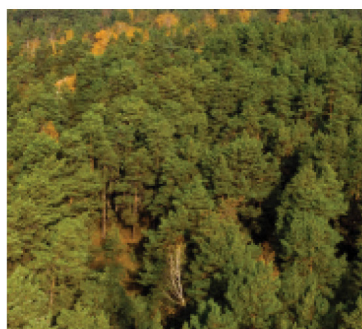
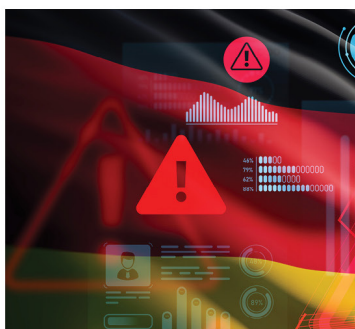
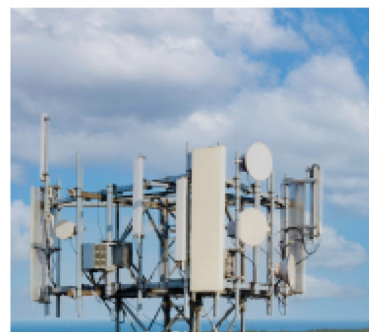
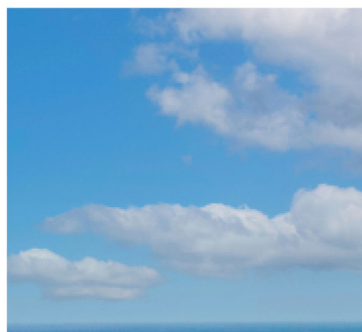
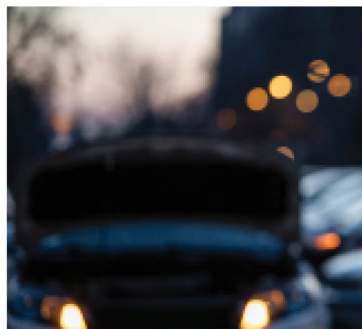


# A guide to developing a national emergency roaming framework



## Acknowledgements

This guide was produced by the ITU Telecommunication Development Bureau (BDT). The ITU Telecommunication Standardization Bureau (TSB) and the ITU Radiocommunication Bureau (BR) contributed to the contents of this Guide. GSMA also worked closely with ITU in the preparation of this guide. It is our hope that the Guide will help countries enhance the resilience of their mobile telecommunication networks in the face of disasters.

The regulatory framework herein proposed draws from international experiences and best practices from different countries that have implemented national emergency roaming frameworks.

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## ISBN

978-92-61-42271-4 (PDF version)

978-92-61-42281-3 (EPUB version)



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# Foreword



*Connectivity in times of crisis is not optional – it is essential. By enabling people to access an available mobile network when their own service is disrupted, national emergency roaming frameworks can help save lives, strengthen preparedness, and ensure that no one is left disconnected when information matters most.*

**Dr Cosmas Luckyson Zavazava**

Director of the Telecommunication Development Bureau  
International Telecommunication Union

## Introduction

In recent years, the frequency and intensity of natural hazards, such as hurricanes, floods, earthquakes, and wildfires have increased significantly, causing disasters that leave communities and entire countries devastated. These events often result in loss of life, destruction of livelihoods, and severe damage to critical infrastructure, with the telecommunication sector often being the hardest hit. Damage to mobile network systems, such as base stations, transmission facilities, and power supplies, can leave large areas without connectivity, delaying emergency communications, hampering response efforts and putting lives at risk.

Mobile connectivity is a critical component of public safety and disaster response. The national emergency roaming framework seeks to address these challenges by proposing a regulatory and operational structure that helps governments put in place temporary roaming agreements between mobile network operators (MNOs). These agreements allow subscribers of impacted networks to access voice, SMS, and data services on other operator networks without additional cost, ensuring continuity of communications and supporting disaster response and recovery. Emergency roaming service agreements are essential for ensuring continuity of mobile services during network outages, disasters, or emergencies, supporting public safety, coordination among stakeholders and first responders, as well as in the recovery phase.

This guide covers the design, implementation, and management of a regulatory framework for emergency roaming service agreements<sup>1</sup> when mobile network operators seek to establish emergency roaming services. It is intended for regulatory authorities but also serves as a reference for mobile network operators (MNOs) seeking to establish bilateral agreements for emergency roaming services.

Specifically, it will support countries develop emergency roaming agreements designed to:

- Ensure continuity of mobile services (voice, SMS, data) during network outages caused by emergencies by allowing subscribers from a failed or damaged network to temporarily roam on other operator networks.
- Enable MNOs to increase the resilience of their mobile network without deploying significant and costly infrastructure.
- Promote resilience, redundancy, and rapid recovery in national telecommunication infrastructure.
- Protect public safety by ensuring subscriber access to emergency services (e.g., 911, 112) when their home network services are unavailable.

The next section provides model/draft regulatory provisions that serve as a basis for developing a national emergency roaming framework. The proposed provisions can be adapted to existing national regulations and adopted by telecommunication regulatory authorities as appropriate. A model set of articles outlining the principal legal, regulatory and operational provisions can be considered when establishing and implementing a national emergency roaming framework.

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<sup>1</sup> Emergency roaming service agreements are pre-established and legally binding arrangements between mobile network operators which, where applicable, are mandated or endorsed by the national telecommunication regulatory authority, and which enable temporary domestic roaming access for subscribers of one operator on the network of another operator during declared emergencies or major service disruptions, to ensure continuity of essential communications and access to emergency services.

The draft regulation to develop a national emergency roaming framework by national telecommunication regulatory authorities is complemented by the following annexes: Annex 1 provides an example of a 3GPP standard on disaster roaming; Annex 2 presents international experiences and best practices from countries that have implemented national emergency roaming frameworks; Annex 3 contains illustrative fictitious case scenarios on national emergency roaming implementation.

# Draft regulation to develop a national emergency roaming framework by national telecommunication regulatory authorities

[National (telecom) Regulatory Authority]

[Resolution number]

[Date]

Regulatory framework for developing a national emergency roaming framework.

The [national regulatory authority], in the discharge of its statutory functions under the [Telecommunications Act (the Act)], hereby issues the following:

## Article 1. Short title

This Resolution may be cited as the national emergency roaming framework.

## Article 2. Objective

The objective of this emergency roaming framework is to establish key definitions, principles, and operational context for emergency roaming service agreements between mobile network operators (MNOs) and how such agreements should be negotiated, implemented and executed.

## Article 3. Definitions

- **Critical network failure:** An unplanned mobile network outage that significantly disrupts mobile services due to disasters arising from natural (e.g., floods, storms, earthquakes, tsunamis, etc.) or human-made hazards (e.g., terrorism, accidents, cyber-attacks, etc.).
- **Emergency roaming:** The temporary provision of domestic voice, text, and data services on another MNO network during the entirety, or part of, a critical network failure.
- **Triggering event:** A critical network failure that activates the emergency roaming protocol.
- **Triggering event declaration:** A formal notification by an MNO that it is experiencing or expects to experience a critical network failure and wishes to invoke emergency roaming.

- **Home network (alternatively referred to as receiving party / originating network):** The impaired MNO network due to a critical network failure and subscribers who require emergency roaming.
- **Host network (alternatively referred to as responding party / visited network):** The MNO that provides emergency roaming services to affected subscribers of the impaired MNO (home network).
- **Emergency roaming area:** The geographical area affected by the critical network failure, i.e., where an MNO network is not able to offer services to its subscribers.

