

**DIRECTORATE FOR SCIENCE, TECHNOLOGY AND INNOVATION
DIGITAL POLICY COMMITTEE**

Cancels & replaces the same document of 7 October 2026

Working Party on Connectivity Services and Infrastructures

**Draft Report on the implementation of the OECD Recommendation on International
Mobile Roaming Services: Preliminary findings**

Developments in International Mobile Roaming Services since 2012

73rd meeting of the WPCSI, 2-3 November 2026, Paris

The Digital Policy Committee is expected to report to Council every five years on the implementation, dissemination and continued relevance of the OECD Recommendation on International Mobile Roaming Services (hereafter, “draft implementation Report”). At its 72nd meeting in May 2026, the Working Party on Connectivity Services and Infrastructure (WPCSI) discussed recent developments in the field as well as a process towards reviewing the implementation of the Recommendation.

Building on that discussion, this document provides an overview of the recent developments related to the Recommendation, as well as a preliminary analysis of Adherents’ implementation efforts. The document also includes targeted questions in order to gather additional data to develop the draft implementation Report.

Action requested: The WPCSI is invited to:

- (i) provide **comments** on the preliminary findings, including examples of relevant domestic efforts in implementing the Recommendations at the WPCSI meeting on 2-3 November 2026 and in writing **by 23 November 2026**.
- (ii) Provide **responses** to questions set out in Annex A, in writing **by 23 November 2026**.

Building on comments received, as well as the responses to the questions set out in Annex A, a first draft of the implementation Report will be shared with the WPCSI for written comments.

This document contributes to the intermediate output result (IOR) 1.3.1.6.3 of the 2025-26 Programme of Work and Budget (PWB) of the DPC.

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The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Note by the Republic of Türkiye

The information in this document with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Türkiye recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Türkiye shall preserve its position concerning the “Cyprus issue”.

Note by all the European Union Member States of the OECD and the European Union

The Republic of Cyprus is recognised by all members of the United Nations with the exception of Türkiye. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

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Key terms and acronyms

Acronym	Meaning
5G	Fifth generation of wireless cellular technology
5G NSA	5G Non-Standalone
6G	Sixth generation of wireless cellular technology
A2A	Agent-to-Agent
AI	Artificial Intelligence
CAN	Comunidad Andina (Andean Community)
CPTPP	Comprehensive and Progressive Agreement for Trans-Pacific Partnership
CSFB	Circuit-Switched Fallback
CUSMA	Canada-United States-Mexico Agreement
D2D	Direct-to-Device
EU	European Union
EEA	European Economic Area
eSIM	Embedded Subscriber Identity Module
GATS	General Agreement on Trade in Services
GCC	Gulf Cooperation Council
GPRS	General Packet Radio Service
GRX	GPRS Roaming Exchange
GSM	Global System for Mobile Communications
GSMA	GSM Association
HR	Home Routing
IMR	International Mobile Roaming
IMSI	International Mobile Subscriber Identity
IoT	Internet of Things
IPX	IP Packet eXchange
ITU	International Telecommunication Union
LBO	Local Breakout
LEO	Low-Earth Orbit
LTE	Long-Term Evolution
LTE-M	LTE for Machines
M2M	Machine-to-Machine
MNO	Mobile Network Operator
MVNO	Mobile Virtual Network Operator
NB-IoT	Narrowband Internet of Things
NTN	Non-Terrestrial Network
OTT	Over-the-Top
QoS	Quality of Service
RLAH	Roam Like at Home
SIM	Subscriber Identity Module
SNO	Satellite Network Operator
VoLTE	Voice over LTE
WLAN	Wireless Local Area Network
WTO	World Trade Organization

Developments in International Mobile Roaming Services since 2012

1. Since the adoption of the OECD Recommendation on International Mobile Roaming Services [\[OECD/LEGAL/0388\]](#) in 2012 (henceforth, the “Recommendation”), communication markets across the OECD have drastically changed, notably with the pervasiveness of new mobile technologies, from 4G to 5G, to the growth and prevalence of the connected devices and the Internet of Things (IoT), as well as emerging technologies reshaping the connectivity ecosystem, such as new trends in low-earth orbit satellites and the growth of mobile traffic in part driven by artificial intelligence. All these trends have had a direct impact on international mobile roaming (IMR) services.
2. In 2015, the Digital Policy Committee (DPC) reported to Council on the implementation, dissemination and continued relevance of the OECD Recommendation on International Mobile Roaming Services [\[OECD/LEGAL/0388\]](#) (henceforth, “the Recommendation” and “implementation Report”), and concluded that many Adherents had adopted policies consistent with the Recommendation, and that it was considered timely, useful, and still relevant [\[C\(2015\)134\]](#) and [\[C\(2015\)134/CORR1\]](#). At the time, Council invited the former Committee on Digital Economy Policy (CDEP), now the DPC, to continue promoting and monitoring the implementation of the Recommendation and report to Council as appropriate. In 2021, as part of its updated Standard-Setting Action Plan [\[DSTI/CDEP\(2021\)15/REV4\]](#), Annex A], the DPC decided to report on the implementation of the Recommendation within 10 years of the first implementation Report to Council (i.e., in 2025). In 2023, in the context of the renewal of the DPC mandate, the timeline for the implementation Report was updated to 2026 [\[C\(2023\)114/REV1\]](#). At its 72nd Session on 6-7 May 2026, the Working Party on Connectivity Services and Infrastructure (WPCSI) discussed recent developments in the field. In particular, the Secretariat proposed to present a preliminary analysis of the implementation of the Recommendation together with a more detailed overview of recent developments in order to assess the need for a possible update of the Recommendation.
3. Building on this discussion, this document provides an overview of main market and technological developments since 2012, as well as a preliminary analysis of Adherents’ implementation efforts. The report first identifies key market, technological and policy developments since the adoption of the Recommendation, takes stock of implementation experiences across OECD Member countries, and provides a preliminary analysis of the continued relevance of the Recommendation considering possible areas that may warrant revision.
4. The document also includes targeted questions, set out in each section of the document and consolidated in Annex A, in order to gather additional data to develop the draft implementation Report. Based on the feedback received on the preliminary findings set out in this document, as well as responses to the questions set out in Annex A, a first draft of the implementation Report will be submitted to the WPCSI for written comments.
5. Once finalised by the WPCSI, the draft report will be transmitted to the DPC for approval and transmission to Council (expected in 2027).

Background

What is international mobile roaming and how does it work in practice?

6. International mobile roaming (IMR) services allow end-users to access mobile communication services when travelling outside their home network. When a subscriber enters a foreign country, their handset connects to a visited operator's network. The visited operator authenticates the subscriber through arrangements with the home operator and provides access to its mobile network. The home and visited operators settle the wholesale charges associated with the IMR services under their roaming agreement, typically through inter-operator tariffs, while the home operator subsequently bills the subscriber through retail roaming charges or retail service plans (OECD, 2009^[1]).

7. The provision of IMR services therefore requires co-operation between mobile operators in different jurisdictions involving wholesale arrangements between the home and visited operators, alongside the retail relationship between the home operator and the subscriber. The way in which roaming traffic is routed between these networks can also differ. Two main configurations are used: home routing (HR) and local breakout (LBO) as described in Box 1.

Box 1. Terminology: International mobile roaming

International mobile roaming (IMR): The ability of a mobile subscriber to continue using mobile communication services, including voice, SMS/MMS and mobile data, when travelling outside the country of the subscriber's **home operator**, by connecting to a **visited operator's** mobile network.

- **Home operator:** The mobile operator with which the subscriber has a subscription, and that provides the subscriber's home mobile service.
- **Visited operator:** The mobile operator whose network the subscriber accesses while roaming in another country.

Roaming traffic can be routed according to two main configurations:

- **Home routing (HR):** A routing configuration in which roaming traffic is routed through the home operator's network before reaching the public Internet. The Internet breakout therefore occurs in the home network. In the terminology of the **3rd Generation Partnership Project (3GPP)**, this is referred to as the **home-routed roaming architecture**.
- **Local breakout (LBO):** A routing configuration in which roaming traffic reaches the public Internet through the visited operator's network, without being routed back through the home operator's network. In the terminology of the Third Generation Partnership Project (**3GPP**), this is referred to as the **local breakout roaming architecture**.

The terms "**home-routed**" and "**local breakout**" describe the routing and Internet breakout of roaming traffic, rather than the physical location of the roaming subscriber.

Sources: OECD (2009^[1]), "International Mobile Roaming Charging in the OECD Area", OECD Digital Economy Papers, No. 166; ITU-T (2016^[2]), Recommendation D.97, "Methodological principles for determining international mobile roaming rates"; 3GPP (2026^[3]), TS 23.501 v20.2.0, "System Architecture for the 5G System (5GS)", §4.2.4, "Roaming reference architectures".

8. Although IMR relies largely on existing mobile network infrastructure, previous OECD analysis conducted before the OECD Council's adoption of the Recommendation in 2012 found that roaming prices were frequently well above the level that could be explained by underlying service provision costs alone and roaming charges were often substantially higher than comparable domestic prices (OECD,

2009^[1]; 2010^[4]; 2011^[5]). OECD analysis also found that roaming markets exhibited several structural characteristics that limited the effectiveness of normal competitive forces. At the wholesale level, the provision of IMR services depended on agreements with foreign operators, and wholesale roaming charges often accounted for a substantial share of retail roaming prices. At the retail level, users rarely selected mobile subscriptions based on roaming prices, as IMR services were used only occasionally and mobile subscriptions were typically purchased as part of broader service bundles that included domestic voice, messaging and data services. As a result, operators faced relatively weak incentives to compete on roaming prices compared with other aspects of competition, such as domestic tariffs, handset offers and network quality (OECD, 2009^[1]; 2010^[4]; 2011^[5]).

9. Subscribers travelling abroad generally rely on the roaming arrangements negotiated by their home operator and could not easily switch to alternative providers while maintaining their existing service relationship. In addition, limited transparency regarding wholesale roaming charges and retail tariffs further reduce the ability of consumers and regulators to assess pricing structures hindering competition dynamics. These challenges become increasingly significant with the growth of mobile data services and smartphones, which may contribute to ‘bill shock’¹ arising from unexpectedly high roaming charges. Additionally, IMR services continue to rely primarily on bilateral wholesale agreements between mobile operators. These agreements determine the technical and commercial conditions under which subscribers can access mobile networks travelling abroad. As roaming markets have evolved, operators may need to negotiate, maintain and periodically update a large number of bilateral agreements.

10. Taken together, these factors mean that competition in roaming markets does not generally function as effectively as in many domestic mobile markets. Therefore, the OECD analysis behind the rationale of the OECD Recommendation on International Mobile Roaming, concluded that persistently high roaming prices reflected not only the pricing decisions of individual operators, but also structural characteristics of the market itself, including high wholesale charges, limited market contestability, weak consumer responsiveness to roaming prices and information asymmetries. These findings formed the analytical foundation for the adoption of the Recommendation.

The purpose of the OECD Recommendation on International Mobile Roaming Services

11. In 2012, in response to concerns over high roaming prices and limited competitive pressure, the OECD Council adopted the Recommendation on the proposal of the Digital Policy Committee (formerly, the Committee for Information, Computer and Communications Policy [ICCP]), with the aim of promoting more affordable, transparent and competitive international mobile roaming services.

12. The Recommendation can be broadly grouped into three areas: improving customer transparency and awareness, promoting competition in both wholesale and retail markets, and the possibility of wholesale and retail price regulation where market outcomes are insufficient (Figure 1).

Figure 1. The eight pillars of the Recommendation

Customer transparency	1. Promoting awareness of roaming prices and substitutes. 2. Promoting transparent information on roaming services.
Wholesale & retail competition	3. Facilitating trans-national networks and alliances. 4. Transparency of Inter-Operator Tariffs. 5. Facilitating access to wholesale mobile services on local terms and conditions.
Regulatory intervention & assessment	6. Wholesale price regulation. 7. Retail price regulation. 8. Assessment of costs and benefits.

Note: The categories above are presented for explanatory purposes only.

Source: OECD elaboration based on the OECD Recommendation on International Mobile Roaming Services [\[OECD/LEGAL/0388\]](#)

13. The Recommendation includes two pillars related to customer² transparency as it is the most immediate and cost-effective safeguard to protect customers in the international roaming market (pillars 1 and 2). Roaming prices often exceeded customers' expectations, resulting in so-called *bill shocks*, largely due to limited price awareness, and a lack of consideration of available alternatives. Therefore, these principles require Members and non-Members having adhered to the Recommendation (hereafter, "Adherents") to take appropriate measures to ensure that customers clearly understand roaming prices and available alternatives (e.g. local Subscriber Identity Module [SIM] cards, access through Wireless Local Area Networks [WLANs] including Wi-Fi, bundled offers). Operators should disclose roaming price tables, data caps, overage fees and all applicable conditions, through measures such as real-time notification upon entering foreign networks.

