

March 2021



Author

Carolina Agurto
Salazar

Fundación IDEA

.....

What's Missing for Boosting Mexico's 5G Rollout?

The Public Policy Landscape

5G BEYOND
BORDERS

This series is a product of the 2020 5G Beyond Borders Workshop organized by:

Centre for International
Governance Innovation





Acknowledgments

This policy brief is a contribution to a workshop focusing on the future of 5G in North America. [The 5G Beyond Borders](#) workshop, organized by the Wilson Center, the Centre for International Governance Innovation (CIGI), and Tecnológico de Monterrey, aimed to discuss how strategic cooperation at the North American level can directly shape the future of 5G and lay the groundwork for expanded North American competitiveness in a range of emerging technologies. One primary goal of the workshop was to help lay the foundations for a broader North American Technology Trust.

Cover image: Shutterstock/ By Suwin

Key points

This policy brief presents a snapshot of Mexico's current public policy surrounding the deployment of 5G technology, with an emphasis on the regulatory and institutional frameworks, as well as the main stakeholders of the ecosystem. The policy brief also provides key recommendations for addressing the challenges and opportunities of the current and future 5G landscape in the country.

Even though Mexico is expected to see one of the fastest rates of 5G adoption in Latin America and that this technology could consolidate prospective applications in key development sectors (manufacturing, health, agriculture), the country faces two main challenges for an optimum rollout of said technology: (i) the atomization of the accountable public entities; and (ii) an existing environment of mistrust and uncertainty derived from a lack of effective communication that aligns the expectation of the private sector with the plans of the current federal government. Besides these challenges, the ongoing COVID-19 pandemic has introduced more uncertainty across several sectors and industries, leading experts to consider that the arrival of 5G in Mexico, on a commercial level, will not be ready until 2025.

With these challenges in mind, Mexico and the stakeholders involved in the deployment of its 5G networks could benefit from considering working towards the following:

1. Define clear roles and attributions of public entities regarding the administration and commercialization of radio spectrum.
2. Establish a comprehensive roadmap for the optimal deployment of 5G technology, addressing at least issues such as: (i) cybersecurity, (ii) risk management and mitigation plans, and (iii) differentiated rollout plans from a geographic-digital development perspective
3. Promote a stable and reliable telecommunications environment with timely spectrum regulation, precise and transparent rules for operators and institutions, incentives for innovation, and solid public-private collaboration mechanisms.
4. Take advantage of the USMCA platform for learning from the countries of the region in creating 5G strategies.



Table of Contents

Introduction	1
1. Context	2
1.1 Concepts and key elements	2
1.2 Regional trends: Latin America	2
1.3 Advantages and applications of 5G in Mexico	4
2. Mexico’s policy framework	5
2.1 Regulatory Framework	6
2.1.1 <i>National Development Plan 2019–2024</i>	6
2.1.2 <i>The Federal Law of Telecommunications and Broadcasting</i>	6
2.1.3 <i>Communications and Transportation Sectorial Program 2020–2024</i>	6
2.1.4 World Radiocommunication Conferences	7
2.1.5 The United States-Mexico-Canada Agreement (Usmca)	7
2.2 Institutional framework	8
2.2.1 <i>Federal Institute of Telecommunications</i>	8
2.2.2 Telecommunications of Mexico	10
2.2.3 CFE Telecommunications and Internet for All	10
3. Relevant stakeholders	11
3.1 Private stakeholders	11
3.2 Public-private coordination and cooperation	12
4. Third-party perspectives	13
5. Conclusions and recommendations	14
Endnotes	16
About the Author	20
About the Project: 5G Beyond Borders	21
Workshop Partners	21



Introduction

This policy brief presents a snapshot of Mexico's 5G policy and ecosystem, as well as its recent relevant developments. The policy brief's objective is to discuss the status of the Mexican public policy regarding the topic as well as the coordination efforts and relationships among the main stakeholders in the public and private sectors. It also seeks to offer key recommendations for said actors thus addressing the challenges and seize the opportunities of the current and future 5G landscape in the country.

The policy brief is divided into five sections. *Section 1* covers key concepts and definitions surrounding 5G technology. The section also touches on regional trends in selected countries regarding 5G developments and their relevance to the Mexican case. Finally, this section briefly presents an overview of the main benefits and applications of 5G systems in Mexico.

Section 2 addresses the Mexican regulatory and institutional frameworks, including the main legal and planning instruments, as well as the public institutions that lead and regulate the telecommunications markets relevant to 5G technologies.

In *Section 3*, the policy brief focuses on the private stakeholders of the 5G ecosystem, as well as the cooperation and coordination relationships of them with the Mexican public sector.

Section 4 discusses some of the forecasts and projections made by third-party experts and consultants in recent years regarding 5G advances and breakthroughs in Mexico.

Finally, *Section 5* gathers the key takeaways of the policy brief and presents the top four recommendations for stakeholders concerning the challenges and opportunities in the Mexican telecommunications and 5G ecosystem.



1. Context

1.1 Concepts and key elements

5G refers to the fifth generation of mobile networks. It comes as the next step in global wireless connectivity after 1G, 2G, 3G, and 4G networks.¹ These technological waves have come in approximately decade-long periods. The first and second generations were focused on voice services and text messaging, while the third and fourth generations brought multimedia, Internet access, and mobile applications, among other advancements.² Now, with 5G, mobile networks will offer advantages such as lower latency,^a higher capacity, and further connectivity with a wider range of devices, among others. 5G will bolster progress regarding the Internet of Things (IoT)^b field, as well as in artificial intelligence technology.

To understand the main developments of the policies surrounding the 5G ecosystem in a country, it is important to clarify the following technical definitions:

Radio spectrum: Radio spectrum is a limited natural resource. It consists of the electromagnetic waves used to carry communications between devices. Mobile networks, such as 3G, 4G, and 5G, depend on radio spectrum to connect devices and provide data transmission.^{3, 4}

- **Frequency bands:** Radio spectrum is divided into frequency bands that range from low to high and can be used for a variety of telecommunication purposes, from radio transmissions to internet connections. Lower frequencies provide wider coverage but increased latency, while higher frequencies allow for more powerful data transmission capacities but have lesser reach. 5G systems require different band frequencies depending on their applications.⁵

Since it is essential for internet connections and data transmission, radio spectrum is a highly demanded natural resource of strategic value for societies. It requires effective management, planning, and stakeholder coordination for its optimal use and to enable the technological innovations that come with it.