## Article 4. Emergency roaming obligation

An emergency roaming obligation is a regulatory requirement that obliges mobile network operators to allow users to access other national networks during emergencies, ensuring uninterrupted communication when the home network is unavailable.

Mobile network operators are required to establish emergency roaming service agreements in accordance with the definitions and principles of this emergency roaming framework.

## Article 5. Mobile virtual network operator subscribers

Emergency roaming shall apply, on a non-discriminatory basis, to all subscribers of a home network, including subscribers of mobile virtual network operators (MVNOs) hosted on that network.

## Article 6. Principles

### 6.1 Good faith

- MNOs must negotiate, implement, and execute emergency roaming service agreements in good faith. All parties are expected to act with transparency, fairness, and a shared commitment to public safety and service continuity.

### 6.2 Geographic overlapping coverage

- MNOs are required to establish emergency roaming service agreements where their network coverage areas overlap, in whole or in part.

### 6.3 Activation and termination of emergency roaming

- A home network shall request emergency roaming as soon as it experiences a triggering event.
- A host network operator shall provide emergency roaming upon request by a home network operator whenever technically feasible.
- Activation of emergency roaming must occur across all radio base stations of the host network in the emergency roaming area no later than two (2) hours after the triggering event declaration has been provided.

- When initiating a triggering event declaration, the home network must provide the host network and the [name of the regulatory authority] with the following information to the best of its knowledge as soon as practicable:
  - a. Description of the critical network failure.
  - b. Geographic scope of the emergency roaming area.
  - c. Estimated duration of the disruption.
  - d. Impacted network nodes.
  - e. Estimated number of affected subscribers.
  - f. Estimated traffic volume to be re-routed.
  - g. Identification of any other MNO providing emergency roaming.
- Emergency roaming must be terminated as soon as reasonably possible once the home network restores services, based on the principle of best efforts.

## 6.4 Network capacity and traffic management

- The host network is not obligated to augment or expand its existing network capacity to accommodate emergency roaming.
- The provision of emergency roaming service by the host network operator is required only to the extent that such service can be accommodated by existing network capacity and does not materially degrade the host network subscriber services.
- The host network may:
  - implement traffic management practices;
  - restrict bandwidth-intensive services (e.g., video streaming, large file transfers);
  - decline or withdraw some or all of the emergency roaming services if:
    - the host network is experiencing critical network failure;
    - anticipates or experiences significant service degradation due to an increase in traffic volumes;
    - security or capacity concerns arise.
- If emergency roaming is declined or withdrawn, the host network must provide arguments for such refusal to the home network and [the regulatory authority] within 24 hours of the triggering event declaration. The host network should provide advance notice of emergency roaming withdrawal where possible.
- If the host network implements traffic management practices, it must disclose the practices to the home network and [the regulatory authority] within 24 hours of implementation.
- The home network may take all reasonable actions to prioritize network access to its own subscribers in the emergency roaming area.

## 6.5 Traffic prioritization for emergency calls and disaster management and humanitarian relief

- Host networks in the emergency roaming area must prioritize critical communications from agencies responsible for disaster management and humanitarian relief (e.g., public protection, emergency services, search and rescue, and disaster response) as well as emergency calls (e.g., 911, 112) over all other communications, and above host network subscriber services.

## 6.6 Pricing

- For emergency roaming, the host network may charge only for direct operating costs associated with the infrastructure used to provide voice, SMS, emergency calls or other services (e.g., data) as determined by the host network traffic management. The host network may not profit from emergency roaming.
- Under no circumstances may emergency roaming generate additional costs for the subscriber.
- The host network shall clearly inform end users that:
  - emergency roaming is limited to essential services (voice, SMS, emergency alerts, etc.);
  - data services may be restricted to preserve network capacity; and
  - no additional charges will apply for use of these services.

## 6.7 Annual testing

- In accordance with emergency roaming service agreements, MNOs are required to conduct annual tests of their emergency roaming capabilities and associated coordination processes. These tests should consider diverse network environments (e.g., GSM, UMTS, LTE, 5G networks, varying frequency bands and network configurations, etc.) and a wide range of potential scenarios (e.g., earthquake, tsunamis, hurricane, cyberattack, or single-network failures).
- Such exercises help to ensure interoperability and facilitate seamless automatic attachment of user devices across networks during emergency roaming events.

## 6.8 Final report

- Home and host networks are required to submit final reports independently to [the Regulatory Authority] detailing the timing, duration, and effectiveness of the emergency roaming implementation during a critical network failure.
- Reports should include as much as detail as possible and be submitted within 60 days after the home network has been restored to normal operating conditions and emergency roaming has ended.

## 6.9 Disputes

- Any disagreements between the MNOs regarding the negotiation, implementation, or execution of an emergency roaming service agreement, must be resolved by the [name of the Regulatory Authority] in accordance with the established framework.

## 6.10 Timeline

- All MNOs must implement emergency roaming service agreements within 12 months once the emergency roaming framework enters into force.

## 6.11 Exceptions

[The national telecommunication regulatory authority may specify exceptions to Article 4 if some mobile network operators are too small to comply with the emergency roaming requirement].

## Annex 1: Standard for disaster national roaming

### 3GPP Standard: Disaster Roaming

Disaster Roaming has been specified in 3GPP TS 23.501 and 3GPP TS 22.261 for 4G/LTE and 5G NR. Based on 3GPP TS 22.261, Disaster Roaming has been defined as a *“special roaming policy that applies during a Disaster Condition,”* and Disaster Condition has been defined as a *“condition that a government decides when to initiate and terminate, e.g. a natural disaster. When this condition applies, users may have the opportunity to mitigate service interruptions and failures.”*

In addition, 3GPP TS 23.501 provides a summary of all other information needed for Disaster Roaming in section 5.40: *“Support of Disaster Roaming with Minimization of Service Interruption.”*

Based on the 3GPP for 5G, subject to operator policy and national/regional regulations, Disaster Roaming should only be implemented in 5G systems when:

- *“there is no available PLMN [Public Land Mobile Network] which is allowable (see TS 23.122 [17]);*
- *the UE [User Equipment] is not in RM-REGISTERED and CM-CONNECTED state over non-3GPP access connected to 5GCN;*
- *the UE cannot get service over non-3GPP access through ePDG;*
- *the UE supports Disaster Roaming service;*
- *the UE has been configured by the HPLMN [Home PLMN] with an indication of whether Disaster roaming is enabled in the UE set to “disaster roaming is enabled in the UE” as specified in clause 5.40.2; and*
- *a PLMN without Disaster Condition is able to accept Disaster Inbound Roamers from the PLMN with Disaster Condition.”*

The end-user device supporting Disaster Roaming should be configured with the following information:

- *“Optionally, indication of whether disaster roaming is enabled in the UE;*
- *Optionally, indication of ‘applicability of “lists of PLMN(s) to be used in disaster condition” provided by a VPLMN [Visited PLMN];*
- *Optionally, list of PLMN(s) to be used in Disaster Condition.”*

In addition, based on the 3GPP 23.501 *“The Activation of Disaster Roaming is performed by the HPLMN by setting the indication of whether Disaster roaming is enabled in the UE to “disaster roaming is enabled in the UE” using the UE Parameters Update Procedure as defined in TS 23.502 [3]. The UE shall only perform disaster roaming if the HPLMN has configured the UE with the indication of whether disaster roaming is enabled in the UE and set the indication to “disaster roaming is enabled in the UE”.”*

## Annex 2: Examples of existing national roaming frameworks

### Canada

In 2022, the Ministry of Innovation, Science and Industry of Canada ordered the mobile network operators (MNOs or Parties<sup>2</sup>) to reach emergency roaming agreements. Such agreements should be established under Schedule A “Emergency Roaming Protocol” of the Memorandum of Understanding on Telecommunications Reliability (MOU) effective since September 9, 2022, for five years.<sup>3</sup> Upon the expiry of the five-year term, the MOU will be automatically extended for successive one year renewal terms until terminated by all Parties.

