# Transmission Line Built Section Assets Options Considerations

Asset Reinvestment Review
Working Group

27 July 2022

Option 1: Base Case – Using "as is" Powerlink Definition

Option 2: Environment

Option 3: Fixed length

Option 4: Function

Option 5: Accessibility

Review a selection of transmission lines across the network to validate the following Transmission Line Asset Classification Principles would be met:

1. Well defined at start of life and consistent of asset lifecycle. (predictable & repeatable)

2. Have regard to transmission industry practice

3. Provides additional customer benefits over the current classification

4. Practical from a general business perspective

The study included transmission lines examples across north, central and southern regions, inland and coastal, urban and rural and varying environments.

- A Built Section (BS) is a section of transmission line that was built/commissioned under a single project, and generally contains structures with identical or very similar characteristics.

- Consistently applied to present asset management approach to all transmission lines assets on the network.

- The current, base case model requires bundling of components (structure, conductor, earthwire & insulation) to extend the life of the built section for an agreed period.

- The life extension period is determined by the future needs for the line.

- The classification does not impact what work is required/performed, it simply defines whether the work is Capex or Opex.

- Powerlink current asset base has 2,437 built sections

Health Indexes along BS1220 Ross to Chalumbin (Strs: 528 , kms: 244.1)
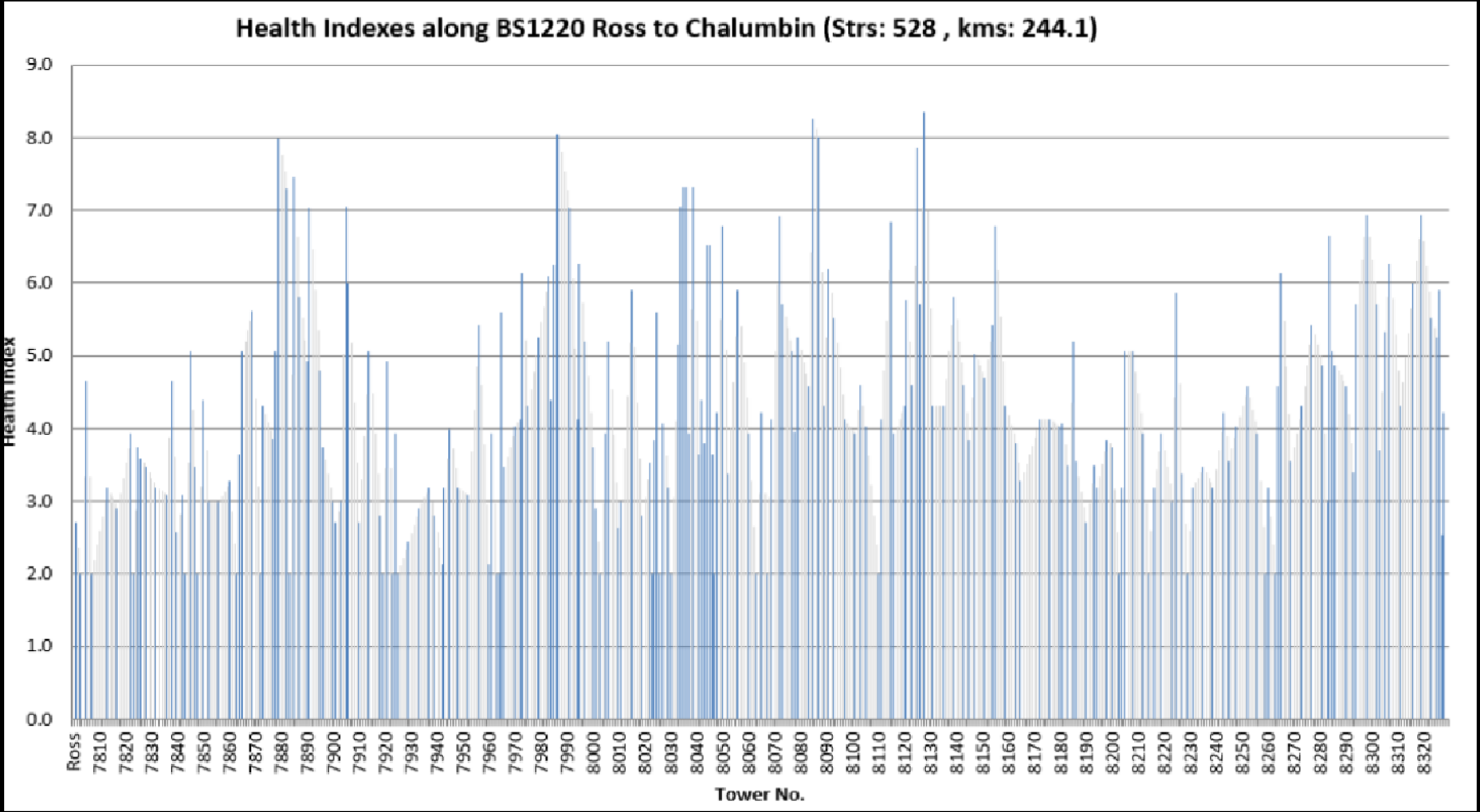
**No clear correlation between environment and asset health.**
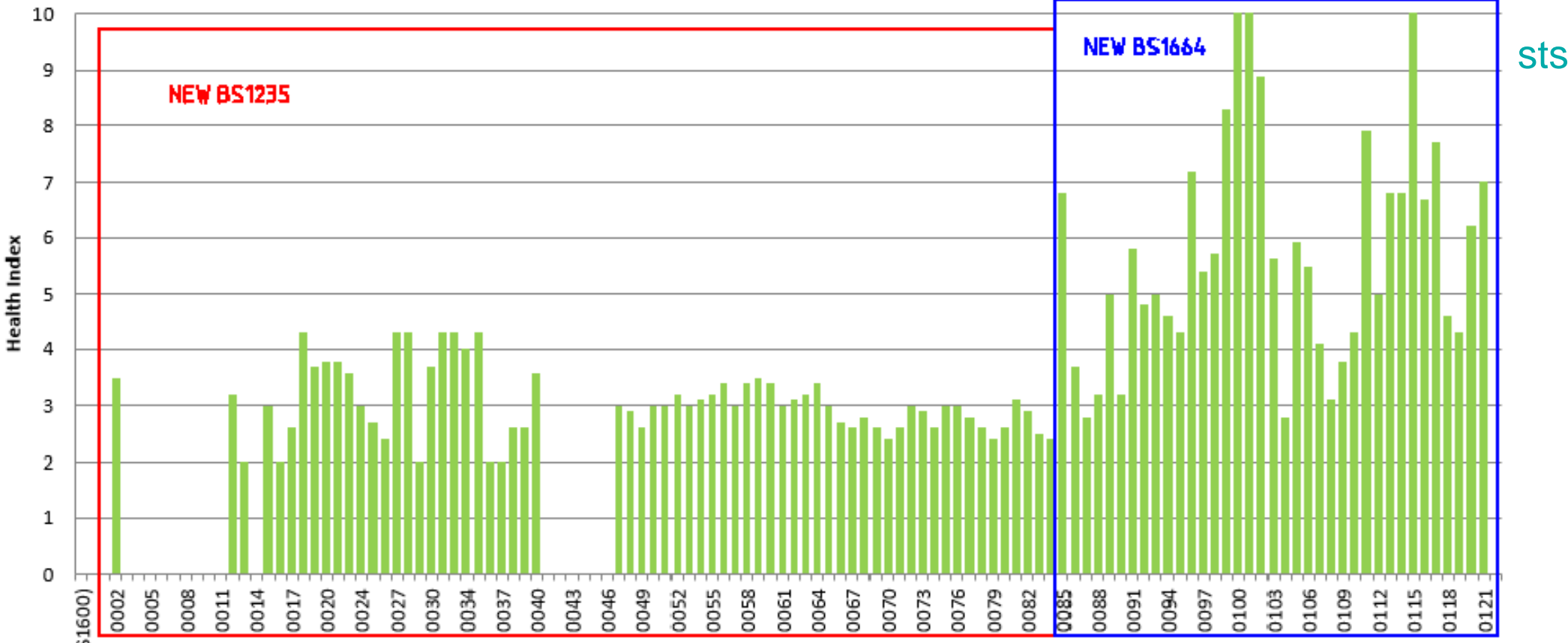
Asset Classification based on a similar environment i.e. corrosion region

