



# ITU / BDT regional seminar Network Planning for the CEE, CIS and Baltic

Belgrade, Serbia and Montenegro, 20– 24 June 2005

## Specific Network Planning

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## BDT workshop on Network Planning

Module 1: Introduction and References to the Region

Module 2  
Role of Network Planning in the current Telecom scenario

Module 3  
Integrated Planning Process

Module 4  
Specific Network Planning per Layer

Module 5  
Supporting Network Planning Needs and Tools

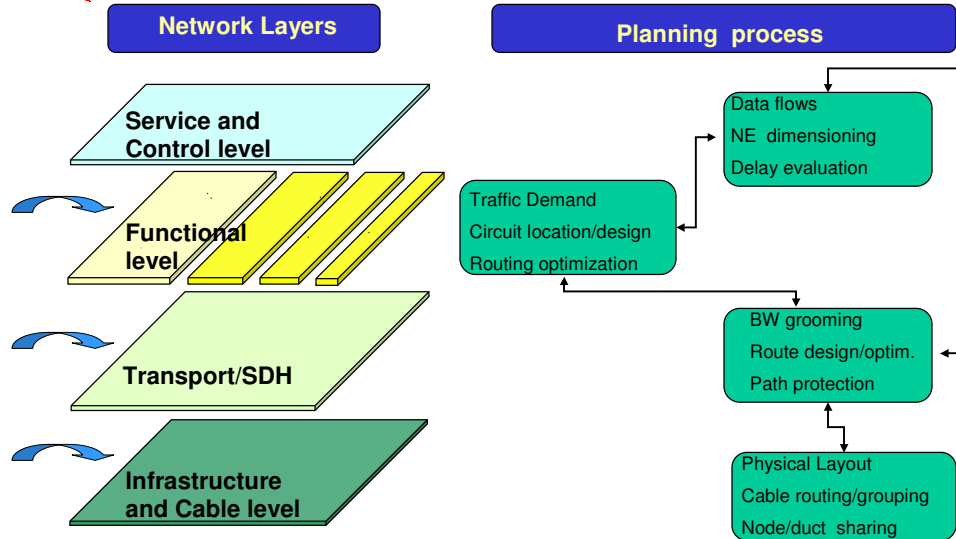


## Specific Network Planning Content

- Examples of case studies
- Typical benefits from planning methods



## Planning Methodology: Multilayer planning sequence





## Specific Network Planning Case study for consolidated architecture (A)

- Network Consolidation: Analysis of Network Architecture and related number of Nodes at core and access

- Initial status

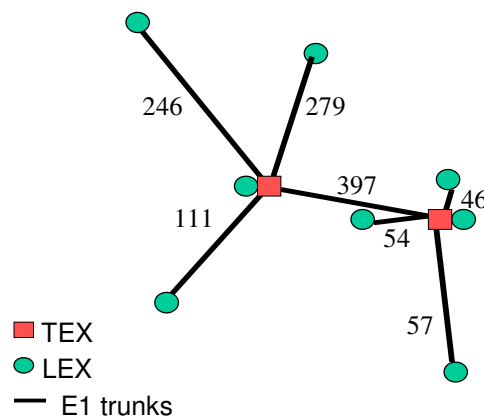
- Medium size network with many hierarchical layers
- Heterogeneous collection of systems
- Routing scheme based on add-on per installation

- Target

- Modern consolidated network
- Optimized hierarchy, routing and number of nodes
- High call completion rate



## Specific Network Planning Case study for Consolidated Architecture

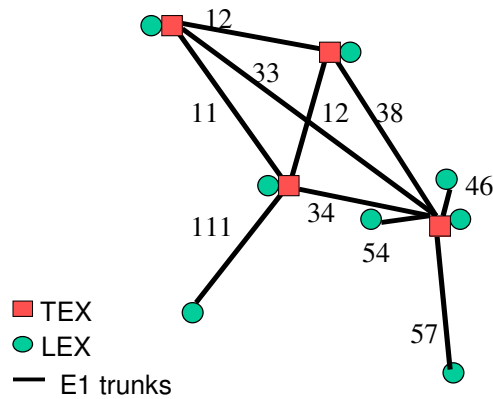


- 2 Transit Nodes (TEX)

- 1190 E1 channels
- 415.440 E1-Km
- 56.6 monetary units
- 40.4 transmission
- 16.2 Switching



## Specific Network Planning Case study for Consolidated Architecture



- 4 Transit Nodes (TEX)
- 408 E1 channels
- 143.700 E1-Km
- 35.5 monetary units
  - 13.9 Transmission
  - 21.6 Switching