The MOU includes an Emergency Roaming Protocol with the following definitions:

1. Accident: An event that happens by chance or that is without apparent or deliberate cause and can happen during planned maintenance or normal operations.
2. Critical Network Failure: An unintentional and unplanned Network outage caused by, or occurring in the context of an Impactful Emergency.
3. Emergency Roaming: Consists of the provision of domestic voice, text and data roaming services on an emergency basis when technically feasible during a Triggering Event, in whole or in part, by a Responding Party to a Receiving Party during the entirety, or part of, a Triggering Event.
4. Impactful Emergency: An urgent and critical situation that seriously endangers the lives, health or safety of Canadians, including but not limited to those arising from Accidents, cyber-attacks or other deliberate malicious acts, fires, floods, storms, earthquakes, emergencies arising from domestic or international security threats, or armed conflicts involving Canada or its allies.
5. Network: A Party’s wireless network including, as the case may be, the access network, network core, backhaul, transport connectivity and the infrastructure, in whole or in part.
6. Receiving Party: Party that receives Emergency Roaming.
7. Responding Party: Party that provides Emergency Roaming.
8. Triggering Event: Critical Network Failure subject to a Triggering Event Declaration.
9. Triggering Event Declaration: Notification by a Party who is experiencing or is likely to experience a Critical Network Failure to another Party that it is activating the Emergency Roaming Protocol in respect thereof.
10. Triggering Event Duration: Period of time between the Triggering Event Start Point and the Triggering Event End Point.
11. Triggering Event End Point: The earlier of (A) notification by the Party who issued the Triggering Event Declaration to the Party who is providing the Emergency Roaming that it is revoking the Triggering Event Declaration, and (B) the resolution of the Critical Network Failure.
12. Triggering Event Start Point: Issuance of a Triggering Event Declaration.

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<sup>2</sup> Parties: Bell Canada, Bragg Communications Inc., Cogeco Communications Inc., Rogers Communications Canada Inc., Saskatchewan Telecommunications, Shaw Communications Inc., Freedom Mobile Inc., Tbaytel, Telesat Canada, Telus Communications Inc., Videotron Ltd., Xplornet Communications Inc., and Zayo Canada Inc.

<sup>3</sup> Memorandum of Understanding on Telecommunications Reliability. <https://ised-isde.canada.ca/site/ised/en/memorandum-understanding-telecommunications-reliability>

Schedule A of the MOU describes the Emergency Roaming Protocol. This protocol applies when one or more Parties provide Emergency Roaming to another Party when the latter Party is experiencing a Triggering Event.

Mobile providers or Parties had to, within nine months of the effective date of the MOU, enter into confidential reciprocal Bilateral Emergency Roaming Agreements or Multilateral Emergency Roaming Agreements, with those Parties with whom they have overlapping Networks, pursuant to the Emergency Roaming Protocol.

According to the MOU, the Bilateral or Multilateral Emergency Roaming Agreements must incorporate the following sixteen principles:

*"1. Emergency Roaming may only be invoked by a Party in case of a Triggering Event Declaration and only after having tried, on a best efforts basis, to take all possible steps to restore services on its own Network(s). For greater certainty, a Party shall be prohibited from initiating a Triggering Event Declaration as part of that Party's response to operational Network outages that do not fall within the definition of a Critical Network Failure.*

*2. The provision of Emergency Roaming by a Responding Party is conditional on the Receiving Party taking all possible steps, throughout the Triggering Event Duration, to restore services on its own Network(s) on a best efforts basis.*

*3. The conduct of a Receiving Party and any Responding Party pursuant to this Emergency Roaming Protocol shall at all times be governed by the duty of good faith.*

*4. A Responding Party shall use reasonable efforts to provide Emergency Roaming to the Receiving Party in a Triggering Event for the Triggering Event Duration. However, nothing in this Emergency Roaming Protocol prevents a Party from assisting another Party outside the scope of this Emergency Roaming Protocol.*

*5. Where a Triggering Event Declaration is made, coincident with the Triggering Event Start Point, or as soon thereafter as reasonably practicable, the Responding Party may request and the Receiving Party shall use reasonable efforts to provide information about the Triggering Event, including: a description of the Critical Network Failure, location(s), estimated duration, impacted Network nodes, identification of any other Parties providing Emergency Roaming and an estimate of the type and quantity of Emergency Roaming required in both number of subscribers/sessions and the amount of traffic.*

*6. A Receiving Party shall receive the scope, extent and quality of Emergency Roaming provided by a Responding Party, on an "as is and where is" basis. For greater certainty there is no duty hereunder upon a Responding Party to augment or supplement its existing Network capacity.*

*7. A Responding Party is required to provide only such reasonable scope and extent of Emergency Roaming, and only to a level that can be accommodated by its existing Network capacity and that will not, in the sole opinion of that Responding Party, materially adversely impact the services it ordinarily provides to its own end-user customers, and to do so where feasible, provided that the Responding Party has reasonably first managed its own Network needs. Without limiting the generality of the foregoing, a Responding Party may, in its sole discretion, decline to provide Emergency Roaming, implement traffic management practices, or withdraw some or all of the Emergency Roaming it had been providing, to the extent the Responding Party is (a) unable to provide, or continue providing, such Emergency Roaming, (b) experiencing a Triggering Event*

itself, or (c) experiencing or reasonably anticipates experiencing material service degradation due to traffic volumes, network capacity considerations, security events or other factors.

8. A Party that is experiencing a material adverse impact to its Network due to an increase in roaming traffic as a result of a Critical Network Failure of another Party/Parties, may take steps to manage its Network in advance of the other Party/Parties issuing a Triggering Event Declaration. The Party that takes steps to manage its Network will provide details of such Network management to the affected Party/Parties within 24 hours of implementing such Network management.

9. In the case where a Triggering Event is followed by one or more Triggering Events, the Parties agree and acknowledge that each Responding Party, as the case may be, shall be required to triage and re-prioritize the scope and extent of their Emergency Roaming and may reasonably redeploy resources in accordance with the scope and severity of the various Triggering Events.

10. Unless specifically stated otherwise in this Emergency Roaming Protocol, Emergency Roaming shall be wound down and terminated as soon as possible based upon the best efforts of the affected Parties to restore service(s) to their end-user customers and upon the restoration of such services.

11. To the extent two or more Parties may experience the same Triggering Event, for example due to the same natural disaster, they shall attempt to coordinate their resources to the extent practicable and reasonable.

12. Where a Responding Party implements traffic management practices or declines to provide or withdraws, Emergency Roaming, in whole or in part, to a Receiving Party:

1. the Responding Party will provide details of the implemented traffic management practices within 24 hours of implementing such practices;
2. the Responding Party will provide advance notice of withdrawal where possible; and
3. the Receiving Party shall be entitled to request the reason(s) for the Responding Party's declining or withdrawal of Emergency Roaming, and the Responding Party shall provide such reasons in writing within 24 hours of receiving such request.

13. During a Triggering Event, a Receiving Party will take all reasonable steps to provide as much network availability as practicable to its own customers in the impacted geographical scope of the Triggering Event ("Emergency Roaming Area").

14. Network considerations may require the Parties to tailor Emergency Roaming to allow or curtail different traffic types as necessary. Parties acknowledge and agree that Emergency Roaming will not provide the same type of service or quality of service as is provided as part of wholesale commercial roaming, whether under commercial agreement or under the applicable Canadian Radio-television and Telecommunications Commission (CRTC) wholesale roaming tariff.

