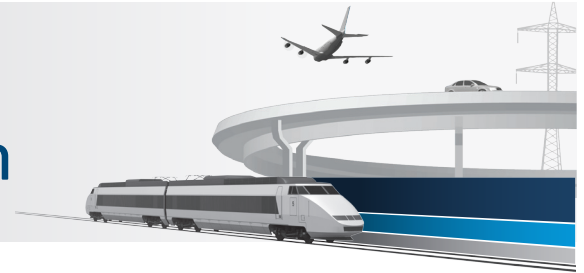


February 2018

Global Listed Infrastructure

Make America Great Again – listed infrastructure has a plan



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Introduction

Infrastructure in the United States today feels like the opening line of Charles Dickens' *A Tale of Two Cities*: "It was the best of times, it was the worst of times". Many segments of the US infrastructure market are working well while other segments suffer from chronic under-investment. We believe that a large part of this disparity can be explained by differences in funding models and ownership structures. The Global Listed Infrastructure asset class plays a large role in the US.

This article looks at the ownership profiles of different US infrastructure segments; and at the performance of those segments. It also discusses the ways that global listed infrastructure companies are providing solutions, and what impact President Trump may have on the sector.

US infrastructure ownership

The US is a large, diverse and complex country with an infrastructure sector to match. The degree of government versus private sector ownership of infrastructure assets in the US varies considerably by sector. The table below compares ownership across different infrastructure sectors.

Three infrastructure sectors – freight rail, oil & gas pipelines and mobile towers – are almost exclusively owned by the private sector. In another four sectors – electric utilities, gas utilities, waste and satellites – ownership is dominated by the private sector, although significant levels of government ownership remains (including the US\$50 billion Tennessee Valley Authority and the US\$25 billion Bonneville Power Administration).

Sea ports are a mixed business model. Port authorities are government-owned, but operated by the private sector. Ownership of water utilities is dominated by local government with the private sector being a small, albeit growing, player. The road, airport and passenger rail sectors are almost exclusively owned by different levels of government.

Ownership of US infrastructure assets

	Public sector owned	Private sector owned
Electric utilities	15% government (federal & local)	70% privately owned, 15% Rural co-ops
Gas utilities	Small minority local government owned	Vast majority privately owned
Water utilities	85% local government owned	15% privately owned
Waste	25% local government owned	75% privately owned
Roads	Almost all local, state & federal government owned	20 privately owned toll roads
Airports	All but one is owned by local, state or federal governments	San Juan (PR) & several Public-private partnerships (PPPs)
Sea Ports	Port authorities owned by local & state governments	Stevedore & terminal management predominately private sector
Freight rail		All privately owned
Passenger rail	Federal government (Amtrak) for long distance trains Local and state government owned metropolitan trains	Several small PPPs
Oil & gas pipelines		All privately owned
Mobile towers		All privately owned
Satellites	Minority federal government owned including GPS, NASA & DoD satellites	Majority privately owned

Source: Industry associations & First State Investments estimates

Performance of US infrastructure

In the World Bank’s 2016-17 Global Competitiveness Index, the US ranks 3rd in overall competitiveness, but only 11th in Infrastructure.

This Infrastructure ranking is behind Japan (5th), France (7th), Germany (8th) and the United Kingdom (9th), but ahead of Canada (15th), Australia (17th) and China (42nd). While the overall ranking is solid, we believe great disparities exist in the quality of infrastructure within the US.

The American Society of Civil Engineers (ASCE) produces an annual report card on US infrastructure. The 2017 grade was D+ (from a potential A to F range), which they define as being “Poor, at risk”. The table below compares ASCE’s sector grades against ownership type. It shows a clear link between private ownership and better grades.

