



REPORT FOR GOOGLE

2022 UPDATE: ECONOMIC IMPACT OF GOOGLE'S APAC NETWORK INFRASTRUCTURE FOCUS ON THE PHILIPPINES

David Abecassis, Dion Teo, Nabeel Hussain

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Analysys Mason Limited
North West Wing, Bush House
Aldwych
London WC2B 4PJ
UK
Tel: +44 (0)20 7395 9000
london@analysysmason.com
www.analysysmason.com
Registered in England and Wales No. 5177472

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Google's network infrastructure investments in Philippines

Investments in submarine cables

**SJC
2013**

CABLE LANDING POINTS
Singapore, Hong Kong,
Japan, China, the Philippines,
Brunei, Thailand

**PLCN
2022**

CABLE LANDING POINTS
Taiwan, USA,
the Philippines

**Apricot
2024**

CABLE LANDING POINTS
Singapore, Japan, Indonesia,
the Philippines, Taiwan, Guam

11

cities with
GGC nodes

Benefits to digital connectivity

SUPPORT USE-CASES FOR
POST-PANDEMIC DIGITAL TRANSFORMATION:



Cloud services



e-Commerce



Video-conferencing



2026 FORECAST



39%

USAGE

**OF INTERNET
ENABLED**



24ms

REDUCTION

**IN END-USER
LATENCY**



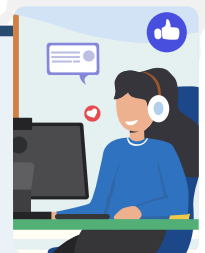
30%

**REDUCTION
IN IP TRANSIT
PRICES**



38%

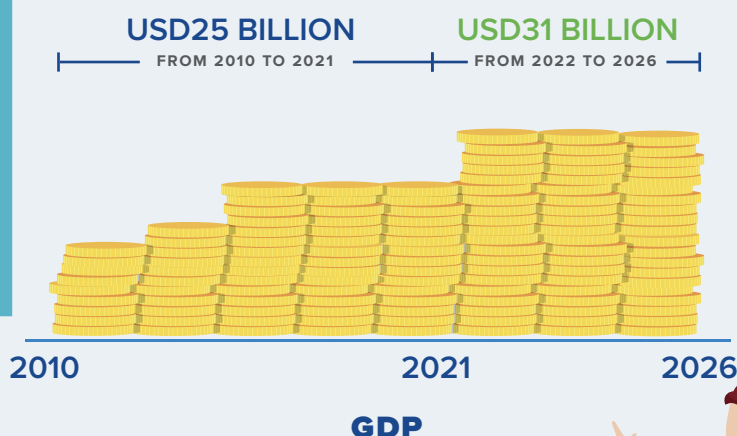
**INCREASE
IN INTERNET
BANDWIDTH**



Economic impact

Forecast to support up to
217 000
additional jobs
in 2026

Supported up to
118 000
additional jobs
in 2021



Regulatory and investment regime

Need to enable ease of :

Deployment and landing
of submarine cables



Protection and maintenance
of submarine cables

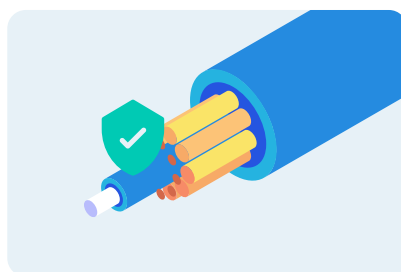


The Philippines can benefit from following best practices from
other leading APAC economies

Potential areas of progression



Streamline license and permit application processes relating to network infrastructure by moving the responsibility to a telecoms administrative body



Strengthen cable protection laws and increase flexibility of cabotage provisions for cable repairs and maintenance



Implement non-discriminatory and cost-oriented access to cable landing stations to promote stronger competition between operators

This report is an update of the *Economic impact of Google's APAC network infrastructure – focus on the Philippines* report, released in 2020.¹ We have further refined our methodology first used in 2020.² Since 2020, digital connectivity and the economic landscape of the Philippines have seen significant development, largely due to the impact of the Covid-19 pandemic. This report will refresh our quantitative impact estimates in line with these developments and our improved methodology.

Internet demand has skyrocketed in the country due to the Covid-19 pandemic, and Google has met this demand through investments it has made in the background. Internet traffic generated across both fixed and mobile networks reached a total of 62EB in 2021, with annual average growth of 67% from 2010 to 2021.

