania Foundation suggested that the Commonwealth should consider contracting to build a peaking plant for the purpose of reducing peak prices in the wholesale market.[7]

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[5] Two areas of Pennsylvania fall outside of PJM. The service territory of Pennsylvania Power Co. in western Pennsylvania is associated with the Midwest Independent System Operator. In addition, the service territory of Pike County Light and Power Co. is associated with the New York Independent System Operator.

[6] North American Electric Reliability Council, *2006 Long-Term Reliability Assessment,* October 2006

[7] Carnegie Mellon Electricity Industry Center, *Competitive Energy Options for Pennsylvania,* January 2007.

Many states, including Pennsylvania, also are encouraging the development of renewable energy sources. In 2004, the General Assembly passed legislation requiring retail energy suppliers to have as part of their energy portfolio a percentage of renewable energy that will increase over time.[8] Incorporating these sources into the existing electric grid provides the benefit of diversity, but also poses a number of challenges. PJM must plan for the reality that some of these sources, such as wind, are intermittent, and may not be available on a hot summer day when usage reaches peak levels. Another infrastructure issue related to wind is that turbines are usually located in areas that are far removed from population centers, and additional transmission infrastructure may be necessary to bring this energy to customers.

Looking to the future, perhaps the most important unanswered question regarding generation infrastructure is whether any entity will take the risk of building a large, capital-intensive baseload plant in a region containing competitive wholesale and retail markets. So far, such plants have only been constructed in regulated regimes, where a utility building the plant has some degree of assurance that it will be able to recover the cost of the plant from customers.[9]

Of the three segments of the electric industry, the greatest concern over infrastructure is with regard to transmission. The transmission system links generating plants directly to large customers, and to the distribution system that serves residential and smaller business customers. At worst, an inadequate transmission system threatens the reliability of service due to the threat of overloads. However, in areas containing competitive wholesale markets, even when the system is not so burdened as to threaten reliability, a congested system raises the price that customers pay for electricity. These "congestion charges" ultimately show up on the bills of retail customers. In addition, greater congestion increases the amount of "line losses" – energy that is lost in the form of heat as it flows through the line. These losses increased from 5% in 1970 to 9.5% in 2001.[10]

It is generally recognized that transmission investment lagged for many years. From 1990 to 2003, electricity demand increased by 25%, but construction of transmission facilities decreased by roughly 30%.[11] Among the factors that contributed to this under-investment were local opposition to siting new lines, uncertainty regarding recovery of costs, lack of clarity regarding responsibility to build, and overlapping jurisdiction regarding siting and permitting.

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[8] Act 213 of 2004, 73 P.S. §§ 1648.1 – 1648.8.
[9] In Pennsylvania, construction has begun on baseload waste coal plants with capacities as high as 525 megawatts. However, existing baseload coal plants built prior to the introduction of competition have capacities as high as 2,360 megawatts. See, Pennsylvania Public Utility Commission, *Electric Power Outlook for Pennsylvania, 2005-2010,* Appendices C and D (August 2006).
[10] *Grid 2030 report,* footnote 4 above.
[11] *Id.*

A coalition of large industrial customers contends, although this view is disputed by others, that the main reason for inadequate transmission investment is that many utilities own both generation and transmission, and that these utilities will not build transmission if it would decrease profits from their generating plants.[12]

The United States Congress attempted to remedy inadequate transmission investment in the Energy Policy Act of 2005 ("EPACT")[13]. This law directed the FERC to consider granting higher returns in setting transmission rates to spur investment, and to study how to create more long-term transmission rights. EPACT also gave the Department of Energy authority to designate "corridors of national interest" for transmission investment. For transmission projects in such corridors, states are limited to one year from the filing of a siting application to make a decision; if this deadline is not met, jurisdiction is transferred to FERC. There is some evidence that the pace of transmission investment is increasing.[14]

The distribution infrastructure also must be modernized to support enhanced reliability and new services in the 21st century. In Pennsylvania, electric utilities recently have emerged from caps on their distribution rates. Rate caps such as these guarantee rate stability, but they may provide a disincentive for additional spending on some projects that could help to assure reliability.

