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Interconnection, Infrastructure Sharing and Mobile National Roaming Instructions

Report for Zain Jordan on public consultation document

15th October 2024

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1. Executive summary

1.1 Introduction

Zain Jordan has asked us to comment on the TRC's Consultation Document on Interconnection, Infrastructure Sharing and Mobile National Roaming Instructions. In Zain's view it is essential, in each of these Instructions, to strike the correct balance between pro-competitive ex-ante regulation, where justified, and allowing commercial arrangements to prevail where there are no competitive concerns.

There are aspects of each of these three draft Instructions which Zain hopes the TRC will re-consider in the light of our feedback, presented in this document. After this Executive Summary, we present our feedback on each Instruction in a separate part of this document. Part I deals with the Interconnection Instruction, Part II with the Infrastructure Sharing Instructions and Part III with the Mobile National Roaming Instructions.

1.2 Part I: Interconnection

Local Unbundling Access Services (LLU and VULA) and Bitstream Unbundling Access Services should be removed from these draft Instructions and made subject of separate Instructions. IXP and Private Peering should also be removed from the new draft Instructions. These removals would hardly change the draft at all, as these services get a very brief mention. Furthermore, the new draft contains no 'Instructions' as such about these services.

It should be made clear that amendments to the list of service categories in Annex C should only be done after due consideration, for example as part of a market review process subject to public consultation.

The provisions of Section 2 ("General rules applicable to all Licensees") should either be removed or transferred to Section 3 ("Rules applicable to Designated Licensees"). Furthermore, it should be made clear for the avoidance of doubt that the rules set forth in Section 3 apply to Designated Licensees only in markets in which they have been designated as dominant.

Paragraph 40 as drafted is ambiguous, and leaves open to misinterpretation whether such "bundling" is allowed inside any one of the 10 services categories in Annex C. For example, it would be reasonable for Bitstream Unbundling Access Services to be sold with obligatory bunding of Bitstream Handover. A solution might be to introduce "Service Category" as a defined term, as per its meaning in Annex C, and to amend Paragraph 40 accordingly.

Technology neutrality (Paragraph 12) is consistent with the idea of "IP-based services" introduced in the proposed draft Instructions. It is a generally accepted concept in telecoms regulation. However, for the avoidance of doubt, the draft should be amended to make it clear that this doesn't (for example) give a Designated Licensee grounds to provide a wholesale service different to the one requested (for example to fulfil VULA orders as Bitstream, or to offer fixed wireless access instead of wireline).

1.3 Part II: Infrastructure sharing

The Infrastructure Sharing Instructions should be reduced in scope to apply only to infrastructure that has been the subject of a determination in a market review process. This would apply to fixed network infrastructure such as ducts and poles in the market for wholesale broadband access (WBA). However it would not apply to any mobile infrastructure because no mobile infrastructure has been the subject of such a determination and there are no Designated Licensees in any mobile market, other than call termination and SMS termination.

The mobile market in Jordan continues to be highly competitive and 99.9% of the population has mobile coverage. Data usage in the market continues to grow rapidly and the operators have taken on population and area coverage targets for 5G.

Given the status of the market, mandatory *mobile* infrastructure sharing will not achieve the TRC's stated objectives for the proposed Instructions. The mobile market already benefits from fair, and intense, competition, as well as benefitting from substantial investment in networks and infrastructure. The market review process that the TRC conducted determined that some infrastructure in the WBA market should be shared to remedy competitive concerns, but there was no equivalent determination in any of the mobile market reviews. Furthermore, there are no Designated Licensees in the mobile market (other than in the call and SMS termination markets). There is therefore no regulatory basis for mandatory infrastructure sharing in mobile networks.

International experience shows that infrastructure sharing is effective when based on commercial agreements. The mobile operators already engage in infrastructure sharing through bilateral commercial arrangements – for example Zain's towers were host to **NO** sites of other mobile network operators (MNOs) prior to their sale to TASC Towers. Furthermore, Zain has sold its towers to TASC Towers, a tower company (partly owned by Zain Group). TASC Towers makes towers available on a commercial basis to other Licensees. The ready availability of towers from TASC Towers ensures that all operators can benefit from towers without having to replicate the asset, so towers will not be a bottleneck.

There are numerous aspects of the proposed Instructions that are burdensome to the owning licensee and there are other aspects that are potentially impractical. The prescribed negotiation process, the requirement to undertake feasibly studies for each sharing request, and the ability of the TRC to adjust the sharing arrangements are all unsuitable for infrastructure that has not been determined to be a competitive concern in a market review.

Some of the provisions of the proposed Instructions will apply only to Designated Licensees. The Instructions should make it clear that these provisions only apply to Designated Licensees in the relevant market in which the infrastructure in question was determined to be a competitive concern.

1.4 Part III: National roaming

The TRC has not demonstrated that the introduction of mandated national roaming in Jordan is required. The Jordanian mobile market is mature, with three well-established operators that have achieved widespread coverage (over 99% of the population). The TRC's 2020 market review found no significant competition issues, making regulatory intervention in national roaming unnecessary. National roaming, if mandated, could lead to adverse consequences, such as reduced incentives for network investment and innovation, harming both the competitive landscape and service quality.

Mandating national roaming will reduce the likelihood of existing operators investing in network expansion and upgrades, as they will know that others can simply access their network without making similar investments. At the same time, operators relying on national roaming will have little incentive to build their own networks, leading to slower development of next-generation technologies like 5G. This would negatively affect Jordan's technological progress and hinder the country's potential economic and social benefits from advanced connectivity.

By allowing one operator to piggyback on the network investments of others without corresponding investments, mandated national roaming risks distorting competition. Operators like Zain, who have made significant financial commitments to achieve universal coverage, will bear the costs, while others may benefit without comparable investments. This could lead to a reliance on existing infrastructure rather than promoting fair competition through innovation and network differentiation.

Global best practice in regulating national roaming suggests that it should only be considered in cases of market failure, such as when a new entrant needs temporary support to build its own network, or when the spectrum licensing framework is regional. In the rare cases where national roaming has been implemented, this has been done on a temporary basis, with clear sunset clauses to ensure the long-term sustainability of network investments. Jordan does not face the conditions that have prompted other markets to introduce such regulations, and its mobile market does not require national roaming to remain competitive.

The TRC should allow commercially negotiated agreements between operators to govern national roaming. Such agreements provide the flexibility to adapt to market dynamics and ensure fair compensation for network usage. If mandated, it should be temporary and limited to operators who demonstrate a commitment to investing in their own networks. Pricing should also be left to commercial negotiation rather than regulatory controls, as seen in most international examples.

In conclusion, mandating national roaming in Jordan's highly competitive and mature market could lead to unintended consequences, including reduced investment, lower service quality, and diminished competition. A market-driven approach can support continued innovation and network development, while also allowing national roaming on market-driven terms.

2. Part I: Interconnection instructions

2.1 Introduction: Interconnect

The new draft proposed Interconnect Instructions document conserves large parts of the existing Instructions. For example, the texts regarding dispute resolution, arbitration, general provisions, management of interconnection, illustrative outline of the RIO, interconnection billing process, definitions and preamble (representing around 20 pages, around a third of the existing Instructions) are basically identical. The parts covering technical aspects of interconnection of public switches, existing interconnection services, remaining interconnection processes (accounting for just under 30 pages, almost half of the original text) contain relatively few drafting changes and rearrangements.

Therefore, remaining parts of the text containing new or significantly amended material account for a small part of the document.

Much of this new or significantly amended material is uncontroversial. For example, the recognition that voice interconnection can be IP-based (Paragraphs 8 through 10). The new Instructions say that non-discrimination should apply to all services offered by a licensee in markets where it has been designated as dominant (Paragraphs 24 through 27). This is uncontroversial, though it can be observed that this text repeats concepts already set forth in market analysis decisions by the TRC, so could be omitted from these Instructions without any impact on regulation. Paragraphs 28 to 35 contain updates and amends regarding publication and transparency which do not raise significant issues. The text regarding content (existing Paragraph 25) are slightly expanded (new Paragraphs 36 to 29), but no material issues arise out of this. A new section on Amendment is introduced (Paragraphs 41-44), which is not problematic. Material regarding charge and cost principles (Paragraphs 45-54) has been brought up to date, largely to reflect advances in the TRC's cost modelling activities. Paragraphs 76-85 broaden out the existing obligation on provision of network information. The existing requirement requires a list POIs for voice interconnection, while the proposed draft expands this to an obligation on licensee designated as dominant in certain markets to provide similar lists relevant to those markets. The new draft's Section 6.3 (Paragraphs 86-124) is an extensive text describing technical and operational aspects of 'Interconnect' as traditional/historically understood for voice calls. Some diagrams, and technical detail, have been removed or amended, but we have not seen anything of concern.

In the sections which now follow we highlight some other changes introduced, which are of concern.