15. By requesting Emergency Roaming, the Requesting Party accepts that the type of service or quality of service provided by the Responding Party pursuant to a commercial roaming agreement or under an applicable CRTC wholesale roaming tariff, as the case may be, may be negatively impacted by the provision of Emergency Roaming.

16. When providing Emergency Roaming during a Triggering Event, the Responding Party will, to the extent feasible, prioritize the transmission of 9-1-1 Wireless Access voice traffic above all other wireless traffic on its Network."

In addition to the above principles, the agreements between MNOs for emergency roaming should also include the following:

- a. clear definitions for determining the Emergency Roaming Area so that all signatories thereto will be able to understand the Triggering Event's scope and boundaries using universal standard(s) of geography scope recognition (e.g., exchange GIS layers for CENSUS divisions);*
- b. a description of any potential impacts which the provision of Emergency Roaming may have upon existing commercial wholesale roaming services between the Responding Party and the Receiving Party;*
- c. reasonable provisions to ensure the Responding Party's networks are not or will not be materially adversely affected by the provision of Emergency Roaming;*
- d. clear network management rights and procedures in order to ensure the orderly access and egress of roaming traffic on the Responding Party's network as well as the overall integrity and resiliency of Networks;*
- e. provisions for:*
  - i. the Parties to complete any preparations (e.g., establishing or modifying Network interfaces) necessary to enable the efficient provision of Emergency Roaming;*
  - ii. frequent communication in order to provide situational awareness during a Triggering Event;*
  - iii. relevant network data exchange as soon as practicable following a Triggering Event;*
  - iv. coordination of the cessation of Emergency Roaming in order to provide an uninterrupted transition (to the extent possible) back to the Receiving Party's Network for impacted subscribers; and*
  - v. emergency roaming to be provided to the Receiving Party's wholesale customers if applicable;*
- f. commercially negotiated fees and payment obligations;*
- g. as long as the following does not jeopardize a Party's Network, a robust testing regime consisting of (i) technical testing of capabilities, (ii) stress testing, and (iii) introduction of learnings from testing into the development phase of the Emergency Roaming; and*
- h. applicable Joint Operating Procedures ("JOPs"), if any, developed pursuant to a Bilateral Emergency Roaming Agreement shall be reviewed on a yearly basis and updated as necessary. All Parties shall ensure that applicable JOPs are shared and understood amongst supporting groups within each Party's organization."*

The MOU includes an indemnification provision related to claims resulting from the provision of emergency roaming, and a reporting provision, requiring both, the Receiving Party and the Responding Party of emergency roaming, to file an Emergency Roaming Report to ISED, the CRTC and CCCS,<sup>4</sup> serving each Party hereto.

Finally, the Emergency Roaming Protocol must be collectively reviewed at least once a year, with the aim to amend and improve it based on learnings from the prior year's Triggering Events and Emergency Roaming Reports, if any.

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<sup>4</sup> ISED: Innovation, Science and Economic Department Canada. CRTC: Canadian Radio-television and Telecommunications Commission. Definition of CCCS not included in the MOU, however, it seems to be the Canadian Centre for Cyber Security.

## Chile

National Automatic Roaming was established in Chile based on Law N° 21.245 of 2020.<sup>5</sup> According to this law, it is mandatory for mobile network operators (MNOs) to enter into roaming agreements throughout the national territory to mitigate mobile network interruptions in emergency situations. If there are disagreements between the MNOs in the negotiation, implementation or execution of the roaming agreement, any disputes must be resolved by an arbitrator.<sup>6</sup>

The arbitrator must resolve the dispute considering the provisions and principles contained in the National Automatic Roaming Law and in other telecommunication regulations, and must also rule in favour of one of the MNO's proposals within a maximum period of three months, which may be extended for a single, justified period of additional three months. The arbitrator may, where appropriate, establish conditions for executing his or her ruling. Their fees shall be borne by the provider whose claim is completely rejected, or the arbitrator may arrange for the burden of paying their fees to be divided among the parties in accordance with their decision. Technical commissions may be established made up of representatives of both parties, through which they will make their best efforts to resolve in advance and by mutual agreement any differences that arise between them.<sup>7</sup>

Based on the National Automatic Roaming Law, the Undersecretary of Telecommunications (Subtel) of the Ministry of Transportation and Telecommunications, issued technical, economic, operational, commercial, and other conditions that must be included the roaming agreements between MNOs through Decree N° 138 of 2020.<sup>8</sup>

The definitions included in the decree and related to emergency roaming are the following:<sup>9</sup>

*"a) Automatic roaming: A service that allows users of a [mobile network operator] to automatically connect to the mobile network of another [mobile network operator], (...) in those areas of the national territory where the former (...) experiences service interruptions in emergency situations (...).*

(...)

*c) Originating Network: This refers to the [mobile network operator] that (...) experiences service interruptions in emergency situations (...).*

*d) Visited Network: This refers to the [mobile network operator] that must serve the users of the Originating Network with which it has entered into an automatic roaming contract.*

(...)

*k) Service interruption in emergency situations [or interruption]: those interruptions that occur due to the emergency situations (...) that are classified as Significant Failures (...)."*

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<sup>5</sup> Law N° 21245 - 2020 "Establece Roaming Automático Nacional". <https://www.bcn.cl/leychile/navegar?idNorma=1147448>

<sup>6</sup> Id.

<sup>7</sup> Id.

<sup>8</sup> Decree N° 138 - 2020 "Aprueba Reglamento Sobre Roaming Automático y Operación Móvil Virtual". (2020 - updated on 2022) <https://www.bcn.cl/leychile/navegar?idNorma=1169345>

<sup>9</sup> Id. Article 2.

According to Decree N°138-2020, and following the National Automatic Roaming Law, roaming agreements are mandatory, for both the Visited Network and the Originating Network, throughout the entire national territory for the purposes of mitigating interruptions of the mobile network in emergency situations. (...) The [roaming] activation will be carried out in all the radio bases of all operators, which cover the area affected by the emergency.<sup>10</sup> Under no circumstances may emergency roaming services impose additional costs on the end user.<sup>11</sup>

The roaming service must be activated when the interruptions are classified as Significant Failures.<sup>12</sup> Once the interruption has occurred or if it is imminent that the interruption will occur, the Originating Network must request the Visited Network to activate the roaming service within a maximum period established Subtel.<sup>13</sup>

The roaming service must be activated automatically and without user intervention.<sup>14</sup> Activation must be carried out on all radio base stations of all operators covering the area affected by the emergency and must remain in effect as a backup for the Originating Network after the affected service has been restored for a period established by Subtel.<sup>15</sup>

Each time a roaming activation request is made in emergency situations, the Originating Network must inform Subtel, indicating the date and time of the request, the geographic area, and the affected radio base stations. Likewise, the Visited Network must inform Subtel the date and time of roaming activation and the activated radio base stations. Once the affected service has been restored and normal service conditions are in place, the Originating Network must inform Subtel indicating the time at which the roaming service deactivation was requested. Likewise, the Visited Network must inform Subtel the date and time of roaming deactivation.<sup>16</sup>

The services available to users of the Originating Network in emergency situations must at least include voice, SMS, and emergency calls. The sending and/or downloading of documents, images, photos, and videos, as well as video streaming, among other services intensive in bandwidth, may be restricted, however the sending of data with lightweight messages may also be permitted.<sup>17</sup>

If the emergency results in a high-severity failure, the mobile services offered by the Visited Network for users of both networks in the affected area may also be limited to those indicated previously, i.e., voice, SMS and emergency calls.<sup>18</sup>

Traffic management must be established by the Visited Network covering the affected emergency area depending on the specific conditions of each failure, with the aim of mitigating potential traffic congestion. The Visited Network must disclose the conditions relating to traffic restrictions in emergency conditions on their websites.<sup>19</sup>

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<sup>10</sup> Id. Article 9.