A 21st century electric delivery system is expected to be built upon equipment used today – lines, substations, and transformers – but also may include distributed energy sources and "distributed intelligence," including "smart appliances" that can be controlled through the internet.[15] There also is considerable interest in "smart meters" that can provide detailed information about a customer's energy use to that customer and, with permission, to alternative suppliers. Some of these technologies have the potential to reduce demand for electricity, especially at times of peak usage, and to reduce the need to build other types of infrastructure to meet this demand.

In summary, there are substantial concerns regarding the level of investment in the electricity infrastructure throughout the United States.

Natural Gas

The natural gas infrastructure consists of production wells, field and gathering lines, transmission pipelines, and distribution mains. Terminals that

[12] See, Electricity Consumers Resource Council, *Today's Organized Markets – A Step Toward Competition or an Exercise in Re-Regulation?* (December 2006.)
[13] P.L. 109-58.
[14] The Edison Electric Institute reports that electric utilities plan to increase transmission investment by nearly 60 % over the 2006-2009 period as compared to the 2002-2005 period. *Transmission Projects at a Glance,* January 2007, available at www.eei.org.
[15] *Grid 2030 report,* footnote 4 above.

are designed to receive and store shipments of liquefied natural gas also may play an important role in the future.[16]

Natural gas satisfies roughly one quarter of our nation's energy needs.[17] It is used by residential, commercial, and industrial customers. In addition, for the past decade, most of the electric generating plants that have been built in the country have been fueled by natural gas. This is a result of reductions in the cost of the technologies used in these plants, and the fact that natural gas-fired plants emit fewer pollutants than coal-fired plants. However, the growing use of natural gas in electric generating plants has contributed to higher wholesale gas prices due to a tighter balance between supply and demand.

On a national basis, perhaps the biggest infrastructure issue regarding natural gas is how to increase supply through more exploration, drilling of new wells, and construction of additional LNG facilities. The natural gas industry supports the elimination of restrictions on exploration for new supplies on the outer continental shelf. In addition, EPACT contained provisions designed to encourage additional LNG facilities. For the most part, these are federal issues.

At the state level, the biggest issue regarding natural gas infrastructure is the age of the system of distribution mains. Most natural gas utilities in Pennsylvania and the northeast have a significant amount of cast iron and bare steel pipe in their distribution systems. These pipes often date back to the early days when the industry was formed. This aging infrastructure is subject to corrosion and leaks, which raises safety concerns. It is estimated that Pennsylvania alone has 13,000 miles of cast iron and bare steel pipeline providing service to roughly 3.6 million natural gas customers.[18]

The mains that will need to be replaced are frequently located beneath heavily-traveled roads in developed urban and suburban neighborhoods. New, creative approaches may be appropriate in these situations. For example, it may be possible in some cases to insert smaller diameter high-pressure plastic lines inside of the old low pressure mains. This approach would minimize the need to dig trenches in roadways while also increasing the capacity of the distribution system.

Whatever technology is used, replacing old natural gas distribution mains is an expensive, time-consuming undertaking. The utilities have begun these replacement projects, but it may be in the public interest to accelerate them. However, such an acceleration could require a gas utility to file one or more requests with the Public Utility Commission to increase base rates; the process such a filing entails can, in itself, be an expensive and time-consuming endeavor. Because of this, the natural gas industry is advocating legislation to authorize a

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[16] FERC, *A Guide to LNG,* available at www.ferc.gov
[17] Comments of the American Gas Association, *Inquiry under Section 1818 of the Energy Policy Act of 2005,* November 2005.
[18] Statistics from the Gas Safety Division, Pennsylvania Public Utility Commission.

surcharge for recovery of distribution system improvement costs. This surcharge may alleviate the need for some base rate filings. Such a surcharge would be similar to one already authorized for water utilities, which will be discussed below.

Water and Wastewater

> *"Local and state officials across the country say thousands of miles of century-old underground water and sewer lines are springing leaks, eroding and – in extreme cases – causing the ground above them to collapse….[T]here is consensus among civil engineers and water experts that things are getting worse."* [19]

Water and wastewater utilities provide essential public services by supplying clean drinking water to citizens, and treating wastewater so that it does not pollute the waters of the Commonwealth. In Pennsylvania, most water and wastewater providers are municipalities or municipal authorities rather than investor-owned utilities. For both water and wastewater providers, the infrastructure consists largely of pipes and treatment plants.

