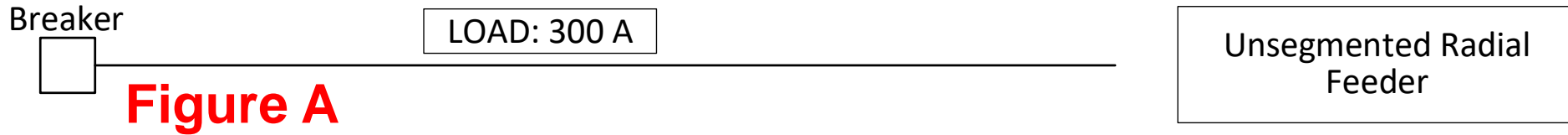


# Achieving SAIFI Improvement Objectives by Increasing Medium-Voltage Looped- Feeder Segmentation

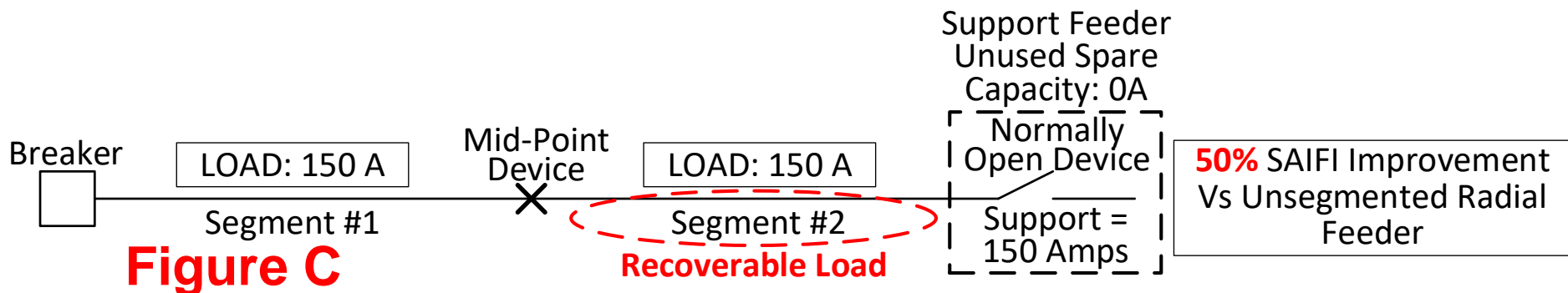
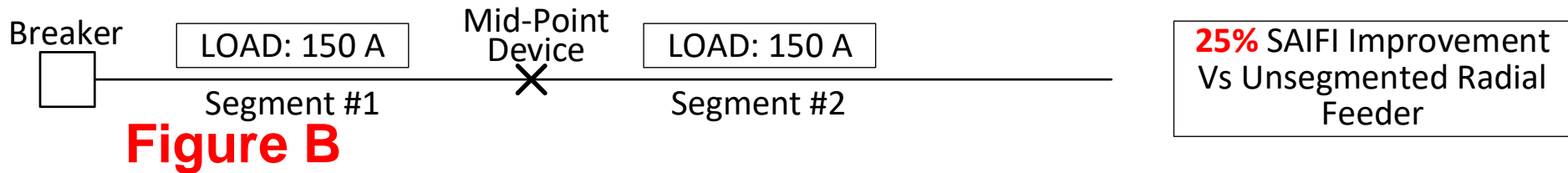
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# Base Case Reference Importance



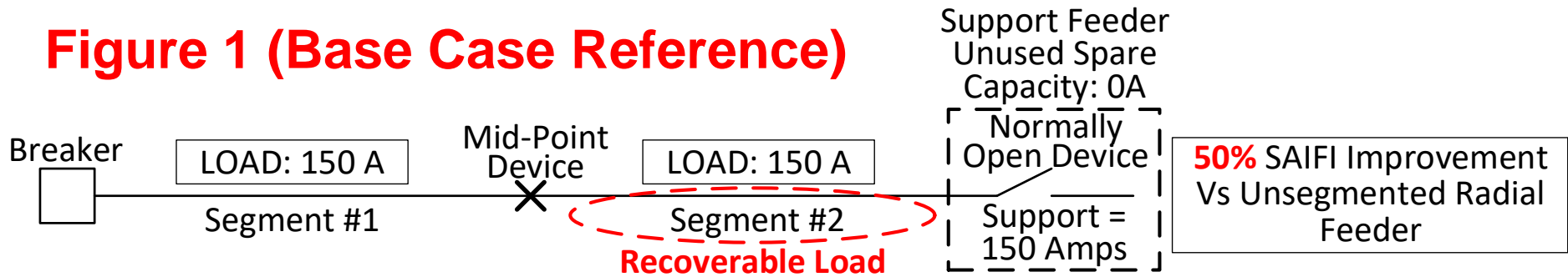
Note: Load current will be used to represent customers throughout this presentation



