

# ECONOMIC COMMENTARY

Federal Reserve Bank of Cleveland

## Public Infrastructure and Economic Development

by Douglas Dalenberg and Randall W. Eberts

The condition of the nation's public capital stock has received much publicity over the past several years. Titles such as *America in Ruins* and *Fragile Foundations* have raised our awareness of the declining state of our nation's public works.<sup>1</sup>

Rather than simply add to this awareness by documenting the deterioration of infrastructure in the Midwest, this *Economic Commentary* discusses the seemingly vicious circle in which many older cities find themselves with regard to public infrastructure and economic development. Cities that have an aging industrial base often find that they cannot afford to maintain or improve their infrastructure because of the heavy demand for welfare programs and the decline in the tax base caused by a sagging local economy.

Analysis shows that public investment is necessary for future local economic development. In many cases, however, cities find themselves in a no-win situation when trying to juggle their budgets. If city governments attend to the immediate welfare needs of the community at the sacrifice of public investment, then these needs will continue to grow as economic development is stifled. If they attend to public infrastructure needs, which can promise more long-term than short-term benefits, then substantial groups within the community may suffer.

One obvious way to break the cycle is for the local economy to begin to grow. Public infrastructure investment provides the essential foundation to support economic development.

### ■ The Extent of the Problem

The Eagle Avenue ramp on the western edge of downtown Cleveland is typical of the problem of public infrastructure deterioration and its effect on urban development. This 58-year-old structure has received considerable attention in the last year. The only convenient major transportation link between two key areas of the city, the ramp was unsafe for several years and without considerable repair would have had to be closed. Closing the ramp would limit access to the surrounding industrial region, threatening to raise the cost of doing business in this area and to cause the possible flight of businesses.

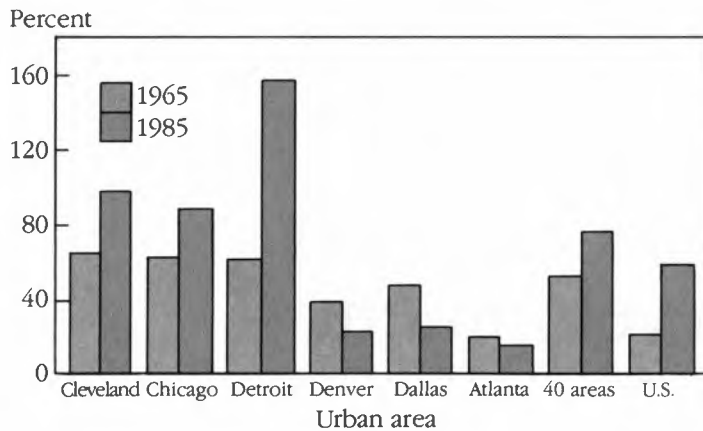
We focus on the Eagle Avenue ramp not because it is unique, but because it is only one example of the thousands of roads, bridges, and other public structures that share a similar condition. Comparable stories could be told about bridges and ramps in Pittsburgh, Chicago, or Detroit that need repair and that in various degrees impede economic activity.

Public infrastructure deterioration has an important effect on urban economic development. Many cities with an aging industrial base are caught between the need to maintain or improve public capital stock and the immediate demand for community welfare programs. Neglecting public infrastructure may make it more difficult for these cities to achieve future economic growth.

This highlights a problem that plagues mature cities. As time passes, the location of economic activities within a city or urban area changes. However, local governments are obliged in many cases to maintain a large portion of the existing infrastructure, even when it is used below capacity. Maintaining the existing capital stock can be a substantial burden.

In the Cleveland area, for example, every dollar that metropolitan governments spend on public infrastructure (such as highways, water treatment and distribution, sewers, or airports) is used just to maintain the

**FIGURE 1 PERCENT OF CURRENT INVESTMENT DOLLAR REQUIRED TO MAINTAIN PUBLIC CAPITAL STOCK**



SOURCE: Authors' calculations based on public capital stock estimates funded by a National Science Foundation Grant to Randall Eberts, Michael Fogarty, and Gary Garofalo; and the Bureau of Economic Analysis gross investment series presented in Michael J. Boskin, Marc S. Robinson, and Alan M. Huber, "New Estimates of State and Local Government Tangible Capital and Net Income," *Working Paper No. 2131*, National Bureau of Economic Research, January 1987.

current stock of public capital at its present level, according to our estimates. This amounts to more than \$50 per person per year.

As can be seen in figure 1, the situation is similar in Chicago: 90 cents of every public investment dollar goes toward keeping public capital stock at its present level. Places that have had a robust economy during the past decade, such as Atlanta, Dallas, and Denver, spend only 20 cents of every dollar to maintain their level of public capital. The national average is about 60 cents per dollar.

