the accidents for the three cases were filtered in the database by including only accidents resulting in derailment. The average number of cars derailed for each of the three cases was then calculated (rounded up to whole numbers):

Case 1. Yard derailments, average number of cars derailed = 4

Case 2. Mainline derailments, speed < 25 mph, average number of cars derailed = 5

Case 3. Mainline derailments, speed 25-60 mph, average number of cars derailed = 11

Based upon the dynamics of a derailment, it was assumed that in an average derailment, the first car derailed plus the immediately following sequence of n-1 cars would derail, where n is the average number of cars derailed. The derailment statistics indicate that although the accident frequency is higher in yards relative to mainline movements, there are fewer cars derailed on average in yard derailments compared to mainline derailments. Regarding mainline movements, lower speed derailment accidents involve fewer cars on average than higher speed derailment accidents.

The filtered data for each of the three cases was then placed into a histogram based on the position of the first car derailed. An example plot for the mainline derailments with train speeds between 25 mph and 60 mph is provided in Figure 23. The first car derailed plots for mainline derailments for train speeds less than 25 mph (Figure 24) and yard derailments (Figure 25) are similar.