RJIL/TRAI/2022-23/217
19th September 2022

To,
Shri Akhilesh Kumar Trivedi
Advisor (Networks, Spectrum and Licensing),
Telecom Regulatory Authority of India
Mahanagar Doorsanchar Bhawan
Jawaharlal Nehru Marg, New Delhi - 110002

Subject: **RJIL's Comments on TRAI's Consultation Paper dated 25.07.2022 on "Embedded SIM for M2M Communications"**

Dear Sir,

Please find enclosed the comments of Reliance Jio Infocomm Limited on the consultation paper dated 25.07.2022 on "Embedded SIM for M2M Communications".

Thanking you,

Yours Sincerely,
For **Reliance Jio Infocomm Limited**

KAPOOR SINGH GULIANI
Digitally signed by KAPOOR SINGH GULIANI
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Kapoor Singh Guliani
Authorized Signatory

Enclosure: As above

Reliance Jio Infocomm Limited's comments on TRAI's Consultation Paper on "Embedded SIM for M2M Communications" dated 25th July 2022.

Preface:

1. Reliance Jio Infocomm Limited (RJIL) thanks the Authority for issuing this consultation paper to deliberate on the provisions pertaining to Embedded SIM (eSIM) for M2M Communications.

2. We submit that eSIM, defined as an embedded universal integrated circuit card (eUICC) by GSMA, has many advantages over the legacy plastic SIM cards, as it is soldered directly into the device hardware. **It provides the flexibility of immediately connect and survival in hostile environments with extreme temperatures, humidity or vibrations, making it most suitable for Internet of Things (IOT) connected devices and wearable connected devices.** The adoption of eSIM is increasing at high pace in IOT devices **due to flexibility provided by simultaneous multiple profiles and remote provisioning along with suitable form factor and associated security aspects. On the other hand, the lead taken by high end smartphones and wearable devices (primarily smartwatches) is being followed by other OEMs across the wireless communications ecosystem to make available eSIM with consumer devices.**

3. As per one market research[1] the global eSIM market was valued at over US$7,190 million in 2021 and is estimated to grow at a compound annual growth rate (CAGR) of 7.8% between 2022 and 2029. Whereas another market research study[2] published by Facts and Factors, notes that the demand analysis of Global eSIM Market size & share revenue was valued at **roughly USD 8.9 billion in 2021 and is predicted to grow to about USD 25.8 billion by 2028, with a compound annual growth rate (CAGR) of approximately 16.42% over the projection period 2022-2028.**

4. Whichever way we look at it, the eSIM market is expanding rapidly, propelled by rapid increase in the IoT connected devices and application of Machine-to-machine (M2M) communications and enterprise use cases. **One Mckinsey insight notes mentions that *"eSIM are being launched to allow flexible network provisioning for enterprise users. Certain semiconductor players have already launched mobile computing chipsets with e-SIM capabilities."***

[1] https://www.agileintelresearch.com/reportdetails/Global-eSIM-Market/30

[2] https://www.globenewswire.com/en/news-release/2022/03/09/2399942/0/en/Global-eSIM-Market-Size-Share-Forecasted-to-Hit-USD-25-8-Billion-By-2028-At-a-16-42-CAGR-Growth-e-SIM-Industry-Trends-Analysis-Report-by-Facts-Factors.html

5. As also noted by Ericsson on its website[3], **eSIM makes the selection, contracting and onboarding of Communication service providers (CSPs) or Telecom service provider (TSP) easier without compromising on legacy SIM services, while providing flexibility of localization service with remote provisioning.** *This flexibility truly enables global device manufacturers to rely on a single eSIM to be able to connect all their devices all over the world. eSIM technology simplifies device manufacturing and logistics by allowing a single stock-keeping unit. With eSIM technology there is guaranteed seamless global connectivity services provided by CSPs across the entire device life cycle.*

6. In view of the massive role and significance of eSIM in M2M communications and its rapidly increasing adoption in consumer devices segments, **it is imperative that the regulatory oversight is settled and made facilitative to the impending growth.** Our suggestions in this regard are detailed in following paras.