14. The Recommendation includes three pillars (pillars 3 to 5) related to domestic and international competition in IMR markets to address market challenges due to the nature of IMR services. Inter-operator tariffs, which directly shape retail roaming prices, are set through agreements with foreign operators. National regulatory authorities have limited visibility of these agreements, and domestic competition alone has no impact on prices. Also, opaque or discriminatory wholesale access limits new entrants and strengthens incumbent dominance. Therefore, in the interest of enhancing competition, these principles encourage Adherents to promote cross-border competitive pressure through transnational operator alliances and agreements, greater transparency of wholesale roaming arrangements, and fair and non-discriminatory wholesale access. They also encourage Adherents to enable operators, including mobile virtual network operators (MVNOs), to obtain access to host networks on fair, reasonable and transparent terms, thereby lowering barriers to entry and strengthening competition. In addition, the Recommendation encourages Adherent countries to take these IMR considerations into account in merger assessments.

15. The Recommendation also includes three pillars (pillars 6 to 8) on regulatory intervention in IMR services. The Recommendation encourages Adherents to introduce wholesale and/or retail price regulations, only when market mechanisms fail to reduce prices sufficiently by improving transparency and competition. The regulatory measures include reaching bi- or multilateral agreements by Adherents and introducing price caps on wholesale and retail charges. The Recommendation further emphasises the importance of an evidence-based approach to avoid unintended consequences. The Recommendation further emphasises that regulatory intervention should be based on an assessment of costs and benefits, considering the likely effects on prices, investment, innovation and consumer welfare, and should be subject to periodic review.

16. The Recommendation currently has 40 Adherents: all 38 OECD Members and two non-Members (Brazil and Ukraine).

Market and technological developments in the field since the adoption of the Recommendation

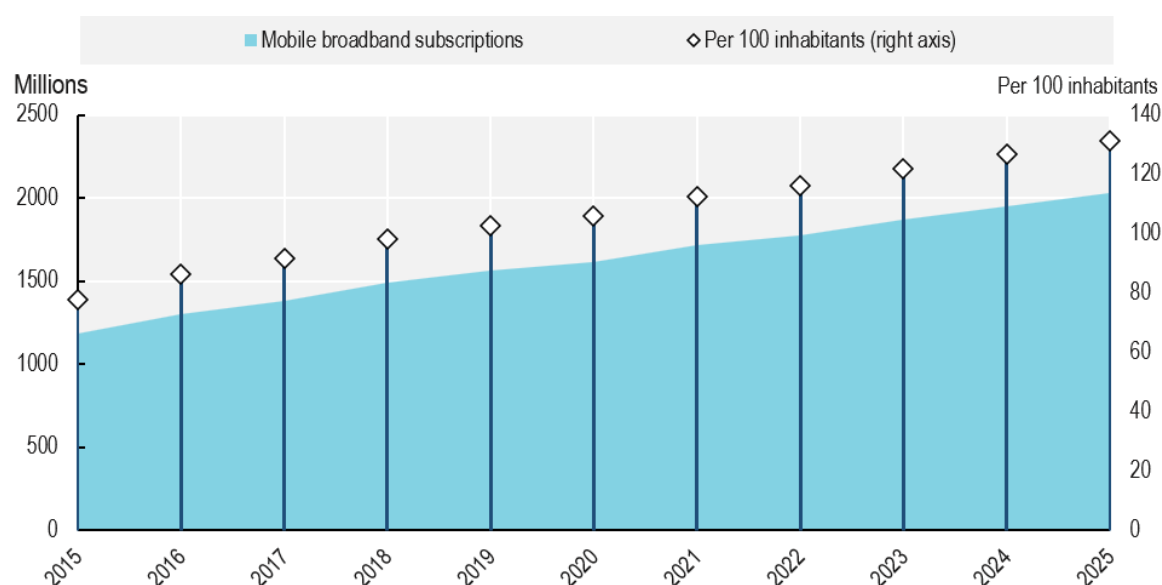
Market developments in wider digital connectivity ecosystem and IMR markets

Development in digital connectivity ecosystem since 2012

17. Since the adoption of the Recommendation in 2012, the broader mobile communication sector has undergone significant transformation, affecting both the technological foundation and policy context in which IMR operates. Mobile broadband adoption has continued to expand rapidly, accompanied by a significant increase in data consumption. Across OECD Member countries, the number of mobile broadband subscriptions rose from about 1.2 billion in 2015 to more than 2.0 billion in 2025, an increase of roughly 70% (Figure 2).

Figure 2. Mobile broadband has become a ubiquitous means of connectivity

Growth in mobile broadband subscriptions in the OECD countries

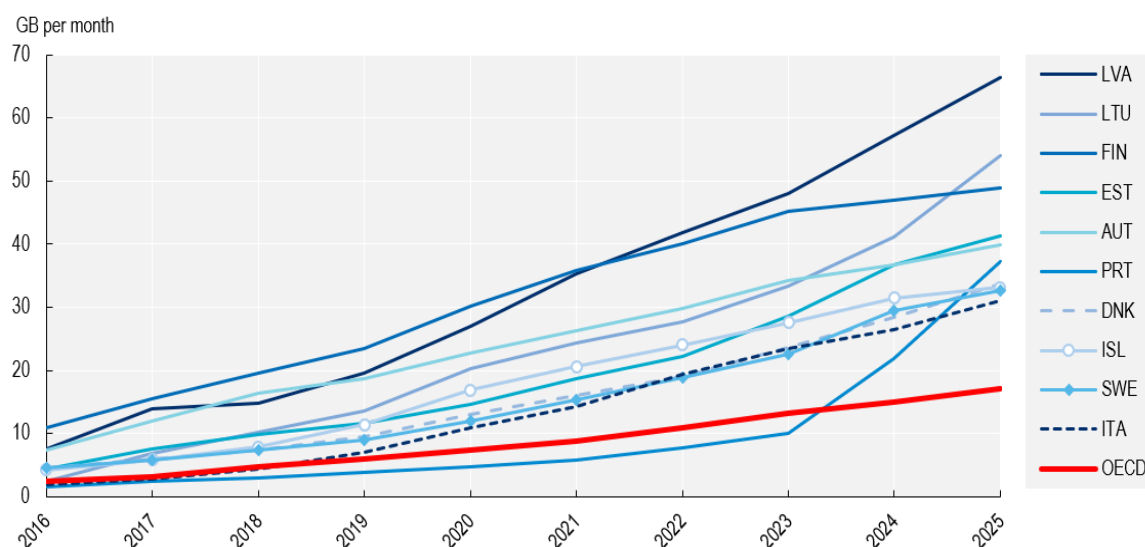


Source: OECD Broadband Statistics, <https://www.oecd.org/en/topics/broadband-statistics.html>

18. Monthly data volume per subscription has more than doubled across the OECD, on average, over the last five years, rising from 7 GB in December 2020 to 17 GB in December 2025. In some OECD Member countries, monthly data usage exceeded 35 GB per month (i.e. Austria, Estonia, Finland, Latvia, Lithuania and Portugal) (Figure 3) (OECD, 2026^[6]). These reflect that communication patterns have shifted from circuit-switching-based voice-centric services toward IP-based data-centric communications.

Figure 3. Mobile data usage has grown rapidly over the past decade

Timeseries of data consumption by countries



Note: The multiplier 1024 is used to convert TB into GB; the total amount of GB is divided by the yearly average number of Mobile broadband subscriptions.

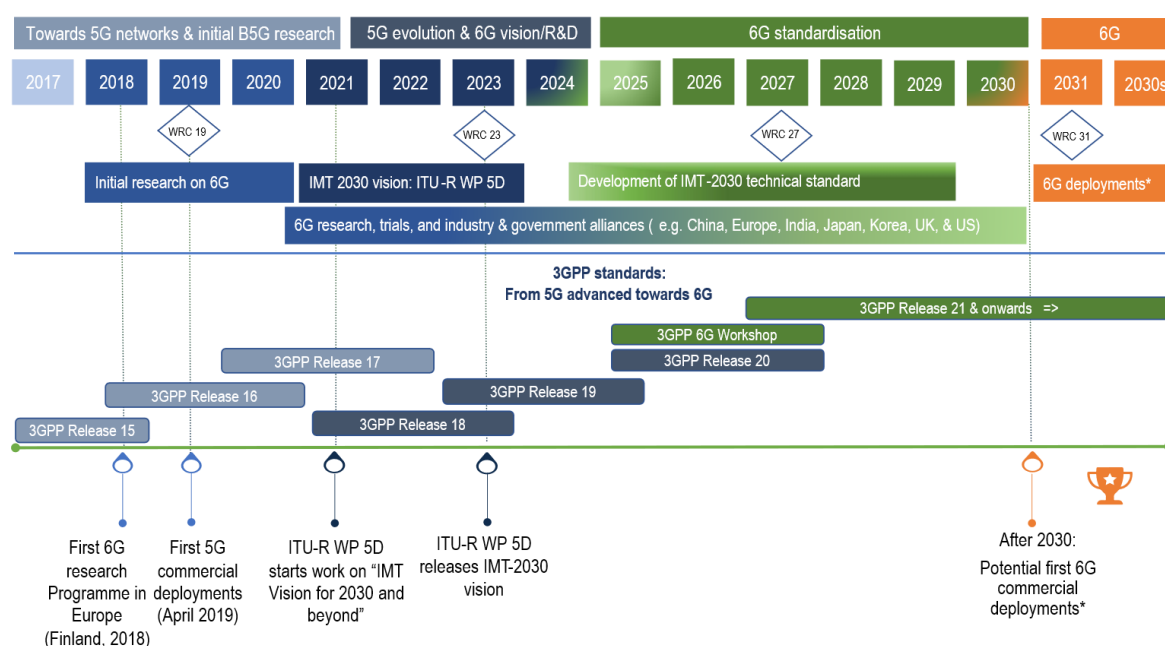
Source: OECD Broadband Statistics, <https://www.oecd.org/en/topics/broadband-statistics.html>

19. These developments have changed the nature of IMR services. Whereas roaming was historically associated primarily with voice calls and SMS messages, roaming users increasingly expect continuous access to high-speed mobile broadband services and data-intensive applications while travelling internationally.

20. Mobile communication networks and services have experienced a rapid and sequential transition from widespread Long-Term Evolution (LTE), also known as 4G, deployment towards the introduction of 5G networks and the emergence of research and development of 6G technology. Building on the capabilities of 4G, countries have progressively introduced 5G, first through non-standalone (NSA) architectures leveraging existing 4G network core networks, and increasingly through 5G standalone (5G SA), which delivers lower latency, higher reliability, and network slicing capabilities for advanced use cases (OECD, 2019^[7]; 2022^[8]; 2024^[9]). In December 2025, all OECD Member countries had deployed commercial 5G networks (both standalone and non-standalone), and it constituted 41.2% of overall mobile broadband subscriptions. By 2025, 173 mobile operators in 70 countries had invested in public 5G SA, while commercial launches have occurred in over 40 countries (GSA, 2025^[10]).

21. 6G research is underway across more than half of OECD Member countries, and early visions emphasise the integration of terrestrial and non-terrestrial networks (NTN), enabling seamless connectivity via satellites, high-altitude platforms, and airborne systems to support ubiquitous geographical coverage and new services, a so-called “network of networks”. Together, these technology cycles illustrate the sector’s continuing shift towards higher capacity, improved performance and enhanced user experience through seamless connectivity (Figure 4) (OECD, 2024^[9]).

Figure 4. The road to 6G: potential timeline



Note: 3GPP's Release 19 is the "5G Advanced" normative phase, while Release 20 is the 6G study phase with NTN technological studies planned. 3GPP's Release 21 is the normative phase of the 6G standards including NTN normative work.

Source: OECD, (2024^[9]), Figure 1.S.1, in "Spotlight. Next generation wireless networks and the connectivity ecosystem", in *OECD Digital Economy Outlook 2024 (Volume 1): Embracing the Technology Frontier*, OECD Publishing, Paris, <https://doi.org/10.1787/a1689dc5-en>.