1.2 Regional trends: Latin America

While some countries such as China, South Korea, and the United States have already started the deployment and commercialization of 5G, other places—such as Latin American countries—are still in the very early stages of preparing for and adopting the new technologies. Nevertheless, among Latin American economies, Mexico stands as one of the leaders.⁶

Latin America is set to have early 5G trials and escalated deployments over the next few years. Mexico, Uruguay, and Brazil are on course to be the first Latin American markets to launch commercial 5G services in 2020.⁷ And, accord-

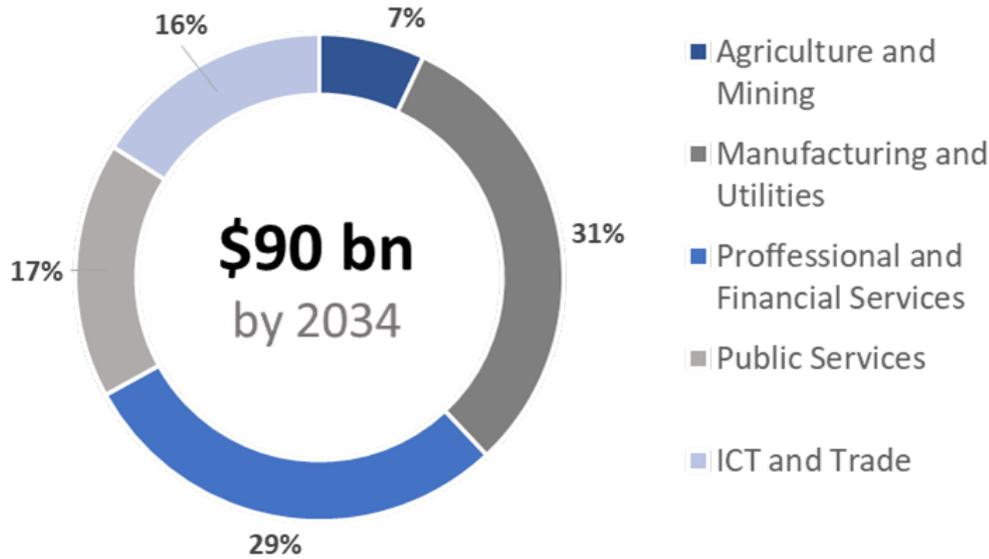
a Latency refers to the time it takes to send information or instructions from one point to another.

b The Internet of Things refers to the connection of physical objects to the internet, enabling them to collect and share data in real time. 5G networks would facilitate a large-scale deployment of IoT devices in an area.



ing to experts on the field, 5G applications will contribute \$90 billion to the Latin American economy by 2034, representing 5.4% of GDP growth.⁸

Figure 1. 5G's contribution to GDP in Latin America over the next 15 years by sector



Source: GSMA Intelligence, 2019.

The following table shows characteristics related to 5G rollouts across selected countries in the region and its comparison to Mexico.

Table 1. 5G related characteristics and trends in five Latin American countries.

Country	5G launch forecast ⁹	Mobile subscriber penetration ¹⁰		Expected 5G usage by 2025 ¹¹	IoT network deployments ¹²
		2018	Expected by 2025		
Mexico	2020	62%	70%	12%	3
Brazil	2021	69%	75%	11%	5
Chile	2022	84%	86%	8%	1
Peru	2023	72%	77%	6%	2
Argentina	2023	69%	79%	9%	1

Source: prepared with data from GSMA Intelligence



In comparison with other countries in the region, Mexico is set to be one of the first to deploy a commercial launch of 5G networks and is expected to be the country with the highest adoption of 5G by the year 2025. Along with Brazil, Mexico also leads the region on the deployment of IoT networks and was the first Latin American country to define an AI strategy.¹³ However, Mexico also has one of the lowest mobile subscriber penetrations, both registered and forecasted, which suggests the harnessing of 5G technology and its applications could present an uneven pattern across the country, in comparison with the rest of the region.

1.3 Advantages and applications of 5G in Mexico

For Mexico, there are several benefits related to the adoption of 5G networks besides enhanced mobile connectivity. Sectors such as healthcare, education, urban planning, and transportation could be positively influenced.¹⁴ The country could also benefit from more available mobile networks with a higher capacity to free the congested 3G and 4G bandwidths.¹⁵ This sub-section presents merely a handful of examples of how the development and utilization of 5G systems could benefit Mexico.



Image courtesy of shutterstock.com/24Novembers



IoT, automatization, 4.0 Industry,^c and smart cities are highlighted among the numerous applications of 5G systems that could impact the Mexican connectivity landscape.

Regarding urban planning applications, the state of Guadalajara has begun the groundwork to become the first smart city in the country. It has implemented technological developments such as advanced lighting and traffic-control systems, and a platform for citizens to report problems and malfunctions to the local authorities through a mobile app. These sorts of technologies would benefit from the faster, higher capacity mobile broadband that 5G can provide.¹⁶

An example in the health and telemedicine sector is the Mexican company Higia, which has developed a non-invasive procedure to identify warning signs related to breast cancer by detecting abnormalities in patients through a wearable device connected to a smartphone or smartwatch.¹⁷

In the industrial front, experts consider that the sizeable Mexican manufacturing sectors are well-positioned to take advantage of IoT applications powered by 5G networks to allow the large scale automatization of processes.¹⁸ This also applies to the agriculture sector, where 5G related technologies could further the development of autonomous farms or port terminals powered by AI and IoT.¹⁹

2. Mexico's policy framework

To better understanding the policy that surrounds 5G technology development and deployment in a country, it is necessary to identify both its regulatory and institutional frameworks. In particular, these frameworks define the main strategies and guidelines concerning the development of telecommunications and broadcasting.

In the case of Mexico, the main instrument that guides policy decisions at the Federal Government is the National Development Plan of the current administration. Despite the existence of a Federal Law and a Sectorial Program (still to be presented), and a roadmap that identifies the country's radio spectrum for 5G mobile networks, there is a pending path on establishing clear and specific "rules of the game" that could facilitate the negotiations and incentivize the participation of potential investors.

On the other hand, regarding the institutions in charge of overseeing the adequate development and deployment of 5G in Mexico, the main actor is the Federal Institute of Telecommunications. However, there is an atomization of institutional entities on the field, with at least three different organizations involved in broadband and mobile internet access.

c The concept of Industry 4.0 refers to the digitalization and automatization of manufacturing processes across various industries, including the use of smart systems fueled by data and machine learning.



2.1 Regulatory Framework

2.1.1 National Development Plan 2019–2024

The National Development Plan 2019 - 2024 (NDP) is a planning instrument presented every six years to set the main development objectives and strategies of each new federal administration. It defines its priorities in terms of central topics such as justice and rule of law, social policy, and economic development.

In its Objective 3.7, the NDP addresses the country's challenges regarding fixed and mobile broadband access, as well as the digital skills needed for its optimal usage. It commits to bolster telecommunications, procuring fair competition conditions, investment certainty, critical networks infrastructure development, and adequate regulatory and institutional frameworks.²⁰

For the current administration, under President Andrés Manuel López-Obrador, the NDP sets its intention to provide wireless internet access country-wide, covering road networks, health centers, schools, and other public spaces.²¹ The government's vision is that internet access can help reducing marginalization and social disparities, and boost economic development.