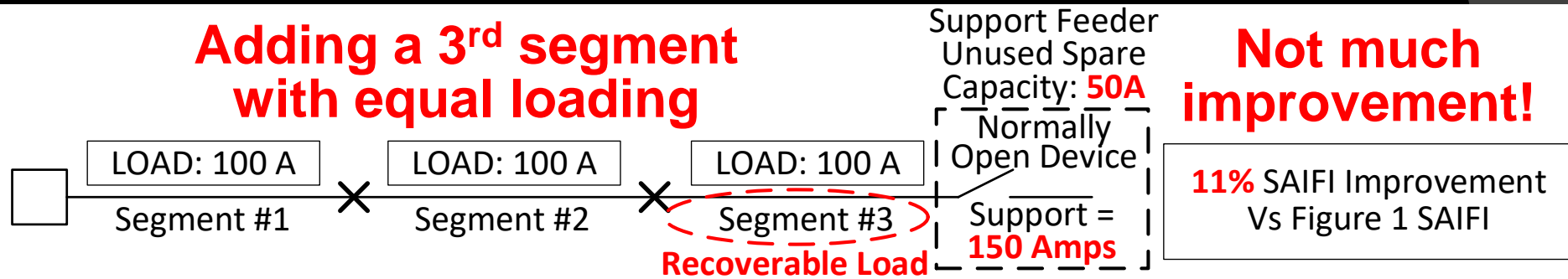
If the Figure B feeder is the SAIFI base case reference, Figure C produces a 33.3% SAIFI improvement – not 50%!

# Support Feeder Spare Capacity Impact

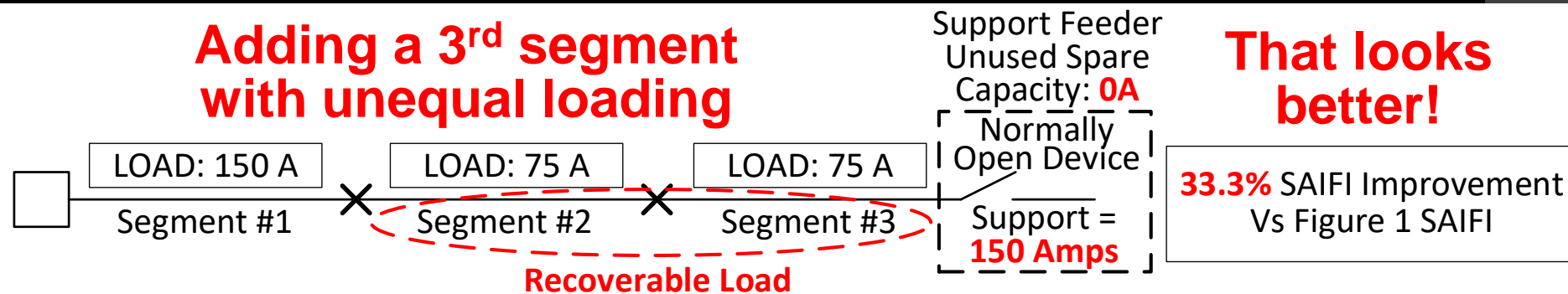
## Figure 1 (Base Case Reference)



