

## Market Trends of America's Infrastructure by States

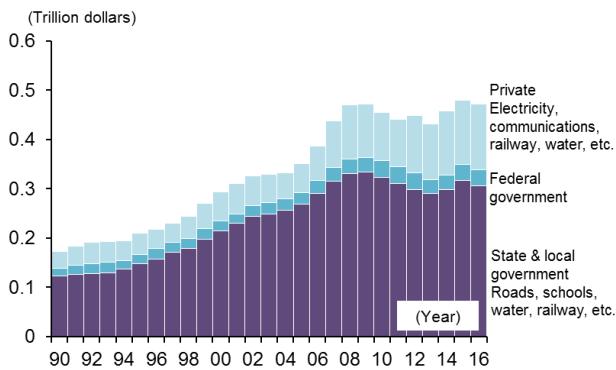
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### Introduction

The social infrastructure (hereinafter, infrastructure) market of the US is 472.2 billion dollars (approximately 52 trillion yen, 2016) which is over three times the size of the Japanese market. Due to the recent aging of infrastructure caused by stagnant investment following the financial crisis, the need for infrastructure maintenance and upgrading is increasing.

Currently, the federal government is discussing an infrastructure policy using private funds while state and local governments mainly pay the cost of infrastructure maintenance (approximately 65%, 2016, Fig. 1). Private investment in infrastructure has been on the rise mainly in projects with expectations of profitability such as electricity, communications, and railways, and accounts for approximately 28% of investment. On the other hand, infrastructure investment by the federal government remains at approximately 7%.



Prepared by Hitachi Research Institute based on data from the Bureau of Economic Analysis, US Department of Commerce

Figure 1 Infrastructure Market Size of the US

Hitachi Research Institute evaluated and ranked opportunities for Japanese companies to enter the infrastructure market of 50 American states and Washington D.C. according to three evaluation criteria, namely, (1) Market size, (2) Environmental policy trends, and (3) Use of private funds (Table 1).

The reasoning for these criteria is as follows. For (1)

Market size, there is a direct connection to opportunities for market entry by Japanese companies. (2) Environmental policy trends of each state also affect whether or not Japanese companies are able to differentiate themselves with proprietary, high-level, environment-related technologies. If the states set more rigid environmental standards than the federal government and appreciate business proposals to reduce the environmental load, market entry by Japanese companies in these states will have high potential. In addition, for (3) Use of private funds as well, the establishment of PPP (Public Private Partnership) schemes is considered necessary for Japanese companies to enter the market, therefore, the use of private funds also affects market entry opportunities. In reality, the establishment status of PPP schemes and target range significantly differ by state.

The overall situation of the 50 states and Washington D.C. for the three evaluation criteria is discussed and characteristic states are addressed below.

Table 1 Evaluation Criteria of Infrastructure Market Entry Opportunities for Japanese Companies in Each State

Evaluation Items	Points	Details	Criteria
Infrastructure market size [10 points]	5.0	• Annual infrastructure investment monetary amount	Evaluation by 5 levels. The state with the largest investment monetary amount is ranked the highest.
	5.0	• Population increase rate	Evaluation by 5 levels. The state with the highest population increase rate is ranked the highest.
Environmental policy [10 points]	2.5	• Paris Agreement compliance	Evaluation by whether or not the state is a member of the United States Climate Alliance.
	2.5	• Formulation of renewable energy percentage (Renewable Portfolio Standard)	Evaluation by 4 levels. The state with the highest renewable energy percentage is ranked the highest.
	2.5	• Formulation of energy efficiency performance standards for commercial buildings	Evaluation by 5 levels. The state with the strictest standards is ranked the highest.
	2.5	• Efficient use of water resource	Evaluation by 5 levels. The state with the highest efficiency is ranked the highest.
Use of private funds [10 points]	10.0	• Establishment of a legal system related to Public Private Partnerships	Evaluation in five fields, namely, roads, power generation, power transmission and distribution, urban transportation, and water and sewage (2 points each).

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## 1. Infrastructure Market Size

Future expansion of the infrastructure market is expected in states with a large market size and relatively high population increase rate. In terms of annual infrastructure investment value, California stands out with 64.6 billion dollars (approximately 7 trillion yen, 2015). California is followed by New York with 45.5 billion dollars (approximately 5 trillion yen), Texas with 33 billion dollars (approximately 4 trillion yen), and Florida with 23.7 billion dollars (approximately 3 trillion yen). If we compare the population growth rate of each state for the past 10 years (2006 to 2016), Texas (18.7%), where industries such as petrochemical and aircraft have been growing, is at the top, while North Dakota and Washington D.C. follow. A growing rate of population is also seen in California (9.1%).

## 2. Environmental Policy

### 2.1 Compliance with the Paris Agreement

In June 2017, the federal government withdrew from the Paris Agreement, which is an international framework of climate change countermeasures, yet the states of New York, California, and Washington established the “United States Climate Alliance” in the same month. As of January 2018, 14 states comprised of mainly east coast states including Massachusetts and Virginia are member states, and the climate alliance aims for compliance of the promises of the US in the Paris Agreement such as a reduction of a certain amount of CO<sup>2</sup> emissions. In these states, the demand is increasing for clean energy infrastructure including power-generating facilities that do not discharge CO<sup>2</sup>.