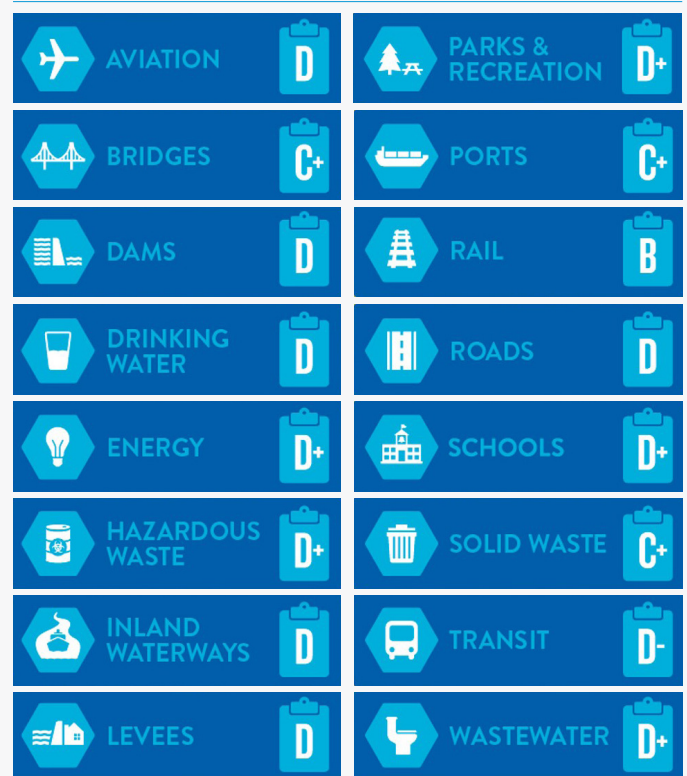
Ownership and quality of US infrastructure assets

	Ownership	ASCE 2017 report card grade (A-F)
Freight rail	All privately owned	B
Waste	Majority privately owned with some government	C+
Sea Ports	Mixed - government owned, privately operated	C+
Electric utilities	Majority privately owned with some government	D+
Gas utilities	Majority privately owned with some government	D+
Water utilities	Majority government owned with some private	D
Roads	Government owned	D
Airports	Government owned	D
Passenger rail	Government owned	D-
Oil & gas pipelines	All privately owned	N/A
Mobile towers	All privately owned	N/A
Satellites	Majority privately owned with some government	N/A

Source: ASCE and First State Investments

Below is the complete ASCE 2017 infrastructure grading by sector.

ASCE 2017 Infrastructure report card



Source: ASCE

Private sector delivering investment

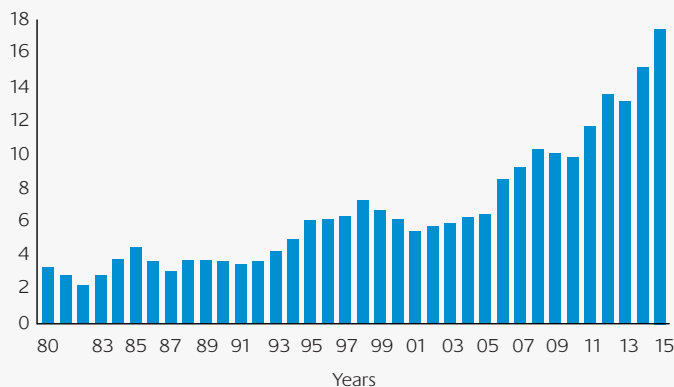
Infrastructure sectors in the US that are owned and operated by private sector players are investing in order to maintain and grow their asset base.

We would argue that the lightly regulated, privately owned freight rail¹, oil & gas pipelines², mobile towers³ and waste⁴ sectors provide the US with world class infrastructure assets run by world class companies. These sectors are able to deploy capital effectively for the following reasons:

- (1) investment is driven by commercial considerations, not through public policy,
- (2) regulation tends to be light handed,
- (3) there is no requirement for government subsidies, and
- (4) there is a predominance of business to business transactions (i.e. freight rail with Walmart, oil & gas pipelines with ExxonMobil, mobile towers with Verizon), with no direct impact on end consumers/voters.

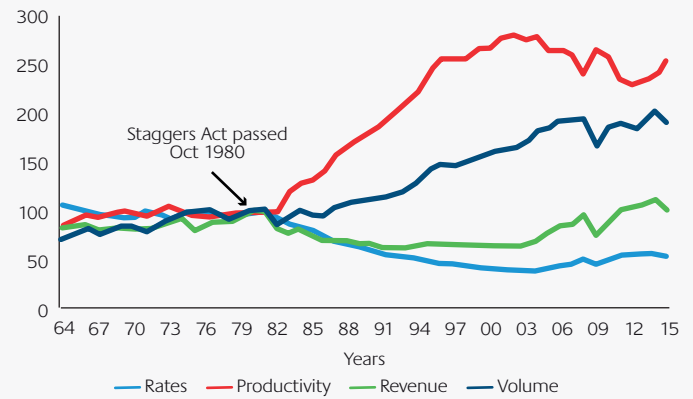
These sectors have proven track records of raising and deploying large amounts of capital to meet the growing needs of the US economy. We have just witnessed a period of significant investment by oil & gas pipeline companies in response to the shale oil and gas energy renaissance in the US. The following charts illustrate the growing capital investments made by the freight railway industry, and the large productivity improvement delivered to the economy.