2.2 Key issues: Interconnect

2.2.1 Reference Interconnect Offer (RIO) Services

The proposed draft introduces several new categories of interconnection services which are not present in the existing Interconnect Instruction:

> "***Local Unbundling Access Services*** *-The provision of unbundled access services in the local loop by one Licensee to other Licensees. This service can include Local Loop Unbundling (LLU) and Virtual Unbundled Local Access (VULA):*
>
> - ***VULA (Virtual Unbundled Local Access)*** *-The service by which a Licensee requesting that service uses a virtual connection provided by another Licensee (the VULA provider) to provide services to end-users connected to the VULA provider's access network. VULA is a form of wholesale access service in which the interconnection occurs locally at the Optical Line Termination (OLT).*

- ***Local Loop Unbundling (LLU)*** *- The LLU Service is a service where the customer's local copper loop in the Owning Licensee's network is disconnected from the rest of the Owning Licensee's network and permanently connected via a co-located Point of Access to the Requesting Licensee's network, from which services are provided to the end-user.*

[…]

Internet Exchange Point (IXP) *- a service that enables interconnection of multiple independent IP based networks*

Private Peering *- the service provided by a Licensee to facilitate the interconnection of networks so that both networks can exchange mutually agreed balanced Internet traffic between them."*[1]

IXP and Private Peering are further elaborated as follows later in Annex B:[2]

> ***"B.14 - Private Peering***
>
> *162. Private Peering is a service provided by a Licensee that facilitates the interconnection of its Network with that of another Licensee by creating a direct physical connection (usually consisting of one or more physical ports) so that both networks can exchange mutually agreed balanced internet traffic between them.*
>
> *163. Private Peering between two Licensees keeps the Internet traffic between their local networks within Jordan. Private Peering is usually based on the principle of a settlement free process meaning that neither Licensee pays the other for the exchange of traffic. However, the operator providing the Private Peering service may charge for any backhaul service that it provides to the other Licensee's point of presence.*
>
> ***B.15 -Internet Exchange Point (IXP)***
>
> *164. Licensees owning an IXP should provide peering at the IXP services to other Requesting Licensees."*

These above-mentioned new service categories are specified very briefly – the only text which refers to them is what we have cited above. The new draft Instruction does not provide any additional definition or specification of these new service categories. Furthermore, the new draft reduces the amount of definition or specification for an existing service, Bitstream Unbundling Access Services, which now receives a mention as brief as that accorded to Local Unbundling Access Services, IXP and Private Peering. This brevity is rather unusual by international standards, especially in view of the much higher level of detail carried forward virtually unchanged from the existing Instruction regarding Interconnection as it has been traditional/historically understood for voice calls.

The lack of detail on the above-mentioned new services makes it premature for them to be included in the new draft Instructions. The scope of the new draft could perhaps be expanded to cover other types of reference offer which are not Reference Interconnection Offers (RIOs), such as Wholesale FTTx Access Reference Offers (RO). However, it would be better for other types of ROs to be made the subject of separate Instructions. In other words, Local Unbundling Access Services (LLU and VULA) and Bitstream Unbundling Access Services should be removed from these draft Instructions and made the subject of separate Instructions.

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[1] Proposed draft Interconnect Instruction, Annex B, Paragraph 127, Page 25.

[2] On Page 32

Such separate Instructions would fit better with the TRC's market analysis process. The TRC's process imposes different remedies on Designated Licensees in specific markets. Each 'transparency' remedy, requiring the production of a Reference Offer, will be specific to the market in which it arises. For example, the Reference Offer stipulated for the wholesale broadband access (WBA) market[3] is totally distinct from the Reference Interconnect Offer required for the Wholesale Fixed Voice Call Termination market and the Wholesale Fixed Transit market.[4] The two types of reference offers are very different documents, because of the fundamental technical differences between the categories of service offered in each market.

Separate Instructions would also fit better with typical practices of electronic communications regulators in other countries. In other countries it is usual for Bitstream, VULA and LLU to be covered by a reference offer (or indeed sometimes several reference offers) distinct from the RIO.

It is not usual by international standards to require reference offers for internet exchange points (IXPs) or Private Peering. Some IXPs already publish prices,[5] but we understand this publication is voluntary, that is, IXPs are not required to do so to under electronic communications regulation. If the TRC views it as necessary to require pricing transparency from IXPs or providers of private peering, that should be implemented via market analysis or via the licensing regime, not introduced via these Instructions. We note that the TRC has already acted separately to regulate IXPs,[6] so pricing transparency requirements, if any, would belong in those separate regulations. Therefore, IXP and private peering should be removed from the new draft Instructions. As noted above, such removal would hardly change the draft at all. Furthermore, the new draft contains no 'Instructions' as such about these services.

We note that the TRC is proposing itself to have total discretion to amend its list of service categories.

> "*125. […] Further services may be introduced and defined by the TRC at any time as deemed necessary.*
>
> *126. The TRC, from time to time, may amend this Annex separately and not as part of a review of the complete Instructions*".[7]

Such discretion is not in line with typical practice in other countries, nor with the TRC's own market analysis process. Amendments to the services should only be done after due consideration, for example as part of a market review process subject to public consultation.

2.2.2 Obligations on non-dominant players

Paragraphs 12-23 appear to be a set of new and potentially intrusive/burdensome obligations on non-dominant players. For example, the proposed draft contains a new obligation of non-discrimination for non-dominant licensees, not present in the existing instructions.

> "*14. All Licensees, upon receipt of a reasonable request from another Licensee, should enter into good faith negotiations to conclude an Interconnection Agreement. Licensees should meet all reasonable requests for Interconnection Services and shall adhere to non-discrimination between Interconnect Services they provide to their own business units and affiliates, and those they provide to other Licensees*".

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[3] TRC, 'Regulatory Decision on the Fixed Markets Review', 30th September 2020. Section 1.3.

[4] TRC, 'Regulatory Decision on the Fixed Markets Review', 30th September 2020. Sections 3.3 and 4.3.

[5] See, for example, https://www.ams-ix.net/ams/pricing and https://www.linx.net/services/service-fees/.

[6] TRC, 'IXP Instruction', 31st January 2021.

[7] Proposed draft Interconnect Instruction, Annex B, Page 24.

Non-dominant licensees have to demonstrate that their prices are "economically reasonable" (Paragraph 15(b)).

There is a new 'obligation to serve' for non-dominant licensees:

> *"16. Every Licensee shall offer, and has the right to receive, Interconnection Services under transparent, fair and non-discriminatory terms and conditions, and in a timely manner."*

It is worth noting that these proposed draft Instructions do not refer only to 'Interconnect' as traditional/historically understood for voice calls. These draft Instructions are intended to apply to all the services in Annex C, that is to say: Traffic Conveyance Services; Transport Service; Collocation and Infrastructure Sharing Services; Operator Services; International Gateway Access Services; Billing and Collection Services; VULA (Virtual Unbundled Local Access); Local Loop Unbundling (LLU); Bitstream Unbundling Access Services; Internet Exchange Point (IXP); Private Peering.

Non-discrimination, "economic reasonability", obligation-to-serve (etc) should only be imposed on licensees found to be dominant in specific markets, i.e. Designated Licensees. Section 2 ("General rules applicable to all Licensees") as currently drafted risks kicking off a series of time-consuming misunderstandings regarding the obligations of licensees in markets where they are not dominant and have not been identified as such by the market review process.

The stipulations of Section 2 might be appropriate for Traffic Conveyance Services, because each provider of voice termination is, in effect, dominant in the market for termination on its lines/mobiles. However, applied to the whole range of Annex C services, this represents excessive regulation on non-dominant players. Furthermore, it is unnecessary even for Traffic Conveyance Services, because obligations in that market arise, in any case, out of a dominance designation.

The provisions of Section 2 ("General rules applicable to all Licensees") should either be removed or transferred to Section 3 ("Rules applicable to Designated Licensees"). Furthermore, it should be made clear for the avoidance of doubt that the rules set forth in Section 3 apply to Designated Licensees only in the markets in which they have been designated as dominant.

2.2.3 Wholesale service "bundling" (tying)

The proposed new draft's Section 3.4 (Paragraph 40) potentially limits the Designated Licensees' commercial freedom:

> *"40. Designated Licensees may not render the provision of individual Interconnection Services conditional on their bundling with separate interconnection, access or other services that are not requested by the other Licensee".*

A hypothetical case of such unwanted bundling might be the insistence by a Designated Licensee that a Licensee buying Local Unbundling Access Service (the final drop to the customer) also buys Transport Service (unnecessary backhaul to some higher network level stipulated by the Designated Licensee). However, such a risk would typically be addressed in the corresponding Reference Offer. For example, in Europe, the equivalent of a Designated Licensee in a wholesale local access market is typically required to offer access and backhaul separately. However, we are not aware of countries which stipulate this kind of prohibition as a general term applied to all potential combinations of wholesale service categories.

