

Fiber to the Home (FTTH) Architecture and Deployment Trends

Jonathan Simpson
Anu Schramm



**INNOVATION SHOWCASE
& CONFERENCE NASHVILLE 2017**

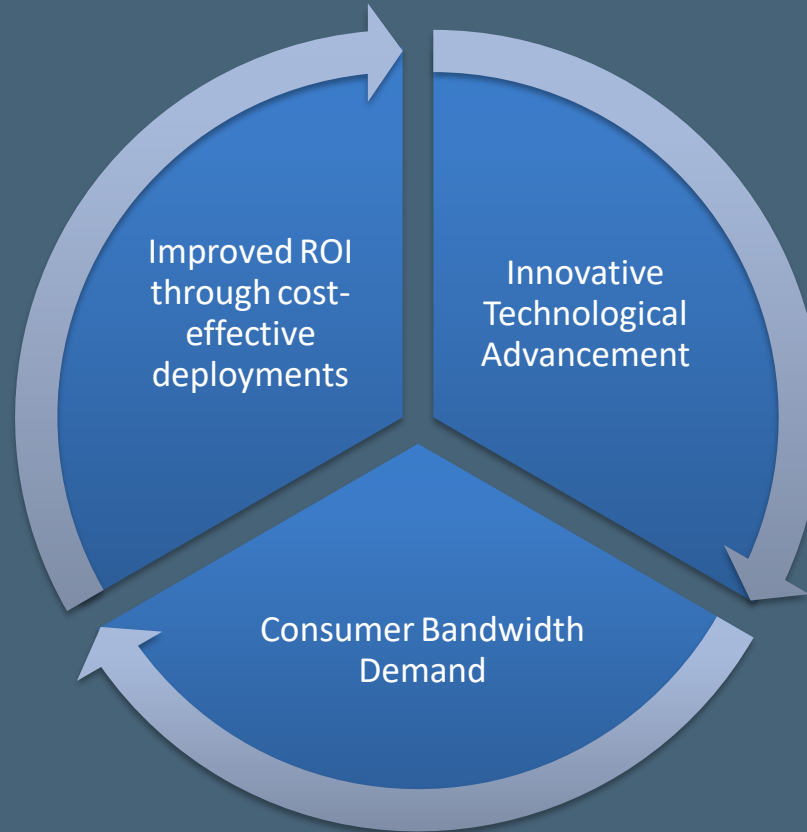
TESSCO
TECHNOLOGIES®

AGENDA

- FTTH Drivers and Trends
- Common Pain Points
- Business Plan Considerations
- FTTH Architectures
- FTTH Deployment Methods
- TESSCO's FTTH Solutions and Services



KEY DRIVERS OF FTTH ADOPTION



MARKET & TECHNOLOGY TRENDS

Market

- Consumers demand is increasing
- “First to the subscriber wins”
- Fiber Optics is a common term for users

Technology

- Quick and error-free turn-up
- Simpler designs
- Future-proofing for next big thing

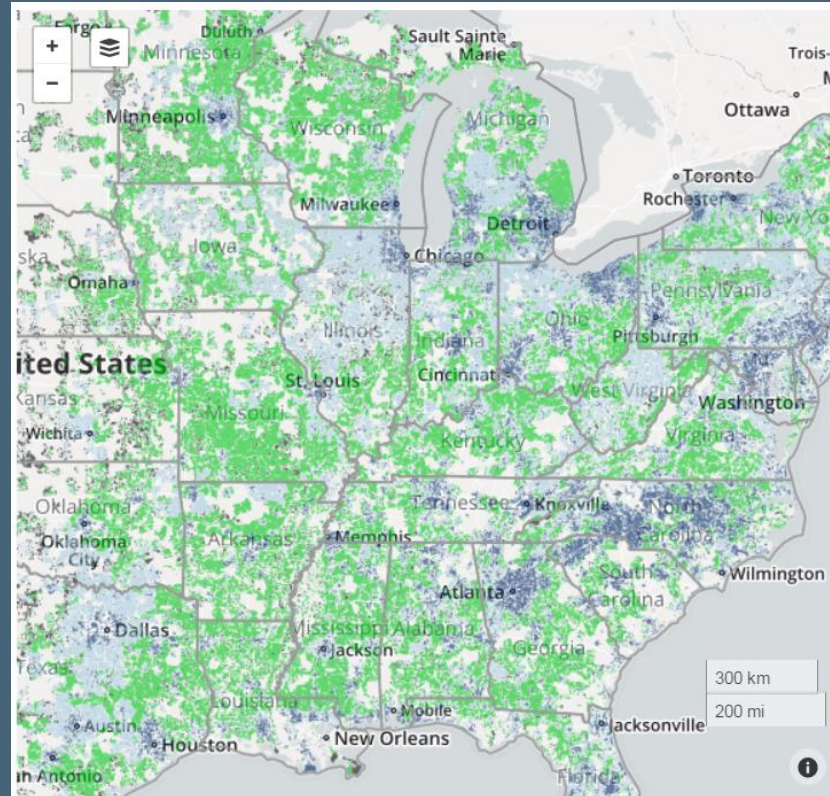


CAF FUNDING

- Phase 2 auction
- \$215 million annually

Good News!

