

# Connectivity in Afghanistan and Kyrgyzstan: Leveraging International Bandwidth



Michael Ruddy

Director of International Research

Terabit Consulting

[www.terabitconsulting.com](http://www.terabitconsulting.com)



# Weak Regional Infrastructure Constrains Afghanistan & Kyrgyzstan

- Afghanistan and Kyrgyzstan have made great advancements in the **development of their own domestic & international fiber connectivity**, including Afghanistan's OFC ring and more than 12,000 route km of fiber in Kyrgyzstan
- However, as landlocked countries they are **reliant on the region's overall fiber infrastructure**, which is **low-capacity, high-cost, and unreliable**
- There are **no coherent, purpose-built, cost-effective pan-regional** fiber optic networks: international connectivity consists only of **bilateral, point-to-point, closed-access** trans-border links
- Afghanistan and Kyrgyzstan's investment in new infrastructure will require **stronger regional infrastructure** in order to be effective



# Low International Bandwidth & Weak Intl. Infrastructure Has a High Cost Across the Economy

- **At the macro level: a major obstacle to economic and human development**
  - Detachment from digital economy
  - Continued economic inefficiencies and restrained growth
  - Lack of access to critical social development tools including telemedicine, distance learning, scientific/research networks
- **More specifically within the telecom environment: higher wholesale and consumer prices, and lower broadband adoption rates**



# An Option for Improved Regional Connectivity: Digital CASA



- Terabit Consulting's *Pre-Feasibility Assessment (2016)* proposed three phases of deployment:
  - Phase I: Proposed Digital CASA segments via CASA-1000 (OPGW)
  - Phase II: Proposed Digital CASA segments via existing telecom fiber
  - Phase III: Proposed Digital CASA segments requiring new construction

# Improved Regional Fiber Connectivity: Immediate Benefits & Opportunities for Afghan & Kyrgyz Operators

## 1. Would bring lower-cost, higher-volume bandwidth

- Via improved regional access to Russia, Europe, and China

## 2. Would increase reliability of int'l. connectivity

- Additional fiber connectivity decreases the likelihood of network outages

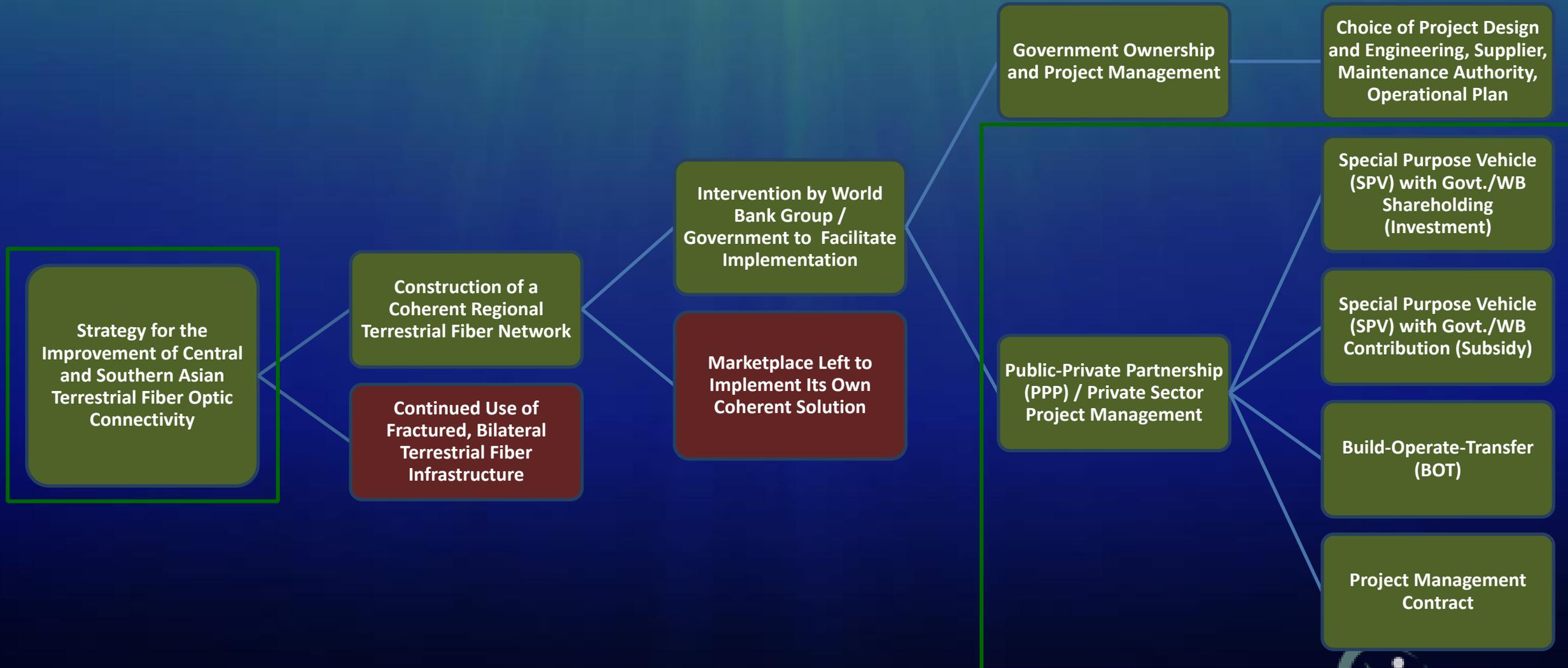
## 3. Would increase value of Afghan & Kyrgyz fiber optic networks

