



Railway Staff College

E Governance in Railways

RailTel and its Role in Latest IT application

15.11.11

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IT Application Require

- **System (Hardware / Software)**
- **Application Program**
- **LAN (Local Area Network)**
- **WAN (Wide Area Network)**

RailTel Role in providing WAN

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- **About RailTel**
- **Network available for WAN**
- **RailTel's Bussiness in Market**
- **The Way Ahead**
 - **PPP Projects**
 - **NOFN**

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Formation of RailTel

- **RailTel**

- Formed on 26th September 2000, a PSU fully owned by Railways
- Authorised capital of Rs. 1000 crore.

- **Objective**

To meet Railways need of Communication

- **Vision**

- To spur growth of telecom and value added services in all parts of country
- To build nationwide multimedia broadband telecom network
- To supplement national infrastructure

- **Assets**

- Railway's ROW along 63,000 route KM for establishing OFC network
- OFC based telecom assets of Indian Railways. (assets worth Rs 250 cr already transferred to RailTel).

RailTel's Organizational Structure

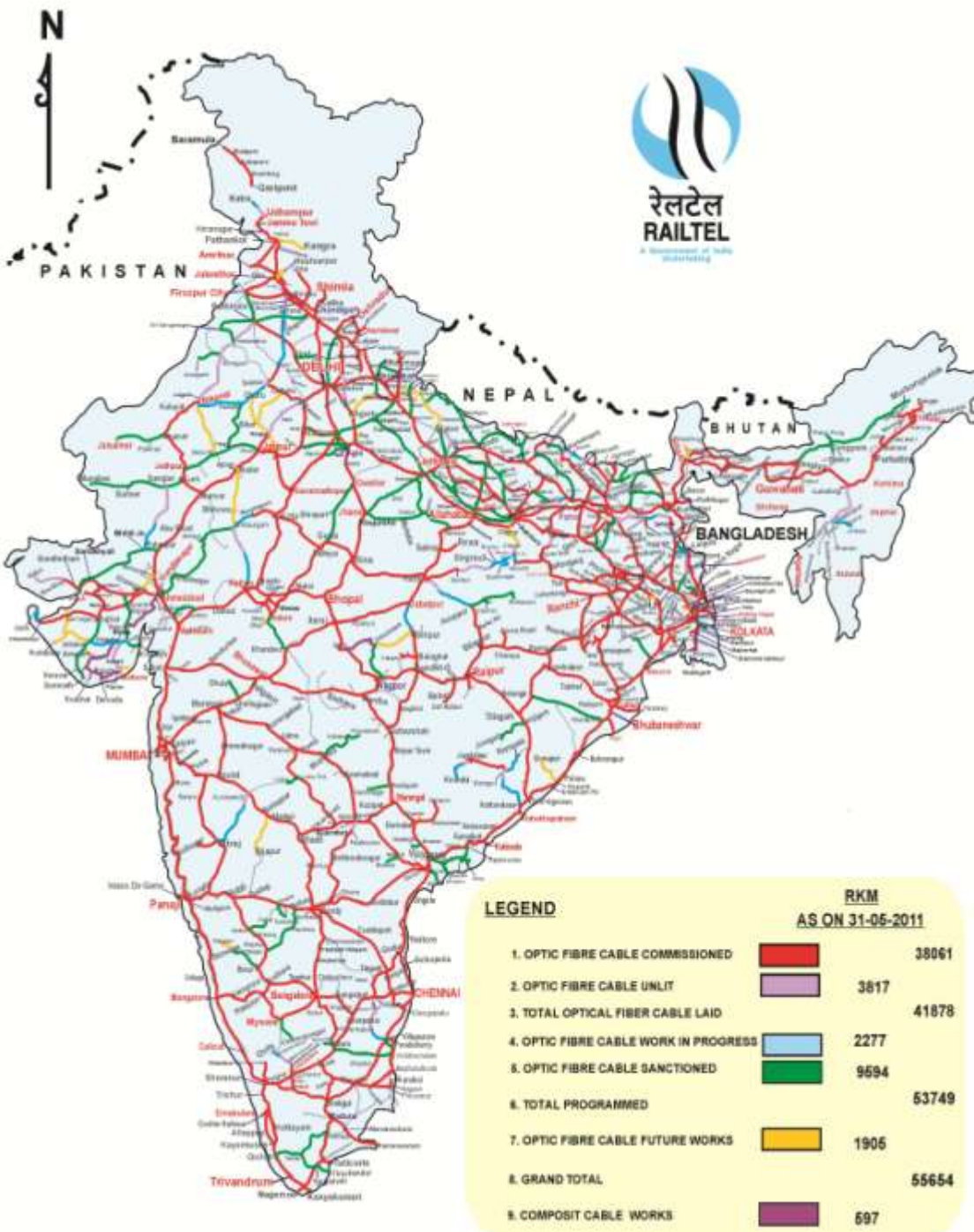
- **Corporate Offices at New Delhi**
- **4 Regional Offices**
 - **Northern Region, New Delhi**
 - **Eastern Region, Kolkata**
 - **Western Region, Mumbai**
 - **Southern Region, Secunderabad**
- **Teritorial offices at Chennai, Ahmedabad , Bangalore, Bhubneshwar, Pune, Chandigarh, Lucknow, Bhopal, Ranchi & Jaipur. More Territorial offices under 4 Regions are being set up.**

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- Creation of RailTel was to modernize Railways' telecommunication Network for safer and efficient train operations.
- Supporting administrative data communication needs of various field organizations of Indian Railways.
 - 4 Fibers provided for Railways own network.
 - STM-1 connectivity drop at each station.
 - MPLS based Wide Area Network for "RailNet".
 - Internet access is also extended to all Railway offices on RailNet.
 - RailTel also facilitates integrating Railway's other networks like PRS, UTS, FOIS, AFRES, COIS, etc on MPLS Network.
 - Videoconferencing setup provided between MoR with all zonal HQs.
 - Facilitated for Mobile CUG connections for 130,000 officers of Indian Railways which is arguably the largest CUG plan worldwide.
 - All major telephone exchanges of Indian Railways were also migrated to future proof NGN technology.



