

# Caribbean Region Quarterly Bulletin



2019: III

Infrastructure for Development in the Caribbean  
Volume 8, Issue 3 | September 2019





Dear Reader,

Welcome to the September 2019 *Caribbean Region Quarterly Bulletin*. Infrastructure is the lifeblood of a country. However, low, and even declining, investments, insufficient maintenance and extreme weather all take a toll on essential infrastructure. This quarterly bulletin gives an overview of the challenges related to infrastructure in the Caribbean countries.

**Special Regional Report: Infrastructure for Development in the Caribbean**

Physical infrastructure for basic services such as transport, telecommunications, energy, and water and sanitation complements other types of capital and labour, as their productive deployment builds on the existence of infrastructure services.

Despite this importance, infrastructure in the Caribbean has deficiencies, which results in negative consequences. On the one hand, they increase the cost to the private sector and act as a constraint to inclusive growth. On the other hand, they can have negative socioeconomic effects and increase existing inequalities.

In spite of differences, common challenges with regard to infrastructure emerge. Infrastructure quality is better in tourism-dependent than in commodity-dependent countries. Infrastructure investments are low, including in the countries that are undergoing fiscal retrenchment, implying a deterioration of infrastructure quality in several countries. These factors result in infrastructure gaps that contribute to the already complex and challenging environment for promoting sustainable growth and development in the Caribbean. The situation is made more difficult by recurrent natural disasters, which are projected to increase in frequency in the future. The regional section of the Quarterly Bulletin provides a comparative overview of these issues, while the country summaries explore individual experiences in more depth.

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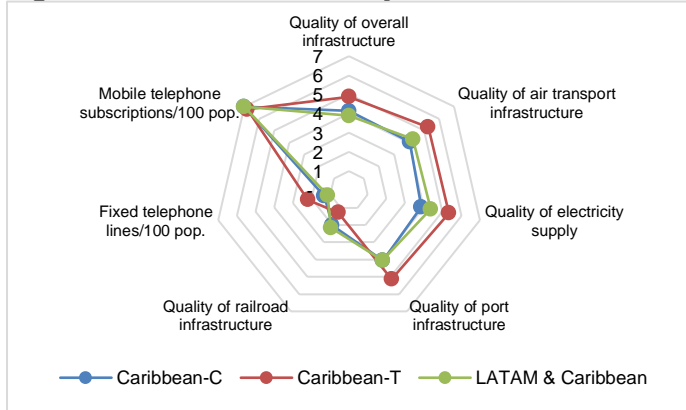
**Introduction**

**Infrastructure plays a central role in an economy.**<sup>1</sup> Physical infrastructure for basic services such as transport, telecommunications, energy, and water and sanitation complements other types of capital and labour, as their productive deployment builds on the existence of infrastructure services. Despite this importance, infrastructure in the Caribbean has deficiencies resulting from both insufficient and inefficient spending. These deficiencies have important consequences. On the one hand, they increase the cost to the private sector and act as a constraint to inclusive growth. On the other hand, they can have negative socioeconomic effects and increase existing inequalities.

**Thus, investment in infrastructure has beneficial effects for an economy.** Investments directly increase GDP and support the creation of jobs, including through multiplier effects. At the same time, investments improve the stock of infrastructure, which supports economic activity.

**State of Infrastructure in the Caribbean**

**Figure 1. Infrastructure Quality Index in the Caribbean**



Source: World Economic Forum (2015).  
 Note: The ratios for fixed telephone lines and mobile telephone subscriptions per 100 population were adjusted to a range between 1 and 7, with 7 being the best. If the ratio was higher than 100, a value of 7 was assumed. Caribbean-C: commodity-dependent economies; Caribbean-T: tourism-dependent economies; LATAM: Latin America.

**Inadequate infrastructure is common in many countries.** According to Cavallo and Powell (2019), on average the perception of infrastructure quality in Latin America and the Caribbean (LAC) is low compared to all other world regions with the exception of sub-Saharan Africa. In addition, the authors show that the availability

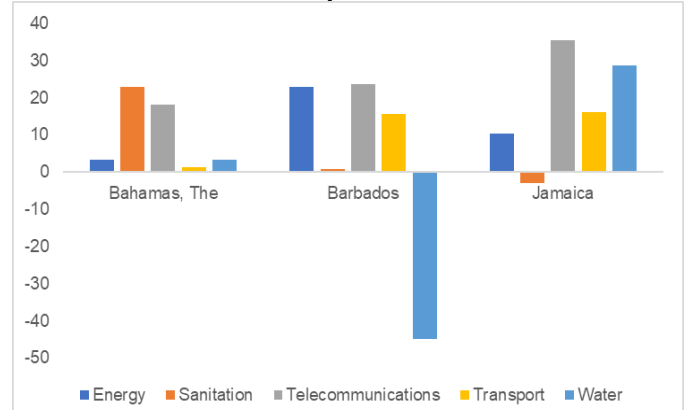
<sup>1</sup> Infrastructure refers to all engineering construction that aims to provide different services to society.

and quality of infrastructure varies in the region, including several countries that experience important lags for different type of infrastructure. Infrastructure quality in the Caribbean also varies. Figure 1 presents the perception of infrastructure quality for tourism- and commodity-dependent countries in the Caribbean and indicates that commodity-producers in general underperform tourism-dependent countries.

**Figure 2. Development Gaps for Infrastructure**  
**A. Commodity-dependent Countries**



**B. Tourism-dependent Countries**



Source: IDB staff estimates based on the methodology described in Acevedo, Borenzstein, and Lennon (2019).  
 Note: Gaps have been standardized for comparison, ranging from -100 to 100.

**Infrastructure gaps are prevalent in Caribbean commodity-producing countries.** Figures 2A and 2B present “development gaps,” which measure the gap from the expected value given per capita GDP across countries, for commodity- and tourism-dependent in the Caribbean. Other than water in Guyana and sanitation in Trinidad and Tobago, commodity producers have significant negative gaps on all measures for infrastructure – that is, measures that are below what would be expected given their level of income.



**Tourism-dependent countries show a positive gap.** For most indicators, the gaps for tourism-dependent countries are positive, implying that the measure is above the level that would be expected given the country's level of income. One reason for this might be that Caribbean tourism is to a large degree in the higher-end category, which depends on high-quality infrastructure. However, even for countries with positive gaps, challenges remain. All three tourism-dependent countries are pursuing fiscal consolidation, which affects the amount of funding available for infrastructure, including maintenance that is essential to keep infrastructure functioning. Energy prices in these three countries are also among the highest in the region, which is a drag on both private consumers and companies, including hotels that require large amounts of reliable energy, particularly for air conditioning. Finally, as the recent tragedy in The Bahamas has shown, the vulnerability of these countries to extreme weather affects infrastructure.

**Infrastructure Investments in the Caribbean**

**Infrastructure investment is in general low.** It is estimated that LAC countries require public investment of approximately 5 percent of GDP over the next two to three decades to close their infrastructure gap (Serebrisky, Suárez-Alemán, and Pastor 2018). However, for all Caribbean countries other than Guyana, the 2015–2018 average has been below 3 percent of GDP. Besides being low, investment has been decreasing in several countries. For instance, investment was around 5 percent of GDP in both Suriname and Trinidad and Tobago before the fall in commodity prices. Similarly, The Bahamas, Barbados, and Jamaica, which have undertaken fiscal consolidation processes, have all seen decreases in the level of public infrastructure investment (Figure 3).

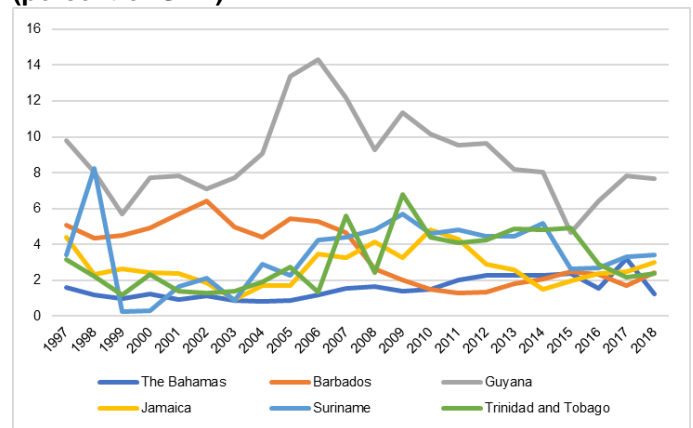
**Private infrastructure investments have been growing.** As outlined in Cavallo and Powell (2019), there has been impressive growth in private infrastructure investment in LAC from a low base over the last 10 years. While systematic data for the Caribbean is not available, the country sections in this bulletin highlight the potential role of private sector infrastructure investments in the individual countries, including through public-private partnerships. While the growth of PPPs has opened new sources of financing, it also puts new demands on the legal and regulatory framework as to avoid creating debt-like long-term commitments or contingent liabilities.<sup>2</sup>

<sup>2</sup> See a discussion of these issues for the case of Brazil at <https://blogs.iadb.org/gestion-fiscal/en/ppps-and-contingent-liabilities-in-brazil/>

**The Importance of Adapting Infrastructure for Climate Change in the Caribbean**

**Authorities are racing against the clock to adapt current infrastructure in the Caribbean countries.** Even though the LAC countries account for less than 10 percent of total global greenhouse gas emissions, they will be affected severely by climate change (Mycoo and Donovan 2017), particularly in the Caribbean. Given the potentially devastating consequences of climate change for the region, it is critical to build, adapt, and improve the resilience of Caribbean coastal cities.

**Figure 3. Public Investment (General Government Net Acquisition of Nonfinancial Assets), 1997–2018 (percent of GDP)**



Source: International Monetary Fund, April 2019 *World Economic Outlook*.

Note: Public investment is defined as the net acquisition of non-financial assets.

**As the number and intensity of hurricanes, tropical cyclones, floods, and droughts increase over the years, the Caribbean economy and population become more vulnerable.** There are approximately 7.8 million people in CCB and OECS countries, and a significant share of this population lives in coastal cities.<sup>3</sup> Moreover, researchers have recently projected that a sea-level increase of one meter would affect between 50 and 60 percent of tourism resort properties in the Caribbean.

**Building or adapting infrastructure could potentially reduce the damage costs associated with natural hazards.** Past events have already resulted in loss of human life, destruction of urban infrastructure and natural resources, and the reduction of GDP. Most recently, category 5 Hurricane Dorian led to loss of life and severely damaged The Bahamas, especially the islands

<sup>3</sup> See Climate Central's Program on Sea Level Rise database, available at: <https://riskfinder.climatecentral.org/>



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of Abaco and Grand Bahama. However, extreme weather is not restricted to hurricanes. For instance, the consequences of flooding in 2005 in the city of Georgetown, Guyana cost an equivalent of 59 percent of the country's GDP and had critical public health impacts on 72 percent of the population (ECLAC 2005). Similarly, Jamaica's long-term drought between 2009 and 2010 led to water shortages and agricultural losses (USAID 2017).

**The Caribbean has implemented strategies to adapt to climate change, but more work needs to be done.** Estimates by Bárcena et al. (2018) suggest that energy, water resources, biodiversity, transport, and agriculture are among the high-priority sectors for mitigation in the LAC countries according to their national climate change plans and/or communications.

**Building resilience against extreme weather is key.** A recent initiative in the region is the Caribbean Climate-Smart Accelerator<sup>4</sup>, formed by Caribbean leaders in response to the devastations by hurricanes in 2017. Through private and public partnerships, the organization is building more resilient countries, cities and industries and stronger infrastructure that can better withstand the effects of climate-disaster.

## Conclusions and Policy Recommendations

**Maintaining good infrastructure poses a special challenge in the Caribbean.** The small size and location of countries in the region imply great dependence on imports, often by ship, as well as lack of economies of scale, making infrastructure investment more expensive. The topography and climate can also put special demands on infrastructure, even more so in light of increasing numbers of episodes of extreme weather that are expected with climate change.

**Economic factors are also constraining infrastructure.** Many countries in the region have experienced extended periods of low economic growth, which is often accompanied by constraints on fiscal space and a negative impact on the ability to finance infrastructure. At the same time, insufficient infrastructure can constrain growth, leading to a vicious cycle of low growth and low infrastructure spending. Related to the issue of fiscal space, several countries in the Caribbean are pursuing fiscal consolidation, often at the expense of restricting capital spending.

**There is no clear strategy on how to break the negative pattern of low growth, low infrastructure spending, and fiscal challenges.** As discussed in the country sections in this bulletin, each country faces

different challenges and can opt for specific solutions. Stronger involvement of the private sector can be beneficial, including in the financing of infrastructure (see the discussion in Chapter 6 of Cavallo and Powell 2019). Policy frameworks for public-private partnerships are usually in place, but there remains room for improvement. Finally, evidence points to important gains that can be achieved by improving the efficiency of infrastructure spending. According to one recent study, countries could save up to 40 percent in infrastructure investment by improving the efficiency of expenditure (Serebrisky, Suárez-Alemán, and Pastor. 2018).

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<sup>4</sup> <https://www.caribbeanaccelerator.org/>



# THE BAHAMAS RESILIENT INFRASTRUCTURE

**Contributor:** Allan Wright

**Editor's Note:** As the September *Quarterly Bulletin* was going to press, The Bahamas was assessing the damage from Hurricane Dorian, one of the largest storms to ever hit the country. The hurricane will most certainly affect not only the welfare of the Bahamian people, but also the country's infrastructure, which is the focus of this bulletin. We will provide an update on the effects of the storm on The Bahamas in the December 2019 *Quarterly Bulletin*.

## Overview

The Bahamas, a small archipelagic nation reliant on the tourism and financial sectors, has an estimated per capita GDP of US\$32,990. The country depends on maritime and airborne transportation to link its people and local economies. The cost of delivering resources across the sea and sometimes sparsely populated land cover remains high. At the same time, fiscal space is restricted, and the central government is committed to maintaining a sustainable fiscal stance.

To appreciate the state of the country's infrastructure, its contribution to economic development, and the challenges the country faces related to infrastructure, this bulletin will scrutinize issues relating to its efficiency, reliability, cost, and vulnerability to disasters and climate change impacts. The sections that follow will describe ongoing national plans and interventions in the areas of water and sanitation, telecommunication, energy and transportation.

## Development Challenges and Infrastructure

**Since the global financial crisis, The Bahamas has experienced low growth rates and higher levels of debt.** Subdued contributions from the tourism sector<sup>1</sup> and the financial sector, along with low productivity gains, were identified as the main reasons for these problems. With regard to infrastructure, serious challenges lie in aging maritime, airport, and energy systems, which require a transformation to deliver adequate services. Additionally, the nation's island geography and vulnerability to weather-related shocks demands climate-resilient infrastructure to better protect fragile ecosystems.

