

Impact of including OM4 as a fiber type option

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IEEE 802.3ba, Quebec Canada, May 2008

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John Petrilla – Avago

Chris Cole – Finisar

Jonathan King – Finisar

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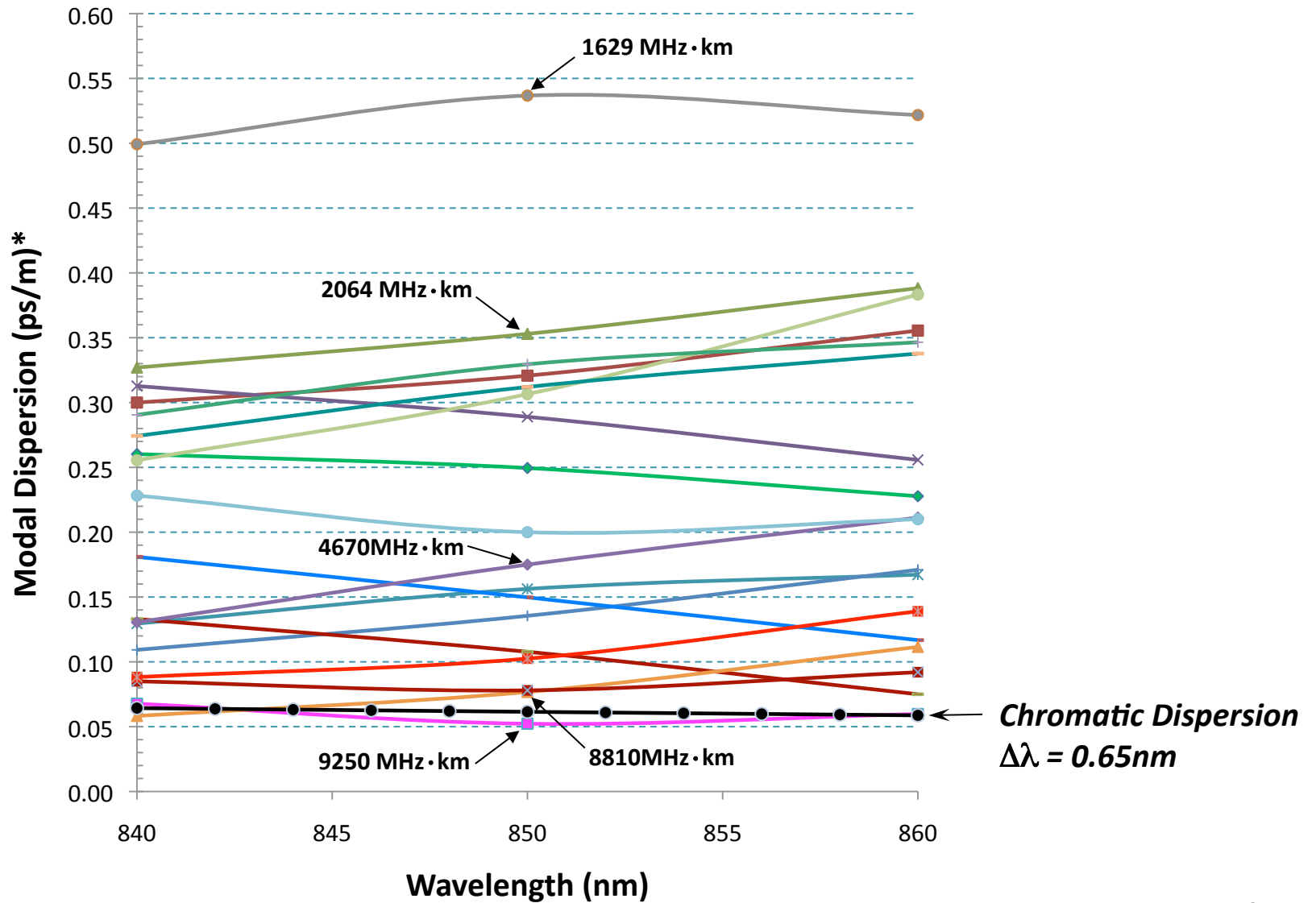
Motivation

