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**A MULTI-STAKEHOLDER ROADMAP FOR 5G
DEPLOYMENT IN SRI LANKA: REGULATORY,
OPERATOR, AND ENTERPRISE USER
PERSPECTIVES**

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Master of Science in Telecommunications

Department of Electronics & Telecommunications Engineering
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University of Moratuwa
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DECLARATION

I declare that this is my own work and this Dissertation does not incorporate without acknowledgment any material previously submitted for a Degree or Diploma in any other University or Institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgment is made in the text. I retain the right to use this content in whole or part in future works (such as articles or books).

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Date: 2/7/2026

The supervisor should certify the Dissertation with the following declaration.

The above candidate has carried out research for the Master of Science in Telecommunications Dissertation under my supervision. I confirm that the declaration made above by the student is true and correct.

Name of Supervisor: Prof.(Mrs) Dileeka Dias

Signature of the Supervisor:

Date: 2/7/2026

DEDICATION

This thesis is dedicated with deepest love and gratitude to my family members, whose unwavering support, encouragement, and sacrifices have been the foundation of my journey.

It is also dedicated to all those striving towards the advancement of Sri Lanka's digital future, to researchers, policy makers, and industry leaders who inspire innovation, and to the next generation of students and professionals who will carry this vision forward.

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I also wish to extend my appreciation to my workplace supervisor and peers, whose encouragement and understanding helped me balance professional responsibilities alongside academic commitments.

Finally, I am deeply thankful to my family and friends for their patience, unwavering support, and constant motivation throughout this journey. Their belief in me has been a source of strength in completing this work.

ABSTRACT

The fifth generation of mobile technology (5G) is widely recognized as a transformative platform for digital economies, offering ultra-low latency, high device density, and enhanced mobile broadband. While early adopters such as South Korea, China, and the United States have demonstrated significant socio-economic benefits, developing nations continue to face barriers related to spectrum scarcity, infrastructure costs, and regulatory uncertainty. Sri Lanka represents a case where national digital ambitions, outlined in strategies for 2030, are not yet matched by an operational roadmap for 5G deployment.

This study examines Sri Lanka's readiness to adopt 5G through a multi-stakeholder lens, focusing on regulators, operators, infrastructure providers, and industry users. Using a qualitative-dominant mixed-methods design, the research combines expert interviews with global benchmarks and secondary data. The analysis is organized around five key themes: spectrum allocation, NSA to SA migration strategies, infrastructure and power cost challenges, policy and regulatory incentives, and enterprise adoption models.

Findings indicate that while operators are technically prepared to launch NSA 5G, progress is constrained by fragmented spectrum, limited fiber backhaul, high energy tariffs, and unclear regulatory processes. Industry adoption is further slowed by device affordability issues and weak enterprise demand. At the same time, lessons from regional peers highlight the importance of phased strategies, transparent spectrum frameworks, and coordinated infrastructure sharing.

Drawing on these insights, the thesis proposes a four-phase roadmap of Enablement, Optimization, Innovation, and Reinvention, designed to align technical, regulatory, and market priorities. The roadmap emphasizes spectrum harmonization, infrastructure cost-sharing, regulatory reform, and targeted enterprise pilots as prerequisites for sustainable rollout.

The study contributes by offering a context-specific model for 5G deployment in a developing economy, balancing international best practices with local constraints. Its outcomes are intended to guide policymakers, operators, and industry stakeholders in ensuring that 5G supports national goals of economic resilience, digital inclusion, and long-term competitiveness.

Keywords: 5G Deployment, Spectrum Management, NSA–SA Migration, Regulatory Framework, Multi-stakeholder roadmap, industry use cases, Sri Lanka

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