2.1.2 The Federal Law of Telecommunications and Broadcasting

Radio spectrum is, by law, a public good in Mexico. The Federal Law of Telecommunications and Broadcasting, in its Article 5422, states that radio spectrum and its resources belong to the public domain and are to be administrated by the Federal Institute of Telecommunications under the Constitution, international treaties, and other applicable instruments.^d

Also, in its Article 5623, the Federal Law of Telecommunications and Broadcasting establishes that any telecommunication development and its technological evolution are a matter of public interest, as well as of local and international scope.^e

2.1.3 Communications and Transportation Sectorial Program 2020–2024

The Communications and Transportation Sectorial Program (CTSP) is a planning instrument that states the specific strategies, action lines, and indicators to be pursued by the federal administration for the communications and transportation sectors, which include the telecommunications subsector.

In July 2020, the federal government presented its CTSP for the 2020-2024 period. One of the four main objectives established by the Mexican government in this document is to promote the coverage, access and use of telecommunication services to strengthen digital inclusion and technological development.

d "The radio spectrum and its orbital resources are goods belonging to the Nation's public domain, whose ownership and administration correspond to the State. Said administration shall be exercised by the [Federal Institute of Telecommunications] in the performance of its duties under the Constitution; this Law; international treaties and agreements signed by Mexico; and, where applicable, following the recommendations of the International Telecommunications Union, and other international organisms." [Author's translation]

e "For the adequate planning, administration, and control of the radio spectrum, as well as its efficient use [...] the Institute shall consider the technological evolutions of telecommunications and broadcasting..." [Author's translation]



The main strategies and action lines to achieve this include reducing the current barriers to expand telecommunications and broadcasting network infrastructures, design strategies to achieve conditions of Internet connectivity through broadband services in the national territory with coordination mechanisms between the private and public sectors, and to strengthen the Internet governance mechanisms to achieve interconnected networks.

The document's foreword clarifies the stance of the federal government around 5G networks and technologies, concluding that it is important to reconsider the role of telecommunication in a more interconnect world and the necessary changes to achieve digital transformation in Mexico. Because of this, they consider Mexico needs to create policies that enable technological suppliers to promote digital inclusion and technological development for the entire population to have access to quality telecommunications, and be able to migrate to 5G and IPv6 technologies in the near future.²⁴

2.1.4 World Radiocommunication Conferences

At the international commitments, the Mexican government takes part in global initiatives regarding telecommunications and mobile spectrum policy, such as the World Radiocommunication Conferences (WRCs).

The WRC is hosted every three to four years by the International Telecommunication Union (ITU)^f and its Radiocommunication Sector. These events gather the Member States to review and revise the international regulations governing the use of radio spectrum, satellite orbits, and Radiocommunication matters of worldwide character.²⁵ The Mexican regulator, the IFT, has actively participated in recent WRCs (2015 and 2019), as well as in various other forums sponsored by the ITU Radiocommunication Sector. Particularly, Mexico was tasked with the development of a report regarding the identification of IMT or broadband network and its applications for the WRC-19, which paved the way for the IFT to prioritize a similar endeavor within the country.^{26, 27}

2.1.5 The United States-Mexico-Canada Agreement (Usmca)

On July 1, 2020, the US-Mexico-Canada Agreement (USMCA), the trade deal that replaces the North American Free Trade Agreement (NAFTA), came into force. The agreement is an important reference for Mexico's telecommunication sector, not only because it enables the country to accelerate the deployment of the 5G network, but it also encourages telecom integration in the region.

Chapters 18, 19 and 20 of the USMCA relate to Telecommunications, Digital Trade and Intellectual Property. The main goal is to help establish a regulatory framework in the region that improves consumer confidence in the sector. The dispositions of these chapters aim to ensure competition between telecom providers, create a telecom committee to implement regulations and promotes technological innovation to ensure an open and efficient market.²⁸

^f The ITU is a specialized agency of the United Nations.



2.2 Institutional framework

2.2.1 Federal Institute of Telecommunications

The Federal Institute of Telecommunications (IFT)^g is an autonomous constitutional body responsible for supervising the development of telecommunications and broadcasting in Mexico. The IFT is the main regulatory authority for the use and exploitation of radio spectrum and the usage of the networks and the telecommunications service delivery markets. Therefore, the IFT is one of the most relevant actors in the development and deployment of 5G networks and technologies.

Since mid-2019, the IFT has been taking actions directed at preparing for the deployment of 5G networks.^h Perhaps the most important of which is the development of the Radio Spectrum Landscape for Fifth Generation Mobile Servicesⁱ (in Spanish, Panorama del espectro radioeléctrico en México para servicios móviles de quinta generación). This document serves as a roadmap to outline the radio spectrum available in the country to carry 5G networks, including low, mid, and high-frequency band spectrums.^j Its objective is to provide timely information and certainty to the private sector, potential investors, academia, and the general public, as well as to inform present and future public sector strategies for infrastructure and network deployment needed for 5G.²⁹ Experts in mobile ecosystems, such as GSMA Intelligence, have highlighted this effort as a step in the right direction for 5G developments in the country.^{30, 31}

g The Organic Statute of the IFT can be found on the following link: <http://www.ift.org.mx/sites/default/files/contenidogeneral/conocenos/COMPILACIONESTATUTOORGANICOMODIFICACIONESDICIEMBRE2018.pdf>

h The IFT has promoted citizen-engagement processes to discuss and conform 5G and radio spectrum policies. On the same note, the Institute recently created the Technical Committee for Radio Spectrum, which includes members of the telecommunications industry, academia, public entities, and any other interested parties.

i Document available at: <http://www.ift.org.mx/sites/default/files/industria/temasrelevantes/14863/documentos/04-estudiouer5g-imt.pdf>

j The IFT document affirms there are up to 11,190 MHz of radio spectrum available for 5G networks in Mexico. The plan is set to be updated in accordance with the constantly changing mobile environment.



Box 1. The Radio Spectrum Landscape for Fifth Generation Mobile Services and its public consultation process

The *Radio Spectrum Landscape for Fifth Generation Mobile Services* document was published in March 2019 by the IFT. It mainly develops the following elements:

- **5G development:** Includes key concepts and an explanation of the importance of radio spectrum for the development of mobile networks, such as 5G.
- **Radio spectrum in Mexico:** Includes IFT's actions on radio spectrum and frequency bands allocation for 5G.
- **Frequency bands for 5G:** Includes specific technical details regarding the different frequency bands available for 5G networks.

At a later stage, and as part of the citizen engagement processes carried out by several government agencies, the IFT launched a public enquiry in September of 2019 to gather comments, opinions or contributions regarding the document through a digital questionnaire and an invitation to upload any additional inputs. As a result, 29 interest parties manifested observations, including stakeholders such as Facebook, CANIETI^a, Axtel and Telmex. Among these contributions, for the purpose of this policy brief, the following three are highlighted:

- CANIETI suggested the **IFT includes the 2.3 GHz, 3.3–3.8 GHz, 6GHz, and 28GHz frequency bands to the already identified by the document**, in order to guarantee the availability of radio spectrum for 5G in the long term (20 years and further). This suggestion was also supported by other contributors such as Pegaso PCS and Nokia Mexico.
- In terms of service co-existence schemes in the radio spectrum bands, Radiomóvil Dipsa recommended **developing case by case studies to determine efficient ways of utilizing and, where necessary, sharing radio spectrum with other services** such as satellite systems. Other contributors like CANIETI and PanAmSat Mexico backed this measure.
- Several participants mentioned the **need for investment incentivizing actions**, including the extension of the time periods for spectrum licenses, the reduction of annual fees for spectrum use or the modification of the payment schemes, and facilities for the deployment and access to optic fiber.