## Critical Infrastructure Areas<sup>2</sup>

**Adequate provision of water and sanitation systems constitutes an ongoing challenge for The Bahamas.** The country's Water and Sanitation Corporation (WSC)

## Highlights

- *The critical challenges for infrastructure in The Bahamas are aging systems that require modernization to deliver timely service.*
- *The nation's island geography demands climate-resilient and eco-friendly infrastructure to protect the environment, sustain fragile ecosystems, and enhance current levels of total factor productivity.*
- *The government intends to use public-private partnerships for the development of renewable energy, primarily within the southernmost islands.*

supplies less than 50 percent of overall potable water demand in The Bahamas, as a significant portion of households and businesses rely on private water and sanitation systems. Currently only 14 percent of the population has access to improved sewerage and sanitation facilities, with negative impacts on the environment and health. The UNICEF/WHO Joint Monitoring Program recommends "urgent" rehabilitation of the sewerage infrastructure in New Providence, given the high dependency on tourism and risks associated with sewerage system failures. On the other hand, physical equipment upgrades and technological efficiency measures introduced under a WSC Support Program have helped reduce non-revenue water losses by 60 percent in New Providence.<sup>3</sup> Additionally, the WSC has implemented several Smart Water Infrastructure Technologies (SWIT) aimed at improving efficiency.<sup>4</sup> Nonetheless, further work is needed on customer interaction tools and automated meter reading.

**Despite recent advances in information and communications technology (ICT), challenges in telecommunications remain that affect e-commerce.**

The Bahamas ranks 22nd in Latin America and the Caribbean (LAC) in mobile telephone penetration, and 15th in wireless broadband penetration (with mobile penetration rates measured at roughly 85 percent), which indicates substantial room for improvement in the development of technological solutions, especially regarding further improvements in financial inclusion. Mobile broadband penetration is increasing steadily, but the country's geography presents significant challenges for

<sup>1</sup> According to 2015 World Travel and Tourism Council, The Bahamas is the 10th most-tourism-dependent economy in the world. Tourism accounts directly and indirectly for 43.6 percent of GDP, 51.6 percent of total employment, and 61.5 percent of total exports. However, the country has been losing market share (-0.5 percent) in the Caribbean region in terms of international tourist arrivals since 2006.

<sup>2</sup> See The Bahamas Country Briefing in IDB (2019) for a more detailed discussion of the country's critical infrastructure.

<sup>3</sup> The Support Program is financed by a US\$81 million IDB loan (BH-L1048).

<sup>4</sup> SWIT includes improvements to pressure management and active leak detection systems. See Arniella (2017).

## THE BAHAMAS RESILIENT INFRASTRUCTURE

the deployment of fixed-line infrastructure. Mobile and broadband price rates are among the highest in the world.<sup>5</sup>

**With old power-generating infrastructure and production shortfalls, The Bahamas suffers from frequent power outages.** Electrification and electrical outage indicators are below expected performance levels (World Bank 2018). According to Complete Caribbean's 2014 Productivity, Technology and Innovation in the Caribbean (PROTEqIN) Survey, Bahamian firms experience an average of 2.2 outages per month, above regional averages. The average duration of such outages, measured in hours of a typical outage, was highest in Jamaica (1.30), Suriname (1.0), The Bahamas (0.9), Barbados (0.6), and Trinidad and Tobago (0.50). The government of The Bahamas has recently appointed a new management board at The Bahamas Power and Light (BPL) and is developing plans to build a new thermal generating plant with a capacity of 132 MW.<sup>6</sup> The BPL will issue a bond of US\$650 million to help refinance its legacy debt and fund system upgrades (IMF 2014). With minimal penetration of renewable energy, The Bahamas has set an ambitious goal of increasing renewables to 30 percent of the energy mix by 2030.<sup>7</sup>

**In terms of transportation, connecting the more remote southernmost islands remains the greatest challenge for the government.** Ports and shipping facilities are fragmented, outdated, and inefficient, requiring modernization to maintain connectivity and aid further development (Government of the Bahamas 2016). With over 53 licensed airports, 28 of which are government-owned and operated, air connectivity is comprehensive and getting better,<sup>8</sup> as The Bahamas caters to all the leading air carriers of North America and some from Europe. However, as is the case for maritime transportation, the Family Islands require substantial investment in aviation transport and connectivity, with recent estimates suggesting that almost US\$140 million is needed to upgrade its obsolete and inadequate public airport infrastructure and systems to comply with international aviation standards (Government of The Bahamas 2016).<sup>9</sup>

### Investment in Infrastructure

<sup>5</sup> The Bahamas Telecommunications Company Ltd (BTC) was partially privatized in 2011, and cellular licenses to operate in that market have been granted in the last two years.

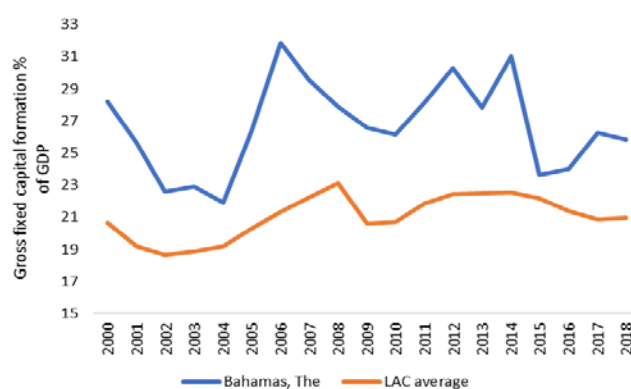
<sup>6</sup> At a cost of \$95 million to increase generation capacity on New Providence.

<sup>7</sup> The Bahamas has received financing for climate change activities in the areas of research and design with a focus on energy efficiency through the Green Climate Fund and Global Environment Facility.

<sup>8</sup> While competition in the domestic aviation market includes only a few domestic airlines in The Bahamas, international seat supply is indeed more competitive and fragmented. Foreign carriers occupy a dominating

**Public investment is not enough given the country's infrastructure needs, even though investment in infrastructure in The Bahamas is high by international comparison (Figures 1 and 2).** The provision of incentives, airlift subsidies, and tax concessions, to encourage varied-scale private capital projects, primarily in the tourism sector, are critical drivers to attract capital investment. Changes in investor confidence and sentiment represent risks to capital inflows and have resulted in lower inflows since 2006, except for 2014 with the building of a mega resort hotel. Time-consuming administrative requirements (World Bank 2018), the rising cost of electricity, and an inadequately trained labor force constitute hindrances to investment opportunities,

**Figure 1: Gross Capital Formation**



Source: International Monetary Fund, April 2019 *World Economic Outlook*.

Note: LAC: Latin America and the Caribbean.

**However, as discussed above, important infrastructure gaps persist.** Expenditure levels of public capital outlays average roughly 2.3 percent of GDP except for periods of hurricane reconstruction.<sup>10</sup> In FY2018/2019, the compression of capital spending helped reduce the deficit (Figure 3).

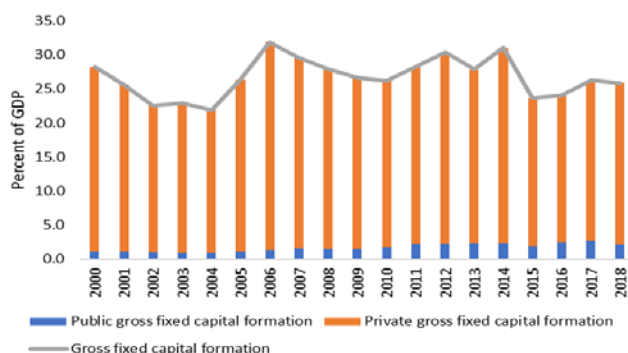
position, accounting for a 75 percent market share in terms of seat capacity (IDB 2014).

<sup>9</sup> The IDB approved a US\$35 million airport infrastructure loan in January 2017, roughly six years after it approved a US\$47.5 million Air Transport Reform Program loan in December 2011.

<sup>10</sup> The contraction in capital expenditure reduced infrastructure-related outlays, as rebuilding work on several islands ratcheted down following Hurricane Matthew in 2016 (Central Bank of The Bahamas 2019).

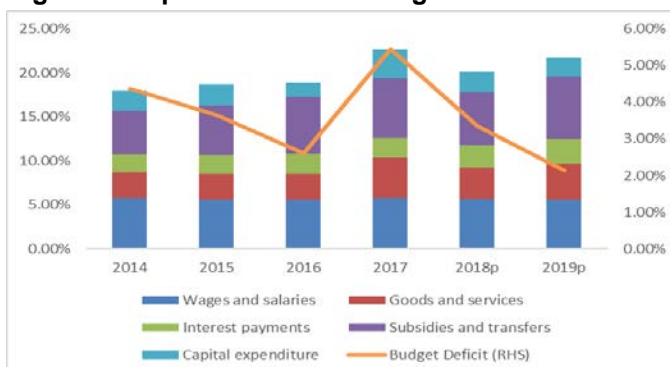
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**Figure 2: Private versus Public Gross Capital Formation**



Source: International Monetary Fund, April 2019 *World Economic Outlook*.

**Figure 3: Expenditures and Budget Deficit**



Sources: International Monetary Fund, April 2019 *World Economic Outlook*; and author's calculations.

**Private sector involvement in infrastructure provision is an important avenue in the context of restricted fiscal space.** The government of The Bahamas distributed a policy document on the likely benefits of employing public-private partnerships (PPPs) to effectively use state-owned assets, such that PPPs are efficiently delivered in a way that realizes value for money both for the government and service users (Government of The Bahamas 2018). The policy document also guides the private sector on what it can expect in developing and executing PPP projects with the government. The government aims to use PPPs to expand renewable energy, primarily within the outermost islands; build maritime and airport facilities; improve road systems and transportation;<sup>11</sup> and enhance

technological innovation, communications, and urban development.<sup>12</sup>

**Environmental vulnerability is high.** Disastrous climatic shocks, even more dangerous because of The Bahamas' geography, fragile ecosystems, and a concentrated population make the nation's infrastructure highly vulnerable to climate change and risk, according to the Centre for Research on the Epidemiology of Disasters.<sup>13</sup> Strengthening preparedness and risk reduction policies, including establishing a natural disaster savings fund, would enhance fiscal and economic resilience. Additionally, insuring public assets, encouraging greater usage of private insurance, investing in resilient infrastructure, and maintaining modern building codes, land use planning, and zoning guidelines were all essential elements outlined in recent reports by the International Monetary Fund (IMF 2018) and the United Nations Economic Commission for Latin America and the Caribbean (ECLAC 2016). The recommendation to implement a disaster relief fund is reflected in the Fiscal Responsibility Legislation passed in 2018, as well as an IDB US\$100 million Contingent Credit Facility approved in the second quarter of 2018.<sup>14</sup>

**The IDB's Climate Resilient Coastal Infrastructure and Management Program is helping the government build capacity in climate-change-adapted infrastructure by training personnel, developing management plans, and updating existing building codes.** The program is also supporting the construction of protective structures to lessen impacts posed by hurricanes and sea-level rise. The climate change adaptation agenda is currently being spearheaded by The Bahamas Science and Technology Commission, and several strategies and policies have been set to achieve compliance with United Nations standards (UNFCCC).<sup>15</sup>

**The nation's infrastructure challenges show that advancements are needed in the water and sanitation, energy, air and maritime, road network, and transport sectors.** Establishment of a disaster relief fund, along with the development of preparedness and risk reduction policies, will advance current climate-reliant infrastructure. Improved customer interaction tools and the establishment of automation processes in meter reading will help reduce waste while improving access to sewerage and sanitation

<sup>11</sup> With limited fiscal space, the example of the Lynden Pindling International Airport concession provides some evidence on the type of partnership public and private entities can employ in reviving and developing critical infrastructure sectors (IMF 2018).

<sup>12</sup> A PPP Steering Committee will be established to provide direction to the PPP program and to oversee the development and implementation of PPP projects.

<sup>13</sup> The Bahamas has a ND-GAIN (measure of vulnerability) overall index score of 53.1 (2015), which is down from 54.0 in 2014 and below Barbados (62.3) and Trinidad and Tobago (55.1).

<sup>14</sup> The Contingent Credit Facility for Natural Disasters (US\$100 million) was approved by the IDB in June 2018, while the Climate Resilient Coastal Infrastructure and Management Program (US\$35 million) was approved in November 2017.

<sup>15</sup> This is to comply with the overall UNFCCC objective to "stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."



facilities. Applying dynamic renewable energy policy and improving current systems will reduce outages and lower consumption costs to commercial and residential customers. The outermost islands appear to be the area in greatest need, as maritime and airport infrastructure will have to be raised to comply with international safety standards.

### Conclusion

**The government has prioritized several infrastructure efforts, beginning with the promotion of energy reform by appointing a new management board at the BPL and by developing plans for a new generating plant.**

The floating of a US\$650 million bond will help retire legacy debts and provide needed resources to update mature equipment. The Bahamas receives financing from the IDB, and loans have been approved to help develop climate-resilient infrastructure and support airport infrastructure.

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# BARBADOS

## INVESTING IN RESILIENT INFRASTRUCTURE

**Contributor:** Laura Giles Alvarez

### Overview

**Barbados continues to implement its economic reform agenda.** Following a decade of low growth, recurring fiscal deficits, and rising debt, the Barbados Economic Recovery and Transformation (BERT) plan was launched in August 2018. BERT became the basis for a four-year US\$290 million Extended Fund Facility (EFF) program with the International Monetary Fund (IMF) signed in October 2018. To date, the bulk of the reforms have centered on fiscal consolidation and debt restructuring, which led to the IMF approving the second US\$49 million disbursement under the program in June 2019 (IMF 2019). Other measures included in BERT seek to improve the business climate, attract investment, and increase climate change resilience.

**The fiscal stance is improving.** The overall and primary fiscal balances improved from -4.3 percent of GDP and 3.3 percent respectively in FY2017/18 to -0.3 percent of GDP and 3.5 percent of GDP in FY2018/19. Following the domestic debt restructuring, gross public sector debt fell from 156.7 percent of GDP at the end of June 2018 to 124.2 percent at the end of June 2019. International reserves rose from US\$220 million (5.6 weeks of imports) in June 2018 to US\$601.8 million (15.3 weeks of imports) in June 2019.

### Development Challenges and Infrastructure

**In addition to macroeconomic challenges, Barbados faces key structural constraints to growth and development.** These include a weak business climate, high dependence on imports, low levels of diversification, limited competitiveness, and vulnerability to natural disasters and climate change externalities.