Present OFC Network of RailTel

Optical Fiber cable

- OFC laid – 41878 RKM & Commissioned- 38061 RKM

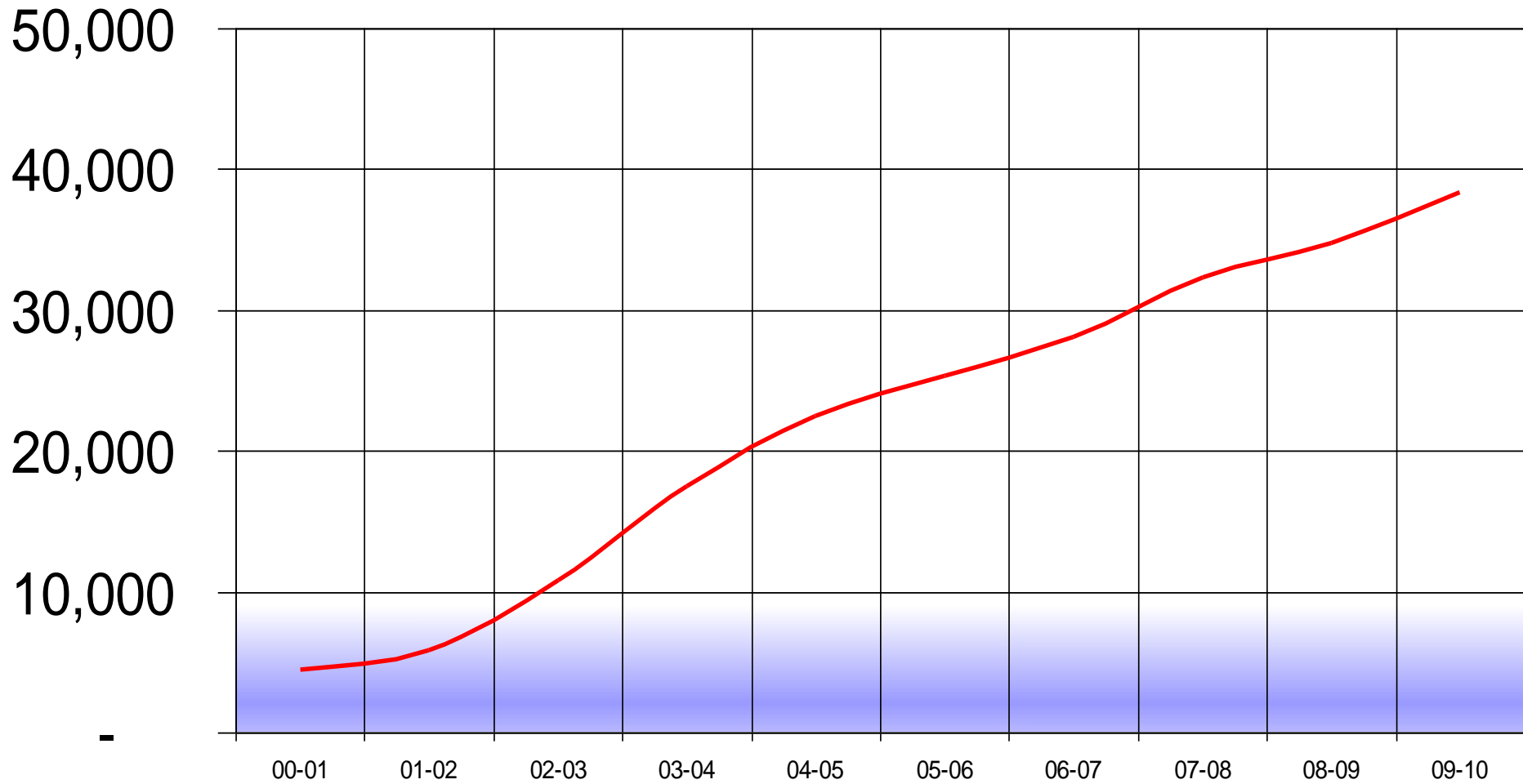
Backbone Layer

- STM 16 based backbone network covering about 26261 RKM (with Multiple rings on common section of 18948 RKM)
- DWDM implemented in 10500 RKM