In November 2019, the IFT stated that the contributions submitted in the public enquiry will be taken into account for the upcoming National Radio Spectrum Program 2019 - 2024, still to be published.

^a CANIETI is the Mexican Chamber of Electronics, Telecommunications and Information Technologies.



2.2.2 Telecommunications of Mexico

Telecommunications of Mexico (Telecomm) is a decentralized public body under the Ministry of Communications and Transport.^k Its mandate is to offer-by itself or through third party operators- telecommunication services for individuals as well as for public and private entities at competitive prices.

One of Telecomm's attributions is to operate public networks of telecommunications³³ and, following the 2013 constitutional telecommunications reform,^l the entity is in charge of "promoting access to broadband services [such as 5G networks] ...and execute the construction and development of a solid telecommunications backbone network that has national coverage... under the corresponding IFT guidelines."³⁴ This backbone network would provide important infrastructure to deploy high capacity data transmissions that make telecommunications services like 5G possible.

To comply with this mandate, Telecomm was set to put out a public bid to form a public-private partnership that would be responsible for the design, funding, deployment, operation, and commercialization of a backbone network project.³⁵ However, after several delays, Telecomm and the Ministry of Communications and Transport announced in August of 2019 the cancelation of the public bid. In its place, the federal government announced its plans for a new, state-led, and non-for-profit initiative to develop the backbone network through a newly created state company: *CFE Telecommunications and Internet for All*.³⁶

2.2.3 CFE TELECOMMUNICATIONS AND INTERNET FOR ALL

CFE Telecommunications and Internet for All (CFE Telecom) is a state-owned subsidiary company of the Federal Electricity Commission (CFE),³⁷ created in 2019 by the federal government. Its objective is to provide telecommunications services -including broadband and internet access- through a non-profit public network reaching a 100% coverage of the Mexican population, with an emphasis on remote and marginalized regions of the country.^{38, 39, 40}

k The Ministry of Communications and Transport is the main federal public entity responsible for the communications and transportations sector, this includes, among others, the telecommunications subsector.

l In 2013, the federal administration under President Enrique Peña Nieto presented and approved a constitutional reform regarding the telecommunications sector in Mexico as part of a project of structural reforms across various sectors in the country.



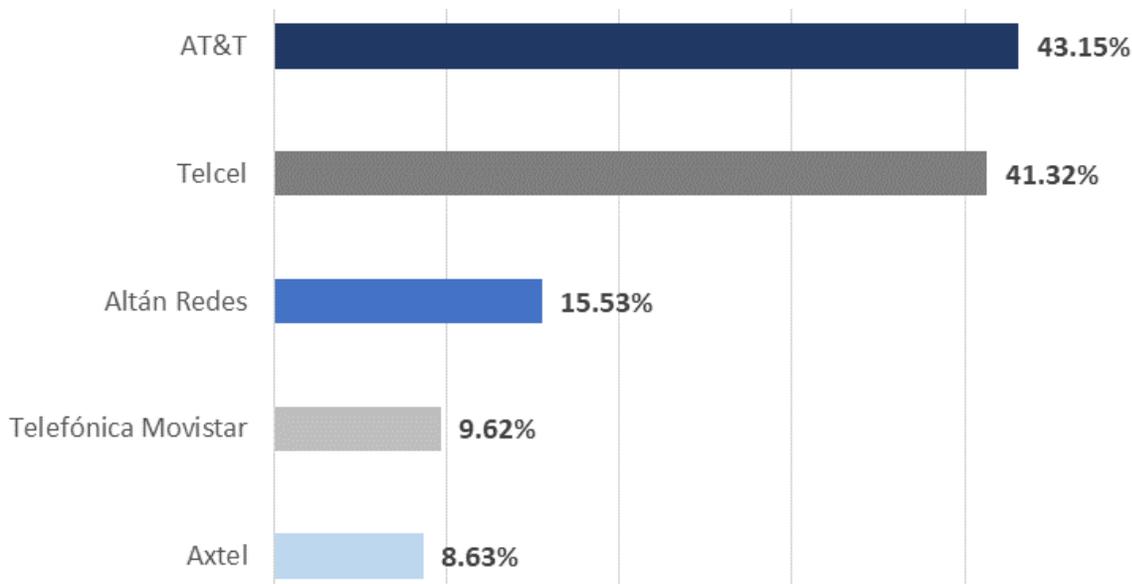
3. Relevant stakeholders

3.1 Private stakeholders

In the Mexican telecommunications and connectivity ecosystem, there are five main operators: Telcel, AT&T, Altán Redes, Telefónica Movistar, and Axtel.

These five operators hold the broadband radio spectrum apt for 5G mobile systems (also known as IMT-2020) in the following proportions:⁴¹

Figure 2. IMT radio spectrum share by operator



Source: IFT, 2020.

Each operator has announced different plans regarding the rollout of 5G networks and technologies in the country, with Telcel and AT&T on the lead with the largest share of the radio spectrum. For example, the Telcel parent company, América Móvil, aims to offer the 5G network to its subscribers in Mexico and Latin America starting in the second half of 2020⁴² and is reportedly in the testing phase of its services.⁴³ Meanwhile, AT&T and Telefónica are also carrying out tests and expect to offer 5G services in 2021, as they start to deactivate their 2G networks to free their capacity for 5G systems.⁴⁴



Additionally, the private sector is also structured in collective organizations, like the GSMA Board, which includes several telecommunications companies operating in Mexico, such as AT&T, América Móvil, and Telefónica Movistar.^{45, m} There is also The National Association of Telecommunications (ANATEL) and The Mexican Chamber of Electronics, Telecommunications and Information Technologies (CANIETI). ANATEL congregates about 52 firms associated that count for 90% of the value that adds the telecommunications sector to the Mexican economy.⁴⁶ While, CANIETI works as an intermediate representation organization, aiming to connect the companies with government agencies and other public entities to further their interests.