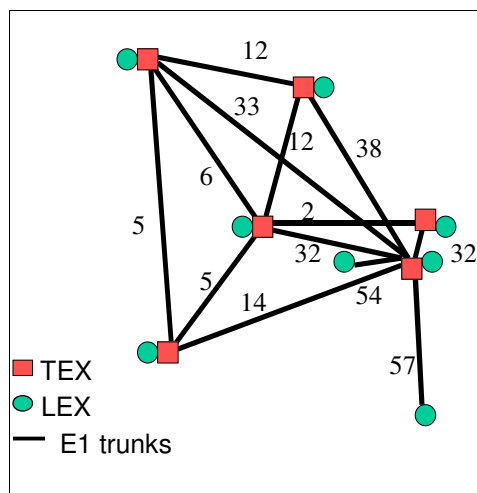
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## Specific Network Planning Case study for Consolidated Architecture



- 6 Transit Nodes (TEX)
- 334 E1 channels
- 112.450 E1-Km
- 35.8 monetary units
  - 11.2 Transmission
  - 24.6 Switching

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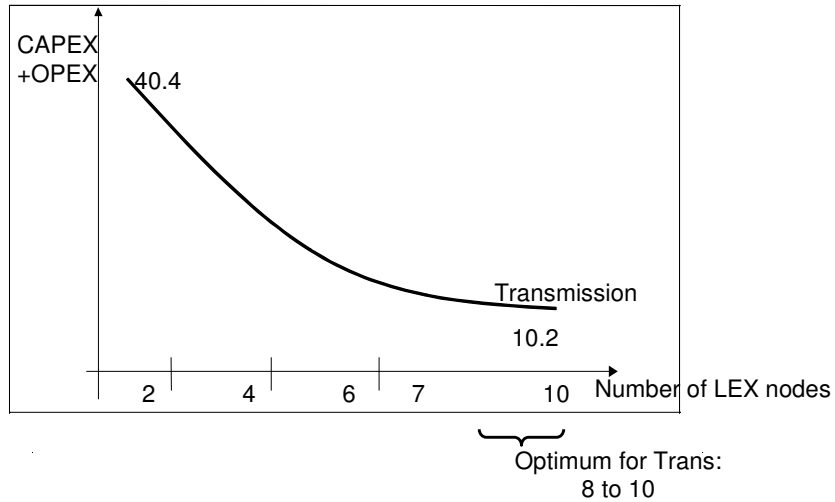
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## Specific Network Planning : Business impacts

Case A : Architecture for transmission and switching layers



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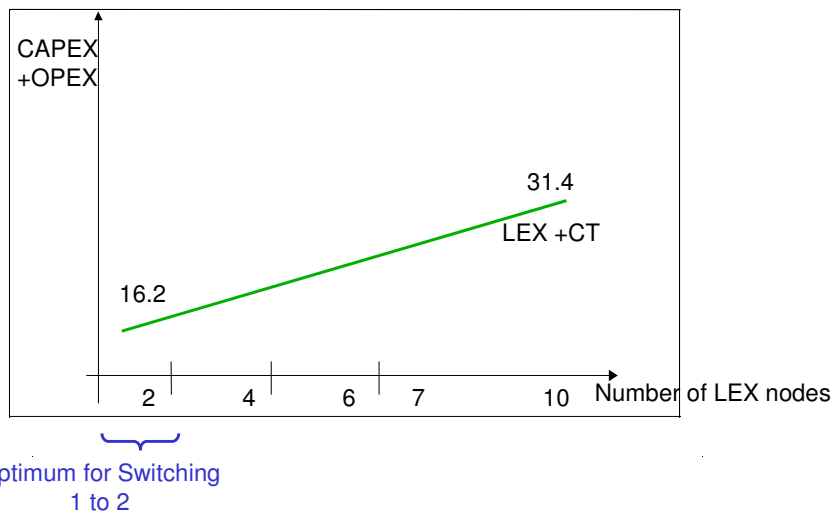
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## Specific Network Planning : Business impacts