In any case Paragraph 40 as drafted is ambiguous, and leaves open to misinterpretation whether such "bundling" is allowed inside any one of the 10 services categories in Annex C. For example, it would be reasonable for Bitstream Unbundling Access Services to be sold with obligatory bunding of Bitstream Handover. A solution might be to include "service category" in the definitions as per its meaning in Annex C, and to amend Paragraph 40 accordingly.

2.2.4 Technology neutrality

The proposed draft stipulates "Technology neutrality".

> "*12. All Interconnection Services shall be provided in a technology neutral manner. […]*".

As far as we know, this concept was not present in the existing Instructions. Technology neutrality, a generally accepted concept in telecoms regulation, is consistent with the idea of "IP-based services" introduced in the proposed draft Instructions. However, for the avoidance of doubt, the draft should be amended to make it clear that "technology neutrality" does not (for example) give a Designated Licensee grounds to provide a wholesale service different to the one specified (for example to fulfil VULA orders as Bitstream, or to offer fixed wireless access instead of wireline).

2.3 Other comments

Paragraphs 8 through 10 introduce "IP-based services" as a new concept which is not present in the existing Instructions. From the wording (e.g. "circuit-switched"), it is apparent that this is about 'Interconnect' as traditional/historically understood for voice calls. This is fine, though for the avoidance of doubt, it would be good to amend the draft to make it clear these Paragraphs 8 through 10 apply only to "Traffic Conveyance Services" in the market for fixed voice calls termination.

Paragraph 12 says "*these Instructions apply to all relevant current and future technologies and networks*". This phrase seems out of place. It refers to the "Instructions" (presumably, the whole of Section 1) but it is inside a paragraph about technology neutrality. It is not clear what is intended on this point, so it can be deleted.

Paragraph 54 says "*Designated Licensees shall publish the charges as annexes to their RIOs*". This paragraph is present in the existing Instruction, at Paragraph 275. Notwithstanding, it should be amended, for the avoidance of doubt, to note that there is no obligation on licensees to publish prices which are commercially negotiated or not regulated, i.e. which have not been specified as a required product in a market analysis decision and costed via the corresponding TRC cost model.

Paragraph 125 says: "*This annex defines the categories of Interconnection Services* ***and provides Instructions for the provision of the services***" (emphasis added). However, the "instructions" are not present. This absence of instructions serves to reinforce our point that access services in the WLA market should be removed for this draft and made subject to separate instructions.

Paragraph 206 says "*The Designated Licensees shall define their bitstream unbundling provisioning procedures in their RIOs*". However, this is in a Section C5 titled "Wholesale Broadband/Local Access Service Processes". It is a minor point, but for completeness it seems Section C5 needs to be checked for terminological consistency.

2.4 Conclusions

The new draft proposed Interconnect Instructions conserves large parts of the existing Instructions and makes acceptable amendments to other large extensions of the text. In the preceding sections we highlighted a subset of the remaining text which does raise issues, in the areas of Reference Interconnect Offer (RIO) Services; obligations on non-dominant players; wholesale service "bundling" (tying); technology neutrality; and others.

3. Part II: Infrastructure sharing instructions

3.1 Introduction: Infrastructure sharing

Infrastructure sharing is widely regarded as an important part of a strong competitive telecommunications market, and it is our understanding based on information provided by Zain that sharing in mobile networks is already becoming established in Jordan through commercial arrangements that are functioning well.

The TRC consulted on Instructions for Telecommunications Network Facilities and Infrastructure sharing and National Roaming in 2019. In its 2019 response Zain highlighted some of the potential drawbacks of infrastructure sharing and noted that there was already an intensely competitive market for mobile communications in Jordan. Zain also pointed to the international use of commercial agreements to achieve infrastructure sharing.

On the question of infrastructure sharing, (we will cover national roaming in Part III) international experience suggests that Infrastructure sharing in mobile networks is best achieved through commercial agreements. Whilst infrastructure sharing is important to reduce the costs and investment required, there is no need to mandate infrastructure sharing in mobile networks because commercially negotiated infrastructure sharing works well, and because there are no competition concerns in the mobile market (other than for termination services). Mandated infrastructure sharing would risk damaging the market for infrastructure sharing that has developed and continues to develop.

Since the 2019 consultation on infrastructure sharing there have been several beneficial changes in the market, including:

- The TRC concluded its market review process in 2020, which determined that infrastructure and facilities in certain parts of the fixed market should be made available to other Licensed Operators on request, but no such determination was made for any mobile market
- The use of infrastructure sharing between mobile network operators (MNOs) has increased, and in 2023 Zain's towers were acquired by TASC Towers, a tower company (partially owned by Zain Group) which now makes them available to all Licensed Operators on a commercial basis
- 5G licences have been issued, with MNOs taking on demanding coverage obligations and launching service in 2023
- The market remains highly competitive, and the services have evolved to 4G/5G services with higher than ever level of usage of data services (**NO** GB/user/month) at highly competitive prices.

Given these developments, mandatory infrastructure sharing for mobile infrastructure is not required – in particular, the most commonly sought mobile infrastructure for sharing, the towers, are now available commercially to all Licensed Operators.

In the remainder of this section we will discuss changes in the market, the determinations of the TRC's market review process and other factors that suggest that the scope of mandatory infrastructure sharing should be limited to infrastructure that has been the subject of a determination in a market review, and limited to the relevant Designated Licensee.

3.2 The market for infrastructure sharing in Jordan

The mobile market in Jordan is characterised by intense competition between three operators, each of which has built extensive network coverage. Zain's network coverage consists of 99.9% of populated

areas and the other two mobile operators have similar levels of coverage. Zain also provides dedicated indoor coverage at many malls, hospitals, universities, government institutions and other high traffic locations.

Each of the MNOs has built its own network, using a combination of infrastructure that it has constructed and the infrastructure of other MNOs, which is made available through bi-lateral commercial agreements.

The mobile market has been characterised by waves of investment as a succession of technologies have been introduced. The high-capacity 4G/5G data networks that each MNO operates today bear little resemblance to the 2G networks that Zain and other MNOs originally launched – the technology, the spectrum and the number and type of cell sites used for mobile have all changed dramatically to support the shift from voice to data, together with the continuing growth in data.

In the early years of network construction, Zain built its own towers to provide mobile coverage, as did the other MNOs. However, as the market for mobile services has developed so has the approach to infrastructure. It is no longer practical for an MNO to build entirely its own infrastructure for its exclusive use. The requirement for coverage together with increasing site density to serve ever-growing capacity requirements means that increasingly MNOs, by necessity, must share infrastructure.

Zain and the other MNOs have, for some time, been accessing each other's sites on a commercial basis. For example, **NO** sites of other MNOs were collocated on the towers of Zain, prior to the sale of those sites to TASC Towers in 2023.

In addition to the MNOs using each other's tower infrastructure, there are also commercial infrastructure providers in the market whose role it is to provide infrastructure on a commercial basis to Licensed Operators. When TASC Towers purchased Zain's towers in 2023, it created the first commercial tower company in Jordan. Its role is to provide towers on a commercial basis to all operators in the market that have a requirement for cell sites, or similar radio sites.

In short there is a developing market for infrastructure sharing between MNOs directly and for shared infrastructure provided by a company that was specifically established to facilitate such sharing on a commercial basis.

Zain has been a prime mover in the increased use of infrastructure sharing in Jordan in recent years and has embraced the concept of infrastructure sharing on a commercial basis to greatly reduce the cost of expanding the network, both for coverage and for increased cell density to provide high capacity 5G services.

3.3 The 2020 market review process

In 2020 the TRC completed a market review process of both mobile markets and fixed markets. In mobile the TRC considered:

- A retail mobile market
- A wholesale mobile voice call termination market
- A wholesale mobile SMS termination market
- A wholesale market for mobile access and voice call origination.

Of those four markets, only the two termination markets (voice calls and SMS) were found to be susceptible to ex-ante regulation, meaning that they have high and persistent barriers to entry, lack of dynamic trends to competition and that ex-post intervention alone would be insufficient. The MNOs were each designated as dominant only in the markets for mobile voice termination and mobile SMS termination on their own networks, but not in any of the other markets analysed by the TRC.

In the fixed market, the TRC undertook market reviews on the following product markets:

- A retail fixed access and call origination (FACO) market
- A retail broadband market
- A wholesale local access market
- A wholesale broadband market
- A wholesale fixed voice call termination market
- A single wholesale fixed voice call origination market, and
- A single wholesale fixed transit market.

Of these, the following markets were found to be susceptible to ex-ante regulation, with a Designated (that is to say, dominant) Licensee in each market (more than one in call termination):

- Wholesale local access
- Wholesale broadband access
- Wholesale fixed voice call termination
- Wholesale fixed voice call origination
- Wholesale fixed transit, and,
- Retail fixed access and call origination (FACO).