One of the leaders regarding innovation issues in CANIETI as well as in ANATEL is the Chinese technology company Huawei, which has partaken in 5G developments in various locations around the world. In recent years, Huawei has invested in technology development projects in Mexico, aimed at enhancing the connectivity and digital skills needed for seizing the coming deployment of 5G networks in the country.⁴⁷

3.2 Public-private coordination and cooperation

Members of the private sector have praised the federal government's commitment to the timely identification of radio spectrum for 5G systems. However, it has also been pointed out that more cooperation and coordination is necessary, both between private stakeholders and with the public sector, regarding asymmetric rules for dominant operators and infrastructural needs, such as fiber deployment and cell and tower architecture.^{48, 49}

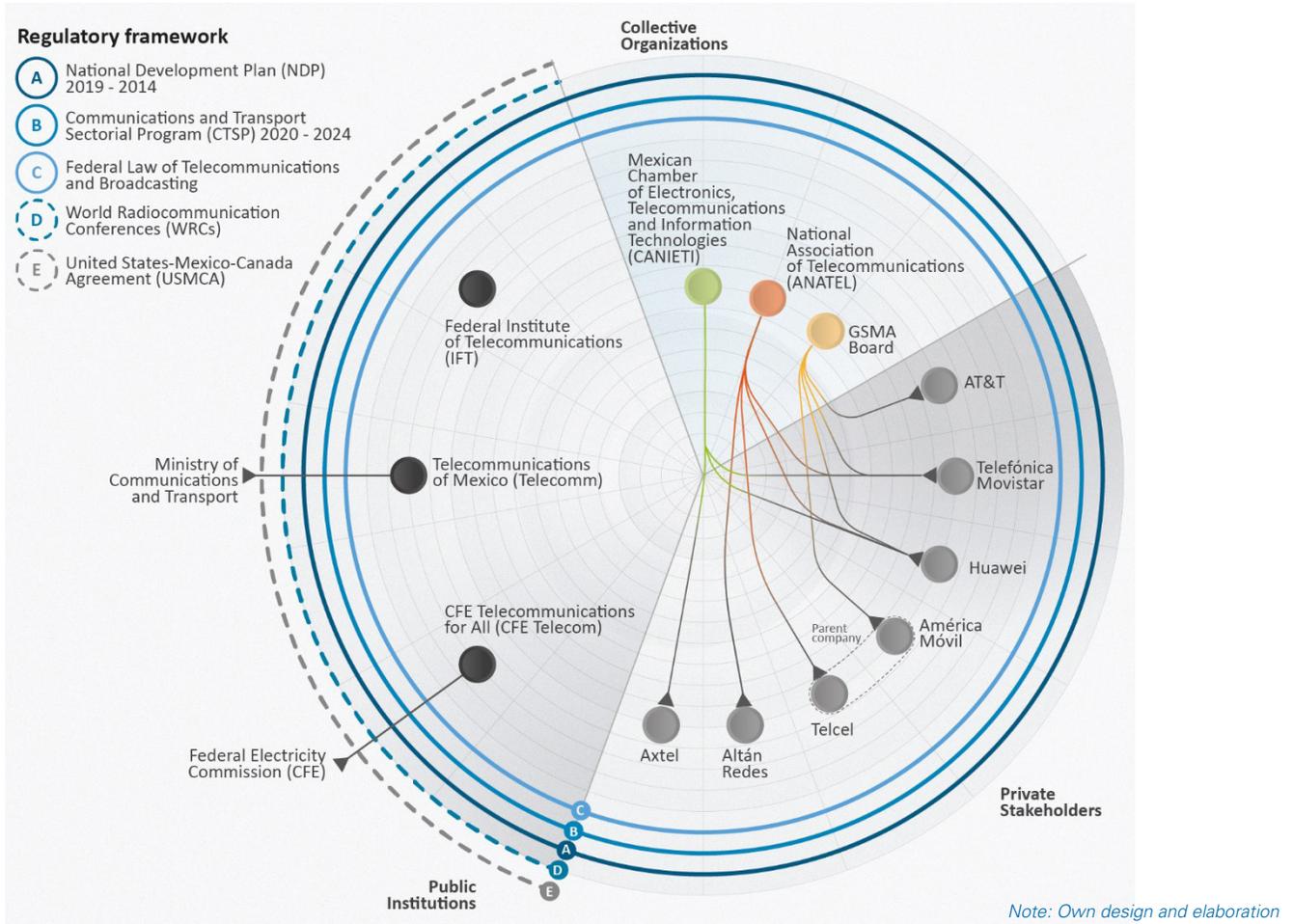
Also, with events such as the prolonged delay and sudden cancellation of the Backbone Network bid (which was set to be a public-private association), and the recent changes in the institutional framework (including the creation of the state-owned internet company CFE Telecom), there has been a climate of uncertainty in the relationship between the government and the non-public sector.⁵⁰ According to experts in the field, these developments could suggest that the federal government is mistrusting of the telecommunications industry and no longer considers the private sector as a key stakeholder for policy development and to further connectivity throughout the country.⁵¹

m In September of 2019, prior to that year's World Radiocommunication Conference, the GSMA Board members issued an open letter to the participating governments (which included Mexico), calling them to support measures for the identification of spectrum for 5G mobile networks.



The following scheme illustrates in a simplified way the 5G ecosystem in Mexico, in terms of policy and stakeholders:

Figure 3. Mexico's 5G ecosystem, as of November



4. Third-party perspectives

As the telecommunications landscape evolves, experts and third-party members of the mobile ecosystem have made forecasts and projections regarding the rollout of 5G technologies in Mexico.

As discussed above, experts such as GSMA have predicted that Mexico would be deploying its first commercial 5G networks in 2020 and would reach an adoption rate of 12% by 2025. Likewise, operators in the country forecasted their first rollouts of the technology as far as the second half of the year. Ericsson's Mobility Report 2020 states an estimated 50% coverage of the 5G network by 2025.⁵²

However, disruptive developments in recent months have altered the original projections for the country. With the cancellation of the Backbone Network bid and the institutional changes in the telecommunications public sector, the development of 5G networks and its applications have taken a detour or have been put on halt. Furthermore, the ongo-



ing COVID-19 global pandemic has generated uncertainty across several sectors and industries, with some experts claiming the crisis will accelerate the deployment of 5G networks in Mexico,^{53, 54} and others expressing concern over probable delays in the current development of infrastructure and spectrum allocation.^{55, 56} An auction of 5G-ready 600 MHz was expected to take place in the second half of 2020, however the IFT commissioner stated that spectrum offers do not take place during the pandemic.⁵⁷

The international consulting firm, Deloitte, has predicted that the arrival of 5G would not be ready in the country until 2025, at least on a commercial level, and the telecommunications consultancy firm, The Competitive Intelligence Unit, also predicted a delay in the deployment of 5G networks of at least 18 months.⁵⁸ Moreover, according to a report by McKinsey & Company, which analyzes the cost of deploying and operating mobile networks from 2018 to 2025, the annual capital and operating cost of 5G networks will increase by 110 percent at most from the current level.⁵⁹

5. Conclusions and recommendations

Mexico is set to delve into its 5G transition in the coming years, and the country will be facing several challenges and debates in terms of the needed infrastructure, the institutional and regulatory framework, as well as the roles of the different stakeholders involved in supporting and developing the 5G ecosystem.

Apart from taking Mexico into the new generation of telecommunications with faster and more reliable connections, 5G associated applications can bolster advancements and breakthroughs across various sectors, from urban development and manufacturing to health and precision agriculture. Also, given the public good nature of radio spectrum, and the current federal administration's commitment to expand the coverage of internet access to the entire territory, the deployment of 5G networks can help bridge the connectivity gap in the country and enhance social and economic development.

While the impact of these technologies will begin to be fully understood in the coming years, the country is expected to see one of the fastest rates of 5G adoption in Latin America. The federal government has taken solid steps towards the identification and allocation of radio spectrum, and there are several national and international stakeholders interested in the roll-out of 5G systems in the country, which can open an array of opportunities for seizing its full potential.

