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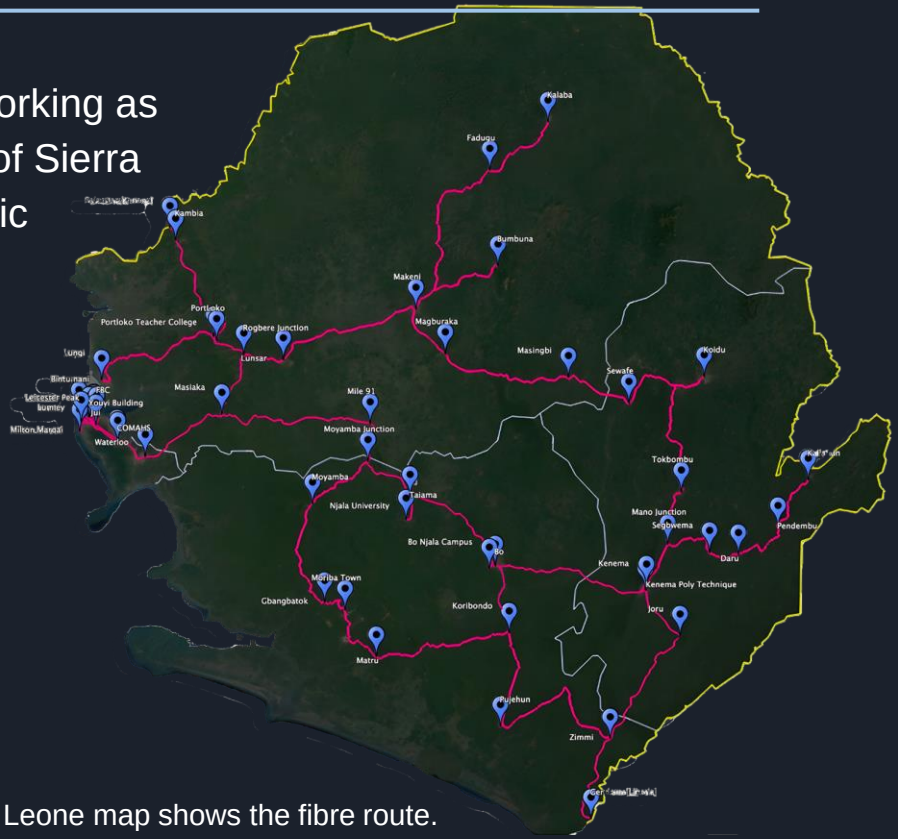
CONNECTING THE UNCONNECTED

QoS
(National Fibre Backbone Network)

Leonecom Overview

- Leonecom is a technology company working as a private partner with the government of Sierra Leone to oversee the national fiber optic backbone and ancillary infrastructure.

- Approx. 1,630 km underground fiber optic network borders with two neighbouring countries (Guinea & Liberia) and covers over 85% of districts, with a footprint in many chiefdoms, towns, and villages.



Red line on the Sierra Leone map shows the fibre route.
Blue GPS icon are the PoP sites

Network QoS Availability Summary (2024)

The network maintained excellent performance in 2024, achieving **~99.70% availability** across all sites. Resilience mechanisms like ring redundancy ensured continuity of core services despite minor outages and one temporary reroute.

Qos Metric	Observation	Remarks
Overall Availability	**~99.70%**	High, within SLA Thresholds
Branch Sites Downtime	**~23 hrs**	Power and redundancy issues
Packet Loss/Delay	**~3 hrs, ~10% total traffic**	Rerouting over low-bandwidth backup path
Redundancy	**Fully Functional**	Ring Failover prevented total core outage