## Adding a 3<sup>rd</sup> segment with equal loading

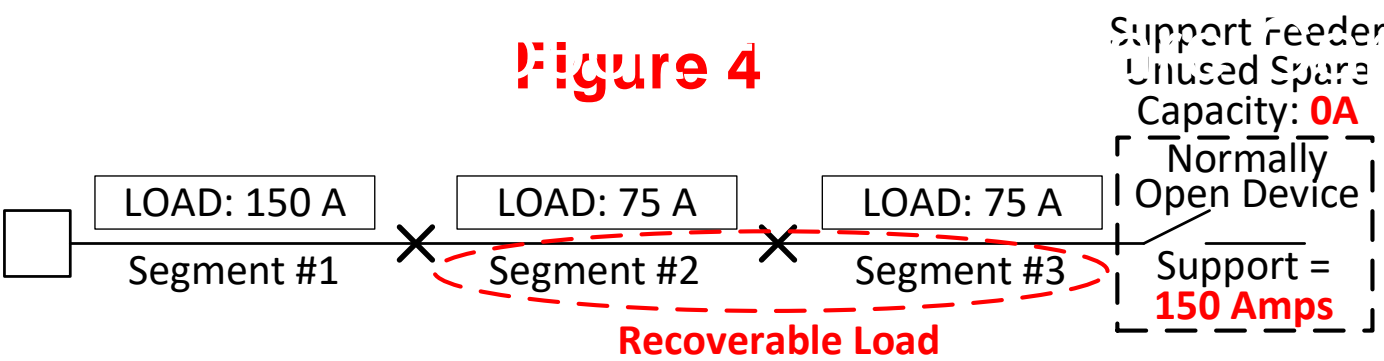


## Adding a 3<sup>rd</sup> segment with unequal loading



Unequal segment loading improves SAIFI by maximizing the use of the support feeder's spare capacity.

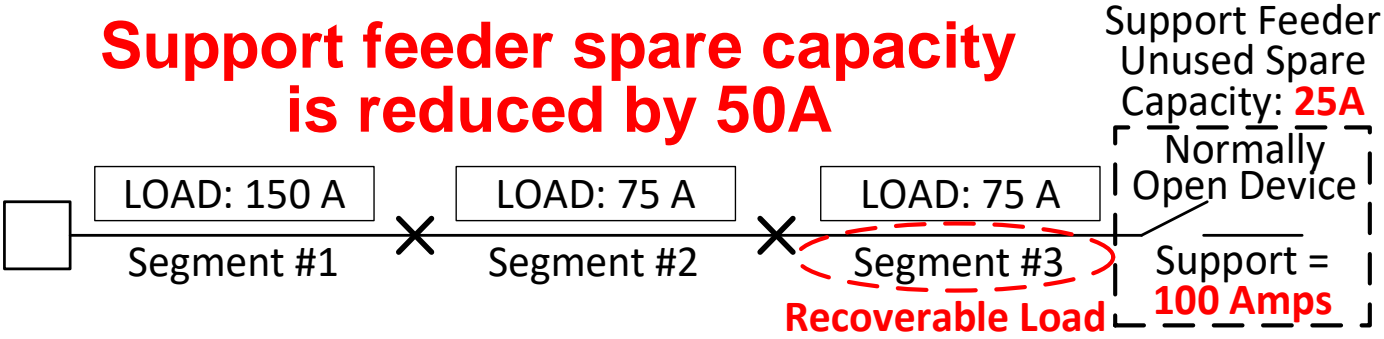
# Figure 4



**Figure 1 is 2-150A segments w/150A support capacity**

**33.3% SAIFI Improvement Vs Figure 1 SAIFI**

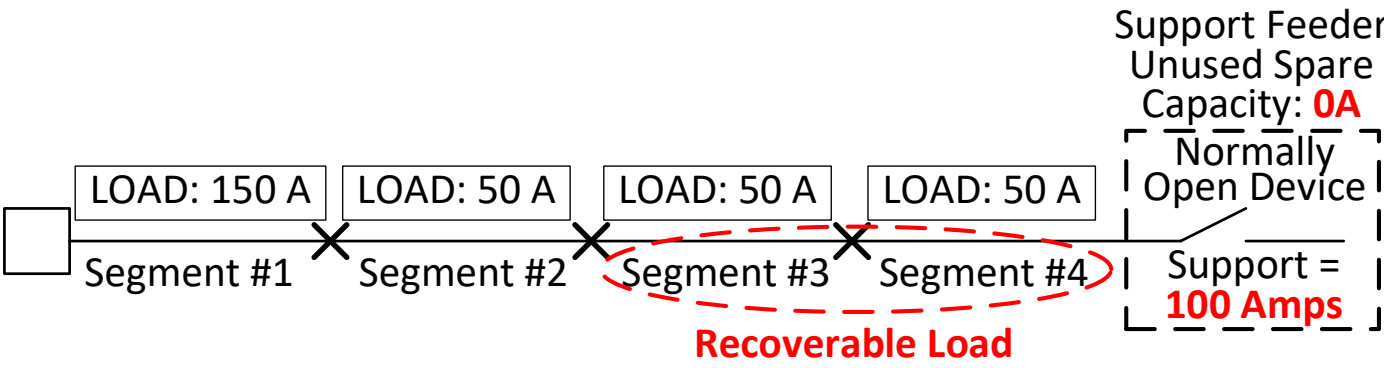
**Support feeder spare capacity is reduced by 50A**