**A worsening infrastructure stock reinforces these structural constraints.** Barbados has high-quality infrastructure indicators by international standards, ranking 30<sup>th</sup> out of 138 countries on the quality of infrastructure pillar of the World Economic Forum's 2016–2017 Global Competitiveness Index. This was the highest position among C-6 countries.<sup>1</sup> At the same time, inadequate levels of investment and maintenance are resulting in the deterioration of the capital stock. This is reflected in a fall of Barbados' Global Competitiveness Index infrastructure pillar rank (by eight positions) between 2012 and 2016 (Figure 1). A deteriorating

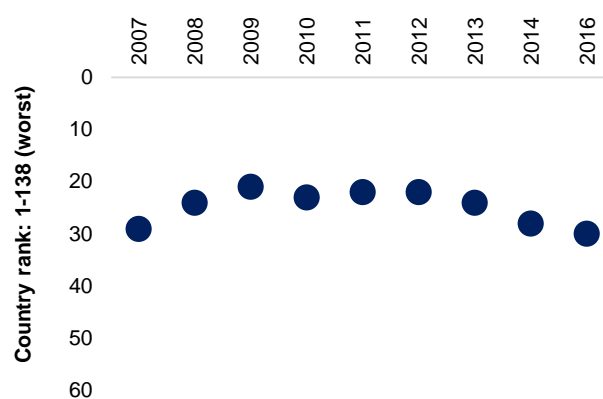
<sup>1</sup> C-6 countries include The Bahamas, Barbados, Guyana, Jamaica, Trinidad and Tobago and Suriname.

### Highlights

- Despite an adequate infrastructure stock in Barbados, the quality of that infrastructure is worsening.
- Fiscal challenges reduce the scope for capital investment and spending on operation and maintenance.
- Further promoting resilient infrastructure and new investment modalities, such as PPPs, will be key to investing in and maintaining the infrastructure stock going forward.

infrastructure stock can have negative implications for economic growth.<sup>2</sup> In spite of the deterioration, Barbados still has positive infrastructure gaps for key sectors of the economy, including energy, transport, water and sanitation, and telecommunications (Figure 2).<sup>3</sup>

**Figure 1. Ranking of Barbados' Infrastructure Pillar**



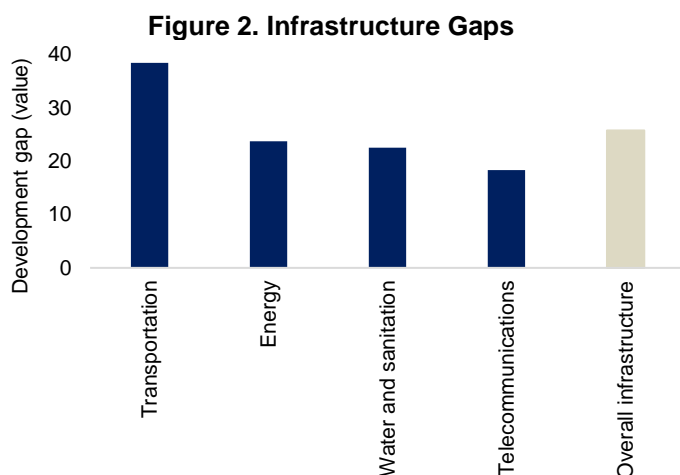
Source: World Economic Forum, 2016–2017 Global Competitiveness Index.

**Transport infrastructure is adequate, but insufficient maintenance and increasing traffic are putting a heavy burden on the sector.** Although 80 percent of roads in Barbados are paved, the country ranked 49<sup>th</sup> out of 138 countries on the quality of road infrastructure subindex of the 2016–2017 Global Competitiveness Index. This reflects a network that is at least 20 years old and in need of maintenance and upgrades to accommodate increasing traffic congestion.

<sup>2</sup> This effect can be measured through a decomposition of GDP growth using a Cobb-Douglas production function.

<sup>3</sup> Following Borensztein et al. (2014), a development gap is defined as the distance between the observed and the expected value of a given output indicator.





Source: Author's calculations based on World Bank and World Economic Forum data.

Note: A development gap is the distance between the output indicator for Barbados and the fitted value resulting from a linear (or quadratic) fit from a cross-country regression of such an indicator on GDP per capita.

**The transport sector would benefit from better maintenance, upgrades, and more efficient use of its infrastructure.** In addition to the lack of appropriate maintenance and new investment, inefficiencies in the use of transport infrastructure also lower the returns to the existing capital stock. For example, inefficiencies in goods clearance processes at the port and the lack of IT infrastructure to simplify administrative requirements increase the time and cost of trade, despite high-quality infrastructure, nautical access, and availability of equipment.

**Electricity generation is based on fossil fuels.** Barbados has a high dependence on imported fossil fuels, which account for almost 95 percent of its primary energy needs. This makes the country vulnerable to international oil price shocks and underpins high fuel and electricity costs.

**Substantial investment is required to promote renewable sources of energy.** Although the country is focusing on promoting greater use of renewables to diversify the energy matrix, these will require substantial capital investment and a revision of the regulatory framework for their effective implementation.

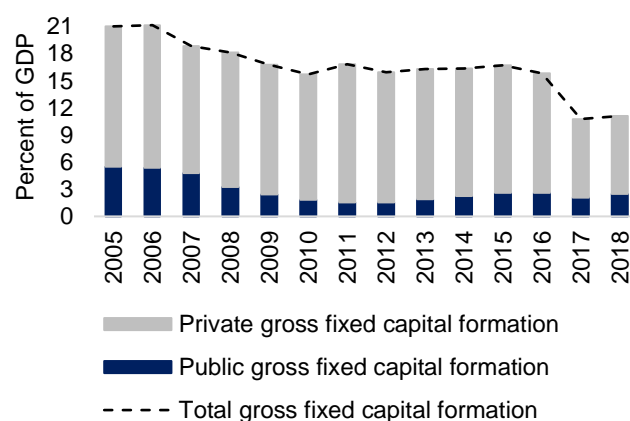
**Barbados faces shortfalls in its water and sanitation infrastructure.** The sanitation system requires fixing and upgrading. Overflows of wastewater from the South Coast Sewerage system between 2016 and 2018 negatively affected individuals, businesses, and the environment. In the water sector, institutional challenges limit the

Barbados Water Authority's capacity to afford operating costs, make capital expenditures, and service its debt. This has negative implications for service delivery and the maintenance of key infrastructure.

**Low levels of adoption by the government of information and communications technology (ICT) contrasts with adequate telecommunications infrastructure and coverage.** In 2015, the World Economic Forum ranked Barbados 101<sup>st</sup> out of 143 countries in government ICT usage, 79<sup>th</sup> in business-to-business Internet use, and 80<sup>th</sup> in business-to-consumer Internet use. These results partly reflect a high concentration of actors in telecommunications, which increases costs despite available and upgraded infrastructure.

**The above-mentioned challenges reflect falling levels of capital investment.** Gross fixed capital formation in Barbados fell from an average 18.4 percent of GDP between 2005 and 2011 to an average 14.7 percent of GDP between 2012 and 2018 (Figure 3). Contrasting this trend, the average gross fixed capital formation in Latin American countries slightly increased from 21.4 percent of GDP between 2005 and 2011, to 21.9 percent of GDP between 2012 and 2018.

**Figure 3. Capital Investments (percent of GDP)**



Source: International Monetary Fund, April 2019 *World Economic Outlook*.

**Barbados' lower investment level is the result of a reduction in public and private investment.** Public investment in Barbados fell from 3.5 percent of GDP between 2005 and 2011 to 2.2 percent of GDP between 2012 and 2018. This was far below the average 5.2 percent of GDP public investment recorded in Latin American countries between 2005 and 2018. At the same



time, private investment in Barbados declined from 14.8 percent of GDP between 2005 and 2011 to 12.5 percent of GDP between 2012 and 2018. This trend contrasted with the average 16.5 percent of GDP private sector investment recorded for Latin American countries between 2005 and 2011 and between 2012 and 2018.

### Public-Private Partnerships

**Fostering alternative financing arrangements through public-private partnerships (PPPs) can support infrastructure financing.** This will be important given the need for new investments and more spending on operation and maintenance in the current fiscal landscape.

**A more robust PPP framework would be advisable.** Lacking institutional structures and an inadequate underlying regulatory framework currently constrain the development of PPPs. To date, any PPP initiative needs to be addressed through the Financial Management and Audit Rules (2011). The Public Procurement Bill (2018), which has not yet been approved, shows the intention of considering PPPs under the procurement law.

### Climate Risks and Resilience

**Climate change externalities pose several risks to infrastructure.** As a small Caribbean island, Barbados is vulnerable to natural disasters and negative externalities of climate change. Further investments in resilient infrastructure are thus important to maintain an adequate infrastructure stock going forward.

**Investing in resilient infrastructure is an important component of the country's development strategy.** Barbados signed and ratified the United Nations Framework Convention on Climate Change in 1992 and 1994 (UNFCCC 2015); ratified the Kyoto Protocol in 2000; and established a climate action plan in the form of a National Determined Contribution under the Paris Agreement framework. Other key national policies that guide the government's actions in climate change adaptation and mitigation include the 2006–2025 National Strategic Plan, the 2013–2020 Medium-Term Growth and Development Strategy (Government of Barbados 2013), the 2012 National Climate Change Policy, the Barbados Sustainable Development Policy, the Physical Development Plan, and the Water Zoning Policy.

**A wide range of government agencies in Barbados work in the areas of climate change and disaster risk management.** These include the Ministry of Environment and National Beautification, Ministry of Finance, Economic Affairs and Investment, Ministry of Housing, Lands and Rural Development, Ministry of Tourism and

International Transport, Ministry of Energy and Water Resources, Ministry of Agriculture and Food Security, and Ministry of Health And Wellness. The recent creation of the Ministry of Maritime Affairs and the Blue Economy has been noted as an innovative approach to coordinating all policies related to marine conservation, which could soon be followed by other states. However, despite widespread institutional support, coordination across institutions can be challenging.

### Conclusion

**Underpinning growth constraints in Barbados is the need to invest in infrastructure.** The worsening quality of infrastructure indicators reflects an aging capital stock and declining infrastructure investments. Given the country's fiscal stance and economic reform program, new investments will likely remain constrained in the next few years. This calls for the support of other investment modalities, such as PPPs. Further promoting resilience in infrastructure investments will also be of the outmost importance given the country's vulnerabilities to climate change and natural disasters.

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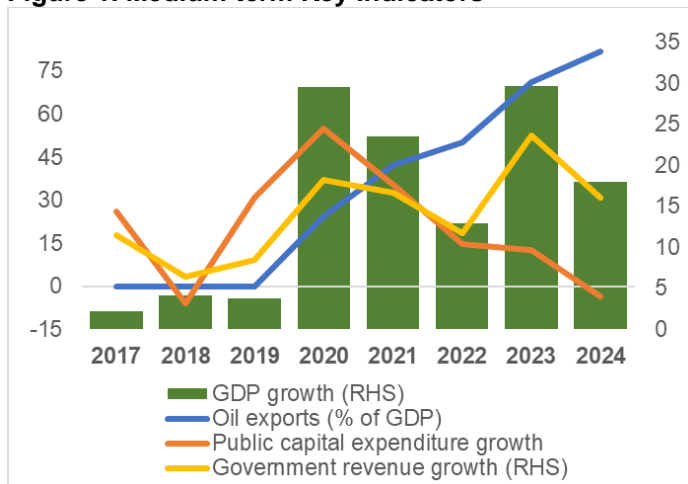


**Contributors:** Victor Gauto and Elton Bollers

### Overview

Like many countries in the world, Guyana faces important infrastructure challenges in transportation, communications, energy, and water and sanitation. Infrastructure development is generally considered a fundamental component of economic growth, with capital stock representing a key determinant of production. The research on infrastructure indicates that every 1 percent increase in physical infrastructure increases gross domestic product (GDP) by approximately 1-2 percent. Infrastructure development is important for two main reasons. First, it is a cornerstone of productivity. Better roads, bridges, energy, and communication reduce transportation and production costs. Second, infrastructure may contribute to reducing income inequality and poverty by enhancing access to jobs, health, and education (Calderon, 2014). In this context, the idea of sustainable infrastructure, which considers the environmental and social aspects of critical projects, has moved to the foreground of development policy discussions.

**Figure 1. Medium-term Key Indicators**



Source: IMF (2019).

While Guyana faces infrastructure challenges, the country is in a unique position because it is transitioning to becoming an oil producer in 2020. The positive economic and fiscal effects of this transition are expected to be profound and extended, with oil production lasting for at least a couple of decades. According to the IMF (2019), Guyana's economy is expected to grow at an average annual rate of 23 percent between 2020 and 2024. Similarly, government revenues are expected to increase by 17 percent annually over the same period, doubling in 2024 with respect to 2019. The dynamics during this reference period represent a fundamental opportunity to address Guyana's challenges, with public

### Highlights

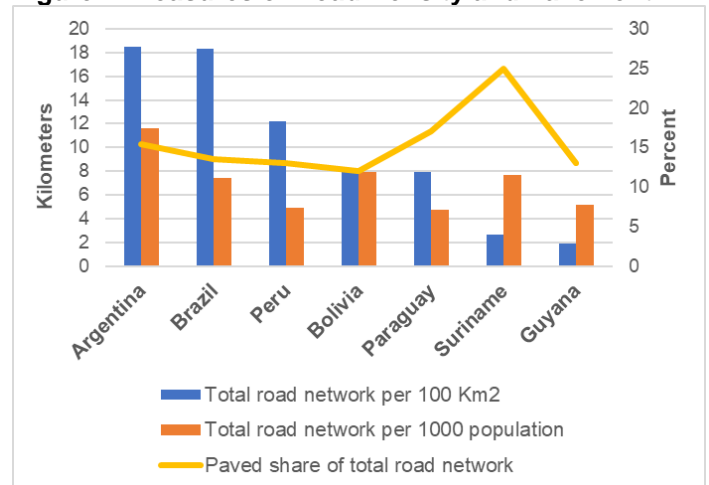
- Even though public capital expenditure in Guyana has remained a relatively large share of GDP, infrastructure challenges abound.
- Access to reliable electricity is a major challenge.
- The combination of public infrastructure challenges may have contributed to relatively low private sector investment, with the public sector leading investment.
- The government has outlined a series of infrastructure projects in its Green State Development Strategy.

capital expenditures also expected to increase 23 percent per year (Figure 1).

### Development Challenges and Infrastructure

Guyana's main challenge will be to translate the government's newfound sources of income into an agent for economic transformation and development. The country's transportation infrastructure (roads, airports, seaports and border crossings) requires improvements to support the growth of the private sector. The limited accessibility and high rates associated with the electricity sector also hinder private sector development. Guyanese firms report high energy costs as a major obstacle to doing business.

**Figure 2. Measures of Road Density and Pavement**



Source: United Nations Economic Commission on Latin America and the Caribbean, *Maritime and Logistics Profile*, IDB public loan documents, world.bymppap.org, authors' estimates.

