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Ability to damp traffic wave when controlling every cars on the road by FollowerStopper controller.

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A small fluctuation in velocities of the vehicles in a traffic system can cause a traffic jam which travels through the road as a stop-and-go wave. FollowerStopper controller is a strategy used in a self-driving car, designed for damping stop-and-go-wave. The previous study shows that controlling only one car can damp the wave in the whole circuit road. Interestingly, in some values of car densities, we have found that using FollowerStopper on every car on the road cannot damp the stop-and-go wave. In this article, we consider the effect of the density on the ability to damp the wave when using the FollowerStopper on every car. To control the density, we run simulations in a circuit road. And, the ability to damp the wave has been reflected as the standard deviation and average velocity of every car. We carried out the simulations of 24 cars running on a circuit road in different circumferences. Our simulation shows that when desired speed is at 7.00 m/s, traffic wave is completely dissipated while density is under 0.06 cars per meter.

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