## ABSTRACT

*Toll road shoulders are toll road lanes for vehicles experiencing an emergency. However, there are still many drivers who violate the use of toll road shoulders, such as stopping too long on the toll road shoulder and overtaking other vehicles through the toll road shoulder. Makadari created a system that can detect these violations. By utilizing CCTV data on toll roads, research can be carried out by detecting vehicles using the Mask R-CNN algorithm. This algorithm can predict an object mask in the Region of Interest for each pixel.*

*Datasets were collected as many as 250 datasets then the data was labeled "Violating" and "Not Violating". Each vehicle object in the image is wrapped using polygons to determine which vehicles are violating and not violating. Then form the configuration of training data, data testing, and data validation. The dataset is trained with a configuration of the number of different datasets and the hyperparameters epoch, batch size, and learning rate. After the data is trained, the best model is obtained with a dataset configuration of 88% training data, 6% testing data, and 6% validation data with hyperparameter epoch 24, batch size 16, learning rate. The results obtained were 79.1% mAP_@.5:90, 97.5% mAP_@.5, 97.5% average precision, and 81.2% average recall.*



***Keyword*:**, , *Mask R-CNN, Object detection, Toll road*.


.