**Ouch!**

**25% SAIFI Reduction Vs Figure 4 SAIFI**

**Reduced support feeder spare capacity can adversely affect SAIFI improvement objectives.**



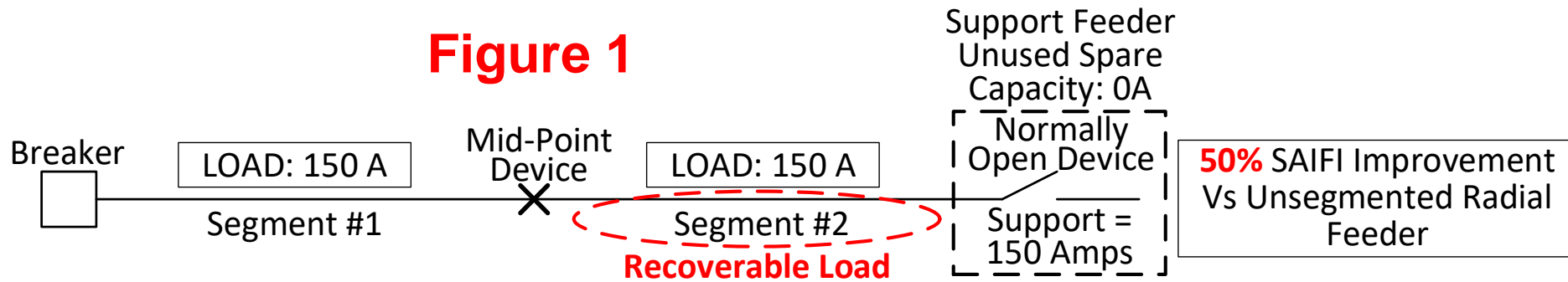
**That looks better!**

**12.5% SAIFI Improvement Vs Figure 4 SAIFI**

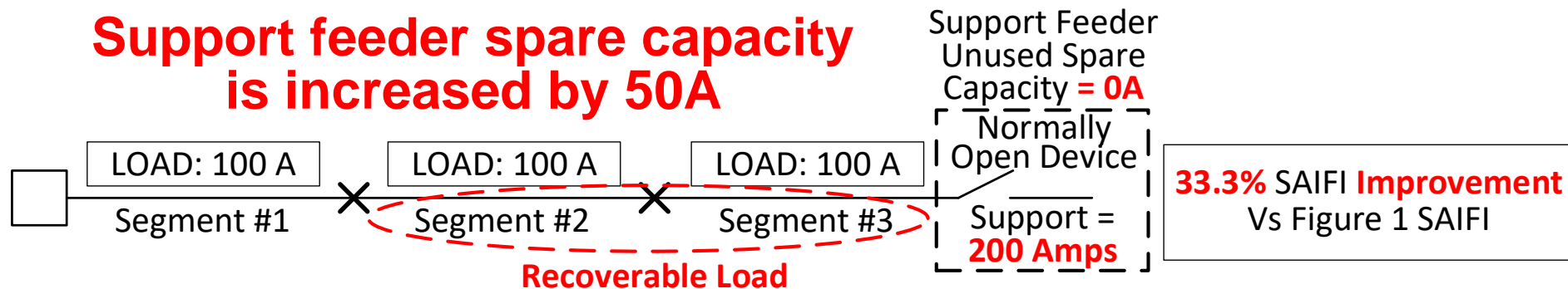
**Increasing segmentation and reappportioning load overcomes reduced spare capacity & recovers SAIFI improvement objectives.**