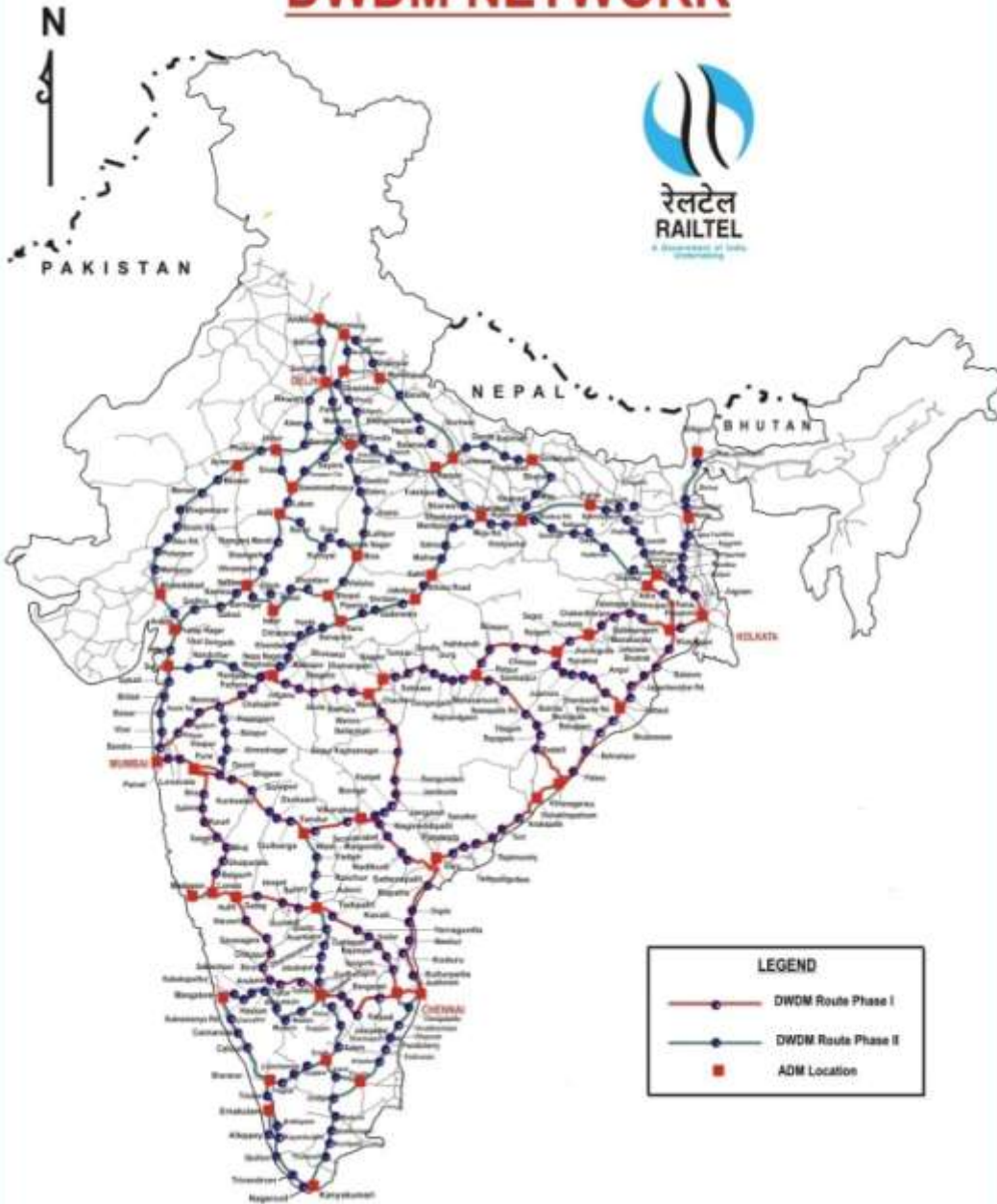
Total PoPs

- Major Cities: 247
- Minor Towns/Cities: 3689

OFC Network Growth



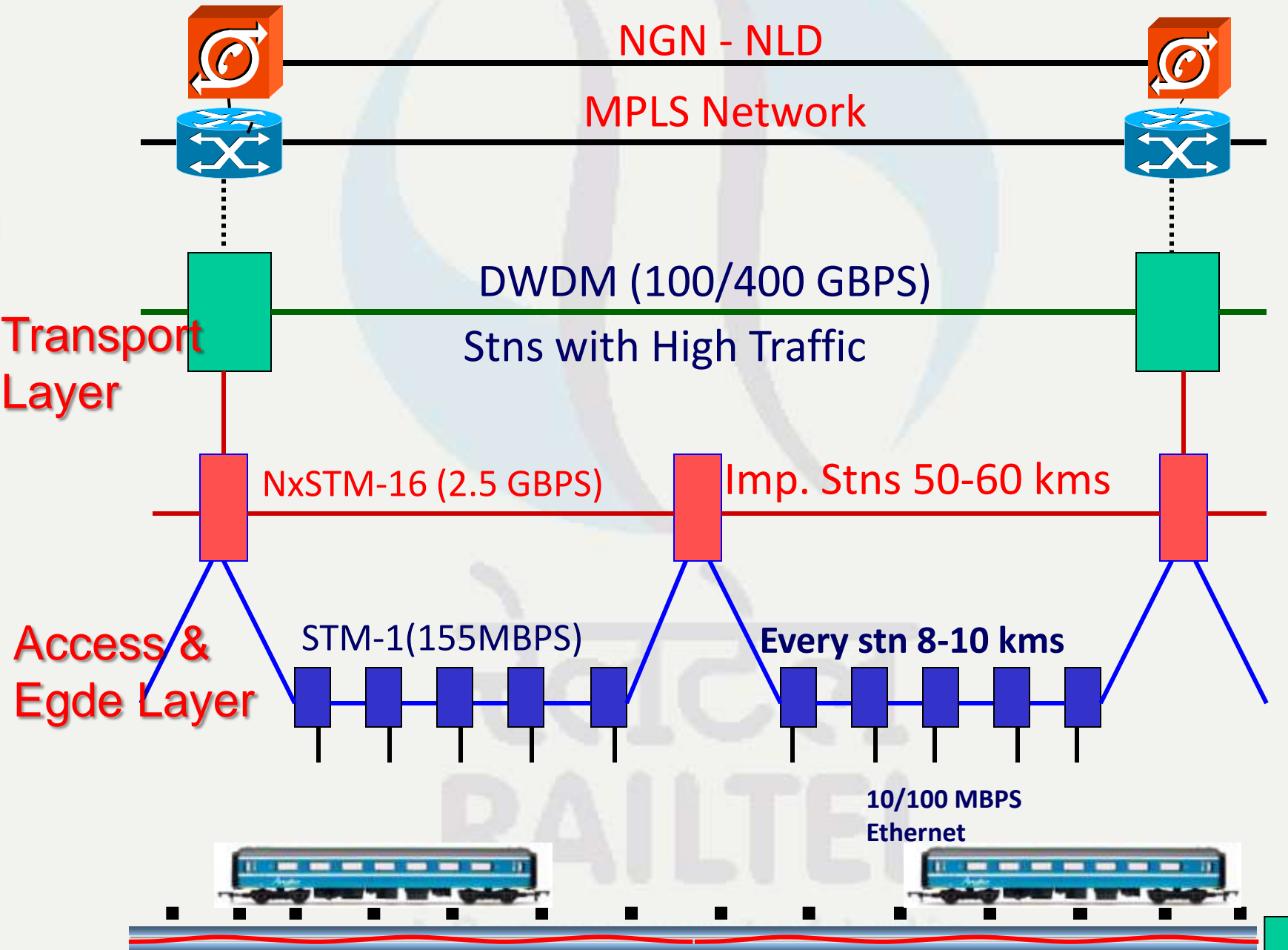
DWDM NETWORK



DWDM Network
of RailTel

Equipped with
100G

OFC System Architecture



ABOUT NETWORK

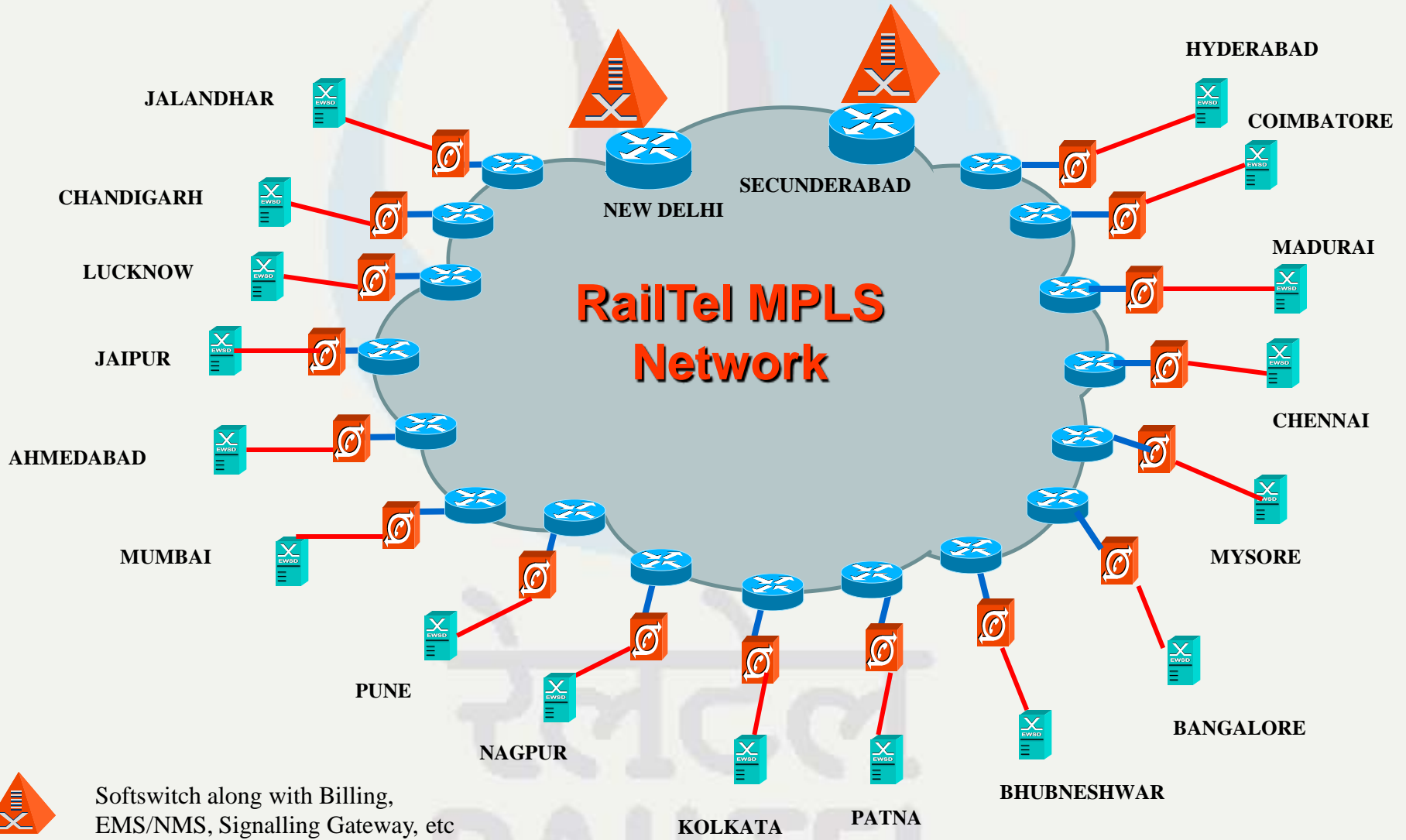
Access Layer / Edge Layer

- **Connects**
 - **Small Towns / cities (every 8-10 km)**
 - **Rural and remote Areas**
- **All stations enroute equipped with**
 - **155 MBPS bandwidth and**
 - **10/100 Mbps Ethernet ports.**
- **Railways requirement**
 - **limited to STM4.**
 - **Huge excess capacity available**
- **Till now 3936 POPs in all part of the country**

MPLS-IP Backbone

- **Country wide IP backbone**
- **Routers- 40 locations covers**
 - **metros, mini metros and other important cities of the country.**
 - **Core routers (13) and edge routers (27) of Juniper**
- **Services**
 - **MPLS IP –VPNs**
 - **Layer 2 VPNs**
 - **Bandwidth on demand**
 - **Corporate leased lines**
 - **VOIP**
 - **Content and Web hosting**
 - **Managed network services**