A. International Roaming and Mobile Country Code 901.XX (Global IMSI) related issues

7. We submit that the Authority has rightly flagged **'security and privacy related concerns' pertaining to devices with international profiles and/or being controlled by international servers, roaming in the country for long durations or on permanent basis.** Therefore, we submit that the international roaming should not be permitted beyond 6 months' time period and it should be mandatory to migrate to Indian profile for all eUICC fitted devices imported in India within 6 months of activation. **This is also imperative to ensure compliance with Indian M2M Regulations and Instructions, as issued from time to time by Department of Telecommunications (DoT) and the Authority.**

8. We further submit that the **similar security, data privacy and compliance related concerns will be applicable, in case the global Mobile Country Code 901.XX (Global IMSI) numbers are permitted in India.** Besides the obvious compliance and security related issues with no means to ensure compliance with Indian laws, **this will also create a lop-sided competitive scenario tilted against Indian TSPs, more particularly in terms of restrictive M2M SIM features that would be applicable only on the Indian TSPs and therefore, we request that these numbers should not be permitted in India.**

B. Issues pertaining to integration of Subscription Manager Secure Routing (SM-SR)

[3] https://www.ericsson.com/en/esim

9. A significant number of devices imported in India are equipped with eSIM which is registered on company's own Subscription Manager Secure Routing (SM-SR) platform outside India. **As these devices cannot be permitted to roam indefinitely, it is important to facilitate shifting the control of eUICC to Indian TSP's SM-SR.** This would require integration between SM-SR of both the entities.

10. GSMA has already prescribed guidelines for such integration, under GSMA SGP.02 specifications. **We request that such migration should be mandated to be carried out as per these GSMA specifications, as this is critical from security and data privacy related aspects.** The SM-SR swap should be completed within one year of activating eSIM which are imported from outside India. Similarly, for the India manufactured devices having Indian TSP profile, SM-SR integration should be done as per GSMA specifications only, if required.

11. Further, the SM-SR may also be permitted to be owned by entities like M2M service provider and OEM, subject to compliance with security and data privacy requirements. **The eSIM personalization or remote provisioning should be carried out through the systems and facilities duly certified by SAS of GSMA. The Subscription Management-Data Preparation (SM-DP), SM-DP+ servers used for eUICC personalization should be located within the geographical boundaries of India.**

C. Other relevant issues

12. As referred by the Authority, *eSIM requires a "bootstrap subscription", which is (technically, the provisioning profile) for that life-stage when eSIM is still in the pre-market, factory stage.* Thus, eUICC can have bootstrap profile of Non-India service provider which is used only for controlling purpose in case operational profile doesn't work as intended and its role remains very limited. **This bootstrap profile, used as controlling point for local profile download, need not be replaced and may be permitted to remain active for longer period like 10 years.**

13. Integrated SIM adoption shall be promoted as it helps to address chip shortage issue as well as saves on number of components. **Integrated SIM should be required to comply with the structure and security guidelines issued by 3GPP and GSMA respectively.**

14. Soft sim should also **be permitted as evolving technology under integrated sim domain and shall be promoted as per global as well as local evolution of standards with required securities in place.**

15. To summarise, we submit as under:

1. **eSIM and upcoming technologies like Integrated SIM and Soft SIM should be facilitated.**
2. **There should not be any scope for permanent roaming or long term roaming for eSIM devices imported in India. The migration to Indian profile should be mandatorily carried out in 6 months' time.**
3. **The integration of SM-SR of international and domestic entities should be facilitated.**
4. **There should be enabling provisions for third parties wishing to control SM-SR and provided additional services.**
5. **eSIM with Mobile Country Code 901.XX (Global IMSI) should not be permitted in India.**
6. **The security and data privacy concerns are of primary importance and all relevant stakeholders should be required to comply with the same under appropriate license/ registration.**

Issue wise response:

Q1. Whether the TRAI recommended timeline, about the foreign eUICC fitted devices to be on roaming with Indian TSP's network for a maximum period of three years only, needs a review? If yes, what should be the timeline after which the eUICC should mandatorily be configured with Indian TSP's profile?