Capital Expenditure by US freight railways (US\$, bn)



Source: Association of American Railroads, Class 1 railways only.

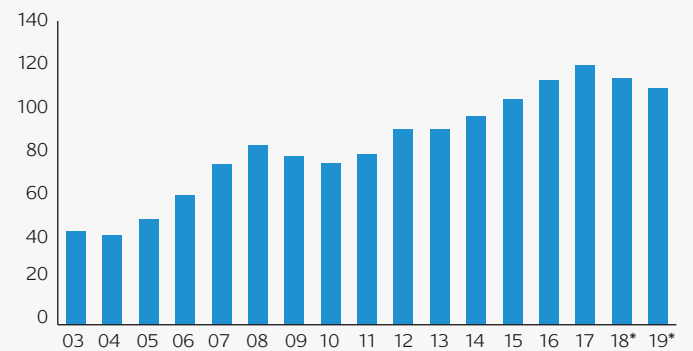
US freight railway performance (re-based to 100 as at 1981)



Source: Association of American Railroads.

While electric and gas utilities are predominately privately owned, they are closely regulated by state utility commissions and, to a lesser extent, the US Federal Energy Regulatory Commission (FERC). Hence their rate of investment tends to be determined in conjunction with state-based public policy objectives, and is often constrained by the impact on customers' / voters' energy bills. In recent years, the shale energy revolution has kept electric and gas utility fuel costs low. This has enabled regulators and utilities to spend money on maintaining and enhancing aged transmission, distribution and generation assets without needing to sharply raise bills.

Investor owned electric utilities investment (US\$, bn)



Source: Edison Electric Institute.

* 2018/2019 are based on company forecast.

“Slowly but surely, government-owned infrastructure sectors are seeking and utilising private sector capital to fund new investment.”

¹ Including companies like Union Pacific, BNSF, CSX, Norfolk Southern and Kansas City Southern.

² Including companies like Kinder Morgan, Williams Cos, Enterprise Products Partners and Enbridge Energy.

³ Including companies like American Tower, Crown Castle, SBAC Communications and Vertical Bridge.

⁴ Including companies like Waste Management, Republic Services, Waste Connections and Advance Disposal.

Public sector investment lagging

The US infrastructure sectors where we believe investment is failing to keep up with demand are roads, bridges, airports, water utilities and passenger rail. These sectors are all dominated by government ownership. In our view the main reasons for this under-investment are:

- (1) inadequate or flawed funding models in a low taxing economy⁵,
- (2) a political inability to raise taxes,
- (3) the timing mismatch between political electoral cycles of between 2 and 4 years and infrastructure asset lifecycles of between 40 and 60 years,
- (4) a public perception that roads and bridges should be “free”, limiting politicians’ ability to introduce tolling systems and,
- (5) planning complexity between local, state, regional and federal governments.

The evidence of under-investment and failure to meet the demands of the growing economy in these government dominated infrastructure sectors are numerous. Some of the main examples include:

- The US Department of Transportation estimates an annual highway and bridge investment shortfall of US\$43 billion.
- Despite a 23% increase in highway spending from 2002 to 2012, travel delays have increased 20% and ride quality has declined by 2%⁶.

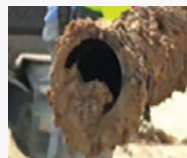
Aging US water utility infrastructure

Defined ASCE Grades US Infrastructure

Without renewal or replacement of existing systems, pipes classified as poor, very poor or elapsed will increase from 10% of pipes in the US to 44% by 2020.