Health Indexes along BS1235 Springmount (BS1600) to Bayview Heights (Strs: 121 , kms: 55.97)
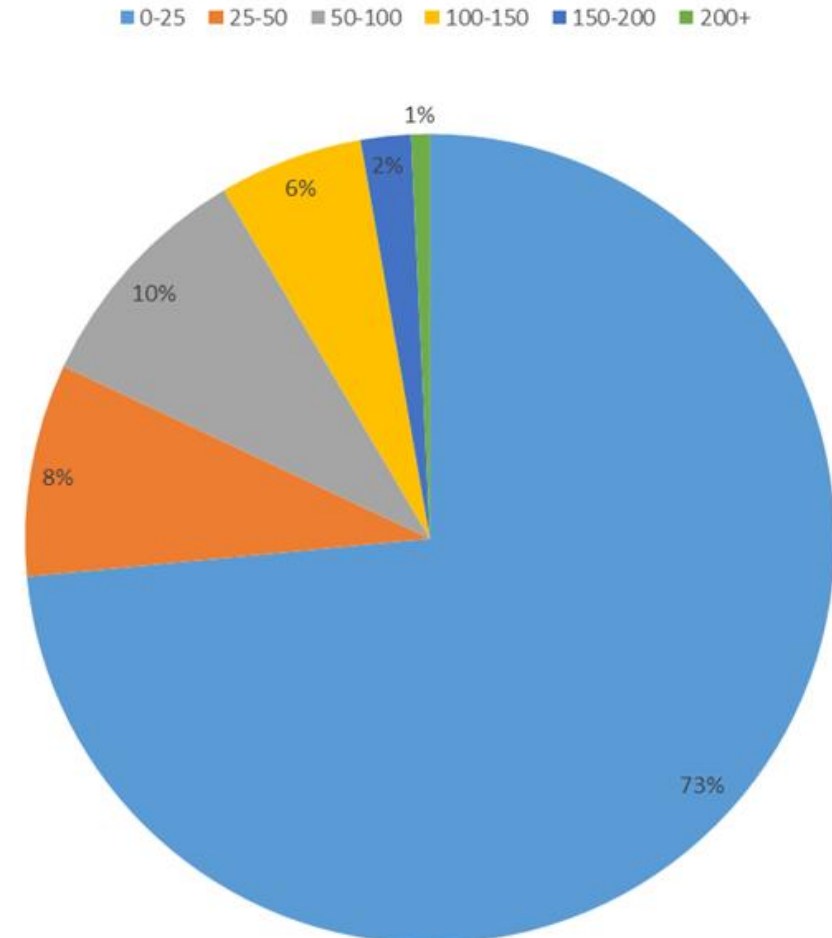
- Does not appear to meet all the Principles, with the following key points:

  - At commissioning, we don't have a granular knowledge of the microenvironments and there will be inaccuracies compared with later observed corrosion performance.

  - Over of the life of the asset environmental conditions can fluctuate due to local development, climate change & vegetation management.