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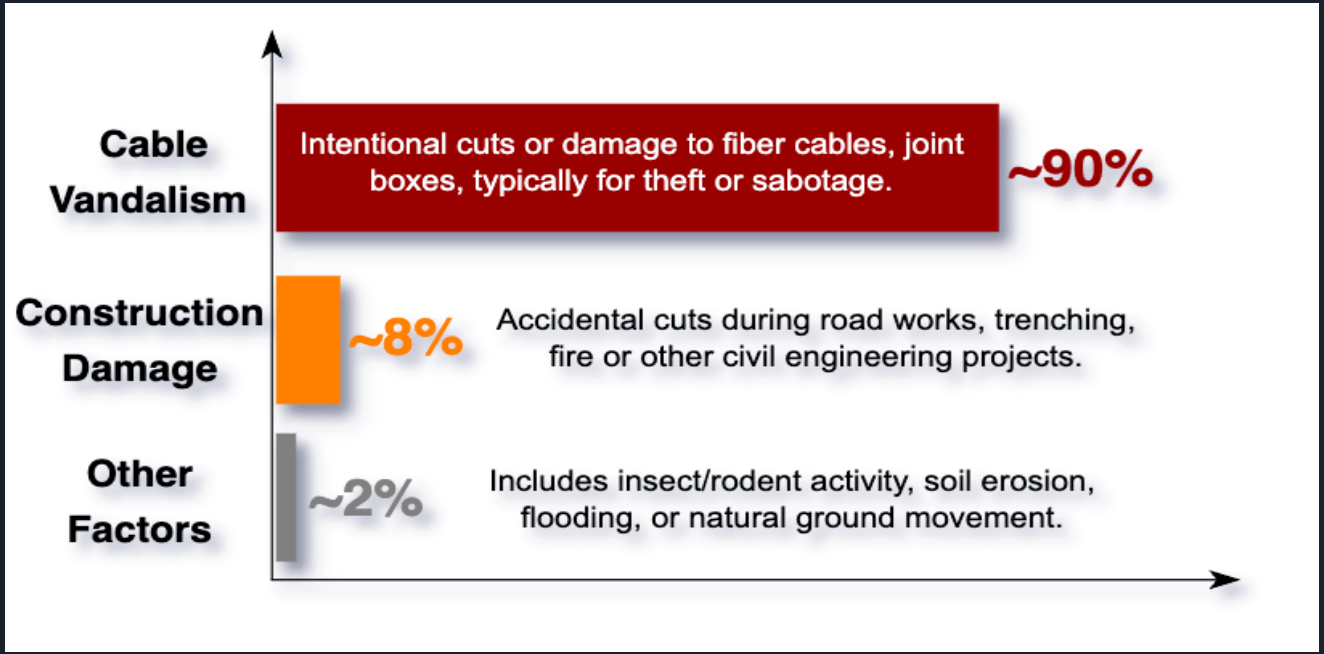
Field-Identified Causes of QoS Issues - Cable

Observed Root Causes of QoS Degradation – Based on Field Experience

Based on extensive field operations and incident analysis, the **primary contributors to Quality of Service (QoS) issues in** underground fiber network are:



Causes of QoS Issues - Power Challenge

The network faces critical power challenges due to an unreliable national grid and frequent outages. Reliance on diesel generators and solar power, which are affected by fuel supply, maintenance and impacts network performance and service quality.

Below is a summary:

Aspect	Detail	Impact on QoS
Access to National Grid	**~10% of sites**	Frequent outage and voltage fluctuations
Diesel Generators	**~100% of sites**	Fuel availability and maintenance - risk of power loss
Solar	**~96% of site**	Limited by weather (especially during the 6 months of rain) and battery storage
Overall Network Impact	**Reduced Availability**	Customer dissatisfaction due to degraded service

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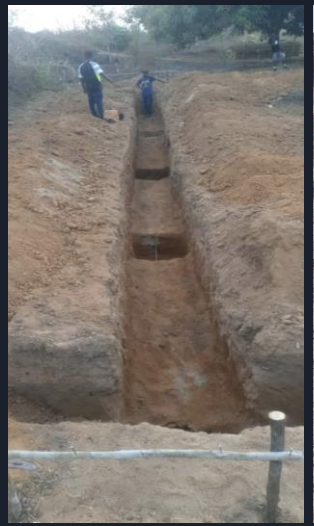
Fibre Backbone Maintenance Challenge:
Widespread Vandalism (>90%)

Approximately **90% of backbone cable damages** are due to **vandalism—deliberate acts of destruction**, often carried out by individuals **mistakenly expecting to find valuable materials** such as copper or aluminum within the fiber optic cables. This misconception leads to severe service disruptions and costly repairs, despite fiber optic cables having **no resale value for scrap**.

Fibre Backbone Maintenance Challenge:
Construction Activities (<10%)

Accidental cable cuts, trenching interference, building construction and uncoordinated roadwork continue to pose a significant—though limited—threat to underground fiber integrity.



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Thank you!

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