

Department for Science, Innovation & Technology

	5G One COMPETITI			
	PROJECT - 5G			
	Project Closure – Prog	ess Report		
Project Start Date: 1 st January 2024		Project Duration: 18 months		
Approved:		Date: 3 rd April 2025		
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Dissemina	ation Level: Public	1		

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Executive Summary

The 5G MoDE project aimed to validate the deployment of an Open RAN solution in a High-Demand Density (HDD) environment, demonstrating its feasibility as a competitive alternative to Tier 1 vendors. Funded by DSIT under the Open Network Ecosystem Competition (ONE), the project successfully transitioned from lab validation (TRL 4) to public demonstration (TRL 6) within six months—an exceptional achievement given that comparable projects typically take years.

The project's key milestones included validating the technology in a controlled lab environment, developing a temporary site, and testing the system's deployment, processes, and personnel during the Autumn Internationals at Twickenham. This culminated in the live deployment of a real-world test site at Twickenham Stadium, with the expectation of successfully carrying live customer traffic during a Six Nations match on the 9th of March 2025. While initial plans aimed to cover multiple events, the successful deployment at Twickenham has validated the solution's readiness and demonstrated Open RAN's viability in high-demand environments.

Prof David Owens, Head of technical trials - Virgin Media O2 31.03.2025

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1. Aims and Scope of the Project

1.1 Project Objectives

The primary objective of 5G MoDE was to:

- Demonstrate that an Open RAN solution can be effectively deployed in a High-Demand Density (HDD) environment.
- Validate the performance and reliability of an Open RAN-based deployment under live traffic conditions.
- Benchmark its performance against incumbent Tier 1 vendors (e.g., Nokia, Ericsson) to support UK network diversification efforts.

1.2 Rationale for the Project

Given the UK government's push to diversify the telecom supply chain, this project was undertaken to address concerns about supplier dependency. Open RAN offers a competitive alternative, but its deployment in high-density environments remained largely unproven. The 5G MoDE project sought to fill this gap by implementing and evaluating Open RAN in one of the most demanding network conditions—a stadium event.

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2. What the Project Did

2.1 Methods, Technologies, and Approaches

The project followed a structured Technology Readiness Level (TRL) approach:

- **TRL 4 (July September 2024):** Lab validation of the 5G MoDE system, including hardware/software integration and network performance assessments.
- **TRL 5 (October December 2024):** Deployment in a relevant environment during Twickenham's Autumn Internationals, providing critical insights into power, backhaul, and network configuration.
- **TRL 6 (February March 2025):** Public demonstration during the England vs. Italy Six Nations match, carrying live traffic and validating interoperability with existing network infrastructure.

2.2 Security Considerations

Security was a major focus, with key measures including:

- End-to-end encryption and network segmentation to ensure integrity.
- Compliance with UK regulatory requirements, particularly for emergency call routing (999).
- Validation of Circuit Switched Fall Back (CSFB) mechanisms to ensure compliance with live network standards.

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3. High-Level Summary of Project Costs

- Total DSIT Contribution: £1,036,968.70*
- Participant Contributions: £1,128,729.66*
- **Equipment & Deployment Costs:** Covered under existing funding allocations, with no additional financial request for proposed additional events.

Category	Total DSIT Funding (£)	Total Partner Funding (£)	Cost as a Proportion of total (%)
Labour	£596,307.35	£724,006.92	61%
Overheads	£285,347.03	£184,531.44	22%
Materials	£23,186.32	£31,443.49	3%
Capital Usage	£74,118.26	£111,177.40	9%
Subcontract Costs	£48,302.72	£72,454.08	6%
Travel and Subsistence	£6,682.87	£4,360.31	1%
Other Costs	£3,024.14	£756.03	0%
Total	£1,036,968.70	£1,128,729.66	100%

*Note: All project costings are account for Claim 1-5 Actuals + Claim 6 Forecast (31/03/25)

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4. Results and Key Findings

4.1 Achievements

- Successful build of the temporary site MS-xx reports
- Successful lab testing of an Open RAN site in lab at Buckingham Avenue, detailed in the MS17 report
- Successful deployment of an Open RAN site in an HDD environment, achieving TRL 6.
- Validation of Open RAN's ability to operate under peak loads, supporting calls, data, and emergency services.
- Demonstration of interoperability with existing MNO infrastructure.

4.2 Challenges and Mitigations

- Vendor Delays: Broadcom's acquisition of VMware introduced dependencies, delaying commissioning activities until late February 2025.
- **Technical Failures:** A GPS card failure required a last-minute replacement, highlighting resilience in troubleshooting and problem resolution.
- **Emergency Calling Issues:** A VoLTE-based 999 call issue was detected and resolved before the live demonstration, ensuring compliance.

Commented [OY1]: Hi @Ghadialy, Zahid (DSIT) I know you've already signed this doc of, do you know if this is missing a number?

Commented [GZ2R1]: Yes, looks like it. Sorry, missed this one.

Commented [OY3R1]: No worries, should be a quick for them to confirm. @Williams2, Alun (DSIT) could you please just get the MS reference from Mathew for you to add in

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5. Impact and Benefits Achieved

5.1 Technical Impact

- **Proven Open RAN Deployment:** The first successful demonstration of Open RAN in an HDD environment within the UK.
- **Operational Insights:** Identified key learnings for power, cooling, and spectrum management in stadium settings.

5.2 Industry and Policy Impact

- **Strengthening UK Telecom Innovation:** Reinforced Open RAN's role in the UK's diversification strategy.
- **Supporting Future Deployments:** Created a foundation for scaling Open RAN trials into commercial deployments.

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6. Learning from the Project

6.1 Key Takeaways

- The integration of Open RAN into an MNO's public network requires careful coordination and risk mitigation.
- Emergency call handling must be rigorously tested in real-world conditions, as unexpected issues can arise.
- Supplier dependencies remain a significant factor in deployment timelines, necessitating better contingency planning.

6.2 Recommendations for Future Work

- Further trials should explore Open RAN's performance across multiple live events to confirm repeatability.
- Additional integration testing with Tier 1 MNOs would enhance confidence in broader commercial adoption.
- A long-term roadmap for Open RAN within UK networks should be established to support ongoing diversification efforts.

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7. Conclusion

5G MoDE has successfully validated the deployment of an Open RAN site in an HDD environment, marking a critical milestone in the UK's efforts to diversify its telecom ecosystem. While initial plans aimed to cover multiple events, the achievement of TRL 6 at Twickenham serves as a robust proof point for Open RAN's feasibility.

We appreciate DSIT's support in this endeavour and believe this project has delivered valuable insights that will inform future Open RAN initiatives across the industry.

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