  - Review of built section corrosion indicates that in most cases segregated environments are not clear or practically implemented.
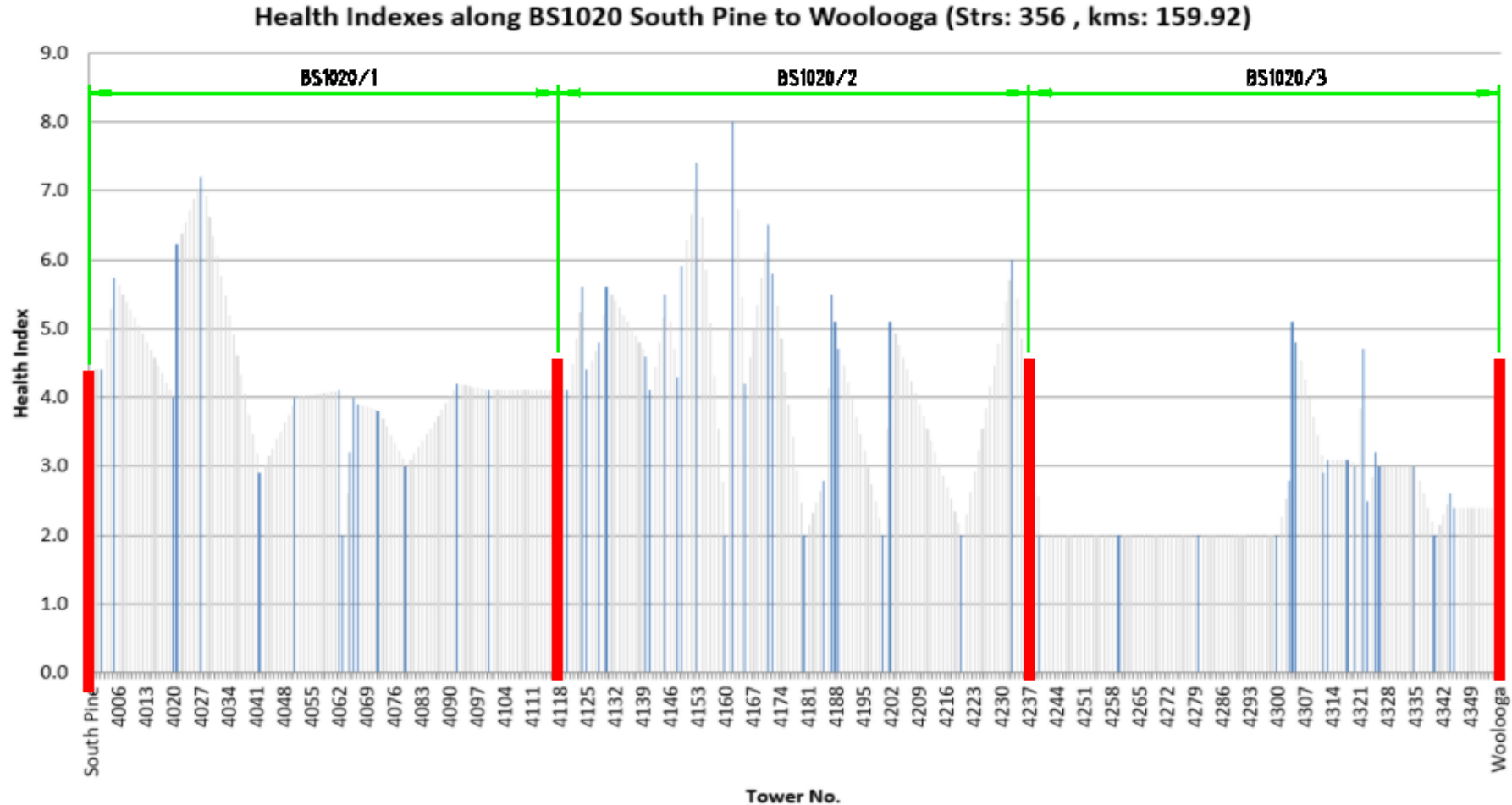
## Define Assets at a fixed length

- More than 80% of built sections are less than 50km total length

- Majority of built sections are less than 25km long.

- Where possible we bundle built sections with similar condition and close locality into a single project to achieve economies of scale.

- While reducing long built section lengths (>100kms) may defer Capex expenditure on 9% of built sections, it will increase Opex expenditure on these in the interim period.

- Reinvestment timing based on built section condition however for long built sections a lower % structures need to have Health Index ≥ 8 to initiate a project

