

# Macroeconomic Impact of U.S Infrastructure Investment or Lack of Investment

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**Abstract.** Now the infrastructure in the United States is beginning to age and damage, and it has begun to affect people's daily lives and the country's economy. These issues have become issues that the U.S. government needs to take seriously, so this study was born. This paper mainly conducts analysis and research through the analysis of the case and the report of the official data. The study points to a decline in U.S. government investment in U.S. infrastructure and neglect to maintain a large amount of aging infrastructure. In this regard, this study proposes to maintain the old bridges, subways, wastewater treatment facilities, etc., and strengthen the infrastructure investments in low-income areas to provide a better environment for people to live in. The significance of this research is to attach importance to the construction and maintenance of infrastructure, which is not only for the country's economic prosperity, but also for the people of the country to live and work in peace and contentment. Infrastructure is a very important part of a country's economy and cannot be ignored.

**Keywords:** Infrastructure Investment; United States; Macroeconomic.

## 1. Introduction

Since the Great Recession, the economy has gradually recovered and enabling states to plan for long-term intergenerational equality. Infrastructure investment is crucial to the nation's economic success. A dollar in infrastructure investment would result in \$1.00 to 2.50 in GDP growth, according to the Congressional Budget Office. This paper will analyze why the United States needs to increase infrastructure investment and what kind of impact it will bring to the United States. Many recent studies have focused on the problem of investments in infrastructure. State and local government spending on all forms of capital fell from 3% of the country's GDP in the late 1960s to less than 2% in 2017(McNichol), which may have resulted in lower quality of life in the future. Since much of state infrastructure, like roads and water systems, was built after World War II, they are in urgent need of repair. If the state and local governments fail to act now will cost more and more in the future [1]. Infrastructure facilitates economic operations. The transportation of products is inseparable from railways. Residents can't live without schools and hospitals. Building and repairing infrastructure can improve the economy and thus provide employment opportunities, increase productivity, and finance investment opportunities. To have the largest payoff, funding requirements differ from state to state where infrastructure is lacking in both quantity and quality.

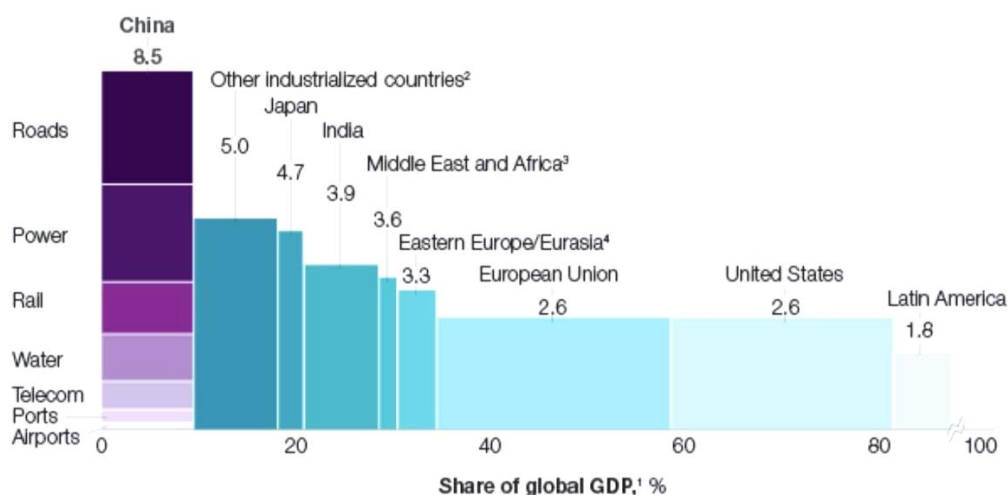
This article focused on the macroeconomic impact of infrastructure investment in the US under the circumstance of the aging infrastructure in the United States and the decreasing investment in infrastructure by federal and state governments. Not only analyzes the theoretical mechanism, but also combines the current situation and demand of infrastructure development in the US. This paper first analyzes the different marginal benefits of infrastructure in China and the United States, and then discusses why the United States government does not pay high attention to long-term infrastructure construction and the consequences of that. It then focuses on why infrastructure is still important to the United States and how should the government respond at the end.