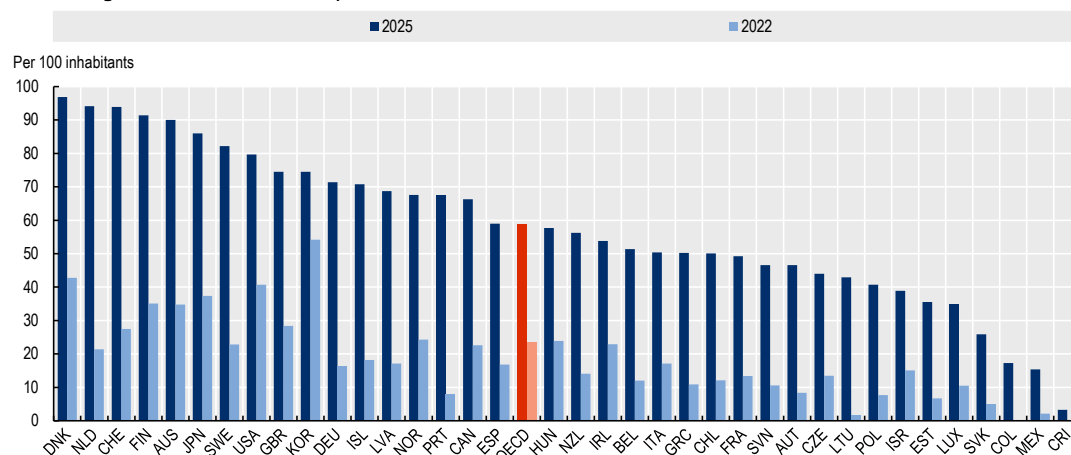
22. The progressive transition from 3G to 4G, then 5G, and toward future 6G networks is reshaping the environment in which IMR operates. As countries progress through these technology cycles at different speeds and along different migration paths, disparities in network capacities and the coexistence or retirement of legacy technologies increasingly affect the quality, reliability and interoperability of IMR services.

23. Over the past three years (2022-25), 5G connections per 100 inhabitants have tripled reaching 60 connections per 100 at the end of 2025, according to GSMA Intelligence data (Figure 5). At the same time, 5G has delivered significantly higher speeds, with 5G download experienced speeds reaching 204 Mbps on average across the OECD in Q2 2026, approximately four times higher than average speeds experienced in 4G networks, according to Opensignal data (Figure 6).

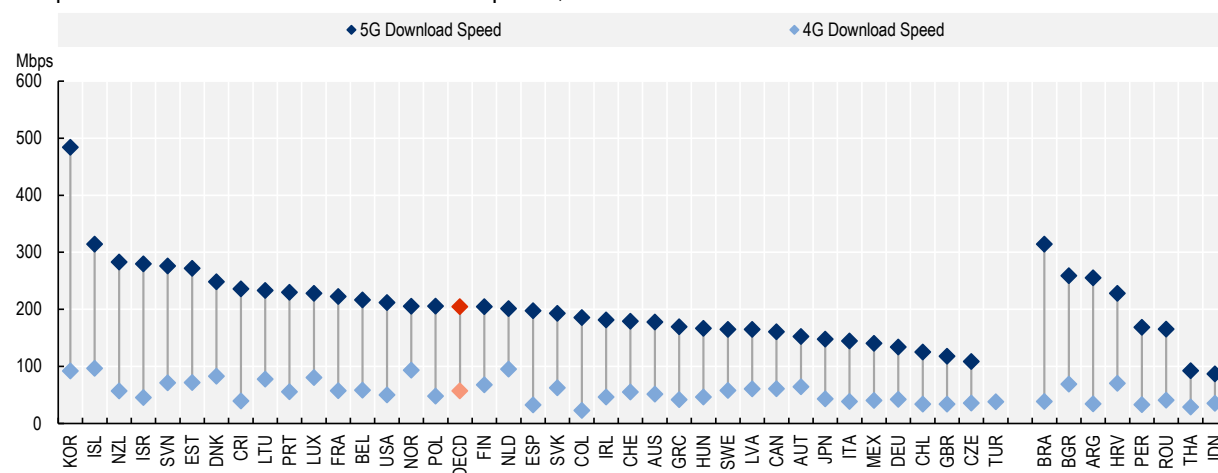
24. Going forward, roaming for 5G standalone services, which may include network slicing³, is expected to offer benefits across borders beyond those of traditional roaming for end-users, by supporting specialised services capabilities potentially in the business-to-business (B2B) segment, such as lower latency, enhanced reliability, and Quality of Service (QoS) differentiation. These capabilities could enable new use cases such as connected autonomous vehicles, industrial IoT, enterprise private networks, mission-critical communications that require consistent service performance when users move between networks and jurisdictions (Ericsson, 2025^[11]; BICS, 2024^[12]). Commercial 5G SA roaming services, however, remain at an early stage as deployment requires end-to-end implementation of new 5G core functions, security mechanisms, signalling and billing systems, as well as interoperability testing and commercial agreements between MNOs (Syniverse, 2026^[13]).

Figure 5. OECD countries are rapidly moving towards 5G connectivity

Percentage of 5G connections per 100 inhabitants, 2022 and 2025

Source: OECD based on GSMA Intelligence (2026) (database), <https://www.gsmainelligence.com/data> (accessed on 26 August 2026).**Figure 6. 5G download speeds are more than 4 times higher than 4G speeds on average in the OECD**

Comparison of 5G and 4G mobile download speeds, Q2 2026

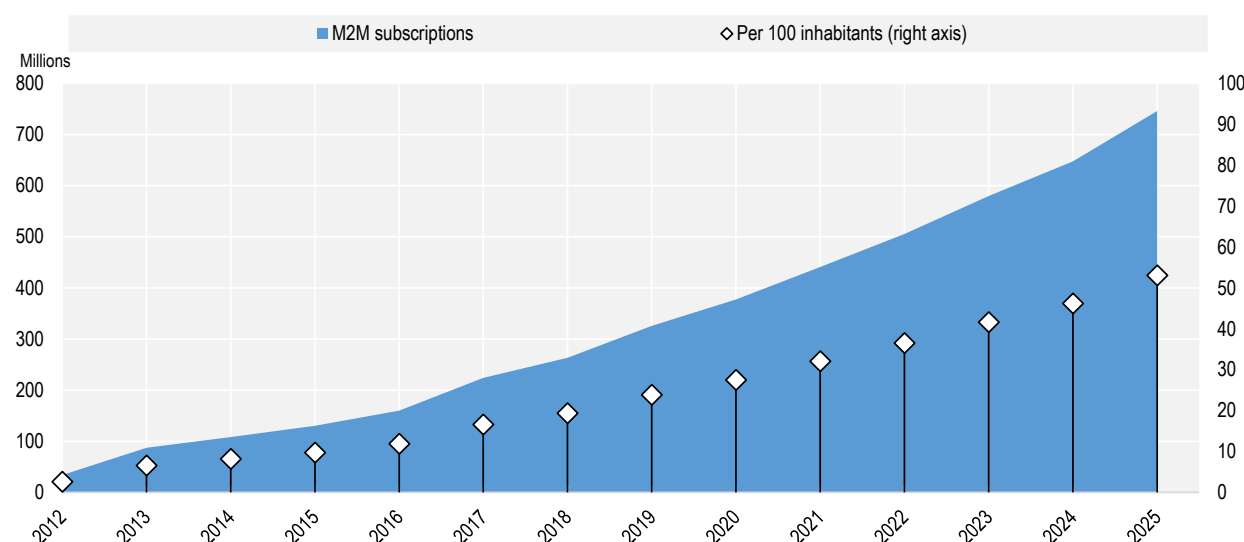
Source: OECD based on Opensignal (2026), Insights, <https://www.opensignal.com>

25. Another important structural change is the rapid growth of IoT and machine-to-machine (M2M) connectivity. Since 2012, the number of IoT and M2M subscriptions across OECD countries has grown at an average annual rate of 26.8%, illustrating the rapid expansion of connected devices across the economy (Figure 7).

26. The growth of M2M subscriptions reflects increasing adoption of connected vehicles, smart infrastructure, industrial automation and other IoT-enabled applications, and signals that machine-generated communications are becoming an increasingly important component of the connectivity ecosystem. IoT deployment across households, businesses, and industrial sectors increasingly involves devices that communicate without human interaction (OECD, 2023^[14]). This

represents a new pattern of digital communication that is not designed solely around human behaviour but instead supports IoT and M2M exchanges across varied environments.

Figure 7. M2M subscriptions have grown almost sixfold across OECD countries since 2012



Source: OECD Broadband Statistics, <https://www.oecd.org/en/topics/broadband-statistics.html>.

27. Looking ahead, connectivity demand may increasingly be shaped not only by interactions among people and connected devices, but also by exchanges among autonomous artificial intelligence (AI)-enabled agents operating as part of broader agentic AI systems. These systems are characterised by the co-ordination of multiple agents that can collaborate, delegate tasks, interact with digital environments, and pursue complex objectives over extended periods with limited human supervision (OECD, 2026^[15]). As such systems become more widely deployed, communication infrastructure may become increasingly important for supporting agent-to-agent (A2A) communication across distributed and potentially cross-border digital ecosystem. This could increase the policy relevance of machine-generated traffic alongside traditional user-generated communications and IoT/M2M connectivity.

Market and regulatory developments regarding international mobile roaming across countries

28. Since the adoption of the Recommendation, international travel has increased substantially and has largely recovered from the disruption caused by the COVID-19 pandemic, expanding the potential demand for IMR services. Across the OECD countries and partner economies, tourism activity has returned to or exceeded pre-pandemic levels (OECD, 2026^[16]). As international travel continues to grow, users increasingly expect mobile connectivity abroad to support a wide range of digital activities, including social networking services, navigation, transport services, online payments, and access to application-based services. These developments have reinforced the importance of affordable and reliable international connectivity. Looking ahead, international tourist arrivals could reach around 2 billion by 2030 (UN Tourism, 2025^[17]). The continued growth in international tourism is expected to increase demand for international connectivity services.

29. While mobile data services were already becoming important in the early 2010s, IMR services remained largely associated with voice calls and SMS communications. Since then, growing

smartphone adoption, advances in mobile broadband networks and the widespread use of Over-the-Top (OTT) applications have accelerated the shift towards data-centric usage of IMR services. As a result, the primary value of IMR services for many users increasingly lies in access to mobile data connectivity rather than voice communications alone. This shift is reflected in roaming traffic patterns. While voice roaming remains a widely used service, data consumption has grown far more rapidly than voice usage.

30. In the European Economic Area (EEA), roaming voice traffic has increased steadily since the introduction of the Roam Like at Home (RLAH) regime, whereas overall roaming data traffic increased by approximately 48-fold between the introduction of the RLAH regime in 2017 and 2024 (European Commission, 2025^[18]). At the same time, average roaming data consumption per roaming subscriber increased from around 0.7 GB in Q3 2018 to 2.3 GB in Q3 2025 (BEREC, 2020^[19]; 2026^[20]). The increase in roaming traffic reflects not only the growth in international travel and the spread of data-centric services but also the benefits associated with lower roaming prices. Evidence from EU's RLAH regime suggests that reductions in roaming charges led to substantial increases in mobile data usage while travelling and generated significant consumer welfare gains (Quinn et al., 2024^[21]).

31. Since 2012, retail IMR plans have diversified across major markets. While pay-by-use pricing served as a baseline option, mobile operators increasingly introduced flat-rate daily or periodic plans, followed by bundled IMR offers integrated into domestic mobile subscriptions. Pay-by-use roaming, under which voice calls, SMS, and data are charged on a per-unit basis, is offered by major operators as a default or fallback option when no roaming packages are activated. From the early 2010s, operators began introducing flat-rate IMR plans, typically charged daily, to address concern over bill shock. For example, AT&T has introduced international Day Pass, enabling customers to use their domestic voice, text, and data allowances abroad for a fixed daily charge in more than 200 destinations (AT&T, 2026^[22]).

32. Bundled IMR plans have become increasingly prominent across OECD Member countries. For example, in Europe, the RLAH regulation requires operators within the EU/EEA to allow subscribers to use mobile services in other EU/EEA countries without retail roaming surcharges, subject to applicable conditions. Outside the scope of the RLAH regime, roaming conditions generally revert to commercial arrangements determined by operators and in such cases, roaming is typically provided through daily roaming passes, destination-specific bundles, or, in the absence of these options pay-by-use pricing. For example, Deutsche Telekom applies RLAH-based roaming within the EU/EEA, while roaming outside the EU/EEA is offered through dedicated options such as country-group roaming packages or time-limited data passes that allow customers to use defined roaming allowances abroad (Deutsche Telekom, 2026^[23]). Similarly, Orange provides surcharge-free roaming within the EU/EEA under RLAH, whereas usage outside this area is generally subject to optional roaming passes with fixed validity periods and data allowances, or otherwise shared on a per-unit basis (Orange, 2026^[24]). Similar approaches can also be observed in other regions mainly through commercial strategies with differences across operators and destination regions. For example, AT&T and Verizon include roaming in Canada and Mexico in their eligible unlimited plans, allowing users to use domestic allowances with no separate roaming charge while in those countries (AT&T, 2026^[22]; Verizon, 2026^[25]).