In order to remedy the identified competition problems, the TRC determined that a series of ex-ante obligations would be required. These included, for the Designated Licensee in Wholesale Local Access (WLA):

- *"Access upon reasonable request by another Licensee to all products and associated facilities that fall within the market for wholesale broadband access (WBA), including (but not limited to) Civil Engineering Infrastructure (CEI), such as poles and ducts, as well as (when access to CEI is unavailable for economic, technical or capacity reasons) dark fibre, if it is reasonably available".*

The above determination was accompanied by a wide range of further ex-ante remedies that were required of the Dominant Licensee in various fixed markets.

It has therefore been determined by the TRC, following a review of relevant markets for fixed services there is a requirement for Designated Licensees to make infrastructure available upon request from another Licensee. No similar determination was reached in the review of the mobile markets, despite a similar market review process having been undertaken.

3.4 The ability of mandatory infrastructure sharing to meet the TRC's stated objectives

In its consultation on the Infrastructure Sharing Instructions, the TRC sets out a number of objectives that it seeks to achieve with the Instructions. These are:

a. Achieve an enabling policy and regulatory framework conducive to infrastructure sharing
b. Enhance consumer choice in terms of price, quality and availability of services
c. Promote fair competition through the sharing of Telecommunications Network Facilities which are not easily replicable
d. Encourage efficient investment in infrastructure and avoid wasteful replication of infrastructure through reducing the inefficient and unnecessary duplication of existing Telecommunications Network Facilities
e. Improve resilience, quality of service, and accelerating coverage for areas where the coverage costs for a single Licensee deployment is high (often rural areas).

Although the TRC's document sets out the above objectives, it does not explain how the objectives are facilitated by the proposed Instructions. In Aetha's analysis, the Instructions will not advance any of the above objectives, given the prior availability of commercial infrastructure sharing, and they could be counter-productive to some of the objectives. We discuss four of these objectives in the sections below.

3.4.1 Promote fair competition through the sharing of Telecommunications Network Facilities which are not easily replicable

Competition in telecommunications may be facilitated by providing access to facilities that are not easily replicable. However, in the case of the mobile networks in Jordan, it does not appear that the TRC has established that there are any 'bottleneck' facilities that are not easily replicable. The market review of 2020 did not find any such 'bottleneck' facilities in the mobile networks, despite identifying them in the fixed network Wholesale Broadband Access (WBA) market, where it recommended ducts and poles, or alternatively, dark fibre, be made available by the Designated Licensee to other requesting Licensees.

As we have discussed above, the mobile operators already make infrastructure available to each other on a commercial basis. Furthermore, there are commercial entities that have been set up solely to make infrastructure such as mobile towers available to third parties. Tower companies, such as TASC Towers, have a commercial incentive to make the infrastructure they own and control available to as many such third parties as possible. It is quite common for tower companies to host three or more MNOs on a mobile tower in popular locations. Because TASC Towers owns the former Zain towers, it can make towers available to other Licensed Operators in most locations where they might be required. For this reason, it seems unlikely that towers, or mobile sites in general, are difficult to replicate or in any sense an economic bottleneck in Jordan – they are readily available.

Because infrastructure, such as towers to support mobile network deployment, is readily available on commercial arrangements throughout Jordan, no improvement in mobile competition would result from implementing the proposed Instructions. On the contrary, the chilling effect of mandatory tower sharing can be expected to slow down investment with a consequent negative knock-on impact on competition.

3.4.2 Encourage efficient investment in infrastructure and avoid wasteful replication

The TRC's concern that infrastructure should not be duplicated in a wasteful manner, and that efficient infrastructure investment should be encouraged, is legitimate. Zain's actions in selling its towers to a tower company is to facilitate maximum re-use of the tower infrastructure is precisely the type of action that helps minimise such wasteful duplication.

We understand that, by making towers available commercially, in Zain's case through a tower company, Zain intends to prevent inefficient duplication of infrastructure whilst also allowing those who deploy infrastructure to get a return on that infrastructure.

Because the current tower sharing arrangements are commercial, rather than mandated, there is no disincentive to develop new infrastructure. An operator, or tower company, that develops infrastructure can make that infrastructure available on terms that provide a return on the investment while also being attractive to the Licensee seeking to use the infrastructure. Commercial arrangements of this type are the rule, not the exception, in mature markets for mobile communications.

Based on our understanding, the current industry arrangements, and in particular the establishment of a commercial Tower Company, effectively prevent the wasteful duplication of infrastructure without disincentivising expenditure on new infrastructure. A mandatory sharing arrangement, even if it reduced

wasteful duplication, can be expected to have the unintended effect of disincentivising infrastructure investment.

3.4.3 Improve resilience, quality of service, and accelerating coverage for areas where the coverage costs for a single Licensee deployment is high (often rural areas)

Increasing the degree of sharing of infrastructure can either increase the resilience of the network to faults or decrease it, depending on type of fault. For example, at a shared site, if the base station equipment of one MNO fails, the base station of other operators may continue to operate normally, so resilience has been improved compared to a case where only one MNO was present in the location.

However, if the shared facility itself is lost, then all operators' sites in a location might fail at the same time – which would not occur if they used their own, non-shared, facilities in that location. In such a case, the resilience to faults of the combined networks has been reduced. Consider, for example, a failure in the grid power supply to a tower. All sharers on the tower would lose power and, once the backup batteries were drained, all of the MNO base stations on that tower would stop working at approximately the same time. Similarly, if all operators were sharing dark fibre on the same cable, they would all fail at the same time if the cable was cut.

The sharing of facilities is therefore neutral at best in promoting increased resilience. The increase of network resilience would be better addressed head-on by each operator through network design, by providing diverse transmission routes, high-capacity battery back-up, redundant equipment with failover and by having a sufficient network density that the loss of a single site is limited in its effect.

3.4.4 Enhance consumer choice in terms of price, quality and availability of services

As noted above, Jordan already enjoys a very high availability of services, with coverage well above 99% of the population. The market is competitive and as a result the prices are highly competitive, and the quality of the services is high.

Where operators need to share infrastructure to maximise service availability, this is already achieved either through direct operator-to-operator arrangements or via one of the commercial entities that exist to share outdoor and indoor infrastructure.

Although elimination of duplication might allow for lower costs, allowing in turn the potential for lower prices, the industry appears to be achieving this through the current commercial initiatives.

In conclusion, the objectives of the TRC, in terms of the outcomes for the mobile market and mobile subscribers, are already being achieved and will continue to be improved further now that the former Zain towers are being commercialised by a tower company.

3.5 Scope of infrastructure sharing

The draft Instructions contain a very wide scope of infrastructure, spanning both fixed and mobile networks:

a. telecommunications Sites, including but not limited to land, space and access to such Sites;
b. masts, towers, poles, antenna structure and other similar structures used on a Site;
c. space, buildings, shelters and rooms on a Site, including access to such Site;
d. utilities required for the operation of the Site, including but not limited to power, cooling, fire protection and earthing;

e. rights of way, trenches, and
f. dark fiber, cable access, including but not limited to ducts, routes and trays

An intervention of this type should be based on the findings of a market review and should be focussed on solving specific competitive issues that have been identified in the market review. As we noted in Section 3.3, the 2020 fixed market review did result in a determination that products and facilities that fall within the market for wholesale broadband access (WBA) should be made available upon the reasonable request of another Licensee, which includes ducts, poles and dark fibre. Based on that review and determination, it is appropriate for the TRC to issue sharing instructions for those fixed network facilities that are required for WBA.

However, the 2020 mobile market review did not reach any equivalent determination relating to facilities in the mobile market. It therefore appears to be unnecessary to introduce infrastructure sharing instructions for mobile, particularly as the industry is already sharing infrastructure on a commercial basis. Given that the market reviews for mobile markets did not highlight any competitive concerns (other than for call and SMS termination) there is no logical reason, and no basis in the regulatory process, for mandating sharing of mobile infrastructure.

Given the regulatory approach in Jordan and the market review process that has been undertaken we would expect any Instructions on infrastructure sharing to be restricted to infrastructure that has been determined to be required for sharing to resolve competitive concerns in a market review. Presently that would be limited to facilities that fall within the market for WBA, which would include ducts, poles and dark fibre in geographic areas where there is insufficient competition to supply such facilities. It would not include masts, towers or mobile telecommunications sites in general.

The scope of any infrastructure sharing Instructions should be limited to tangible infrastructure that the Owning Licensee can share (subject to a market review and the licensee being a Designated Licensee, as noted above). Article 13e includes rights of way, which are not tangible items of infrastructure. The rights of way are granted to licensees by the TRA as described in the Instructions for the use of scarce resources, issued in 2008. The TRA can directly grant equivalent rights of way to other licensees and so there is no need for the concept of sharing a right of way. Rights of way should therefore be removed from Article 13e.

3.6 The roll out obligations of the mobile network operators

Each of the mobile operators in Jordan has taken on rollout commitments. There were rollout commitments in Zain's 3G licence, and there are commitments in Zain's 5G licence to cover both population and area types over the first 3, 4 and 9 years.

