



CREATING DIGITAL
HIGHWAY FOR EFFICIENT
NETWORK OF SMARTER
FUTURE AND TRANSFORMING
MILLIONS OF LIVES ...

A BharatNet Phase II

CASE STUDY

Around

35,000 Kms

of OFC-based network to connect

7,872

Gram Panchayats (GPs)

After **Gujarat and Bihar**,
Polycab is on its way to make
**HIGH-SPEED
DIGITAL HIGHWAY**
a reality in **TAMIL NADU**

**A BHARATNET PHASE II
CASE STUDY**

**PROJECT IMPLEMENTATION:
GUJARAT, BIHAR AND TAMIL NADU**

GUJARAT



3,764 GPs, connected to the SDC at Gandhinagar, by laying 16,953 kms of OFC-based network under Part B of BharatNet Phase-II



Gujarat gov., adopting the state-led model, formed a Special Purpose Vehicle (SPV), Gujarat Fiber Grid Network Ltd. (GFGNL) to execute the EPC Project in the state. GFGNL divided Gujarat's GPs into two parts – Part A (comprising rest of Gujarat) and Part B (Saurashtra-region).



SCOPE OF WORK

- Polycab, as a Project Implementing Agency (PIA), was awarded Package B to connect 3,764 GPs in 65 Blocks across 10 districts in Gujarat, including their Operation and Maintenance (O&M) for 7 years.
- To execute Survey, Planning, Supply, Installation, E-2-E Integration, Testing and Commissioning of OFCs (underground and aerial) and Gigabit Passive Optical Network (GPON), with an additional responsibility to create transport network
- To develop the design and network to achieve 98.5% service up-time

CHALLENGES

- A major shift from the BOQ-based project-completion milestone to an EPC model
- To install the OLTs through the non-functional BSNL Exchanges
- Taking RoW from NHAI and other respective concerned authorities for railway-crossings, Narmada canal-crossings, bridge-crossings and crossroads
- Laying cables through a diverse topography of Saurashtra

IMPLEMENTATION

- We executed our RoW-responsibility by taking clearances from respective concerned authorities right at the time of inception with proper documentation, once the network-design was finalized.
- The entire network-deployment was planned on 100% fibre roll-out.
- Optical Line Terminal (OLT) to GP (Optical Network Terminal- ONT) connection was made in a Star Topology and the OLTs were connected in a cascaded manner to the State Data Centre (SDC) at Gandhinagar.
- Each OLT was connected to ~20 GPs.
- To solve the BSNL Exchange-readiness challenge, we built telecom shelters, equipped with AC-DC power plant and electricity-support, to achieve 98.5% up-time, an integral part of the SLA.
- 12 dedicated optical fibres with bandwidth of ~100 Mbps were made operational in all the 3,764 GPs, which are scalable up to 1 Gbps
- A 3-layered approach for network-designing, i.e. Dense Wavelength Division Multiplexing (DWDM) Transport Layer, Packet Aggregation and GPON Access in Ring Topology, to achieve stability & up-time as per the SLA.
- NMS was connected to the Remote Fibre Monitoring Device (RFMS) Server Units, which were installed at each OLT-location and were integrated with GIS.
- RFMS Technology came as a big help in real-time monitoring of Dark Fibres without looping or cascading the fibres and helped in achieving operational efficiency and ensuring 24*7 availability of the fibres.

THE ENTIRE NETWORK IS RUNNING SUCCESSFULLY UNDER O&M

BIHAR



1,013 GPs were lit up by laying 3,785 kms of OFC-based network under Package B3 of BharatNet Phase-II



Bihar, following the PSU-led model of BharatNet Phase II, was divided into 3 Packages under the project.

SCOPE OF WORK

- A total of 3,785 kms of OFC-based network was laid, connecting 1,013 GPs across 65 Blocks in 6 districts of the state.
- To execute the Survey, Planning, Supply, Installation, E-2-E Integration, Testing and Commissioning of OFCs (underground)
- To design and implement the network for achieving 95% service up-time in all the GPs with the O&M for 6 years

CHALLENGES

- Laying cables through a difficult topology in Bihar
- Some GPs were located in severe flood-prone areas, where laying of OFCs was unworkable and fibre-maintenance was very hard

IMPLEMENTATION

- All the OLTs at BSNL-exchanges were connected to the BBNL's NOCs at two main locations, i.e. New Delhi and Bengaluru.
- Both the locations were equipped with Element Management System (EMS) and Network Management System (NMS).
- We connected 1,007 GPs in a linear Access Layer.
- 6 of the assigned GPs were located in the area which bears floods for almost nine months in a year and so, we decided to deploy Radio Frequency-links in those 6 GPs.