 - **Unified messaging services**
- **Extend IP services to 3936 POPs on SDH network**

NETWORK TOPOLOGY OF RAILTEL'S NLD NETWORK



Softswitch along with Billing, EMS/NMS, Signalling Gateway, etc



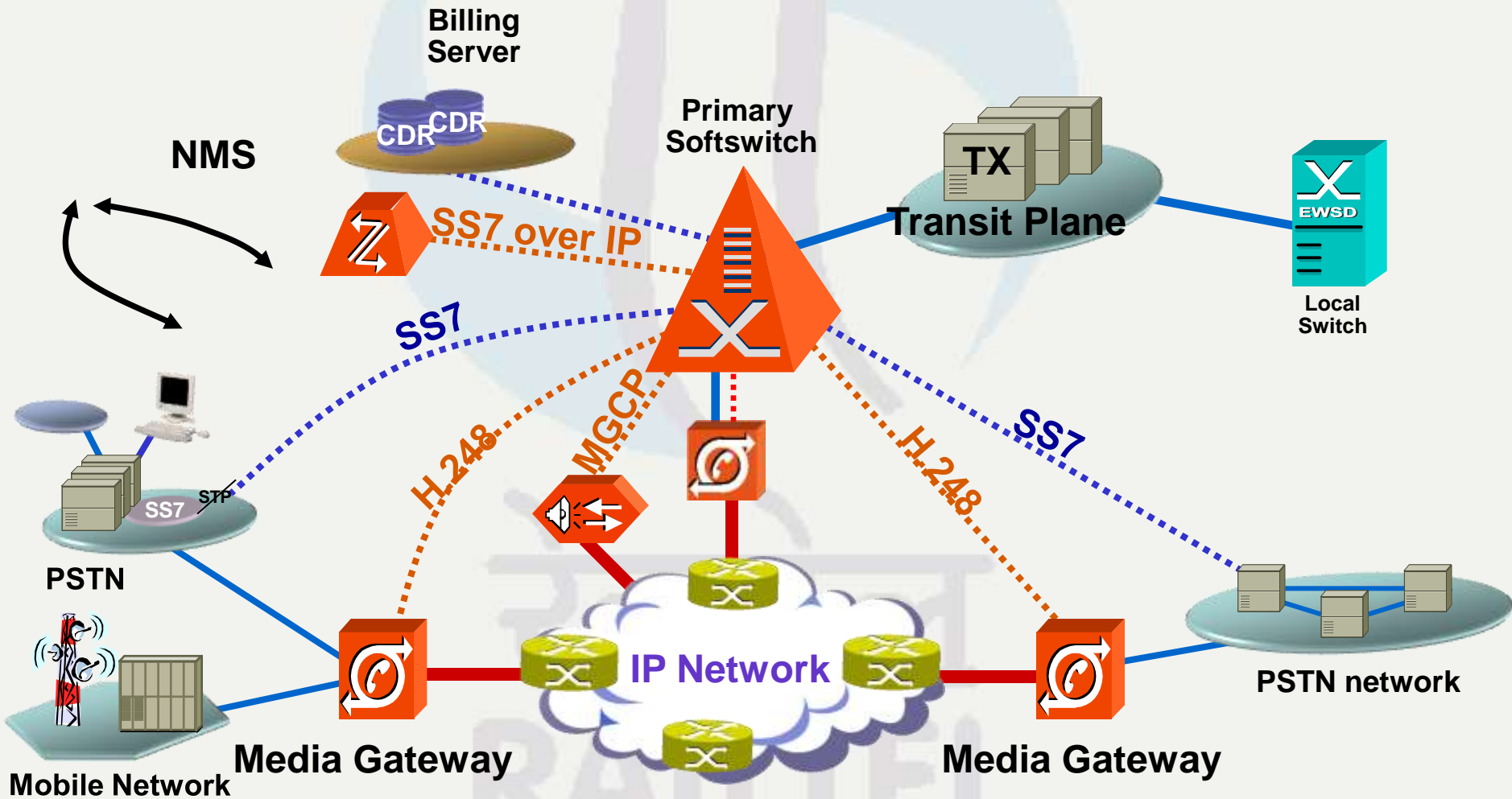
Media Gateway



PSTN/Mobile Network Switch

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NLD Network Architecture



RAILTEL NETWORK - OPERATIONS AND MAINTENANCE

- **Secured Right of Way**
 - **Minimal outside interference**
 - **Least damage to OFC**
- **Round the clock manning**
- **Multiple self healing rings**
- **For MPLS-IP network**
 - **Dorado Redcell for provisioning**
 - **Infovista performance and SLA management system**

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CUSTOMERS

Lease Line Customers

M/s Tata Tele Services



M/s AIRTEL



M/s SIFY



M/s Tulip IT Services



M/s Hutch Essar

M/s Idea Cellular



M/s BPL Mobile



M/s CDAC



M/s Patni Computers



M/s Reliance Infocomm



M/s Dishnet DSL



M/s AIRCEL Digilink



M/s ENIL (Times of India Group)

