

# Response to Questionnaire on Public Wireless Supply Chain Innovation Funding

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## Questions on the State of the Industry

1. What are the chief challenges to the adoption and deployment of open and interoperable, standards-based RAN, such as Open RAN? Are those challenges different for public vs. private networks?

[KT] KT expects that the chief challenges include inter-vendor compatibility, performance optimization, and complexity of operation/maintenance due to multi-vendor deployment. This will apply the same to both public and private networks.

- a. What are the challenges for brownfield deployments, in which existing networks are upgraded to incorporate open, interoperable, and standards-based equipment?

[KT] For Korean telecommunication operators who have already deployed nationwide 5G public network has less demand for additional infrastructure deployment based on Open RAN. Also, great burden for operators replacing existing network infrastructure to Open RAN based infrastructure before ROI (Return on Investment) has not yet been met.

2. What ongoing public and private sector initiatives may be relevant to the Innovation Fund?

[KT] Korean government is supporting domestic Open RAN R&D through national project, also plans to invigorate the domestic ecosystem by initiating Open RAN Alliance based on industries, Universities and Research Institute collaboration.

- a. What gaps exist from an R&D, commercialization, and standards perspective?

[KT] Current commercial 5G deployment is based on RU with beamforming support. However, Open RAN RU (Cat-A) from domestic vendors are yet to support beamforming.

- b. How might NTIA best ensure funding is used in a way that complements existing public and private sector initiatives?

[KT] No opinion

3. What kind of workforce constraints impact the development and deployment of open and interoperable, standards-based RAN, such as Open RAN? How (if at all)

can the Innovation Fund help alleviate some of these workforce challenges?

[KT] Upon the deployment of multi-vendor infrastructure and operation/maintenance, increase of DU/RU link combinations will result significant increase of workforce compared to legacy network.

4. What is the current climate for private investment in Open RAN, and how can the Innovation Fund help increase and accelerate the pace of investment by public and private entities?

[KT] As domestic Open RAN ecosystem is not matured, it is extremely difficult for SME vendors to invest on development of Open RAN equipment. Therefore, it would be very helpful if Innovation Fund can support SME vendors on research and development costs (e.g. NRE).

5. How do global supply chains impact the open, interoperable, and standards-based RAN market, particularly in terms of procuring equipment for trials or deployments?

[KT] Existing RAN vendors are not actively collaborating with operators like KT who already deployed commercial 5G network and no large scale investment is expected on Open RAN Trial or deployment. If global supply chain on Open RAN is expanded, operators expect to collaborate on trials and deployments smoothly.

## Questions on Technology Development and Standards

6. What open and interoperable, standards-based network elements, including RAN and core network elements, would most benefit from additional research and development (R&D) supported by the Innovation Fund?

[KT] KT believe that Innovation Fund supporting additional research such as basestation virtualization for cost effective network deployment, RIC (RAN Intelligent Controller) for operation automation, Open RAN RU (Cat-B) with beamforming support which can compete with existing macro network, will benefit operators.

7. Are the 5G and open and interoperable RAN standards environments sufficiently mature to produce stable, interoperable, cost-effective, and market-ready RAN products? If not:

a. What barriers are faced in the standards environment for open and interoperable RAN?

[KT] Fronthaul interface has been standardized in O-RAN alliance meeting the commercial requirements, other interfaces (e.g. RIC, etc.) needs to be more matured

b. What is required, from a standards perspective, to improve stability, interoperability, cost effectiveness, and market readiness?

[KT] No specific opinion

c. What criteria should be used to define equipment as compliant with open standards for multivendor network equipment interoperability?

[KT] In order to set the requirements for Open RAN interoperability, Conformance/Interoperability test requirements specified in O-RAN alliance and 3GPP shall be met.

8. What kinds of projects would help ensure 6G and future generation standards are built on a foundation of open and interoperable, standards-based RAN elements?

[KT] In order to apply on 6G and next generation network, developing generation-agnostic Open RAN standards and technology is important. Also, further research and development on the next generation open O&M architecture which can integrate/manage legacy RAN is needed.

## Questions on Integration, Interoperability, and Certification

9. How can projects funded through the Innovation Fund most effectively support promoting and deploying compatibility of new 5G equipment with future open, interoperable, and standards-based equipment?

[KT] If the government initiated 5G Open RAN demonstration project (e.g. Government network, Custom network, etc.) can be funded through the Innovation Fund, this will boost Open RAN based 5G equipment development and deployment.

a. Are interoperability testing and debugging events (e.g., “plugfests”) an effective mechanism to support this goal? Are there other models that work better?

[KT] We believe interoperability testing and debugging events such as “plugfest” can help gaining attentions from various vendors and operators which will positively effect on Open RAN ecosystem.

10. How can projects funded through the program most effectively support the “integration of multi-vendor network environments”?

[KT] For supporting integration of “multi-vendor network environments”, gradually providing multi-vendor test environment through testbed deployment, securing operation technique for multi-vendor through trial deployment, and obtaining maintenance technique for multi-vendor via commercial deployment will be effective.

11. How do certification programs impact commercial adoption and deployment?

a. Is certification of open, interoperable, standards-based equipment necessary for a successful marketplace?

[KT] If certification on multi-vendor combinations for Open RAN equipment is possible, this will reduce time to market on commercialization and costs on deployments.

b. What bodies or fora would be appropriate to host such a certification process?