Case A : Architecture for transmission and switching layers



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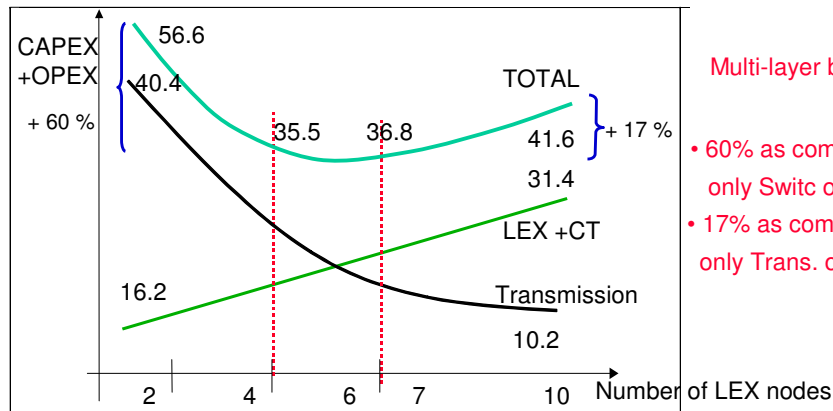
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## Specific Network Planning: Business impacts

Case A :Architecture for transmission and switching layers



Multi-layer benefit:

- 60% as compared to only Switch optimum
- 17% as compared to only Trans. optimum

Optimum for Switc: 1 to 2  
Optimum for Customer: 4 to 6  
Optimum for Trans: 8 to 10

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## Specific Network Planning Case study for access solutions (B)

•Analysis of Network Architecture and solutions for access in an heterogeneous region

### •Initial status

- Network with low deployment level
- Heterogeneous areas with varying customer densities
- Demand of PSTN and data services in Metro and suburban
- Basically POTS demand in rural areas

### •Target

- Network infrastructure grow at high rate
- Most economical solutions per scenario
- Optimized architecture per area

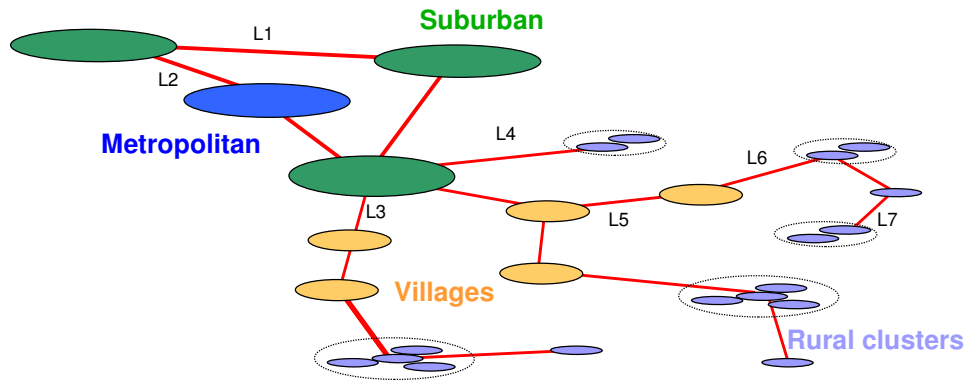
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## Specific Network Planning Case study for access structure Geo scenario



- L1: distance between suburban  
L2: suburban - metropolitan distance  
L3: Suburban - village distance  
L4: Suburban - rural distance  
L5: distance between villages  
L6: Villages - rural distance  
L7: distance between rural

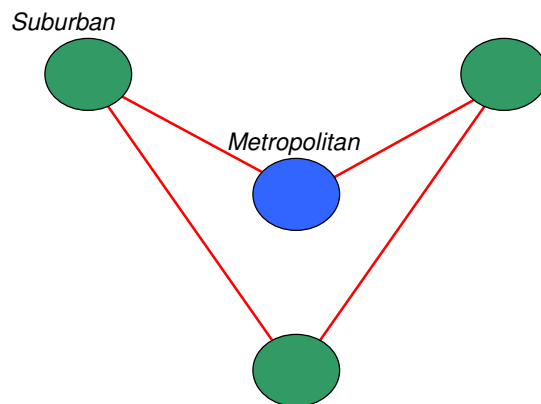
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## Specific Network Planning Case study for access structure Core network