33. Comparative assessments conducted by the Canadian Radio-television and Telecommunications Commission (CRTC) indicate that roaming prices and commercial offers continue to vary considerably across operators and countries outside shared regulatory frameworks. While daily roaming passes, destination-specific bundles and regional roaming packages have become increasingly common, substantial variation remains in terms of pricing structures, included allowances, validity periods and destination coverage. The findings suggest that unlike in the EU/EEA where regulatory intervention has facilitated convergence between domestic and roaming prices, roaming

conditions in many markets continue to be shaped primarily by commercial arrangements and therefore remain highly heterogeneous across operators and destinations (CRTC, 2024^[26]).

Emerging technologies impacting IMR services and routing models

IoT permanent roaming; balancing international IoT/M2M connectivity and regulatory objectives

34. International mobile roaming was originally developed to support continued connectivity while travelling outside a home country and has traditionally been associated with temporary mobility of people rather than long-term provision of communication services in another jurisdiction (European Union, 2022^[27]). Permanent roaming generally refers to situations when a user or device remains connected to a visited network on a long-term basis when using a subscription issued in another jurisdiction. In case of human users, concerns about permanent roaming arose because international roaming could be used on a sustained basis as a substitute for domestic subscriptions, and this led to the introduction of safeguards such as fair-use policies designed to ensure that roaming remained linked to temporary travel.

35. However, the concept of permanent roaming in the context of IoT/M2M connectivity differs fundamentally from permanent roaming by human users. Whereas fair-policies were developed to prevent substitution of domestic mobile subscriptions by long-term roaming, many IoT and M2M applications rely on long-term or permanent cross-border connectivity as a core feature of the service itself.

36. Some IoT devices are manufactured in one jurisdiction and deployed and operated in another jurisdiction for extended periods or throughout their operational lifetime. In this context, unlike traditional roaming designed to support temporary travel, permanent roaming may facilitate the deployment of cross-border IoT/M2M services by enabling devices to operate seamlessly across multiple jurisdictions without changing subscriptions or connectivity arrangements. This can reduce deployment complexity and support the international provision of connected products and services. Permanent roaming can therefore contribute to reduce barriers to trade and enable scalable connectivity solutions. Such benefits may be particularly relevant for globally distributed applications, including connected vehicles, industrial equipment, and global tracking systems. As a result, long-term or permanent roaming arrangements have become increasingly important for a growing range of IoT use cases (OECD, 2020^[28]; ITU, 2023^[29]).

37. At the same time, the increasing use of permanent roaming has raised questions regarding the relationship between roaming arrangements and domestic connectivity markets. Where devices remain connected to a visited network on a long-term basis while relying on subscriptions issued in another jurisdiction, concerns may arise regarding the distinction between temporary roaming and domestic service provisions. From a regulatory perspective, some reports have highlighted issues relating to domestic licensing frameworks and other national regulatory requirements including lawful interception, security and data protection, the management of numbering resources, taxation, registration and certification requirements (Transatel, 2026^[30]; Transforma Insights, 2026^[31]). In particular, concerns have been raised that global service providers are able to serve local customers through foreign SIMs and roaming arrangements under different regulatory obligations from domestic operators and potential distortions of domestic competition (European Commission, 2024^[32]).

38. Approaches to permanent roaming differ across jurisdictions. In the European Union, the current Roaming Regulation (EU) 2022/612 was designed to facilitate temporary travel and includes safeguards that allow operators to establish contractual procedures to address abusive or anomalous roaming, including forms of permanent roaming. The suspension or termination of wholesale roaming agreements is listed as a last resort subject to national regulatory authority oversight (European Union,

2022^[27]). These types of safeguards were generally developed in the context of roaming by human users and were intended to preserve the temporary nature of roaming rather than address IoT/M2M connectivity. While most jurisdictions do not have an explicit ban on permanent roaming for IoT, or at least do not explicitly prohibit it, some jurisdictions (e.g. Brazil, India, Türkiye, the United Arab Emirates, and the Kingdom of Saudi Arabia) have adopted more restrictive approaches to explicitly prohibit or restrict permanent roaming for IoT/M2M services by regulations (BEREC, 2024^[33]).

39. In addition, restrictions may arise through commercial arrangements. The Body of European Regulators for Electronic Communications (BEREC) notes that international mobile roaming access seekers have faced contractual restrictions, including clauses limiting the provision of services to domestic customers and other conditions constraining permanent roaming arrangements (BEREC, 2024^[33]). In the same report, BEREC highlights that industry stakeholders have also argued that some roaming agreements do not permit permanent roaming for IoT/M2M services, making the availability of such arrangements dependent on bilateral negotiations between operators (BEREC, 2024^[33]).

40. Industry stakeholders have expressed differing views on the role of permanent roaming in IoT/M2M markets. According to stakeholder views reported by BEREC, MVNOs have argued that permanent roaming is often necessary to support cross-border IoT/M2M services and enable seamless connectivity across multiple jurisdictions. They contend that restrictions on permanent roaming may limit the ability to deploy connected devices efficiently and increase operational complexity and costs. Some MVNO stakeholders have further argued that commercial negotiations alone may not ensure effective access to permanent roaming arrangements and have called for regulatory intervention including stronger wholesale access obligations to support global IoT services. By contrast, MNOs generally support maintaining flexibility for commercial negotiations regarding permanent roaming. They argued that additional mandatory access requirements could enable global service providers to enter national markets without investing in local infrastructure, which may weaken investment incentives and distort competition. MNOs also highlighted technical concerns that some IoT devices generate low traffic volumes but significant signalling loads, requiring measures to safeguard network integrity and recover associated costs (BEREC, 2024^[33]).

41. The policy challenge regarding IoT/M2M permanent roaming is therefore not limited to facilitating cross-border connectivity. Rather, it involves balancing the objective of enabling seamless cross-border IoT connectivity with the need to preserve regulatory oversight, sustainable competition, and incentives for continued investment in mobile network infrastructure. In the case of IoT/M2M services, this balance may be particularly difficult because permanent or near-permanent cross-border connectivity is often not an exceptional circumstance but a core component of the IoT service itself.

Broader issues regarding IoT/M2M roaming beyond permanent roaming

42. Beyond the specific issues of permanent roaming, the growing importance of IoT/M2M connectivity raises broader questions regarding the sustainability of existing frameworks for IMR services. The Recommendation was developed primarily to address concerns relating to retail customer roaming, including transparency, bill shock and roaming charges incurred by users. By contrast, many IoT/M2M applications involve limited or no human interaction, enterprise-based contractual arrangements, large numbers of devices and long operational lifecycles. Going forward, the growth of A2A traffic as AI becomes more pervasive, exacerbates these questions. As a result, an increasing share of international connectivity falls outside the assumptions that originally informed roaming policy discussions.

43. Stakeholders have also identified a range of issues relating to the broader IoT/M2M roaming ecosystem that extend beyond permanent roaming. In the BEREC 2024 review, MVNOs raised concerns regarding the use of numbering resources in cross-border IoT deployments, wholesale, minimum commitment requirements, International Mobile Subscriber Identity (IMSI) -based wholesale

charging mechanisms rather than volume-based charges, restrictions on access to specific M2M technologies such as narrowband IoT (NB-IoT) and LTE for machine (LTE-M). These issues suggest that certain challenges associated with IoT/M2M connectivity may relate less to the duration of roaming and more to wholesale market structures, technology access, and the evolving role of specialised connectivity providers in cross-border connectivity markets (BEREC, 2024^[33]).

44. More broadly, these developments raise questions regarding whether future roaming policy frameworks should continue to address human-centric roaming and IoT/M2M connectivity through a common framework, or more differentiated approaches may be warranted. Traditional roaming is typically based on occasional individual usage, while IoT connectivity often involves millions of devices generating relatively small amounts of traffic under long-term contracts.

45. Several industry holders argued that bulk IoT connectivity is frequently priced using economic models that differ substantially from those underpinning IMR services designed for human users. They also argued that IoT/M2M services often rely on wholesale arrangements distinct from traditional consumer roaming and advocated clearer wholesale access conditions for IoT/M2M deployments (BEREC, 2024^[33]). Large MVNO providers for IoT services have raised issues concerning the applicability of user-protection-oriented roaming measures to machine-based communications. Existing roaming frameworks frequently rely on mechanisms such as transparency requirements, usage notifications and bill-shock prevention measures designed for end users. However, many IoT devices operate autonomously and may have limited or no direct human interaction. This has led some stakeholders to question whether certain obligations originally designed for retail customer roaming remain fully appropriate for all IoT/M2M cases.

Emergence of eSIM-enabled international connectivity services

46. Programmable SIM technologies, such as embedded SIM (eSIM) technology have potential to alleviate some of the transaction costs and market rigidities traditionally associated with international mobile connectivity. By enabling users to remotely activate and switch between mobile subscription profiles without replacing physical SIM cards, eSIM technology may reduce switching costs, facilitate access to alternative service providers and increase competitive pressure on international mobile roaming offers (Bourassa et al., 2016^[34]; OECD, 2020^[28]). The eSIM technology is increasingly incorporated into smartphones, tablets, vehicles and IoT devices, reducing SIM distribution costs, simplifying customer onboarding and allowing mobile subscription to be managed digitally throughout the device lifetime (GSMA, 2026^[35]; 2026^[36]).

47. The widespread adoption of eSIM technology is expanding the range of alternatives available to international travellers beyond traditional IMR services. Traditionally, international travellers relied on IMR services offered by their home operators. The use of eSIMs allows users to directly download and activate connectivity plans from alternative local providers through their devices without necessarily relying on IMR. The increasing availability of unlocked smartphones has expanded customers' ability to switch providers and use alternative services (FCC, 2025^[37]). In particular, travel eSIM providers generally require devices to be carrier-unlocked, enabling customers to obtain international connectivity directly from third-party providers rather than relying exclusively on roaming arrangements offered by their home operators (Airalo, 2026^[38]). These developments have enabled the rapid growth of travel eSIM services, which offer short-term connectivity packages for specific destinations or regions.

48. According to a survey by the Global GSM Association (GSMA), 51% of eSIM users reported having used an eSIM service while travelling abroad for leisure or personal reasons during the previous 12 months and 28% of travel-eSIM users purchased services from global connectivity providers (GSMA Intelligence, 2025^[39]). Another industry research estimates that revenues from travel eSIM package will increase from USD 989 million in 2024 to USD 1.8 billion by the end of 2025 (Juniper Research, 2025^[40]).

49. The travel eSIM business is characterised by several business models. Some providers operate as global aggregators, purchasing and combining connectivity sourced from multiple MNOs into a single retail eSIM offering. Other models involve MNOs providing international connectivity to their subscribers directly through roaming agreements with foreign operators. In addition, some local MNOs offer eSIM products specifically targeting inbound travellers (GSMA Intelligence, 2025^[39]). From a customer perspective, travel eSIM services are reshaping the retail distribution of international connectivity by allowing users to access foreign mobile networks without purchasing traditional roaming packages. However, these travel eSIM services generally continue to rely on underlying agreements between MNOs and connectivity providers. Consequently, while the retail interface has evolved, the inter-operator arrangements underpinning cross-border connectivity remain an important feature of the international mobile ecosystem.

50. A recent study by Ookla provides additional insights into the structure of the travel eSIM ecosystem. While a growing number of eSIM brands compete at the retail level, it mapped more than 50 travel eSIM providers to around 13 underlying wholesale connectivity providers for travel eSIM services. It also suggests that some providers use multiple wholesale partners and may allocate users to different underlying connectivity arrangements depending on destination markets and service offerings. These would lead to an increasingly complex international value chain involving retail providers, wholesale connectivity providers and MNOs (Ookla, 2026^[41]). Ookla's report also suggests that many travel eSIM offerings continue to rely on home routing (HR) associated with the location where home or wholesale provider locates before reaching the public Internet. Local breakout (LBO) arrangements may also be used, but they appear to remain less common among travel eSIM offerings, although they may increase latency (Ookla, 2026^[41]). These architectural differences may influence end-user experience. Users connected to the same visited mobile network may nevertheless experience substantially different latency outcomes depending on the underlying routing arrangements used by their travel eSIM providers. This suggests that the growing diversity of travel eSIM services may be associated not only with differences in pricing but also with differences in the underlying connectivity solutions supporting those services.