The scope of the problem with water and wastewater infrastructure was summarized recently by the Pennsylvania Chapter of the National Association of Water Companies:

> *"A significant portion of our nation's water and wastewater infrastructure is reaching the end of its useful life. There are thousands of miles of pipelines that were installed 50 to 100 years ago, which need to be replaced."*[20]

This conclusion is consistent with the 2005 infrastructure report card issued by ASCE, which assigned grades of "D +" for drinking water and "D -" for wastewater infrastructure in Pennsylvania.

It is worth noting that, at the same time that much of our existing water and wastewater infrastructure is reaching the end of its useful life, we steadily are increasing the environmental requirements for treatment of water and wastewater. These more stringent requirements cannot usually be met without adding new infrastructure costs.

A particularly difficult problem in the wastewater sector is the need to eliminate "combined sewer overflows." These antiquated systems, which continue to exist in many larger communities in Pennsylvania, result in the

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[19] *New York Times, "Gaping Reminders of Aging and Crumbling Pipes",* February 8, 2007.
[20] *Policy Brief,* Pa. Chapter of NAWC, January 2007.

discharge of untreated sewage into rivers and streams during periods of heavy runoff. Replacing these systems with sanitary sewers is very expensive, and imposing these costs upon urban residents who may be economically disadvantaged is not an easy decision.

Although there is a consensus that much of the nation's water and wastewater infrastructure must be replaced, there are contrasting views over how to pay for it. A coalition named the "Water Infrastructure Network" ("WIN"), composed mostly of municipal providers, has argued for federal assistance to help defray infrastructure improvement costs[21]. On the other hand, the investor-owned utilities advocate that infrastructure needs generally should be financed through the rates charged to customers. Consistent with the latter philosophy, investor-owned water utilities successfully lobbied the Pennsylvania General Assembly for authorization to collect a special surcharge for distribution system improvements that would ease the need to file expensive, time-consuming rate cases. The Legislative Budget and Finance Committee recently recommended that a similar surcharge be authorized for wastewater system improvements.[22]

One final issue that merits discussion here is the interaction between "smart growth" land use policies and water and wastewater infrastructure. Smart growth advocates generally seek to direct development efforts into, or adjacent to, existing communities. From this perspective, efforts to extend new water and wastewater lines into currently undeveloped land are often viewed as undesirable. Depending on one's perspective, this could be viewed as either impeding infrastructure development and growth, or as a prudent attempt to make the best use of existing infrastructure. The smart growth movement may also be a factor in decisions regarding other types of infrastructure.

In summary, the infrastructure problems of many water and wastewater providers could be described as a crisis. Although the industry in general is experiencing problems with aging infrastructure (i.e., leaking pipes, inadequate pressure for fire protection, and water quality issues), some providers have initiated active infrastructure replacement programs to address these problems.

Telecommunications

The nature of the issues surrounding development of telecommunications infrastructure contrast with the infrastructure issues in other industries discussed in this report. The rapid development of technology and the new services it has made possible are the driving forces in this industry. The main issue is not how to prevent deterioration of the infrastructure, but how to deploy advanced forms of infrastructure (and the services it makes possible) more quickly throughout the entire Commonwealth. In particular, there is a policy concern over whether some

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[21] *Water Infrastructure Now: Recommendations for Clean and Safe Water in the 21st Century,* available at www.win-water.org.

[22] Legislative Budget and Finance Committee, *Performance Audit of the Pennsylvania Public Utility Commission,* January 2007, page S-4.

rural areas may be disadvantaged because of the difficulty and expense of deploying an advanced telecommunications infrastructure in these areas.

In the past 30 years there has been a revolution in the way that we communicate. We now have several alternatives to the traditional landline telephone, including wireless telephone, e-mail, cable telephony, and "voice-over-internet protocol" ("VOIP"). Perhaps the most important development has been the growth of the internet. More and more, customers want high speed, broadband connections to enhance their use of the internet. Different providers are fighting for market share in providing broadband service to customers.

The two largest providers of broadband service to residential customers are cable television operators and telephone companies, in that order.[23] Wireless and satellite broadband services are also growing. Depending on their size and their needs, business customers may subscribe to service from cable operators or telephone companies (using digital subscriber line technology, discussed below, employed to serve residential customers), or they may pay more to a telephone company for a faster, dedicated connection such as a "T-1" line.