### Junction Ring:

- between suburban and metropolitan areas
- STM-16 ring
- Duct fibre

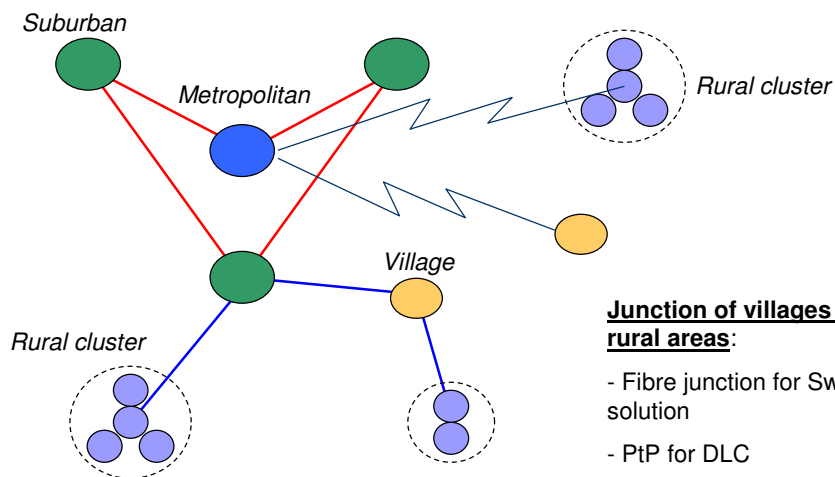
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## Specific Network Planning Case study for access structure Areas interconnection



### Junction of villages and rural areas:

- Fibre junction for Switching solution
- PtP for DLC
- PMP for WLL

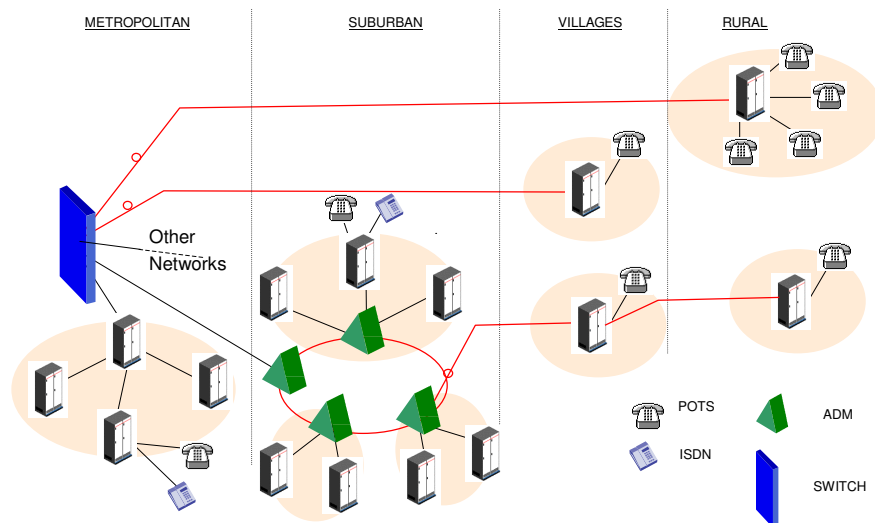
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## Case study for access structure Classical Switching based solution



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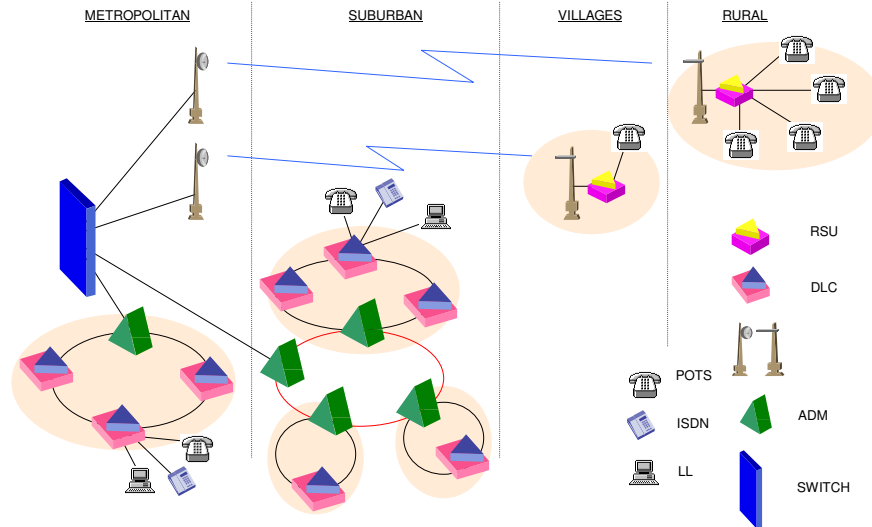
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## Case study for access structure Switching - DLC based solution



