

Highway Capacity Benefits from Using Vehicle-to-Vehicle Communication and Sensors for Collision Avoidance

This paper compared the highway capacity when using sensors alone and when using sensors along with vehicle-to-vehicle communication. Based on the rules for using these two technologies to prevent collisions, the paper calculated the average safe inter-vehicle distance and further estimated the highway capacity.

According to the results, though both the two technologies can help to increase the highway capacity, using sensors along with vehicle-to-vehicle communication will result in a much higher percentage increase in highway capacity than using sensors alone. The increase in highway capacity is 43% when using sensors alone while it dramatically jumped to 273% when using the two technologies together. Besides, it is demonstrated that when using sensors together with vehicle-to-vehicle communication, the highway capacity improves slowly when there is only a small portion of equipped vehicles while improves much more quickly as the portion increases. As a contrast, the capacity improves almost linearly as the portion of equipped vehicles increases when only sensors are used.