<sup>11</sup> Id. Article 13.

<sup>12</sup> Id. Article 9.

<sup>13</sup> Id.

<sup>14</sup> However, activation by the user on the mobile device is needed. For Android and iOS users, the government provides instructions in the following website: <https://www.gob.cl/noticias/roaming-emergencia-nacional-guia-pasos-como-activar-ios-android/>

<sup>15</sup> Decree N° 138 - 2020 "Aprueba Reglamento Sobre Roaming Automático y Operación Móvil Virtual". (2020 - updated on 2022) <https://www.bcn.cl/leychile/navegar?idNorma=1169345>. Article 9.

<sup>16</sup> Id.

<sup>17</sup> Id. Article 10.

<sup>18</sup> Id.

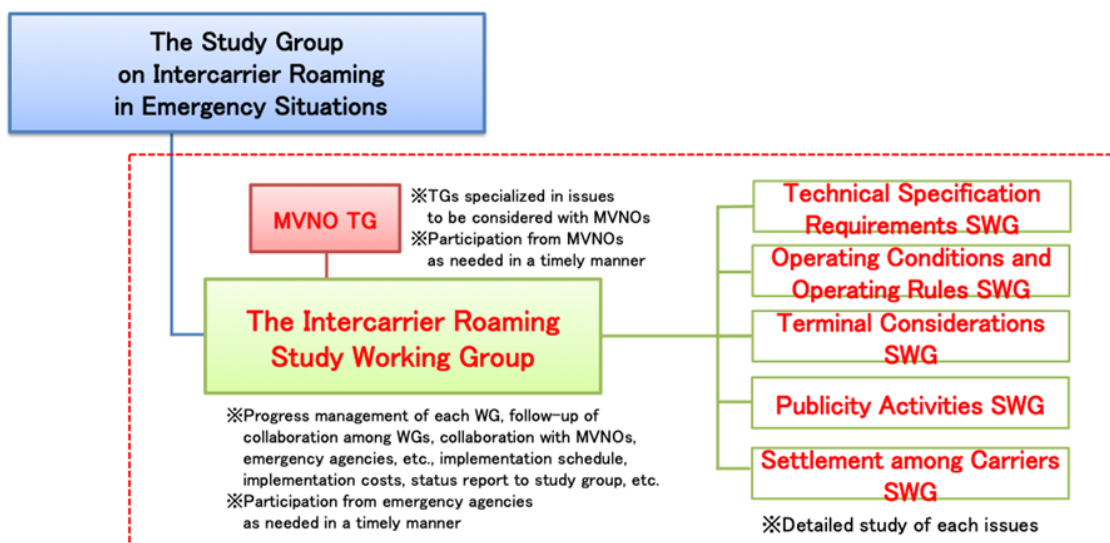
<sup>19</sup> Id.

Finally, since the emergency roaming rules are included in the framework of national automatic roaming, the provisions related to national automatic roaming also apply to emergency roaming. MNOs must publicly release a roaming service offer which should include technical, economic, commercial and operational conditions, among others, that allow any other MNO to know the costs, technical implications and obligations in the event of celebrating a national automatic roaming agreement. It is important to highlight that in the case of roaming for emergency situations, the price for roaming services established by the Visited Network must only consider direct operating costs related to the infrastructure used for voice, SMS and emergency calls services, or other services depending on the traffic management established by the Visited Network.<sup>20</sup>

## Japan

Since 2022, the Ministry of Internal Affairs and Communications (MIC) has been studying intercarrier roaming, which allows mobile phone users to temporarily use other carrier’s networks in order to ensure means of communication during emergencies. A “Study Group on Intercarrier Roaming in Emergencies” was created for this purpose.<sup>21</sup> In addition, the Intercarrier Roaming Study Working Group was established under the Study Group for the purpose of studying technical specifications requirements, operating conditions and rules, terminal considerations, publicity activities and settlement among carriers, as well as addressing MVNO issues to be considered for intercarrier roaming (see Figure 1).<sup>22</sup>

**Figure 1: Structure of the Study Group on Intercarrier Roaming in Emergencies**



Source: Study Group at the Ministry of Internal Affairs and Communications (2023) Second Report on Intercarrier Roaming in Emergency in Japan.

Three reports have been delivered by the Study Group since 2022 addressing some topics of the Study Working Groups.<sup>23</sup> The First Report, released at the end of 2022, addressed the agreement on a basic policy for the introduction of intercarrier roaming based on Full Intercarrier Roaming

<sup>20</sup> Decree N° 138 - 2020 "Aprueba Reglamento Sobre Roaming Automático y Operación Móvil Virtual". (2020 - updated on 2022) <https://www.bcn.cl/leychile/navegar?idNorma=1169345>.

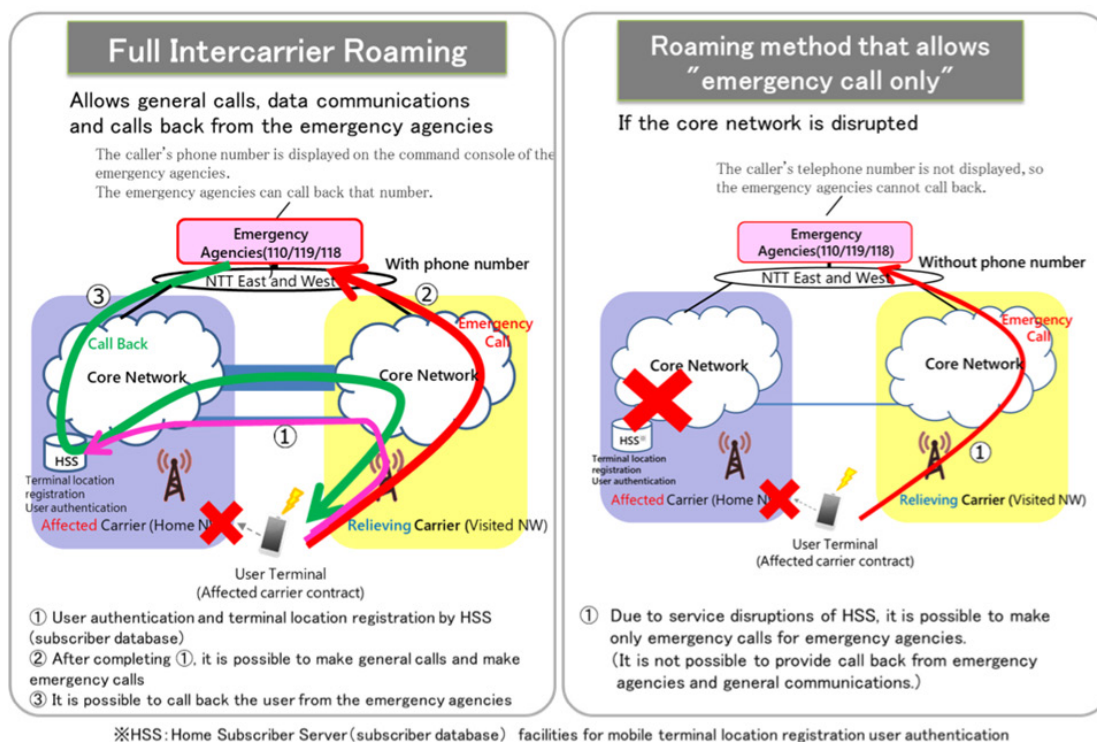
<sup>21</sup> [https://www.soumu.go.jp/main\\_sosiki/joho\\_tsusin/eng/pressrelease/2024/6/5\\_2.html](https://www.soumu.go.jp/main_sosiki/joho_tsusin/eng/pressrelease/2024/6/5_2.html)

<sup>22</sup> Study Group at the Ministry of Internal Affairs and Communications (2023) Second Report on Intercarrier Roaming in Emergency in Japan. [https://www.soumu.go.jp/main\\_content/000984470.pdf](https://www.soumu.go.jp/main_content/000984470.pdf). Pag. 8.