**Built Section Length Distribution**

Legend: ■ 0-25 ■ 25-50 ■ 50-100 ■ 100-150 ■ 150-200 ■ 200+



Pie chart values: 73%, 8%, 10%, 6%, 2%, 1%

## Southern Region Example



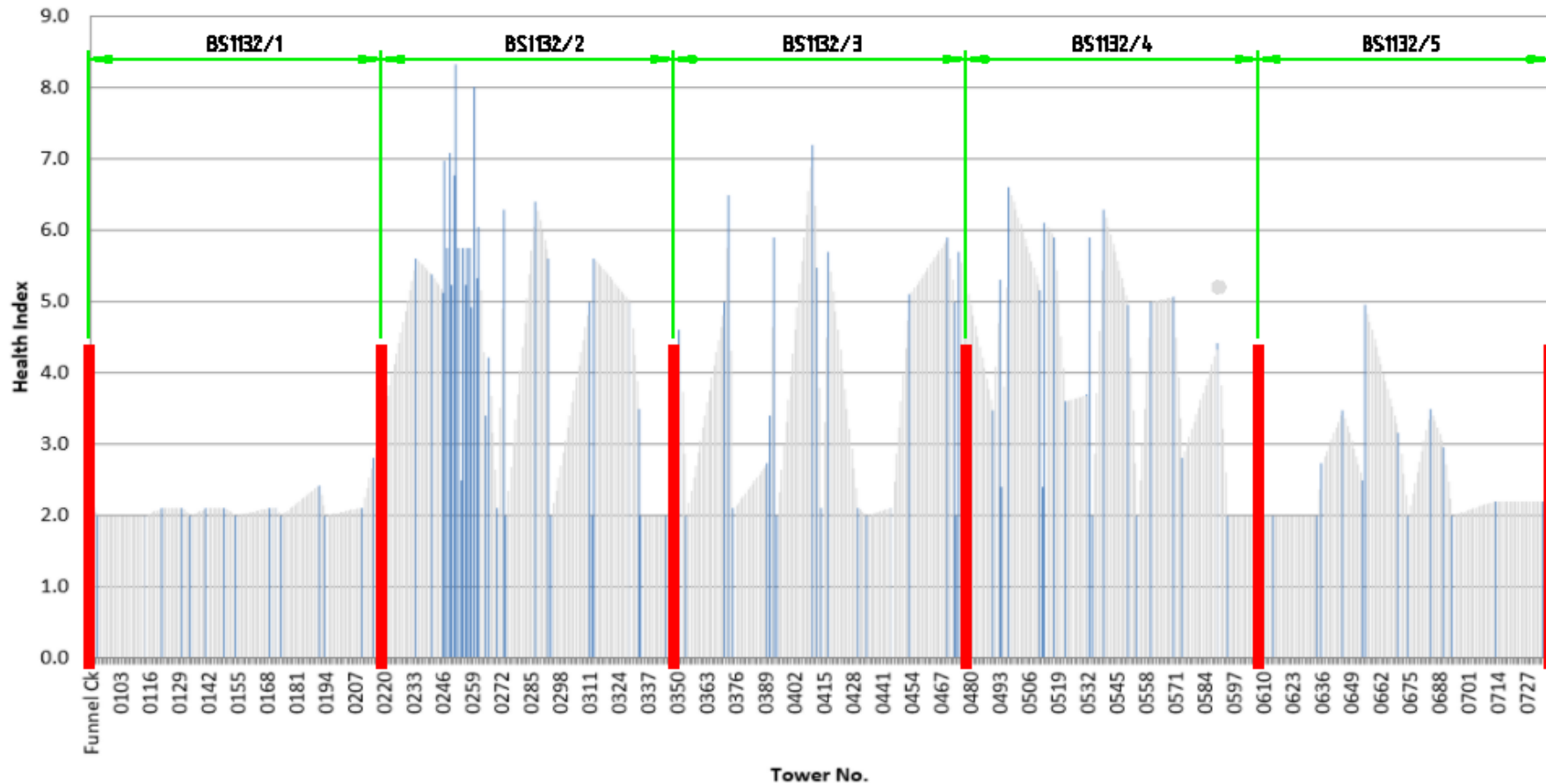Health Indexes along BS1020 South Pine to Woolooga (Strs: 356 , kms: 159.92)