Provide design flexibility for multimode fiber PMD

- Increased link margin
 - higher reliability
- Increased deployment flexibility
 - longer reach (extended 25%)
 - Premium solution for links near 100m
- Facilitate faster market acceptance
 - Addresses >30% of the links greater than 100m
 - High density, low cost alternative to LR/ER PMDs
 - Provides “future proof” solution

Chromatic vs. Modal Dispersion

18 Fibers from 3 Fiber Manufactures



*DMD template temporal width

Link Model

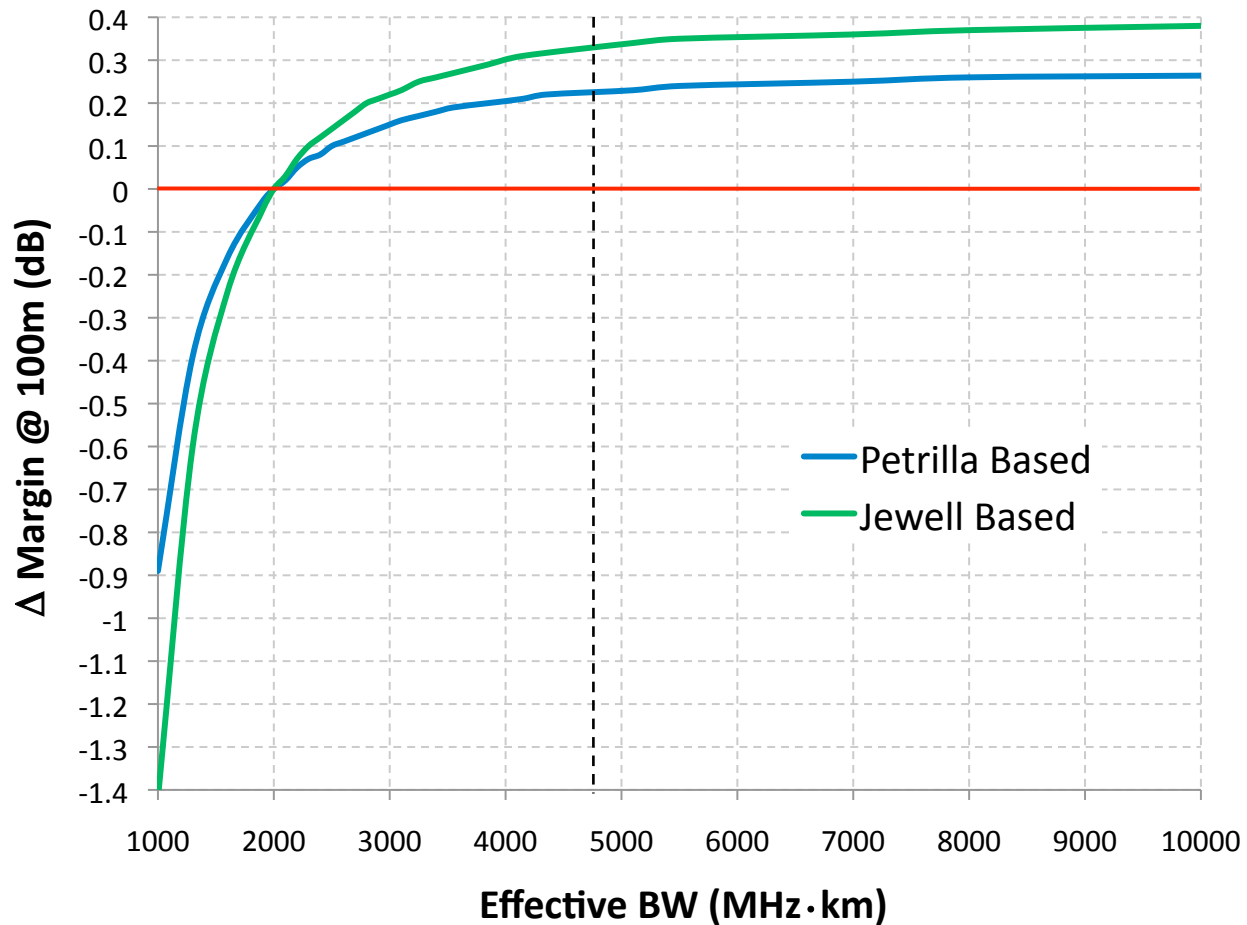
(Predicts 100m reach with OM3)