Nevertheless, Mexico is facing various challenges on its road to a successful 5G rollout. The atomization of the institutional framework and the current climate of uncertainty brought by last year's cancelation of the Backbone Network is added to the current difficulties posed by the ongoing COVID-19 pandemic. Furthermore, there is concern regarding 5G set-up requirements such as fiber deployment, small cell and tower architecture, and other necessary infrastructure.

With these challenges in mind, Mexico and the stakeholders involved in the deployment of its 5G networks could benefit from considering the following four recommendations:

1. The **multiple public entities** related to the telecommunications ecosystem in the country **need to clearly define their roles and attributions regarding the administration and commercialization of radio spectrum**. This includes promptly bidding and allocating the frequency bands among the operators.



2. The **Mexican federal government**, through the IFT and in partnership with private operators, **should establish and present clear plans for the optimal development of necessary infrastructure for 5G deployment**, considering the available architecture and the existent fiber infrastructure owned by the predominant operator. Moreover, this roadmap needs to address issues such as:
 - a. Cybersecurity around the implementation of 5G;
 - b. Risk management and mitigation plans. Information available of current tangible case studies could be a good reference for this purpose (i.e. usage of automated vehicles, semi-automated surgeries, among others); and,
 - c. Differentiated rollout plans from a geographic digital development perspective (urban vs. rural areas).
3. The **Mexican 5G ecosystem needs to promote a stable and reliable telecommunications environment** with timely spectrum regulation, precise and transparent rules for operators and institutions, incentives for innovation, and solid public-private collaboration mechanisms.
4. **Stakeholders should take advantage of the USMCA platform for, among others, learning from the countries of the region in creating 5G strategies** (for example, for developing the already mentioned technology, risk, and spectrum/security roadmaps). This agreement is crucial for the Mexican telecom sector as it paves the way for Mexico to accelerate the deployment of the 5G network. The agreement **encourages telecom integration in the region** and states regulatory frameworks that improve consumer confidence in the sector, **opening the space for more telecommunications companies to invest in the country**.



Endnotes

- 1 Qualcomm. (ND). *Everything you need to know about 5G*. Qualcomm web page. Available at: <https://www.qualcomm.com/invention/5g/what-is-5g>
- 2 Information, Technology & Innovation Foundation. (2020). *A U.S. National Strategy for 5G and Future Wireless Innovation*. Available at https://itif.org/publications/2020/04/27/us-national-strategy-5g-and-future-wireless-innovation?mc_cid=d0edcfff99&mc_eid=80cd7ef865
- 3 U.S. Department of Transportation. (ND). *What is Radio Spectrum?* Available at: <https://www.transportation.gov/pnt/what-radio-spectrum>
- 4 Information, Technology & Innovation Foundation. (2020). *A U.S. National Strategy for 5G and Future Wireless Innovation*. Available at https://itif.org/publications/2020/04/27/us-national-strategy-5g-and-future-wireless-innovation?mc_cid=d0edcfff99&mc_eid=80cd7ef865
- 5 Federal Institute of Telecommunications. (2019). *Mexico's radio spectrum landscape for fifth generation mobile services*. Available at: <http://www.ift.org.mx/sites/default/files/panoramadelespectroradioelectricoenmexicopara5g.pdf>
- 6 GSMA Intelligence. (2019). *The Mobile Economy Latin America*. Available at: <https://www.gsma.com/latinamerica/wp-content/uploads/2020/02/Mobile-Economy-Latin-America-2019-English-Full-Report.pdf>
- 7 GSMA Intelligence. (2019). *The Mobile Economy Latin America*. Available at: <https://www.gsma.com/latinamerica/wp-content/uploads/2020/02/Mobile-Economy-Latin-America-2019-English-Full-Report.pdf>
- 8 GSMA Intelligence. (2019). *The Mobile Economy Latin America*. Available at: <https://www.gsma.com/latinamerica/wp-content/uploads/2020/02/Mobile-Economy-Latin-America-2019-English-Full-Report.pdf>
- 9 GSMA Intelligence. (2019). *Latin America's evolving digital landscape*. Available at: <https://www.gsma.com/latinamerica/wp-content/uploads/2019/09/Latin-Americas-evolving-digital-landscape.pdf>
- 10 GSMA Intelligence. (2019). *The Mobile Economy Latin America*. Available at: <https://www.gsma.com/latinamerica/wp-content/uploads/2020/02/Mobile-Economy-Latin-America-2019-English-Full-Report.pdf>
- 11 GSMA Intelligence. (2019). *The Mobile Economy Latin America*. Available at: <https://www.gsma.com/latinamerica/wp-content/uploads/2020/02/Mobile-Economy-Latin-America-2019-English-Full-Report.pdf>
- 12 GSMA Intelligence. (2019). *The Mobile Economy Latin America*. Available at: <https://www.gsma.com/latinamerica/wp-content/uploads/2020/02/Mobile-Economy-Latin-America-2019-English-Full-Report.pdf>
- 13 GSMA Intelligence. (2019). *The Mobile Economy Latin America..* Available at: <https://www.gsma.com/latinamerica/wp-content/uploads/2020/02/Mobile-Economy-Latin-America-2019-English-Full-Report.pdf>
- 14 The Inter-American Dialogue. (2019). *Latin America and 5G: Five Things to Know*. Available at: <https://www.thedialogue.org/analysis/latin-america-and-5g-five-things-to-know/>
- 15 Tutela. (2019). *Mexico - Network congestion across the largest 10 cities*. Available at: <https://www.tutela.com/reports/mexico-cities-may-19?hsCtaTracking=99277eaf-fb44-46f4-b873-f5f904944c1e%7C468ef35e-5dae-4eee-a9cf-8c936f4af356>
- 16 GSMA Intelligence. (2019). *The Mobile Economy Latin America*. Available at: <https://www.gsma.com/latinamerica/wp-content/uploads/2020/02/Mobile-Economy-Latin-America-2019-English-Full-Report.pdf>