Zain's licence commits it to 50% coverage within 4 years and to continue increasing coverage to hit 75% population coverage by 9 years from the spectrum licence being issued. Furthermore, there is a commitment to cover dense city centres, industrial and commercial zones within the first three years.

Zain will achieve the 5G coverage objectives using its own network, and significantly using infrastructure that it originally built, but has now commercialised through sale to TASC Towers, as well as towers that it has had purpose-built by TASC for its own requirements ('Build to Suit' towers).

In Zain's case, the towers that Zain has built and will have built on its behalf to hit the coverage obligations will be commercially available to other Licensed Operators through TASC towers. If another Licensed Operator wishes to make the same investment as Zain in providing coverage, the tower infrastructure it requires will be available on a commercial basis via TASC towers.

3.7 Zain's investment in digital infrastructure and support of the digital economy

The Government of Jordan has an ambitious policy for the development of a digital economy, which is set out in the General Policy for Telecommunications, Information Technology and Postal Sectors 2018 (the Policy). The primary goal of the Policy is to use the development of a digital economy as a route to renewed economic development and wealth generation.

The Policy (paragraph 25) aims to encourage licensed telecommunications operators to deploy infrastructure and develop the services needed to support the vision for delivering the digital economy. In Paragraph 27 the Policy highlights the importance of telecommunications operators and service providers generating a rate of return on investment that will encourage network investment. The Policy therefore both acknowledges the importance of investment in telecommunications infrastructure in delivering the digital economy and the importance of operators generating a rate of return to encourage that investment.

The mobile operators are at the forefront of investment in telecoms infrastructure. Zain and the other mobile operators have taken on substantial obligations to roll-out 5G networks and Zain is committed to investing the necessary capital expenditure to do so. This investment in 5G directly supports the objectives of the Policy and will be a key component in delivering the services required to enable the digital economy. Furthermore, because of the high coverage levels of mobile networks, the investment also supports the Policy objective of serving the underserved.

Zain invests a substantial amount in its network (between JOD**NO**m and JOD**NO**m each year from 2012 to 2023) to achieve the roll-out of 5G and the delivery of 5G and other network services. As a commercial operator, Zain has to be able to earn a reasonable return on that investment, as recognised in the Policy.

Any regulatory developments that threaten to reduce Zain's return on investment by requiring Zain to share its infrastructure, or its network, on any basis other than fully commercial terms is likely to put continued investment at risk. In particular, if a regulated price for infrastructure sharing was set that allowed for further market entry by players that could offer equivalent services to Zain, but without making similar investments to Zain, then Zain's ability to earn a fair return on investment would be fundamentally compromised. In such circumstances there would be a chilling effect in investment in the mobile telecommunications sector, reducing its ability to contribute to the development of the digital economy.

By allowing infrastructure sharing to continue on fully commercial terms, Zain and other mobile operators have the ability to gain the cost advantages of sharing infrastructure while ensuring that they do not strike deals that undermine their ability to earn a return on investment, thereby protecting that investment and supporting the Policy.

3.8 Practical aspects of mandatory infrastructure sharing

Several aspects of the proposed Instructions appear likely to give rise to practical implementation problems – either imposing too high a burden on the owning Licensed Operator for such a wide scope of infrastructure, or being unworkable, or both. We comment on each of these below.

3.8.1 The use of a RIO for mandated facilities sharing

The production of Reference Offers (ROs) has usually been associated with interconnect services and related services that are regulated based on a market review. As noted above, there has been no market review that determined that mobile infrastructure should be mandated to be made available.

Requiring a RO for infrastructure, without a market review determining that the infrastructure should be made available, imposes an unreasonable burden on the owning Licensed Operator. The use of a RO is also counter to our view, and international experience, that sharing of mobile infrastructure is best done through commercial agreements.

3.8.2 Sharing agreement negotiating procedures

The negotiating procedure put forward is too prescriptive and is likely to be burdensome to the owning Licensee and in some respects impractical. As with the requirement to publish in a RIO, this type of requirement should be limited to infrastructure and facilities that have been the subject of determination in a market review process.

Mandating this negotiating procedure and associated timelines for the broad scope of Infrastructure included in the draft Instruction can be expected to lead to considerable costs for the owning licensee. In particular:

- the production of a feasibility report each time a request form is submitted will lead to substantial extra costs
- the completion of a Sharing Agreement within 60 days does not correspond to the timescales of a commercial negotiation in the real world.

3.8.3 Redevelopment and alteration of telecommunications network facilities

The requirement to make adequate capacity and space available to other licensees for the purpose of sharing when upgrading facilities is impractical because the owning operator does not know the plans of the other licensed operators. There is a risk that owning operators can only meet this requirement by over-dimensioning facilities in the hope that there might be sharers.

The choice of the capacity of the infrastructure should be left to the commercial judgement of the party investing in the infrastructure. That party (be it a Licenced Operator, or a provider of infrastructure such as a tower company) may well decide to incorporate additional capacity for a sharer, if that infrastructure sharing is commercial. However, it would be wasteful for the owning licensee to be mandated to build capacity for sharers that ultimately may not require that capacity, going contrary to the TRC's objective of efficient investment.

3.8.4 Capacity issues

Although the TRC's draft Instructions allow for capacity to be reserved for the future plans of the owning Licensee, it is burdensome to expect the owning Licensee always to have a plan for the capacity. This places an extra requirement on an operator's budgeting and planning process, that is not necessary if the sharing is left to commercial agreements.

As with other provisions that we have mentioned above, we believe that this should only apply when the sharing is required based on a determination in a market review process.

3.8.5 Site access procedures

Site access procedures for shared infrastructure should be agreed between the owning Licensee and the sharing Licensee, as suggested by the TRC. Although it may be desirable to have 24/7 access, and access with no prior notice for unplanned maintenance, we note that in the case of mobile sites there needs to be a higher degree of co-ordination between sharers, particularly for any equipment that is in proximity to the antennas of another Licensee due to safety requirements.

The mobile operators already have procedures for access to shared sites which have been agreed on a bilateral basis.

3.8.6 Charges of sharing facilities

The concept of fair and reasonable charges, as envisaged in the draft Instructions, is aligned with the practise in several international regulatory regimes. Where infrastructure has not been identified as a potential competition concern in a market review, we expect that the outcome of a commercial negotiation meets the requirements of 'fair and reasonable'.

Only where an infrastructure has been determined as being required to be shared due to competition concerns in a market review, would we anticipate that a commercial negotiation may be unable to achieve a fair and reasonable outcome, or perhaps not achieve an outcome at all. For this reason, the TRC should only have the right to require adjustment to the charges for Infrastructure that is shared as the result of a determination in a market review.

3.9 Response to other specific points of the Instruction

Article 18, 19, 25 and 26: The requirements on Designated Licensee's in these two clauses should be modified to make it clear that the requirements apply only to Network Facilities in the market in which the are Designated Licensees.

Article 20: It is unreasonable to expect Owning Licensees to share confidential cost data with another licensee, particularly with a competitor. The cost base of an MNO is part of its competitive advantage and its competitive position could be undermined by sharing such data with a competing licensee. Part b of Article 20 should therefore be removed.

Article 24: In addition to the reasons elaborated in points a, b, and c, the Owning Licensee should also have the right to refuse sharing when the Owning Licensee does not have the legal right to allow another third party to use the facility in question. This should be added as a further point, d, in Article 24.

Article 27: The requirement to include a written declaration is unnecessary because the TRC always has the power to and authority to audit and check the conformity to law and instructions of the provision of any and all telecommunications services, and the Licensed operators always have the obligation to comply with Instructions and the law at all times.

Article 33: The requirement to prepare a feasibility study within one month is in line with Zain's feedback on the 2019 consultation that the proposed 21 days be increased. However, the procedure would be improved if there was the possibility of an extension of another month available with written justification of the owning Licensee for circumstances where the feasibility study cannot be produced in one month, for example, due to a requirement to carry out a structural survey.

4. Part III: Mobile national roaming instructions

4.1 Introduction

The adoption of mandated national roaming in Jordan, which has a mature and competitive mobile market, carries significant risks, particularly regarding the disincentives it creates for network investment. Therefore, our response to this consultation, building on Zain's previous efforts responding to the 2019 consultation on the same topic, will assess whether such obligations are necessary or beneficial to mobile consumers.

We focus on the key issues surrounding national roaming, such as its impact on investment and market competition, pricing approach, and the appropriate scope and duration of any obligations. We will also draw on international examples to demonstrate that national roaming is not mandated in most benchmark countries, and where it is regulated, this is typically done on a temporary basis to address specific market failures.