[KT] Certification process hosted by government should be appropriate.

12. What existing gaps or barriers are presented in the current RAN and open and interoperable, standards-based RAN certification regimes?

a. Are there alternative processes to certification that may prove more agile, economical, or effective than certification?

b. What role, if any, should NTIA take in addressing gaps and barriers in open and interoperable, standards-based RAN certification regimes?

[KT] No comments on this issue

## Questions on Trials, Pilots, Use Cases, and Market Development

13. What are the foreseeable use cases for open and interoperable, standards-based networks, such as Open RAN, including for public and private 5G networks? What kinds of use cases, if any, should be prioritized?

[KT] For the rapid ecosystem development, meaningful trial project is necessary. Applying to U.S./Korean local Private 5G project, and/or Open RAN based 5G deployment/operations on other countries with local operator and foreign operator/vendor altogether. We can consider prioritizing NTIA fund to 5G Open RAN projects participating from like-minded countries of U.S./Korea.

14. What kinds of trials, use cases, feasibility studies, or proofs of concept will help achieve the goals identified in 47 U.S.C. 906(a)(1)(C) (<https://www.govinfo.gov/link/uscode/47/906>), including accelerating commercial deployments?

a. What kinds of testbeds, trials, and pilots, if any, should be prioritized?

[KT] For accelerating Open RAN commercial deployments, trial/pilot on major sports events like UEFA Euro 2024 (5G), World Cup 2026 (5G-Advanced). 2028 LA Olympics (Pre-6G) is important.

15. How might existing testbeds be utilized to accelerate adoption and deployment?

[KT] For the rapid spread of the outcomes from research testbed and equipment, finding applicable use case is essential. We can try applying to Private 5G projects on transport industries (airport, seaport, industrial complex, etc.), public safety, government administrative network, smartcities.

16. What sort of outcomes would be required from proof-of-concept pilots and trials to enable widespread adoption and deployment of open and interoperable, standards-based RAN, such as Open RAN?

[KT] Besides interoperability, performance optimization, and ease of operation/maintenance, cost-effectiveness also needs to be guaranteed for enabling widespread adoption and deployment of commercial Open RAN.

## Questions on Security

17. “Promoting and deploying security features enhancing the integrity and availability of equipment in multi-vendor networks,” is a key aim of the Innovation Fund (47 U.S.C 906(a)(1)(C)(vi) (<https://www.govinfo.gov/link/uscode/47/906>)). How can the projects and initiatives funded through the program best address this goal and alleviate some of the ongoing concerns relating to the security of open and interoperable, standards-based RAN?

**[KT] As Open RAN equipment are linked through open interface, development of realtime security management technology for O-RU, O-DU equipment is necessary.**

a. What role should security reporting play in the program's criteria?

**[KT] No opinion**

b. What role should security elements or requirements, such as industry standards, best practices, and frameworks, play in the program's criteria?

**[KT] No opinion**

18. What steps are companies already taking to address security concerns?

**[KT] No opinion**

19. What role can the Innovation Fund play in strengthening the security of open and interoperable, standards-based RAN?

**[KT] No opinion**

20. How is the “zero-trust model” currently applied to 5G network deployment, for both traditional and open and interoperable, standards-based RAN? What work remains in this space?

**[KT] No opinion**

## Questions on Program Execution and Monitoring

21. Transparency and accountability are critical to programs such as the Innovation Fund. What kind of metrics and data should NTIA collect from awardees to evaluate the impact of the projects being funded?

**[KT] Improving transparency and accountability by regularly based report and sharing the outcome of the project is necessary.**

22. How can NTIA ensure that a diverse array of stakeholders can compete for funding through the program? Are there any types of stakeholders NTIA should ensure are represented?

**[KT] Mixed types of stakeholders such as big enterprises, SMEs, legacy vendors, and new start-ups should altogether participate the project.**

23. How (if at all) should NTIA promote teaming and/or encourage industry consortiums to apply for grants?

**[KT] New start-ups and SME vendors should be given some privilege when applied for grants.**

24. How can NTIA maximize matching contributions by entities seeking grants from the Innovation Fund without adversely discouraging participation? Matching requirements can include monetary contributions and/or third-party in-kind contributions (as defined in 2 CFR 200.1 (<https://www.ecfr.gov/current/title-2/section-200.1>)).

**[KT] No opinion**

25. How can the fund ensure that programs promote U.S. competitiveness in the 5G market?

a. Should NTIA require that grantee projects take place in the U.S.?

**[KT] This should be decided by the participants of the project.**

b. How should NTIA address potential grantees based in the U.S. with significant overseas operations and potential grantees not based in the U.S. ( i.e., parent companies headquartered overseas) with significant U.S.-based operations?



[KT] Discriminative act upon U.S. based operation or not is not necessary.

c. What requirements, if any, should NTIA take to ensure “American-made” network components are used? What criteria (if any) should be used to consider whether a component is “American-made”?

[KT] No opinion

26. How, if at all, should NTIA collaborate with like-minded governments to achieve Innovation Fund goals?

[KT] No opinion

### **Additional Questions**

27. Are there specific kinds of initiatives or projects that should be considered for funding that fall outside of the questions outlined above?

[KT] No opinion

28. In addition to the listening session mentioned above and forthcoming NOFOs, are there other outreach actions NTIA should take to support the goals of the Innovation Fund?

[KT] No opinion