The trend is increasing for both the Midwest and the United States. In 1965, it took 60 cents per investment dollar to maintain the level of public capital stock for a typical Midwestern city, while today it requires the entire dollar. For the United States, the

amount has grown from 20 cents to 60 cents. Thus, while most cities in the nation are adding to their infrastructure, many Midwestern cities are disinvesting in public capital, or are at best holding on to what they created in the past.

Mature cities tend to spend most of their public investment dollar to keep public capital at its current level for two reasons. First, these cities simply have a greater stock per person, due to a longer history of accumulating stock or due to a population decline. Second, their public works expenditures are decreasing, especially with respect to the existing capital stock.

Another way to view the problem facing older industrial cities is to look at the age of their public capital stock. One measure of age is the percent of current capital stock put in place within the last 15 years. As shown in figure 2, the average for 40 urban areas is 37 percent. For Cleveland and Chicago the value is about 20 percent—almost half the sample average. In contrast, Atlanta and Dallas have had more than 40 percent of their capital stock built since 1970.

This difference in age across various types of cities is disturbing not only with respect to the condition of capital stock in cities like Cleveland, but also with respect to the ability of local areas to adapt to changing demands for infrastructure. Not only does the spatial demand for infrastructure change, but the demand for the various types of infrastructure also varies. Suburban airports have replaced downtown railroad stations; freeways have replaced trolley systems; and an information-based economy is encroaching on a material-processing economy. Thus, lack of discretion in how limited funds can be spent is a serious problem for older cities in their efforts to position themselves for future economic development.

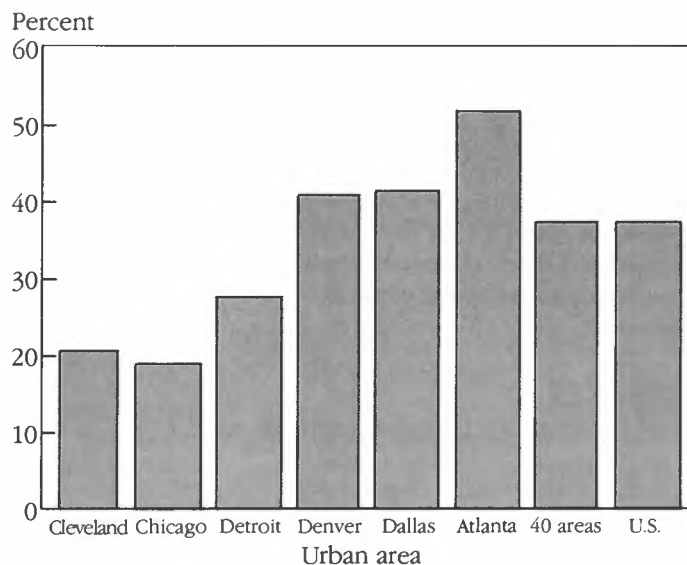
#### ■ The Importance of Public Infrastructure to Economic Development

The importance of public infrastructure to economic development might be captured in one business owner's response to the possible closing of Cleveland's Eagle Avenue ramp: "The ramp is the only viable way for my East Side customers to find me."<sup>2</sup> When the ramp did close for repairs, no businesses reportedly shut down. It is not clear, however, what would have happened had the ramp closed permanently.

Implicit in much of the discussion of the need for public infrastructure is the belief that deterioration in the quality of a city's public capital stock reduces the city's attractiveness to firms and residents, stifling economic development, productivity, and the creation of jobs. Furthermore, policymakers concerned with regional issues have claimed for years that public infrastructure investment is one of the primary means to implement a regional growth strategy.

Empirical studies support the established intuition that public infrastructure plays an important role in economic development. In general,

**FIGURE 2 PERCENT OF CURRENT PUBLIC CAPITAL STOCK PUT IN PLACE SINCE 1970**



SOURCE: See figure 1.

studies show that public infrastructure investment affects the growth rate of a region as measured by personal income.<sup>3</sup>

The effect of public infrastructure on economic development can come through various channels. Research has found that the level of public infrastructure significantly affects manufacturing output in metropolitan areas.<sup>4</sup> Studies also show that public investment stimulates private investment, both in local economies and at the national level.<sup>5</sup>

Of particular importance to the issues discussed here is the finding that public investment has a greater effect on net capital formation in distressed cities than in growing cities.<sup>6</sup> Furthermore, studies show that specific types of infrastructure, such as transportation and communication, have a larger effect on economic growth than do other types of infrastructure.<sup>7</sup>

If public infrastructure indeed provides important services to the private sector, then another way to measure the condition of the nation's infrastructure is to compare the growth of public investment to private investment. We find that the annual rate of

public works investment versus private manufacturing investment in U.S. cities has declined steadily since the 1950s. Between 1958 and 1978, manufacturing private capital stock has grown at an annual rate of 2.7 percent, while public capital stock has grown at an annual rate of 1.6 percent.<sup>8</sup> These trends cast doubt on the ability of current levels of infrastructure to support future economic expansion.