51. At the same time, eSIM-enabled cross-border services raise a range of regulatory and jurisdictional questions. As connectivity can be provisioned remotely across borders, regulators may need to consider how existing frameworks should apply to increasingly global and software-based connectivity services. Additionally, unlike traditional mobile roaming, travel eSIM traffic may be routed through wholesale providers and network infrastructure located in third countries that are not apparent to users, potentially affecting the jurisdiction through which traffic passes. Thus, the cross-border nature of eSIM-enabled services may raise questions regarding the application of domestic communication framework rules where service providers, connectivity providers and users are located in different jurisdictions (e.g. "Know Your Customer" requirements, privacy and security obligations, taxation regimes, among others).

52. Beyond the retail travel eSIM market, remote SIM provisioning capabilities may also facilitate the localization of connectivity in connected devices in IoT deployments by enabling profiles to be downloaded and managed remotely. This capability has been discussed as a means of supporting compliance with regulatory frameworks which limit long-term or permanent roaming arrangements (GSMA, 2024^[42]; eRedCap, 2026^[43]).

Trends in non-terrestrial network connectivity

53. Recent advances in non-terrestrial network connectivity, including satellite systems and other aerial platforms, are changing the connectivity ecosystem. The emergence and prevalence of low-Earth orbit (LEO) satellite constellations and direct-to-device (D2D) technologies are increasingly being viewed as a means of not only complementing coverage of terrestrial mobile networks but also

enhancing resilience, service continuity and enabling new use cases (OECD, 2024^[9]). Roaming services are provided through satellite-based maritime and in-flight networks and enable users to connect to the Internet even outside the cellular coverage. Looking ahead, emerging 6G concepts envisage the native integration of terrestrial and non-terrestrial networks within a unified architecture, suggesting that NTN may evolve from a complementary solution into a more prominent component of the future network architecture (OECD, forthcoming^[44]).

54. Alongside satellite services, D2D services are introducing new forms of international roaming. Current commercial deployments of D2D rely on commercial and technical arrangements between MNOs and satellite network operators, allowing subscribers to access satellite connectivity provided through their existing terrestrial mobile subscription. Some deployments also involve reciprocal roaming agreements between MNOs across borders for complementary satellite connectivity which allow subscribers of one operator to access D2D services when travelling in a territory served by another participating operator. Examples include partnerships involving T-Mobile (the United States), KDDI (Japan), Globe Telecom (the Philippines), Spark (New Zealand), Rogers (Canada) (KDDI, 2026^[45]; Rogers, 2026^[46]; T-Mobile, 2026^[47]).

55. Looking further ahead, interoperability may extend beyond roaming between terrestrial and non-terrestrial networks to include roaming between satellite network operators (SNOs). Such arrangements could enable subscribers to access alternative networks when outside the coverage footprint of their home provider, potentially improving service continuity and expanding global coverage (MSSA, 2026^[48]). Achieving SNO-to-SNO roaming would require common approaches to authentication, charging, service management and inter-operator agreements. In this context, the GSM Association (GSMA) is using its NTN Community and associated working groups as a forum for developing the technical and commercial frameworks needed to support the interoperability and roaming between terrestrial and non-terrestrial networks, including terrestrial-to-NTN and NTN-to-NTN roaming, building on its broader role in facilitating interoperability and roaming agreements among MNOs for traditional IMR services (GSMA, 2026^[49]).

56. More fundamentally, the emergence of NTN may have implications that extend beyond the evolution of roaming forms and user-protection issues. IMR has historically relied on roaming agreements between national MNOs and the distinction between home and visited networks. By contrast, some NTN business models are designed to provide broadband connectivity across multiple jurisdictions through globally deployed network infrastructures and common service platforms. For example, Starlink Roam enables subscribers to access broadband connectivity with the same terminal and subscription across multiple countries and regions under a single service relationship and ecosystem, subject to plan-specific conditions and local regulatory requirements (Starlink, 2026^[50]). Depending on the plan, users may access connectivity while travelling across borders without changing or adding service providers, devices or subscriptions. This suggests that, over the longer term, if globally available NTN platforms become capable of providing continuous cross-border connectivity, they may complement traditional roaming agreements in certain use cases within the broader international connectivity ecosystem.

Other IMR-related technological developments

Developments in interconnection and exchange architectures for IMR services

57. International mobile roaming enables customers travelling abroad to access mobile services through a visited mobile operator while maintaining key home network functions such as subscriber authentication, subscription management, and policy control. Roaming traffic is commonly routed using either home routing (HR) or local breakout (LBO) arrangements (Box 1). In an HR arrangement, user traffic is routed back to the home operator's core network before accessing the Internet, whereas in an

LBO arrangement, user traffic is handled by the visited operator's network and may access external networks locally, which may reduce latency by shortening the traffic path.

58. At the international level, roaming depends on dedicated interconnection and exchange mechanisms that allow mobile operators to exchange signalling, user traffic and billing information across borders. During the General Packet Radio Service (GPRS) era in the early 2000s, packet-data roaming was enabled through GPRS Roaming Exchange (GRX), an inter-operator IP backbone developed to support GPRS and data roaming between Global System for Mobile Communications (GSM) operators. As mobile networks expanded and a growing range of IP-based services required interworking, the GSMA developed the IP Packet eXchange (IPX) framework as an enhancement of the GRX model. Compared with GRX, IPX was designed to provide end-to-end QoS capabilities, enhanced security, and support of multilateral interconnection arrangements (GSMA, 2025^[51]). More recently, as service-based interactions between 5G core network functions have been introduced, the transition towards 5G SA roaming has introduced new interconnection requirements, including support for 5G control-plane interfaces, network slicing support for roaming and security functions which have been incorporated into contemporary IPX architecture (GSMA, 2026^[52]).

59. Recent developments in cloud-enabled mobile network architectures introduced a new approach to roaming optimisation. Rather than locating all roaming functions in the home network, some operators are exploring distributed user-plane deployment models enabled by cloud-enabled user-plane functions that are deployed closer to users while control-plane functions remain centrally managed (AWS, 2024^[53]).

60. Looking ahead, roaming architectures are likely to face new technical advantages and challenges associated with growing distribution and virtualisation of network functions. Future architectures may need to support end-to-end service continuity, and cross-border orchestration across multiple interconnected networks, particularly for latency-sensitive and mission-critical services. These developments may raise questions regarding interoperability, security requirements, and investment needs associated with next-generation roaming services.

User interfaces enabling control over IMR services

61. User interfaces on devices also changed how customers interact with IMR services. Modern smartphone operating systems allow users to activate and deactivate data roaming, set data usage limits, and monitor mobile data consumption directly from device settings. These functions are widely available on major consumer smartphone platforms and provide users with greater visibility and control over roaming usage. Examples include management features available on devices using Apple iOS and Google Android operating systems (Apple, 2026^[54]; Google, 2026^[55]).

62. Some regulators also complement operator-based transparency and notification measures by encouraging users to make use of these device-level controls over roaming when travelling abroad. For example, the Canadian regulator, the CRTC advises users to switch on and off data roaming where appropriate, while highlighting alternatives such as local SIM cards, eSIM, and prepaid plans as ways of avoiding unintended roaming charges (CRTC, 2024^[56]). These developments suggest that customer protection increasingly relies not only on operator-provided information but also on functionality embedded in user devices.

Questions for the Delegates regarding market developments

Q1. Are there any other market and technological developments that the draft implementation Report should consider?

Note: All delegate questions are consolidated in Annex A

Overview of implementation of the Recommendation and relevant regulatory and policy developments regarding IMR services

63. This section aims to provide an overview of policy and regulatory developments following the adoption of the Recommendation in relation to measures advocated in the Recommendation and examines the extent to which they have been implemented, remain relevant or may require updating. The Recommendation sets out a graduated set of policy measures ranging from approaches focused on transparency and consumer awareness to regulatory measures (Figure 1). Namely, it is structured around the eight pillars of the Recommendation:

- I. Promoting awareness of roaming prices and substitutes.
- II. Promoting transparent information on roaming services.
- III. Facilitating transnational networks and alliances.
- IV. Transparency of Inter-Operator Tariffs.
- V. Facilitating access to wholesale mobile services on local terms and conditions.
- VI. Wholesale price regulation.
- VII. Retail price regulation.
- VIII. Assessment of costs and benefits.

64. The policy and regulatory developments indicate that many measures contained in the eight pillars of the Recommendation remain relevant and have been widely implemented through domestic regulatory initiatives, regional frameworks, bilateral arrangements and commercial developments. Transparency and customer awareness measures and competition-enhancing initiatives appear particularly well established across jurisdictions. At the same time, implementation experience reveals market and policy developments that were not explicitly envisaged in 2012. These include the increasing relevance of permanent roaming arrangements and evolving quality expectations in 5G environments rather than affordability of IMR services.

Measures to improve customer transparency and awareness (Pillar 1-2)

65. The Recommendation encourages Adherents to improve customer awareness of roaming prices and alternative options and to increase transparency regarding roaming charges and conditions of use. Since the adoption of the Recommendation, a wide range of jurisdictions have introduced or strengthened measures consistent with these objectives. Countries have introduced or strengthened requirements relating to roaming notifications, pricing information and transparency obligations. The Recommendation also encourages measures aimed at protecting users from unexpectedly high roaming charges. Since 2012, many jurisdictions have adopted safeguards such as notifications, spending limits and other consumer-protection mechanisms. Such measures are a prominent feature of roaming frameworks and have been reinforced in a number of regional regimes.

National examples of measures to improve customer transparency and awareness

66. **Australia** addresses international mobile roaming mainly through consumer protection measures to prevent bill shock, imposing obligations on mobile service providers to notify customers of

roaming charges, provide usage alerts, and offer tools to manage or cap expenditure for IMR services (ACMA, 2025^[57]; ACMA, 2019^[58]).

67. The **Canadian** regulator, the CRTC, addresses roaming-related user protection mainly through the Wireless Code which requires operators to provide clear information on IMR charges and suspend roaming once users reach predefined expenditure caps, unless they consent to additional charges. It prohibits providers from charging more than CAD 100 (71.4 USD)⁴ in international data roaming fees per billing cycle unless the customer consents to additional charges, and carriers are required to send immediate notifications when a subscriber begins roaming internationally (CRTC, 2026^[59]; CRTC, 2026^[60]). Operators are also required to notify customers when roaming-related data charges reach CAD 50 (35.7 USD)⁵ in data overage charges while roaming internationally (CRTC, 2026^[61]). The CRTC has also introduced measures to facilitate switching and self-service account management, thereby promoting competition and consumer choice in the mobile market including IMR services (CRTC, 2026^[62]; 2026^[63]). In response to persistent affordability concerns, the CRTC in October 2024 issued a formal public directive requiring the country's three national carriers (i.e. Bell, Rogers, and TELUS), to take immediate, concrete steps to reduce international roaming fees (CRTC, 2024^[64]).

68. **Colombia** has implemented a set of user protection measures for IMR services. These measures include mandatory disclosure of roaming tariffs and conditions, arrival notifications via SMS, automatic deactivation of the service when the selected limit is reached, daily usage notifications, and user-defined limits for usage with alerts when data spending reaches 80% of the thresholds (CRC, 2016^[65]; 2017^[66]; 2021^[67]).

69. **Korea** has implemented roaming usage and expenditure alert mechanisms designed to reduce bill shock to increase consumer awareness of roaming expenditure and reduce the risk of unexpectedly high roaming charges when using IMR services (Ministry of Science and ICT, 2012^[68]).

70. The **United Kingdom** removed legal obligations on mobile operators to provide surcharge-free international roaming after exiting the European Union. Rather than introducing wholesale or retail price caps, UK policy focuses on consumer protection measures. Through updates to Ofcom's General Conditions, providers are required to notify customers when roaming begins, provide clear information on charges and fair use limits, and offer tools to manage or limit expenditure, including safeguards against inadvertent roaming (Ofcom, 2024^[69]).

71. In the **United States**, the Federal Communications Commission (FCC) provides official guidance to consumers explaining that international roaming fees vary by carrier and destination, and it instructs subscribers to check their plans, understand rate structures, and confirm network compatibility prior to travel. The guidance includes consideration for using alternatives to IMR services such as OTT voice services and subscribing to a local eSIM (FCC, 2025^[70]).