# Increased Support Feeder Spare Capacity Impact

**Figure 1**



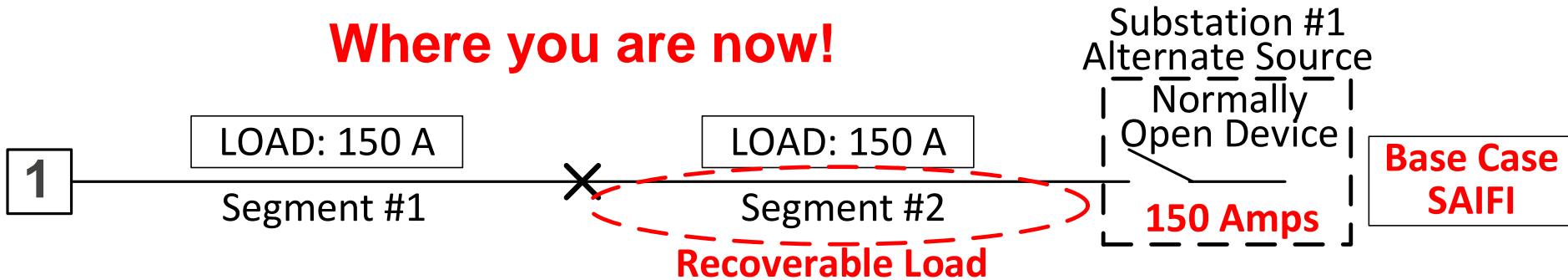
**Support feeder spare capacity is increased by 50A**



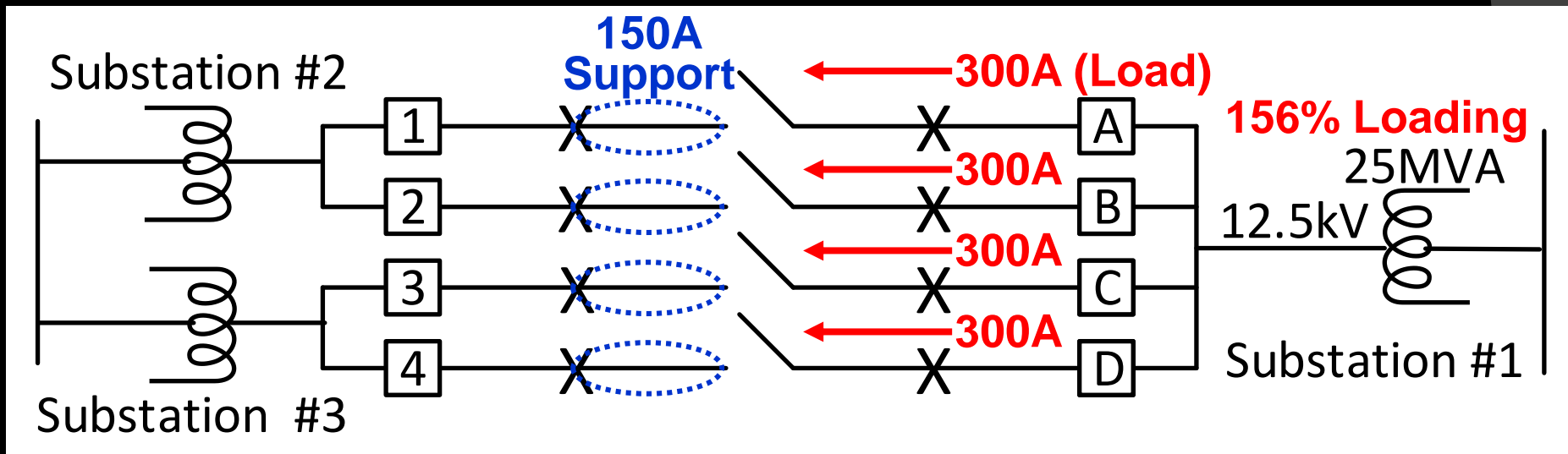
Uniformly increasing load segmentation sometimes means increasing support feeder spare capacity to achieve SAIFI improvement objectives.