Wooden water pipes



Corroded water pipe

Drinking water report card

2017 Grade:	D
2013 Grade:	D
2009 Grade:	D-
2005 Grade:	D-

Wastewater report card

2017 Grade:	D+
2013 Grade:	D
2009 Grade:	D-
2005 Grade:	D-

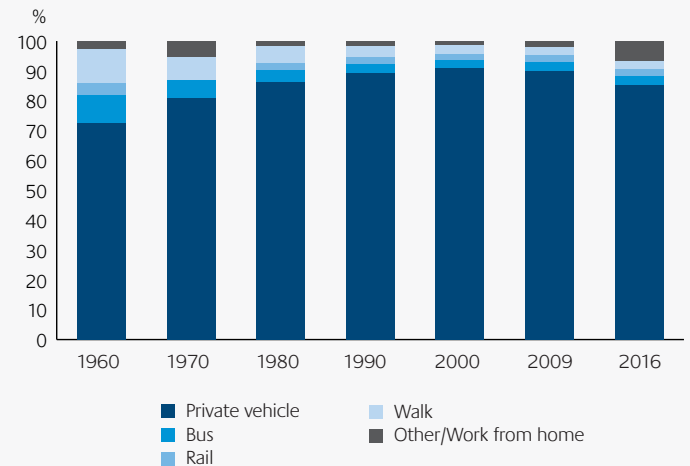
The American Water Works Association (AWWA) estimates that investment needs for buried drinking water infrastructure total more than US\$1 trillion nationwide over the next 25 years.

Source: American Water Works.

- 9% of US bridges carrying 188 million trips per day are rated structurally deficient by the ASCE⁷.
- 240,000 water mains break every year wasting two trillion gallons of treated drinking water.
- Water pipes are being replaced at a rate of just 0.5% pa or every 200 years - almost twice the useful lives.
- While the government-owned Amtrak passenger rail provider has improved its ridership and operating performance in recent years, it still loses US\$1 billion⁸ pa, only has two profitable services⁹, and has failed to implement the “land value capture strategy” around its stations that has proved so successful for Asian rail operators.
- Within metropolitan areas, public transport has a low and declining share of commuter usage. Nowhere is this more apparent in the US’ second largest city, Los Angeles, where the metropolitan transport authority’s ridership is almost 20% below 1985 levels despite an almost 20% increase in population over this time¹¹.

Over the past decade we have seen modest signs that governments are slowly but surely opening up some of these underfunded infrastructure sectors to private operators. In the road space, new privately funded express lane projects have been established in Texas, Virginia and North Carolina, two toll roads in Puerto Rico have been sold to a private company, and Public Private Partnerships¹⁰ (PPPs) have been set up for new bridges / tunnels in New York / New Jersey, Ohio / Kentucky, Pennsylvania, Virginia and Florida.

How Americans commute to work



Source: US Census Bureau.

⁵ Tax as a percentage of US GDP was 26% in 2016, well below the Organisation for Economic Co-operation and Development (OECD) average of 34%. Over the past 50 years this percentage has increased by just 2% for the US but by 9% on average for the OECD.

⁶ Source is '2015 Status of the Nation's Highways, Bridges, and Transit: Conditions & Performance' report.

⁷ We note this percentage has been declining over the past five years.

⁸ These losses include over US\$200 million from state subsidies.

⁹ Acela Express and Northeast Regional services which account for around a third of Amtrak's passengers.

¹⁰ PPPs are “a project delivery model whereby private companies partner with local governments to finance, construct, manage, and share the risk of public projects. Depending on the scope of the partnership, a private company may take on just some or all aspects of a project. The private companies are repaid in various ways, including by income generated through highway tolls or airport fees or bonds issued by local governments. Payments often are tied to performance metrics; failure to meet established thresholds may trigger reduced or delayed payments” – Icons of Infrastructure.

¹¹ Source: Los Angeles Times

In the airports space, Puerto Rico has sold its main airport to the private sector, while PPPs are being used to upgrade terminals at LaGuardia Airport and Denver International Airport. Plans are also in train for a US\$10 billion PPP at John F. Kennedy International Airport.

In the passenger rail space, Denver’s US\$2.2 billion Eagle P3 project was completed in 2016, the privately owned Brightline railway has recently opened in Florida, Maryland’s Purple Line PPP broke ground in 2017 (with completion due in 2022) and there are plans for a privately funded fast train between Dallas and Houston (of which we remain highly sceptical).

In the words of Ferrovial, “PPPs help local governments leverage their limited resources to build infrastructure quickly and at a reduced cost”.