Cable operators use a coaxial cable infrastructure, while telephone companies generally use digital subscriber line ("DSL") technology, which uses the copper lines traditionally found in telephone networks. More recently, however, Verizon Communications, has begun in some areas to deploy fiber optic cable throughout the "last mile" of its distribution network, an architecture that will support more advanced services than DSL. Although this strategy entails a massive, perhaps risky, outlay of capital, Verizon believes that there will be a strong market for the advanced services this infrastructure will make possible.[24]

Encouraging deployment of a broadband-capable infrastructure throughout Pennsylvania has been a policy priority since the early 1990's. In 1993, the General Assembly added Chapter 30 to the Public Utility Code. This law was designed to provide incumbent local telephone companies with eased rate regulation in return for a commitment to build broadband capable networks in all areas – including rural areas -- by 2015. That law expired at the end of 2003, but in late 2004 a new Chapter 30 law was enacted[25]. The new law allows greater rate freedom for telephone companies, and provides additional incentives for companies to complete deployment of broadband infrastructure earlier than the original deadline of 2015[26]. In addition, the telephone companies are

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[23] Federal Communications Commission, *High-Speed Services for Internet Access: Status as of June 30, 2006,* (January 2007).
[24] *Wall Street Journal, "Verizon's New Network Tests Telecom Giant,"* March 7, 2007.
[25] Act 183 of 2004, 66 Pa.C.S. § 3011-3019.
[26] Whether the PUC has provided enough freedom from regulation to the telephone industry has been a matter of dispute. In general, representatives of consumers often contend that continued regulation is appropriate, while the telephone industry asserts that it unfairly is being subjected to regulatory restrictions that are not applied to its new competitors (VOIP providers, etc.).

required to subsidize broadband service to schools; to provide funding for development of broadband infrastructure for economic development; and, in some cases, to allow customers to obtain broadband service at an earlier date where a number of customers express interest in obtaining service.

While the new Chapter 30 law is designed to further advance the deployment of broadband infrastructure to all areas of the Commonwealth, it does not – and arguably cannot – promise to completely level the playing field between urban, suburban, and rural areas. Telephone companies already have deployed broadband infrastructure in many rural areas pursuant to their obligation to balance deployment among urban, suburban, and rural areas. In addition, many rural telephone companies have chosen to fully deploy broadband capability by 2008 pursuant to the new Chapter 30 law. These are significant accomplishments, and they have been achieved without contributions from taxpayers.

Nevertheless, other rural areas are likely to be among the last to receive the advanced infrastructure before the deadline, because the return on these investments may be weaker than in more densely populated areas. These rural areas also are the least likely to have fiber-optic cable deployed to their premises, because Chapter 30 only requires speeds of 1.5 megabits per second in one direction, and this speed can be achieved by DSL technology without replacing the copper wire in the distribution system. Finally, even when a rural area is provided with DSL service, it is not as likely to benefit from competition among different broadband providers as urban and suburban areas.

The issue of broadband penetration rates, especially in rural areas, also is an issue at the national level. For most of the past decade, the United States has lagged behind other countries in levels of broadband penetration, although subscription levels are accelerating here in the past two years. On the issue of rural deployment, there is a debate whether the federal government should subsidize accelerated deployment to rural areas. Although it can be argued that this should be left to the market, if broadband availability is viewed as necessary to modern commerce and life, then government intervention to make it available could be analogized to federal policies that led to rural electrification in the 20th century.

It is obvious from this discussion that while telecommunications infrastructure is changing and growing, it still presents significant public policy challenges.

Transportation: Roads, Bridges, and Transit Systems

A structurally sound, well-maintained system of roads and bridges is necessary to satisfy our personal needs for mobility and to advance the economic health of Pennsylvania. In addition, modern and efficient public transit systems are necessary to meet the transportation needs of citizens, including senior citizens and the disabled, in more densely populated areas in an environmentally responsible manner.

The current system of roads and bridges in Pennsylvania took shape over many years in the 20th century. A watershed event took place in 1956, when the federal government offered to underwrite 90% of the cost of a new network of national expressways. Pennsylvania accepted this offer. With regard to funding for highways and bridges, significant events included the enactment in 1921 of the first retail gas tax (1 cent per gallon then, 12 cents per gallon now), the signing into law of a dedicated motor license fund by Governor Gifford Pinchot in 1925, and passage of a tax on the wholesale price of fuel in 1981. In 2005-06, these taxes raised just over $3.4 billion when combined with a few smaller sources of revenue.