- You do not need to have government funding in order to deploy FTTH!



Nationwide Summary

PC Carrier	Eligible Locations	Support Amount
AT&T	1,265,036	\$493,973,528
CenturyLink	1,190,016	\$514,334,051
Cincinnati Bell	7,084	\$2,229,129
Consolidated Communications	24,698	\$13,922,480
Fairpoint Communications	106,380	\$38,193,432
Frontier Communications	659,587	\$283,401,884
Hawaiian		
Telcom Inc	11,081	\$4,424,320
Micronesian Telecom	11,143	\$2,627,177
Verizon	387,470	\$143,924,995
Windstream Communications	413,345	\$178,779,073
Total	4,075,840	\$1,675,810,069

Map Legend

- Eligible
- Ineligible - Exceeds Threshold
- Ineligible - Below Benchmark
- Ineligible - Other
- Elected Frozen

FTTH KEY PLAYERS



PAIN POINTS OF LARGE SCALE DEPLOYMENTS



Speed

Optimization of contractor resources and management of skill bottlenecks

Cost

Nation-wide building and management of complex and variable mass infrastructure deployments

Quality

Consistent delivery of aesthetically pleasing, low consumer impact, high quality networks

SKILLED LABOR AVAILABILITY AND EXPENSE ARE PARAMOUNT

- FTTH total deployment cost can be as high as 50% for labor and as low as 15% for passive products
- Challenge is to reduce skilled labor requirements



BEFORE YOU BEGIN... THE BUSINESS CASE

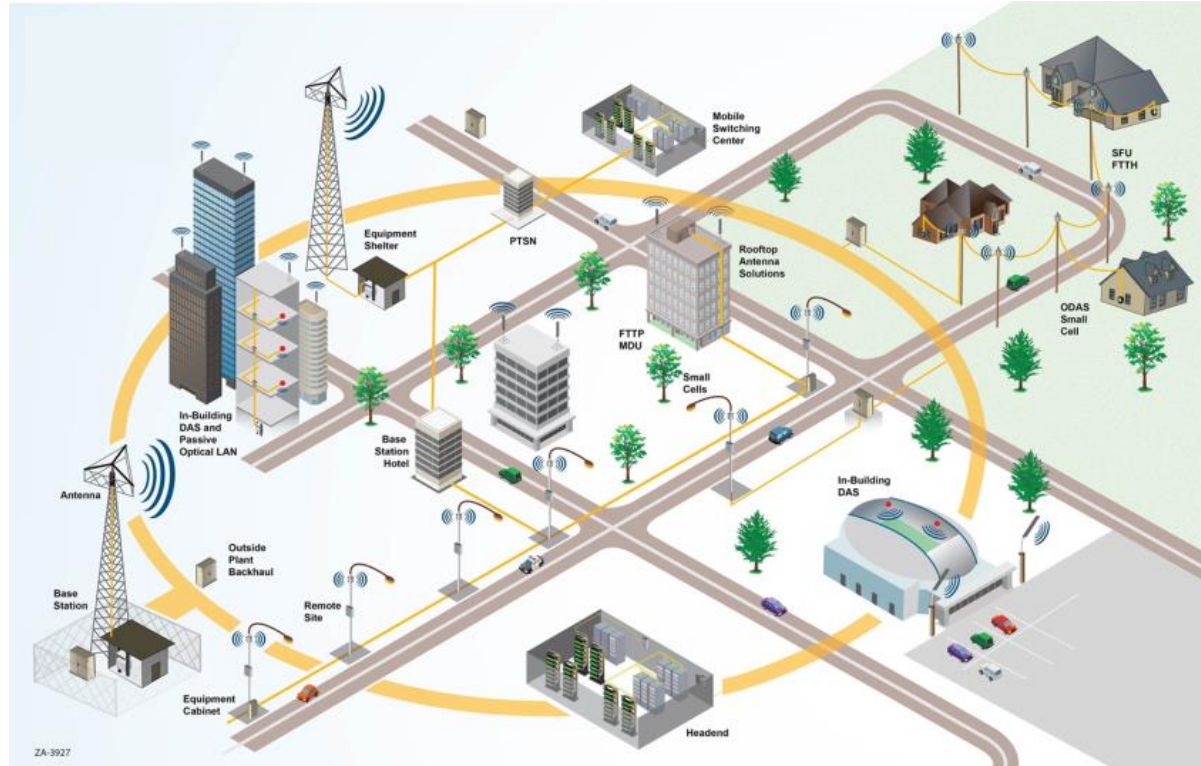
Fundamentals of the scope of the build must be set forth:

- Number of available residential subscribers
- Competitive offerings
- Expected take rates
- Business/anchor institution needs
- Future services (wireless, security, smart grid, etc.)
- Population growth
- Service offerings and ARPU



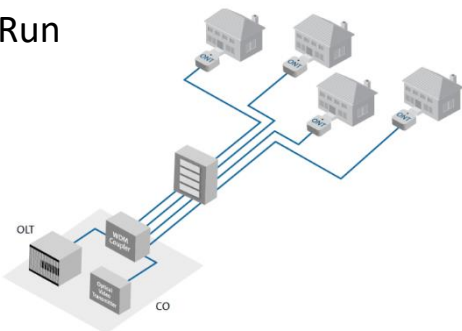
FTTH ARCHITECTURE AND DEPLOYMENT OPTIONS

FTTH A NATURAL EXTENSION OF THE FIBER NETWORK

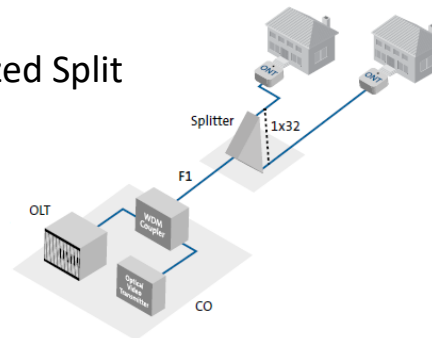


FTTH NETWORK ARCHITECTURES

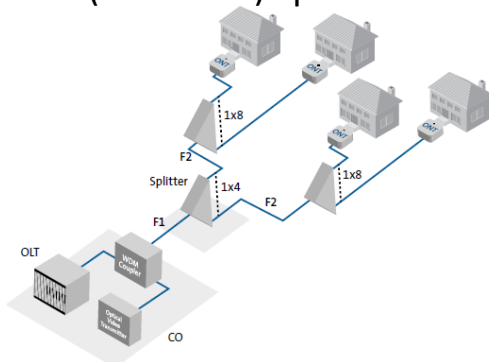