### 2.2 Percentage of Renewable Energy

A system that mandates the use of a certain amount of renewable energy by electric power suppliers (Renewable Portfolio Standard, hereinafter, RPS) is stipulated in 30 states. Each state decides its own goals for values and year. Hawaii has set a high target of achieving 100% renewable energy by 2045. The State of California set a renewable energy target of 50% of generated electricity by 2030 and aims for further increases in its renewable energy percentage. Texas has already achieved its RPS target in 2015 with wind

power generation, and the state accounts for the largest portion of renewable energy production in terms of quantity (21%, 2015) in the US. In states with high RPS goals, an expansion of the demand for infrastructure related to the generation and distribution of renewable energy such as solar power and wind power is expected according to the characteristics of each state including the amount of sunlight and wind range.

### 2.3 Energy Efficiency Performance Standards for Commercial Buildings

Approximately 40% of energy in the US is consumed within buildings, and in particular, large buildings such as commercial buildings use large amounts of energy. California, Washington, Massachusetts, Vermont, and many other states are proactively working on the energy efficiency of buildings, and the demand for energy efficiency-related infrastructure has been on the rise. ASHRAE 90.1 (formulated by the American Society of Heating, Refrigerating and Air-Conditioning Engineers) is an energy efficiency model standard and sets forth energy efficiency performance of commercial buildings, more specifically, temperature, humidity, insulation of outside walls, and brightness of lighting, etc. ASHRAE 90.1 is being upwardly revised every three years by the federal government. State governments may decide which yearly version of ASHRAE 90.1 that they will adopt. The State of California has set a goal of zero net energy in all commercial buildings by 2030 and has adopted the latest federal standards. Furthermore, the state has set the strictest standards on its own.

### 2.4 Efficient Use of Water Resources

Many inland states including Idaho, Nebraska, and Missouri have low interest in the conservation and efficient use of water resources. On the other hand, in addition to California and Texas where the demand for water has been growing due to the increase in population, Arizona, Washington, and Rhode Island have been promoting measures for the efficient use of water resources such as the establishment of drinking water protection organizations, restrictions on the amount of water used by household devices, and regulations on water efficiency in buildings.

Furthermore, local governments must formulate a water conservation plan and obtain approval from the state government. The states are also offering their own financial support programs. In this way, these states are carrying out measures for water resource conservation. In addition, the introduction of desalination infrastructure to secure drinking water and daily life water is also progressing in these states.

### 3. Use of Private Funds

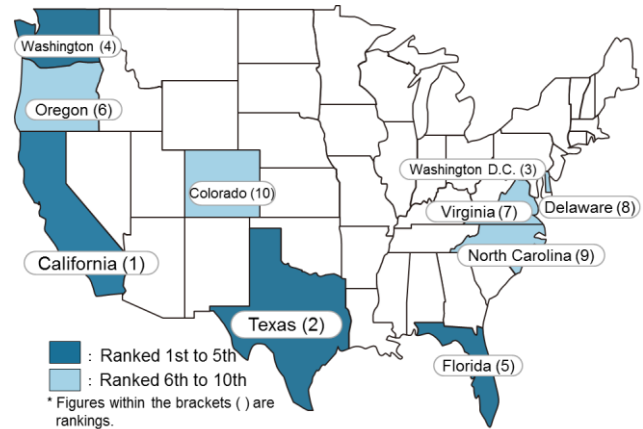
Since the financial crisis of 2008, infrastructure investment by state and local governments has decreased due to revenue shortfalls caused by declines in tax revenue while new establishment, maintenance, and upgrading of toll roads, water, and sewerage from the use of private funds (PPP) has spread. As a result, we are now seeing creative measures for agreement methods as illustrated by availability agreements. In an availability agreement, consideration is paid by maintaining a certain level of services and operation of equipment even in projects where profitability is difficult to secure. 37 states established legal systems related to PPP as of January 2017. While in many states PPPs are only for toll road projects, in California, Texas, and Washington D.C., PPP targets power generation, urban transportation, and water and sewage as well, and an environment for flexibly using private funds for infrastructure development has been established.

### Conclusion: Ranking of Evaluation Results

Based on these analyses, California, Texas, and Washington D.C. are considered to have infrastructure markets that have many opportunities for Japanese companies to enter (Fig. 2).

California is proactive in the formulation of PPP schemes and the introduction of renewable energy and energy efficiency, and recently, due to a water shortage, efforts for the desalination of underground water with high salt levels are progressing. Texas has also been promoting PPP projects in the backdrop of water shortages, and in order to lessen the impact on the environment from the petrochemical industry, the state has been working on the use of renewable energy such as wind power and energy efficiency measures.

One could say these advanced states that have set high environmental standards are markets with many opportunities for Japanese companies to enter. Hitachi Research Institute will continue to study infrastructure market trends in the US through trend analysis of state and local governments.



Scores of Top 10 States (Full Mark: 30 points)					
1	California	25.4	6	Oregon	16.1
2	Texas	23.1	7	Virginia	15.5
3	Washington D.C.	20.2	8	Delaware	14.3
4	Washington	16.6	9	North Carolina	13.3
5	Florida	16.6	10	Colorado	13.1

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 Figure 2 Ranking of Prospective American States' Infrastructure Markets for Japanese Companies