The innovation of this paper is that the infrastructure not only includes economic growth infrastructure such as railways and bridges, but also adds social infrastructure such as schools and parks which can improve the happiness of life for citizens. At the same time, this paper also has many deficiencies. Firstly, the theoretical analysis can be more in-depth, and secondly, the selection of indicators and data can be more optimized. In addition, the different situations faced by different states in the United States can also be more specific analysis.

## 2. Case Description

Infrastructure is an important support for economic and social development. In the short term, infrastructure investment, especially major water conservancy projects, attracts large investments, has a long industrial chain, and creates many employment opportunities, which will help stabilize the macroeconomic market. In the long run, comprehensively strengthening infrastructure investment will help ensure national security, expand domestic demand, and promote high-quality development.

Infrastructure Investment has a marginal effect. For example, there was a Country A like China in 1992-2011, at that time, China has produced a powerful politician. The domestic political situation is relatively stable, and has a certain educational foundation. In this case, the marginal effect of infrastructure is very good, because infrastructure is the foundation of economic development, especially electricity, transportation, etc., which have a great role to enhance economic development. This kind of infrastructure has a very good effect on driving GDP. Like China more than ten years ago, one dollar of infrastructure can drive several dollars of GDP as shown in Figure 1.



**Fig. 1** Sum went through on foundation from 1992-2011, weighted normal 8.5% of country's GDP.

At present, China has put out 8.5 percent of GDP of infrastructure, it's much more than any other country spends. Infrastructure development remains a need for the Chinese government, which has continuously known that the cutting-edge economy is inseparably connected to transportation, electricity, and telecommunications. From the late 1990s to 2005, 100 million Chinese profited from power and broadcast communications updates. Between 2001 and 2004, speculation in country streets developed by a gigantic 51 percent every year. The substantial GDP growth brought by infrastructure to China also shows the importance of infrastructure to economic growth [2].

But for a Country B like the United States whose infrastructure has been built a lot, marginal effect of infrastructure is not that high, because over time, the old infrastructure began to be scrapped and affected people's daily life, which also affected the country's economy. Therefore, the US government has not put too much emphasis on long-term infrastructure, but this has led to many hidden problems. The new report of American society of civil engineers indicated that in the event that the U.S. does not pay its late infrastructure bill, by 2039 the U.S. economy will lose \$10 trillion in development and sends out will decay by \$2.4 trillion. More than 3 million occupations will be misplaced in 2039.

In expansion, each American family will bear \$3,300 in covered up costs per year [3]. This will have a big impact on the US economy. Therefore, if the U.S. government does not pay attention to infrastructure, it may pay a heavy price for it as shown in Table 1.

**Table 1.** 2021 Infrastructure Report Card

| Infrastructure System                   | Total Needs | Funded | Funding Gap |
|-----------------------------------------|-------------|--------|-------------|
| Surface Transportation                  | \$2834      | \$1619 | \$1215      |
| Drinking<br>Water/Wastewater/Stormwater | \$1045      | \$611  | \$434       |
| Electricity                             | \$637       | \$440  | \$197       |
| Airports                                | \$237       | \$ 126 | \$111       |
| Island Waterways & Marine Ports         | \$42        | \$ 17  | \$25        |
| Dams                                    | \$94        | \$13   | \$81        |
| Hazardous & Solid Waste                 | \$21        | \$14   | \$7         |
| Levees                                  | \$80        | \$10   | \$70        |
| Public Parks & Recreation               | \$76        | \$10   | \$68        |
| Schools                                 | \$870       | \$490  | \$380       |
| TOTALS                                  | \$5937      | \$3350 | \$2588      |

The above discussion is about the most basic infrastructure, it does not mean that infrastructure has lost its role in stimulating the economy for the United States. In the current era, with the continuous innovation and development of science and technology, developed countries have begun to have more and more high-tech infrastructure. For example, the United States has made breakthroughs in technology. One research analysis predicts that the US government created the high-tech infrastructure called Materials Genome Initiative (MGI) consisting of a range of policy tools that can be used to improve research and production efficiency. And the potential economic benefit of \$123 billion to \$270 billion per year from improved materials innovation infrastructure. This study fully reflects the huge benefits that high-tech infrastructure has brought to the national economy, and has a very important role in promoting economic development. And the changes brought about by technological progress will increase the marginal effect of infrastructure construction again [4].