RJIL Response:

1. We submit that the **TRAI Recommendations, vide its letter dated 5th September 2017,** mandating for IOT devices fitted with eUICC to be moved from a roaming status to a local Indian profile in maximum three years from the date of activation of roaming in the network of Indian TSP, **were issued prior to the DoT instructions dated 16th May 2018 and 30th May 2019 and were therefore proposed without considering the restrictive features of M2 SIMs.**

2. Therefore, it is imperative that these recommendations be revised in view of the changed regulatory oversight as well as ground situation. **We understand that in order to facilitate IOT devices with international eUICC but at the same time ensuring that all devices in India are compliant with Indian Regulations, six months is a reasonable time for migrating from a roaming profile to local profile and therefore, we submit that these timelines should be revised and reduced to six months.**

3. We further submit that while migration to Indian TSP profile is required within 6 months, however, **eUICC can still have a bootstrap profile of Non-India MNO, which can only be used for selective purpose of local profile download. This bootstrap profile can remain active for longer period like 10 years.**

Q2. Whether there is a need to change the controlling SM-SR from foreign TSP to Indian TSP in case of foreign eUICC fitted devices operating in India? If yes, what should be the methodology and time period within which it should be done?

RJIL Response:

1. We submit that the current practice of keeping the control of eUICC with the foreign SM-SR, even after downloading and activating Indian TSPs profile on the eUICC is not ideal and need to be changed with a regulatory intervention. **The Authority has rightly flagged the security and privacy concerns under prevailing practice.**

2. **The current practice leads to data collection by controlling SM-SR, which should not be permitted, once the Indian TSP's profile is downloaded to the eUICC.** The SM-SR migration methodology is already defined in GSMA SGP.02 (ES7 interface) and it should be followed.

3. We submit that the migration of SM-SR should ideally be done to Indian SM-SR immediately on the downloading of Indian profile, however, it is possible that owing to this being a new intervention, more time may be required for the end to end design flows, design, development, testing and integration efforts. **Nevertheless, in any case, this timeline should not exceed one year.**

Q3. Whether there is a need for the SM-SR of each TSP to be integrated with the SM-DP of each other TSP? If yes, what should be the methodology for integration? Please specify the timelines also.

RJIL Response:

1. We submit that before mandating any such integration between Indian TSPs, it would be important to consider the requirements and use cases. **We understand that at present there are no use cases requiring downloading of one TSPs profile on an eUICC controlled by the SM-SR of another TSPs. However, considering the evolving use cases, this possibility cannot be ruled out as well.**

2. Therefore, we submit that this integration should be dictated by the on-ground requirements and the integration of SM-SR of each Indian TSP with SM-DP of each other should be driven by OEM/customer requirement, if established in due course of time.

3. Nevertheless, the Authority **may recommend that any such integration, if required, should be done in compliance with methodology defined in GSMA SGP.02 specs. No need to reiterate that this integration should be established based on use case and customer requirements.**

Q4. Whether there is a need to prescribe SM-SR swapping among the Indian TSPs? If yes, what should be the modalities and procedure for such swap?

RJIL Response:

1. We submit that this scenario will be a special use case of the SM-SR integration in Indian TSPs, which can be triggered by an OEM choosing to switch from one TSP to another TSP.

2. **We submit that this should be permitted, as OEMs are critical stakeholder in the IOT eco-system and they should be permitted to change service providers if required. The TSPs should be mandated to facilitate such requirements by OEMs.**

3. Further, in case of an Indian SM-SR provider shutting down services, it should be mandated **to provide services and migration support for reasonable period of time subsequent to the notice sent to customers on closure of service.** This will allow customers to choose another operator and ensure smooth migrate to new SM-SR. Migration support should be required to be provided as per GSMA SGP.02 guidelines.