Home Run



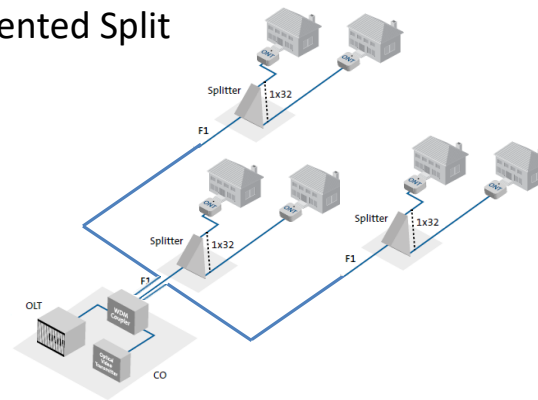
Centralized Split



Distributed (Cascaded) Split

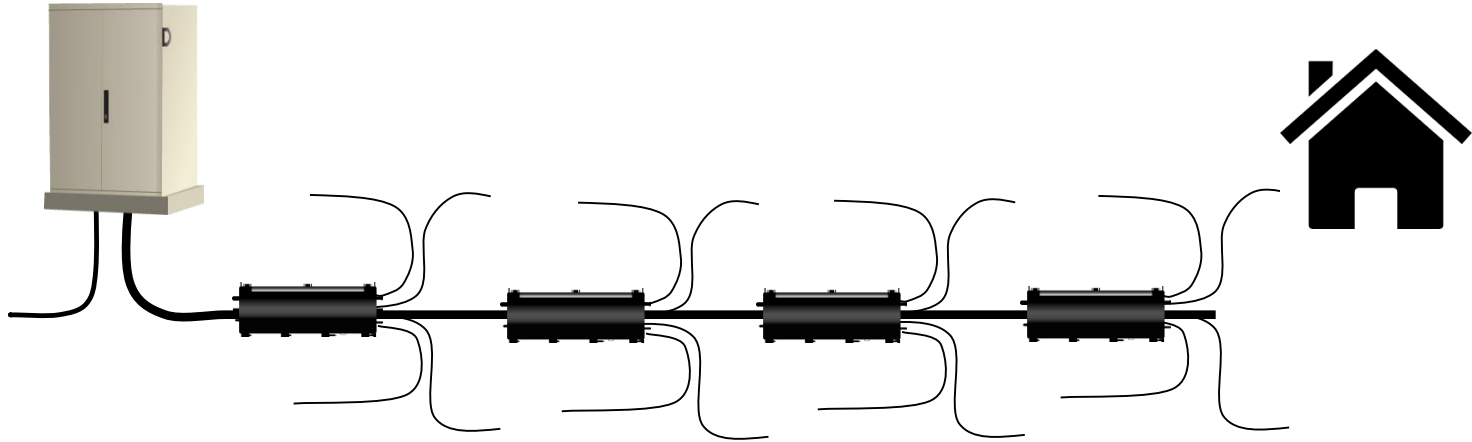


Segmented Split

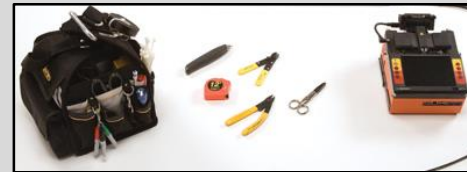


TRADITIONAL SOLUTION APPROACH

FULL SPLICE

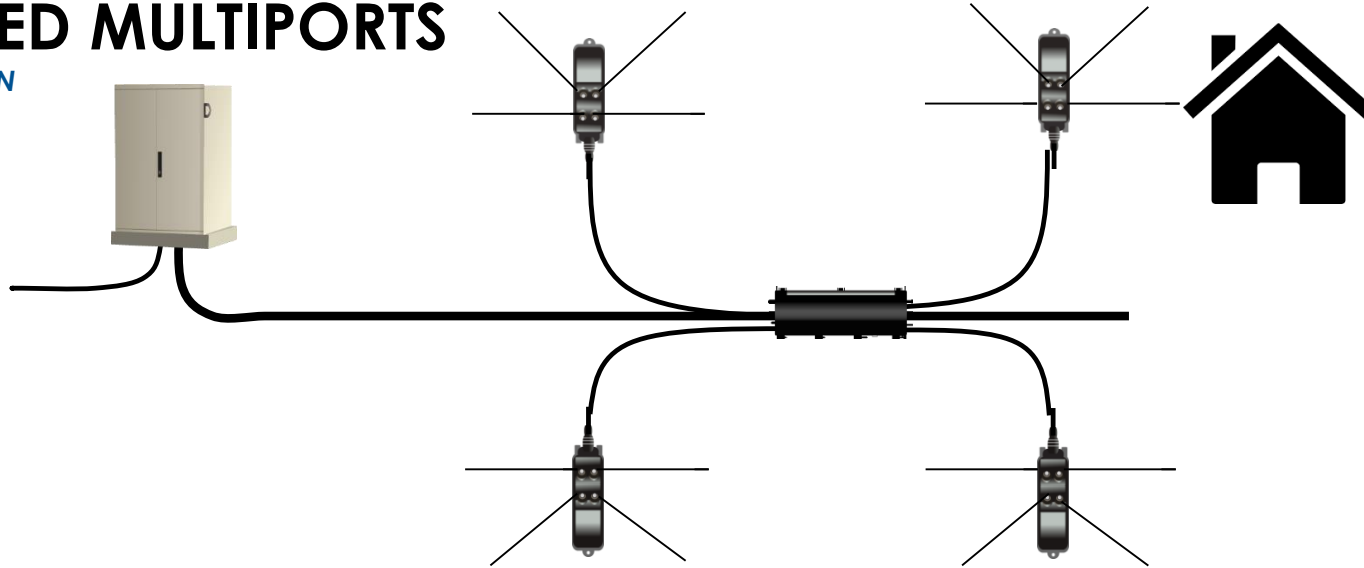


- Slowest to deploy with spliced drops
- Labor intensive with highly skilled workers
- Least upfront planning effort needed
- Low initial material cost; Highest total cost solution