In transportation, the country has a sparse road network that limits land transportation within and to neighbouring countries. With a total road network of an estimated 3,995 km, and with approximately 520 km of paved roads, Guyana has an estimated 1.9 km of roads per 100 km<sup>2</sup> of territory. This is relatively low compared to other large countries with low population densities. For

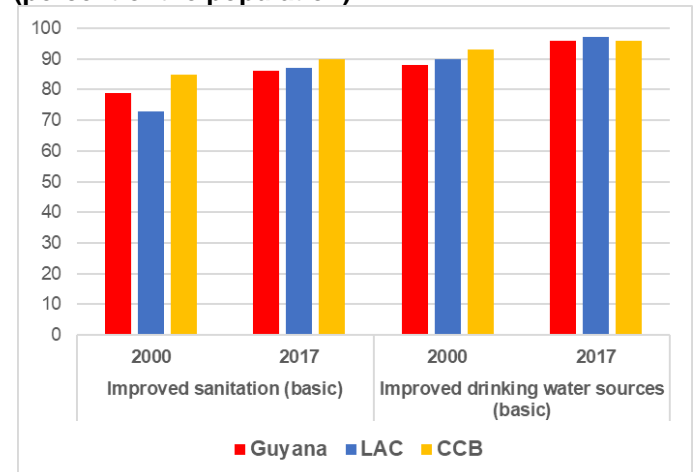
example, Argentina and Bolivia, which have higher population densities than Guyana, have 18.5 and 8 km per 100 km<sup>2</sup> of roads, respectively. Guyana has approximately 5.1 km of roads per 1,000 population, which is also lower than Argentina and Bolivia, but higher than countries such as Peru, Paraguay, and Chile which have 4.9 km, 4.7 km, and 4.3 km per 1,000 population, respectively. The share of paved roads in the total road network in Guyana is estimated to be 13 percent, which is similar to other countries that are large relative to their populations. In Brazil, Peru, and Bolivia, the shares of paved roads relative to the total road network are 14 percent, 13 percent, and 12 percent, respectively (Figure 2). Most of the population has access to paved roads in Guyana because the roads are mostly located along the coastal areas where almost 90 percent of the population resides.

**In water and sanitation, Guyana has made progress with regard to the United Nations Sustainable Development Goals (SDGs).** The UN has reported that in 2017, 96 percent of the population had access to improved drinking water sources and 86 percent had access to improved sanitation facilities (UNICEF/WHO, 2019). Guyana was slightly below the average for Latin America and the Caribbean (LAC) of 97 percent of the population with access to improved drinking water and 87 percent of the population with access to improved sanitation (Figure 3)<sup>1</sup>. The population with access to improved drinking water sources in Guyana increased by 8 percent between 2000 and 2017, however, safe water management and quality continue to represent challenges. In sanitation, sewer connections cover a limited share of the population.

**The telecommunications sector represents a challenge in Guyana.** According to the World Bank's World Development Indicators, in 2017 approximately 37 percent of the population used the internet (Figure 4). This is a significant improvement relative to 2007, when 14 percent of the population used the Internet. Still, these figures remained below the LAC and CCB averages in 2017 of 62 and 63 percent, respectively. These trends may reflect the number of secure Internet servers per million population and fixed broadband subscriptions per 100 population. While the LAC and CCB regional averages in 2017 for secure Internet servers per million population were 998 and 482, respectively, in Guyana the figure was 32. Between 2007 and 2017, broadband subscriptions in Guyana increased at a greater rate than the LAC and CCB averages, but the country remains below both averages at 8.3 subscriptions per 100 population compared to 11.9 in LAC and 16.5 in the CCB. In mobile communications,

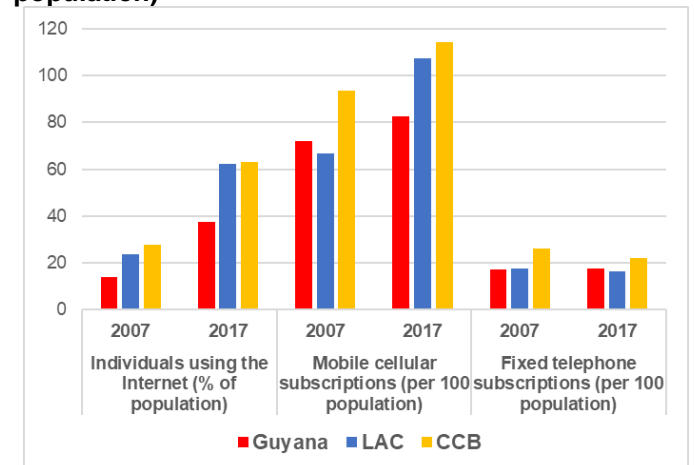
Guyana had 82.6 mobile cellular subscribers per 100 population in 2017, below the LAC and CCB averages of 107.4 and 114.

**Figure 3. Use of Water and Sanitation Facilities (percent of the population)**



Source: UNICEF/WHO (2019). Note: CCB: Country Department Caribbean; LAC: Latin America and the Caribbean.

**Figure 4. Communications Measures (percent of population)**



Source: World Bank, World Development Indicators.

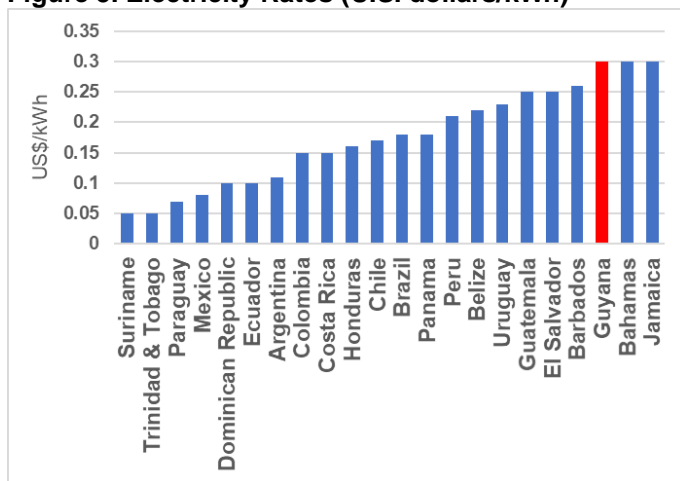
**The electricity sector and its close relation to private sector activity is a great development challenge affecting private sector business activity.** Guyanese firms report high energy costs as a major obstacle to doing business, according to Compete Caribbean's 2014 Productivity, Technology and Innovation in the Caribbean (PROTEqIN) Survey. Electricity generation and transmission infrastructure are under great pressure due to growing demand, which is expected to increase even more as Guyana transitions into an oil economy. The public

<sup>1</sup> The figures for CCB include Barbados, The Bahamas, Guyana, Jamaica, Suriname, Trinidad and Tobago.



electricity utility is characterized by high service costs and frequent power outages. The high costs are driven by Guyana's dependency on imported fuel to generate electricity. The average tariff for electricity in Guyana is about US\$0.30/kilowatt hour (kWh) representing one of the highest rates in LAC, where the average tariff is US\$ 0.18/kWh (Figure 5). Because of the system's compromised reliability, many Guyanese firms and households source power from generators to supplement public electricity transmission, representing significant private costs to the economy.

**Figure 5. Electricity Rates (U.S. dollars/kWh)**



Sources: Globalpetrolprices.com; United Nations, *Caribbean Human Development Report* (2016); and authors' estimates.

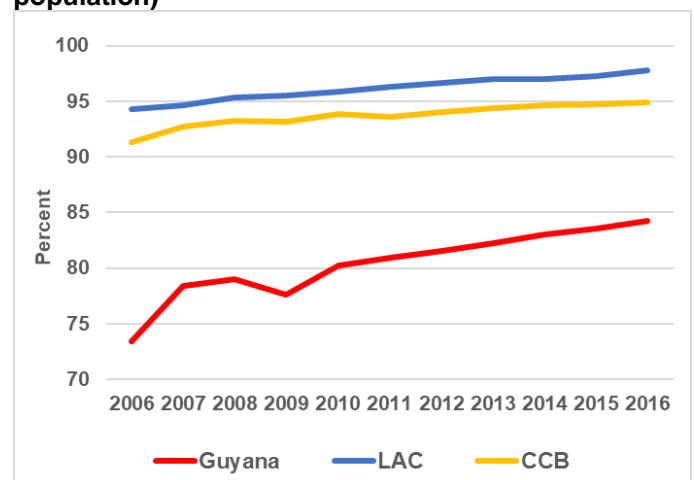
**Access to electricity is below regional averages in Guyana.** According to World Bank data, the share of the population with access to electricity increased from 73 percent in 2006 to 84 percent in 2016, while the LAC and CCB averages were 98 and 95 percent, respectively (Figure 6). Very much like road infrastructure, the main electrical transmission grid is also located along the coastal areas of Guyana, serving most of the population. However, access to electricity in rural areas away from the coast remains a challenge. Electricity coverage in rural areas is approximately 80 percent. The government supports several power utility companies serving specific communities that are separated from the main distribution system. Most are based on community-scale diesel generators, with some development projects moving towards renewable solar energy as a source of power.

**The public sector has historically led investment in Guyana.** Public capital expenditures as a share of GDP have remained relatively high in the country, averaging 8.4 of GDP between 2008 and 2018 (Figure 7). This is significantly higher than the LAC and CCB averages of 2.5

<sup>2</sup> Public capital expenditures are measured by net acquisitions of non-financial assets. The measure is consistent with another measure of

and 3.0 percent during the same time period.<sup>2</sup> The only year in the series with a significant decline was 2015, a period characterized by political disputes, early elections, and significant delays in public investment. Even though capital expenditures declined to 4.6 percent of GDP in 2015, the level was still well above LAC and CCB averages. Other countries with relatively high average capital expenditure rates for the reference period include Bolivia (12.6 percent), Ecuador (11.5 percent), Haiti, (10.7 percent), and Panama (7.2 percent). These are all relatively high levels of public capital expenditure, though they may not all specifically reflect infrastructure spending. The recent literature on infrastructure spending in the region suggests that LAC has important infrastructure gaps and that total public and private investment should reach approximately 5 percent of GDP. Investment in infrastructure averaged 2.4 percent of GDP in LAC countries between 1992 and 2013 (Serebrisky et al. 2015).

**Figure 6. Access to Electricity (percent of the population)**



Source: World Bank – World Development Indicators. Note: CCB: Country Department Caribbean; LAC: Latin America and the Caribbean.

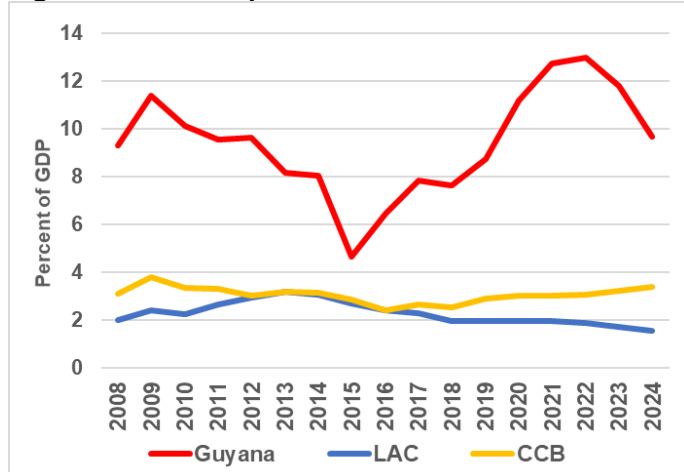
**On the other hand, private sector investment in Guyana has remained relatively low, which could be related to infrastructure gaps and the investment climate, implicitly taxing private sector activities.** Private investment in the country, measured by private gross fixed capital formation as a share of GDP, has continuously remained well below LAC and CCB averages, where, between 2008 and 2018, private sector investment levels were above 16 and 13 percent of GDP, respectively. In contrast, private sector investment in Guyana averaged slightly less than 8 percent of GDP during the same period. In the medium term, this ratio is expected to decline further after 2020, though this will be mainly due to GDP growing at exceedingly high rates after oil production begins

investment, gross fixed capital formation which is used to discuss the private sector.



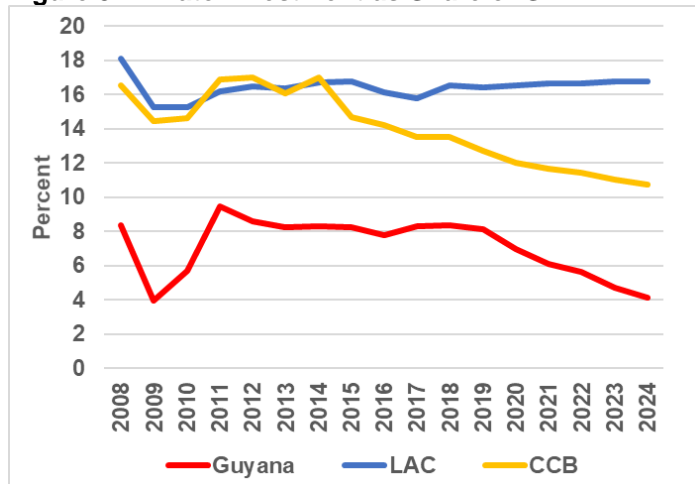
(Figure 8). Recently, foreign direct investment (FDI) in Guyana has significantly increased, reaching 6 percent of GDP in 2017 and 2018, higher than the 3 and 4 percent average for LAC and CCB countries in those years. These higher levels of FDI in Guyana are attributable to increased private sector activity related to oil and gas.

Figure 7. Public Capital Investment as a Share of GDP



Source: IMF (2019). Note: CCB: Country Department Caribbean; LAC: Latin America and the Caribbean.

Figure 8. Private investment as Share of GDP



Source: IMF (2019). Note: No data available for Jamaica, Suriname, and Trinidad and Tobago.

**One policy tool that has been used in many countries to promote private sector participation in infrastructure development has been public-private partnerships (PPPs).** A key feature of PPPs is that they can extend the reach of the public sector by engaging the private sector to supply infrastructure projects or services. In 2018, the government of Guyana completed a Public-Private Partnership Policy Framework aimed at developing and enabling the environment for PPPs. Such partnerships are frequently supported with legislation and

regulations. Guyana's PPP framework recognizes the importance of developing institutional arrangements and capacity for this objective.

**Finally, in the face of growing climate risks and Guyana's exposure to rising sea levels, the significance of planning and developing climate resilient infrastructure takes on even greater importance.** Climate change could increase the risk and intensity of natural disasters such as hurricanes and floods. Environmental sustainability considers climate change adaptation, mitigation and natural disaster risk reduction. Consequently, construction standards and technologies must be developed to ensure that new projects can withstand adverse weather conditions.