Regional examples of measures to improve customer transparency and awareness

72. Among Adherents that are members of the **European Union**, under Regulation (EU) 2022/612, roaming providers are required to inform users automatically when they enter another Member State and provide information on applicable roaming conditions. The framework also includes transparency obligations relating to access to the emergency services, inadvertent roaming and additional charges that may arise when users connect to networks outside the EU and non-terrestrial networks such as maritime and in-flight networks (European Union, 2022^[27]). Some IMR services inflight or onboard that are enabled by NTN raise user protection and transparency considerations. IMR services provided through satellite-based maritime and in-flight networks may involve substantially higher charges than conventional terrestrial IMR services, creating potential user-protection concerns where users are not fully aware of the applicable charging conditions and connection to the service. In this context, BEREC

has identified roaming on NTN as an issue requiring continued monitoring, particularly in relation to transparency and user protection (BEREC, 2025^[71]).

73. Brazil, an Adherents to the Recommendation, participates in regional initiatives aimed at addressing IMR issues. In Latin America, the Southern Common Market (MERCOSUR for its initials in Spanish), is a regional integration process with Argentina, Brazil, Paraguay, and Uruguay as full Member States. MERCOSUR reached a political agreement to address high international mobile roaming issues through the 'Agreement for the Elimination of the Collection of International Roaming Charges to MERCOSUR End Users', signed in 2019 (MERCOSUR, 2019^[72]). The agreement presents the first binding regional commitment within MERCOSUR to address IMR issues. It includes transparency measures requiring retail roaming prices to be publicly accessible and roaming users to be provided with mechanisms to monitor their usage of data, voice and messaging services. It also seeks to minimise barriers to technological alternatives to international roaming, thereby facilitating user choice and access to telecommunications services while travelling within the region (MERCOSUR, 2019^[72]).

74. Beyond Adherents to the Recommendation, efforts that align with the principles thereof have been noticed in other regions. For example, in Southeast Asia, the ASEAN Framework on International Mobile Roaming, adopted at 17th ASEAN TELMIN in 2017, is a non-binding framework aimed at improving the affordability of IMR services. It also promotes user transparency through measures such as providing welcome SMS notifications, accessible pricing information, and notifications when users reach specified roaming data usage thresholds. It also encourages Member States and operators to offer daily flat-rate roaming service and negotiate commercial roaming arrangements (ASEAN, 2017^[73]).

Implementation experiences across countries

75. These examples suggest that transparency-related measures have been among the most widely adopted elements of the Recommendation. While approaches differ across jurisdictions, these implementations indicate broad acceptance of the principle that users should receive clear and timely information regarding roaming charges and available options. At the same time, the emergence of eSIM-enabled connectivity and other alternatives suggests that transparency requirements may increasingly need to extend beyond traditional roaming offers in a broader range of international connectivity options. Concerns regarding unexpected charges remain highly relevant. In addition to traditional concerns relating to bill shocks, policymakers are increasingly considering issues such as inadvertent roaming that are enabled by NTN. This suggests that the underlying objective remains valid, while specific implementation approaches may require updating to reflect changing market conditions.

Measures to promote competition and market-based solutions (Pillar 3-5)

76. The Recommendation places emphasis on promoting effective competition as the primary means of improving outcomes in international mobile roaming markets. It recommends Adherents to facilitate market-based solutions, including trans-national networks, alliances and other commercial arrangements that may improve roaming offers and benefit users. In assessing mergers and acquisitions in mobile markets, Adherents are encouraged to consider both the potential of such networks to generate user benefits and the possible effects of consolidation on operators' ability to negotiate reasonable wholesale roaming terms. The Recommendation also promotes the removal of barriers faced by smaller operators and MVNOs, and greater transparency in wholesale roaming markets, including with respect to inter-operator tariffs.

Regional examples of measures to promote competition in roaming markets

77. Among Adherents that are members of the European Union, the “Roaming-like-at-home” (RLAH) framework incorporates competition-enhancing measures by requiring mobile network operators to grant wholesale roaming access on fair and reasonable terms, including to MVNOs and resellers, and it also includes dispute-resolution mechanisms. This framework is supported by regular monitoring and periodic reviews conducted by the European Commission and BEREC, including data collection, benchmarking exercises and assessments of wholesale market developments.

78. The WTO’s GATS framework does not specifically address international mobile roaming, however, it established foundational telecommunications disciplines relating to regulatory transparency (i.e. publication and availability of laws, regulations, conditions of access, licensing criteria and related regulatory measures), non-discrimination and access to telecommunication networks and services (WTO, 1994^[74]; 1994^[75]). These principles have subsequently been complemented by IMR-specific provisions in some bi- or multilateral trade agreements to foster the efficient delivery of IMR services.

79. The Comprehensive and Progressive Agreement for Trans-Pacific Partnership⁶ (CPTPP, signed 8 March 2018) and the Canada-United States-Mexico Agreement (CUSMA, also known as T-MEC in Mexico and USMCA in the United States, signed 30 November 2018) establish binding commitments through a regional trade framework. Both agreements include broadly similar communication policy guidelines, including non-discrimination obligations, competitive safeguards (i.e. measures designed to prevent anti-competitive conduct by major communication operators), interconnection requirements and market-access provisions, which are intended to reduce barriers faced by foreign operators and support more contestable market conditions. With respect to IMR, the two agreements contain IMR provisions relating to transparency of retail prices and information on alternatives to roaming, whereas the CPTPP contains more detailed provisions on regulatory co-operation, information sharing and reciprocal arrangements under which Parties may apply wholesale roaming regulation on a mutually agreed basis (Government of Canada, 2016^[76]; CRTC, 2023^[77]; Secretariat of Economy, 2026^[78]; Office of the United States Trade Representative, 2026^[79]).

80. Looking beyond Adherents to the Recommendation, the ASEAN Framework on International Mobile Roaming established an approach to promoting affordability and transparency of IMR services across the member states, encouraging ASEAN Member States to reduce roaming charges where feasible and facilitate cross-border digital integration by coordinating actions for tariff transparency and wholesale-tariff cooperation without imposing binding price caps. (ASEAN, 2017^[73])

Implementation experiences

81. These examples suggest that competition remains a central mechanism for improving outcomes in international roaming markets. However, the structure of competition has evolved considerably since the adoption of the Recommendation. Competition increasingly involves not only mobile network operators but also new market actors offering alternative forms of international connectivity, including eSIM-based services. This suggests that the competition-related provisions of the Recommendation may remain broadly relevant, although the competitive landscape has evolved since 2012.

82. The Recommendation envisages a potential role for trans-national networks and alliances in enhancing competitive conditions in roaming markets, including through enhancing bargaining power in wholesale roaming negotiations. While regional roaming initiatives and commercial partnerships have become common, available evidence on the role of trans-national operator alliances in achieving these objectives remains limited.

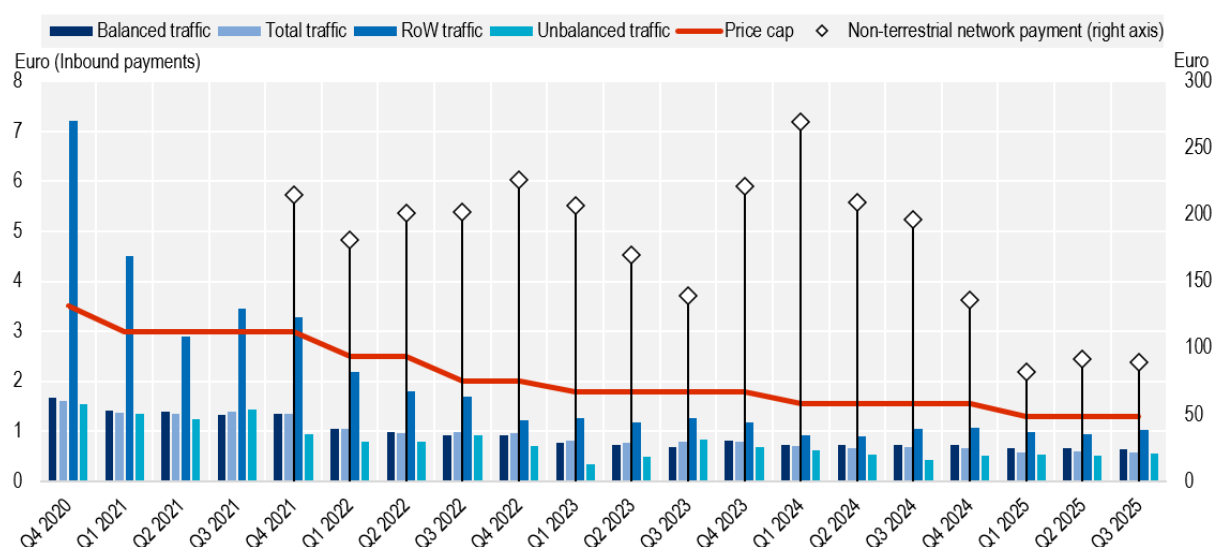
Measures to regulate and intervene in IMR markets (Pillar 6-8)

83. The Recommendation recognises that roaming prices should, where possible, be determined by market forces, while acknowledging that wholesale and retail regulation may be warranted where competition alone is insufficient to deliver reasonable outcomes. The Recommendation further emphasises the importance of ex-ante assessment and periodic review of regulatory measures to evaluate their effectiveness and ensure that they continue to address identified market concerns.

Regional examples on measures to regulate IMR markets

84. The most significant development occurred in the European Economic Area⁷ (EEA), where successive reforms of the EU roaming framework and implementation of the RLAH regime progressively reduced both wholesale and retail roaming charges (Box 2). Following the adoption of the Roaming Regulation in 2015, the EU implemented the RLAH regime in 2017, abolishing retail roaming surcharges and allowing users to use IMR services at domestic prices within the EEA. The decline of international roaming prices has been observed across voice, SMS and data services, although developments have differed by service category. For voice and SMS services, roaming charges have gradually converged towards domestic pricing conditions, particularly following the introduction of RLAH. Roaming voice traffic has continued to increase, suggesting that lower charges removed barriers to use while travelling. The most significant changes have occurred in data roaming markets. Historically, data roaming charges were among the highest roaming costs faced by consumers and were frequently associated with concerns over bill shock. BEREC reports indicate that wholesale charges declined over time and generally remained below applicable regulatory ceilings, while retail surcharges largely disappeared for intra-EEA roaming traffic (Figure 8).

Figure 8. EEA average wholesale data rates per GB, Q4 2020-Q3 2025 (balanced, unbalanced, total and RoW traffic and non-terrestrial networks) and price cap applied



Note: RoW = rest of world. The average is calculated by dividing the wholesale revenues for GB by the number of GB in the respective category. Non-terrestrial network payments are aligned to the secondary axis due to higher number differences with other services fees. Please note that most MNOs report total data, while only some report balanced and unbalanced data.
Source: (BEREC, 2026_[20]) 32nd BEREC International Roaming Benchmark Data and Monitoring Report.

85. To support the sustainability of this regime, the European Union complements retail measures with regulated caps on wholesale roaming charges, fair-use policies that aim at preventing permanent roaming, and sustainability derogations that allow operators to recover costs under specific circumstances (European Union, 2022^[27]).

86. Colombia participates in regional initiatives aimed at addressing IMR price issues. The Andean Community (CAN for its acronym in Spanish, consisting of Bolivia, Colombia, Ecuador and Peru) adopted Decision 854 of 2020, establishing a common regional framework for IMR services, which combines wholesale tariff caps, transparency obligations and a RLAH-like regime at retail prices. Since 2022, users travelling within the Andean Community have been able to use voice, SMS, and data services under the same tariff conditions as their domestic plans without additional roaming surcharges.

87. Brazil also participates in regional initiatives aimed at addressing IMR price issues. The MERCOSUR's 'Agreement for the Elimination of the Collection of International Roaming Charges to MERCOSUR End Users' aims to implement RLAH-like principles within MERCOSUR region, under which mobile users travelling in another Member State would be charged according to the retail prices of their domestic mobile plans for voice call, SMS, and mobile data services.

88. The United Kingdom, Iceland, Liechtenstein and Norway Free Trade Agreement addresses international mobile roaming through wholesale roaming rate caps between operators, with the objective of facilitating low-cost roaming for end-users, while leaving retail pricing decisions to national regulation and market practices⁸ (Government of the United Kingdom et al., 2021^[80]). The wholesale roaming cap provisions were described as a "world-first" inclusion of such measures in a free trade agreement (House of Commons International Trade Committee, 2022^[81]).

89. The Brazil-Chile Free Trade Agreement provides for the abolition of retail roaming surcharges for mobile operators, requiring application of domestic retail prices or rates to IMR services during temporary stays in each territory (Government of Brazil, 2022^[82]). While most free trade agreements address IMR through principles of competition, regulatory transparency and cooperation, the Brazil-Chile FTA directly constrains retail pricing for IMR services.

