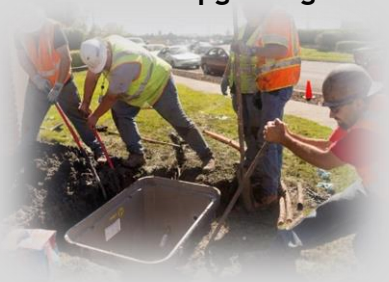
# How to fine tune my density-based brownfield strategy?



## Problem Statement

An operator would like to **develop brownfield SFU upgrade guidelines**. They have access to different access technologies such as Fiber Deep and Fiber To The Home in their portfolio. Question is what are the guidelines for deploying technologies for different node densities?

**SFU node level upgrade guidelines**



**Q: What are the guidelines for deploying technologies for different node densities?**

## High Level Assumptions

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

- SFU nodes with 500 HHP with varying densities are used
- All nodes are at present D3.0 with (approx.) N+5 state
- Technologies available are – Node Splits, N+0, FDX, FTTH
- Downstream /Upstream growth – 45%/30%
- 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%; CIN cost: $50/HHP; FDX CPE: $200; FDX Node: $8K

## Scope of the Analysis

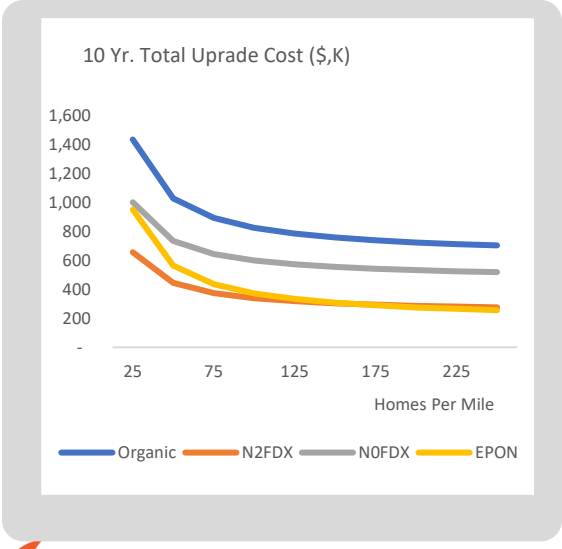
For this analysis, the operator is considering four different technology transition scenarios. These are –

- Organic: D3.0 → D3.1 → Node Split → N+0 → Full Duplex
- N2FDX: D3.0 → D3.1 → Node Split → Full Duplex
- N0FDX: D3.0 → D3.1 → N+0 → Full Duplex
- EPON: D3.0 → 1G EPON → 10G EPON

The leadership team is asking the planning team to evaluate -

- Short-term versus long-term impact (cost and capabilities) on different technology deployment strategies
- Options to deploy different targeted solutions for different densities

Each of the above four scenarios are modeled through AP-Jibe to understand the cost overlay, operational complexity and network capacity implications for different node densities. Some of the results are presented 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.*

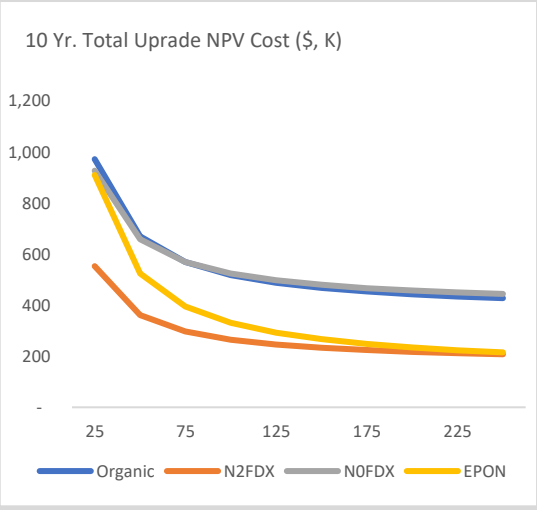
These different scenarios provide very detailed output in AP-Jibe. We summarized cumulative CapEx for different node densities over a 10-year period. Some of the observations that can be derived from such analysis include –

- The impact of density on different transition scenario
- A relative cost effectiveness of scenarios at a given density
- The cost reduction profile of a scenario against density

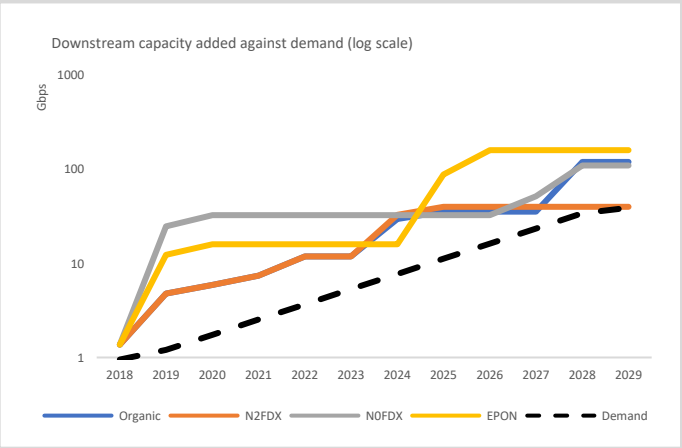
Such analysis can be used by the operator for their short-term node level guidelines driven by longer term vision.

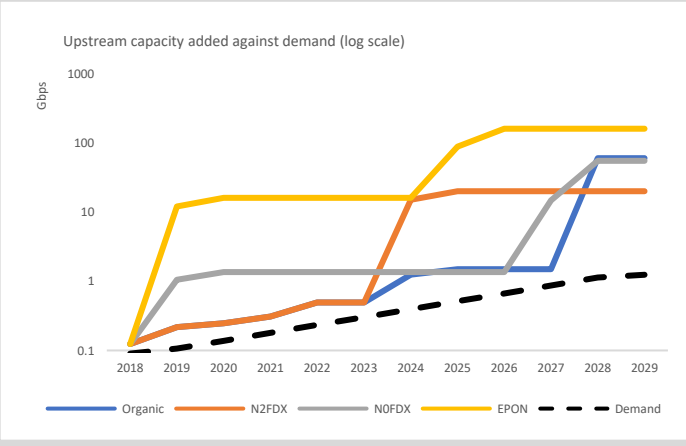
The financial team may be interested in the 10-year NPV to understand the investment overlay as shown in the figure. Some of the observations here include -

- Which technology needs higher near-term investment?
- At what density does different choices cross over?
- How are these choices different than pure total cost-based observations (as shown above)?




The operator also knows that in addition to the cost these scenarios offer different bandwidth per subscriber capabilities. This metric can be considered as, sort of, the return on investment. The operator can look at such additional capacity added as an insurance for the competitive threats. This information against the demand over a 10-year period can be observed from the Jibe output.




The operator can look at the downstream and upstream demand vs supply of the capacity provided by different technology options. They can answer stakeholder's concerns, such as –

- Are we meeting demand just-in-time?
- Can we offer higher upstream speeds?
- Can we support symmetrical speeds?
- When can we support symmetrical speeds?
- Limitations or capabilities of a given scenario

Such analysis from AP-Jibe can assist the operator in selecting a suitable scenario for a given node density. At the same time, they can evaluate the choices from technology, product and financial points of view.

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