<sup>23</sup> [https://www.soumu.go.jp/main\\_sosiki/joho\\_tsusin/eng/pressrelease/2024/6/5\\_2.html](https://www.soumu.go.jp/main_sosiki/joho_tsusin/eng/pressrelease/2024/6/5_2.html)

and the operation rules, among other issues; the Second Report addressed the agreement on a policy to introduce the roaming method that allows Emergency Call Only on a temporary basis.<sup>24</sup> Intercarrier roaming with this method has some limitations, such as the inability to call back from the emergency response agencies or provide general communications, however, the group discussed this method because it is the only opportunity for mobile users to make emergency calls if the failure occurs in the core network of their service provider.<sup>25</sup> Below, Figure 2 shows the difference between Full Intercarrier Roaming and Emergency Call Only roaming.

**Figure 2: Full intercarrier roaming and roaming method that allows emergency call only**



Source: Study Group at the Ministry of Internal Affairs and Communications (2023) Second Report on Intercarrier Roaming in Emergency in Japan.

The Third Report provides additional information on Full Intercarrier Roaming and Emergency Call Only roaming. In addition, it addresses terminal specifications and restrictions, notifications of public line mobile networks (PLMN) numbers for roaming, base stations that are difficult to support intercarrier roaming such as femtocells, among other issues.

It is important to highlight that Japan has already implemented the roaming.<sup>26</sup>

The basic policy for the introduction of intercarrier roaming from the First Report includes the agreement of the MNOs<sup>27</sup> to implement Full Intercarrier Roaming, allowing calls and data roaming, and calls back from emergency agencies, to the extent that facility capacities of the relieving carriers is not strained by the affected carrier, i.e., the carrier experiencing service

<sup>24</sup> Study Group at the Ministry of Internal Affairs and Communications (2023) Second Report on Intercarrier Roaming in Emergency in Japan. [https://www.soumu.go.jp/main\\_content/000984470.pdf](https://www.soumu.go.jp/main_content/000984470.pdf). Pag. 4.

<sup>25</sup> Id. Pag. 4.

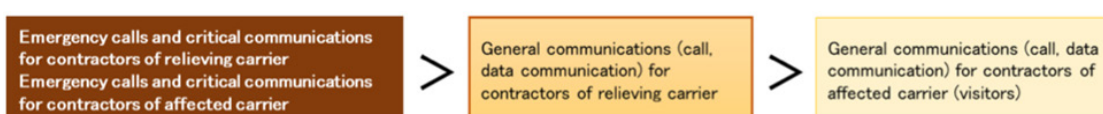
<sup>26</sup> [Ministry of Internal Affairs and Communications Improving Safety and Reliability Roaming between Operators in Emergencies](#)

<sup>27</sup> NTT Docomo, Inc., KDDI Corporation, SoftBank Corp., Rakuten Mobile, Inc., and Okinawa Cellular Telephone Company.

disruptions due to large-scale disasters or facility disruptions, except for the core network. If the core network of the affected carrier is disrupted, there may be limitations in providing roaming services.<sup>28</sup>

When providing roaming services to the affected carrier who have experienced failures due to large-scale disasters or telecommunication facility accidents, in order to alleviate the facility capacity strained of the relieving carriers and to allow more users of the affected carrier to roam, it would be preferable for all other mobile carriers to provide roaming services simultaneously as relieving carriers within the limits of their facility capacity.<sup>29</sup> In addition, to enable relieving carriers to appropriately cope with capacity constraints, they should manage communications service quality level for users of the affected carrier, if necessary (see Figure 3).<sup>30</sup>

**Figure 3: Priority management of communications in the relieving carrier networks**



Source: Study Group at the Ministry of Internal Affairs and Communications (2022) First Report on Intercarrier Roaming in Emergency in Japan.

The First Report also addressed a number of topics such as when should roaming must be initiated and ended, inclusion of MVNOs, informing mobile users on how to use roaming services, service prioritization, roaming areas, and information sharing, among others.

Intercarrier roaming is expected to be utilized for situations where mobile phone service is disrupted due to disasters arising from natural hazards, telecommunication facility accidents, prolonged power outages, or large-scale accidents (e.g., large-scale fires).<sup>31</sup> In order to ensure uninterrupted emergency communications, the decision to initiate roaming services is a critical one. The affected carrier should contact other carriers to inform them of the details of roaming services to be initiated, and the relieving carriers should respond to such request. Operational rules should be established to ensure that intercarrier roaming is initiated when service disruption of mobile services is expected to continue for more than a certain period. When the system recovers from service disruptions, operational rules should be established to terminate roaming services promptly based on appropriate procedures and publicity to users. When starting or ending intercarrier roaming, mobile carriers shall promptly notify the MIC and relevant organizations (police agencies, fire stations, coast guard, designated public agencies, etc.).<sup>32</sup>

Close cooperation among mobile carriers related to information is paramount to enable a smooth beginning of intercarrier roaming. The affected carrier must provide the relieving carriers and MIC with information related to the status of the service disruptions, the area where the disruptions occurred, the number of affected users, and the expected duration of the service disruptions.<sup>33</sup>

<sup>28</sup> Study Group at the Ministry of Internal Affairs and Communications (2022) First Report on Intercarrier Roaming in Emergency in Japan. [https://www.soumu.go.jp/main\\_content/000883579.pdf](https://www.soumu.go.jp/main_content/000883579.pdf). Pag. 5.

<sup>29</sup> Id. Pag. 12.

<sup>30</sup> Id. Pag. 16.

<sup>31</sup> Id. Pag. 6.

<sup>32</sup> Id. Pag. 12-13.

<sup>33</sup> Id. Pag. 17.

In addition, ways to carefully inform users about the terminal settings modifications necessary for intercarrier roaming should be considered.<sup>34</sup> Carriers should consider awareness-raising and user-participatory national training on intercarrier roaming so that users can practice and learn the settings modifications.<sup>35</sup>

Communications through intercarrier roaming should be prioritized for important agencies responsible for disaster prevention or relief, ensuring transportation, communication, or electricity supply, or maintaining order.<sup>36</sup> In addition, providing roaming for emergency calls and critical communications should have priority treatment in the relieving carrier's network.<sup>37</sup>

Intercarrier roaming must be limited to the service area where mobile services are disrupted and should be determined by area units such as prefecture or municipality.<sup>38</sup>

The study group established a basic policy to ensure that roaming services are similarly provided to users of MVNOs that utilize the network infrastructure of MNOs.<sup>39</sup>

The basic policy, among other issues, related to roaming for Emergency Call Only were addressed in the Second Report. Emergency Call Only must be implemented when user authentication and location registration database of the core network fails; therefore, Full Intercarrier Roaming is difficult to activate and at least emergency outgoing calls to three-digit numbers 110, 119 and 118 through roaming, must be possible temporarily (see Figure 4).<sup>40</sup>

When Emergency Call Only roaming is activated, the caller's phone number cannot be transmitted to the emergency agencies, nor can the emergency agencies call back. However, currently used mobile devices do not support Emergency Call Only roaming; thus, it is necessary to wait for the supply of new devices compliant with such type of roaming. On March 26, 2025, the Information and Communications Administration and Postal Administration Council held deliberations, and the MIC received a report from the Council stating that it is appropriate to partially amend the Regulations for Terminal Facilities, etc. and the Regulations Concerning the Technical Standards Conformity Approval for Terminal Equipment as consulted.<sup>41</sup> Based on the report and the results of the solicitation for opinions, the amended regulations were enforced on October 1, 2025. Mobile devices that comply with the amended regulations are expected to be released after Spring 2026. Stakeholders, including terminal equipment vendors, are expected to voluntarily enable intercarrier roaming on mobile devices released prior to Spring 2026 wherever feasible.