There are three main telecoms service providers in the Philippines as of March 2021:

- **PLDT** – the incumbent operator with both fixed and mobile networks
- **Globe** – currently the largest mobile network operator (MNO) based on subscribers
- **DITO** – a new MNO that launched in the Philippines in March 2021 and is backed by China Telecom.

Fixed networks have fallen behind mobile networks in terms of coverage, with an estimated 54% of households³ having access to fibre broadband in 2021, while over 96% of the population are within range of 4G mobile services.⁴ In terms of international connectivity, the Philippines is connected to ten international submarine cable systems that offered a total of 553Tbit/s in potential capacity⁵ in 2021. Two new cables, JUPITER and PLCN, landed in the Philippines in 2020 and 2022 respectively, delivering 60Tbit/s and 144Tbit/s of potential capacity respectively.

1 Google's network infrastructure investments generated benefits to the connectivity ecosystem, leading to greater usage of the internet in the Philippines

Recent developments in Philippine internet infrastructure have significantly improved internet performance. However, improvements in speed and pricing are needed for the Philippines to draw level with other economies in South-East Asia, according to the National Economic and Development Authority (NEDA).⁶

¹ Analysys Mason – Economic impact of Google's APAC network infrastructure, see: analysismason.com/consulting-redirect/reports/impact-of-google-network-apac-2020/

² We have updated the list of cables with additional “open-cable” effect to include not just Google cables but that of other CASPs. We have also assessed the impact differently for each Google cable depending on a combination of factors including the number of international submarine cables landing in the country, the number of Google cables landing in the country, the consortium members participating in the cable, and Google's level of contribution to the consortium.

³ Analysys Mason Research – FTTx coverage and capex: worldwide trends and forecasts 2020–2026

⁴ TeleGeography: based on PLDT 4G coverage

⁵ Refers to the estimated theoretical maximum capacity that a cable could handle with current technology

⁶ Newsbytes – NEDA chief says PH needs to further improve broadband speed, see: newsbytes.ph/2022/02/01/neda-chief-says-ph-needs-to-further-improve-broadband-speed/

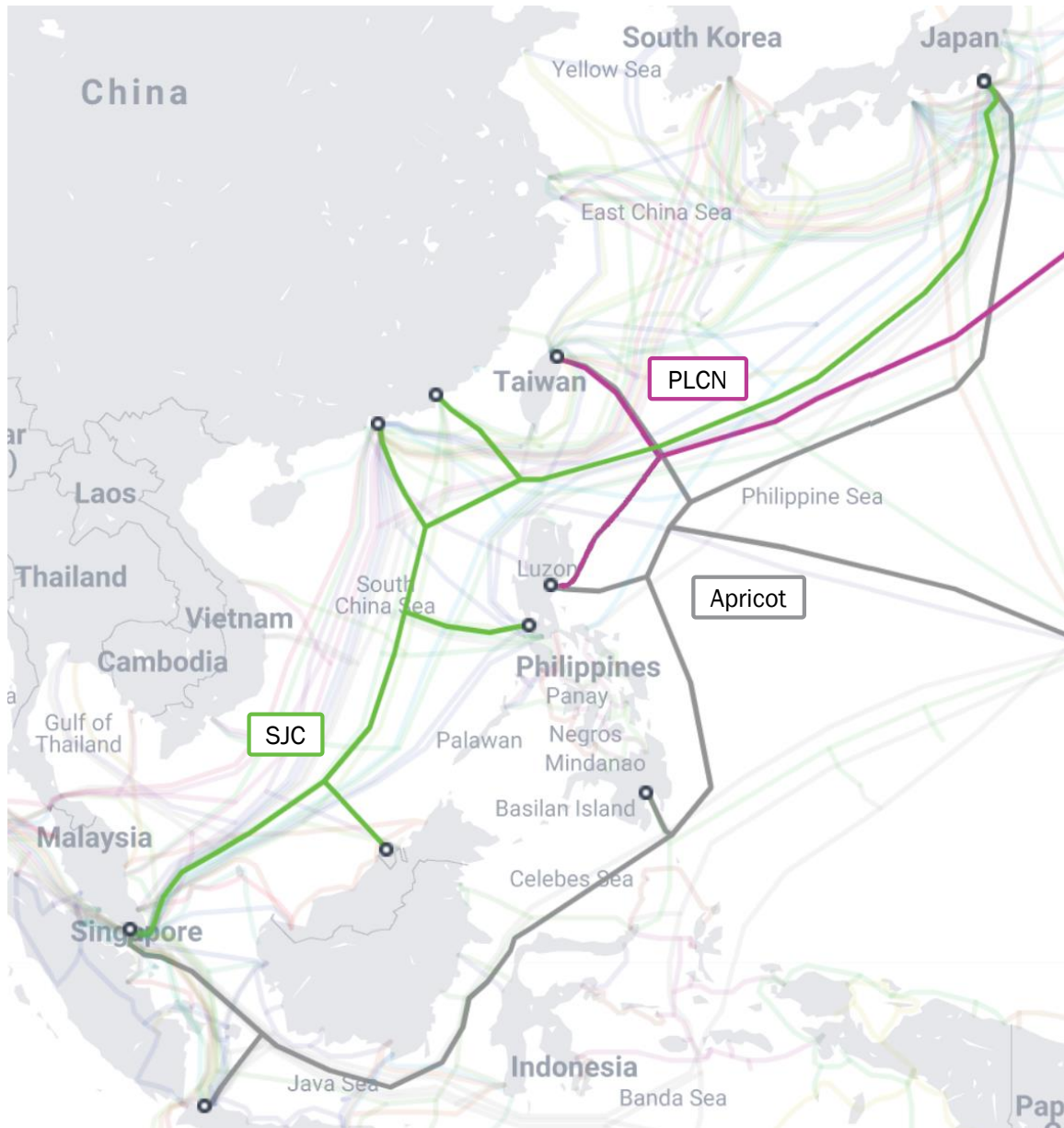
Google's investments in the SJC (2013) and PLCN (2022) cables have markedly improved network connectivity in the Philippines, and the future deployment of Apricot in (2024) will continue this positive effect:

- **SJC (2013)** – Pan-Asian cable system connecting the Philippines to Singapore, China, Hong Kong, Thailand, Brunei and Japan. Japan then connects to the USA via the Google-invested Unity cable, providing direct trans-Pacific connectivity between Asia and North America.
- **PLCN (2022)** – high-capacity, trans-Pacific cable deployed between the Philippines, Hong Kong, Taiwan and the USA using the world's first C+L technology implementation. This technology increases capacity, resulting in 144Tbit/s of potential capacity.
- **Apricot (2024)** – Pan-Asian cable system due to connect the Philippines, Japan, Indonesia, Singapore, Taiwan and Guam with a state-of-the-art cable system offering 190Tbit/s of flexible capacity, based on a space division multiplexing design.⁷

A map of Google's submarine cable investments that connect to the Philippines is provided in Figure 1. These cables have significantly increased international capacity and internet performance for the Philippines, therefore enabling sustained traffic growth since 2013 and into the future.

⁷ Engineering at Meta – Apricot subsea cable will boost internet capacity, speeds in the Asia-Pacific region, see: engineering.fb.com/2021/08/15/connectivity/apricot-subsea-cable/

Figure 1: Map of Google's submarine cable investments that connect to the Philippines [Source: Submarine Cable Map, 2022]



