STL

5G and the Fibre Mandate

5 key things to consider during fibre deployment

Launch of 5G is going to catapult data usage to a whole new level. 5G is all set to move beyond mobile, to the world of billions of connected devices

Today, every two days we create as much data as we have from the beginning of time till 2003. Connectivity is now as important as running water and electricity, and Smarter Networks are the new core infrastructure

Launch of 5G is going to catapult data usage to a whole new level. 5G is all set to move beyond mobile, to the world of billions of connected devices and pave way for a new era of consumer-technology interactions

As we begin to understand how 5G will change the world, there is a need to understand how current networks will evolve to support this big change

In the foreseeable future, network augmentation needs for 5G will be driven by extensive fibre roll outs around the world

- Adoption of small cells networks is critical to network densification. Small cells can be backhauled over copper, microwave or fibre. With fibre being most scalable, secure and cost effective option, it is expected to play a pivotal role in 5G rollout world over

- Tower backhaul is another area which is critical to 5G rollout. Need for reliable and secure data transmission in backhaul networks make fibre the most suitable option

- With big data explosion and manifold increase in data centres, fibre will be critical to meet the speed, latency and capacity requirements

Top communication service providers (CSPs) across the world are gearing up for the 5G launch and are cognizant of the 'fibre imperative'

Extensive fibreization in the front haul and access networks will translate into considerable monetary benefits for the CSPs in the form of:

- Reduced TCO for backhaul
- Higher revenue per site
- Better QoE and satisfied customers

While the role of fibre in networks of tomorrow is clearly established, OFC (optical fibre cable) deployment, which is the single most important part of fibre roll outs still remains under emphasized

CSPs across the globe need to delve upon two key points:

Complexities involved in OFC deployment

- Terrain and civil work challenges
- Regulatory and RoW challenges
- Holistic preliminary survey
- Network design
- Program and project management expertise

Effective deployment and high performing networks

- The effective life and quality of the OFC depends on the deployment quality
- Deployment quality impacts the O&M costs
- Cuts per 1000 km – varies a great deal according to the kind of deployment practices used

Fibre deployment standardisation is the need of the hour to ensure seamless and effective network rollout

Some of the considerations which CSPs should be aware of while undertaking fibre deployment to ensure high quality, scalable and future proof roll outs

1. Long term view of fibre deployment

Fibre deployment basis a short term view can prove to be a drainer in the future

- Practice of incremental fibre deployment on need basis while not considering the holistic connectivity requirements, may lead to inefficient capex spend

- This can be seen in the cases of tower wise business cases, or only last mile specific roll outs. This approach might fit right in the short term view, but can cause a significant time and value erosion in the long term

2. Role of planning in efficient deployment

Planning plays a vital role in efficient deployment

- A well planned fibre roll out can help in efficient and scalable network expansion

- Legacy networks usually are a deterrent to clean slate planning. There needs to be a conscious stakeholder buy in on proper expansion planning with clear expectations on capex realisation and value demonstration

- Incremental need based approach vs best fit route approach can be the key differentiator between an optimised and un-optimised network. Efficient route planning can help reduce the cost per site and lead to a better resilient network

- Fibre deployment process is dependent on various externalities like manpower supply gap, machines availability and regulatory issues. Planned roll outs can help minimise the impact of these factors

- The market dynamics are changing fast and existing telecom networks were not built to manage the scale and complexity arising out of data growth. Without proper expansion planning, there can be throughput / demand bust scenarios which can de stabilise operations and push operators into cost inefficient ad hoc roll outs

3. Gap between planning and actual deployment

Gap between planning and actual deployment

- Due to the complex ecosystem, there remains a gap between planning and actual implementation on ground

- Some of the issues that can significantly impact the deployment are

    - Approval challenges – RoW
    - Vendor challenges – shortage of skilled manpower, lack of right machinery
    - Inability to ramp up supervision during large scale deployment
    - Terrain challenges – limited geo technical inputs may result in cost and time overruns
    - Partner challenges – limited availability of partners of scale with desired domain expertise

- Effective deployment is the critical factor in determining the quality and performance of the network. It governs the longevity of fibre cables, impacts optical parameters like attenuation losses and has a bearing on future O&M costs