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<sup>34</sup> Id. Pag. 5.

<sup>35</sup> Id. Pag. 18.

<sup>36</sup> Id. Pag. 6.

<sup>37</sup> Id. Pag. 15.

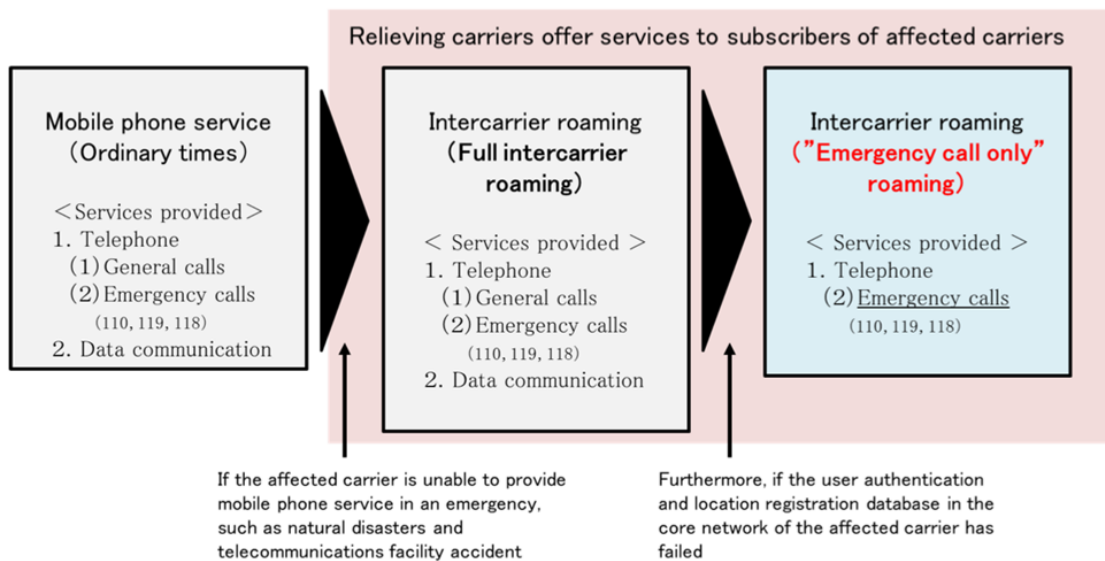
<sup>38</sup> Id. Pag. 7.

<sup>39</sup> Id. Pag. 5.

<sup>40</sup> Study Group at the Ministry of Internal Affairs and Communications (2023) Second Report on Intercarrier Roaming in Emergency in Japan. [https://www.soumu.go.jp/main\\_content/000984470.pdf](https://www.soumu.go.jp/main_content/000984470.pdf). Pag 16. Since approximately 60% of emergency calls are made from mobile phones, it is a priority in Japan to ensure that at least emergency calls can be made when roaming (three-digit numbers 110, 119, 118).

<sup>41</sup> [https://www.soumu.go.jp/main\\_sosiki/joho\\_tsusin/eng/pressrelease/2025/3/26\\_1.html](https://www.soumu.go.jp/main_sosiki/joho_tsusin/eng/pressrelease/2025/3/26_1.html)

**Figure 4: Relationship between mobile phone service and intercarrier roaming**



Source: Study Group at the Ministry of Internal Affairs and Communications (2023) Second Report on Intercarrier Roaming in Emergency in Japan.

## United States

With the aim of reducing wireless service outages for the public and support faster service restoration after natural hazards, such as hurricanes and wildfires, the Federal Communications Commission (FCC) adopted mandatory actions in 2022, i.e., the Mandatory Disaster Response Initiative (MDRI), to improve the reliability and resiliency of wireless networks during emergencies.<sup>42</sup>

The MDRI “requires that each facilities-based mobile wireless provider [MNO] enter into bilateral roaming agreements with all other facilities-based mobile wireless providers from which it may foreseeably request roaming privileges, or that may foreseeably request roaming privileges from it, when the MDRI is active.”<sup>43</sup> The FCC clarifies that “roaming is foreseeable, without limitation, when two providers’ geographic coverage areas overlap”<sup>44</sup> or where technically feasible.<sup>45</sup>

Before the MDRI was established, disaster recovery activities by MNOs were supported by the 2016 Wireless Network Resiliency Cooperative Framework. This was a voluntary framework to which several MNOs committed to, e.g., AT&T, T-Mobile, Verizon Wireless, U.S. Cellular, among others.<sup>46</sup> However, the FCC observed that the previous framework would be more effective and valuable if extended to all facilities-based mobile wireless providers, i.e., MNOs.<sup>47</sup>

<sup>42</sup> <https://www.fcc.gov/wireless-network-resiliency-during-disasters>

<sup>43</sup> FCC (2022). “Report and Order and Further Notice of Proposed Rulemaking on Resilient Networks”. [https://docs.fcc.gov/public/attachments/FCC-22-50A1\\_Rcd.pdf](https://docs.fcc.gov/public/attachments/FCC-22-50A1_Rcd.pdf), par. 17.

<sup>44</sup> Id.

<sup>45</sup> <https://www.fcc.gov/wireless-network-resiliency-during-disasters>

<sup>46</sup> Id.

<sup>47</sup> FCC (2022). “Report and Order and Further Notice of Proposed Rulemaking on Resilient Networks”. [https://docs.fcc.gov/public/attachments/FCC-22-50A1\\_Rcd.pdf](https://docs.fcc.gov/public/attachments/FCC-22-50A1_Rcd.pdf), par. 12.

The Mandatory Disaster Response Initiative states the following:<sup>48</sup>

*“(a) Facilities-based mobile wireless providers are required to perform, or have established, the following procedures when:*

- (1) Any entity authorized to declare Emergency Support Function 2 (ESF-2) activates ESF-2 for a given emergency or disaster;*
- (2) The Commission activates the Disaster Information Reporting System (DIRS); or*
- (3) The Commission's Chief of the Public Safety and Homeland Security Bureau issues a Public Notice activating the Mandatory Disaster Response Initiative in response to a state request to do so, where the state has also either activated its Emergency Operations Center, activated mutual aid or proclaimed a local state of emergency:*
  - (i) Provide for reasonable roaming under disaster arrangements (RuDs) when technically feasible, where:*
    - [A] A requesting provider's network has become inoperable, and the requesting provider has taken all appropriate steps to attempt to restore its own network; and*
    - [B] The provider receiving the request (home provider) has determined that roaming is technically feasible and will not adversely affect service to the home provider's own subscribers, provided that existing roaming arrangements and call processing methods do not already achieve these objectives and that any new arrangements are limited in duration and contingent on the requesting provider taking all possible steps to restore service on its own network as quickly as possible;*
  - (ii) Establish mutual aid arrangements with other facilities-based mobile wireless providers for providing aid upon request to those providers during emergencies, where such agreements address the sharing of physical assets and commit to engaging in necessary consultation where feasible during and after disasters, provided that the provider supplying the aid has reasonably first managed its own network needs;*
  - (iii) Take reasonable measures to enhance municipal preparedness and restoration;*
  - (iv) Take reasonable measures to increase consumer readiness and preparation; and*
  - (v) Take reasonable measures to improve public awareness and stakeholder communications on service and restoration status.*

