

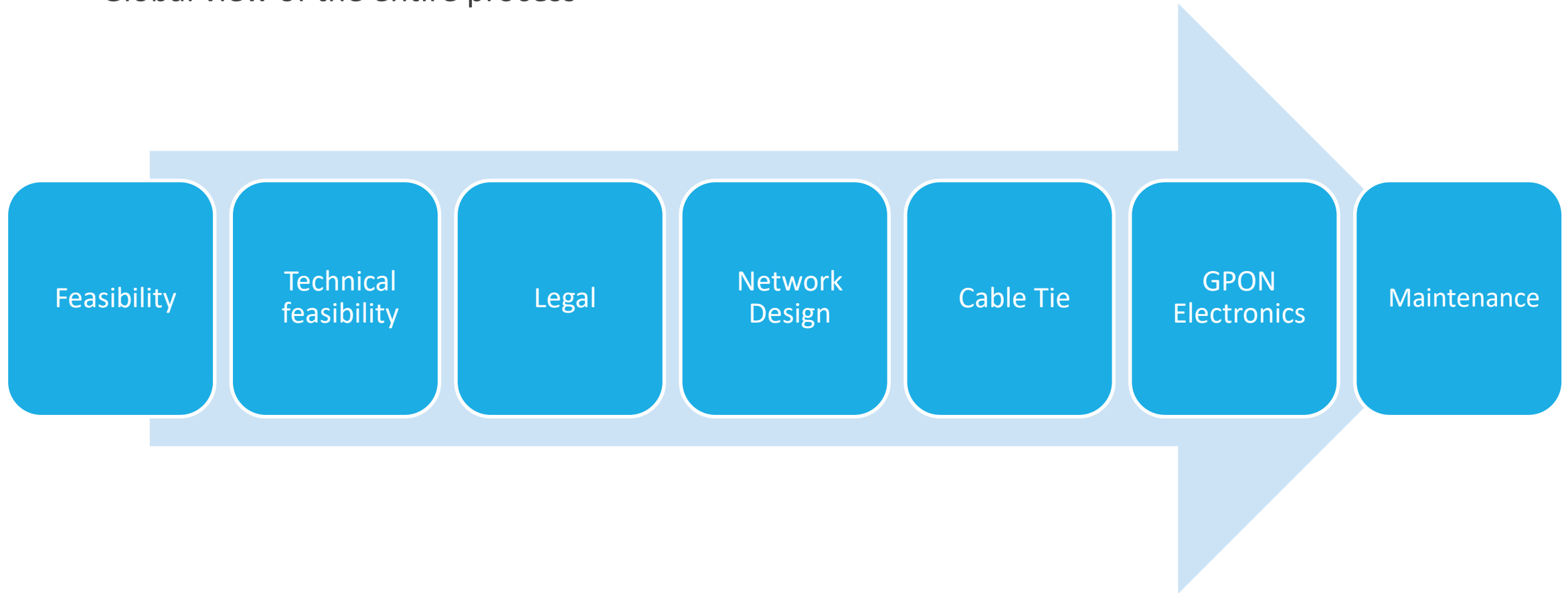
# Fiber network deployment paradigms



# Objectives of the workshop

---

Global view of the entire process



# 1. Feasibility of the Project

---

First key checklist

- CAPEX Available. Civil works needed?
- Transport Availability (OF or Radio)
- Forecast for OPEX
  - Cost Transport services
  - Maintenance Reservation
  - Administrative Service (Operator vs Association)
  - Recurrent infrastructure measurement (MARCo, Towers, Renting)

## 2. Technical feasibility

---

Where do we pass the cable?

### Front

There is need for permissions from the owners and follow the existing wiring

Everyone request them?