# Achieving Regional SAIFI Improvement Goals

**Where you are now!**



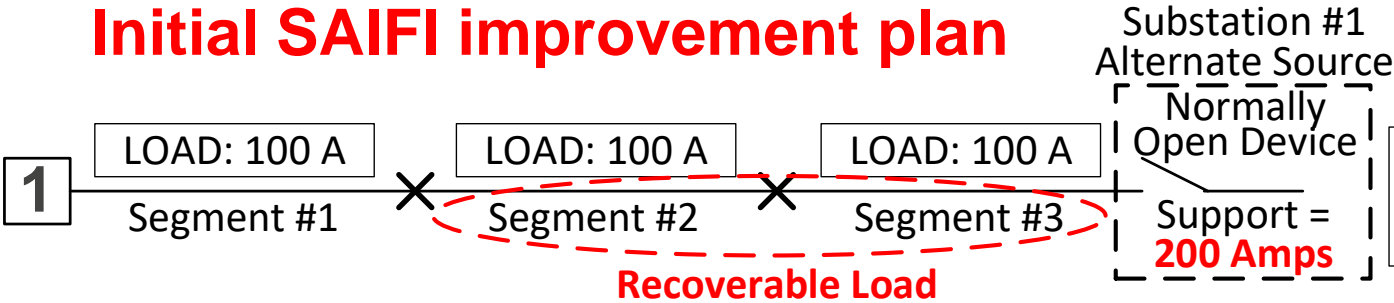
Existing feeder segmentation levels and alternate source support capacity – a separate transmission line feeds Substations #2 & #3