90. Beyond Adherents to the Recommendation, other regions have also developed relevant practice. For example, in the Middle East, the Co-operation Council for the Arab States of the Gulf (GCC, consisting of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) has developed a region-wide IMR framework since the 2010s, based on coordinated decisions by GCC ministers and implementation by national telecommunication regulators. Initial regulatory action was taken in 2012, focusing primarily on voice IMR services. Building on this first phase, the GCC introduced binding price caps at both wholesale and retail levels from 2015, extending the regulatory framework to cover SMS and data roaming services (GCC Roaming Working Group, 2015^[83]).

Implementation experiences across countries

91. These examples suggest that no single preferred regulatory model has emerged and diversity of regulatory models is broadly consistent with the Recommendation's flexible approach. Instead, jurisdictions continue to rely on different combinations of market-based and regulatory measures depending on market conditions, regional integration objectives, and policy priorities. Regulatory approaches range from wholesale access obligations and wholesale price caps to RLAH-type arrangements and regional roaming agreements embedded in broader economic integration frameworks (Box 2). This diversity of approaches supports the continued relevance of proportionate and graduated approaches to regulatory interventions, while highlighting the importance of the periodic review to ensure that measures remain appropriate to evolving market conditions.

Box 2. Progressive developments of EU's Roam-Like at Home regulation and the undergoing review

The **European Union** has developed one of the most comprehensive regional frameworks for IMR through a series of regulatory reforms. Regulation (EU) No 531/2012 established the legal basis for the EU roaming regime, including wholesale roaming access obligations, retail and wholesale regulation, transparency requirements and consumer protection measures designed to reduce roaming charges (European Union, 2012^[84]). The framework was amended by Regulation (EU) 2015/2120, which introduced 'Roam Like at Home' (RLAH) principles and paved the way for the abolition of roaming surcharges across the European Union from 2017. It also introduced a Fair Use Policy to prevent abuse such as permanent roaming and introduced a sustainability mechanism to prevent market distortions (European Union, 2015^[85]). To support the RLAH, Regulation (EU) 2017/920 revised wholesale roaming caps and strengthened the regulation of wholesale roaming markets to ensure the long-term sustainability of surcharge-free roaming (European Union, 2017^[86]).

The current framework is established under Regulation (EU) 2022/612, which extended the RLAH regime until 2032 and introduced several additional consumers-protection and service-quality assurance mechanism (European Union, 2022^[27]). The Regulation requires roaming providers, where technically feasible, to ensure that roaming users can access the same Quality of Service (QoS) available domestically including access to 4G and 5G. It also strengthened transparency regarding access to emergency services while roaming, bill-shock safeguards against inadvertent roaming and unexpected charges associated with non-terrestrial networks, including maritime and in-flight satellite connectivity services. Additionally, the regulation continues the progressive reduction of wholesale roaming caps to preserve the sustainability of surcharge-free roaming access across the EU.

Regulation 2022/612 itself mandates the European Commission (EC) to conduct assessments of the regime by 2025 and 2029. The recent reviews conducted by the EC and BEREC indicate that the RLAH regime has largely achieved its objectives and remains broadly sustainable under current market conditions (European Commission, 2025^[18]; BEREC, 2025^[87]). The regulators continue to monitor issues relating to the provision of consistent 5G and 5G SA roaming services, the growth of IoT/M2M roaming, user protection challenges associated with non-terrestrial and value-added services, and long-term sustainability of wholesale roaming markets as cross-border data usage continues to increase. The Commission also indicates that rapidly growing roaming traffic and potential imbalance between wholesale costs and retail revenues in the future may require continuing monitoring and potential reassessment of cost-recovery conditions.

The EU roaming framework continues to expand beyond the boundaries of the EU/EEA. In 2025, the Council of the EU adopted decisions enabling Ukraine and Moldova to join the EU's RLAH regime from 2026 (Council of the European Union, 2025^[88]). For Ukraine, this development builds on a voluntary agreement between the EU and Ukrainian operators introduced in 2022.

Sources: European Union (2012^[84]; 2015^[85]; 2017^[86]; 2022^[27]), European Commission (2025^[18]), BEREC (2025^[87]), Council of the European Union (2025^[88]).

Other policy and regulatory developments beyond the Recommendation

Assurance of quality of service (QoS) and shut down of legacy networks

92. While the Recommendation primarily focuses on affordability of IMR services through measures aimed at improving transparency, competition and proportionate regulatory intervention,

policymakers have increasingly paid attention to the network quality experienced by roaming users. As retail roaming prices have declined in several jurisdictions due to market developments and regulatory interventions, concerns have emerged regarding whether roaming users receive network performance comparable to that available to domestic users. Such concerns may arise from factors including access to different generations of mobile networks, traffic management practices and technical or commercial arrangements between operators.

93. While price and competition issues remain central to IMR policy, some recent regional initiatives have also incorporated provisions relating to quality of service and quality of experience, transparency of service conditions and the overall roaming experience of end-users. The EU has progressively incorporated service quality considerations into its RLAH framework. In addition to the abolition of retail surcharges, the regime includes provisions intended to ensure that roaming users can access network technologies and service quality comparable to those available domestically, where technically possible. Operators are also required to provide information regarding expected service quality and network availability (European Union, 2022^[27]). Similar concerns have also emerged in regional roaming initiatives outside Europe. The MERCOSUR's agreement on IMR extends beyond pricing issues and includes policy elements such as assurance of QoS in visited networks subject to technical availability, reflecting growing demand for consistent mobile connectivity across borders (MERCOSUR, 2019^[72]). Likewise, the Brazil-Chile Free Trade Agreement includes provisions relating to roaming experiences, which requires operators to offer roaming users the same quality of service as their domestic users, supported by cooperation between regulators (Government of Brazil, 2022^[82]).

94. Differences in the pace of network deployment among countries may create challenges for roaming arrangements and QoS assurance. Differences in the availability of 5G networks can affect the quality of IMR services available in visited networks. As operators migrate towards 5G SA networks and support new functionalities such as network slicing, roaming arrangements require additional technical coordination to ensure interoperability, continuity, of service and consistent support for advanced network capabilities (GSMA, 2026^[52]; Kaleido Intelligence, 2023^[89]). Meanwhile, the phase-out of 2G and 3G networks raises questions about continuity of essential services such as emergency calling for roaming users (GSMA, 2021^[90]). The shutdown of legacy networks (2G, 3G) may affect assurance of access to emergency calls in visited networks, for example when devices rely on Circuit-Switched Fallback (i.e. a mechanism used in mobile networks where a device connected to a 4G LTE packet-switched network temporarily falls back to a 2G or 3G circuit-switched network to make or receive a traditional voice call) or where Voice over LTE emergency calling is not fully implemented.

95. More fundamentally, mobile users roaming internationally may experience lower network performance than that expected by domestic users. For example, according to data from Opensignal, roamers spend on average almost 60% less time connected to 5G networks than local users and are correspondingly more likely to rely on legacy networks such as 3G, reflecting differences in roaming agreements and network arrangements (Opensignal, 2024^[91]).

96. These developments suggest that, alongside affordability and competition, the quality of roaming experience is becoming an increasingly important dimension of IMR policy. As mobile broadband evolves towards 5G and future network generations, this may attract greater attention to the conditions under which roaming users access services in visited networks and on whether roaming users receive service quality comparable to domestic users including access to emergency calls.

International co-operation regarding IMR

97. At the time of the Recommendation's adoption, international trade agreements were also considered relevant to addressing challenges in IMR market. Earlier OECD analytical work noted that roaming service could fall within the scope of World Trade Organization (WTO) General Agreement on Trade in Services (GATS), potentially providing a cross-border legal framework for IMR services.

Reflecting this perspective, the Recommendation invites Members to liaise with the WTO and other relevant international organisations regarding IMR services. The last implementation report noted that the Australian Mission to the WTO hosted a Symposium on International Mobile Roaming in 2012, at which the OECD Secretariat presented the Recommendation (Bourassa et al., 2016^[34]). However, significant follow-up activities or sustained WTO engagement on IMR since that initiative was not identified, while subsequent international-trade co-operation efforts appear to have been concentrated primarily in bi- or multilateral roaming initiative in free trade agreements.

98. The Recommendations from the International Telecommunication Union (ITU) on IMR form a non-binding framework addressing matters such as transparency and user protection, pricing and competition considerations, cost-oriented pricing principles in IMR markets where cross-border structures limit the effectiveness of domestic regulation. Rather than prescribing uniform retail and wholesale controls, the ITU Recommendations rely on a graduated approach which shares principles with the OECD Recommendation (ITU, 2012^[92]; 2016^[21]). They also examine the design and implementation of regional roaming frameworks and regional initiatives aimed at facilitating cross-border connectivity (ITU, 2023^[93]). More recent ITU work has examined the applicability of roaming concepts to IoT/M2M services and highlights wider regulatory challenges extending beyond pricing and competition to issues such as taxation, numbering resource management, and cross-border regulatory coordination (ITU, 2023^[29]).

Remaining issues and areas for further discussion regarding IMR

99. Several Adherents and stakeholders also identified additional issues that may warrant further consideration in future discussions. These include the treatment of prepaid subscriptions in regional roaming frameworks, the handling of taxation-related surcharges and communications to third countries under RLAH-type arrangements, and consent-management mechanisms for IMR services.

100. While these preliminary findings identify significant market, technological and regulatory developments since the adoption of the Recommendation, additional information from Adherents would be useful to support a more systematic assessment of implementation experiences.

Questions for the Delegates regarding policy and regulatory developments

- Q2. Are there any other policy and regulatory developments that should be included in the draft implementation Report? Examples may include developments relating to user protection and transparency, competition and wholesale regulation, QoS assurance, international co-operation initiatives, regional roaming frameworks, regional regulatory arrangements, trade agreements, engagement with international organisations (e.g. WTO and ITU), or other policy and regulatory measures affecting international mobile roaming services.
- Q3. Please provide examples of dissemination efforts to raise awareness of the Recommendation, in particular throughout the public and private sectors, including governments, businesses, consumer groups, civil society and other international organisations.

Note: All delegate questions are consolidated in Annex A.

Preliminary conclusions

101. Overall, these preliminary findings suggest that the Recommendation has generally remained fit for purpose and that its core policy principles continue to be broadly relevant despite the significant developments in IMR markets since its adoption in 2012. The implementation experience reviewed since the adoption indicates that the core objective of the Recommendation, namely promoting transparency and user awareness, encouraging competition and international cooperation, and enabling proportionate intervention where appropriate, continue to provide a broadly relevant framework for addressing IMR issues across different market and regulatory environments.

102. However, developments since 2012 point towards a modernisation of the existing framework to address new market and technological developments. At the same time, this analysis highlights a number of developments that were not fully envisaged when the Recommendation was adopted, including IoT/M2M connectivity and permanent roaming, eSIM-enabled international connectivity, emergence of NTN and developing considerations on the importance of the quality of IMR services. These changes suggest that the Recommendation could benefit from updating and clarifying how its existing principles should be applied in a significantly changed connectivity environment, while preserving its underlying objectives and policy rationale.

Continued relevance of the Recommendation's core principles

103. The principle of transparency and user awareness appears to have remained particularly relevant. Since 2012, many jurisdictions have introduced or strengthened requirements related to roaming notifications, billing transparency, spending controls and the provision of information regarding roaming charges. While implementation approaches vary, there is broad acceptance of the underlying principle that users should receive clear and timely information to make informed decisions and to avoid unexpected charges. This suggests that transparency and user awareness remain a foundational policy objective for IMR services.

104. Similarly, the Recommendation's emphasis on competition for improving outcomes remains consistent with developments observed across many roaming markets. IMR prices have declined in several jurisdictions since the adoption, reflecting a combination of increased competition, commercial innovation, regional initiatives and in some cases, regulatory intervention. While market structures and policy approaches differ across jurisdictions, and competition increasingly involves not only MNOs but also new providers of international connectivity services, including eSIM-enabled services, evidence continues to support the view that promoting competitive conditions remains an important mechanism for improving user outcomes.

105. The Recommendation's approach to regulatory intervention also remains broadly applicable. Rather than prescribing a single regulatory model for wholesale and retail price regulation, the Recommendation recognises that intervention may be warranted where competitive market outcomes are insufficient to achieve policy objectives. While some jurisdictions have adopted primarily market-based solutions, others have adopted retail price regulation, wholesale price regulation or regional roaming frameworks involving varying degrees of intervention. These experiences suggest that the Recommendation's emphasis on proportionate and evidence-based intervention remains relevant and continues to provide flexibility for differing market circumstances, levels of market integration and policy objectives.

