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Direct-to-Device Satellite Connectivity: Regulatory Implications for Africa's Digital Future

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Direct-to-device ("D2D") satellite connectivity is emerging as one of the most consequential developments in the global telecommunications landscape. By enabling standard mobile devices to connect directly to satellites, D2D introduces a fundamentally different model of connectivity-one that is particularly relevant in regions where traditional network deployment has proven challenging, or infrastructure is unreliable or vulnerable to disruption. While this has the potential to expand coverage in underserved and remote areas, it also challenges long-standing regulatory frameworks built on a clear separation between satellite and terrestrial networks.

A Potential New Layer of Connectivity for Africa

Although mobile network coverage has expanded considerably across Africa, gaps remain in rural and hard-to-reach areas, and network resilience continues to be tested by environmental and other disruptions.

D2D introduces regulatory complexity that existing frameworks, historically based on a clear distinction between satellite and terrestrial services, were not designed to address. As these boundaries blur, regulators, operators and investors are confronted with evolving questions relating to spectrum use, licensing models, and market structure. These questions remain unsettled and are being approached differently across jurisdictions.

This article considers the key regulatory issues arising in relation to D2D across Africa, and where the technology may have the most meaningful impact.

Understanding D2D: The Convergence of Satellite and Mobile Networks

At its core, D2D refers to satellite-enabled communications services that connect directly to standard consumer devices, such as smartphones and Internet of Things ("IoT") devices, without the need for terrestrial base stations or specialised equipment.

Two broad deployment methods are emerging.

- The first relies on spectrum traditionally allocated to mobile satellite servicers (MSS), typically requiring compatible device chipsets and operating within established international regulatory frameworks.
- The second involves the use of terrestrial mobile spectrum, usually through partnerships with licensed mobile network operators ("MNOs"), and raises more complex regulatory questions on spectrum sharing, licensing and competition.

Key Regulatory Issues

The emergence of D2D satellite connectivity raises a number of interrelated regulatory questions for African regulators, spanning several areas of telecommunications regulation.

Spectrum assignment and interference

The use of terrestrial mobile spectrum by satellite systems lies at the centre of current regulatory discussions. Although use of terrestrial mobile spectrum enables seamless connectivity using standard devices, it introduces the risk of interference with existing mobile networks. Regulators must therefore consider how to balance the efficient use of spectrum with the protection of incumbent licensees. For example, in Kenya, the Communications Authority of Kenya has initiated a technical review of satellite-to-device services, including assessing whether transmissions from low Earth orbit satellites to mobile devices could interfere with existing terrestrial mobile networks.

Licensing framework

A key issue is whether existing licensing frameworks can accommodate D2D services, or whether new approaches are required. Traditional regimes distinguish clearly between satellite operators and terrestrial network operators. D2D, however, sits between these categories.

Some countries have indicated that existing frameworks may be capable of accommodating D2D, particularly where services are delivered through partnerships with licensed mobile operators. For example, in the Independent Communications Authority of South Africa authorised the use of MNO-licensed spectrum for testing purposes, suggesting a degree of adaptability within the current framework.

In other jurisdictions, there is less certainty. Questions remain regarding direct service provision to end-users, the form of authorisation required, and the regulatory treatment of user devices. These issues are still being actively explored in several countries, including Zambia, where a consultation process on the interim procedure to facilitate D2D has been initiated by the Zambia Information and Communication Technology Authority, but a D2D specific framework has not yet been finalised.

Role of MNOs

D2D also raises important questions regarding the role of MNOs in the evolving telecommunications ecosystem. While some models envisage direct service provision by satellite operators, industry stakeholders have consistently emphasised the importance of maintaining a role for licensed MNOs, particularly where terrestrial spectrum is used, both to ensure regulatory alignment and to support efficient spectrum management.

This is not only a regulatory issue, but also a commercial one. MNOs have made substantial investments in infrastructure, and there is concern that allowing satellite operators to bypass existing frameworks could disrupt established market dynamics. As a result, partnership-based models are increasingly being viewed as a practical means for aligning innovation with existing regulatory and commercial realities.

Competition and regulatory parity

The expansion of satellite operators into markets traditionally served by MNOs introduces a new competitive dynamic. Satellite operators may not be subject to the same regulatory obligations as local licensees, while MNOs are typically subject to licensing requirements, spectrum fees, consumer protection rules, and infrastructure commitments. This raises concerns that permitting comparable services without equivalent obligations could distort competition and undermine investment incentives.

Regulators must therefore strike a balance between encouraging innovation and protecting the integrity of their domestic telecommunications markets.

Cross-border and jurisdictional issues

Satellite services there are inherently cross-border, in contrast to the national focus of telecommunications regulation in Africa. As a result, operators must navigate fragmented regulatory regimes across jurisdictions, each with distinct licensing requirements and policy priorities.

For investors seeking to deploy D2D services at scale, this fragmentation presents a practical challenge. While harmonisation efforts may develop over time, current approaches remain largely country specific.

Regulatory Timing and Global Developments

The question of timing is also significant. A further issue is whether national regulatory approaches should be aligned with international developments, particularly the outcomes of the International Telecommunication Union's World Radiocommunication Conference in 2027 (WRC-27), where aspects of non-terrestrial network integration are expected to be considered.

Pending WRC-27, regulatory flexibility and interim measures may be required to enable testing and early deployment of D2D, particularly in markets where connectivity gaps remain significant. For example, the Tanzania Communications Regulatory Authority published guidelines for the provision of D2D, which it designed to serve as an interim measure until the global framework is finalised at WRC-27.

This divergence reflects a broader tension between the need for regulatory certainty and the desire to support innovation in a rapidly evolving technological environment.

Opportunities for Africa: Where D2D Could Have the Greatest Impact

While much of the focus has been on challenges, D2D also presents significant opportunities for Africa.

Its most immediate impact is likely to be in extending coverage to rural and underserved regions, where traditional network deployment remains economically challenging.

It also has potential use in sectors such as agriculture, mining, and logistics, where connectivity in remote locations is often critical.

D2D may further enhance emergency communications and disaster response, by providing connectivity where terrestrial networks are unavailable.

Conclusion

D2D satellite connectivity presents both significant opportunities and complex regulatory challenges for Africa. It has the potential to extend connectivity to underserved areas, but also raises important questions relating to spectrum, licensing, the role of MNOs, competition, regulatory parity and cross-border coordination.

Regulatory approaches across African jurisdictions are still evolving. While the outcomes of WRC-27 are expected to provide important international guidance, national regulators will continue to play a critical role in shaping frameworks that can support the effective deployment of D2D services.

Against this backdrop, a key question remains: will existing regulatory frameworks prove sufficiently flexible to accommodate D2D services at scale, or will more deliberate regulatory evolution be required?

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