M/s Cablecomm



M/s HCL Infinet



M/s British Gas Broadband



M/s Spectranet



MPLS Customers

M/s Andhra Bank



M/s Bank of Rajasthan



M/s IRCTC



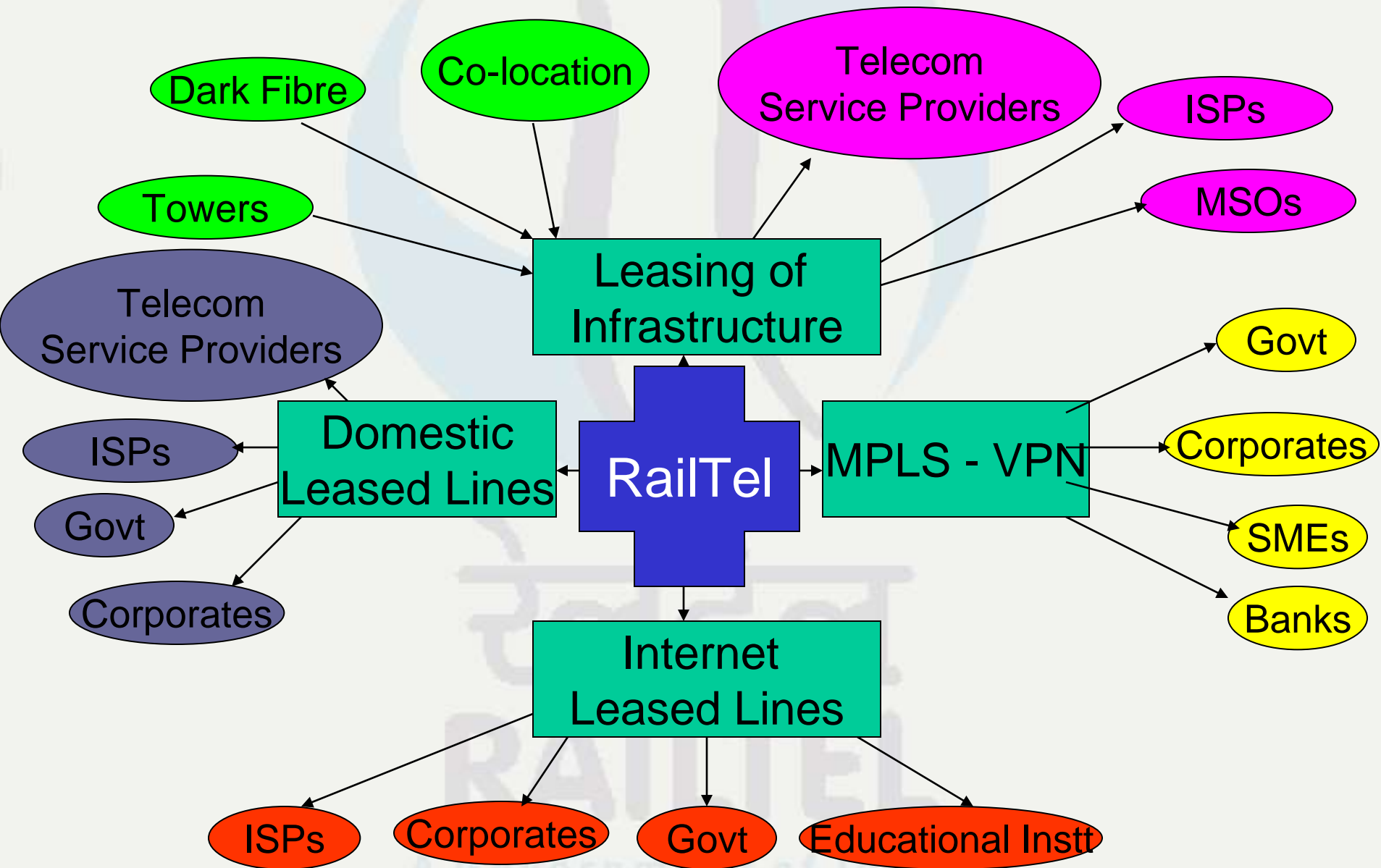
M/s RailNet



M/s Bajaj Hindustan



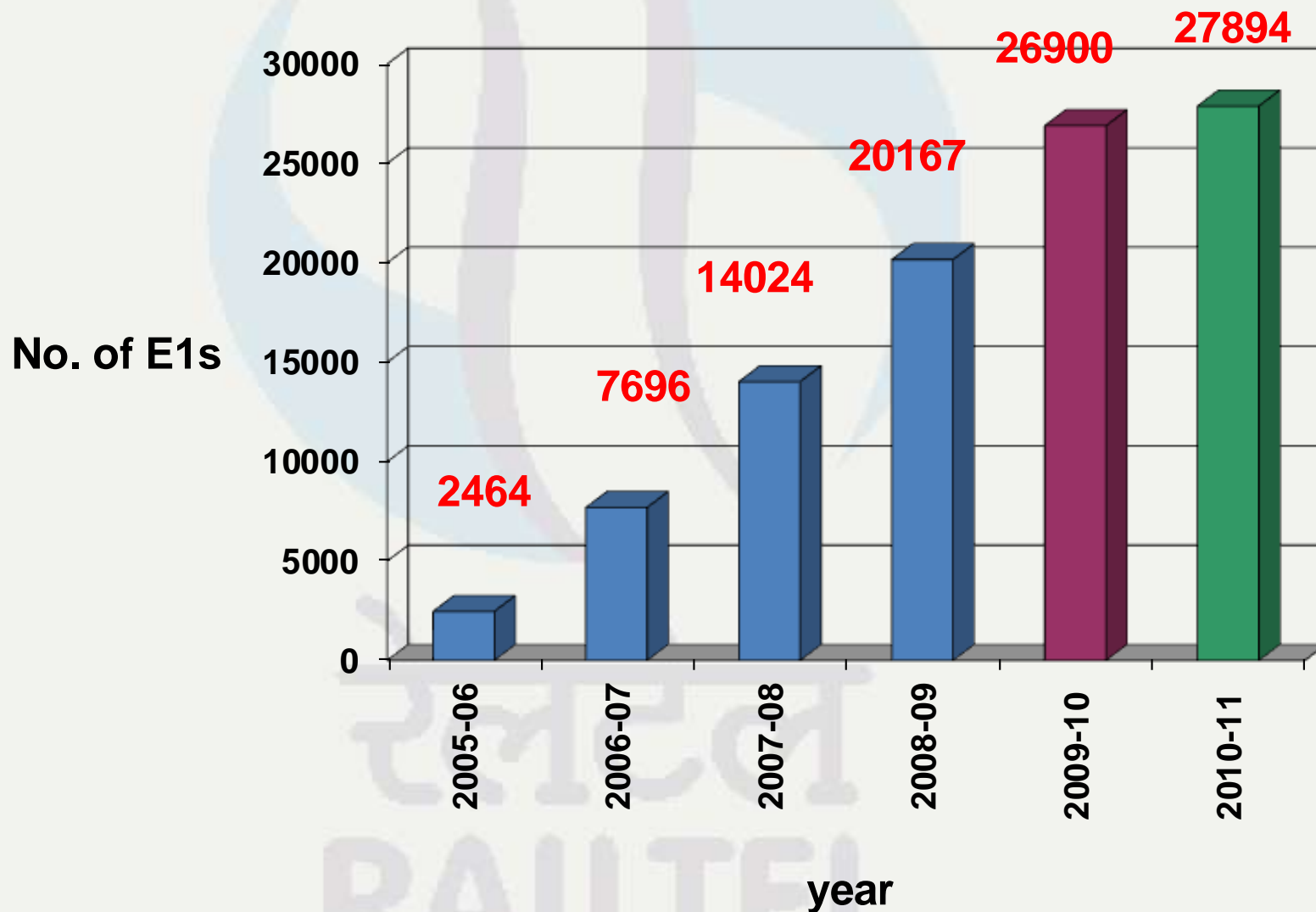
M/s SBI



Licenses and services

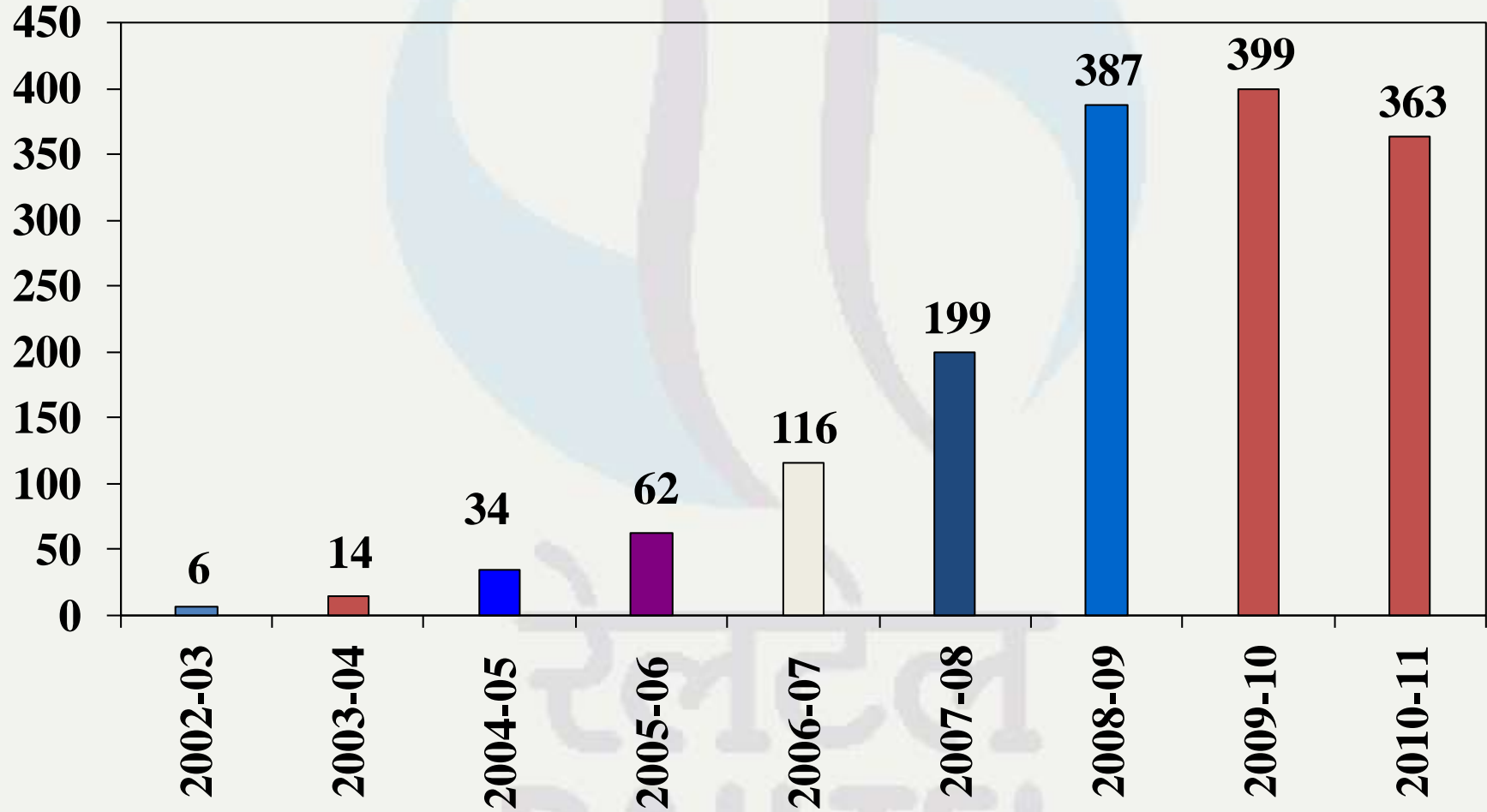
- RailTel has IP-I, IP-II, NLD, ISP (Category A) and IPVPN licenses and is offering following services:
 - Infrastructure leasing
 - Bandwidth leasing
 - National Long Distance
 - ISP services
 - VPN services
- RailTel plans to enter into following other services
 - Data Center

Growth in Bandwidth in terms of E1s*



*Exclusive of NKN - 19.5 G CORE, & 34 G Access links & Railways circuits - 1200 E1s).

Financial Achievement (Rs. Cr)