**Conclusion**

**The government of Guyana has outlined a series of infrastructure projects in its the Green State Development Strategy geared towards developing resilient infrastructure.** The main areas of development include road transportation, such as paving a 454 km stretch of road that would connect Guyana's coast to Brazil; deep-water port infrastructure accommodating large vessels, which could also serve as a trade outlet for the northern states of Brazil; improved communications infrastructure; coastal protection infrastructure and drainage; and key climate risk mitigation measures for exposed crops and property. Finally, in terms of private sector development and energy, Guyana's oil and gas boom could contribute to lowering private sector and household costs by continuing the discussion on natural gas for electricity generation, as discussed in the Green State Development Strategy.

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# JAMAICA INCREASING FOCUS ON PUBLIC INVESTMENT

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## Overview

**While necessary, fiscal consolidation in Jamaica has adversely affected public investment.** The need to restore fiscal sustainability and reduce debt in recent years has compromised the government's ability to allocate resources to public investment. This period of fiscal restraint was preceded by several decades of underinvestment (compared to other countries at similar levels of development) in related areas, owing in large part to recurring economic challenges and resource limitations.

**New sources of funding have helped to compensate for lower public spending.** In this context, the government has turned to the private sector and new financing modalities to help fill the gap, including via public-private partnerships (PPPs) for key initiatives such as highways, powerplants, and water and sanitation infrastructure over the last 20 years. This bulletin will consider these and related infrastructure sectors, provide cross-country comparisons to determine where gaps may exist for Jamaica, and discuss policy priorities and options for the future.

## Public Investment

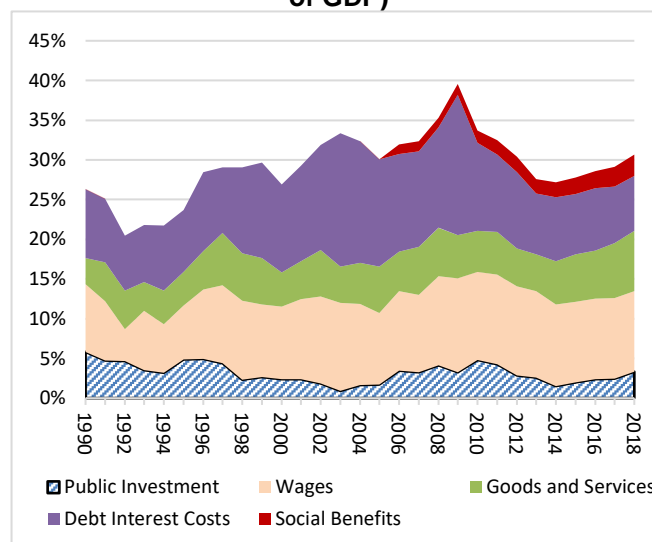
**The government was the main source of investment in the early years of Jamaica's independence.** From 1969 through the 1980s, public capital expenditure averaged about 12 percent of GDP, which represented most of the investment in Jamaica's infrastructure during this period. This highlights the government's crucial role and the breadth of its responsibilities during the first two decades following independence.

**Rising debt levels and increasing debt service costs led to a compression of fiscal space for investment.** Subsequently, the level of public capital investment declined considerably, reflecting a compression of fiscal space driven by rising debt levels and debt service costs, and rising public wages (Figure 1). The implications of this decline for Jamaica's infrastructure were exacerbated by structural inefficiencies plaguing the public procurement process. These and related challenges have led to significant underinvestment in both existing infrastructure and emerging needs across several sectors and regions of the country.

## Highlights

- Public investment in key areas in Jamaica has fallen victim to priority fiscal reforms and debt reduction in recent years.
- Efforts to supplement resources and knowledge with public-private partnerships have helped compensate for contracting public resources.
- Infrastructure gaps in key areas remain, particularly in terms of transportation (e.g., airports and roads), as well as with respect to energy, water, and sanitation.
- Looking forward, increased fiscal flexibility from successful debt reduction and institutional reforms should provide the government with additional scope for investments.

**Figure 1. Public Expenditure by Category (percent of GDP)**



Sources: International Monetary Fund, World Economic Outlook database; and authors' calculations.

Note: Public investment is defined as the net acquisition of non-financial assets.

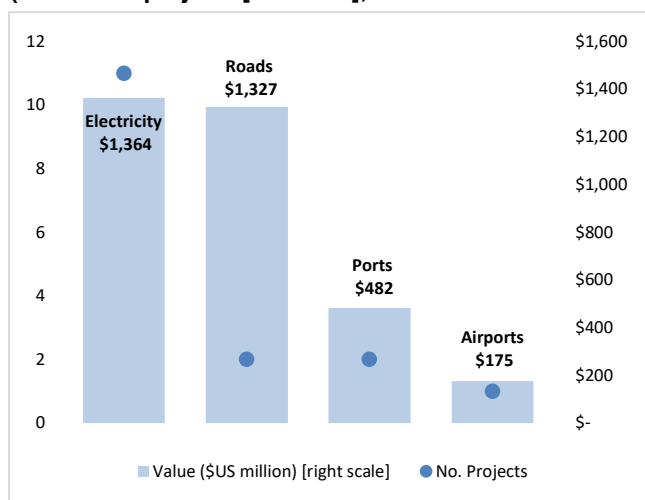
## Private-Public Partnerships

**The need for new sources of funding for crucial infrastructure has led to increased reliance on PPPs.** In order to help offset the compression of public investment, the government began working with the private sector to supplement resources. One such effort has been an increased emphasis on PPPs, including for power infrastructure, roads, ports and airports (Figure 2). In this context, the government put in place a new PPP policy framework in 2012 that also focused on the privatization of some public assets (including loss-making or inefficient entities). PPPs and related projects are also currently being considered in the health, tourism, water and sanitation, and other crucial sectors.





**Figure 2. Public-Private Partnerships by Sector**  
(Number of projects [left scale]; and value in millions of US\$)

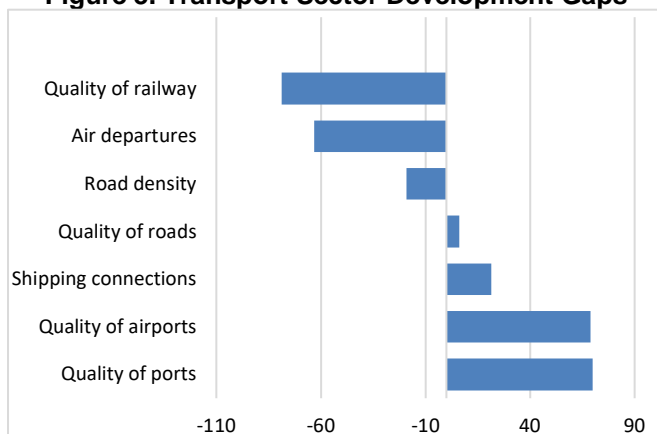


Sources: World Bank databases; and authors' calculations.

### Sector-Specific Deficits

Despite recent improvements, infrastructure deficits in the transport sector remain evident. Some dimensions of Jamaica's transport infrastructure compare well with those of other small economies based on cross-country comparisons.<sup>1</sup> These include logistics infrastructure, particularly ports and shipping connections, airports, and road quality, though road density could still be improved (Figure 3).

**Figure 3. Transport Sector Development Gaps**



Sources: Inter-American Development Bank; and authors' calculations.

However, the number of air carrier departures is relatively low compared to other similar countries. In this context, the government is working towards a new PPP involving a long-term concession with a private

<sup>1</sup> Development gaps refer to cross-country comparisons of key infrastructure and capacity-related variables. A negative gap refers to a sector where Jamaica compares poorly with other similar countries, while a positive gap suggests the inverse.

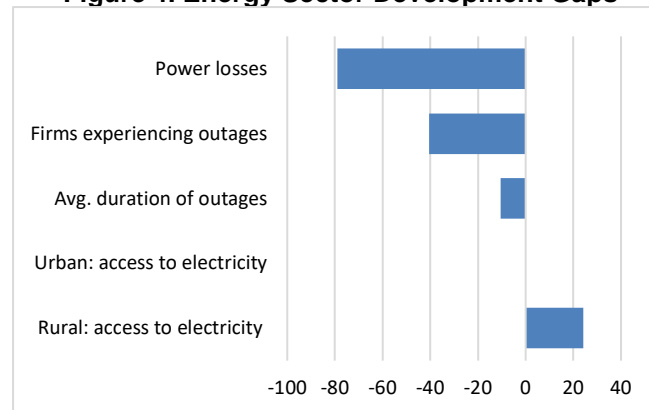
partner to develop, maintain, and operate the Norman Manley International Airport in Kingston.

**New Investment in ports and related infrastructure aims at creating a regional hub.** The Kingston Freeport Terminal was upgraded in response to the expansion of the Panama Canal, in order to capitalize on increased seaborne traffic throughout the region. This is expected to spur job creation and investment in new and profitable globally-integrated industries. Looking forward, further upgrades to logistics capacity are needed to support higher value-added services at the port, which should also help accelerate growth of the broader maritime sector.

**Energy consumption accounts for the largest share of Jamaica's import bill.** Fossil fuels including heavy fuel oil, diesel oil, and liquefied natural gas power approximately 88 percent of all electricity generation, with the balance produced by a mix of wind, solar, and hydroelectric plants. Hydrocarbon fuels have averaged about 26 percent of total goods imports since 1990. This reliance on imported fuel, combined with antiquated infrastructure, has contributed to an average retail electricity rate of approximately US\$0.3/kWh, with prices rising as high as US\$0.4/kWh when oil prices spiked in 2008. This compares to an average electricity cost of about US\$0.1/kWh<sup>2</sup> in the United States.

**Jamaica's National Energy Policy (NEP) aims to increase the share of power from renewable sources to at least 30 percent by 2030.** A number of PPPs are focused on this objective, including several major solar and wind projects that have added more than 100MW of clean power to the grid over the past five years, driven by investments totaling some US\$230 million.

**Figure 4. Energy Sector Development Gaps**



Sources: Inter-American Development Bank; and authors' calculations.

**When compared with similar countries, Jamaica displays both relative strengths and deficits in terms**

<sup>2</sup> U.S. Energy Information Administration, May 2019.



**JAMAICA INCREASING FOCUS ON PUBLIC INVESTMENT**

**of power access and reliability.** Rural access to electricity is relatively strong, with an extensive network of transmission infrastructure in place across the island. However, electricity theft is one of the most daunting challenges facing the utilities sector. Jamaica’s main power utility company reported losses of JM\$1.15 billion (US\$8.58 million) in 2018, with total system losses representing about 27 percent of net generation. This level of losses was consistent with past years. Furthermore, of the over 800,000 energy consumers in Jamaica, about 180,000 are estimated to have illegally consumed electricity—about a quarter of all customers. These financial losses have impacted the utility’s ability to invest in newer and more efficient technologies.

**Despite relatively poor performance on some measures of reliability, some improvements are evident.** For example, the main utility company reported a sharp reduction in the frequency and duration of outages over the past five years, following new investments (Table 1). Further efforts to improve access, reduce losses, and prevent outages will include the use of smart meters and a hybrid energy storage facility to improve island-wide reliability, along with voltage standardization to improve quality.

**Table 1: Change in Electricity Outage and Duration**

Year	Duration of Outages (annual)	Average Frequency of Outages
2014	41 hours	19
2018	27 hours	10

Source: Jamaica Public Service Company Limited.

**The water and sanitation sector is characterized by outdated and poorly-maintained infrastructure.** This stems in part from financial sustainability issues driven by leakage and a high level of non-revenue water (e.g., leakage and stolen water resources). Though Jamaica compares relatively well in terms of rural access to water and sanitation, this masks significant investment needs. For example, a lack of indoor plumbing (e.g., for toilets and other purposes) is still common throughout schools and homes in rural communities. In urban areas, low water levels in the main dams and reservoirs cause water shortages, especially during the dry season.

**Rehabilitating existing infrastructure and improving management to reduce losses is crucial.** Various projects have been commissioned by the government to repair, expand, or construct new water and sanitation infrastructure. Examples include the School Sanitation Project and the Basic Needs Project, both commissioned

in 2019 with a joint budget of J\$593 million. Furthermore, a recent PPP to build a 15 million gallon water treatment plant in St. Catherine is being taken forward, at a cost of approximately US\$60 million.

**The telecommunications sector is highly developed, with broad geographic coverage.** Jamaica is served by two major telecommunications service providers—Digicel and Flow— including both 4G and 3G network coverage to most of the populated parts of the island. In this context, Jamaica compares well with other small and developing countries on most relevant indicators, as well as with many developed countries.

**Looking forward, new infrastructure development plans must consider climate and disaster resilience.** The Ministry of Water, Land, Environment and Climate Change acts as the executive agency responsible for implementing programs outlined under the Pilot Program for Climate Resilience. One such program is the Strategic Programme for Climate Resilience (SPCR), which was initiated in 2011 by the Planning Institute of Jamaica. The SPCR is a 12-year program that aims to ensure that government investments and policy initiatives include a focus on environmental resilience and climate adaptability in key sectors, including tourism, agriculture, food security, health, water, human settlement, and coastal resources. Some funding for the program is being provided by the IDB and World Bank, including through the Climate Investment Fund.

**Conclusion**

**Public investment in infrastructure has been affected by fiscal retrenchment, but prospects are improving.** Looking forward, prospects for higher levels of public capital expenditure aimed at upgrading and extending infrastructure should benefit from the country’s strong progress with debt reduction and reform. Partnerships between the government and the private sector have also helped, with the transfer of both ownership and management of public utilities helping to improve efficiency in several areas, and with PPPs providing new forms of financing for key sectors. Comparative assessments of the performance and adequacy of various sectors suggest that while improvements have been made in recent years, much work remains to be done in key areas – including physical and transport infrastructure, energy availability, water and sanitation, and other areas critical to improving lives and catalyzing new investment in Jamaica.



# SURINAME

# INFRASTRUCTURE GAPS

**Contributor:** Jeetendra Khadan

## Overview

**Even though economic growth has returned in Suriname, challenges remain.** After a contraction in real GDP by 9 percent over 2014–2016, an increase in gold production has helped return economic growth to positive territory, averaging 1.85 percent for 2017–2018. Along with improvements in growth, inflation has declined to low single digits and the official exchange rate has remained relatively stable. Despite these improvements, however, sustaining economic growth will require adequately addressing development challenges.

## Development Challenges and Infrastructure

**Different weaknesses are holding Suriname back.** The findings of an empirical exercise using the Development Gaps Model of Borensztein et al. (2014) indicated that the main challenges facing the country relate to (1) public sector management, (2) private sector development, and (3) human capital strengthening, while climate change and gender inequality are considered cross-cutting challenges as there is a need to integrate them across sectors.