4.2 The ability of mandated national roaming to meet the TRC's objectives

As with its Infrastructure Sharing Instructions, the TRC's proposed Instructions set out a number of objectives that should be achieved through national roaming. These are defined under Article 5 of the National Roaming Instructions:

a) achieve an enabling policy and regulatory framework conducive to Mobile National Roaming

b) enhance consumer choice in terms of price, quality, and availability of service

c) promote fair competition through the sharing of Telecommunications Network Facilities which are not replicable

d) encourage efficient investment in infrastructure and avoid wasteful replication of infrastructure through reducing the inefficient and unnecessary duplication of existing Telecommunications Network Facilities

e) improve resilience, quality of service, and accelerating coverage for areas where the coverage costs for a single Licensee deployment is high (often rural areas)

f) address the concerns of the public and environmental and planning authorities over the environmental impact of multiplication of masts and towers, and

g) ensure that Mobile National Roaming between the Licensees in Jordan takes place on a fair, transparent, and economically efficient basis, for the benefits of consumers, Licensees and the overall economy.

Although the TRC's document sets out the above objectives, it does not explain how these objectives are facilitated by the proposed instruction. In the next subsections, we briefly discuss our view on each of the proposed objectives.

4.2.1 Achieve an enabling policy and regulatory framework conducive to Mobile National Roaming; Ensure that Mobile National Roaming between the Licensees in Jordan takes place on a fair, transparent, and economically efficient basis, for the benefits of consumers, Licensees and the overall economy.

It is not clear why there is a need to implement a regulatory framework that mandates national roaming. The Jordanian mobile market is a highly competitive three-player market, and each operator has achieved over 99% population coverage. Moreover, the TRC's review of the Jordanian mobile market in 2020 found no competition issues in the retail mobile market and concluded that there is no need for any ex-ante regulation. Therefore, it is not clear that national roaming should not be mandated. Mandating it would not be in line with international best practice – most countries do not mandate national roaming, and in countries where national roaming is mandated, this is done temporarily to address specific market failures such as:

- Provide new entrants with a level playing field if they have shown a willingness to invest in developing their network by acquiring spectrum and/or covering a significant proportion of the population – this is done on a temporary basis until the new entrants are able to compete effectively with the existing players
- Address concerns regarding the reduction of competition following, for example, the merger of two mobile operators – again, this is done on a temporary basis
- Allow regional operators to compete effectively with national operators in large countries where IMT spectrum is assigned regionally rather than over the whole country.

These factors are not present in Jordan – there is no potential entrant that has acquired spectrum and is planning to deploy its own network, and spectrum is assigned nationally. The TRC should not introduce new Instructions if they do not solve a clear market failure, particularly when the proposed Instructions do not follow international best practice. We explore how national roaming has been regulated in other countries in more detail in Section 4.4.

4.2.2 Enhance consumer choice in terms of price, quality, and availability of service

As we discuss in more detail in Section 4.3, mandated national roaming can have significant adverse effects on the quality and availability of mobile service by significantly reducing the investment incentives for the national roaming providers, which will likely lead to a reduction in the quality and availability of service.

Moreover, operators that focus primarily on national roaming instead of investing in their own mobile networks will be heavily reliant on the roaming providers and may eventually struggle to differentiate themselves, limiting the potential for innovation and price competition.

4.2.3 Promote fair competition through the sharing of Telecommunications Network Facilities which are not replicable

The TRC has not established that there is a competition issue in the Jordanian mobile market and that the competition is not fair in the absence of mandated national roaming. Moreover, in its 2020 review of the mobile market, the TRC found no evidence of a dominant player in the mobile retail market and concluded that no ex-ante regulation was required. The Jordanian mobile market is highly competitive with three operators who have achieved over 99% coverage.

4.2.4 Encourage efficient investment and avoid wasteful replication of infrastructure; Reduce the environmental impact of the duplication of masts

As discussed in Section 3, the TRC's concern that infrastructure should not be duplicated in a wasteful manner both when it comes to investment and environmental impact is legitimate. However, the establishment of an existing commercial tower company (through Zain's action of selling its mobile towers) already prevents wasteful duplication of infrastructure without disincentivising expenditure on new infrastructure. Mandating national roaming would only reduce the incentives to invest in mobile networks in places where this is required, as we explore in detail in Section 4.3.

4.2.5 Improve resilience, quality of service, and accelerating coverage for areas where the coverage costs for a single Licensee deployment is high (often rural areas)

It is unclear to us how mandated national roaming will improve the resilience of mobile networks – having multiple operators use the same mobile network means that any network failure will affect the services of multiple providers. Additionally, mandated national roaming could hurt the network investment incentives, negatively affecting the quality of service and mobile coverage in Jordan. We explore this issue in detail in Section 4.3.

4.3 Impact of mandated national roaming on investment incentives

As previously discussed in section 3.7, the Jordanian MNOs are committed to investing the necessary capital to fulfil their 5G coverage obligations. These investments directly support the objectives of The Government of Jordan's Policy, and the Policy acknowledges the importance of operators generating a rate of return that encourages that investment.

One of the most significant concerns with mandatory national roaming is its potential to disincentivise network investment. The imposition of national roaming could undermine the incentive for operators to build and upgrade their own networks. This issue is particularly relevant in the context of Jordan, where the mobile market is highly competitive, and operators have made substantial investments to achieve almost universal coverage (as discussed in the previous section).

The availability of national roaming would create an environment where operators who have not acquired sufficient spectrum or invested sufficiently in their network can rely on the network of existing operators without making similar investments. This problem could distort competition, as the operators who have made significant financial commitments to deploy a network across the country would bear the costs while roaming operators benefit without the same level of investment.

Zain has invested extensively in expanding its network to achieve over 99% population coverage. This has been done in good faith and with the expectation of a competitive return on investment driven by coverage and network quality. However, if other operators are permitted to use Zain's network through mandatory national roaming, the value of these investments may be diminished, and future upgrades may slow down.

This concern is especially critical for the deployment of 5G technology, which Zain is actively rolling out across Jordan. The success of 5G relies heavily on significant network investments. If operators become overly reliant on national roaming, the incentive to invest in the necessary 5G infrastructure could be severely diminished, slowing the deployment of next-generation services. This would not only impact the quality of 5G services but also delay the economic and social benefits associated with faster,

more reliable connectivity, such as smart cities, enhanced IoT capabilities, and improved public services. Ensuring that each operator is motivated to build out its own 5G infrastructure is essential to fostering innovation and maintaining Jordan's leadership in telecoms technology.

Furthermore, mobile operators will have reduced incentives to differentiate their networks, as the other operators could simply use national roaming to get access to the same network quality. Therefore, operators are likely to invest less in improving network performance, resulting in operational inefficiencies, slower maintenance responses, and delayed upgrades. Over time, this can lead to a reduction in the quality of mobile service.

In addition, operators that focus primarily on national roaming instead of investing in their own mobile networks will become heavily reliant on their roaming providers. Without their own network infrastructure, such operators may struggle to differentiate themselves in terms of service offerings, as they would be delivering essentially the same network experience as their competitors who own the infrastructure. This lack of differentiation can stifle innovation, as operators are less able to introduce new technologies or improve network performance independently.

Ultimately, by focusing on national roaming rather than investing in their own network, operators not only risk losing their competitive edge but may also contribute to market stagnation. The absence of independent network investment could slow the overall pace of technological advancements and hinder the development of innovative new services, to the detriment of both consumers and the broader telecommunications industry.

International recognition of this risk

Other regulators have recognised the potential risks of mandated national roaming, including the UK and France, as we explain below.

Ofcom, the UK telecommunications regulator, investigated options for improving mobile coverage8. One of these options was rural national roaming – however, Ofcom noted that mandated national roaming comes with a risk of undermining investment incentives. Quoting Ofcom's analysis:

"Rural wholesale access would reduce the extent to which operators could differentiate themselves on the basis of coverage or network quality. There is therefore a potential risk that it could have a chilling effect on investment in networks. This could manifest itself in three ways:

a) Operators might decommission existing masts in some rural areas if offering coverage in these areas ceased to be a source of competitive differentiation. If left unmitigated this could result in a reduction in coverage in some areas;

b) Operators might stop building new masts to expand coverage in rural areas if doing so no longer gave them a competitive advantage; and

c) Operators might be deterred from upgrading masts to new technologies in existing partial not spots in rural areas if other operators could piggy-back off their networks. For example, there is a risk rural wholesale access could have an adverse effect on incentives to invest in 5G."

As a result of this issue, as well as the high estimated costs of implementation, Ofcom and the UK government decided not to pursue regulated roaming but rather to implement the SRN (Shared Rural Network), a deal with the mobile operators which includes over GBP500m of public funding to increase

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[8] Ofcom, 'Further options for improving mobile coverage', 2018

coverage in rural areas[9]. When asked about national roaming in 2023, the Minister answered that "Any decision on rural roaming are commercial decisions for mobile operators."[10]

Another illustrative example comes from France, where the telecoms regulator, ARCEP, does not currently mandate national roaming. In 2016, ARCEP issued a report on the status of mobile networks in France, with particular attention to the impact of the commercial national roaming agreement (2G and 3G only) between Free and Orange[11]. The regulator was concerned that such agreements, if prolonged, might discourage Free Mobile from investing in its infrastructure, thus harming long-term competition and innovation in the market.