Distance Learning - RailTel's Role in fulfilling Education Grid Mission

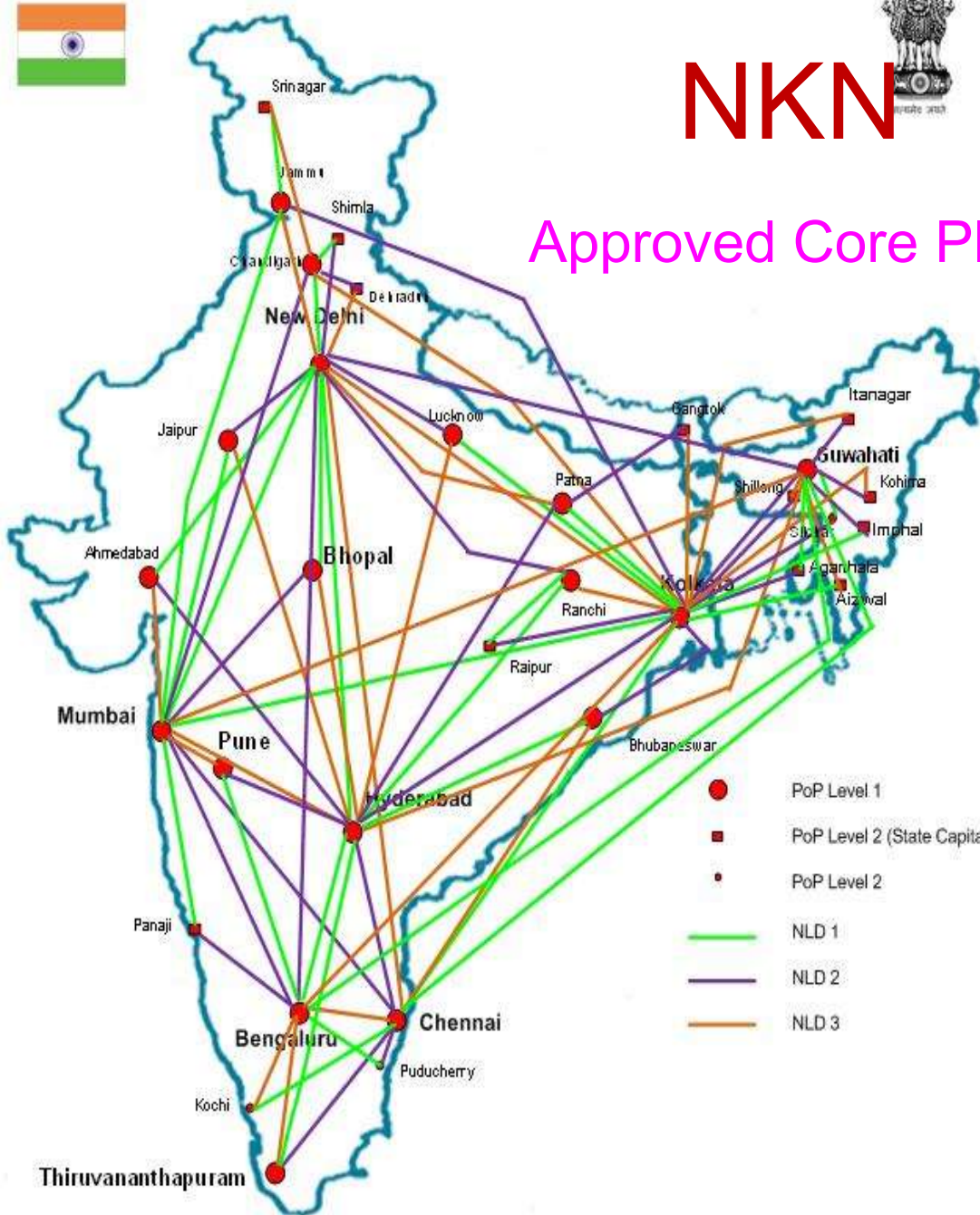
Infrastructure Under Creation
- NKN

National
Knowledge
Commission



NKN

Approved Core Plan



NKN Project

(10 yrs service period)

Approved Mar'10

33 Locations 89 Core links, 600 Dist & 1500 Access links

Access links

Implementation by: NIC, BSNL, PGCIL, RailTel

Total Cost: Rs 5990 Cr
Network Rs 4000 Cr

RailTel Expectation-

Revenue: Rs 1200 Cr

PO Recd Rs 894 Cr

Funds Recd Rs 473 Cr

Links: Core 26, Dist 44 & Access 270



INAUGURATION OF

Broadband Terrestrial Education Grid link between IIITM-K and NAGALAND UNIVERSITY

Shri. Mani Shankar Aiyar, Honourable Minister
for DONER and Panchayati Raj

Saturday, 12th July 2008



Guest of Honour :

Shri. Neiphiu Rio

(Honourable Chief Minister of Nagaland)

ided by

.A. Baby

(for Education and Culture)

Shri Mani Shankar Aiyar formally inaugurates the Link

President Inaugurating NKN Initial Phase - 9th April 2009



President Inaugurating NKN Initial Phase - 9th April 2009



USOF Project for Optical Fiber Network in NE

- RailTel bagged the prestigious project for laying of OFC in NE-I (Mizoram, Tripura, Meghalaya) & NE-II (Arunachal Pradesh, Manipur & Nagaland).
- RailTel to get subsidy of Rs. 89.50 crore in NE-I and Rs. 298.50 crore in NE-II project.
- Laying of fiber in 6 states of North-East for creation of intra/inter district network connecting all DHQs and SDHQs
- The agreement between USOF & RailTel for a period of 7 years.
- The whole project has to be completed within 24 / 30 months timeline from the date of signing of agreement.

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- Laying of OFC on 11267 RKM under PPP
- Roll out of Broadband services under PPP
- NOFN project

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The Way Ahead

- Ministry of Railways had envisaged that PPP partners shall utilize Indian Railways ROW, assigned exclusively to RailTel to lay Optical Fiber cable (OFC) and also utilize RailTel existing OFC & IP infrastructure , including Railway infrastructure to extend broadband services on PPP basis.
- The project is expected to enhance the presence & share of RailTel in over all Broadband services across the country.
- Nodal Ministry is Railways and RailTel is the executing agency

Laying of 11267 Rkms OFC on PPP model

- Private Partners will invest its own capital for creating OFC network in the sections, which are non-contiguous sections.
- ROW assigned to RailTel, shall be shared with Private Partners for laying of OFC .
- RailTel shall facilitate in integrating the newly developed OFC network on these non contiguous sections to provide continuous BW/fiber connectivity for PPP Partners.
- Private Partners may carry out their own business under PPP partnership on these sections.
- 8 fibers will be handed over to RailTel and 4 fiber to Indian Railway for their own usage by Private Partners.
- This is based on fixed revenue share model.
- Investment is Rs 625 Cr (App).