## 2. Technical feasibility

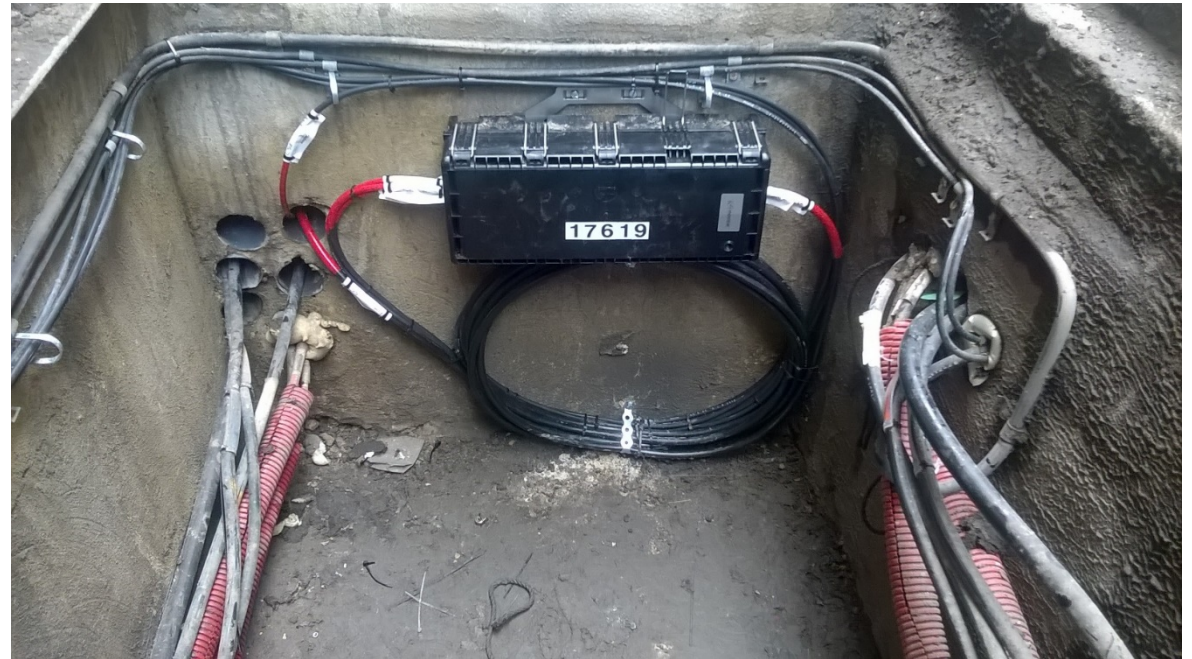
---

Where do we pass the cable?

### CONDUITS

Is there enough space?

Who is the owner? Permits,  
Economic Agreement





## 2. Technical feasibility

---

Where do we pass the cable?

### **POLES**

Who is the owner? Permits, Economic Agreement



# 2. Technical feasibility

Movistar Database



## 2. Technical feasibility

---

MARCo - Wholesale Offer of Access to Registers and Ducts

<http://www.movistar.es/operadores/ServiciosRegulados/>

CNMC forces Movistar to place its infrastructures at the disposal of all operators

CNMC Forces Operators to Reach Agreements for Infrastructure Sharing

The agreement is between Owner and interested operator

### **WHO IS THE OWNER?**

Are the poles all from Telefonica? Are all the ducts from Telefonica?

Telefonica says ALL is theirs? How to pay Telefonica the MARCO?



## 2. Technical feasibility

---

MARCo - Wholesale Offer of Access to Registers and Ducts

“REPLANNING”

