

Problem Statement

A brownfield N+5 DOCSIS3.0 node is running out of capacity and needs to be upgraded. Which option should be used to upgrade the node to achieve the lowest 10-year total cost?

High Level Assumptions

The following network topology and cost assumptions are used for this use case:

- Brownfield HFC N+5 DOCSIS3.0 node:
 - Homes passed: MDU - 29; SFU - 730; Businesses - 204
 - Take rate: 50%
 - Aerial Coax: 5.6 miles
 - Underground Coax: 0.35 miles
 - Conduit Availability: 80%
- Growth Rates: 40% downstream / 30% upstream
- Major Cost Assumptions (*Note: Costs are illustrative only*)
 RPD Node: \$5k; OLT: \$20k; Broadband Service Group Cost: \$13k per node; Aerial Construction: \$20k/mile; UG Construction: \$50k/mile; Discount Rate: 12%

Node topologies evaluated:

- HFC N+5 DOCSIS3.0
- HFC N+5 DOCSIS3.1
- Node Split
- Fiber Deep (N+0) with RPD
- HFC N+2 Full Duplex
- FTTH (EPON 1/1, 10/10 Gbps)

Brief Description of the Problem and Jibe Approach

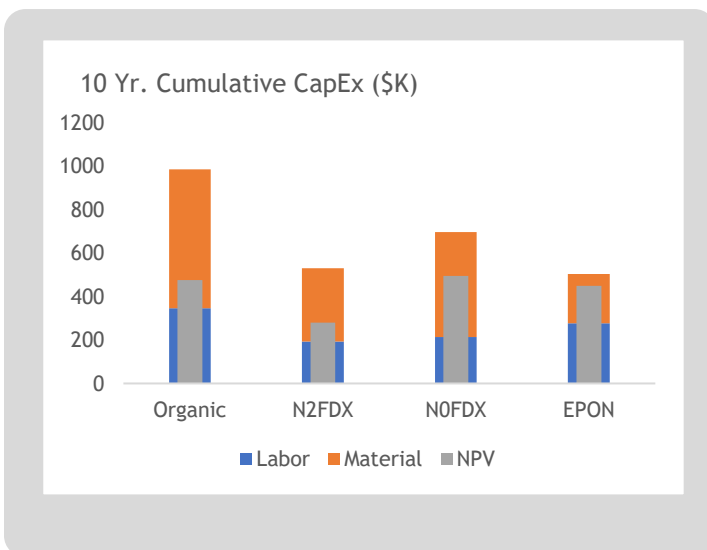
A brownfield N+5 DOCSIS3.0 node is running out of capacity and needs to be upgraded. The network operator has several upgrade options to consider over the next 10-year period:

- Organic: D3.0 → D3.1 → Node Split → N+0 → Full Duplex
- N2FDX: D3.0 → D3.1 → Node Split → Full Duplex
- NOFDX: D3.0 → D3.1 → N+0 → Full Duplex
- EPON: D3.0 → 1G EPON → 10G EPON

Which upgrade path should the operator choose to minimize total upgrade cost over the 10-year period?

An analysis is conducted using AP-Jibe to provide:

- Total CapEx (activities, construction, material) needs for each upgrade scenario above for 10-year period
- Total costs as well as associated net present value are compared in the chart below



Results and Conclusions

Caution: These results are based on our high-level assumptions for illustrative purposes only. Actual results may vary based on each operator's environment.

These different scenarios provide very detailed output in AP-Jibe. We summarized cumulative labor and material CapEx for different cases. Some of the decisions that can be derived from such analysis include:

- Which upgrade path is cheaper over 10-year period?
- Which upgrade path is resource intensive?
- Which has higher NPV (higher near-term investment)?

Such analysis from AP-Jibe can be used by operator for their network element level decisions, or even can use to

develop short term guidelines with longer term vision.

For more information on this application note contact us at contact@fpinno.com or +1-919-444-2270