SPLICED MULTIPORTS

SEMI-PRECON

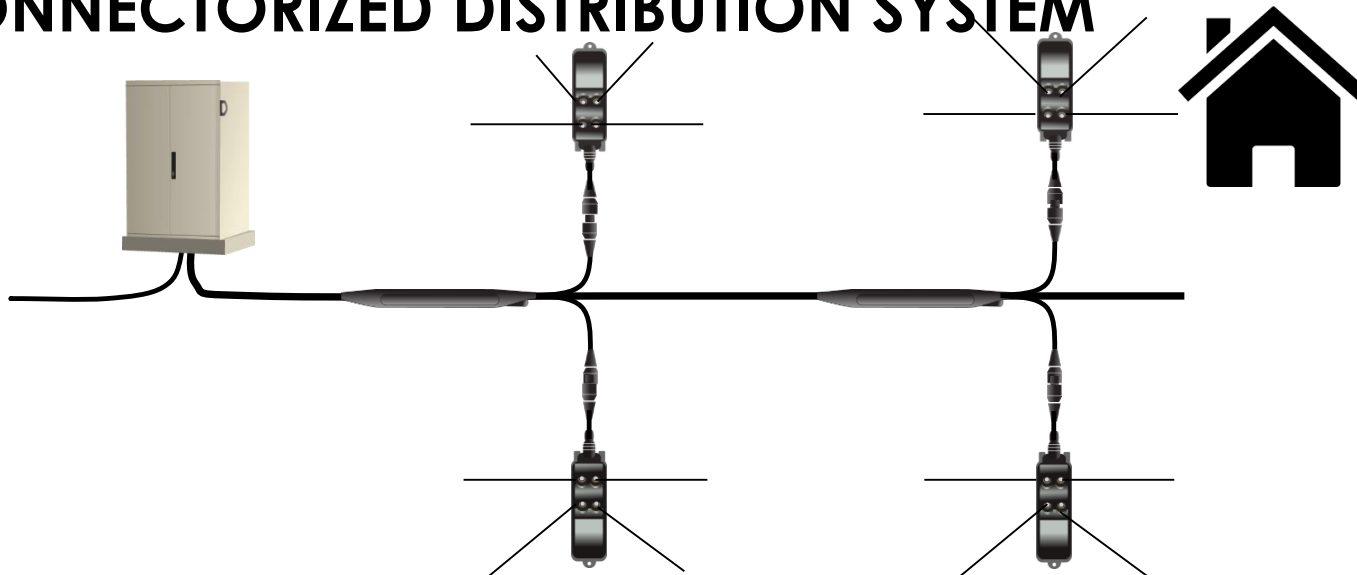


- Enables preconnectorized drops for subscriber connection
- Slow initial install utilizing skilled labor to splice terminals
- Medium upfront planning effort needed
- Moderate level of risk during installation



PRE-CONNECTORIZED DISTRIBUTION SYSTEM

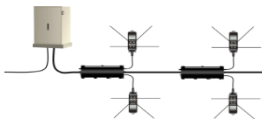
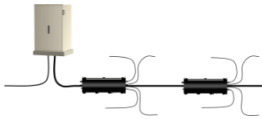
FULL PRECON



- Fastest installation with full precon
- Lowest total installed cost solution
- Highest level of pre-engineering upfront
- Minimized risk, least obtrusive install



DECISION FACTORS

	Full-Precon Solutions	Semi-Precon Solutions	Full-Splice Solutions
			
Speed of Deployment	Fast	Slow	Slow
Subscriber Connection Speed	Fast	Fast	Slow
Type of build	Aerial, Duct	Aerial, Duct, Direct Buried	Aerial, Duct, Direct Buried
Design verification/planning	High	Moderate	Low
Level of Risk	Low	Moderate	Moderate to High
Splices in the field	Low	High	High
Labor Skill Level	Low	Moderate	High
Deferability	High	Moderate	Low



TESSCO'S COMPLETE FTTH SOLUTION



TESSCO'S COMPLETE FTTH SOLUTION

One stop shop for FTTH Solutions

- Passive FTTH equipment from many vendors
- Active electronics from Zhone
- Expertise
- Financing

CORNING COMMSCOPE®

Prysmian
Group

Z H O N E®
Bandwidth Changes Everything™

Quazite®

3M

tii
tii technologies

FAFL

Oldcastle
Precast®

CURRENT PROJECTS

- Iowa – 2,500 Homes
- Kansas City – 26,000 Homes
- Arkansas – 9,500 Homes
- Texas – 1,000 Homes, 2,000 Apartments
- Arizona – 7,000 Homes
- Independent companies and Investors
- Co-Ops
- Tier 2
- WISPs





QUESTIONS?



THANK YOU

Jonathan Simpson

Sr Product Manager - simpsonj@tessco.com

Anu Schramm

Solutions Architect – schramma@tessco.com