Mass transit systems started out as privately owned businesses. As early as the 1930s, however, they began to lose riders as automobiles proliferated. Trolleys began to disappear in the 1940s as companies such as Firestone Tire began to purchase transit systems and switch them to buses. By the 1960s, privately owned transit collapsed. Rather than allow mass transit to disappear, the federal government began to provide aid, and states and regional authorities stepped in to manage transit.

Funding of public transit systems by the Commonwealth has had a patchwork quality compared to funding of roads and bridges. In contrast to the latter, for which dedicated funds have been established, only 30% of state transit funding is dedicated. This insecurity as to funding sources, in combination with the inadequacy of the level of funding, has been one of the major problems facing transit systems.

In 2005, Governor Edward G. Rendell issued Executive Order No. 2005-1, creating the Transportation Funding and Reform Commission – a bipartisan group of nine members. The Commission was charged with responsibility to develop a long-term solution to the problem of transit funding and also to investigate the structure and magnitude of state funding for roads and bridges. The specific problem of a deteriorating transportation infrastructure was not mentioned in the Executive Order.

The Commission issued its report in November 2006, concluding:

> "*The Commission confirmed that Pennsylvania's public transportation and highway and bridge systems are in crisis, both in terms of inadequate funding for operations, capital improvement, and maintenance, as well as decaying physical conditions. The Commission believes that this funding crisis needs to*

be addressed before the condition of our system further deteriorates”.[27]

Specifically with respect to highways and bridges, the Commission reported that combined state and federal funding were not keeping pace with increases in construction costs. Despite some improvements in the past ten years, a significant number of highways remain in poor condition. In addition, the percentage of bridges in Pennsylvania that are structurally deficient is more than twice the national average, and more than a third of the 21,000 miles of state-owned secondary roads are rated “poor.” Finally, the Commission commented that these repairs will become more costly the longer it takes to find a funding solution.[28]

With regard to the infrastructure of public transit, the Commission noted that funding shortfalls have created an investment backlog. This has prevented transit systems from investing in high return projects, and has made service less reliable and attractive to patrons. All of this results in fewer riders, lower revenues, and higher operating costs.[29]

These findings are consistent with the ASCE report card on infrastructure, which assigned grades of “D” for roads and “D+” for transit to both the U.S. and Pennsylvania. With respect to roads and bridges, ASCE stated that “America has been seriously under-investing in needed road and bridge repairs” and that “total spending of $59.4 billion annually is well below the $94 billion needed annually to improve transportation infrastructure conditions nationally.”[30] Regarding transit, ASCE noted that increased federal investment helped to stem the decline in the condition of transit infrastructure; however, reduced federal support since then combined with revenue being spread more thinly over new systems and existing systems raises serious concerns for the future of transit.[31]

The Transportation Funding and Reform Commission has recommended that the Commonwealth increase funding by $1.7 billion annually to maintain, and make modest improvements to, the transportation infrastructure in Pennsylvania. Among other things, the Commission recommended that the Commonwealth explore leasing the Pennsylvania Turnpike to generate the additional revenue needed. Governor Rendell has expressed a willingness to consider this idea. As of the date of this report, the outcome of additional transportation funding is unclear.

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[27] *Investing in Our Future: Addressing Pennsylvania’s Transportation Funding Crisis,* November 2006.
[28] *Id.*
[29] *Id.*
[30] *ASCE Report Card for America’s Infrastructure,* (section on Roads) 2005.
[31] *Id.* (section on Transit).

The Benefits of a More Comprehensive Approach to Infrastructure

It is clear that concerns over infrastructure are not isolated to any one utility or transportation industry. It also is apparent that there are some common themes in the issues facing the industries: maintenance and improvements are time-consuming and expensive; developing public support is a challenge; government policies in other areas – environmental and land use, for example – often affect infrastructure; public-private partnerships are viewed as a possible solution; and providing enhanced security is a priority since the terrorist attacks of September 11, 2001. These common themes suggest that a more comprehensive approach may be appropriate.

There may be several practical advantages to approaching infrastructure more comprehensively. To the extent the issues are similar in the various industries, it may help to find solutions. It may help to form a critical mass of support to influence public policy. It may facilitate a sharing of best practices within and among the affected industries. It may lead to a pooling of resources to support public education, research, interaction between the private and public sectors, and other constructive efforts. Finally, it may facilitate greater coordination of efforts across industry lines – for example, a greater effort could be made to coordinate road projects with main replacement projects (by one or more utilities) to save money and the inconvenience of tearing up streets.

