THINGS TO CONSIDER
CONSTRUCTION TYPE:
OH – OVERHEAD
UG – UNDERGROUND

• Factors to consider to determine if OH construction is feasible
  
• A. Who owns the poles

• B. Condition of the pole line (height and class of the pole) age of pole

• C. Can you get proper clearances both above ground and from other utilities

• D. Can pole line be accessed by trucks (buckets) or will they need to be climbed

• E. Do you have resources to maintain OH plant in house or will it need to be contracted out – trained in house personnel?
UG CONSTRUCTION

• A. Terrain type (Soil makeup, presence of rock, water table, flat land or mountains)

• B. Right of Way (private or public, width, presence of other utilities, etc.)

• C. Space to set up machinery (will determine what method will be used to bury cable such as directional bore, plowed in, missile bore, trench, micro trench, hand dig). Note method selected will affect cost significantly

• D. Number of street, driveway and walkway crossings, the spacing between each will be a factor in determining construction method in congested areas
• E. Traffic control (will you need law enforcement help)
• F. How much landscape restoration will be necessary
• G. Will you use above ground (pedestals) or at grade vaults to house your network access points
PERMITTING

• A. Pole attachment permits from pole owners (Private Power companies, Co-Ops, Municipal Power, Telco Poles, etc.)

• B. Encroachment agreements, both state DOT and local, road / street closure permits, sidewalk closure permits, pavement cut permits, etc.

• C. Wetland or protected land permits

• D. Waterway crossing permits (rivers, sounds, etc.)
DETERMINING THE OSP NETWORK CAPACITY

• A. number of potential customers by type (single family residential, multifamily residential, commercial) PON network, active switch network, demand for special services such as diverse routing

• B. Loss Budget (may dictate installing remote electronics, dropping split rate if PON network, etc.)

• C. Distance from headend or serving electronics to the most distant customer in design
LOSS BUDGET COMPUTATION ON PON NETWORK

• \((Ca \times Lf) + (Sp \times .02) + (Cn \times .5) + (Sc \times Clf) = \text{loss on OSP cable facility}\)

• Where:
  • \(Ca\) = Cable length in Km
  • \(Lf\) = loss factor by wavelength
  • \(Sp\) = Number of splices
  • \(Cn\) = number of connectors
  • \(Sc\) = number of splitter cards
  • \(Clf\) = card loss factor

• Note: Design with a margin to allow for additional splices in the future (repair, new branch splice, etc.)
BUDGET CONSIDERATIONS

• The cost for each project has to be built on its own. There is no true “One Cost fits all” formula to use.

• Using the information from the previous slides you can build your estimated project cost by:

  A. determining the construction method, or methods, based on your field survey
  B. Will extra personnel be necessary for traffic control?
• C. Permitting Cost (factor in the engineering labor cost for number of estimated hours to prepare permits. Note: some permits can be filled out and filed in just a few minutes. Others may require a field visit to gather the necessary information. Others, such as a railroad or waterway crossing, may require $10,000 + just to prepare and submit the required information.

• D. Material Cost (construction method will determine type, planned network capacity with determine the size).

• E. Labor, both in house and contract

• F. Will additional electronics be needed in the field due to loop length (loss calculations)

• G. Unusual terrain considerations such as rock (may inflate the cost from $10 per foot to $125 per foot for example)
• H. Time of year and expected weather conditions during the construction period.

• I. Payback on investment. Based on cost of goods sold and the set monthly reoccurring charges. How long will it take project to break even. Note: for networks solely serving just the governmental needs then payback would be based on the cost of the project and the net savings by not paying another provider for the service (if the required speed was even available from another provider)
• **G. Inflation for both labor and material cost.** Inflation has not been a large consideration since the mid 1980's but if the time frame from the planning and budget phases to the actual construction completion date is going to be extended, then for planning purposes inflation should be taken into account.

• *(a rate of 2% per year for example).*
QUESTIONS / COMMENTS?