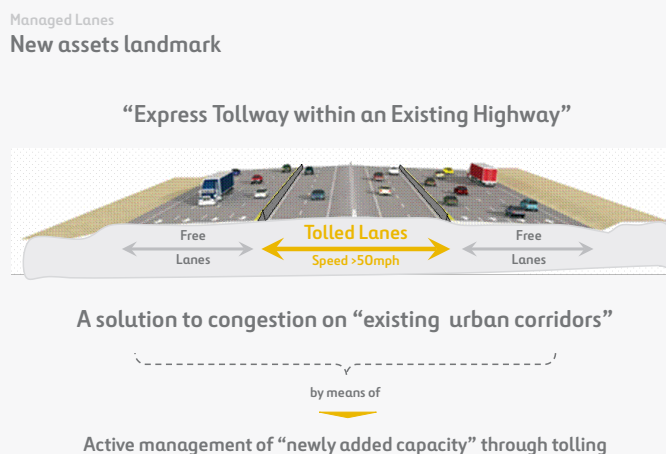
Global listed infrastructure is part of the funding solution

The global listed infrastructure asset class is a significant, successful investor in the US, predominantly via the freight railway, oil & gas pipeline, mobile tower, waste and electric, gas & water utilities sectors. As stated above, we believe these sectors are effectively deploying substantial amounts of capital into the stock of US infrastructure. Going forward, we believe more global listed infrastructure companies can participate in funding and fixing the US infrastructure investment deficit in various sectors. Some of the main opportunities are outlined below:

Toll roads

- **Transurban, Ferrovial** and **Vinci** are world leaders in designing, building and owning toll road concessions. We would expect these firms to be active participants in any new projects.
- **Transurban, Ferrovial, Vinci** and **Abertis** all have operating toll roads assets in the US.
- **Atlantia** has an electronic toll collection company in the US.

Express Lane example



Source: Ferrovial.

Airports

- **Ferrovial, Vinci, Groupe AdP, AENA** and **Fraport** would be active participants in any airport privatisations or PPPs
- **Ferrovial** is leading the US\$800 million Denver International Airport PPP
- **Grupo Aeroportuario del Sureste** owns Puerto Rico’s San Juan airport
- **BBA Aviation** operates a network of US private jet airports
- **CCR** provides support services to US airports.

LaGuardia Airport PPP



Source: LaGuardia Gateway Partners.

Water utilities

- **American Water Works, Aqua America, Eversource Energy** and **Suez Environment** are active consolidators of the fragmented and government-dominated US water utility sector.

Passenger rail

- Listed Japanese passenger rail companies **East Japan Railway** and **Central Japan Railway** are both seeking to export their fast train technology into the US market.

