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Modeling Road Safety for signalized crossings in urban Roads Case Study: Corniche Road - Alexandria, Egypt

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Abstract. Recently, Egypt has invested heavily in expanding the road network, highlighting the need for improving highway safety. Ensuring safe intersection design has become a priority due to the critical impact of intersection-related crashes on traffic safety. This study focuses on the signalized intersections along Alexandria Corniche Road, aiming to develop a safety performance function (SPF). Negative Binomial (NB) regression was used since the Likelihood Ratio (LR) test confirmed its superiority over the Poisson model. Crash data from 2019 to 2022 were analyzed to investigate the relationship between intersection characteristics and crash history. Main traits, including intersection length (X_t), Average Daily Traffic (ADT), and Average Daily Pedestrian Volume (ADPV), were identified as significant contributors to total crashes. The Variance Inflation Factor (VIF) ruled out multicollinearity. Additional variables like pedestrian crossing time percentage (TG%) and number of lanes (N_{lanes}), were excluded to avoid overfitting, enhancing the crash prediction accuracy of the model.