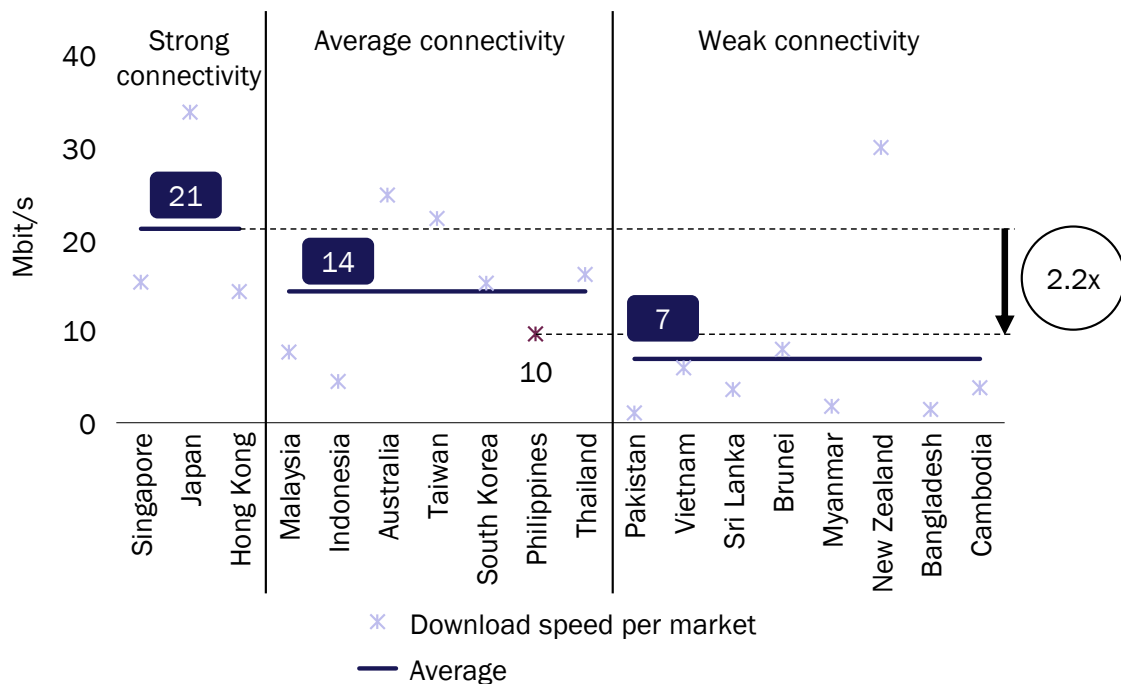
The increased diversity of submarine cable supply resulting from Google's investments have increased cable route resilience, provided internet service providers (ISPs) with more opportunities to reduce IP transit costs, and decreased end-user latency. Google Global Cache (GGC) nodes have also been deployed in operator networks across 11 cities in the Philippines, which reduces content delivery time to end users and costs for ISPs.

These investments in submarine cables and GGC nodes in the Philippines have continued to bring improvements to the connectivity ecosystem.

<i>End-user latency</i>	End-user latency will reduce by an additional 24 milliseconds (or 37%) beyond latency forecasts by 2026 with Google's investments
<i>IP transit prices</i>	IP transit prices are forecast to be 30% lower by 2026 due to the increased internet supply from SJC, PLCN and Apricot
<i>Internet traffic</i>	By 2026, we forecast that the impact of Google's investments will have enabled 39% of internet traffic ⁸

Download speeds in the Philippines have improved significantly since 2020, due to the combined impact of submarine cable deployment and the development of national infrastructure. However, the Philippine download speed still lags behind that of other APAC economies (see Figure 2 below). The Philippines will need to continue attracting network investments, in order to assist ISPs in delivering higher-performance internet services.

Figure 2: Download speed comparison⁹ [Source: M-lab, 2021]



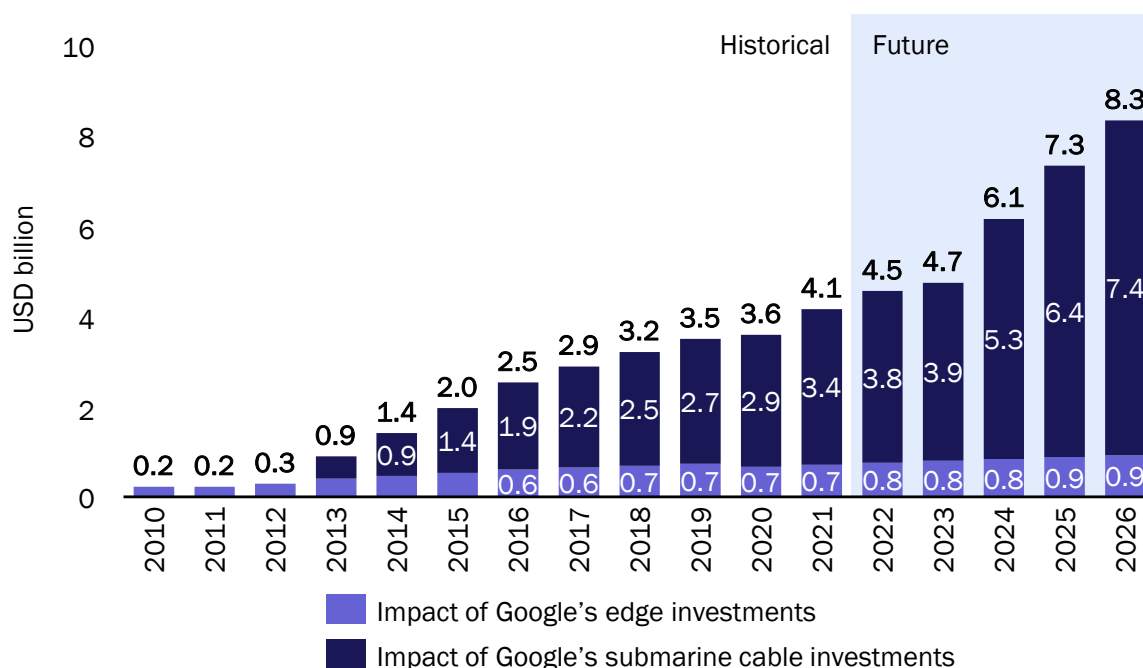
⁸ We forecast that Google's network infrastructure investments will drive an additional 65% increase in internet traffic beyond forecasts without these investments by 2026. This results in 39% of total traffic being attributed to Google's network infrastructure investments in the Philippines.