- 17 GSMA Intelligence. (2019). *The Mobile Economy Latin America*. Available at: <https://www.gsma.com/latinamerica/wp-content/uploads/2020/02/Mobile-Economy-Latin-America-2019-English-Full-Report.pdf>
- 18 Myers, M., & García, G. (2019, December 14). Latin America and 5G: Five Things to Know. *The Inter-American Dialogue*. Available at: <https://www.thedialogue.org/analysis/latin-america-and-5g-five-things-to-know/>
- 19 Huawei. (2020, January 21). 5G, la apuesta para alcanzar el máximo potencial de México y América Latina. *Huawei Press Center*. Available at: <https://www.huawei.com/mx/press-events/news/mx/2020/5g-la-apuesta-para-alcanzar-el-maximo-potencial-de-mexico-y-america-latina>
- 20 House of Representatives. (2019). *National Development Plan 2019-2024*. Parliamentary Gazette 5266-XVIII. Available at: <http://gaceta.diputados.gob.mx/PDF/64/2019/abr/20190430-XVIII-1.pdf>
- 21 DOF. (2019). Statement on the National Development Plan 2019-2024. Available at: <https://www.gob.mx/cenace/acciones-y-programas/plan-nacional-de-desarrollo-2019-2024-195029>
- 22 Federal Institute of Telecommunications. (2019). *Mexico's radio spectrum landscape for fifth generation mobile services*. Available at: <http://www.ift.org.mx/sites/default/files/panoramadespectroradioelectricoenmexicopara5g.pdf>
- 23 Federal Institute of Telecommunications. (2019). *Mexico's radio spectrum landscape for fifth generation mobile services*. Available at: <http://www.ift.org.mx/sites/default/files/panoramadespectroradioelectricoenmexicopara5g.pdf>
- 24 Secretary of Communications and Transport. (2020). *Communications and Transportation Sectorial Program 2020 – 2024*. Available at: https://www.gob.mx/cms/uploads/attachment/file/565614/Programa_Sectorial_de_Comunicaciones_y_Transportes_2020-2024.pdf
- 25 ITU. (ND). *World Radiocommunication Conferences (WRC)*. Available at: <https://www.itu.int/en/ITU-R/conferences/wrc/Pages/default.aspx>
- 26 Federal Institute of Telecommunications. (2019). *Mexico's radio spectrum landscape for fifth generation mobile services*. Available at: <http://www.ift.org.mx/sites/default/files/panoramadespectroradioelectricoenmexicopara5g.pdf>
- 27 Consumotic. (2019, October 30). Inicia CMR-19 con participación activa del IFT. *Consumotic*. Available at: <https://www.consumotic.mx/telecom/inicia-cmr-19-con-participacion-activa-del-ift/>
- 28 Ranine Awwad. (2020, July 2). USMCA: an important agreement for Mexico 5G network. Available at: <https://www.insidetelecom.com/usmca-an-important-agreement-for-mexico-5g-network/>
- 29 Federal Institute of Telecommunications. (2019). *Mexico's radio spectrum landscape for fifth generation mobile services*. Available at: <http://www.ift.org.mx/sites/default/files/panoramadespectroradioelectricoenmexicopara5g.pdf>
- 30 GSMA Intelligence. (2019). *The Mobile Economy Latin America*. Available at: <https://www.gsma.com/latinamerica/wp-content/uploads/2020/02/Mobile-Economy-Latin-America-2019-English-Full-Report.pdf>
- 31 GSMA Intelligence. (2019). *Latin America's evolving digital landscape*. Available at: <https://www.gsma.com/latinamerica/wp-content/uploads/2019/09/Latin-Americas-evolving-digital-landscape.pdf>
- 32 IFT. (2019). Informe de consideraciones del Instituto Federal de Telecomunicaciones a la consulta pública de integración del cuestionario sobre bandas de frecuencias del espectro radioeléctrico para sistemas móviles de quinta generación (5G). Available at: <http://www.ift.org.mx/sites/default/files/industria/temasrelevantes/14862/documentos/informededeconsultapublica5g.pdf>
- 33 DOF. (2018). New Organic Statute of Telecommunications of Mexico. Available at: <http://www.diputados.gob.mx/LeyesBiblio/regla/n314.pdf>



- 34 DOF. (2013). *Decree by which articles 6th, 7th, 27th, 28th, 73rd, 78th, 94th, and 105th of the Political Constitution of the United Mexican States with regard to telecommunications are reformed*. Available at: [file:///C:/Users/hmartinez/Downloads/4.%20CPEUM_ref_208_11jun13%20\(1\).pdf](file:///C:/Users/hmartinez/Downloads/4.%20CPEUM_ref_208_11jun13%20(1).pdf)
- 35 Telecomm. (ND). *Backbone Network*. Available at: <https://www.telecomm.gob.mx/rtroncal/>
- 36 Corona, L. (2019, August 15). CFE Telecomunicaciones pone fin al proyecto de la Red Troncal. *Expansión*. Available at: <https://expansion.mx/empresas/2019/08/15/cfe-telecomunicaciones-pone-fin-al-proyecto-de-la-red-troncal>
- 37 DOF. (2019). *Organic Statute of the Federal Electricity Commission*. Available at: http://dof.gob.mx/nota_detalle.php?codigo=5479615&fecha=12/04/2017
- 38 Corona, L. (2019, August 15). CFE Telecomunicaciones pone fin al proyecto de la Red Troncal. *Expansión*. Available at: <https://expansion.mx/empresas/2019/08/15/cfe-telecomunicaciones-pone-fin-al-proyecto-de-la-red-troncal>
- 39 Garrido, R. (2019, August 2). 'CFE Telecomunicaciones e Internet para Todos' es oficial: así será el nuevo proveedor de internet del Gobierno de México. *Xataka Mexico*. Available at: <https://www.xataka.com.mx/telecomunicaciones/cfe-telecomunicaciones-e-internet-para-todos-oficial-asi-sera-nuevo-proveedor-internet-gobierno-mexico>
- 40 DOF. (2019). Agreement establishing CFE Telecommunications and Internet for All. Available at: https://www.dof.gob.mx/nota_detalle.php?codigo=5567088&fecha=02/08/2019
- 41 IFT. (2020). *IMT in Mexico*. Available at: http://www.ift.org.mx/sites/default/files/imt_en_mexico_2020va.pdf
- 42 Reuters. (2020, February 11). Mexico's America Movil to focus on bringing 5G to Latin America. *Reuters*. Available at: <https://www.reuters.com/article/us-americanovil-results/mexicos-america-movil-to-focus-on-bringing-5g-to-latin-america-idUSKBN20608M>
- 43 Cahun, A. (2020, April 13). Telcel pisa el acelerador para lanzar su red 5G en México: Telmex le cede su banda y comienza con pruebas, según El Economista. *Xataka Mexico*. Available at: <https://www.xataka.com.mx/telecomunicaciones/telcel-pisa-acelerador-para-lanzar-su-red-5g-mexico-telmex-le-cede-su-banda-comienza-pruebas-economista>
- 44 Steve, O. (2020, May 25). Habrá 5G en México para 2021, según IDC: con Telcel o AT&T, la potente red de nueva generación estará lista en menos de un año. *Xataka Mexico*. Available at: <https://www.xataka.com.mx/telecomunicaciones/habra-5g-mexico-para-2021-idc-telcel-at-t-potente-red-nueva-generacion-estaria-lista-ano>
- 45 GSMA. (2019). *Operators call for governments to secure 5G's future at WRC-19*. Available at: <https://www.gsma.com/latinamerica/resources/operators-call-for-governments-to-secure-5gs-future-at-wrc-19/>
- 46 ANATEL (2020). <http://www.anatel.org.mx/quienes.php>
- 47 Huawei. (2020, January 21). 5G, la apuesta para alcanzar el máximo potencial de México y América Latina. *Huawei Press Center*. Available at: <https://www.huawei.com/mx/press-events/news/mx/2020/5g-la-apuesta-para-alcanzar-el-maximo-potencial-de-mexico-y-america-latina>
- 48 Hernández, M. (2019, June 5). La falta de fibra es el mayor lastre para la 5G: AT&T México. *Forbes Mexico*. Available at: <https://www.forbes.com.mx/el-principal-cuello-de-botella-para-la-red-5g-no-es-el-espectro-es-la-fibra-monica-aspe/>
- 49 Digital Policy Law. (2019, December 19). Regulación al preponderante, 5G y T-MEC, las razones de la visita del CEO de AT&T a México. *Digital Policy Law News*. Available at: <https://digitalpolicylaw.com/regulacion-al-preponderante-5g-y-t-mec-las-razones-de-la-visita-del-ceo-de-att-a-mexico/>