As a result, ARCEP imposed a schedule on Free and Orange, mandating that the national roaming agreement be gradually reduced starting in 2018, with complete termination of the agreement by the end of 2020. While the agreement was later extended until Orange's legacy network switch-off (in 2025), ARCEP has mandated clear terms such as maintaining reduced data speeds for roaming users (384Kbps) or new financial terms[12]. This ensured that Free Mobile would be incentivised to invest in its infrastructure, particularly in rural and less densely populated areas, to provide full coverage through its own network.

These examples clearly illustrate that mandated national roaming carries a significant risk of disincentivising investment in mobile networks. This is reflected in the fact that only 25 of the 36 benchmarked countries mandate national roaming.

4.4 National roaming best practice

As discussed in the previous sections, we do not see a need for introducing mandated national roaming and doing so could risk unintended consequences such as disincentivising network investments and reducing competition. However, if the TRC decides to introduce national roaming, we suggest that international best practice be followed. In particular, we suggest the following:

- Mandated national roaming is only offered to operators who have already proved their willingness to invest in spectrum and a mobile network
- Mandated national roaming is time-limited to incentivise investments in mobile networks
- Pricing for national roaming is negotiated commercially, ensuring that market forces determine fair and sustainable prices.

To explore the conditions that have led other regulators to mandate national roaming, as well as how national roaming has been implemented by these regulators, we have analysed 36 countries, with the results detailed in Figure 1 below. Of these, 25 do not mandate national roaming. In the next three subsections, we explore each of the items mentioned above in more detail. Critically, where national roaming is mandated, it is due to a market event (such as a spectrum auction or a merger) rather than included in the general telecommunications regulation.

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[9] Department for Digital, Culture, Media, and Sport, "Press release: Shared Rural Network', March 2020

[10] Questions for Department of Science, Innovation, and Technology, 16 November 2023

[11] ARCEP press release: 'The Conseil d'Etat validates Arcep's action on network sharing between mobile operators, and the roaming agreement between Free Mobile and Orange', 21 December 2017

[12] ARCEP press release: 'Mobile Network Sharing', 7 Septebmer 2022

Figure 1: National roaming regulation benchmark

Example	Summary of implementation
Countries where national roaming is not mandated (2024)[13]	Austria, Bulgaria, Cyprus, Denmark, Estonia, Finland, France, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, UK, Bahrain, Qatar, UAE, Kuwait
Belgium – 2022[14]	**Reason for introduction**: National roaming was introduced as part of the 700MHz spectrum licences which were auctioned in 2022. Operators who do not yet have a complete network but have acquired a 700MHz spectrum licence, are entitled to national roaming from established operators like Proximus, Orange, and Telenet. This was aimed at giving new entrants who are deploying their own networks a level playing field. **Pricing**: The pricing of national roaming is negotiated commercially in the first instance – if required, the regulator uses a 'retail-minus' formula to settle disputes - subtracting costs that are not incurred when offering roaming to new entrants from the retail price the established operators charge their customers **Sunset clause**: Mandated national roaming expires 8 years after the 5G spectrum auction, point at which it is expected that the new entrant has built sufficient infrastructure **Other clauses**: The national roaming seeker must have acquired a 700MHz spectrum licence during the 5G spectrum auction
UK – 1999[15]	**Reason for introduction:** In 1999, Ofcom introduced a licence condition for national roaming to the 3G licences, arguing that a new 3G entrant would be at a significant disadvantage compared to the existing players **Pricing**: Roaming was to be negotiated on reasonable terms and conditions, but prices were not set by the regulator **Sunset clause**: Ofcom reviewed the national roaming condition in 2003 and 2004 and decided to remove this condition from the regulation – recognising that regulation was not needed as the mobile market was competitive and functioning without the need for Ofcom's intervention **Other clauses**: The regulation only applies to access seekers with a network already covering 20% of UK's population

[13] Sources: CMS, DLA Piper Intelligence, iclg, Autoriteit Consument & Markt (Netherlands), Aetha. Notes: National roaming is encouraged by regulators in Slovenia and Slovakia, but not mandated. The Romanian regulator can impose localised national roaming for coverage extension, but this is not automatically done under the regulation. No evidence of national roaming regulation can be found on regulator websites for Bahrain, Cyprus, Estonia, Latvia, Lithuania, Malta, so we assume it is not regulated

[14] Sources: Federal Public Service Economy Ministry of Belgium, Aetha

[15] Sources: Evan Sutherland, 'The regulation of national roaming', 2011; Analysis Mason, 'International examples of national roaming and their relevance to the ACCC's enquiry in Australia', 2016

Norway – 2020 and 2024[16]	**Reason for introduction:** Ice.net entered the Norwegian telecoms market in 2015 by acquiring assets from Tele2, positioning itself as the third national mobile network operator. To support its early network rollout, Norway's regulator, Nkom, imposed national roaming to incumbent Telenor, which has SMP status **Pricing:** Roaming prices were initially regulated using margin-squeeze tests, with allowances for higher prices in rural areas to incentivise network expansion. However, in 2024, the reliance on regulated pricing was phased out in favour of commercially negotiated agreement **Sunset clause:** To ensure that Ice.net is incentivised to deploy its network in Norway, Nkom reviews the need for mandated national roaming every three years by assessing the market dynamics and whether there is an imbalance **Other remarks**: Ice pursued a national roaming agreement on commercial terms with the other MNO in Norway, Telia, who was under no obligation to provide national roaming
Portugal - 2022[17]	**Reason for introduction:** Mandated national roaming was introduced as part of the 5G spectrum auction and is designed to help new entrants who acquire spectrum **Pricing:** No mandated pricing is mentioned in the regulator's document **Sunset clause:** Mandated national roaming expires after eight years **Other clauses:** The new entrants have to acquire spectrum licences from the 5G auction; the new entrants are required to cover at least 25% of the population within three years and at least 50% of the population within six years (with their own networks)
Italy - 2018[18]	**Reason for introduction**: Mandated national roaming was introduced as part of the 5G spectrum auction to ensure that the new entrants can establish services while building their own networks **Pricing**: Pricing is set on a commercial basis under fair, transparent, and non-discriminatory terms **Sunset clause**: Mandated national roaming expires after 30 months nationally and after 60 months in specific regions where the seeker has not deployed its network **Other clauses**: To qualify for mandated national roaming, operators have to acquire spectrum in the 700MHz band, as well as cover 10% of Italy's population with its own network. The operator also has to fulfil all coverage obligations attached to the spectrum licence.

[16] Sources: Nkom, 'Decision on designating undertakings with significant market power and imposing specific obligations in the market for access and call origination on public mobile telephone networks', 2024

[17] Sources: ANACOM, 'Auction Regulation for the Allocation of Rights of Use of Frequencies in the 700 MHz, 900 MHz, 1800 MHz, 2.1 GHz, 2.6 GHz and 3.6 GHz bands', 2022

[18] Sources: 5G spectrum auction rules,

Canada – 2021	**Reason for introduction:** The national carriers (Bell Mobility, Rogers, Telus), as well as SaskTel, must offer wholesale access to regional providers that have invested in network infrastructure and spectrum. The reason for national roaming is to support regional operators who might otherwise struggle to offer nationwide services, given Canada's regional spectrum allocation model **Pricing:** The roaming agreements are commercially negotiated, but if terms cannot be agreed upon, the CRTC steps in through Final Offer Arbitration (FOA). The CRTC reviews cost structures, margins, and historical rates to ensure fair pricing. **Sunset clause:** Mandated roaming agreement ends after eight years, point at which it is expected that the regional operators would have built their network. **Other clauses**: National roaming seekers must acquire spectrum licences in the regions where they would like to use national roaming
Germany – 2014[19]	**Reason for introduction:** Telefonica was mandated to offer national roaming to new entrants like 1&1 Drillish as part of a merger remedies package for the approval of its merger with E-Plus **Pricing**: Followed a commercial model based on the terms of an earlier MVNO contract **Sunset clause**: Roaming provisions were set to last until 2025
Greece – 2020[20]	**Reason for introduction:** As part of 700MHz spectrum licences, spectrum holders must offer national roaming to new entrants **Pricing**: Pricing is done on a commercial basis, but should be reasonable **Sunset clause:** National roaming expires after five years, while regional roaming should be provided for the duration of the assignment
Croatia - 2021[21]	**Reason for introduction:** Introduced as part of 5G spectrum auctions to increase coverage in underserved areas **Pricing**: Based on commercial pricing, non-discriminatory **Other clauses**: Only applies to remote areas that are not economically viable for a single operator to cover
Czech Republic - 2020[22]	**Reason for introduction**: As part of 700MHz spectrum licences, spectrum holders must offer national roaming to new entrants who acquire 5G spectrum licences **Pricing**: Based on LRAIC+ model, taking account of return of capital invested, as well as a 5G premium **Sunset clause**: Mandated national roaming expires after ten years **Other clauses**: National roaming seekers must acquire spectrum licences as part of the auction, and be liable to all coverage obligations associated with those licences

