

Super-PON

Economic Feasibility

Liang Du

Claudio DeSanti

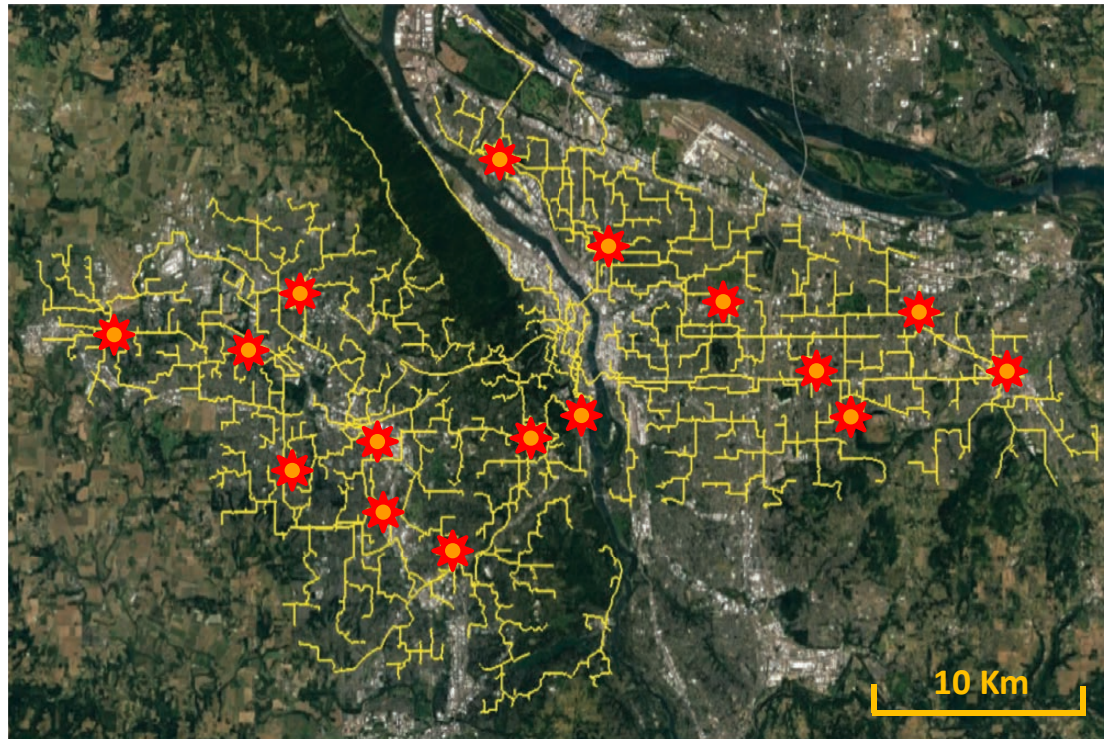
(Google)

Introduction

- At the Spokane interim meeting more data has been requested to validate the economic feasibility of a Super-PON solution
- This validation requires relative cost estimates for both outside plant (OSP) construction and optical equipment
- A example topology scenario is introduced and used as basis for the OSP analysis
- Reasonable assumptions are made to estimate the relative costs of the optical equipment

Scenario

10G-PON: 16 COs



— Trunk fiber

Super-PON: 3 COs



Trunk fiber —
Feeder fiber —

OSP Parameters

	Super-PON	10G-PON
Target households	593668	593668
Trunk footprint	245,838 m	829,212 m
Feeder footprint	687,173 m	0 m
144F cable (trunk)	385,791 m	2,529,404 m
24F cable (feeder)	880,589 m	0 m
144F splices	11110	72846
24F splices	4226	0
Central Offices	3	16

Assumption: 24F cables installed with microtrenching techniques,
144F cables installed with conventional trenching techniques