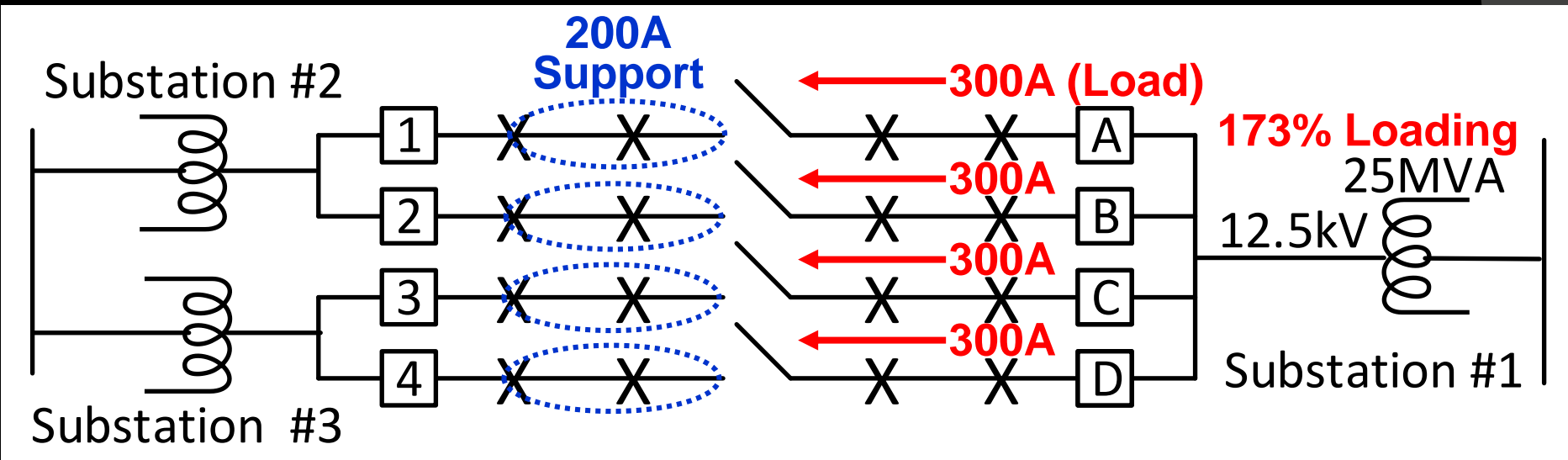
# Initial SAIFI improvement plan

Base case is 2-150A segments w/150A support capacity

33.3% SAIFI Improvement Vs Base Case SAIFI



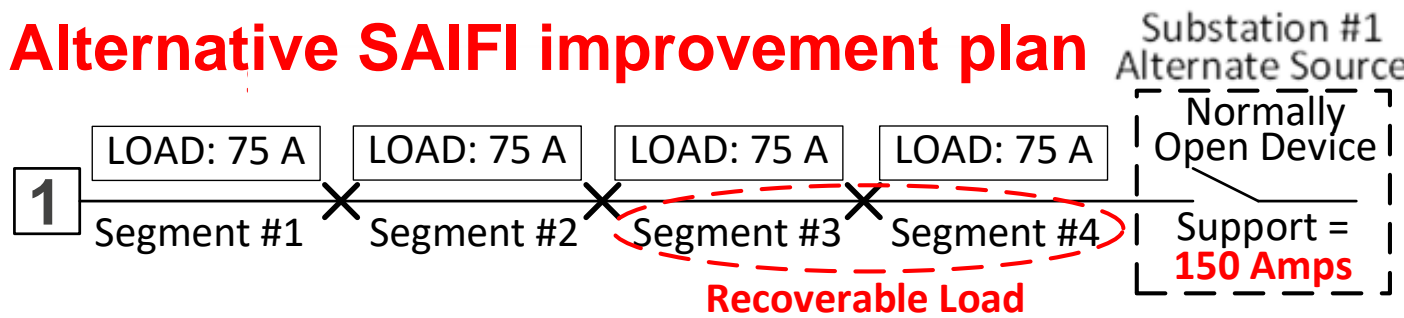
Achieving SAIFI improvement objectives using this method means increasing support feeder spare capacity.



The 25-MVA Substation #1 transformer must be replaced to supply feeders #1, #2, #3 & #4 with 200A of support capacity should a transmission line loss occur.

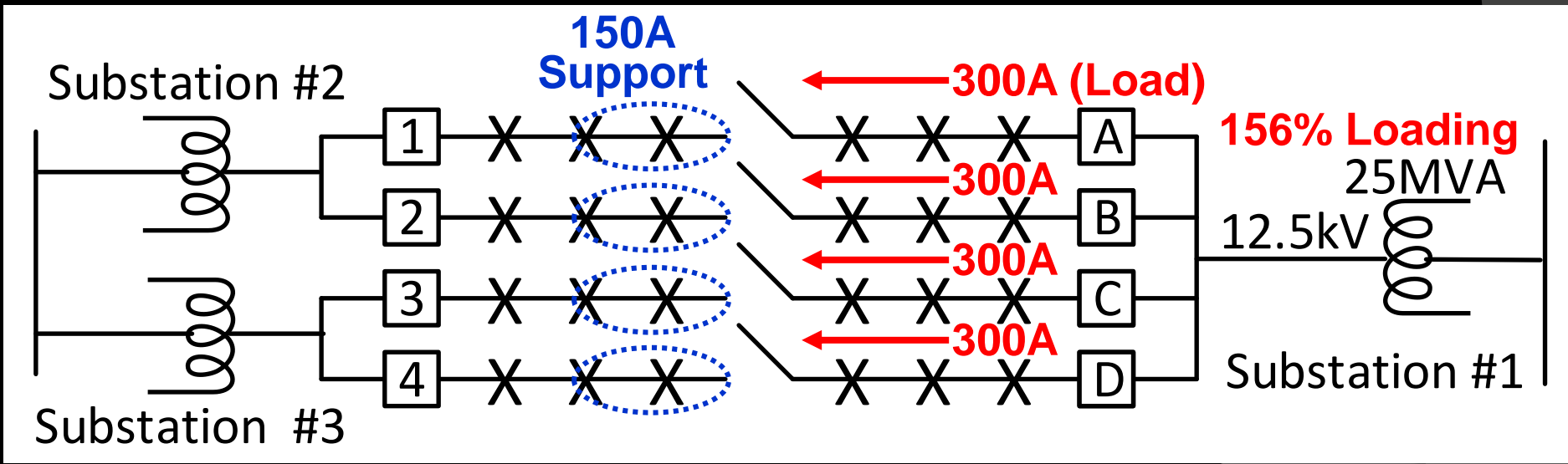
**Base case is 2-150A segments w/150A support capacity**

## Alternative SAIFI improvement plan



**37.5% SAIFI Improvement Vs Base Case SAIFI**

Adding one more segment/feeder avoids replacing the Substation #1 transformer and exceeds SAIFI improvement objectives.



Comparing the cost of replacing the 25-MVA Substation #1 transformer vs adding one more segment to all 8-feeders, the conclusion is glaringly obvious – add one more segment!



# Questions?