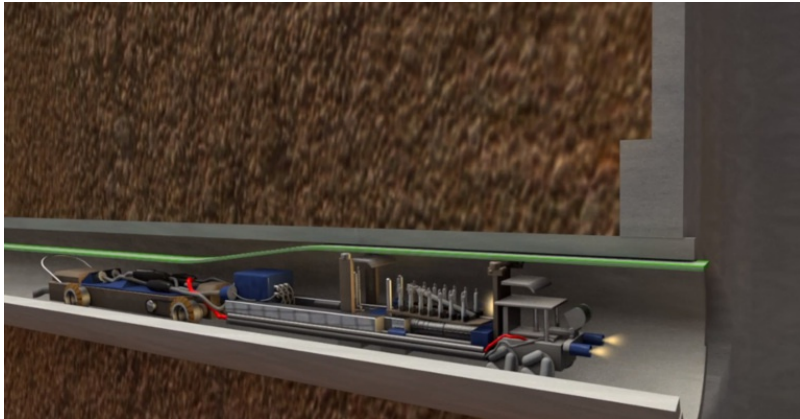


## 2. Technical feasibility

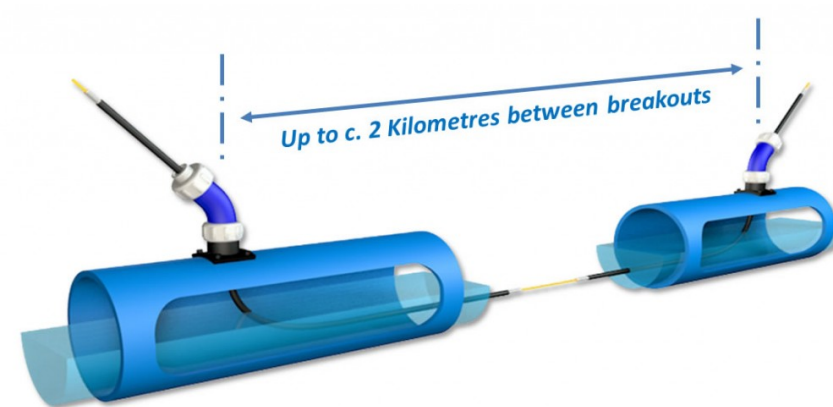
---

Other systems

Sewer system



Water pipes (Fiberwater)



And the connections from subscribers? And the maintenance of these infrastructures?

## 2. Technical feasibility

---

Location of the data center



Power box

## 2. Technical feasibility

---

Viable Project?

Prepare documentation and start

- Pre-project draft
- Project
- Deployment plan
- ...



# 3. Legal aspects

---

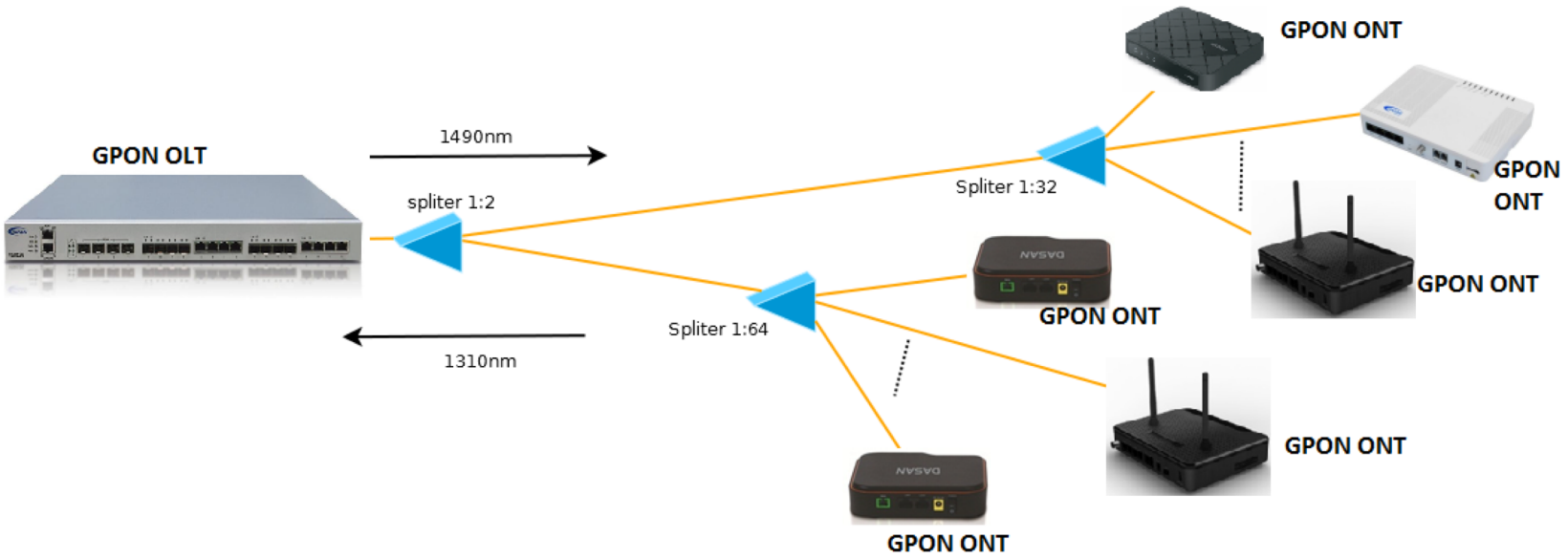
## ToDo:

1. Submit "Deployment Plan"  
Document to inform what deployments are planned.  
Administrative silence → Yes
2. Project for municipality  
If required
3. Owners Permissions (including wayleave)  
Ajuntament, Generalitat, Diputació, Large Infrastructure operators (Adif, Abertis, etc), private owners.
4. MARCo  
Managed through Fundació