- Hence it becomes critical to see the deployment process as an 'expert job' and not just as a digging and laying job. Some of the key areas which cannot and should not be ignored by the CSPs include – project management, detailed design and engineering and partner management

A case for expert led fibre deployment

An expert network integrator can make all the difference through and can be an answer for almost all of the aforementioned issues. It would ensure:

- Comprehensive planning and end to end design
- Superior build quality through project management skills (project managers, quality managers, site engineers at specified intervals, use of smart monitoring tools)
- Handling execution complexities by deploying experts (certified personnel)
- Superior ability to handle the last leg of deployment – connecting, splicing, link testing etc
- Ability to navigate through road blocks by troubleshooting and problem solving
- Making the network traceable and future proof
- Reduced RoW costs – effective planning and management will avoid delays and re digging
- End to end partner management to ensure seamless integration
- Reduced TCO and O&M costs in medium to long run

4. Navigating regulatory issues

Navigate through the regulatory issues with proper knowledge, liaison and planning

ROW plays a key role in the overall deployment of a project. It is an externality for which the entire ecosystem needs to come together and take steps to work around

Some of the key points that can be addressed by CSPs and Network integrators include

- Consistent relationship building and engagement efforts with the regulatory stakeholders – encompassing policy topics like fibre as an infrastructure requirement, long term benefits of underground fibre deployment

- The ecosystem needs to persistently voice issues that matter the most – like single window clearance for RoW

- Proper geo technical analysis is the key to tackling foreseeable RoW issues well in advance

- Account for the time taken to get ROW clearance in the overall project execution timelines

- Engagement with ROW authorities to define duct policies and dedicated telecom duct corridors

5. Best cabling solutions & techniques

Choose the right technique and right kind of cabling products

- A whole new ecosystem for deployment techniques and equipment has come up. There are many techniques to choose from:
    - Micro trenching – for minimum invasive cabling in urban areas
    - State of the art open trench system
    - Horizontal directional drilling - trench less conduit installation. It can be used in wetlands, river crossings, un-navigable urban spaces
    - Aerial lashing – an alternative to digging, being extensively used for FTTH applications in many countries
    - Leveraging spare space in existing occupied ducts to deploy new cable
    - Using existing infrastructure for cable deployment – not only existing duct spaces, but gas lines, sewer lines and water lines are increasingly being considered as effective deployment options

- Sourcing cables is no more just a 'purchase job'. Cable manufacturers can play the role of consultants and create special solutions to tackle operator specific challenges. CSPs should look at long term strategic relationships with cable suppliers to develop innovative solutions for connectivity problems

Yogalite™ Cables – A case in point for cable innovation

- Yogalite™ cables are multipurpose cables developed by STL to handle the complexity of deployment
- Application includes duct and micro-duct, directly buried cables or for overhead cables
- Utilized both indoors and outdoors making them a very versatile fibre transport system for cables
- Due to small size, it is easier for fibre storage (5X more storage in the same space) and controlled mid-span access
- Faster cable preparation times (30% time saving) and reduced civil work

With so many cable innovations and deployment methods to choose from, CSPs should focus on need gap assessment and an expert view for solution storming

With clear focus and careful considerations on the five points mentioned in this paper, the CSPs can extract maximum value out of their deployment process. Due to the granularity, complexity and scale involved in these projects, the need for network integration experts cannot be over emphasised in this space

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STL is an industry leading integrator of data networks.

We design, build and manage fibre and wireless networks for our customers. With core capabilities in optical connectivity and virtualized edge solutions, we are the industry's leading end-to-end solutions provider for global data networks. We partner with global telecom companies, cloud companies, citizen networks andlarge enterprises to deliver solutions for their fixed and wireless networks for current and future needs.

We believe in harnessing technology to create a world with next generation connected experiences that transform everyday living. With intense focus on end-to-end network solutions development, we conduct fundamental research in next-generation network applications at our Centres of Excellence. STL has a strong global presence with next-gen optical preform, fibre and cable manufacturing facilities in India, Italy, China and Brazil, along with two software-development centres across India and one data centre design facility in the UK.

Mobility Solutions

Access Solutions

Core Network Solutions

Network Modernization

Data Centre Solutions