

## **Design and vision of Kerala-Fibre Optic Network (K-FON)**

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Kerala government wants to create a knowledge powered digital society through digital empowerment of citizens and promote digital lifestyles and e-commerce. This is possible only if we have a proper information infrastructure in place for effective communication, processing, and dissemination of information. Kerala Government has done a study on existing TELCO infrastructure and found that there is only limited fiber infrastructure in rural areas. 4G services in many places are not proper available. The Government / Educational institutions are now getting broadband services from various TSPs. Existing Kerala State Wide Area Network (KSWAN) infrastructure provides connectivity to nearly 3800 offices. KSWAN infrastructure is not scalable to provide connectivity up to 30,000 institutions. Department of Telecommunications (DoT) has conducted a comparative study with respect to broadband density among these high teledensity states and Kerala is not in a back position. In urban areas, we have 92 and rural areas it is 57. This is not sufficient to achieve the vision of Kerala Government's "Knowledge Powered Digital Society".

One of the main reasons why Kerala is not having proper 4G connectivity across the state is the poor fiberisation of the telecom towers. Nearly 36% of the towers are connected to fiber and remaining are connected through microwave which can provide only limited bandwidth (50 to 100Mbps). So fiberisation of all the towers with the existing fiber infrastructure is not possible.

Hence, Kerala Government has decided to move forward for building a proper fibre infrastructure to bridge the digital divide and provide proper connectivity to all Government institutions and leverage the infrastructure for TELCOS so that they can deliver proper

broadband services in all parts of the state. The main scope of the K- FON project includes the creation of a highly scalable and resilient core fiber infrastructure, provision of high speed connectivity to 30,000 Government institutions and to be an infrastructure provider and share the infrastructure for TSP/ISP/MSPs.

While designing KFON infrastructure, main considerations are 1. Reliability and availability perspective. 2. Optimize the fiber consumption and also optimize the cost and time. Considering these points, KSEB infrastructure has been selected as the platform for laying fiber since KSEB infrastructure reaches most of the areas of the State. Accordingly, it has been decided to lay fibre on KSEB Poles (Transmission and Distribution network ) and construct PoPs in KSEB substations, because the power failures in substations are very rare. Having decided to lay backbone fibre over transmission line which is more safe, there is only a remote chance of Fiber cut over transmission line.

In order to cover the entire geography of the state, it has been decided to go for tiered architecture which includes Tier I (Core), which connects all the districts, Tier II (Aggregation), Tier III (Pre- Aggregation) and Spur for the inter-district connectivity. Also while choosing the technology we had a lot of deliberation on various technologies currently available and conducted workshops with major technology providers. Finally, it was decided to use DWDM technology for the inter- district traffic, IP-MPLS for intra-district traffic and GPON technology for access network.

Expected outcomes of K-FON include bridging the digital divide by providing free internet to 20 lakh households, leveraging K-FON infrastructure to TSPs on a non-discriminatory basis so that they can provide high speed broadband connectivity to households in rural areas, providing a scalable bandwidth from 10Mbps to 1Gbps to the government institutions, depending upon their requirement, providing high speed connectivity to Start-ups, IT Parks, airports, and Wi-Fi Hotspots. K-FON also provides free access to the e-learning, e-health, e-Governance applications which are hosted at SDC.

5G is the upcoming technology. TSPs are in the final stage of designing and implementation of 5G in India. 5G requires large number of towers/ small cells because it is high speed connectivity and it is operating at a high frequency. So we need to have more number of 5G towers/ small cells to cover the entire geography. Since we have fiber infrastructure across the state and it is laid over KSEB poles, small cells can be installed on the pole itself. TSP can reduce a lot of CAPEX on 5G Roll out.

With this infrastructure in place, we are expecting many benefits to the citizen which include

1. **Human capital development:** Remote delivery of education, job creation, skills enhancements and remote access to health care etc.
2. **Infrastructure development:** which basically smart cities, smart villages, smart grids and transportation management all can be addressed using KFON infrastructure
3. **Infotainment:** Proper information sharing and best practices related to e-governance, agri-techniques etc. Also building a platform for delivering services like IPTV, OTT, Content delivery services etc.
4. **Innovation** will happen with the collaboration of communities like researchers, developers, product development etc. Hence KFON is going to be the key enabler for the knowledge-based economy.