Used Link Model to Predict Margin/Additional Length using OM3 and OM4 fibers

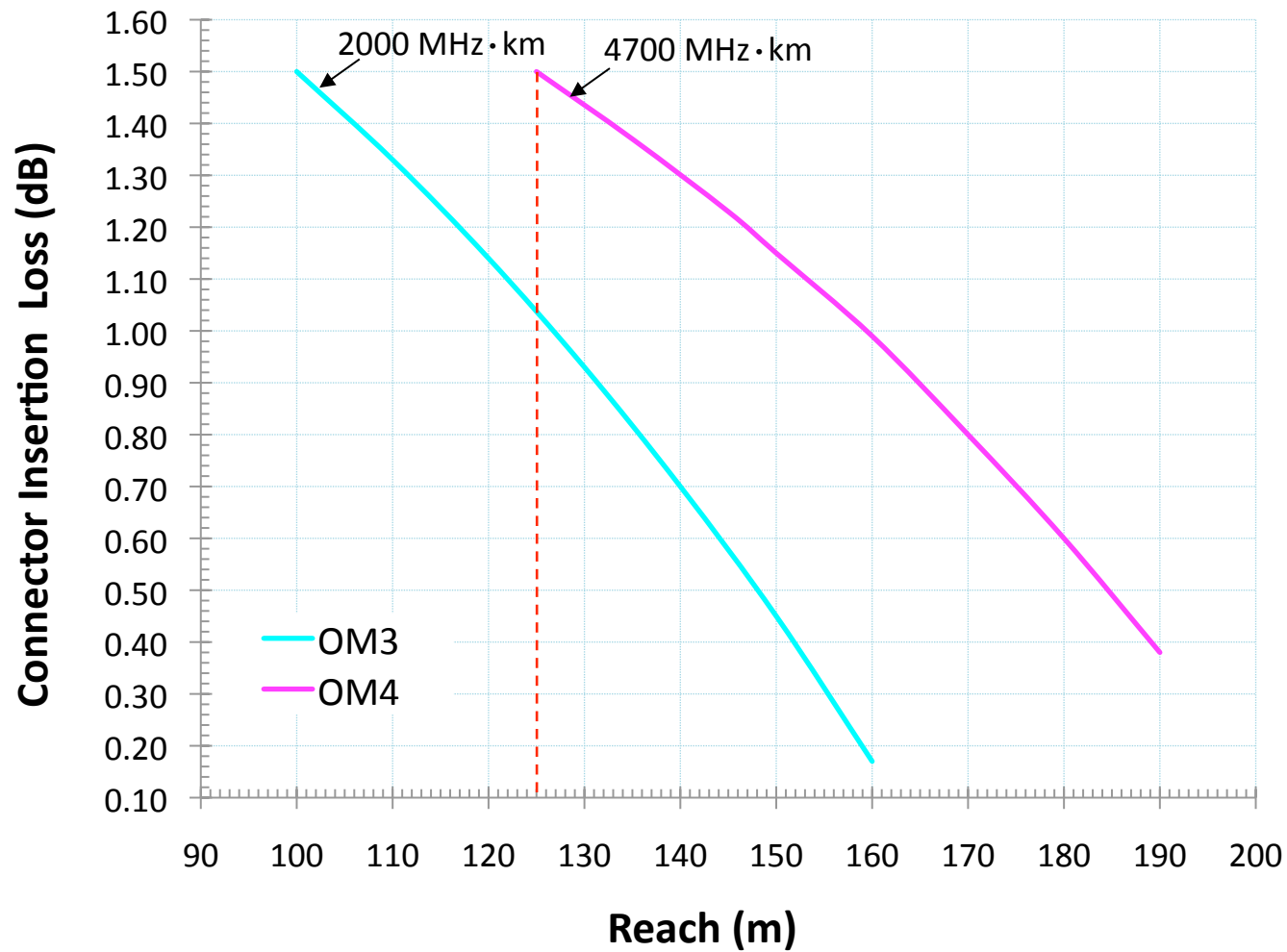
Base Link Model Version 3_1_16a Values:

- Wavelength $\lambda_c = 840$ nm; Spectral Width $\Delta\lambda = 0.65$ nm
- RIN (OMA) = -130 dB/Hz; RIN Coef. = 0.7
- MPN k (OMA) = 0.3; Modal Noise Pen. = 0.3 dB
- Rec_BW = 8250 MHz; Test Rec. BW = 7500 MHz
- RMS Baseline Wander, SD = 0.025
- Power Budget = 8.3 dB
- OM3 Effective BW = 2000 MHz km; **OM4 Effective BW = 4700 MHz km**
- Using Petrilla_01_0309
 - $T_{\text{rise}}/T_{\text{fall}}$ (20-80) = 35.6 ps
 - Tx PWR. OMA = -3 dBm; Nominal Rec. Sensitivity OMA = -11.3 dBm
 - Disp. Min. $\lambda_0 = 1320$ nm; Disp. $S_0 = 0.11$ ps/nm²km
 - **Adjusted DCD_DJ = 12.15 ps & Det. Jitter = 26.3 ps to get similar Power Penalties**
- Using Jewell_01_0508
 - $T_{\text{rise}}/T_{\text{fall}}$ (20-80) = 45.3 ps
 - Tx PWR. OMA = -2.8 dBm; Nominal Rec. Sensitivity OMA = -11.1 dBm
 - Disp. Min. $\lambda_0 = 1316$ nm; Disp. $S_0 = 0.10275$ ps/nm²km
 - DCD_DJ = 20.535 ps; Det. Jitter = 29.8 ps

IEEE Link Model Predicts Improved Margin For 4700MHz·km Multimode Fiber (OM4)