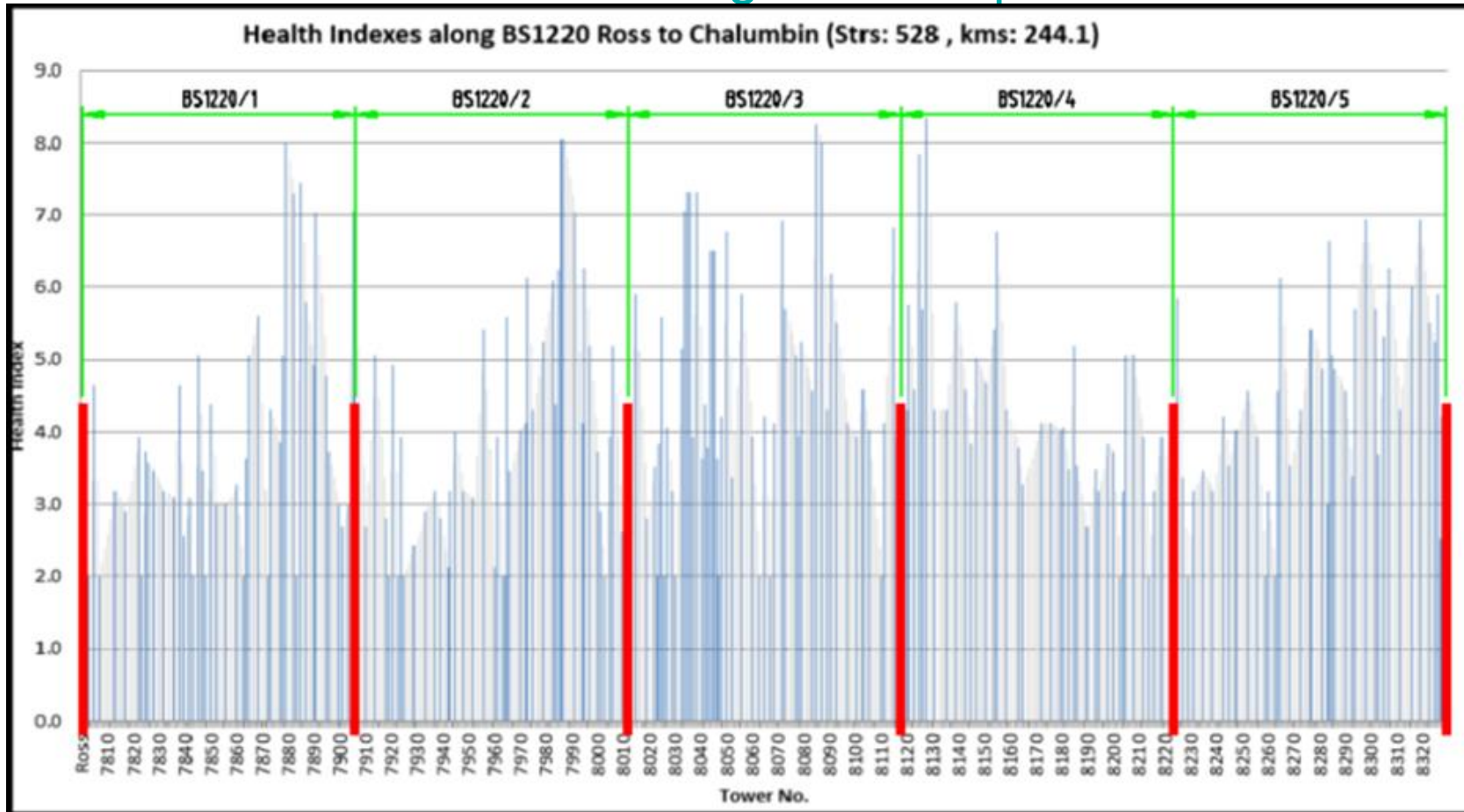**No clear correlation between length and asset condition**

## Central Region Example



Structure Health Indices along BS1132 Funnel Ck to Bouldercombe (Strs: 646 , kms: 259.8)

**No clear correlation between length and asset condition**

## Northern Region Example



Health Indexes along BS1220 Ross to Chalumbin (Strs: 528 , kms: 244.1)

- Assets defined based on function:

  - Structure (including foundations) ~22,000 lattice towers and ~3,000 poles

  - Insulator string (including fittings)  ~180,000 strings

  - Conductor span (including fittings) ~75,000 conductor spans

  - Earthwire span (including fittings)   ~25,000 earthwire spans

  - Land ~40,000 hectares over 10,000 route kilometres

- Would result in a large increase in the number of assets for financial purposes

- Would change the division between Capex and Opex

- This option is likely to meet Principles 1 and 2, however a detailed analysis of this asset model on a sample of projects to follow to determine:

  - Where it would provide an overall net customer benefit (principle 3)

  - Practicality to implement including from a financial point of view (principle 4)

  - determine its cost viability and advantages and disadvantages

- Propose continuing this analysis and report back at the next ARR working group meeting.