### 3. Analysis on the Problems

#### 3.1 Decrepit Infrastructure

The United States built hundreds of airports and bridges, massive public transport routes, a whole network of waterworks, and other convenient infrastructure to restore the economy from World War II in the last century. After so many years, according to the latest report from the American Society of Vicil Engineers (ASCE), The United States Infrastructure Scores a C- overall in 2021 [5]. Although it improved compared with D+ in 2017 and 2013, the issue of deficient funding is getting to be increasingly genuine. The engineers indicated that by 2039, America's past due infrastructure charge will take a toll on the normal American family of \$3,300 a year, or \$63 a week. Poor airports and surface transportation will increase travel time and cost. The old water conservancy system will lead

to the waste of water resources, which is not environmentally friendly. Unmaintained power projects may have potential safety hazards. In general, the infrastructure is in urgent need of repair.

### **3.2 Imbalanced Regional Distribution and Imbalanced Structure**

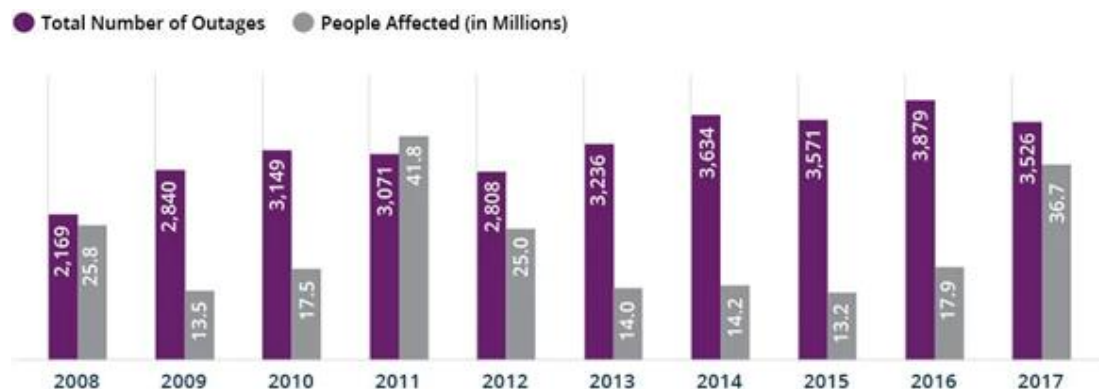
Based on the different conditions of different states, the investment varies primarily by states. Because the different population and city size of each city will lead to different demands on infrastructure. Infrastructure projects with distinct landforms and climates are also at variance. For example, in a metropolis like New York, the subway traffic is huge every day, and it needs funding to repair. But in a state like Maine, the population of any city is not enough to build a subway, because the cost is too high.

### **3.3 Low Efficiency**

The labor cost in the United States is quite expensive and the construction time is long. It usually takes years or even decades to complete the construction. This has made it more difficult to repair the old infrastructure. It will take many years if the infrastructure is to be built and repaired. For example, the Central Artery/Tunnel Project (CA/T), commonly known as "the Big Dig", is a 1.5-mile central tunnel project in Boston. It started construction in 1991 of the last centuries and was initially planned to be completed in 1998. At that time, the estimated cost was \$2.8 billion. It was not until 2006 that the main works were completed, and by 2006, the cost had exceeded 14.6 billion dollars. If an immediate effect is demanded, it is feasible by addressing the symptoms rather than the root causes, such as upgrading a few buses. But the issue still exists and will end up increasingly serious.