# 4. Network design



Objective: To dimension the zones to avoid being short (Buildings, industrial areas, etc)



# 4. Network design

Calculate the optical power that will reach the client

$$\text{Power at ONT} = \text{Power OLT} - \text{loss passive elements}$$

Output power OLT: -1.5dB

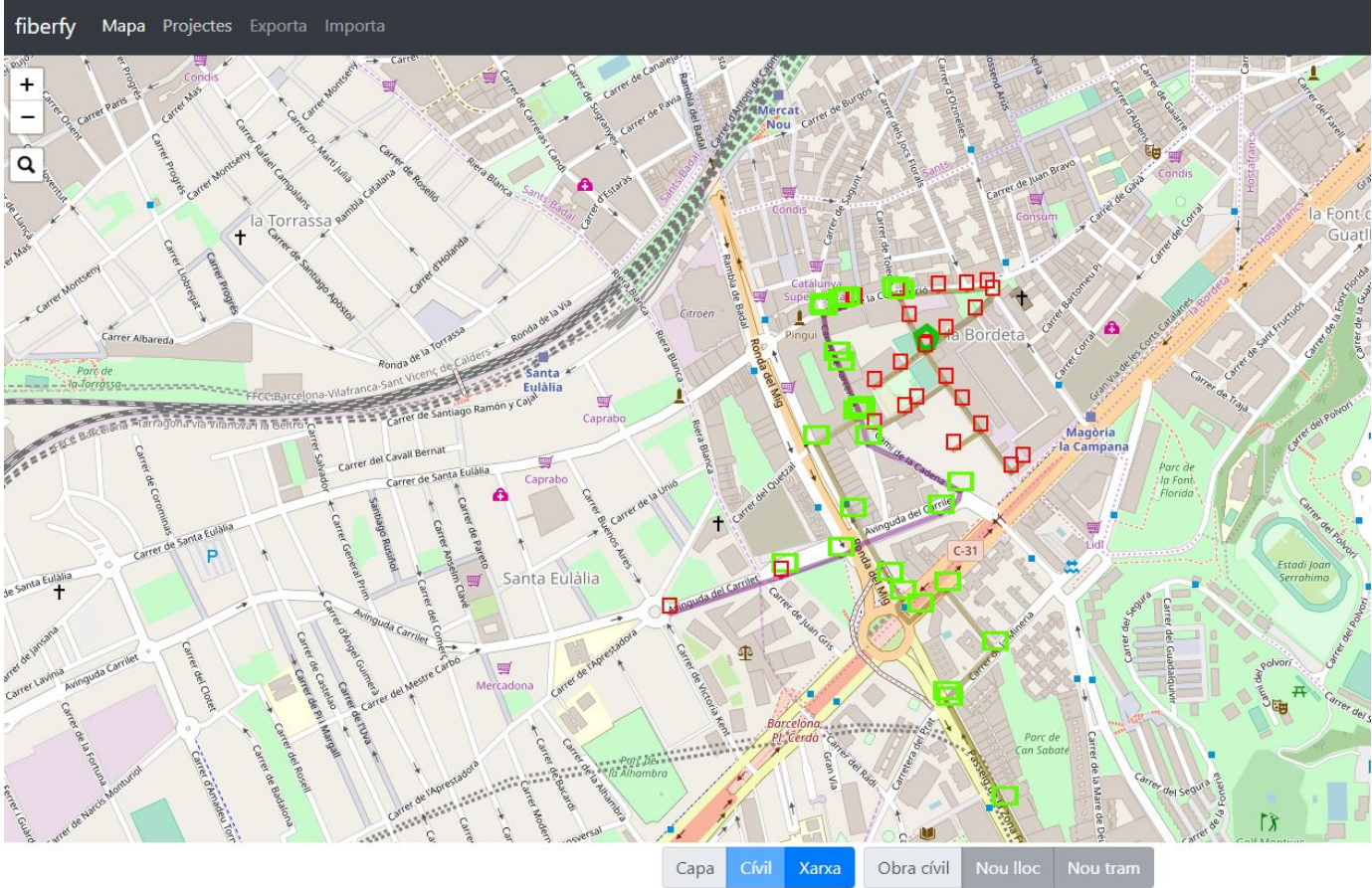
Loss passive elements

Cable	Splice	Splitter
-0.4dB / km	-0.3dB	1x2 -3dB 1x4 -6dB 1x8 -9dB 1x16 -12dB 1x32 -15dB 1x64 -18dB