Delivery of Broadband Services under PPP

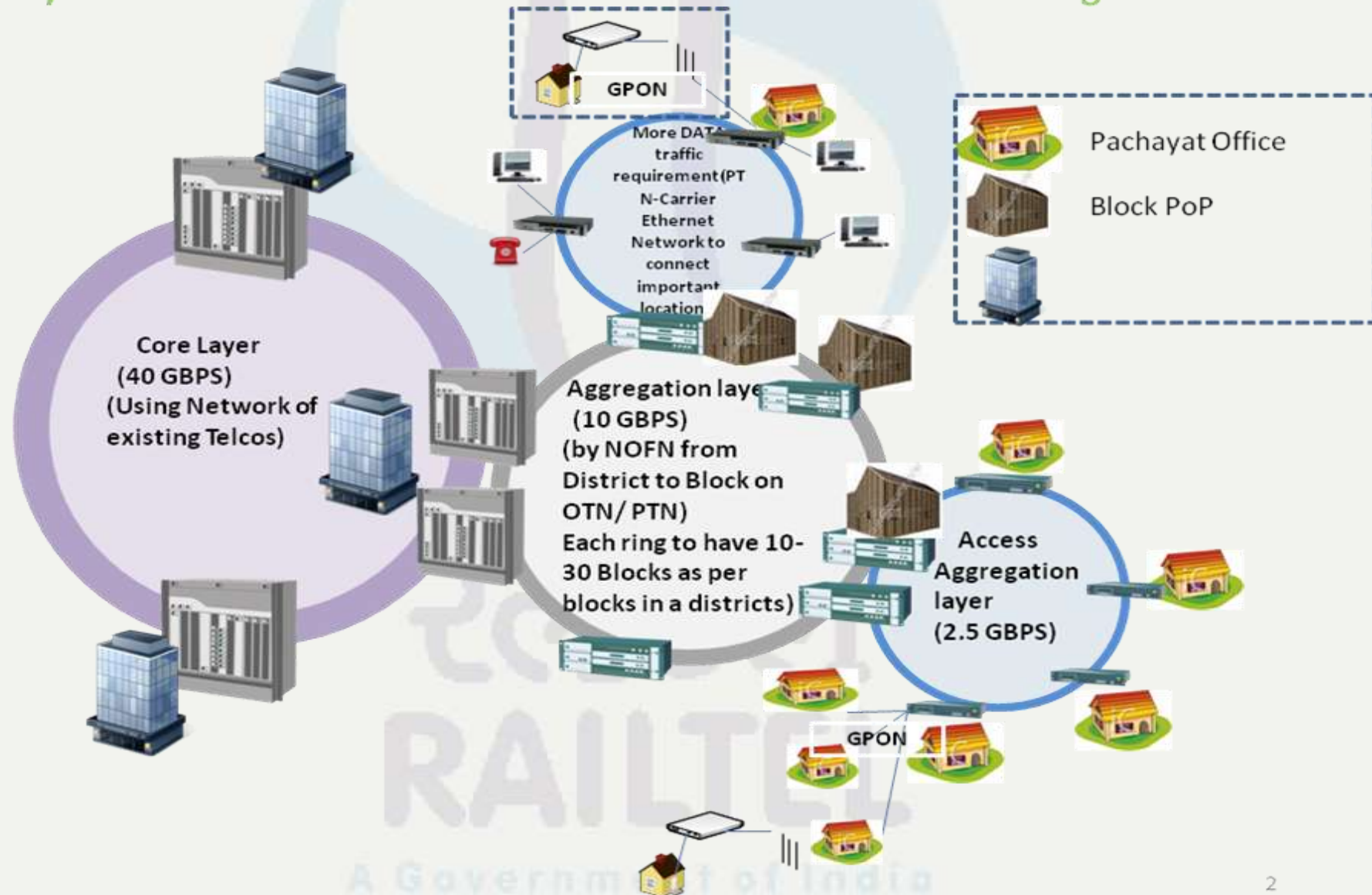
- This Project envisages utilizing RailTel's SDH and IP infrastructure to the optimum with PPP partners in offering Broadband services.
- Broadband service provider must have all necessary licenses.
- The Railway will be granting access right to its infrastructure for a defined concession period of 20 years, so as to enable PPP Partners to develop Broadband infrastructure.
- The selected PPP partner will plan, create, market and manage broadband services to its various customers.
- PPP Partner will set up its own broadband infrastructure, deploying its own capital. This shall include creation of wired/wireless last mile infrastructure including provision of electronics, towers, pole mount antennas, collocation of equipments, customers and equipments, billing, CRM help lines, power plant etc.

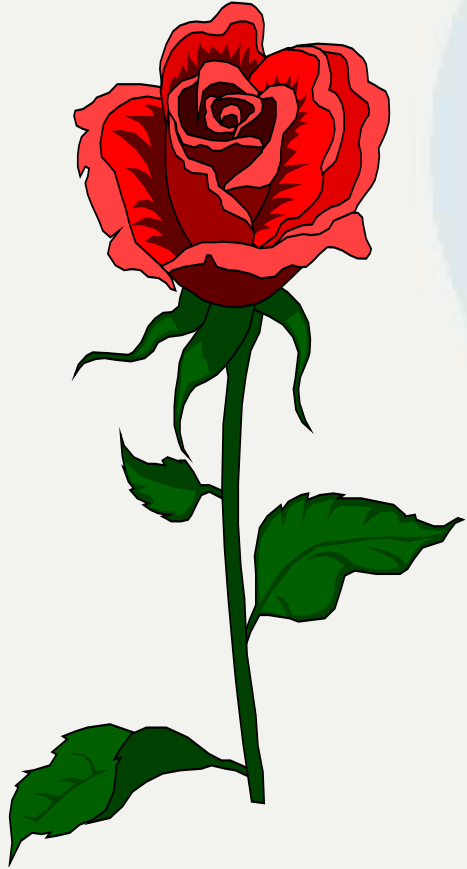
NOFN(National Optical Fiber Network) for Panchayats

- **RailTel first CPSU Telco to complete GIS mapped digitized infra information**
- **Based on GIS mapping about 70000 Panchayats can be reached from RailTel network.**
- **Broadband to all 2.5 lakh Panchayat**
- **High Level Committee headed by Sam Pitroda and Nandan Nilekani decided**
 - **BSNL, RailTel and PGCIL to create NOFN in 3:1:1 ratio**
 - **3.5 lakh Kms new OFC to be laid by 3**
 - **Utilization of Pan-India existing fiber network (Total 6 Lakh Kms)**
 - **Likely project cost is Rs 20000 Crs**
 - **NOFN Network shall be BW leasing company having equity from BSNL, RailTel, PGCIL.**
 - **OFC shall be normally laid from Blocks to all Panchayats. District to Blocks OFC laying only on those areas where only one operator as connectivity.**
 - **Service Providers to use this infra for giving services at Panchayat level..**
- **Core Group comprising of officers of RailTel, BSNL, CDOT, PGCIL, NIC decided modalities, system design and DPR**
- **Cabinet approval accorded in Oct 2011 for creation of NOFN.**
- **RailTel likely to get Rs. 4000-5000 Cr. worth project for network roll out in 60-70K panchayats.**

Network Topology for Panchayats

Bird Eye View of the Rural Telecom network- A mix of Technologies.





धन्यवाद



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The Way Ahead - Railway Applications

- Pilot Demo Project to demonstrate optical fiber based sensing technology with a industry partner, under the direction of RDSO, Lucknow, to demonstrate efficacy of optical fiber based sensing technology providing following operating benefits to Indian Railways.
 - To detect digging/excavation of earth near cables, so as to alert maintenance staff, preventing asset failure.
 - Train tracking and train actuated warning system for level crossing gate for road users.
 - Flat wheel detection etc.
- RailTel has also participated to pilot a demonstration of WiMAX based broadband service deliver platform on moving trains with Southern Railways. The Pilot Project has utilized the backhaul as well as internet bandwidth of RailTel to deliver the same Onboard running trains for e-ticketing, on board surveillance, internet and content delivery to passengers.
- RailTel is also deploying DSLAM's on existing Railway exchanges to provide Broadband services to several thousand homes and offices of Indian Railways in both urban and rural areas using the existing Copper wire last mile of Railways.