This study examined drivers’ perceptions of distance to a rearward vehicle while using a camera-based rear vision system in actual driving conditions. Participants drove an instrumented car equipped with conventional rearview mirrors and with a camera rear vision system. Using various configurations of these rear vision systems, they observed the approach of an overtaking car and indicated the last moment at which it would be safe to initiate a lane-change maneuver in front of it. Their judgments were strongly affected by the type of display used to observe the overtaking car. The longest distances were obtained with the camera-based display at unit magnification. Distances were substantially shorter with the conventional mirror and with the camera-based display at 0.5 magnification. These results are consistent with results from an earlier study conducted under static conditions.