[19] Source: European Comission, 'Mergers: Commission clears proposed merger between Telefónica Deutschland (Telefónica) E-Plus subject to conditions-frequently asked questions', 2 July 2014

[20] Sources: Aetha

[21] Sources: 5G spectrum auction rules, Aetha

[22] Sources: 5G spectrum auction rules, Aetha

Oman[23]	**Context**: National roaming is included in the Reference Interconnection Offers of Omantel and Ooredoo Oman. Oman is a country with vast rural areas that make it economically challenging for operators to provide extensive network coverage **Pricing**: Pricing in the Interconnection Offers is based on retail-minus methodology
Saudi Arabia[24]	**Context:** Operators designated as Significant Market Powers are mandated to negotiate national roaming agreements with mobile operators while they are building their network **Pricing:** Based on commercial negotiations **Sunset clause**: Mandated national roaming expires after five years **Other clauses**: National Roaming seekers have to fulfil their spectrum licence coverage obligations with their own networks

4.4.1 Conditions for national roaming provision

In many of the benchmark countries where national roaming has been introduced, strict conditions govern who can access it. One common requirement is that operators seeking national roaming must have acquired spectrum or made significant investments in their own network infrastructure. This approach ensures that only operators with a demonstrated commitment to developing their own networks benefit from roaming rather than allowing free-riders who avoid infrastructure investment altogether.

For example, 700MHz spectrum licences from the Italian 2018 5G auction mandate national roaming to support new entrants, possibly as a response to the then-recent merger between Wind and 3 Italy. However, to qualify for national roaming, the new entrants were obligated to first achieve at least 10% population coverage with their own networks. This ensures that national roaming is not a substitute for network expansion but a tool to assist operators as they scale up their infrastructure.

Another example of additional conditions for national roaming seekers is that they own spectrum – this can be seen in Belgium, where operators who have not yet developed their own nationwide network can use mandated national roaming for a limited period (8 years). However, the national roaming seekers must first acquire a spectrum licence in the 700MHz band to show their willingness to invest in the network. Similarly, regional operators in Canada can roam on the networks of national MNOs, but this is mandated only for the areas where the regional operators own spectrum licences, showing their willingness to invest in the networks.

These examples show that, in most cases, access to national roaming is contingent on operators' willingness to invest in their own networks. This framework prevents the misuse of national roaming as a shortcut for smaller operators who might otherwise avoid making the necessary investments in infrastructure. By requiring operators to meet minimum deployment obligations or hold spectrum rights, regulators maintain incentives for network expansion and preserve fair competition, preventing larger players from shouldering the cost of network development while smaller ones "free-ride" on their efforts.

[23] Sources: Reference Interconnection Offers: OmanTel, Ooredoo Oman

[24] Sources: CITC, 'Regulatory Framework on National Roaming for Mobile Facility Based Providers'

4.4.2 Temporary and geographic limitations

If the TRC decides to implement national roaming obligations, the Commission should ensure that these obligations are limited in duration and in line with international best practices, rather than an indefinite application of national roaming, which would unfairly disadvantage operators who have invested heavily in their networks. The experience from all benchmarked countries shows that to encourage network investment, national roaming obligations need to be time-bound. In all countries where national roaming has been mandated, the obligations were set to expire after a well-defined period, ensuring that any access seekers would eventually build their own networks rather than relying indefinitely on existing networks.

4.4.3 Pricing of national roaming

Any national roaming arrangements, if deemed necessary, should be governed by commercially negotiated agreements rather than regulated prices. The experience of other markets shows that commercial negotiations between operators tend to lead to more efficient and fair outcomes that reflect the true cost of providing roaming services and incentivise continued investment in networks.

The 2019 consultation included a clause (Clause 114) that stated that *"The prices for national roaming should be cost-oriented, below retail levels"*. At that time, Zain argued that regulated, cost-based pricing for national roaming would distort the market by failing to account for the true cost of infrastructure deployment. It advocated for pricing to be determined through commercial negotiation, as this allows operators to factor in market dynamics, the cost of providing the service, and the need for continued investment.

The TRC has acknowledged this point by removing the explicit requirement for cost-based pricing from the 2024 draft Instructions in favour of a fair and non-discriminatory pricing model. While this is a step in the right direction, commercially negotiated rates should be the standard approach, as seen in most of the benchmarked countries (like Norway, Germany, or Saudi Arabia), where the regulators have chosen not to intervene in pricing, recognising that commercial agreements incentivise investment and provide flexibility for operators to adapt to changing market conditions.

A notable example of best practice is Norway, which has been progressively shifting its approach to national roaming pricing, transitioning from using a "retail-minus" model to commercially negotiated agreements. Initially, prices were regulated through margin-squeeze tests, which were also designed to reflect the higher costs associated with providing services in rural areas. However, in 2024, the reliance on regulated pricing was phased out, allowing operators to negotiate rates directly, thus encouraging more investment in network infrastructure. This balances regulatory oversight with the flexibility of market-driven pricing, ensuring sustainable competition while incentivising network expansion.

Moreover, imposing cost-based pricing or regulatory controls on national roaming would create an unnecessary burden on the TRC and operators alike. Negotiating roaming rates commercially allows for a more dynamic and flexible approach that can evolve with the market, ensuring that both parties—host operators and roaming seekers—are fairly compensated for the services provided.

4.5 Specific comments

Article 13: "The unjustified refusal to negotiate in good faith or denial of the provision of facilities for roaming or other discriminatory practices with respect to roaming will be considered a violation of the licence terms and subject to sanctions"

The introduction of new obligations after licenses have been issued disrupts the legal certainty and commercial expectations that formed the basis for significant investment decisions. When Zain and other operators were granted their licenses, the terms were clear, stable, and intended to foster long-term commitments to network infrastructure development. Retroactively altering these conditions undermines this stability and negatively impacts the investment environment.

Article 15: "The TRC will ensure that the Mobile National Roaming Agreement (...) does not, in the TRC's opinion, result in the potential of lessening of competition and other potential market harms"

This clause suggests that mandated national roaming should not lead to the lessening of competition or other potential market harms. However, as we discuss in our general comments, we firmly believe that the drawbacks of mandated national roaming (disincentivise network investment, over-reliance of national roaming seekers on the national roaming providers) will lead to a significant reduction of competitions and other market harms (such as lack of investment). Therefore, we believe that the TRC should not mandate national roaming, or at the very least, it should follow international best practices.

Article 17: "In some circumstances, the TRC has the right to enforce Mobile National Roaming in certain geographical areas for specific time frames as the TRC deems necessary"

It is unclear how this instruction differs from the general national roaming instructions, which mandate national roaming over the whole of Jordan for an unlimited period. Therefore, the TRC should explain the purpose of this article.

Article 21: "The Mobile National Roaming Agreement maybe for a limited period of time that would allow a Mobile Operator to deploy a network to a specific geographical area within Jordan to allow the time for the roll-out of a new technology. The TRC will consider the duration of the agreement in its approval process and consider whether the length of such an Agreement could result in a lessening of competition."

As we discuss in the general comments section, any mandated national roaming agreement could have adverse effects on the mobile market in Jordan by, for example, reducing the incentives to deploy new technologies. This effect is enhanced if the agreements are not time-limited, which would allow operators to 'piggyback' on the existing network indefinitely. Therefore, and not excluding our arguments against mandated national roaming as a whole, if national roaming is mandated, all agreements should be time-limited rather than just some (implied by the words 'may be' in this article).

Article 23: "Within one calendar month from the date of submission of the request by the Requesting Mobile Operator, the Host Mobile Operator shall complete a feasibility study and provide a decision to the Requesting Mobile Operator in writing"

Extra time should be available for national roaming requests that require an accurate and precise feasibility study. We recommend setting 30 working days and, if needed, another 30 working days with an acceptable justification for the extension.

4.6 Conclusions

The implementation of mandated national roaming in Jordan does not seem to be required. The country's mobile market is highly competitive, with three well-established operators providing extensive coverage and competitive services. Introducing national roaming regulations would result in significant drawbacks, including reduced incentives for network investment and lower quality and availability of mobile service. These regulations could also distort competition by allowing operators that rely on national roaming to "free-ride" on the investments made by others.

National roaming should be based on commercial agreements rather than regulatory mandates, following international best practices. Countries that have imposed national roaming typically do so temporarily and under specific conditions, such as to support new entrants or in markets with regional licensing regimes. Jordan, however, does not face these circumstances and, therefore, does not require such measures.

If the TRC chooses to proceed with national roaming, it should ensure that any obligations are temporary and only apply to operators that demonstrate a commitment to network investment. Pricing for roaming services should be commercially negotiated rather than regulated, allowing market dynamics to determine fair and sustainable outcomes.

In conclusion, mandated national roaming is unnecessary in Jordan's mature market and poses significant risks to investment, competition, and service quality. A market-driven approach is the preferred solution to ensure continued innovation and network expansion.

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