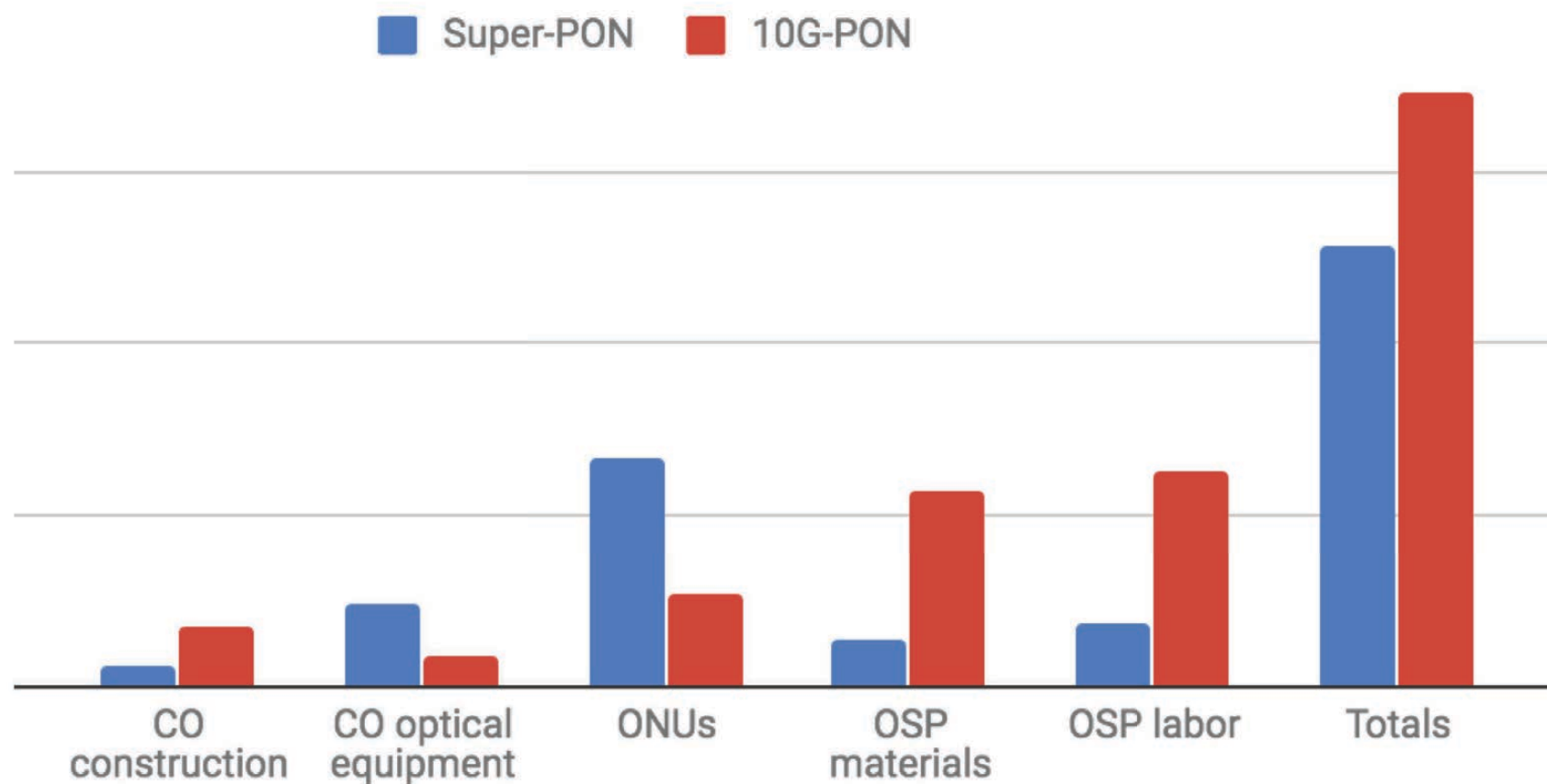
Equipment Parameters

	Super-PON	10G-PON
Take rate	0.3	0.3
Power split ratio	64	64
Splitter utilization	0.75	0.75
Super-PON wavelengths	12	
Wavelength utilization	0.85	
OLT ports	12368	12368
MUX/Amplifiers	1212	
Wavelength Splitters	1212	
ONUs	178100	178100

Optics Assumptions

- Assume the cost of a Super-PON ONU to be ~ 2.5 times the cost of a 10G-PON ONU
 - Based on a Ovum report at OFC 2018 claiming the cost of an NG-PON2 ONU to be 2 to 2.5 times the cost of an XGS-PON ONU
- Assume the cost of Super-PON OLT optics to be $\sim 25\%$ more expensive than 10G-PON OLT optics
 - Non tunable
- Estimate the cost of the MUX/Amplifiers and of the Wavelength Splitters based on our experience

Relative Costs based on US DoT Data*



*see [https://www.itscosts.its.dot.gov/its/benecost.nsf/SubsystemCosts?ReadForm&Subsystem=Roadside+Telecommunications+\(RS-TC\)](https://www.itscosts.its.dot.gov/its/benecost.nsf/SubsystemCosts?ReadForm&Subsystem=Roadside+Telecommunications+(RS-TC))

Conclusion

- A Super-PON solution appears to be economically feasible

Thank you