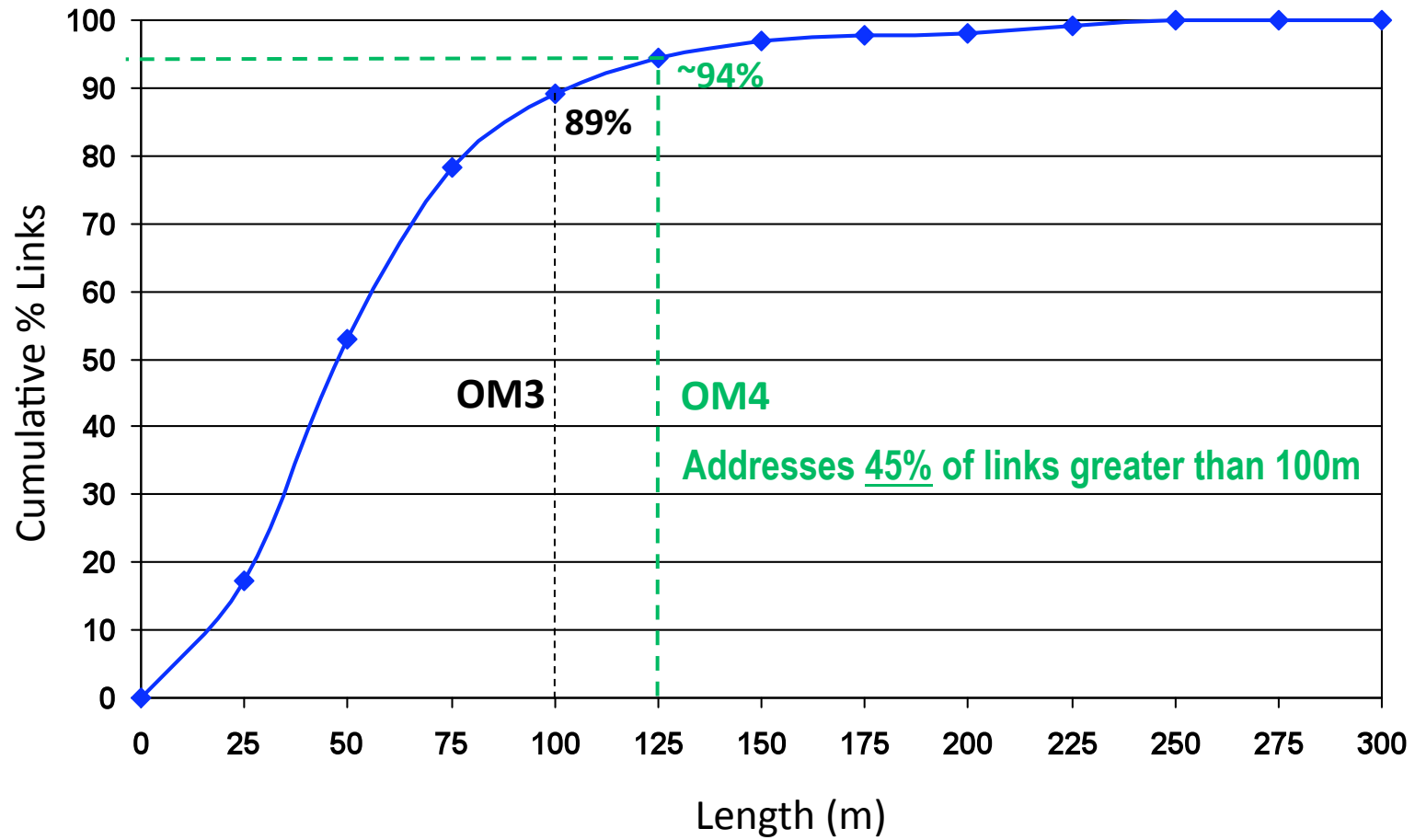
Improved Margin or Longer Reach (25%) (using the IEEE Link Model)