Q5. Whether the profile switchover, from one TSP to another, is driven by the user or OEM? If yes, what methods can be deployed to execute such switchover?

RJIL Response:

1. We understand that in the era of ubiquitous coverage by all TSPs, the possibility of IOT devices not getting sufficient coverage are remote, however, this use case cannot be completely ruled out.

2. However, it is pertinent to mention here that, **in case of IOT, the commercial and technical arrangements would be between TSP and OEM on bulk basis and there may not be feasibility to accommodate a single user request. As for migration of single user, the techno-commercial requirements will remain same, it will be better if such requests are processed through OEM or M2M service provider.**

3. Nevertheless, we submit that there should not be any restriction on customer choice and subject of technical feasibility, the option of profile migration shall be available to customer. In order to execute it, GSMA SGP.02 method of SM-SR migration should be followed.

Q6. Whether non-TSP entities, such as OEMs and M2M Service Providers, should be permitted to own SM-SR and manage the subscribed profiles for their devices? If yes, what should be methodology and procedure?

RJIL Response:

1. We submit that the issue of owning and controlling SM-SR by non-TSP entities has international precedents and should be examined. **However, in view of the security and customer data privacy related concerns flagged by the Authority in consultation paper, it is imperative that these should be addressed before permitting the non-TSP entities to own and control SM-SR.**

2. We understand that these concerns have been addressed sufficiently under the **"Guidelines for registration process of M2M Service Providers (M2MSP) and WPAN/WLAN connectivity provider for M2M Services-regarding" dated 8th February 2022 (M2MSP Guidelines). Therefore, the entities desirous of owning SM-SR should be required to register under the M2MSP Guidelines.**

3. We further submit that such entities should be required to comply with GSMA guidelines. These entities should be located in India after permitted period and the SM-SR related data should also be stored in India. **Since these entities will always have dependency with TSP for profiles, they should strictly follow GSMA SAS guidelines and must use Indian TSP services for local usage.**

4. Additionally, multiple profile management might also be provided by third party as bundled service along with other added services along with devices. TSPs may provide the details for eUICC cards managed by TSP SM-SR in such cases, however, **in this scenario as well, the third-party managing profile by Over the Air (OTA) mechanism should be M2M registered and should be required to comply with GSMA approved methods and specifications.**

Q7. Whether the use of ITU allocated shared Mobile Country Code 901.XX (Global IMSI) be permitted in India for M2M Communication? If yes, what should be the methodology and procedure? If not, what are the reasons and challenges in implementation of Global IMSI? Please elaborate.

RJIL Response:

1. Presently most of the Satellite phone users use MCC 901 (with assigned MNCs) as a Global IMSI, so that it can serve anywhere in the globe. **However, extending this MCC for M2M usage will useful only for Permanent IR devices, which is not recommended in India.**

2. In India, the Telecom services are required to comply with the National Numbering plan 2003 (NNP 2003), as amended from time to time. The NNP 2003, further specifies that dialing procedure as per ITU Recommendation E.164 has to be followed. **Accordingly, all Indian Telecom operators are complying with the NNP2003 and following the dialing as per ITU recommendation E.164.**

3. Additionally, DOT has specified that mobile based M2M services have to follow 13 -digit numbering starting with 575 and have already allocated number resources to the Indian Telecom operators. Further, these 13 digit numbers are required to comply with the restrictive features for voice, data and SMS services, as prescribed by DOT from time to time.