# 4. Network design

Fiberfy

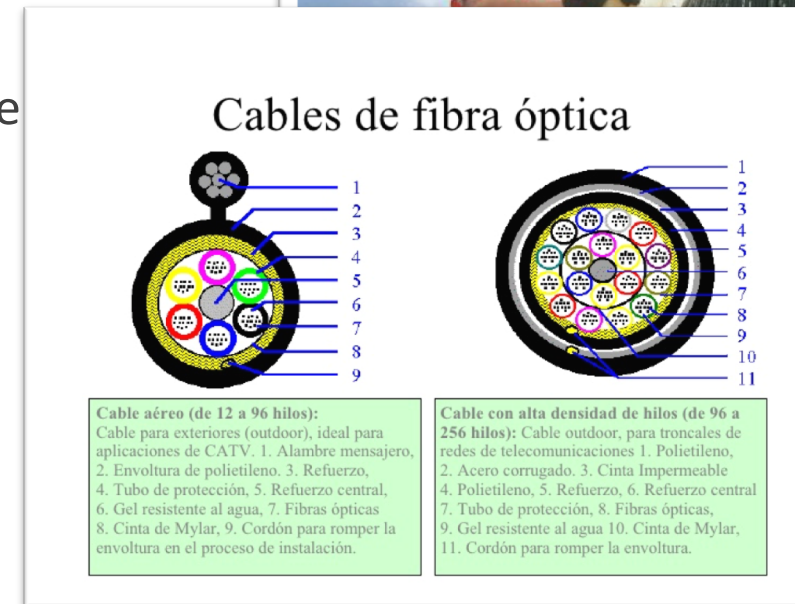


# 5. Cable deployment

The fiber cable is not expensive → Lets go!

Dimensioning the fibre for

- FTTH Deployment
- Fibres dedicated to subscribe
- Extension of the trunk

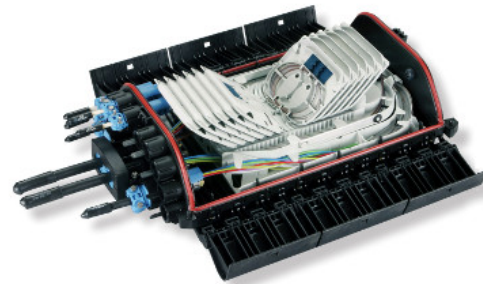


# 5. Cable deployment

---

Preconnected system or fused cable ?

	Preconnector	Fused cable
Cost Material	High	Low
Initial cost	Avoids 1 splice	2 splices
Security	Prevents manipulation of passive network	Requires CTO manipulation





# 5. Cable deployment

---

Tools



Fault prevention: loops



# 6. GPON Electronics

---



3072 subscribers



512 subscribers



ONT + External Router



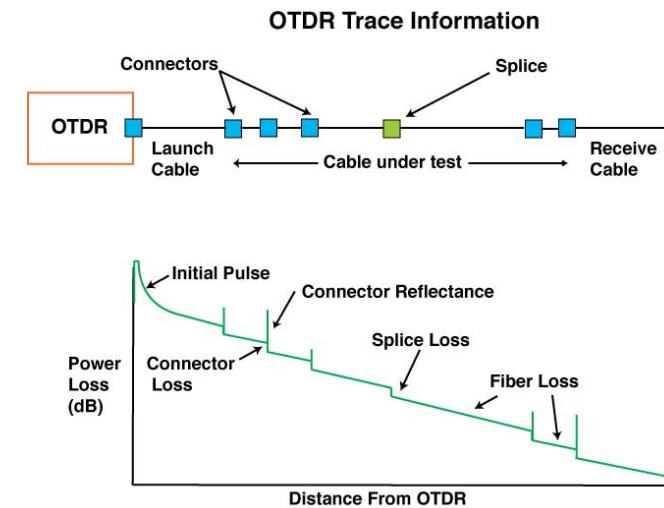


# 7. Maintenance

Optic fiber → Few faults

80% incidents are problems in households

- Self-provisioning tools
  - Open Source software available
- Optical reflectometer (OTDR)



# Thanks !

---