⁹ The data extracted from M-lab ranges from January to November 2021. M-lab aggregates and groups data to establish log scale 'buckets'. The sets of data are then randomised and calculated from random samples daily. M-lab would then count the samples that fall into each bucket and obtain the frequencies for the histogram. The eventual download speeds from M-lab are measured as log average throughputs (Mbit/s)

2 These investments generate social benefits by supporting new use cases and economic benefits in the form of GDP growth and jobs

To achieve rapid growth in the Philippine economy, the Philippine government has recognised the importance of the internet, the internet economy, and the policies around it, as seen in frameworks such as the E-commerce Philippine 2022 Roadmap.¹⁰ Digital connectivity has been and will continue to be vital in the Philippine economic recovery from the impact of the Covid-19 pandemic. It will also help the economy to prepare for a post-pandemic digital world across industries such as education and trade. Thus far, we estimate that the additional internet usage enabled by Google's network infrastructure investments has driven an additional cumulative USD model 24.7 billion in GDP (in real terms¹¹) in the Philippines from 2010 to 2021. Following the deployment of SJC, PLCN and Apricot, we forecast an additional cumulative USD30.9 billion in GDP enabled by Google's investments between 2022 and 2026 (see Figure 3 below).

Figure 3: Increase in real GDP attributable to Google's network infrastructure investments in the Philippines [Source: Analysys Mason, 2022]



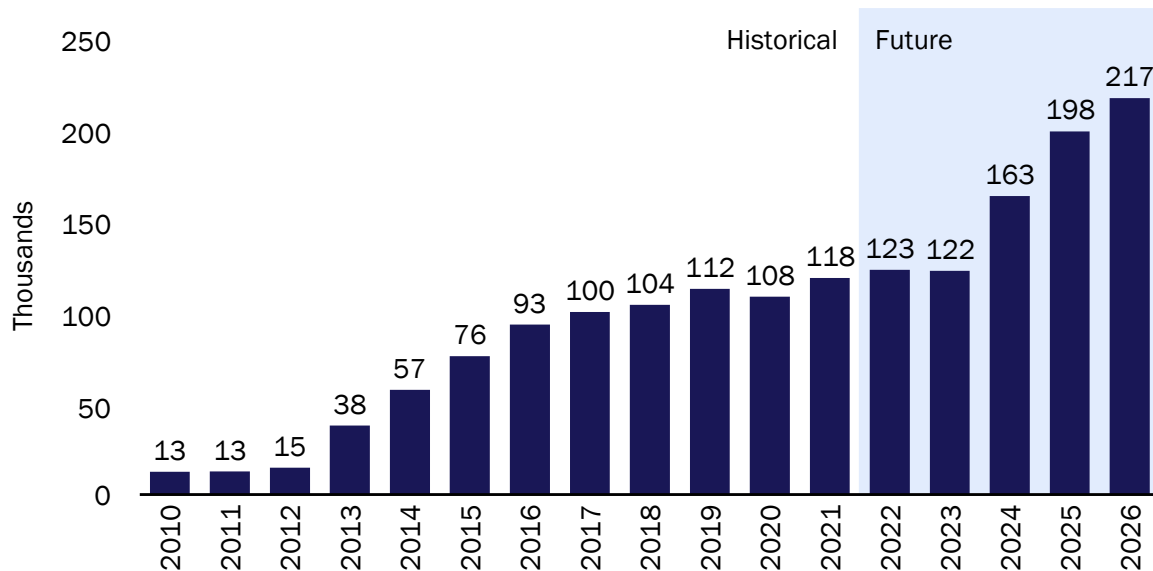
The economic benefits arising from Google's network infrastructure investments lead to direct job creation in sectors such as telecoms and construction. Indirect job creation is prominent in industries that can benefit most from improved internet connectivity and digitalisation, namely IT, financial and professional services, and manufacturing. Based on the gross value added (GVA) of these

