1. Definition of the research question:

Determine when a bridge element in the given location (one of the 50 US States in this case) is likely to have its condition state (CS1, CS2, CS3 and CS4) change from one state to another. When will an element from the bridge change go from being in the state known as CS1 to CS2 as an example. When will an element go from CS3 to CS4? The ultimate question of the analysis is to gauge the lifespan of individual elements in the bridges of a particular US State.

The variables of interest are:

Dependent variables:

Condition States (CS1-CS4), the total quantities associated with each element (TOTALQTY) which determines the percentage of the element that exists in a particular condition state

Independent variables:

Time. The data is collected yearly, and the data in this case is for the years 2016 through 2022. The data is assumed to be collected continuously (although that is probably unrealistic) meaning that any one element in the highway system is

Location of the bridge. The location data for each bridge is presently no more sophisticated than to give which of the 50 US States in which the bridge is located. The location of each bridge should be considered more rigorously for the purpose of a detailed analysis taking into account latitude and longitude and the proximity of the bridge to corrosive environments like salt air and industrial areas, but also tremendously important to consider is the average daily traffic a bridge experiences, and generally depends on the location of the bridge. (Presently the model is not using any type of latitude and longitude data to adjust the rate at which any bridge element is assumed to progress through the different condition states.)

1. Data Collection:
   1. The data comes from the FHWA (Federal Highway Administration) website and is available in possibly multiple formats- the format used in this analysis being that the data is parsed from a file in the XML format.
   2. No additional steps have been taken to procure additional data for the analysis.
2. Data Preprocessing:
   1. Outliers have been removed from the