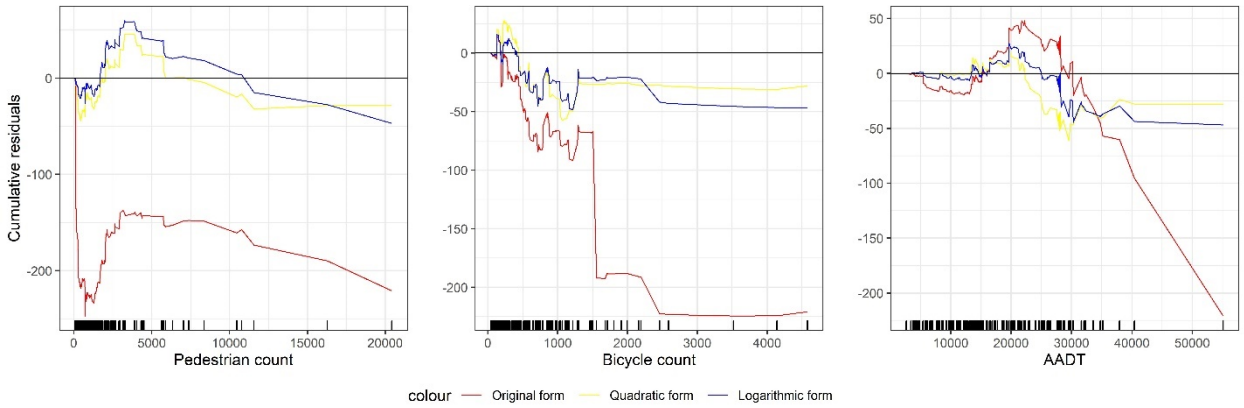
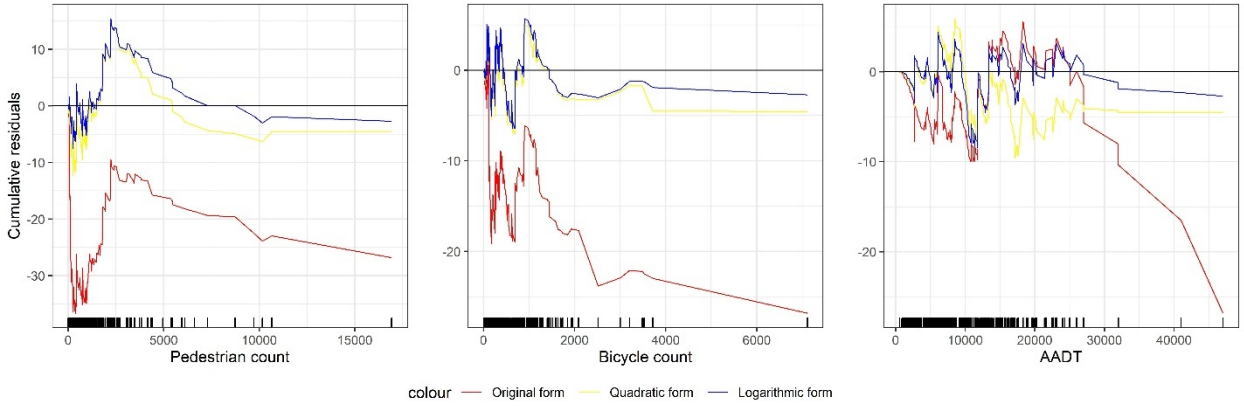
Appendix B