- 50 Liliana Corona. (2019, August 15). CFE Telecomunicaciones pone fin al proyecto de la Red Troncal. *Expansión*. Available at: <https://expansion.mx/empresas/2019/08/15/cfe-telecomunicaciones-pone-fin-al-proyecto-de-la-red-troncal>
- 51 Martínez, C. (2019, August 16). Red Troncal le deja libre el camino a CFE Telecom. *El Universal*. Available at: <https://www.eluniversal.com.mx/carera/telecom/red-troncal-le-deja-libre-el-camino-cfe-telecom>
- 52 Ericsson. (2020, June). *Ericsson Mobility Report, June 2020*. Available at: <https://www.ericsson.com/en/mobility-report/reports/june-2020>
- 53 The Mexicanist. (2020, April 14). Launch of 5G speeds up in Mexico because of Covid-19. *The Mexicanist*. Available at: <https://www.mexicanist.com//5g-network-in-mexico/>
- 54 Cuatro Cero. (2020, April 14). Se acelera llegada de 5G a México. Cuatro Cero. Available at: <https://cuatro-cero.mx/noticias/se-acelera-llegada-de-5g-a-mexico/>
- 55 Reyes, E. (2020, March 3). El coronavirus retrasará el despliegue de 5G, en México y el mundo. *Expansión*. Available at: <https://expansion.mx/tecnologia/2020/03/03/el-coronavirus-retrasara-el-despliegue-de-5g-en-mexico-y-el-mundo>
- 56 BNAméricas. (2020, March 17). Espectro y crisis del coronavirus afectarán despliegue de redes 5G. *BNAméricas*. Available at: <https://www.bnamericas.com/es/noticias/espectro-y-tesis-del-coronavirus-afectaran-despliegue-de-redes-5g>
- 57 Lucas, Nicolás. (2020, Julio 02). Es posible que México aplase varios meses su primera subasta de espectro 5G: Alejandro Navarrete, de IFT. Available at: <https://www.eleconomista.com.mx/empresas/Es-posible-que-Mexico-aplace-varios-meses-su-primera-subasta-de-espectro-5G-Alejandro-Navarrete-de-IFT-20200702-0054.html>
- 58 The Mexicanist. (2020, April 14). Launch of 5G speeds up in Mexico because of Covid-19. *The Mexicanist*. Available at: <https://www.mexicanist.com//5g-network-in-mexico/>
- 59 International Development Bank. (2020). 5G. The Driver for the Next-Generation Digital Society in Latin America and the Caribbean. Available at: https://publications.iadb.org/publications/english/document/5G_The_Driver_for_the_Next-Generation_Digital_Society_in_Latin_America_and_the_Caribbean.pdf



About the author

Carolina Agurto Salazar joined Fundación IDEA in 2016. Currently, she is a Partner of the think tank and supervises the execution of projects and research regarding STI, regulation, competition, trade, entrepreneurship, among others. Furthermore, Carolina served as independent consultant for the World Bank and Inter-American Development Bank (2017), and for United Nations Office on Drugs and Crime (2018-2019).

Previously, Carolina collaborated with the Institute for Justice on Entrepreneurship in Chicago (2016); and worked for the Directorate of Governance and Territorial Organization of the OECD (2015); for the Directorate of International Economy, Competitiveness and Productivity in the Peruvian Ministry of Economy and Finance (2012-2014); for the Peruvian National Institute for the Defense of Competition and Protection for Intellectual Property (2010-2012); among others.

Carolina holds a Master of Public Policy from the University of Chicago, was a Fulbright Scholar, a grant recipient of the Government of Japan/World Bank and a Dean's Scholar of the School of Public Policy at the University of Chicago. In 2015, she was a fellow at the Hoover Institute of Stanford University for the Summer Institute on the Economics and Politics of Innovation, as well as of the Institute of Politics of the University of Chicago. Moreover, she participated in J-PAL's Incubator Course for the Evaluation of Youth Employment Programs of 2018. Carolina has a bachelor's degree in Economics and Finance from the Peruvian University of Applied Sciences.



About the Project: 5G Beyond Borders

5g.wilsoncenter.org

The **Wilson Center's 5G Beyond Borders** project explores how the U.S., Canada, and Mexico can work together to maximize the benefits of 5G and related technology through informed policy solutions. The project offers an overview of the landscape of 5G technology around the globe, while also focusing on the impact of 5G on North American business, and smart manufacturing. Cross-border collaboration between the U.S., Canada, and Mexico is essential to a secure transition. 5G Beyond Borders explores not only 5G security, but how North American cooperation can reduce risks, maximize economic gains, and ensure an efficient 5G rollout.

Workshop Partners

The Wilson Center was chartered by Congress in 1968 as the official memorial to President Woodrow Wilson. It serves as the nation's key non-partisan policy forum for tackling global issues through independent research and open dialogue to inform actionable ideas for the policy community. The workshop is part of the Wilson Center's **5G Beyond Borders** project, which is a larger collaboration between the Wilson Center's Mexico Institute, Canada Institute, and Science and Technology Innovation Program (STIP).

The Centre for International Governance Innovation (CIGI) is an independent, non-partisan think tank whose peer-reviewed research and trusted analysis influence policy makers to innovate. Our global network of multidisciplinary researchers and strategic partnerships provide policy solutions for the digital era with one goal: to improve people's lives everywhere. Headquartered in Waterloo, Canada, CIGI has received support from the Government of Canada, the Government of Ontario and founder Jim Balsillie.

Tecnológico de Monterrey is a private, non-profit, and independent institution with no political and religious affiliations, founded in September of 1943. Since then, the university has enrolled more than 65,000 undergraduate and graduate students in Monterrey, Mexico City, Guadalajara and 26 other cities in Mexico. The work of Tecnológico de Monterrey is supported by civil associations made up of a numerous group of outstanding leaders from all over the country who are committed to quality in higher education. It is the only non-US university in the Princeton Review of Top Schools for Entrepreneurship Studies (2020).



Copyright © 2021 by Carolina Agurto Salazar and the Fundación IDEA

Woodrow Wilson International Center for Scholars
One Woodrow Wilson Plaza
1300 Pennsylvania Avenue NW
Washington, DC 20004-3027

The Wilson Center

-  www.wilsoncenter.org
-  wwics@wilsoncenter.org
-  facebook.com/woodrowwilsoncenter
-  [@thewilsoncenter](https://twitter.com/thewilsoncenter)
-  202.691.4000