### **3.4 Infrastructure Importance Analysis**

Concrete, steel, and fiber optic cables are an imperative portion of the economy. Framework speculation encourages exchange, interfaces laborers to their occupations, makes openings for battling communities, and secures nations from a progressively eccentric normal environment. From private venture in broadcast communications frameworks, broadband systems, cargo rail, vitality ventures and pipelines, to open investing on transportation, water, buildings and parks, framework is the spine of a solid economy. It moreover bolsters laborers for millions of occupations each year for development and upkeep. The economy needs solid foundation to associate supply chains and productively exchange products and administrations over borders. Foundation interfaces families in metropolitan zones to higher-quality business, wellbeing care, and instructive openings. So, the same financial rationale applies to broadband systems, water frameworks, and vitality generation and dissemination. Sensational statistic and social changes such as maturing and expanding social orders, contracting family sizes and inner movement have highlighted the require for modern transportation and broadcast communications to associate individuals and communities. Not like Western Europe and parts of Asia, the numbers of population in the United States are still increasing. The U.S. has included 25 million individuals over the past 10 a long time. This gigantic development concentrated within the 50 biggest metropolitan ranges will put modern requests on an as of now overburdened foundation. The current state of the U.S. lattice highlights the unavoidable maturing of foundation resources. Agreeing to the 2021 Foundation Report Card discharged by the American Society of Civil Engineers, 70% of U.S. transmission and dissemination frameworks are within the moment half of their life cycle [6]. As a result, there have been different control blackouts over the nation as of late which have influenced an expansive number of clients over the nation as appeared in Figure 2 [7].



**Fig. 2** U.S. repeatedly challenged by power outages

At present, many utility operators in the United States still adopt public ownership and are operated by federal, state, or municipal governments. At the same time, the debt burden of advanced economies around the world has reached an all-time high. This trend was in place long before the COVID-19 pandemic and the resulting economic shutdown. Demographic imbalances (including shrinking and aging populations), expansion of welfare programs, and a prolonged low-interest-rate environment that spurred borrowing have led to unprecedented government deficits in the U.S. and many EU countries as shown in Figure 3[8].



**Fig. 3** 2017-2020 Government Deficit.

After the outbreak of the COVID-19 epidemic, the government's financial pressure has further increased which makes this problem become even worse. In the field of infrastructure, many traditional asset operators are facing a huge funding gap for system maintenance. For example, the American Society of Civil Engineers estimates that the cumulative funding gap in the United States will reach a total of \$2.5 trillion between 2020 and 2029 as shown in Table 1 [9].

Late Friday on November 5 in 2021, the House passed the Senate adaptation of the Foundation Venture and Occupations Act (IIJA). The U.S. at long last incorporates a generation-defining framework charge and in case the settlement budget moreover passes, the U.S. will begin a greater development than it did amid the Modern Bargain. The \$1.2 trillion charge contains an evaluated \$550 billion in modern investing over the standard. This investing touches all ranges of foundation from transportation, water to vitality, broadband, and the versatility and restoration of our nation's characteristic assets. In spite of the fact that the most numbers from the Senate rundown appeared us the common drift in subsidizing allotments, more than half of the modern spendings is transportation focused and the size of these ventures needs advance investigate. The charge is additionally wide in scope counting policy reforms and subsidizing for hundreds of programs. Numerous of these programs have existed for decades just like the Clean Water and Drinking Water State Rotating Fund.

Concurring to Bipartisan Foundation Speculation and Occupations Act rundown, modern ventures are too being channeled through these existing frameworks such as an extra \$15 billion for the Drinking Water State Rotating Finance reserved for supplanting major benefit lines as appeared in Figure 4 [10].