- Aftel revenue from the optical fiber network grew from USD\$25 million in 2009 to USD\$100 million in 2014; improved regional fiber connectivity would greatly increase the utility and value of domestic networks

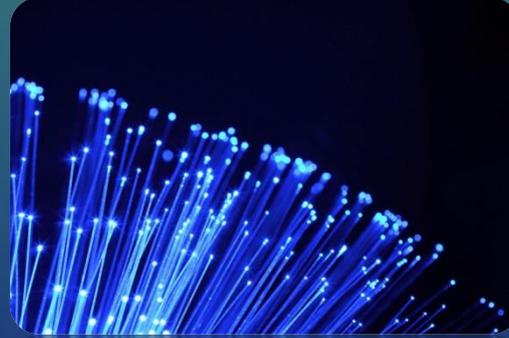
## 4. Would present a stronger opportunity for the sale of transit capacity to neighbors & share of Europe-Asia

- Improved regional connectivity would allow countries to export to their neighboring markets, and also to capture a share of the lucrative Europe-to-Asia transit market (currently in excess of 15 Tbps)

# Business Models for Network Development



# Strategies to Ensure Successful Network Development



## 1. Functioning and monitored as single, uniform network

- Existing multi-national terrestrial networks cannot offer uniform quality-of-service guarantees between endpoints (as good as “weakest link” or “weakest operator”).

## 2. Leveraging existing infrastructure

- Right-of-way procurement and uniform construction techniques would be enabled through the use of linear infrastructure such as the highways, railways, or energy transport and transmission infrastructure.

## 3. Fully integrated and coherent

- Redundant ring or mesh architecture would allow for in-network healing in the event of physical cable outages or instability affecting connectivity in specific countries.

# Strategies to Ensure Successful Network Development

(Continued)



## 4. Cost-effective

- With suitable transmission capacity and fiber count, a pan-regional terrestrial fiber network could compete effectively with submarine cable on both a regional and intercontinental basis.

## 5. Open access and non-discriminatory pricing

- In order to achieve development and policy goals, as well as to serve the region's consumers, all purchasers of capacity must be able to access the network on an equal, non-discriminatory basis.

## 6. Developed and managed by a Special Purpose Vehicle (SPV)

- SPV shareholding would ensure the neutrality and efficiency of the network
- Allows participation by all stakeholders while still maintaining arm's-length terms over all capacity sales and leases.

# Possible Obstacles to Fully Leveraging Afghanistan & Kyrgyzstan's International Connectivity



Limitations in  
International Gateway  
Competition and Access



Limitations in Domestic,  
Inter-city Connectivity



Restricted local access  
& Expensive Consumer  
Broadband Services



Lack of ICT Equipment,  
Lack of Electricity

# Downstream Policy Initiatives to Ensure Bandwidth Success

- ✓ Truly independent and transparent regulatory environment
- ✓ A strong commitment to competition and open-access, non-discriminatory tariff frameworks throughout the entire telecommunications ecosystem
  - ✓ International gateway, international bandwidth, and IP transit
  - ✓ Backhaul, interconnection, domestic transport, and access networks
- ✓ Local-loop unbundling, as well as antenna and tower site sharing, to ensure competitive service offerings to end-users
- ✓ Promotion of public Internet exchanges to more efficiently interconnect domestic operators and prevent “hairpinning” of domestic and/or regional traffic via international transit paths.
  - ✓ By encouraging private-sector IXP participation as well as requiring government entities (and possibly educational and research networks) to participate in IXPs



**Intelligence, Analysis, and Forecasting  
for the International Telecommunications  
Infrastructure Community**

## **Michael Ruddy**

Director of International Research

Cambridge Riverview Center

245 First Street, 18th Floor

Cambridge, Massachusetts 02142 USA    [mruddy@terabitconsulting.com](mailto:mruddy@terabitconsulting.com)

Tel.: +1 617 444 8605

Fax: +1 617 444 8405

**[www.terabitconsulting.com](http://www.terabitconsulting.com)**