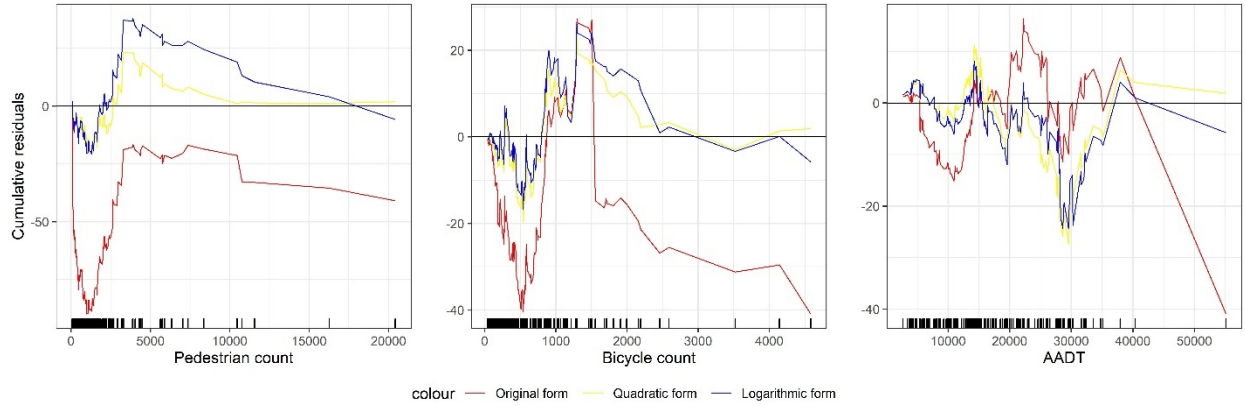
We developed three sets of SPFs with different transformations of the three exposure variables (pedestrian count, bicycle count, and AADT), including their original forms, quadratic forms, and logarithmic forms. Because we wanted to determine the proper forms of the exposure variables before we further included other types of risk factors, the SPFs included only these three exposure variables. We compared their CURE plots (Figure B1) to choose a proper form of transformation. Note that this comparison is mainly focused on different forms of exposure variables. The SPFs here did not include all the independent variables. We did not add the boundaries of the upper and lower limit in these CURE plots.



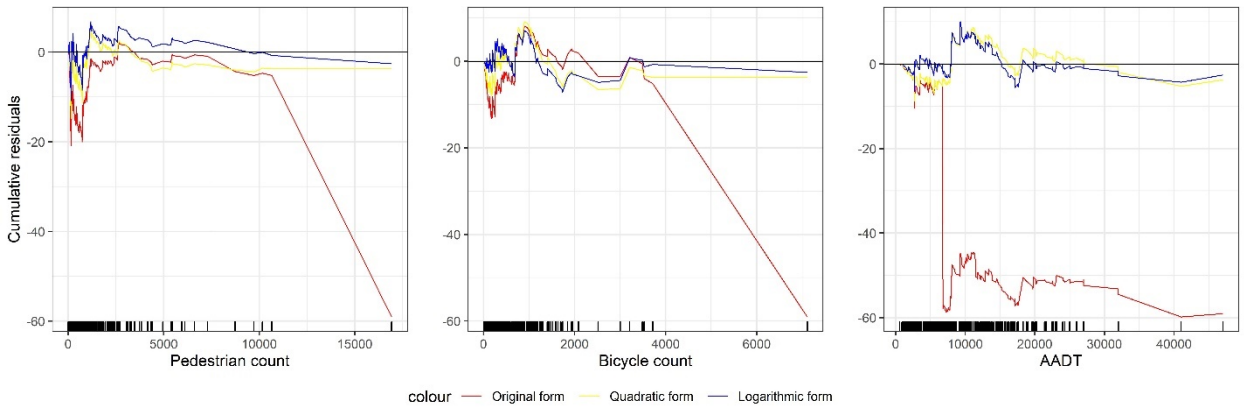
(a) Pedestrian intersection model



(b) Pedestrian mid-block model



(c) Bicycle intersection model



(d) Bicycle mid-block model

Figure B1. CURE plots for models of (a) pedestrian intersection crash, (b) pedestrian mid-block crash, (c) bicycle intersection crash, and (d) bicycle mid-block crash (Tick marks on the x-axis indicate the distribution of the corresponding independent variable)

The CURE plots that oscillate about 0 show better fit to the data (Srinivasan & Bauer, 2013; Srinivasan et al., 2013). Figure B1 shows that the logarithmic form of the exposure variables (blue line) provides better fit to the data than the other two forms, especially during the intervals where most of the observations distribute. Therefore, we chose the logarithmic form of the exposure variables in our SPFs.

References

Srinivasan, R., & Bauer, K. (2013). *Safety performance function development guide: Developing jurisdiction-specific SPFs.* Washington, DC: Federal Highway Administration, Office of Safety.

Srinivasan, R., Carter, D., & Bauer, K. (2013). *Safety performance function decision guide: SPF calibration vs SPF development.* Washington, DC: Federal Highway Administration, Office of Safety.