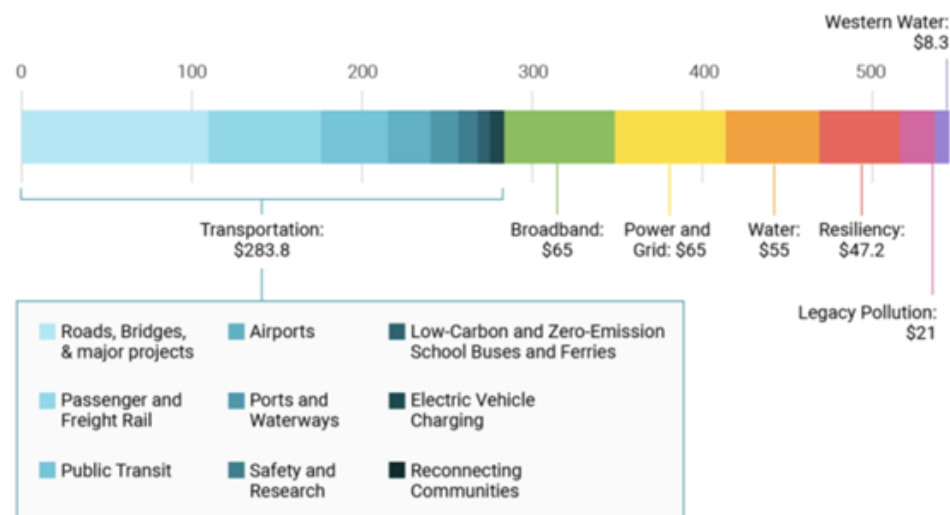


Fig. 4 The scale of infrastructure construction

## 4. Suggestion

Other than financial benefits, well-designed ventures in parks, libraries, schools, and way better streets and open transportation can make strides residents' quality of life. There are moreover numerous ways to progress the country's environment by contributing in "green" innovations for squander transfer, vitality generation and open transport.

### 4.1 Improving the Quality of Life

Modern and progressed open offices can bring less self-evident but exceptionally practical benefits to state inhabitants. For illustration, the children are taught in up-to-date and uncrowded schools that offer the most recent innovation, great sports preparing, and expressions offices. Perhaps the way a community makes strides can be troublesome to degree. Such speculations can extend the openings for children and upgrade their learning encounter. The quality of life in a region moreover will increment when individuals have simply get to advanced libraries and parks. Well-maintained streets, bridges and open transportations make commutes smoother which make strides the complete trade and quality of life.

### 4.2 Better Environment

Numerous sorts of open foundation play a critical part in keeping up and making strides the complete country's environment. States can make strides neighborhood and territorial situations by carefully planning modern control plants, open transportation, and wastewater treatment offices. These benefits to states and domains are exceptionally realistic even on the off chance that they do not continuously show up within the commonplace measures of financial development and efficiency in framework impacts. A cleaner environment can make strides the solid quality of inhabitants and move forward the quality of life by giving places for amusement and natural life for citizens.

### 4.3 Provide Opportunities for Everyone

A major reason for open instead of private venture in framework is to guarantee that individuals of all wage levels have get to conveniences such as great streets, schools, and clinics. The private division cannot be depended upon to supply a speculation when the returns on a venture are spread

out in time and put that it is inconceivable to urge benefit from it. So, it is up to all levels of government to guarantee break even with get to. A few poorer ranges frequently have obsolete framework past schools. Hence, states ought to increment ventures in low-income areas.

## 5. Conclusion

Now, the United States are facing a demographic, economic, environmental, and technical period. However, this change presents good opportunities. Also, there are great challenges such as environmental sustainability and social problems. Furthermore, infrastructure is a way of advancing national priorities and achieving national goals, but so far it has been rarely considered outside of a project-by-project perspective. And educate are driven by pork and legislative issues, not approach. Tragically, the total negative impacts of broken frameworks begin to have noteworthy impacts. Still, development is happening within the private segment at metropolitan level and national level. As Representative Vilsack said, the states have to be back a framework vision of national needs: financial development, natural sustainability, and social consideration. The vision ought to be results-driven, evidence-based, and be able to attain these objectives within the long run.

From a comprehensive perspective, unlike the expectation of the infrastructure investment effect, the economic measure fails. However, with the development of the technology, this situation will no longer exist. In other words, technological progress will increase the marginal effect of infrastructure again. The infrastructure of the United States is basically able to meet the needs of the people but analyzing from a larger economic scale of the United States, the infrastructure still needs to be improved if the country wants to become better and stronger. At the same time, some poor countries' infrastructure is already outdated. If the government keeps putting the same amounts of the investment in those areas, it will not be as efficient as others which mean the government should change the policies and try to improve the infrastructure investment in these areas.

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