**The underlying factors contributing to these challenges can be traced to the quality of institutions and limited infrastructure.** Infrastructure deficiencies can constrain private sector growth because they lower the returns to investment, and can simultaneously affect the accumulation of human capital because of limited access to basic services such as water and sanitation, education, and health. Public finances are also strained if there are inefficiencies in the delivery and maintenance of existing infrastructure (IDB 2018a). As the previous issue of the *Quarterly Bulletin* examined the quality of the country's institutions, this issue will turn our attention to infrastructure-related development challenges facing Suriname (2018b).

**The quality of Suriname's infrastructure is below the benchmark level for countries in the region.** Figure 1 shows infrastructure-related development gaps, which are estimated following Borensztein et al. (2014).<sup>1</sup> The gaps are estimated using indicators related to access, connectivity, quality, and sustainability of infrastructure from various international databases (Figures 1-5).<sup>2</sup> The overall findings show that Suriname has negative development gaps with respect to the benchmark region of Latin America and the Caribbean (LAC) in all four sectors

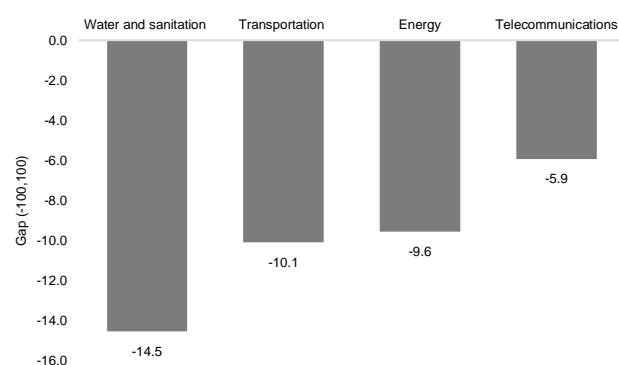
<sup>1</sup> All gaps are standardized with respect to their mean and standard deviation across countries, and the standardized gaps are rescaled such that the values fall in the same range (-100,100). All standardized gaps are aggregated at the sector level. The corresponding sector gaps are used to determine whether there is a gap and to rank the gaps according

## Highlights

- Suriname's water and sanitation sector has the largest negative development gap, followed by transportation, energy, and telecommunications.
- More work is needed to develop an effective public-private partnership framework to support infrastructure development in Suriname.
- Suriname is receiving support from many bilateral and multilateral partners to address infrastructure-related climate change challenges, but there is a need for a stronger institutional framework.

considered. Water and sanitation has the largest gap, followed by transportation, energy, and telecommunications. Each sector is examined in detail below.

**Figure 1. Infrastructure Development Gaps (percent)**



Source: Staff estimates from various databases

**The energy sector is challenged by limited access, insufficient investments in transmission and distribution, below-cost tariffs, service unreliability, and inadequate information on the sector (see Figure 2).** Electricity access is estimated at 87 percent of the total population, but it is particularly limited in rural areas, where only 69 percent of the rural population has access to electricity, compared to an average of 94.2 percent in LAC. There are several factors that contribute to the challenge of providing affordable electrification to rural areas, including geographic distances, remote locations, low population density, and limited infrastructure. While there have been investments to increase power generation capacity, more investment is needed for transmission and

to their magnitude. The comparator for the gap analysis is the group of Latin American and Caribbean countries.

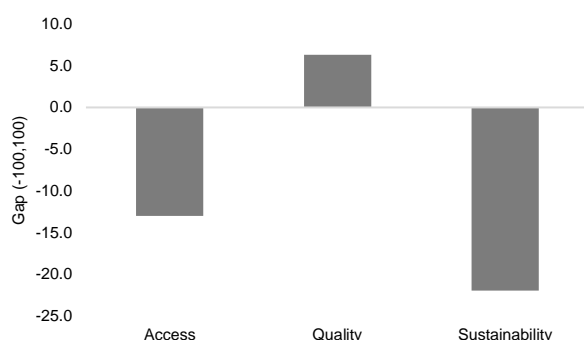
<sup>2</sup> Details on the variables used to construct the development gaps in Figures 1-5 can be obtained from the authors upon request.





distribution, both in terms of expansion and upgrading (IDB 2016). The existing electricity tariffs are below-cost and do not allow for full cost recovery, which results in a transfer of public funds to subsidize the sector: electricity tariff subsidies financed through the budget constituted 3.6 percent of GDP in 2017 (IMF 2018). Those constraints contribute to unreliable service, with 88 percent of private firms surveyed in 2018 reporting having experienced power interruptions, and 67 percent of those reporting between one and two interruptions in a typical month (World Bank 2018). The sector is also constrained by institutional weaknesses that are reflected in a lack of publicly available comprehensive data on electricity generation, the sale and consumption of electricity, the capacity of individual grids, and peak demand. However, progress is being made to address some of these challenges through the completion of an energy sector plan and establishment of an energy authority for the electricity sector.

Figure 2. Energy

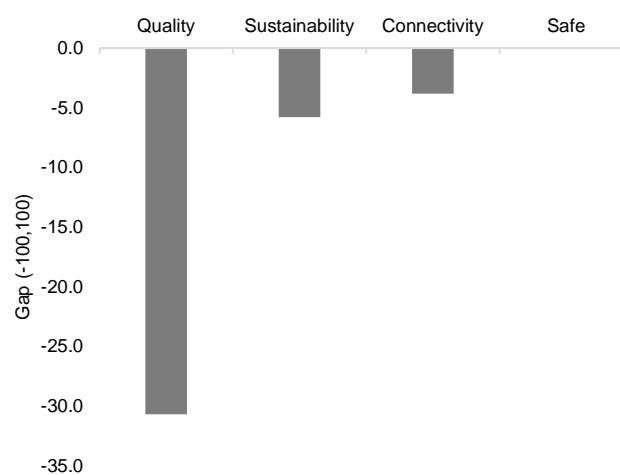


Source: Staff estimates from various databases

**Challenges in the transportation sector relate to limited infrastructure, inadequate maintenance of existing infrastructure, safety, and relatively weak institutions (Figure 3).** Transportation spans the road, air, and maritime networks. The road network is affected by congestion, as reflected in a high motorization rate of 303 vehicles per 1,000 population, compared to 204 per 1,000 population in 2015 for LAC. Some of the factors contributing to congestion include high population density in coastal areas, an inefficient public transportation system, limited parking arrangements, inadequate designated lanes for motorcyclists and bicyclists, and a lack of pedestrian walkways. Those challenges in the presence of risky practices such as speeding contribute to a safety hazard, as reflected in a relatively high fatality rate of 19.1 road fatalities per 100,000 population, compared to 16.7 for LAC, according to the World Health Organization. The challenges to air service relate to unreliability, infrequent flights, and logistical issues for both

international and domestic flights. In maritime transportation, connectivity is low because of few direct connections and a small number of service providers. This is reflected in Suriname's 2018 score on the United Nations Conference on Trade and Development Liner Ship Connectivity Index of 6.01 (on a 100-point scale), which is one of the lowest in LAC. There is need to invest more in staff capacity and to reduce institutional gaps to effectively administer and maintain the country's transport infrastructure.

Figure 3. Transportation



Source: Staff estimates from various databases

**The main challenges affecting the water and sanitation sector include inadequate infrastructure and institutional deficiencies, which contribute to high levels of non-revenue water (Figure 4).** Non-revenue water is estimated at 45 percent (IDB 2017a). With respect to access, the total population that uses at least basic drinking water services is 94.7 percent – marginally lower than the average for LAC (96 percent). However, access is lower in rural areas: 87.8 percent compared to 98.2 percent in urban areas. Infrastructure challenges relate to aging pipes that are functioning beyond their designed lifespan of 30-50 years, inadequate storage facilities, and the a lack of standby generators for continued production during power outages. The Suriname Water Company (SWM) and the water sector are also inhibited by governance challenges due to the lack of a public regulator. The government, which is the owner of SWM, is also functioning as the regulator. In the sanitation subsector, the World Bank estimates that 79.2 percent of the population uses at least basic sanitation services, but this varies between urban (88.4 percent) and rural areas (61.4 percent). Inadequate infrastructure, such as the lack of wastewater treatment facilities, results in the discharge of storm and sanitary wastewater directly into the

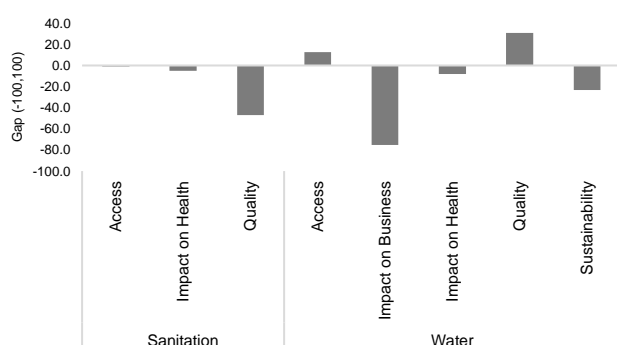


# SURINAME

# INFRASTRUCTURE GAPS

Suriname River via sluices or drainage pumps. Also, there are deficiencies in the design and construction of septic tanks used by households, which leads to the discharge of improperly stabilized septic waste into the environment. Both water and sanitation sectors are affected by limited cost-recovery mechanisms (IDB 2017a).

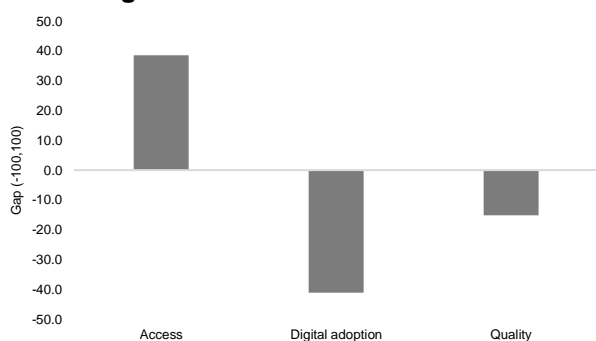
**Figure 4. Water and Sanitation**



Source: Staff estimates from various databases

In terms of telecommunications, Suriname faces challenges in digital connectivity (Figure 5): Internet usage and the number of secure Internet servers are relatively low. The World Bank estimates that about 45.4 percent of the population uses the Internet, which is lower than the average of 57.4 percent for LAC. The number of secure Internet servers, at 204 per 1 million population, is much lower than the average of 998 for LAC. On the other hand, fixed telephone subscriptions per 100 population (15.8) and fixed broadband subscriptions per 100 population (12.6) are similar to the average for LAC, although Suriname has a higher mobile cellular subscription per 100 population at 141.3 compared to 107.4 for LAC.

**Figure 5. Telecommunication**



Source: Staff estimates from various databases

**Continuous investment in infrastructure and maintenance is important to reduce infrastructure gaps.** Suriname's gross investment compared more

favorably with the LAC average in 2010 (the latest data available for Suriname from the World Bank's World Development Indicators): gross fixed capital formation was 37.5 percent of GDP compared to 20.2 percent for LAC. However, information on the areas that drove investment is not easily accessible. Relative political stability and high and increasing commodity prices could partly explain the higher level of investment in Suriname over the past two decades compared to the LAC average.

**Infrastructure financing needs are relatively high.** Suriname's national development plan for 2017–2021 assesses the challenges facing the country, including physical infrastructure, with estimates on public investments needed for energy, water, transportation, and communications. Government estimates for infrastructure financing needs for 2017–2021 are relatively high – especially given ongoing fiscal challenges – at US\$1,987 million (or 58 percent of 2018 GDP).

**Public-private partnerships (PPPs) can help loosen fiscal constraints, but Suriname has more work to do to establish an effective PPP framework.** A PPP framework could help to foster long-term infrastructure investments and close the infrastructure gap in energy, telecommunications, transportation, water and sanitation, and other sectors. Currently, Suriname does not have an effective PPP framework. The World Bank (2014) found limitations to doing PPPs in several areas, including the country's laws, policies, guidelines, dedicated units, dedicated project preparation funding, and staff with adequate PPP experience. However, as part of its ongoing fiscal strengthening program the government is planning to improve the public investment system by (1) strengthening the national investment system, including strategic guidelines, methodologies and tools for project preparation, and selection and execution of investment projects; (2) providing training on new methodologies for staff and consultants; (3) creating a PPP Unit; (4) developing a pilot performance management system for selected investment projects, including projects that are based on gender issues; and (5) strengthening the Ministry of Finance's ability to review project profiles, select projects based on specific criteria, and develop a multi-year investment plan (IDB 2017b).

**The cost for climate-compatible development is high.** Suriname could be affected by the direct physical impact of sea-level rise, and the expected temperature changes could also impact specific sectors of the economy such as agriculture, health, water resources, and coastal zones. The expected cost to achieve climate-compatible development for Suriname, as outlined in its National Climate Change Policy, Strategy and Action Plan, is high, estimated at US\$3,492 billion (102 percent of GDP) by



2025 (IEA 2015). This covers forests and renewable energy, including the adaptation of critical infrastructure such as dikes, drainage, and water management.

**Suriname is receiving climate change support from many bilateral and multilateral donors, but the country's institutional framework needs to be strengthened.** In particular, the IDB includes climate change as a cross-cutting theme in all of its projects. Similar support either directly or indirectly related to climate change resilience and adaptation is provided by the United Nations agencies, U.S. agencies, the European Union, the World Bank, and other countries such as Canada. However, there is need to further strengthen the current institutional framework for climate change governance, as it is considered to be fragmented, with responsibilities shared between various government ministries and stakeholders. This limits the effective coordination of climate-related tasks (CCCC and the Republic of Suriname 2015).

### Conclusion

**Suriname faces important challenges going forward.** This bulletin has examined infrastructure challenges in four sectors: water and sanitation, transportation, energy, and telecommunications. The evidence shows that compared with LAC, Suriname's water and sanitation sector has the largest negative gap, followed by transportation, energy, and telecommunications. Further details show deficiencies in factors related to access, connectivity, quality of output/service, and governance and institutions.

**A key priority for Suriname is to focus on improving its national investment system.** Although gross investment is higher than the LAC average, more work is needed to strengthen public investment management and related institutions. In terms of financing, the country could benefit from an effective PPP framework to help loosen existing fiscal constraints by engaging private investment in the financing, design, construction, and management of public infrastructure and related services. Moreover, climate change is expected to have adverse implications on the country's infrastructure. While Suriname is receiving support from multilateral and bilateral donors, more work is needed to reduce the fragmentation of responsibilities across stakeholders and promote effective coordination of climate-related tasks. The government's ongoing fiscal strengthening program can help to improve the efficiency of public investment in infrastructure. Looking forward, there are plans to establish a PPP unit, improve the public investment system, and strengthen public financial management, all of which could yield positive results for Suriname.