¹⁰ DTI Philippines – E-commerce Philippine 2022 Roadmap, see: ecommerce.dti.gov.ph/madali/

¹¹ GDP figures are in constant USD using 2020 as the base year and using a fixed exchange rate to USD in 2020; GDP statistics in USD are sourced from the World Bank and Euromonitor

industries, we estimate that the increase in GDP from Google's investments supported up to 118 000 direct, indirect and induced jobs in 2021, growing to 217 000 in 2026 (see Figure 4).

Figure 4: Jobs supported by Google's network infrastructure investments in the Philippines [Source: Analysys Mason, 2022]



3 Google Cloud is supporting the Philippines in its recovery from the Covid-19 pandemic and will support the economy in its digital transformation into the post-pandemic future

Digital transformation holds the key to economic success in the Philippines, as in some other APAC economies. The key technologies behind digital transformation include cloud computing; big data; mobile internet; artificial intelligence (AI); financial technology (FinTech); the Internet of Things (IoT) and remote sensing, advanced robotics, and additive manufacturing.¹² The same report estimated that digital transformation can create up to USD101 billion in annual economic value in the Philippines by 2030. Google Cloud underpins the success and development of these industries in the Philippines by offering a range of industry-focused services that include BigQuery, Google Data Studio, Vertex AI, Open Banking APIs and High Performance Computing.

Google's network infrastructure investments support the company's initiatives in Philippines. In education, Google provided Google Workspace for Education accounts to over 20 million public school students in partnership with the Department of Education. To help digitise micro, small and medium enterprises (MSME), Google trained over 100 000 MSME owners and employees in partnership with multi-sector stakeholders such as Department of Trade and Industry. As part of its COVID-19 response efforts, Google launched the Community Mobility Reports, gave ad credits to the government to surface authoritative information, donated funding for the personal protective equipment of frontliners and supported network traffic for video conferencing through Google Meet.

¹² AlphaBeta – The Growing Digital Economy in the Philippines: Opportunities, Challenges, and Google's Contributions, see: alphabeta.com/wp-content/uploads/2021/10/philippines-economic-impact-report.pdf

4 The Philippines should continue its efforts to reform its regulatory environment in the interest of promoting foreign investment in network infrastructure

While recent regulatory developments in the Philippines have been positive, opportunities remain to reduce barriers to foreign investment. In 2018, Google sponsored a study on the need for regulatory reform in connectivity in the Philippines. Some of the regulatory recommendations made in that study have since been implemented across technologies including satellite internet and infrastructure sharing. If the Philippine regulatory environment continues to evolve and reform in this manner, the economy may be able to position itself as a digital hub for the APAC region. The Philippines could be strategically important as a digital hub, given its island geography that allows submarine cable routes to avoid passing through the Luzon Strait – a highly concentrated cable route that is prone to natural disaster and political strife.

The Philippine licensing and permit application processes relating to network infrastructure are currently not particularly streamlined, and this could be a point of focus. For example, in order to become a telecoms operator in this economy, potential operators must pass through a parliamentary process, rather than the operators' applications being sent to an administrative body that is focused on telecoms operators. If this type of application process were made the responsibility of a telecoms body, it would remove uncertainty, reduce the time taken, and only involve industry professionals in the process. In turn, this would stimulate more foreign investments in network infrastructure.

Following through on recent legislative changes to attract foreign investments and improve competition, the Philippines could adopt clear licensing procedures, straightforward licensing processes fair and cost-oriented access to cable landing stations, open investment policies that are conducive to foreign investors, cable protection laws, and flexible provisions for cable repairs and maintenance. Such best practice processes, combined with strong regulatory enforcement principles to ensure adherence to lawful procedures, would mean that the Philippines could attract significantly more external network infrastructure investment, supporting its aim of becoming a strategic digital hub in APAC.