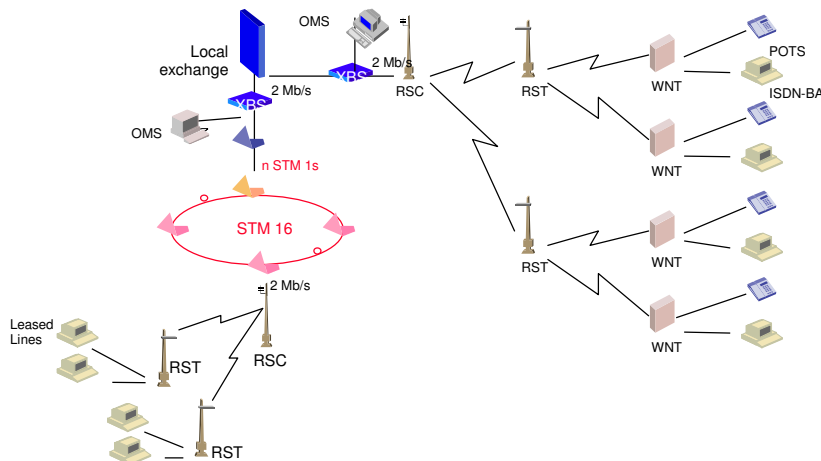
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## Case study for access structure WLL based solution



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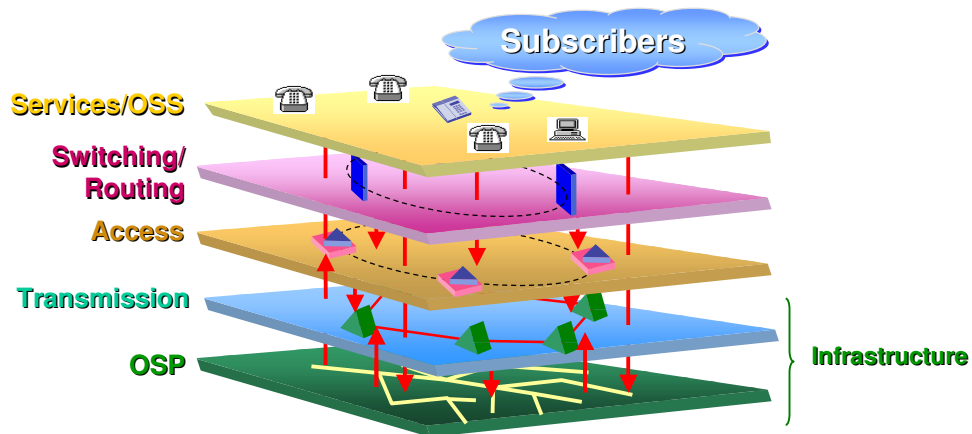
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## Case study for access structure Multilayer modeling

Modeled Layers and Interrelation to ensure consistency of Dimensioning and Quoting



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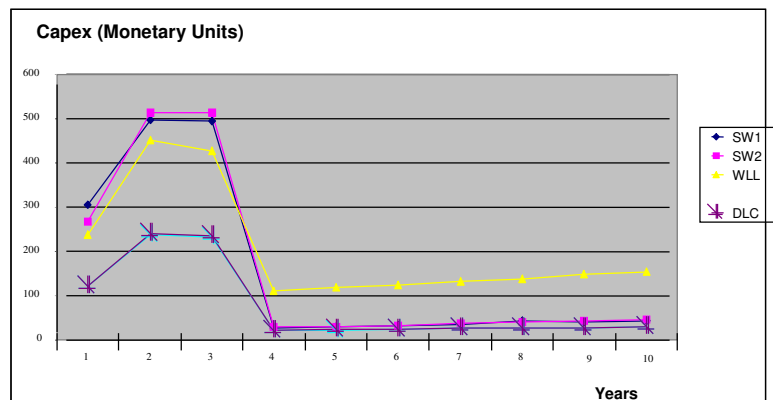
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## Case study for access structure Comparison of investment per solution

Metropolitan investments ( Ducts + Aerial - 1 switching node - 6% LL )



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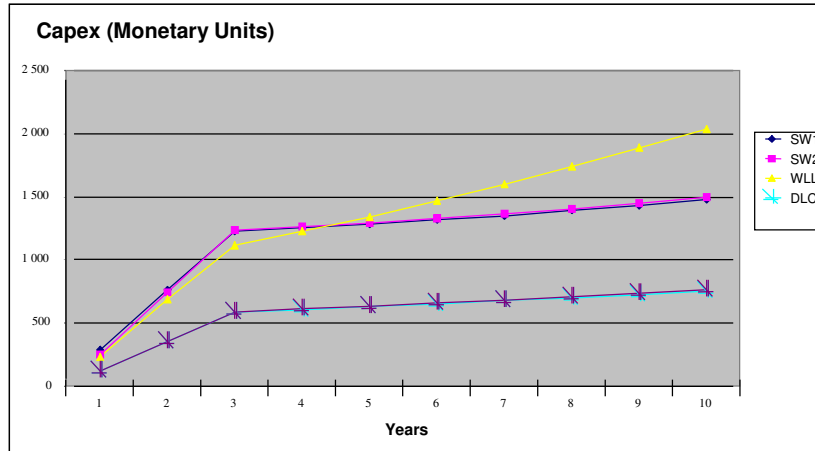
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## Case study for access structure Comparison of investment per solution