Public policy in both Pennsylvania and the United States has tended to view each industry segment separately, so that infrastructure issues in, for example, the water industry are evaluated separately from those in other utility or transportation industries. Other countries appear to approach the subject of infrastructure differently. In Australia, for example, several industry groups came together to form "Infrastructure Partnerships Australia" ("IPA").[32] This group encompasses a very broad range of infrastructure categories:

- Property – including sports stadiums and arenas, cultural venues, convention facilities, and even affordable housing.
- Transport – including roads, rails, and ports.
- Social infrastructure – such as schools, hospitals, courts, and prisons.
- Utilities – including natural gas, electricity, water, and telecommunications.

The purposes of IPA are to influence government policies toward infrastructure, to forge better communications and understanding between private infrastructure providers and government, to undertake community education and industry research, and to advocate solutions to infrastructure

[32] Information on IPA can be obtained from its website at www.infrastructure.org.au .

delivery – such as public-private partnerships. There does not appear to be any similar type of organization in the United States.

One example of a modest step toward a more comprehensive approach in the United States is the introduction of legislation to establish a "National Commission on the Infrastructure of the United States."[33] This Commission would have the duty to prepare a study of, among other things, the age and condition of infrastructure, its ability to sustain economic growth, methods to finance maintenance and improvements, who should bear the burden of paying for maintenance and improvements, and trends or innovations in infrastructure procurement methods. The Commission would also have responsibility to recommend a "Federal infrastructure plan." The scope of the term "infrastructure" in the bill includes roads, bridges, highways, mass transit, airports, water and wastewater, waterways, levees, ports, and solid waste disposal facilities. ASCE has lauded the introduction of this legislation.[34]

What specific steps could be taken toward a more comprehensive approach to infrastructure issues in Pennsylvania? The following ideas are submitted for consideration:

- An interested statewide organization or organizations could sponsor a conference to discuss infrastructure issues within each industry, possible solutions, benefits of a comprehensive approach to infrastructure, and additional steps that could be taken to further a comprehensive approach.

- Legislative committees could be encouraged to conduct hearings regarding the infrastructure issues in each industry, and the benefits of a comprehensive approach in establishing infrastructure policies.

- The various industries could organize an informal coalition to address legislative and regulatory issues that affect all of those industries and that must be addressed to support modernization and expansion of infrastructure.

- Utility providers in conjunction with the Department of Transportation and municipalities could form regional teams to coordinate infrastructure projects. These projects may include road reconstruction, bridge replacement and repair, and all types of utility infrastructure projects that affect roads and bridges.

- The various industries could explore formation of a think tank that would concentrate on infrastructure issues. This think tank could be either a stand-alone organization or associated with a university. The

[33] S. 2388, introduced March 8, 2006. Senator George Voinovich (R-OH) recently announced the introduction of similar legislation in the current legislative session, but a bill number is not yet available.
[34] Press release, March 7, 2007, available at www.asce.org.

latter would have the advantage of already possessing significant resources, expertise, and credibility. A think tank could provide a central body of expertise to policymakers, sponsor research, organize conferences, and influence public opinion.

- The various industries could band together to form an organization that would be an advocate for their position on infrastructure issues, similar to Infrastructure Partnerships Australia, discussed above.

This list of possible steps forward is not intended to be exhaustive or prescriptive. Also, as stated in the first bullet above, an initial conference could explore these alternatives as well as other ideas.

Conclusion

Pennsylvania and the United States face major challenges in maintaining and upgrading infrastructure. There is cause for concern that government is not developing policies that will meet these challenges. Some of the reasons are not hard to understand: solving these problems will be very expensive, the general public is not aware of the magnitude of the problems and may not support paying more to address them, and the long-term focus needed to develop sound policy in this area is difficult to sustain given the myriad of other issues confronting policymakers. In addition, our balkanized approach to infrastructure does not help.

Most of our existing infrastructure was built by past generations. They had the vision and made the sacrifices necessary to build things that would benefit not just themselves, but also future generations. The problems that the current generation faces with infrastructure are difficult, but no more challenging than those faced by past generations in putting together the infrastructure in the first place. A more comprehensive approach to infrastructure may be a small step in the direction of meeting our current challenges.

April 4, 2007