Evaluating the impact of longer change and clearance intervals on signalized intersections and corridors is the main goal of this study. In fact, the Florida department of Transportation (FDOT) has adopted a new signal retiming effort in a number of signalized intersections along several corridors. The Orange County started implementing the new signal timing from December, 2013 and completed it in June, 2015. The identical purpose behind this action is to minimize the red light running rate. This study is dedicated to investigate the signal retiming effort adopted by the FDOT and how the new signal timing might impact the studied signalized intersections’ performance and safety. To address this issue, a number of signalized intersections along three corridors in Orange County were investigated during three time of the day. Additionally, three categories of signal timings were adopted to better understand the performance and safety of old (pattern 1), current (pattern 2), and proposed (pattern 3) signal timings. The analysis was based on the Simtraffic simulation which is a part of Synchro 8 software. The research results provide that the signalized intersection’s performance along the three corridors during the three plans of the day were found significantly affected by lengthening the change and clearance intervals. Signal timing 2 and 3 were observed significantly different than signal timing 1 which have greater intersection delay, queue length, and total volume to capacity v/c. Furthermore, the results show that the signal timing 2 and signal timing 3 significantly improved the total delay and travel time along the studied arterials during the three plans of the day.