#### ■ Sources of the Problem

The reasons for the general decay of the nation's infrastructure are many and varied, and no single factor can be blamed. For Cleveland and cities like it, much of the problem can be traced to an aging industrial base, which wields a double-edged sword, both reducing the fiscal base and increasing the need for welfare programs.

In many cities, immediate welfare needs have supplanted the longer-run benefits of public investment programs. For example, poverty-related social expenditures per capita in Cleveland increased 55 percent from 1977 to 1985, while the average of

these expenditures for a representative sample of 37 large urban areas increased only 13 percent. Meanwhile, per capita expenditures on development services in Cleveland fell 6 percent over the same period, while the average in other urban areas increased 10 percent.<sup>9</sup>

While needs have increased and local resources have declined, federal assistance has fallen. Federal grants-in-aid have dropped to 20 percent of local government receipts in 1985 from a high of 30 percent in the late 1970s. This percentage matches the federal government's role in 1965, which predates major federal initiatives such as the Clean Air and Water acts, general revenue sharing, and many block grant programs. The states have picked up about half of the loss of federal funds, but local governments must absorb the shortfall through some combination of raising additional revenues, eliminating services, cutting back on welfare transfers, or reducing public investment.

The greatest impact of reduced federal assistance to local governments has been on infrastructure projects, primarily because of the way in which various levels of government have assumed responsibility for public works. Local governments are responsible for construction of over 50 percent of the public works investment in the country, and this percentage is growing. More than half of the financing for these projects comes from federal grants, however, and this percentage is declining.

The federal budget for 1988 and the proposed budget for 1989 have further reduced some of the key public works programs and have called for the elimination of others, including Urban Development and Assistance Grants and the Economic Development Administration. Highway funding is the only area that remains unscathed, partly because its expenditures come from a trust fund and do not compete for funds from the general budget.

Overall, the 1988 budget called for a 14.3 percent real decline in community and regional development outlays, and an 8.8 percent real decline in transportation outlays.<sup>10</sup> Thus, as the needs of many older cities grow and as local sources of funds to meet these needs dwindle, the federal government is playing a smaller role in financing local public works projects.

#### ■ Conclusion

The Eagle Avenue ramp is currently under repair, with financing comprised largely of federal funds. Once reopened, the ramp will provide an important access to one of Cleveland's industrial areas. While this renovation does not promise to bring new growth to an area that has lagged behind the national average during the last decade, it is nonetheless necessary for the routine operations of a local economy.

The solution to other infrastructure problems may not be as easy. Metropolitan governments are faced with some very difficult trade-offs between the long-run development of the city and the short-run well-being of subgroups of its population.

Public infrastructure is an important factor in urban economic development. Whether local governments can carry a large part of the burden of financing public investment without severely curtailing other necessary programs is not clear. What is clear is that the longer public works improvements are neglected, the harder it will be to break the cycle between deteriorating infrastructure and economic growth.

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*The views stated herein are those of the authors and not necessarily those of the Federal Reserve Bank of Cleveland or of the Board of Governors of the Federal Reserve System.*

#### ■ Footnotes

1. Pat Choate and Susan Walter, *America in Ruins: Beyond the Public Works Pork Barrel*, Washington, D.C.: Council of State Planning Agencies, 1981; and National Council on Public Works Improvement, *Fragile Foundations: A Report on America's Public Works*, Washington, D.C.: U.S. Government Printing Office, February 1988.

2. Shuara Wilson, "Span Closing Hurts Few Firms," *Crain's Cleveland Business*, September 28, 1987, p. 18.

3. Teresa Garcia-Mila and Therese J. McGuire, "The Contribution of Publicly Provided Inputs to States' Economies," *Working Paper* No. 292, State University of New York at Stony Brook, Department of Economics, July 1987.

4. Randall W. Eberts, "Estimating the Contribution of Urban Public Capital Stock to Regional Growth," unpublished revision of *Working Paper* 8610, Federal Reserve Bank of Cleveland, December 1986.

5. Randall W. Eberts and Michael S. Fogarty, "Estimating the Relationship Between Local Public and Private Investment," *Working Paper* 8703, Federal Reserve Bank of Cleveland, May 1987; and David Alan Aschauer, "Is the Public Capital Stock too Low?" *Chicago Fed Letter*, Federal Reserve Bank of Chicago, October 1987, No. 2.

6. Kevin Deno, "The Short Run Relationship Between Investment in Public Infrastructure and the Formation of Private Capital," unpublished doctoral dissertation, University of Oregon, 1986.

7. Koichi Mera, *Income Distribution and Regional Development*, Tokyo: University of Tokyo Press, 1975.

8. Eberts (1986), op. cit.

9. The Center for Regional Economic Issues, "A Primer on the Cleveland Area's Fiscal Environment: Charts and Tables," *REI Program Paper*, October 1987.

10. Northeast-Midwest Congressional Coalition, "The Budget and the Region," Washington, D.C.: Northeast-Midwest Institute, February 1987.

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