4. The 901.xx numbering is based on the ITU recommendation E.212. The 901 number is a shared Mobile Country Code and the next two digits are allocated by ITU. These were initially allocated to Satellite based mobile operators but has subsequently also been allocated for Mobile as well as Fixed networks as well as VNO's. **However, there are multiple concerns in using these number for M2M services in India, a few of these concerns are listed below:**

    i) **Home node mapping – like HSS, PCRF, SCEF**
    ii) **Routing aspects**
    iii) **How MSISDN to IMSI mapping be maintained for such IMSI series?**
    iv) **LIM Issues concerning ownership of IMSI/MSISDN by a given operator.**
    v) **Circle specific Network dimensioning challenges**
    vi) **Compliance with restrictive features for M2M Services**

5. Further, these numbers also pose a security risk, **as there will be no means to ensure compliance with Indian M2M oversight by the devices working with 901.xx numbers in India. Furthermore, in absence of any such controls, these numbers can violate DoT instructions dated 16th May 2018 and 30th May 2019 without impunity and can also remain on permanent roaming. This will also lead to tilting the level playing field while simultaneously making a mockery of applicable regulatory oversight.**

6. In view of this **we submit that 901.xx numbering should not be permitted for M2M communication in India.** The Authority and DoT should first clear out **all the administrative and compliance related issues and ensure that Indian TSPs are also facilitated with these numbers by DOT/TEC before even considering allowing the numbering to be used in India.**

Q8. Is there any issue, pertaining to the Consumer eSIM, that needs to be addressed? Please highlight the issue and suggest mechanism to address it with justification.

RJIL Response:

1. We submit that the consumer **eSIM usage is currently going on smoothly and there are no major technical issues. Further, in order to ensure simple inter-operable mechanism, it is suggested that for M2M use, GSMA SGP.22 guidelines should be followed.**

2. As mentioned in the preface, more and more devices are going to be eSIM enabled, and with the device migration cycle and device upgradation, more consumers would seek to upgrade to eSIM devices. **However, it is pertinent to mention here that there is no standard process for eSIM migration from one device to another device. Therefore, in interest of consumer convenience and to prevent possible frauds, it is important that a standard process may be prescribed by the DoT basis Authority's recommendations.**

3. On other matters, the Authority may maintain a policy of Forbearance for now and permit the market forces to evolve the most efficient mechanism. Of course, the Authority can intervene in case of market failure.

4. Further, in September 2018 we had submitted certain **suggestions regarding changes required in Telecom Consumer Protection Regulations 2012, in view of growing adoption of consumer e-SIMs. We had requested the Authority to consider permitting the provision of all relevant information regarding plan, terms and conditions and TRAI regulations to customers through digital means including SMS and e-mail.** We once again request you to consider these suggestions and make appropriate changes to facilitate consumer eSIM users.

Q9. Give your comments on any related matter that is not covered in this Consultation Paper.

RJIL Response:

1. There is new GSMA proposal for adopting and using consumer eSIM for IOT devices, defined in GSMA TS SGP.31 which provides an architecture and requirements for remote provisioning of eUICCs in Network Constrained and/or User Interface (UI) Constrained IoT Devices.

2. This should be promoted for easier profile migration for consumer IOT devices dealing with end customer as this provides flexibility in terms of usage and choice to end user rather than controlled by OEM, end to end service provider etc. More details on this are also available at https://www.gsma.com/esim/resources/sgp-31-esim-iot-architecture-and-requirements/

3. Further, the Industry has made representations to DoT on further relaxation on the restrictive features under the instructions dated 16th May 2018 and 30th May 2019. We request that the same may be considered and appropriate recommendations should be made on these issues as well.

4. The Authority is also requested to consider the fact that eSIM requirement is increasing day by day with increasing number of applications and devices in market without comparable increase in domestic availability of these devices. Therefore, we request for permitting **eSIM production outside India, as this will enable use cases such as import of vehicles /devices from global manufacturer.**

5. As mentioned in previous sections, ISIM technology is useful in low power M2M devices and should be permitted to support cost effective IOT offerings. Further, ISIM personalization should be allowed from outside India as this implementation is tightly integrated with modem chipset.

6. Along with OTA download, devices with eUICC can also come with local profile preloaded which will need personalization at non-India location and the same should be permitted. Both eUICC and non eUICC cards to be accepted as embedded cards as not all use cases may need remote manageability and cost is also important factor between these 2 sim types.