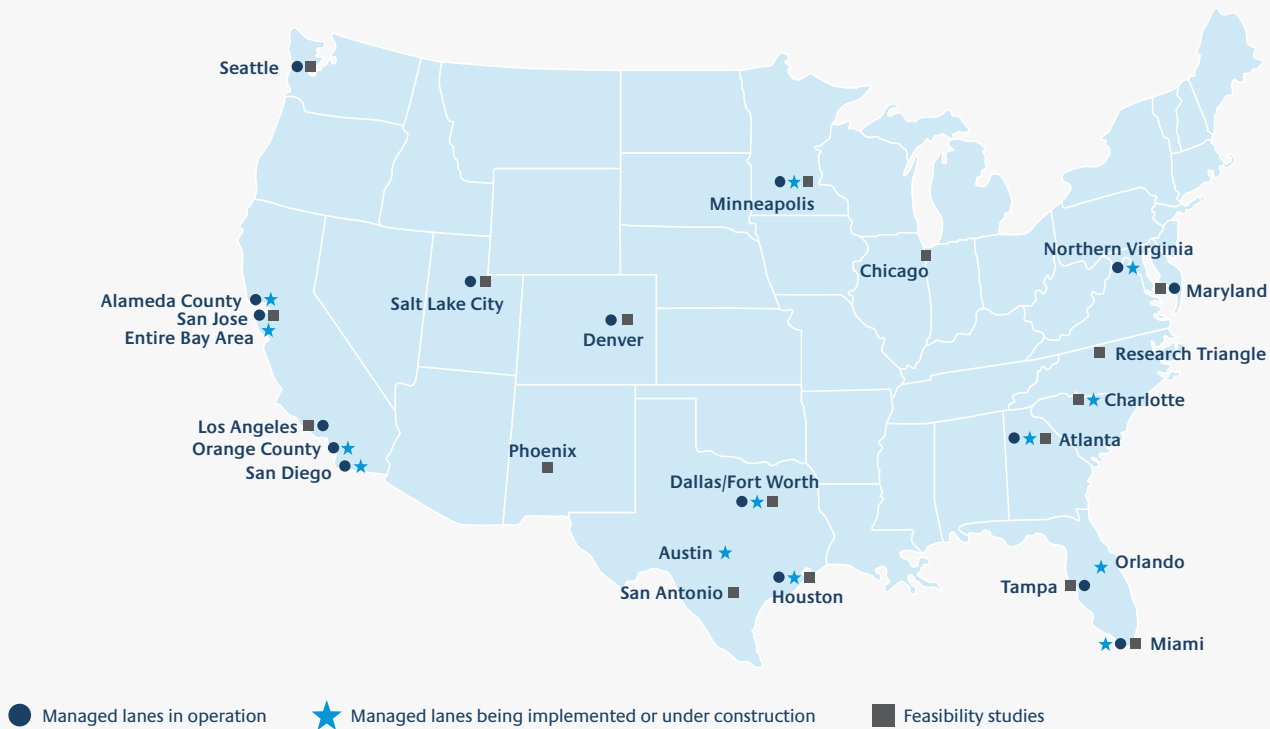
We believe the most promising areas of investment growth for global listed infrastructure within the US are express lanes and airport PPPs. We believe these solutions work as they:

- solve the political problem for governments; that being, they don’t have to sell / privatise the asset, and they don’t need to put up taxes / tolls / user charges,
- strongly attract private sector investment,
- increase economic prosperity and productivity,
- improve the customer / voter experience,
- reduce congestion levels, and
- insulate users from construction cost overruns.

We anticipate that **Ferrovial, Transurban** and **Vinci** will be major players in the US express lane and airport PPP space over the coming three to five years. Even a small portion of the massive US infrastructure market opening up to private sector investment can equate to a substantial opportunity for these global listed infrastructure firms.

US Express Toll Lane projects (2016)

Source: Reason Foundation.



What can President Trump do to help US infrastructure?

We believe the Trump presidency will have a positive impact on private sector investment in US infrastructure, which we expect to benefit global listed infrastructure companies.

To be clear, we do not expect any ‘big bang’ step change in private sector infrastructure investment; rather, a gradual increase. This is because the US system of government is very much state based. Most infrastructure decisions are made at local or state government level, not federal. For example, local and state governments own 96% of US highways and 98% of bridges. As one infrastructure Chief Financial Officer (CFO) said to us recently “Demand for infrastructure in US is strong – but the decision-making process is very fragmented”.

Focus on ex-Goldman appointees to deliver infrastructure



Source: peoplespunditdaily.com.

However, even a gradual increase in private sector investment in this massive market can be very meaningful for global listed infrastructure firms. The four main impacts we expect the Trump presidency to have on the infrastructure sector are outlined below.

Firstly, Trump has established a pro-business political and regulatory environment, lowering the barriers to investment. He has made pro-business appointments to the Federal Energy Regulatory Commission (FERC), the Federal Communications Commission (FCC) and the Environmental Protection Agency (EPA). These moves are positive for infrastructure investment.

Secondly, by cutting taxes (and most likely increasing the US deficit), Trump is “starving the beast of government”, meaning that the government now has less revenue to spend on infrastructure projects. As a result, private sector capital will become an even more necessary source of funding for infrastructure projects.

Thirdly, it is widely expected that Trump will release his infrastructure agenda in the first half of 2018. The table on the next page is the leaked priority list of infrastructure projects. While we have low expectations, it should at least provide more low cost financing, tax credits and a framework for using more private sector capital. All of this will be helpful for global listed infrastructure investment. However as one CFO said to us recently, “All Trump can do is supply more financing, but financing is not the problem. We need states to make decisions”.