*(b) Providers subject to the requirements of paragraph (a) of this section are required to perform annual testing of their roaming capabilities and related coordination processes, with such testing performed bilaterally with other providers that may foreseeably roam, or request roaming from, the provider during times of disaster or other exigency.*

*(c) Providers subject to the requirements of paragraph (a) of this section are required to submit reports to the Commission detailing the timing, duration, and effectiveness of their implementation of the Mandatory Disaster Response Initiative's provisions in this section within 60 days of when the Public Safety and Homeland Security Bureau issues a Public Notice announcing such reports must be filed for providers operating in a certain geographic area in the aftermath of a disaster.*

*(d) Providers subject to the requirements of paragraph (a) of this section are required retain RuDs for a period of at least one year after their expiration and supply copies of such agreements to the Commission promptly upon Commission request.*

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<sup>48</sup> US Code of Federal Regulations (2024). Title 47, Chapter I, Subchapter A, Part 4 on “Reporting Requirements for Disruptions to Communications” - Paragraph “§ 4.17 Mandatory Disaster Response Initiative”. <https://www.ecfr.gov/current/title-47/section-4.17>

(e) Compliance with the provisions of this section is required beginning May 1, 2024."

The FCC required that providers negotiate roaming agreements in good faith and noted that any disputes would be addressed by the FCC Enforcement Bureau on a case-by-case basis.<sup>49</sup>

According to the FCC, what constitutes *reasonable roaming, technically feasible* - roaming - and *adversely affect* - service to the home provider's own subscribers - will depend on facts and realities that cannot be determined universally in advance of a situation that gives rise to a particular MDRI activation. However, the FCC provides clarification and basic guidance that would help MNOs understand what activities constitute reasonable roaming, technical feasibility and adverse effect.<sup>50</sup>

The FCC clarifies that *reasonable roaming* "is roaming that does not disturb, but includes compliance with, the FCC's existing requirements that voice roaming arrangements be just, reasonable, and non-discriminatory, and that data roaming arrangements be commercially reasonable."<sup>51</sup> The FCC further clarifies that *technically feasible* roaming "for purposes of the FCC's disaster roaming rules requires a host provider to permit a requesting provider's customers to roam on the host provider's network on all compatible generations of network technology that it offers to its own customers."<sup>52</sup>

In addition, *reasonable roaming* "would include providing a means of denying a roaming request in writing to the requesting provider, preferably with the specific reasons why roaming is infeasible."<sup>53</sup> The FCC believes "that this approach would allow the requesting provider to evaluate the substance of the reasons so that it can make a renewed request at an appropriate time later, if warranted, and will create accountability on the part of requesting providers to ensure that denials are only issued when the circumstances truly warrant. Moreover, this approach, while optional, could help to provide insight into modifications that would facilitate a future roaming agreement or create a record in the event a dispute arises."<sup>54</sup>

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<sup>49</sup> FCC (2022). "Report and Order and Further Notice of Proposed Rulemaking on Resilient Networks". [https://docs.fcc.gov/public/attachments/FCC-22-50A1\\_Rcd.pdf](https://docs.fcc.gov/public/attachments/FCC-22-50A1_Rcd.pdf), par. 16.

<sup>50</sup> Id. Par. 20.

<sup>51</sup> Id. Par. 21.

<sup>52</sup> Id.

<sup>53</sup> Id. Par. 22.

<sup>54</sup> Id.

## Annex 3: Fictitious illustrative case scenarios on national emergency roaming implementation

### Scenario 1: Activation of national emergency roaming service

Operator A and Operator B have agreed and signed an emergency roaming service agreement enabling temporary domestic roaming access for subscribers of either operator on the network of the other operator during declared emergencies or major service disruptions, to ensure continuity of essential communications and access to emergency services.

Following a severe earthquake (triggering event), several mobile base stations operated by Operator A were damaged in the northern region of the country, leaving its subscribers without mobile service in that region (critical network failure). However, in the same region, Operator B still had functioning network infrastructure and was able to provide limited coverage and services, prioritizing voice and text messages services.

Based on the Emergency Roaming Service Agreement, Operator A requested emergency roaming service (triggering event declaration) in the northern region (emergency roaming area) from Operator B and notified the national regulatory authority (NRA) of the request. The following information, to the best of its knowledge, was provided by Operator A to Operator B and the NRA:

- a. Description of the critical network failure
- b. Geographic scope of the emergency roaming area
- c. Estimated duration of the disruption
- d. Impacted network nodes
- e. Estimated number of affected subscribers
- f. Estimated traffic volume to be re-routed
- g. Identification of any other operators providing emergency roaming

Once emergency roaming services were established, subscribers from Operator A were temporarily allowed to roam on the Operator B mobile network, making voice calls, sending text messages, and reaching emergency services, even though they are not subscribers of Operator B. Broadband mobile services were not provided due to traffic congestion.

Subscribers from Operator A did not need to make any action to roam on the Operator B mobile network. Mobile devices subscribed to Operator A that previously showed "no services" automatically connected to the Operator B network once the emergency roaming service was requested by Operator A. In addition, subscribers from Operator A did not pay roaming charges during the emergency period.

Once Operator A restored its damaged network infrastructure and normal services were resumed, the Emergency Roaming Service Agreement was deactivated and mobile devices from Operator A automatically reconnected to their home network, ending the roaming service without any intervention from the end user. Both, Operator A and Operator B, submitted final reports independently to the NRA detailing the timing, duration, and effectiveness of the emergency roaming service implementation.

Reports provided information as much as detail as possible and were submitted within 60 days after Operator A had restored its network to normal operating conditions and the emergency roaming service had ended.

As a result of the roaming agreement, temporary roaming ensured the continuity of essential communications such as voice and text SMS messages during and after the earthquake and until the affected operator restored its mobile network infrastructure.

### **Scenario 2: No activation of national emergency roaming service**

Operator A and Operator B do not have an emergency roaming service agreement to enable temporary domestic roaming access for subscribers of either operator on the network of the other operator.

Following a major flood that affected the southern region of the country, several mobile base stations operated by Operator A were disabled. Power outages and damaged backhaul links prevented Operator A from restoring service quickly. In the same region, Operator B still had functioning infrastructure to provide coverage and services to its own subscribers.

Because there was no pre-established emergency roaming service agreement and no regulatory obligation requiring operators enter into such agreements, subscribers of Operator A were not permitted to use the Operator B mobile network, (*i.e.*, the Operator B network authentication system rejects SIM cards from Operator A mobile subscriber devices). As a result, affected users' phones displayed "no service," even though another mobile network was available in the affected region.

From the end user's point of view, there is nothing they can do to restore connectivity from their mobile device. Manually selecting another network does not work, voice calls, text messages, and access to emergency services was unavailable through the Operator A mobile network.

Operator B continued to operate normally attending its own subscribers, while Operator A works to repair its infrastructure in the affected region. Only once the Operator A network was restored, hours or days later, its subscribers regain mobile service. The absence of emergency roaming agreements means that network outages affect users unevenly and that available infrastructure cannot be used to maintain basic connectivity during the disaster.

This scenario illustrates how, without emergency roaming arrangements or regulatory provisions, mobile service continuity during natural hazards depends entirely on the resilience of each individual network rather than on shared use of available infrastructure.

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ISBN 978-92-61-42271-4



Published in Switzerland  
Geneva, 2026