Possible areas for considering updates

106. Although the Recommendation's core principles remain relevant, developments since 2012 suggest that a number of existing provisions may benefit from updating to reflect changes in international connectivity markets.

107. With respect to improving transparency and user awareness, the Recommendation was adopted in an environment in which traditional roaming offers, local SIM cards, Wi-Fi access and OTT communications services constituted the main alternative options to users. Since then, the emergence of eSIM-enabled services has expanded the range of connectivity options available to users and reduced barriers to switching or adding subscriptions while travelling internationally. The underlying principle of promoting awareness of roaming prices and substitutes remains highly relevant but the examples, implementation considerations and policy guidance associated with this principle may warrant updating to reflect the increasing importance of eSIM-enabled international connectivity services and other emerging alternatives.

108. With respect to encouraging competition, the Recommendation was largely developed in the context of competition among national MNOs and between national MNOs and national MVNOs. While these actors remain central, travel eSIM providers, MVNOs that operate internationally, and other types of providers increasingly contribute to the provision of international connectivity services. Although the Recommendation's underlying competition principles remain applicable, updated guidance may be useful to reflect a broader range of market actors and business models than those envisaged in 2012.

109. In addition, the increasing complexity of roaming negotiations may warrant consideration. This complexity reflects not only the entry of new entrants, but also the growing technological diversity associated with 5G, IoT connectivity providers, and other evolving connectivity services. In such an environment, industry-led mechanisms that facilitate multilateral or hub-based roaming arrangements may help reduce transaction costs, simplify negotiations, and support the efficient scaling of IMR services, while preserving flexibility for commercial negotiations between operators.

110. The emergence of travel eSIM services demonstrates how competition in the international connectivity market is increasingly taking place through a new layer of intermediation. While users may encounter a growing number of differentiated retail brands, a significant share of these services may be supported by a smaller set of wholesale connectivity providers. This development does not necessarily diminish the benefits of retail innovation or increased choices for users, but it suggests that assessment of competition may increasingly need to consider both retail and wholesale layers of international connectivity markets.

111. With respect to regulatory interventions, the Recommendation's provisions concerning regulatory interventions were developed primarily in the context of retail affordability, wholesale pricing and the prevention of bill shock. These objectives remain relevant in many jurisdictions but the developments since the adoption suggest that implementation guidance could be updated to reflect evolving market conditions, including questions relating to wholesale sustainability and long-term functioning of roaming arrangements that need to address rapid expansion of roaming traffic. Such considerations could be connected to the Recommendation's existing objectives and intervention framework.

112. In addition, the Recommendation's provisions relating to international co-operation were developed in the context of co-operating among governments and regulators. Since the adoption, regional roaming arrangements and more formalised cross-border frameworks have become increasingly important features of the IMR landscape. These arrangements have taken a variety of forms, including regional roaming regulation, regional trade agreements and regulatory cooperation mechanisms. These developments suggest that such arrangements have an important means of pursuing roaming policy objectives. These developments may warrant consideration of whether the

Recommendation's existing provisions should be updated to better reflect the role of regional approaches in addressing IMR policy challenges.

Questions for the Delegates regarding potential update on existing principles of the Recommendation

- Q4. Are the existing transparency and customer awareness provisions of the Recommendation adequately adapted to developments of emerging alternative services that provide international connectivity such as eSIM-enabled connectivity services?
- Q5. Should the Recommendation's provision on competition be updated to better reflect the growing role of travel eSIM providers, internationally operating MVNOs and other emerging business models in the provision of international connectivity?
- Q6. To what extent should the Recommendation's guidance on regulatory intervention be updated to reflect evolving market conditions?
- Q7. To what extent does the increasing complexity in wholesale roaming arrangements and negotiations, arising from both technological developments (e.g. 5G and IoT) and the emergence of new market actors, warrant additional guidance on international co-operation and industry co-ordination?
- Q8. Are the existing provisions on international co-operation sufficient to reflect the growing importance of regional roaming frameworks, regional regulatory arrangements and trade agreements in achieving roaming policy objectives?

Note: All delegate questions are consolidated in Annex A.

Emerging issues that may be considered under the Recommendation

Quality of service and interoperability and advanced 5G roaming capabilities

113. The Recommendation was developed primarily in a policy environment in which affordability, retail prices, wholesale prices and the prevention of bill shock constituted the principal concerns associated with IMR. Since then, roaming prices have declined substantially in some jurisdictions, and policy discussions have increasingly broadened beyond pricing issues alone. Policymakers are considering whether roaming users are able to access services comparable to those available domestically, including access to advanced network capabilities such as 5G and above, and other functionalities. Consequently, the policy attention is increasingly directed not only towards the price of IMR services and prevention of bill shocks, but also towards the quality and functionality of those services. These issues were not a major feature of roaming policy discussions at the time of adoption and may warrant additional consideration in any future revision of the Recommendation.

114. On the one hand, the deployment of new network technologies, such as 5G SA, may introduce additional consideration beyond traditional IMR services as 5G SA enables advanced network capabilities such as network slicing, differentiated QoS, and support for latency-sensitive and mission critical applications. As a result, future roaming arrangements may increasingly need to support not only basic connectivity but also continuity of service characteristics and performance level across jurisdictions. These developments raise questions regarding whether the revised Recommendation should provide additional guidance on advanced roaming capabilities and their availability in roaming environments. On the other hand, the ongoing shutdown of 2G and 3G mobile networks raises

additional questions regarding service continuity for roaming users. In particular, legacy arrangements supporting emergency communications may be affected where roaming users rely on technologies such as Circuit-Switched Fallback. These developments may warrant consideration of whether further guidance relating to emergency communications and service continuity is needed.

115. The increasing importance of eSIM-enabled international connectivity services also highlights issues regarding QoS assurance. While roaming performance has traditionally been associated with the characteristics of the visited network, routing architectures and connectivity arrangements may increasingly influence user experience. These developments may warrant consideration of whether existing transparency frameworks sufficiently enable users to understand potential differences in QoS and performance.

Questions for the Delegates regarding quality of service and interoperability

- Q9. To what extent should the Recommendation provide guidance on ensuring service quality and continuity of international mobile service across different networks and jurisdictions?
- Q10. Are additional transparency measures needed regarding the availability of advanced roaming functionalities and the difference in architectures that affects QoS and performance?
- Q11. Does the ongoing shutdown of legacy mobile networks raise additional policy considerations relating to emergency communications and service continuity for IMR users?

Note: All delegate questions are consolidated in Annex A.

Cross-border IoT/M2M connectivity including permanent IoT/M2M roaming

116. The Recommendation was primarily developed with the mindset of connected people being the main users of mobile services. Since the adoption, roaming has increasingly become relevant to connected vehicles, industrial systems, logistics applications, smart infrastructure and other IoT/M2M applications. These uses involve different traffic patterns, business models and regulatory considerations from those associated with traditional retail IMR services. While existing principles may remain relevant, additional guidance may be warranted regarding their application in these contexts. For example, further consideration may be warranted regarding exemption from transparency requirements for IoT/M2M-specialised subscriptions, competition and regulatory principles as applied to large-scale IoT/M2M deployments relying on cross-border connectivity arrangements.

117. Closely related to the growth of IoT/M2M services, the importance of IoT/M2M permanent roaming is increasing. Although permanent roaming was not a major focus of policy discussions when the Recommendation was adopted, it has become relevant in cross-border IoT/M2M deployments. Regulatory approaches vary among jurisdictions, reflecting differing policy objectives, market structures and regulatory frameworks. These developments raise issues that are only partially addressed by the existing Recommendation. These issues may warrant additional guidance regarding the application of the Recommendation's principles in contexts where roaming is used as a long-term connectivity solution rather than for temporary travel.

Questions for the Delegates regarding IoT/M2M connectivity

- Q12. Are the existing principles of the Recommendation appropriate to address developments in IoT and M2M connectivity services?
- Q13. Should there be a distinction between human roaming and IoT/M2M connectivity roaming use cases?
- Q14. To what extent should the Recommendation address permanent roaming arrangements?
- Q15. Are there interoperability, competition or regulatory issues specific to IoT roaming that warrant additional guidance?

Note: All delegate questions are consolidated in Annex A.

Developments in non-terrestrial connectivity

118. Developments relating to NTN and other emerging connectivity solutions that are inherently cross-border by nature were largely outside the scope of roaming policy discussions fifteen years ago. While it may be premature to establish detailed policy guidance in these areas, consideration may be warranted regarding how the Recommendation's principles should apply in an evolving connectivity ecosystem.

Questions for the Delegates regarding non-terrestrial connectivity

- Q16. To what extent do NTN services raise new issues relating to transparency, pricing or customer awareness?
- Q17. Is additional guidance needed to address the integration of terrestrial and non-terrestrial connectivity services?

Note: All delegate questions are consolidated in Annex A.

Annex A. Consolidated questions for Delegates

Table A. Consolidated questions for the Delegates on the implementation, dissemination and continued relevance of the OECD Recommendation on International Mobile Roaming Services

No.	Questions	Section / related topic
1	Are there any other market and technological developments that the draft implementation Report should consider?	Market and technological developments
2	Are there any other policy and regulatory developments that should be included in the draft implementation Report? Examples may include developments relating to user protection and transparency, competition and wholesale regulation, QoS assurance, international co-operation initiatives, regional roaming frameworks, regional regulatory arrangements, trade agreements, engagement with international organisations (e.g. WTO and ITU), or other policy and regulatory measures affecting international mobile roaming services.	Policy and regulatory developments
3	Please provide examples of dissemination efforts to raise awareness of the Recommendation, in particular throughout the public and private sectors, including governments, businesses, consumer groups, civil society and other international organisations	Dissemination of the Recommendation
4	Are the existing transparency and customer awareness provisions of the Recommendation adequately adapted to developments of emerging alternative services that provide international connectivity such as eSIM-enabled connectivity services?	Transparency and user awareness
5	Should the Recommendation's provision on competition be updated to better reflect the growing role of travel eSIM providers, internationally operating MVNOs and other emerging business models in the provision of international connectivity?	Competition
6	To what extent should the Recommendation's guidance on regulatory intervention be updated to reflect evolving market conditions?	Regulatory intervention
7	To what extent does the increasing complexity in wholesale roaming arrangements and negotiations, arising from both technological developments (e.g. 5G and IoT) and the emergence of new market actors, warrant additional guidance on international co-operation and industry co-ordination?	International co-operation
8	Are the existing provisions on international co-operation sufficient to reflect the growing importance of regional roaming frameworks, regional regulatory arrangements and trade agreements in achieving roaming policy objectives?	Regional cooperation
9	To what extent should the Recommendation provide guidance on ensuring service quality and continuity of international mobile service across different networks and jurisdictions?	QoS and service continuity
10	Are additional transparency measures needed regarding the availability of advanced roaming functionalities and the difference in architectures that affects QoS and performance?	QoS and service continuity
11	Does the ongoing shutdown of legacy mobile networks raise additional policy considerations relating to emergency communications and service continuity for IMR users?	QoS and service continuity
12	Are the existing principles of the Recommendation appropriate to address developments in IoT and M2M connectivity services?	IoT/M2M connectivity
13	Should there be a distinction between human roaming and IoT/M2M connectivity use cases?	IoT/M2M connectivity
14	To what extent should the Recommendation address permanent roaming arrangements?	IoT/M2M connectivity and permanent roaming
15	Are there interoperability, competition or regulatory issues specific to IoT roaming that warrant additional guidance?	Competition, IoT/M2M connectivity
16	To what extent do NTN services raise new issues relating to transparency, pricing or customer awareness?	Transparency and user awareness, NTN
17	Is additional guidance needed to address the integration of terrestrial and non-terrestrial connectivity services?	NTN

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End notes

¹ Bill shock refers to unexpectedly high charges, often as a result of limited awareness of roaming tariffs or unintentional data usage abroad.

² In the Recommendation, the term ‘customer’ includes both consumers and business users.

³ Network slicing is the capability of 5G networks to create multiple virtual end-to-end networks over a shared physical infrastructure, with each slice tailored to the performance requirements of a specific service or application (OECD, 2022^[8]).

⁴ Using an exchange rate of CAD 1.4/USD in 2025 according to OECD.stat.

⁵ Using an exchange rate of CAD 1.4/USD in 2025 according to OECD.stat.

⁶ As of July 2026, CPTPP members are Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, the United Kingdom, Singapore and Vietnam.

⁷ The EEA comprises the 27 Member States of the European Union (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain and Sweden), plus Iceland, Liechtenstein and Norway (European Union, 2026^[94]; European Commission, 2026^[95]).

⁸ This provision does not currently apply to Liechtenstein.