Enterprise Data Centre Cabling Lengths

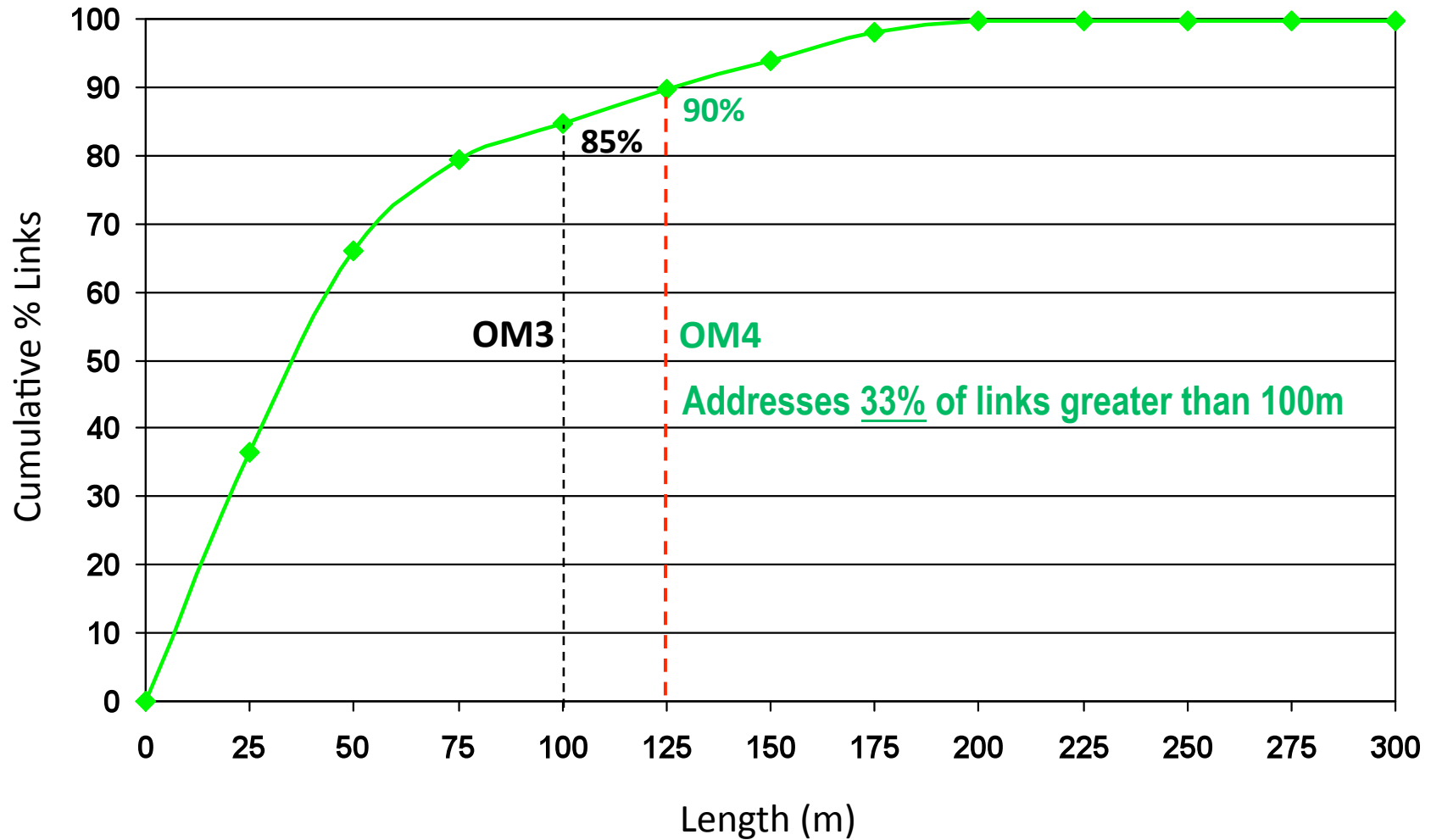
Access-to-Distribution Channels

IEEE 802.3ba Flatman_01_0108.pdf



Flatman Enterprise Data Centre Cabling Length Distribution-to-Core Channels

IEEE 802.3ba Flatman_01_0108.pdf



Proposed Changes to Draft 2.0

Additions to clause 86:

1. **Add OM4 to Table 86-1**
 - a. Include footnote “Specified in TIA-492AAAD”
2. **Add “TIA-492AAAD” to subclause 86.6, p.275, line 27**
3. **Add Operating distance 0.5 to 125 for 4700 MHz·km, in Table 86-13**
 - a. Include footnote “Specified in TIA-492AAAD”
4. **Add “TIA-492AAAD” to subclause 86.10.2.1, p.296, line 38**
5. **Add “OM4” and “125m” to Table 86-18.**
6. **Add 4700 MHz·km to Table 86-19**
7. **Include reference to TIA-492AAAD in subclause 86.11.4.7 Table**

Other Additions:

1. **Add OM4 to Subclause 30.5.1.1.2, p.30, lines 7 & 14.**