## Assets grouped together based upon their ease of access

- This option does not appear to meet Principles, for the following reasons:
  - Accessibility of a given asset is not fixed over its life due to wet weather, vegetation management, access tracks, climate change, landholder relations and outages etc.

  - Difficult at commissioning to define an accessibility when populations fluctuate particularly in regional towns based on economic factors.

  - Not aware of any other transmission utilities who use accessibility as a basis.

- Powerlink bundle transmission lines projects together where it provides a cost benefit in doing so.

- The built section accessibility factor is already somewhat factored into the current model, with rural lines tending to be longer with greater distances between substations and urban lines at reduced length.

| | 1.<br>Base Case | 2.<br>Environment | 3.<br>Length | 4.<br>Function | 5.<br>Accessibility |
|---|---|---|---|---|---|
| 1. Defined at commissioning & Consistent throughout life | Meets Principal | Does not appear to Meet Principal | Meets Principal | Meets Principal | Does not appear to Meet Principal |
| 2. Have regard to transmission industry practice | Somewhat Meets Principal | Somewhat Meets Principal | Somewhat Meets Principal | Meets Principal | Somewhat Meets Principal |
| 3. Significant customer benefits compared to current class. | Not Applicable | Somewhat Meets Principal | Does not appear to Meet Principal | Further Analysis Required | Somewhat Meets Principal |
| 4. Practical from business perspective | Meets Principal | Somewhat Meets Principal | Somewhat Meets Principal | Further Analysis Required | Somewhat Meets Principal |

**Legend**

| | |
|---|---|
| | Meets Principal |
| | Somewhat Meets Principal |
| | Does not appear to Meet Principal |
| | Not Applicable |
| | Further Analysis Required |

# What comments do you have on the options review?

- Powerlink will undertake further detailed analysis on a sample of projects for both the Base Case (Option 1) and Assets defined by function (Option 4)

- Powerlink will report findings back at the next ARR Working Group meeting.

# Customer Reference Group Accounting Treatment – Built Section

27 July 2022

**Towers and Lines assets**

- Recorded as a built section of multiple components

  – Towers

  – Lines

  – Insulators

  – Land

- All the components have varying useful lives from 25 years for insulators to between 60 – 80 years for towers

- The weighted average useful lives of the components equates to the useful life of the asset – average 40 – 60 years

**Capital Expenditure**

- Expenditure on the asset that either

  – Extends the useful life of the asset[1] or

  – Is significant expenditure[2] greater than 5% - 10% of the asset value;

**Operating Expenditure**

- Expenditure during the life of the asset that enables the asset to continue to be used in the manner intended but no extension of the life of the asset
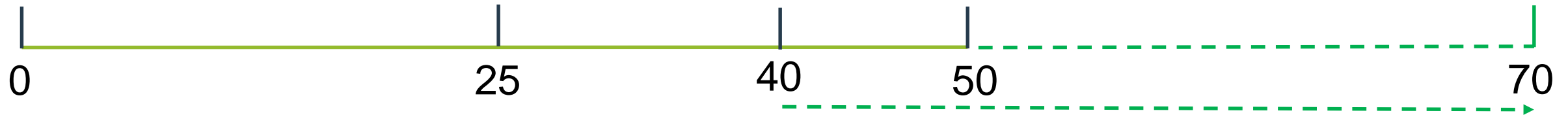
[1] Asset life extension reflects an increase to the future economic benefit (AASB116 para7(a)).

[2] Significant subsequent asset expenditure reflects the characteristics of an asset overhaul (AASB116 para 13, & AASB 1031 para 4.1.6).

**Insulator Refurbishment:** No extension of useful life generally less than 5%-10% of asset value therefore Opex

**Line Refit:** May include insulator replacement, line re-stringing and general tower refurbishment. Will result in extension of asset useful life

0    25    40    50    70

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