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## TRINIDAD AND TOBAGO INFRASTRUCTURE IN PLAY

**Contributors:** Lodewijk Smets, Denesh Baboolal, and Robin Montano

### Overview

**Trinidad and Tobago is a resource-based economy dependent on the performance of the energy sector.** The population of the country is estimated at 1,350,000, and per capita income is US\$32,227 in purchasing power parity, one of the highest levels among Latin American and Caribbean (LAC) countries. While the economy is expected to grow at around 1.5 percent on average in the medium term, tackling structural constraints – including in infrastructure – would contribute to increasing growth prospects.

### Development Challenges and Infrastructure

**In addition to challenges in public sector governance and competitiveness, the country's infrastructure needs improvement.** High automobile ownership combined with inadequate road infrastructure have led to congestion problems, while aging water and sanitation facilities cause frequent supply problems and waste. On the other hand, Trinidad and Tobago's energy and telecommunication infrastructure is well developed, although efficiency improvements are nevertheless needed in those sectors.

**Trinidad and Tobago's aged road infrastructure, high automobile ownership of 583 vehicles per 1,000 population, and low use of public transportation have led to congestion problems that affect productivity.** The abundance of automobiles is particularly severe given the limited connections between the capital and large residential areas. Approximately 51 percent of roads are paved, meaning that a large portion of the road network is in poor condition, despite significant capital expenditure. This suggests there are inefficiencies in allocation and maintenance (Ministry of Planning and Sustainable Development 2014; Oxford Business Group 2018). To address deficiencies in road infrastructure, the government is planning to extend two highways to north and south Trinidad and improve the infrastructure for public transportation.

**With regard to maritime transport, the major transnational port in the capital has an 11-meter draft, which restricts the size of the vessels entering and the time they may enter.** Coupled with outdated cranes and low productivity, the handling time for containers is more than that of more efficient ports in the region. Furthermore, the main transnational port's location in the capital has limited land for storage and further contributes to traffic congestion.

**Investments in airport infrastructure would increase safety and capacity.** Although the country's two

### Highlights

- *Trinidad and Tobago's infrastructure needs improvement, especially in transportation and water and sanitation.*
- *The government is already investing in road infrastructure and is aiming to improve energy efficiency.*
- *To maintain fiscal sustainability, the authorities may consider involving the private sector to address the country's infrastructure needs.*

international airports can accommodate large wide-body aircraft, full-length parallel runways should be developed on both sides of the existing taxiway to increase peak-hour capacity. Furthermore, low-visibility landing systems should be installed to enhance safety (Oxford Business Group 2018). The government is currently looking to improve the airport of Tobago.

**In terms of water and sanitation, almost all persons in Trinidad and Tobago have access to centralized water services, which has more than 93 percent coverage in both urban and rural areas.** Nevertheless, the nation's water and sanitation system is still presented with challenges, many of which surround the Water and Sewage Authority (WASA) that acts as both the country's water resource agency and utility. The existing system's aging pipes, which have not been replaced in over 50 years, leak severely, which has led to high levels of non-revenue water approximating 50 percent (IDB 2019). The result is that only 20 percent of the population of Trinidad has a continuous water supply. The result is that only 60 percent of the population of Trinidad and Tobago has a continuous 24/7 water supply during the wet season and 31 percent during the dry season. The Ministry of Public Utilities has been engaging the IDB in a technical dialogue to chart a way forward to improving the water supply system in Trinidad and Tobago through a Non-Revenue Water Reduction and Infrastructure Rehabilitation Program

**Issues of aging infrastructure affect wastewater systems.** Only 30 percent of the population has access to wastewater treatment facilities, while the rest use on-site sanitation services (IDB 2019). As a result, a large amount of untreated effluent is discharged into existing watercourses. This not only poses significant health and environmental risks, but also raises the costs of water treatment. Additionally, the lack of storm water drainage infrastructure and uncoordinated solutions to flooding have led to poor drainage facilities. In order to reduce the amount of untreated wastewater released into the environment, the Government of Trinidad and Tobago received financing from the IDB to fund the construction

of two new wastewater treatment plants, lift stations and collection systems in the San Fernando and the Malabar catchments. The Malabar system was recently commissioned and is fully operational, while the San Fernando system is in an advanced state of construction. Waste stabilization ponds, lift stations and collection systems were also constructed in South West Tobago.

**Trinidad and Tobago's energy infrastructure is well developed and extensive.** The sector itself consists of the government-owned electricity transmission and distribution utility, the Trinidad and Tobago Electricity Commission, and three independent power producers (Espinasa and Humpert 2016). Rural and urban access to electricity both stand at 100 percent of the population, higher than the respective LAC average of 92 and 99 percent (World Bank 2019). Nonetheless, the system suffers from inefficiencies. Around 96 percent of the country's electricity is produced using natural gas, which entails large opportunity costs. And while the transmission system benefits from minimal losses of 2.3 percent (the global average is 8.3 percent), power generation at independent plants is relatively inefficient, with a wastage rate of 70 percent. Despite significant upfront costs, upgrading existing plants to combined cycle units would increase efficiency to around 50 percent, significantly reducing energy wastage (Regulated Industries Commission 2018).

**High levels of energy subsidies give the country the lowest retail electricity price in the Caribbean.** Rates in Trinidad and Tobago reach about US\$0.05 per kWh in 2017 versus US\$0.30 to US\$0.40 per kWh in other islands. Such below-market rates do not incentivize investment in energy efficiency or renewable energy systems. The subsidies have resulted in overconsumption of electricity and left the country's emissions per capita from energy-related activities approximately two times higher than the LAC average. In seeking to boost energy efficiency and promote renewable energy investments, the Regulated Industries Commission has embarked on a review exercise for electricity rates. Also, an inter-ministerial energy efficiency commission has been set up. The objective of the commission is to develop a policy and an action plan towards greater energy efficiency and use of renewable energy.

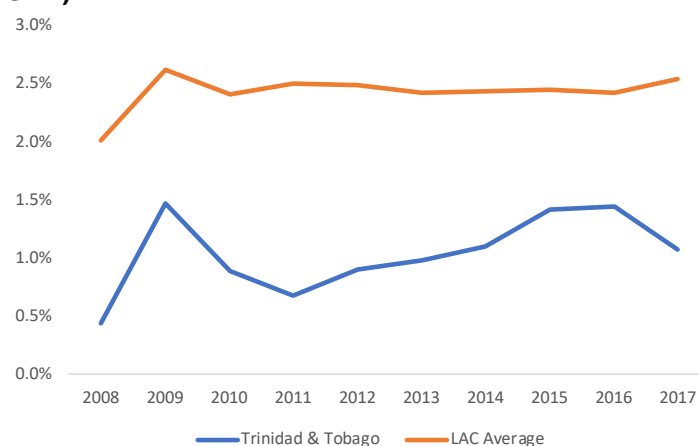
**The telecommunications infrastructure in Trinidad and Tobago is significantly developed.** The country has the 11th highest number of mobile subscriptions globally, around 160 for every 100 persons, compared to the global average of 148 (World Bank 2019). Large-scale Internet usage by over 73 percent of the population is less than the LAC regional average of 77.3 percent. Over 70 percent of households have a computer and

access to the Internet, compared to a regional average of 63 percent. However, Trinidad and Tobago still lacks the robust legal and regulatory framework required for eBusiness, eCommerce, and eServices.

### Investment in Infrastructure

**Attention is required for Trinidad and Tobago to meet its infrastructure needs.** As discussed above, there is a clear need to invest in the country's infrastructure. While infrastructure investment was on the rise during 2011–2015, it is still below the LAC average (Figure 1). Furthermore, during 2016–2017, infrastructure investment decreased relative to GDP. Looking forward, the government has indicated it intends to increase capital spending, especially in road infrastructure. While in principle this is welcome, prudence is also required as debt sustainability needs to be considered, especially given the country's dependence on the volatile energy sector. Therefore, the government should seek infrastructure investments with high social and economic returns.

**Figure 1: Total Investment in Infrastructure (% of GDP)**



Source: Infralatom.

Note: LAC: Latin America and the Caribbean.

**During 2008–2017, infrastructure investment was driven entirely by public funds.** Of that funding, the transportation sector received the largest amount, (approximately 60 percent), followed by the water and sanitation sector. The telecommunication sector was afforded increased attention during the 2010–2017 period, with an investment level in 2017 that was five times greater than in 2010 (Infralatom 2019). Despite this, important infrastructure gaps persist, suggesting that sole public funding of infrastructure is not enough to satisfy infrastructure needs.

**To maintain fiscal sustainability, the country may consider attracting private investment to develop infrastructure.** The government drafted a policy document stating that public-private partnerships (PPPs) would be used to support key public policy objectives and provide opportunities to improve physical infrastructure, thus maximizing the utility of resources available (Government of Trinidad and Tobago 2012). The document, however, has not been approved. There is, therefore, potential to develop and implement an institutional framework for PPPs.

**The Ministry of Planning and Development is responsible for the climate change strategy for Trinidad and Tobago.** In accordance with the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, Trinidad and Tobago has committed to (1) reducing emissions from its three main emitting sectors (power generation, transport, and industry) by 15 percent by 2030, and (2) reducing public transport emissions by 30 percent by 2030 and (3) generate 10 percent of its energy production from renewable sources. A National Climate Change Policy provides guidelines for achieving these goals, including the development of an appropriate administrative and legislative framework. Implementation to date has resulted in the development of a Carbon Reduction Strategy and Nationally Appropriate Mitigation Actions.

### Conclusion

Trinidad and Tobago faces important infrastructure gaps, especially in transport and water and sanitation, while efficiency gains are also needed in energy infrastructure and telecommunications. The government is currently developing a policy to improve energy efficiency and the use of renewable energy. The authorities are also engaging in large capital investments – specifically in road infrastructure, which may lead to productivity gains and bring infrastructure investment closer to the regional average. Prudence is necessary, however, as debt sustainability needs to be considered, especially given the country's dependence on the volatile energy sector. Therefore, the government should seek infrastructure

investments with high social and economic returns and consider involving the private sector to further develop the country's infrastructure.

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**Overview<sup>1</sup>**

**The Organisation of Eastern Caribbean States (OECS) region has witnessed a number of challenges that constrain growth and development.** Growth in the OECS has slowed in recent years, evidence of the vulnerability of these small island developing states to external shocks. After the global downturn in 2009, growth declined from an average of 3.6 percent over 2000–2008 to 1.5 percent over 2010–2018. Key common challenges among the OECS countries include being dependent on one highly volatile sector – tourism – along with limited fiscal space, a weak business environment, and high vulnerability to natural disasters. While fiscal consolidation efforts have led to improved fiscal positions in some OECS countries, debt levels across the region remained elevated at an average of 73 percent of GDP at the end of 2018.

**Investing in high-quality infrastructure can result in positive economic outcomes.** Infrastructure investment can foster economic growth by raising productivity, reducing production costs, expanding trade activity, and ultimately promoting greater competitiveness and private sector development (IDB 2019). Evidence suggests that investing in resilient infrastructure can also help countries withstand natural disasters. This is important in the OECS region, particularly as these events are predicted to become more severe in the future (OECD 2018). In this context, the purpose of this analysis is to highlight key development challenges facing the OECS region and to examine the importance of infrastructure.

**Development Challenges and Infrastructure**

**The OECS region faces a number of developmental and growth challenges.<sup>2</sup>** Key development challenges to growth include low diversification and high dependence on tourism, a weak business climate, a high reliance on imports, and susceptibility to natural disasters. Low growth, recurring fiscal deficits, and rising debt levels in some of the countries limit the scope to invest in infrastructure that could boost growth going forward.

**The outcome of extreme weather events disrupts economic growth, increases fiscal deficits, and contributes to higher public debt.** The frequency of natural disasters has taken a toll on economic activity in the region and increased reconstruction costs in countries with limited fiscal space. According to the 2019 Global

**Highlights**

- *Weak economic growth coupled with recurring fiscal deficits and rising debt levels limit the scope to invest in infrastructure in the OECS region.*
- *The region could benefit from further investments stemming from alternative sources, such as international financial institutions, as well as from the promotion of new investment modalities such as public-private partnerships.*

Climate Risk Index, extreme weather events from 1998–2017 were associated with annual costs averaging 6.5 percent of GDP, with major losses recorded in Grenada (7.1 percent of GDP), Dominica (21 percent), and St. Kitts and Nevis (4.2 percent) (Eckstein, Hutfils, and Wings 2018). Moreover, research suggests that the debt-to-GDP ratio in the OECS grew by almost 5 percentage points faster during the year a storm struck, with a cumulative debt increase of 5 percent of GDP a few years later (Acevedo 2014).

**Vulnerability to natural disasters also has adverse effects on the OECS region’s infrastructure.** Infrastructure stock that is not resilient is more susceptible to the impact of climate change. Since 2010, the OECS region has recorded damage to property, crops, and livestock of around US\$2.2 billion.<sup>3</sup> In Dominica, damage from Hurricane Maria alone in 2017 is estimated at US\$1.3 billion, or 226 percent of GDP, with approximately 80 percent of buildings on the island either damaged or destroyed. At the same time, key economic sectors for growth, such as tourism, are extremely vulnerable to natural disasters. Most of the tourism infrastructure is located near coastlines, and the sector’s value proposition is beach-based, which makes the sector and thus regional growth highly susceptible to natural disasters.

**Status and Importance of Specific Infrastructure**

In recent years, there has been an expansion of infrastructure projects in the OECS region with a focus on transportation, water and sanitation, energy, and telecommunications.

**An efficient transportation sector can improve the region’s competitiveness by allowing it to trade goods and services on a timely basis with lower transaction costs.** There have been a number of key investments in transportation infrastructure in the region in recent years. Examples include the ongoing Robert L. Bradshaw

<sup>1</sup> This bulletin focuses on developments in the independent member countries of the OECS: Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Vincent and the Grenadines, and St. Lucia. Figures exclude territories that are members of the OECS.

<sup>2</sup> See IDB (2018) for a further discussion on development challenges in the OECS region.

<sup>3</sup> Source: The Emergency Events Database (EM-DAT) - Université Catholique de Louvain ([www.emdat.be](http://www.emdat.be), Brussels, Belgium).

International Airport rehabilitation project in St. Kitts and Nevis and a road infrastructure project in Antigua and Barbuda funded with the United Kingdom Caribbean Infrastructure Fund (UK-CIF), estimated at £13.9 million.

