



**Infrastructure deficit**

**US\$1 trillion** – annual gap in current infrastructure spend vs. demand  
**60%** – increase in the world investment in infrastructure needed by 2030

# Infrastructure deficit

Infrastructure again becomes a source of competitive advantage. Emerging economies invest in new railroads and highways for more effective movement of people and goods, while developed nations suffer from poor legacy.

Infrastructure - ports, pipelines, hospitals, highways, water, sewage and phone systems – matters, providing the bedrock of national prosperity and well-being. Facilitating transport, promoting communication, providing energy and water, boosting the health and education of the workforce and enabling the whole economy to flourish. The costs of building infrastructure are vast, but the costs of failing to make such investments are incalculable.

For a country to be competitive, it needs roads and airports to provide access to markets, power sources to fuel homes and businesses, reliable water to generate productivity. In today's globally connected world, information and communication technologies (ICTs) are increasingly important, with growing empirical literature on how ICTs facilitate innovation and impact firm and country productivity by giving decision makers more complete information.

Improved infrastructure produces abundant benefits for the economy, environment and social progress, unlocking growth and generating economic and social benefits and progress. Infrastructure projects are a source of major employment, catalyse local economic growth, develop skills at all levels in the workforce which then provides the underpinning for developing new products and services, opening access to new markets and reducing waste and environmental impact.

*Every 10% increase in infrastructure provision increases output by approximately 1%.*

As INSEAD academic and co-author of the World Bank's global innovation index Bruno Lanvin says: "Infrastructure spending will be increasingly important for future economic growth, especially for the development of high-tech and knowledge-based industries ... Major infrastructure projects help to diversify the economy by indirectly encouraging new industries. There are things you can do in countries with good infrastructure that you just cannot do anywhere else". According to the World Bank "Research shows that every 10% increase in infrastructure provision increases output by approximately 1% in the long term". These findings are consistent with a substantial EU study that demonstrated causality of electricity and transport infrastructure investment driving GDP growth in the long-run.

While the case for investing in infrastructure would appear clear, there is a problem: there is an enormous infrastructure deficit. The World Bank believes that there is a US\$1 trillion p.a gap (or 1.4% of global GDP) between what is required and what is currently being spent. The development of environmentally clean infrastructure would raise this estimate by an additional \$200-300 million yearly. According to the McKinsey Global Institute Infrastructure Practice, "the world needs to increase its investment in infrastructure by 60%" through to 2030 just to maintain current levels of infrastructure capacity and service relative to GDP. Critically this figure does not include the cost of maintenance, renewal and backlog in many countries - or the cost of climate change adaptation - and will not raise the standard of infrastructure in emerging economies beyond their natural level.

## Our habitat



The demand for infrastructure investment in the developed world never wavers. “In the developed world, a particular concern is that so much legacy infrastructure needs maintenance and rehabilitation, owing to the ageing of assets, stricter environmental regulations and the globalization of supply chains. The supply of new infrastructure cannot keep pace with demand because of various impediments; notably, the public sector’s budget constraints following the global financial crisis, and the reluctance of private financiers to commit capital to long-term and risky projects. In addition, the delivery of infrastructure programmes is hampered by several issues in the project origination and preparation phase, including biased project identification and prioritization, low-quality master-planning, slow permit and procurement processes, and inadequate risk allocation and delivery models.”

Looking forward, there are a number of actions that can be taken to narrow or close the infrastructure deficit. Governments can theoretically pull three levers: reduce infrastructure demand, build new assets, or optimize existing infrastructure assets through efficient operation and maintenance. It will take all three, but many believe it is the last that may offer the most potential, with big-data and digital networks helping us to use current infrastructure more efficiently, or even bypass it entirely. It is also likely that policy makers will increasingly bet on longer-term options with built-in adaptability for changing technologies and infrastructure use. One emerging challenge, as cities and government become ever more transient, is who will take, and be trusted to take, overall responsibility for its infrastructure?

*The supply of new infrastructure cannot keep pace with demand.*

Adjacent to this will likely be a continued evolution in the source and mix of infrastructure funding. According to PWC, “the trend for governments to seek private-sector involvement in projects rather than go it alone will likely grow, as will participation by funds dedicated to specific kinds of infrastructure – water, for example. And high-growth economies such as China, India, Russia, Brazil, South Korea and Indonesia may consume an increasing share of world investment capital.” To collectively address major urban challenges, as shown by Medellin in Colombia, governments will need to increasingly openly collaborate with business to improve not only the institutional fabric of cities but also core infrastructure.

*Policy makers will increasingly bet on longer-term options.*

Core infrastructure needs to evolve to accommodate future technical opportunities. These include: driverless cars will require driverless highways, complete with a myriad of sensors, to enable increased road capacity, reduced journey times and fewer accidents; Tube transportation networks, such as Elon Musk’s superfast hyperloop; Atmospheric water harvesters to access more of the planet’s clean water; Japan’s Aerospace Exploration Agency (JAXA), a 25-year plan to build the world’s first 1-gigawatt power plant in space, as harvesting solar in space is an order of magnitude more efficient than doing so on earth; the development and roll out of drone delivery networks; the development of mass energy storage solutions; the roll out of the infrastructure required to support the Internet of Things, with a trillion-sensors embedded in the environment. These and other initiatives will increase the complexity for decision makers in which infrastructure choice to make.

### Related insights

#### Basic sanitation



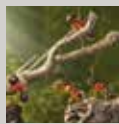
Poor sanitation continues to impact public health and restrict social progress, particularly for women. Governments and donor organisations prioritise measurement, education and innovation in a bid to drive change.

#### Built-in flexibility



The path to a connected, accessible and distributed infrastructure is fraught with complex, costly and risky issues: Upgrading and repurposing systems to make them more open plus on-going maintenance need significant resources.

#### Deeper collaboration



Partnerships shift to become more dynamic, long-term, democratised, multi-party collaborations. Competitor alliances and wider public participation drive regulators to create new legal frameworks for open, empathetic collaboration.

#### Flooded cities



The vast majority of our cities are not prepared for flooding. Many districts and households can no longer get flood insurance and are in jeopardy. It’s going to get worse before it gets better.