Influence of implementing an urban bicycle highway on pedestrian traffic – finding a traffic control strategy with optimal coordination

Master‘s Thesis of Arifin Islam

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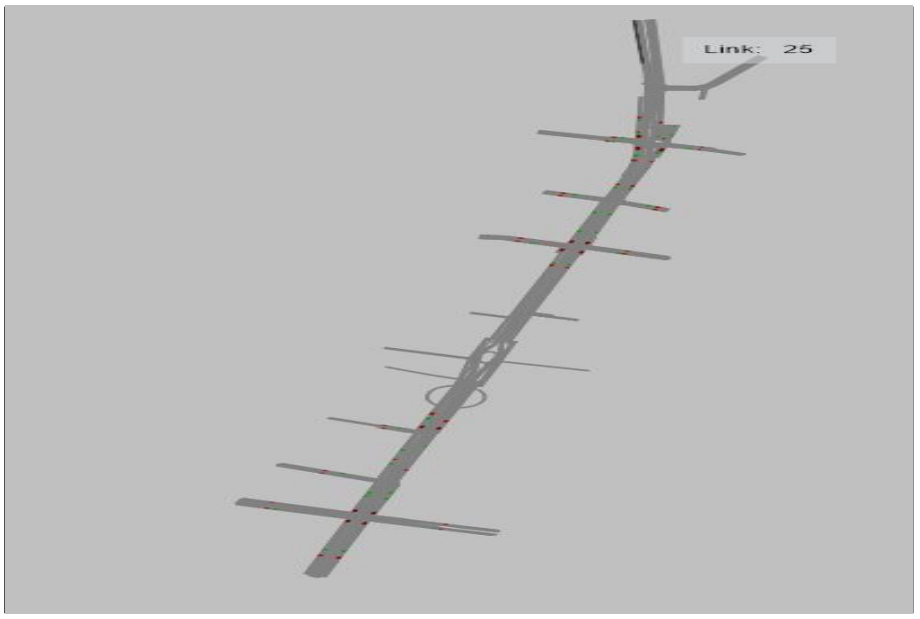
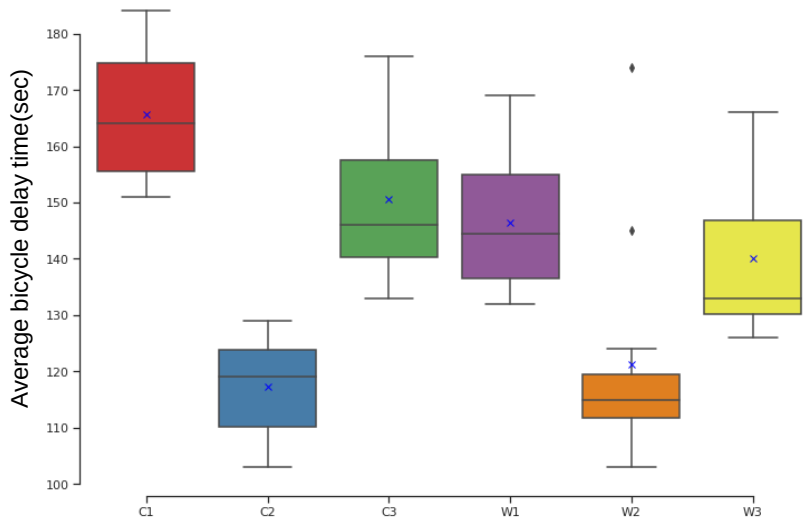
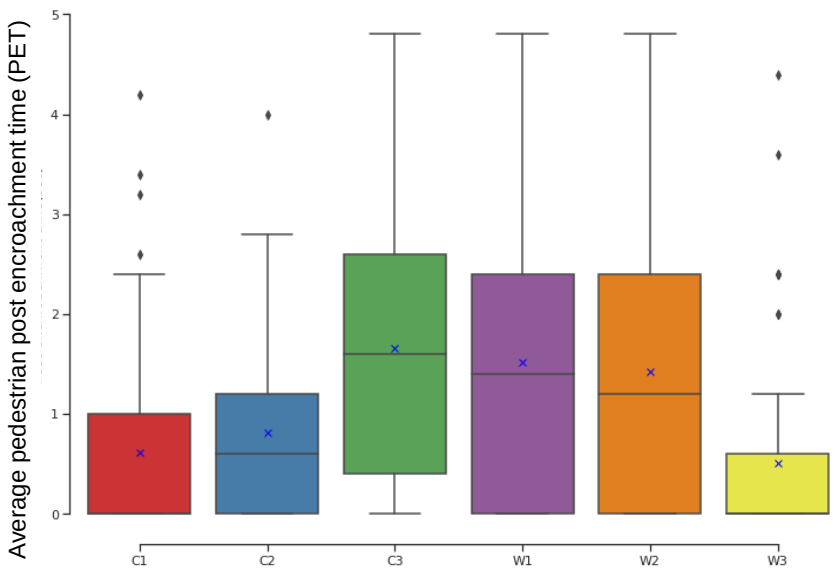


The objective of this study is to define a novel traffic control strategy for a designed bicycle highway in Munich, which will provide highest efficiency for different traffic participants. A special consideration was given to simulated pedestrian also from a safety perspective as the influence of implementing an urban bicycle highway was yet to be investigated.

In this thesis, the present state of the study area is designed in PTV VISSIM where the model was calibrated and validated for analyzing the proposed improvement. Surrogate safety assessment model (SSAM) was used to evaluate the traffic safety of the network in this study. Traffic signal coordination was applied for both cars and bicycles separately for the direction of North to South. Five variations were created of the model depending on coordination and width of bicycle lane. The alternative models were compared among them based of traffic efficiency and traffic safety. The impact of simulated pedestrian was observed further to analyze their interaction with urban bicycle highway. The simulation was done based on evening peal hour scenario by focusing mainly major stream flow.





The results of this research show improvement on the quality of performance in the study area. Co-ordination of traffic signal had more positive impacts than widening of bicycle lane for bicycle highway. Bicycle delay time and number of stops reduced by up to 17% and 28%.Travel time for bicycle reduced by 6%. For cars depending on the alternate model delay time was observed to be reduced by 27% and number of stops reduced by 8%. Traffic safety assessment showed 10% improvement in TTC value and 6% improve in PET value. Interaction between pedestrian and other traffic shareholders show higher number of collision in the alternate models but with lower severity.