**Improving existing water and sanitation infrastructure in the OECS is crucial given the region’s water scarcity, limited freshwater resource base, and high water demand.** In recent years, a number of countries have undertaken projects to increase the reliability and sustainability of the water supply. In 2015, St. Lucia undertook a rehabilitation project of the John Compton Dam, which is crucial for the water supply for the north of the island. In 2016, Grenada approved the Water Supply Expansion and Sewerage Improvement Project to upgrade and expand the Southern St. George’s Water Supply System and the Carenage/Lagoon Road Wastewater Collection System. In Dominica, an Alternate Water Harvesting and Storage Project, which officially opened in 2019, aims to provide about 400 residents with new water supply.<sup>4</sup>

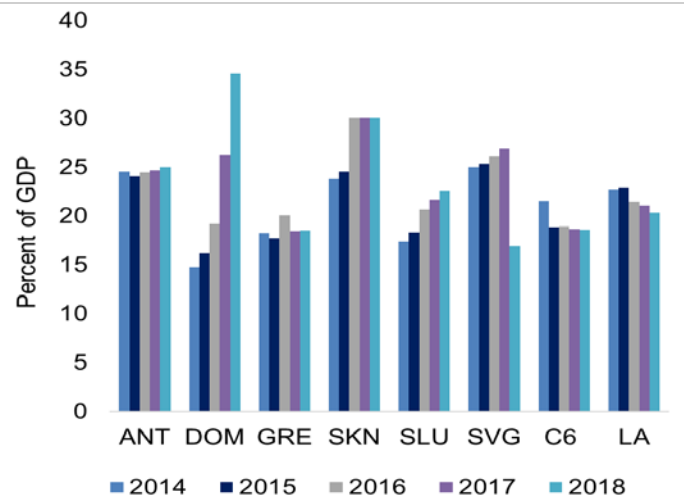
**Adequate telecommunications infrastructure is important because high-quality telecommunications services, and specifically broadband availability, can increase business and employment opportunities, firm productivity, and economic growth.** In 2019, the National Telecommunications Regulatory Commission embarked on a project in St. Kitts and Nevis to supply, install, and commission Internet access to 13 community centers in Nevis funded by the Universal Service Fund. The Antigua Public Utilities Authority is expected to invest US\$29.6 million to acquire its own sub-sea cable and to democratize access to the Internet by providing more affordable, reliable, and faster service to residents.

**In terms of energy, the OECS region is heavily dependent on imported fossil fuels.** Consequently, diversifying the region’s energy mix and finding energy-efficient solutions have become priorities in recent years. This is evidenced by a number of sustainable energy projects undertaken with the assistance of international financial institutions. For instance, the Caribbean Development Bank (CDB), the European Union-Caribbean Investment Facility, and the UK Department for International Development jointly funded the Sustainable Energy for the Eastern Caribbean Program in the OECS

region. Additionally, the IDB and CDB are jointly funding a US\$85.6 million Sustainable Energy Facility Programme for the Eastern Caribbean to finance geothermal energy projects within the OECS region.<sup>5</sup> Furthermore, in 2019, the World Bank approved a US\$27 million project to support the construction of a geothermal power plant in Dominica.

**Investment in infrastructure has grown in the OECS region.** Limited data suggest that gross fixed capital formation as a share of GDP grew on average from 21 percent in 2014 to 24.6 percent in 2018 for the OECS region.<sup>6</sup> In comparison, at the end of 2018, the average for the C6 countries<sup>7</sup> and Latin American countries reached 18.6 percent and 20.3 percent, respectively.<sup>8</sup> Total investment ranged from 17 percent of GDP in St. Vincent and the Grenadines to 30 percent in St. Kitts and Nevis and 34.5 percent in Dominica at the end of 2018 (Figure 1).

**Figure 1. Total Investment (percent of GDP)**



Source: International Monetary Fund, April 2019 World Economic Outlook database.

Note: ANT: Antigua and Barbuda; DOM: Dominica; GRE: Grenada; SKN: St. Kitts and Nevis; SLU: St. Lucia; SVG: St. Vincent and the Grenadines; LA: Latin American countries; C6: The Bahamas, Barbados, Guyana, Jamaica, Trinidad and Tobago and Suriname.

<sup>4</sup> This project was funded by the Japan Caribbean Climate Change Partnership (J-CCP) Project.

<sup>5</sup> This excludes Antigua and Barbuda.

<sup>6</sup> With the exception of Dominica, no data for gross fixed capital formation were available prior to 2014 for the OECS region from the International Monetary Fund’s April 2019 World Economic Outlook database.

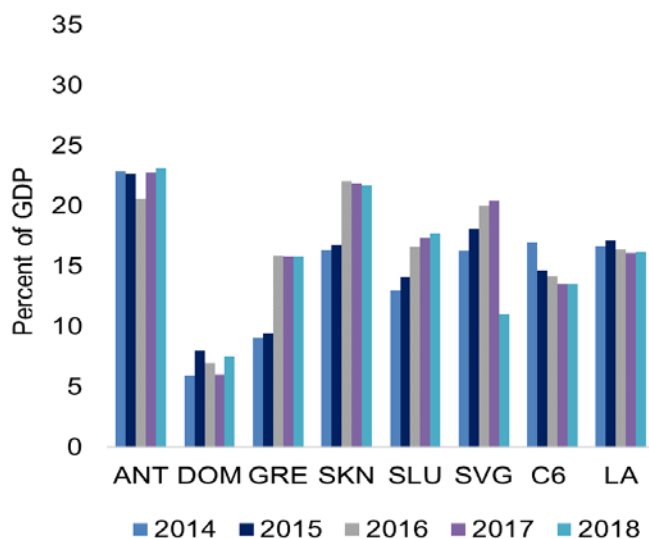
<sup>7</sup> The C6 includes The Bahamas, Barbados, Guyana, Jamaica, Suriname, and Trinidad and Tobago, but data for the latter two countries were unavailable.

<sup>8</sup> While total investment was higher in comparison to the wider Latin America and Caribbean region as of the end of 2018, given the frequency of natural disasters faced by the region, these comparisons must be taken with care.



**The share of private investment in the OECS region was on par with the average for Latin American countries at the end of 2018.** Private gross fixed capital formation as a share of GDP grew on average from 14 percent in 2014 to 16.2 percent in 2018 for the OECS region. The average for OECS countries at the end of 2018 was on par with the Latin American countries (16 percent of GDP) and above that of the C6 countries (13.5 percent of GDP). Antigua and Barbuda and St. Kitts and Nevis recorded the highest private investment as a share of GDP at the end of 2018 at 23.1 percent and 21.7 percent, respectively (Figure 2). Implementation of Citizenship by Investment (CBI) Programmes in these countries would have assisted in attracting private investment and stimulating growth. Programmes with private investment options can have a direct real sector impact, especially on construction and real estate, and increase tourism room capacity (Gomez Osorio, Waithe, and Blenman 2017).

**Figure 2. Private Investment (percent of GDP)**

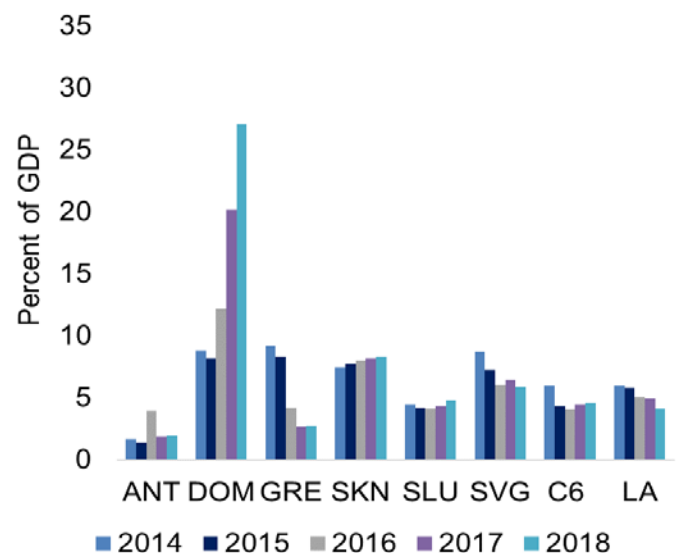


Source: International Monetary Fund, April 2019 World Economic Outlook database  
 Note: ANT: Antigua and Barbuda; DOM: Dominica; GRE: Grenada; SKN: St. Kitts and Nevis; SLU: St. Lucia; SVG: St. Vincent and the Grenadines; LA: Latin American countries; C6: The Bahamas, Barbados, Guyana, Jamaica, Trinidad and Tobago and Suriname.

**Dominica has recorded the highest public investment in the OECS region.** Public gross fixed capital formation as a share of GDP grew from 8.8 percent of GDP in 2014 to 27 percent at the end of 2018 in Dominica (Figure 3). The pick-up in capital expenditure at the end of 2018 was largely associated with spending on rehabilitation works as well as housing repair and reconstruction following Hurricane Maria. The other countries in the OECS region

saw public investment ranging from 1.9 percent of GDP in Antigua and Barbuda to 8.3 percent in St. Kitts and Nevis in 2018. Comparatively, the C6 and Latin American countries averaged 4.6 percent and 4.1 percent of GDP, respectively. According to Gomez Osorio, Waithe, and Blenman (2017), capital expenditures led to a larger fiscal deficit in many of the countries in the OECS region. Countries such as Antigua and Barbuda and St. Vincent and the Grenadines invested in new airports, while other countries invested in reconstruction following natural disasters. While deep investment is growth-positive, affordability was a challenge and these investments were largely public-sector driven and contributed to debt accumulation (Gomez Osorio, Waithe, and Blenman 2017).

**Figure 3. Public Investment (percent of GDP)**



Source: International Monetary Fund, April 2019 World Economic Outlook database.  
 Note: ANT: Antigua and Barbuda; DOM: Dominica; GRE: Grenada; SKN: St. Kitts and Nevis; SLU: St. Lucia; SVG: St. Vincent and the Grenadines; LA: Latin American countries; C6: The Bahamas, Barbados, Guyana, Jamaica, Trinidad and Tobago and Suriname.

**Public-Private Partnerships in the OECS Region**

**Maintaining adequate infrastructure poses a great financial burden on the OECS region given its limited fiscal capacity.** Developing alternative financing arrangements such as public-private partnerships (PPPs) can support resilient infrastructure financing and help close the existing infrastructure gaps in transportation, water and sanitation, telecommunications, and energy. In this regard, several countries in the region have increased their efforts to improve their PPP policy frameworks. St. Lucia





and Grenada have PPP policies that set out how the government will identify, develop, implement, and manage PPPs. St. Kitts and Nevis has developed a National Competitiveness Council to institutionalize PPPs under the private sector development strategy. Developing appropriate regulations and establishing an institutional framework relating to PPPs is key for the region going forward.

**The OECS region has implemented a number of PPP initiatives.** Examples of existing PPPs in the region include the Nevis Geothermal Project, a PPP between the Nevis Island Administration, Nevis Renewable Energy International, Inc., and Power Engineers; and the La Soufriere geothermal project in St. Vincent and the Grenadines. Additionally, the World Bank funded the Caribbean Regional Communications Infrastructure Programme (CARCIP) National Broadband Project in Grenada, St. Lucia, and St. Vincent and the Grenadines.

### Climate Risks, Resilience, and Adaptation to Climate Change

**Infrastructure in the OECS region is particularly vulnerable to the potential adverse effects of climate change.** Consequently, the region has undertaken a number of projects with the financial and technical assistance of several international financial institutions to increase the resilience of its infrastructure and ecosystems to climate change risks. For instance, the United Nations Development Programme implemented a program to strengthen resilience and coping capacity in the Caribbean through an Integrated Early Warning Systems Project in Dominica, St. Lucia, and St. Vincent and the Grenadines. Moreover, the Integrated Climate Change Adaption Strategies Project has funded 27 community projects around Grenada. The Global Environment Facility funded an Integrating Watershed and Coastal Areas Management Project in countries of the OECS region. The Food and Agriculture Organization funded the Climate Change Adaptation of the Eastern Caribbean Fisheries Sector Project in the OECS region. Finally, the World Bank is funding a Disaster Vulnerability Reduction Project in Dominica.

### Conclusion

**The OECS region faces a number of key challenges to its infrastructure.** In this regard, governments in the region have been increasing their focus on building climate-resilient infrastructure and investing particularly in the four sectors highlighted in this bulletin, which can potentially reduce the impact of future natural disasters in these economies. At the same time, the OECS region can benefit from partnering with the international development community to help provide greater access to resources, grant funding, technical assistance, and concessional financing to build resilience to these recurring natural disasters. Given the OECS region's infrastructure needs and ongoing fiscal challenges, having the appropriate regulations and strengthening the institutional framework for PPPs would be key going forward.

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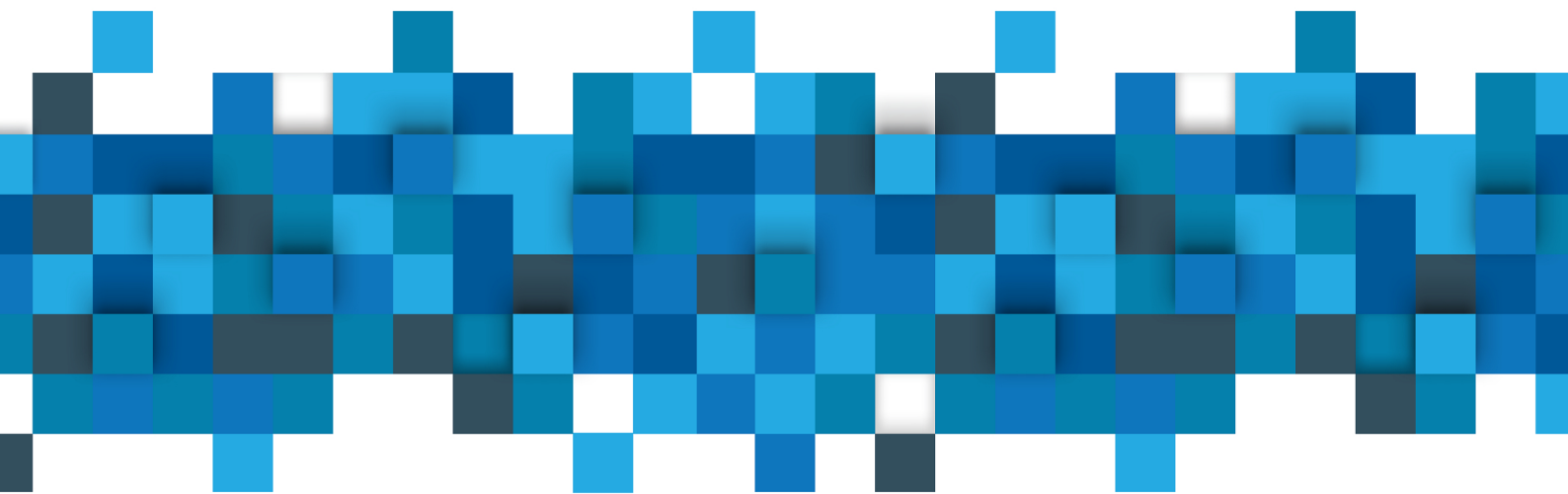
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