President Trump's infrastructure priority list	Sector	State	Revenue Stream
Gateway Program	Mass Transit/Rail	NY, NJ	No
The Brent Spence Bridge	Highways and Bridges	OH, KY	No
National Research Lab for Infrastructure	National Initiative	OH	No
Locks and Dams 52 and 53 on the Ohio River	Inland Waterways	IL	Yes
I-95 Critical Highway Repairs	Highways and Bridges	NC	No
15 Bridges on I-95, Philadelphia	Highways and Bridges	PA	No
Mississippi River Shipping Channel Dredging	Ports	LA	Yes
NextGen Air Traffic Control System	National Initiative	National	No
Plains and Eastern Electric Transmission Lines	Electricity and Transmission	OK	Yes
Project Clean Lake, Cleveland	Water	OH	Yes
South Carolina Dams Accelerated Repairs	Water/Inland Waterways	SC	No
Hydroelectric Plants operated by USACE	Inland Waterways/Electricity	National	Yes
Alaska Pipeline & LNG Project	Oil and Gas	AK	Yes
Cotton Belt Line Rail Project	Mass Transit	TX	Yes
Cadiz Water Conveyance Project	Water	CA	Yes
TransWest Express Transmission	Electricity and Transmission	CA, NV, AZ	Yes
Chokecherry and Sierra Madre Wind Energy	Electricity and Transmission	WY	Yes
Second Avenue Subway - Phases 2 & 3	Mass Transit	NY	Yes (Partial)
Savannah Harbor Expansion Acceleration	Ports	GA	Yes
Atlantic Coast Pipeline	Oil and Gas	VA, NC	Yes
Champlain Hudson Power Express	Electricity and Transmission	NY	Yes
DC Union Station Expansion and Rehab	Rail	DC	No
Maryland Purple Line	Mass Transit	MD	Yes
M-1 Rail, Detroit	Mass Transit	MI	Yes
Gordie Howe International Bridge	Highways and Bridges	MI	Yes
Kansas City Airport	Airports	MO	Yes
The Peace Bridge	Highways and Bridges	NY	No
MBTA Green Line Extension, Boston	Mass Transit	MA	Yes (Partial)
Augustin Plains Ranch	Water	NM	Yes
I-93 Rebuild	Highways and Bridges	NH	No
Lake Ponchartrain Bridge	Highways and Bridges	LA	Yes
Port Newark Container Terminal Improvements	Ports	NJ	Yes
Fort Mojave Solar Project	Electricity and Transmission	AZ	Yes
Red and Purple Line Modernization, Chicago	Mass Transit	IL	Yes (Partial)
I-95/I-395 Reconstruction	Highways and Bridges	FL	No
Chicago Union Station Redevelopment	Rail	IL	No
Upper Mississippi Locks 20-25	Inland Waterways	MO	Yes
Illinois River Locks	Inland Waterways	IL	Yes
Colorado I-70 Mountain Corridor	Highways and Bridges	CO	No
Colorado I-25 Improvements	Highways and Bridges	CO	No
INHC Lock Replacement, New Orleans	Inland Waterways	LA	Yes
Chickamauga Lock	Inland Waterways	TN	Yes
Soo Locks Modernization Project	Inland Waterways	MI	Yes
Huntington Beach Desalination Plant	Water	CA	Yes
Upper Ohio Navigation Improvements	Inland Waterways	OH	Yes
Monongahela River Locks and Dams	Inland Waterways	PA	Yes
Seattle Airport Expansion	Airports	WA	Yes
Arlington Memorial Bridge	Highways and Bridges	VA	No
Energy Storage and Grid Modernization	Electricity and Transmission	National	Yes
St. Louis Airport	Airports	MO	Yes

Source: McClatchy.

Fourthly, a committed federal government can work with states – at least with red, Republican-led ones - to find solutions and remove the obstacles blocking new infrastructure investment. While the US presidency is weak in many areas of domestic policy, we should not underestimate the value of Theodore Roosevelt's "bully pulpit" to advocate for an infrastructure agenda.

While we do not believe the Trump presidency will create a step change in infrastructure spending, it is likely to assist in providing more investment opportunities for global listed infrastructure companies.

Outlook – slowly but surely

The US infrastructure sector is divided between privately owned assets which work well, and government-owned sectors which suffer from chronic under-investment from a low taxing government.

Slowly but surely, government-owned infrastructure sectors are seeking and utilising private sector capital to fund new investment. Over the next three to five years we expect global listed infrastructure companies to expand their participation in the US infrastructure market.

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