THE ENTIRE NETWORK IS RUNNING SUCCESSFULLY UNDER O&M

TAMIL NADU



3,095 GPs are to be lit up by laying around 13,919 kms of OFC-based network under Package A of BharatNet Phase-II



In Tamil Nadu, a Special Purpose Vehicle (SPV) namely Tamil Nadu FibreNet Corporation Limited (TANFINET), has been formed to execute BharatNet Phase II project, that is being implemented through State-led Model to connect all the 12,525 Gram Panchayats (GPs) in the state with OFCs in Aerial and Underground Modes and provide all the demarcated GPs with 1Gbps connectivity.

SCOPE OF WORK

- To execute Survey, Supply, Installation, Testing, Commissioning, E-2-E Integration, Operation and Maintenance of the optical fibre network, both for aerial & underground modes in the Package A
- Setting up of State Network Operation Centre (S-NOC) and E-2-E integration of electronics across the state, alongside integration with S-NOC & BBNL NOC
- O&M for S-NOC and continuous service-provisioning for 3 years from the date of Go-Live

CHALLENGES

Taking RoW from NHAI, NH and other respective concerned authorities for railway-crossings, Forests etc.
Continuing the aerial stringing on existing live poles amid heavy monsoon and during cultivation



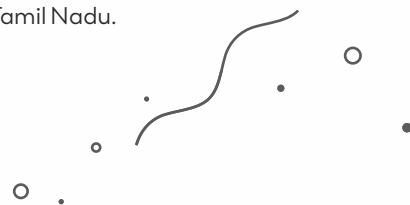
IMPLEMENTATION

- Priority given to Aggregation Blocks, as Uplink/connectivity from SNOC is delivered at these blocks
- Subsequent plans with neighbouring Blocks for extending uplink/connectivity from aggregator and for block-to-block span-closure
- IPMPLS Network-design to achieve maximum redundancy at Block & GP-Level in Ring Topology
- Installation of ISP Links at Blocks, ensuring connection of Aggregation Block Devices corresponding to all the 75 Blocks with TN-SWAN
- Creation of connectivity between Data Centre I and Data Centre II, involving fibre-laying, integration and civil work
- Establishment of link between the BharatNet Infra and NKN to provide internet-connectivity in GPs

WE DESIGNED, SUPPLIED, INSTALLED AND COMMISSIONED **S-NOC**



- With expertise in solution-architecture, our core team applied the best-approach methodology for preparing the requisite High-Level Design (HLD) & Low-Level Design (LLD) in the early stage of the project.
- We designed, supplied, installed and commissioned the S-NOC, which integrates all the Hardware and Software of various Active/Passive components, fitted across the entire project in Tamil Nadu.



MAJOR EQUIPMENT DEPLOYMENT

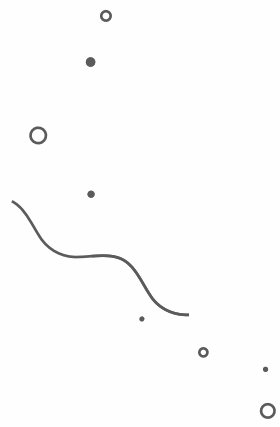


O&M HAS COMMENCED FOR THE DELIVERED PROJECT.

SOCIO-ECONOMIC IMPACT

Every digital facility can be seen as a connection which can become a model of bridge to eliminate the divide between rural and urban India in the digital context. Digital Highway in Gujarat, Bihar and Tamil Nadu, is sure to become a bedrock of future digitalisation in these states, which would reshape every aspect of villagers' lives by making various e-governance, banking, educational and healthcare services accessible to them easily.

A scalable digital network for rural population in Gujarat, Bihar and Tamil Nadu would certainly go a long way in bolstering the Digital India-journey.



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