Metropolitan ( Ducts + Aerial - 1switching node - 6 % LL )



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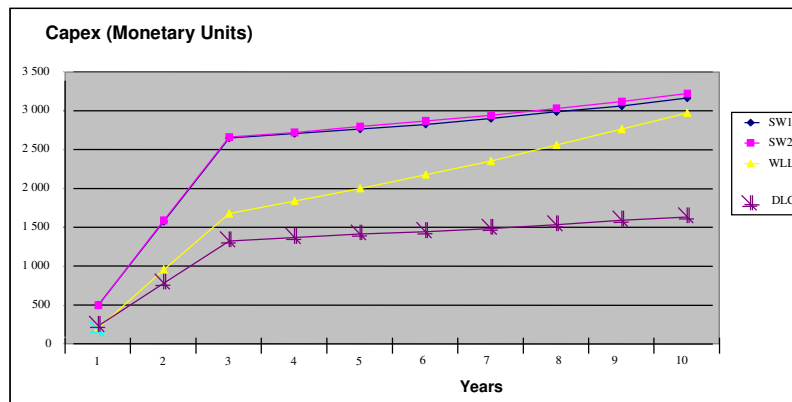
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## Case study for access structure Comparison of investment per solution

Suburban ( Ducts + Aerial - 3\*1switching nodes + 5% LL )



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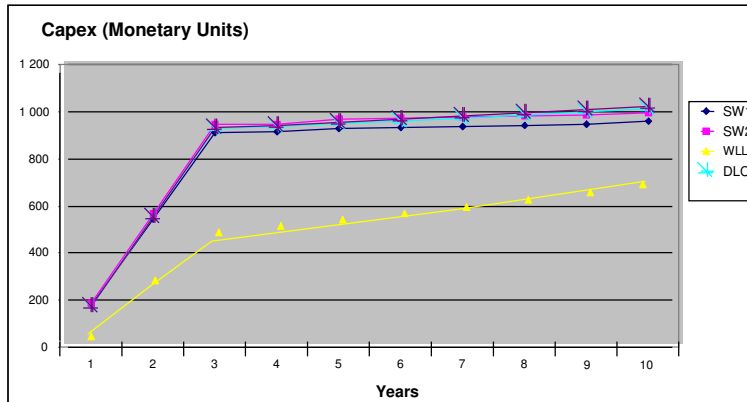
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## Case study for access structure Comparison of investment per solution

### Villages ( Aerial - only POTS )



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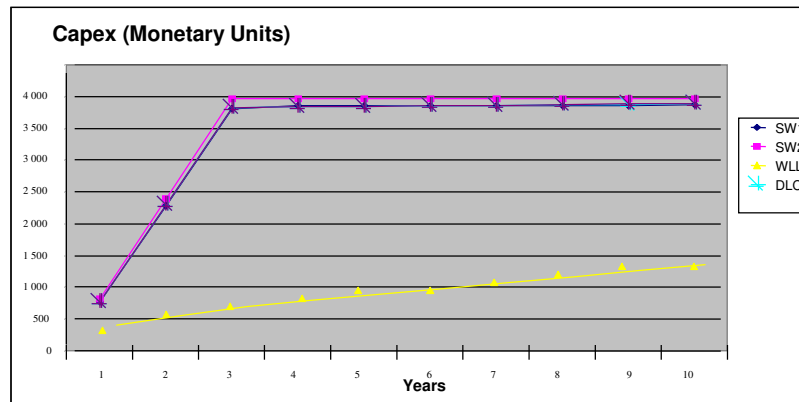
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## Case study for access structure Comparison of investment per solution

### Rural ( Aerial - Only POTS )



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## Case study for access structure Comparison of investment per solution

Comparison of CAPEX in global scenario: Best technology assignment per area versus single technology for the 4 scenario types (SW + DLC for Metropolitan, DLC for Suburban, WLL for Villages and Rural)

