87. We take the direction of motion as $+x$, so $a = -5.18$ m/s^2, and we use SI units, so $v_0 = 55(1000/3600) =$ 15.28 m/s.

(a) The velocity is constant during the reaction time T, so the distance traveled during it is $d_r = v_0T - (15.28)(0.75) = 11.46$ m. We use Eq. 2-16 (with $v = 0$) to find the distance d_b traveled during braking:

$$v^2 = v_0^2 + 2ad_b \quad \Longrightarrow \quad d_b = -\frac{15.28^2}{2(-5.18)}$$

which yields $d_b = 22.53$ m. Thus, the total distance is $d_r + d_b = 34.0$ m, which means that the driver *is* able to stop in time. And if the driver were to continue at v_0, the car would enter the intersection in $t = (40\,\text{m})/(15.28\,\text{m/s}) = 2.6$ s which is (barely) enough time to enter the intersection before the light turns, which many people would consider an acceptable situation.

(b) In this case, the total distance to stop (found in part (a) to be 34 m) is greater than the distance to the intersection, so the driver cannot stop without the front end of the car being a couple of meters into the intersection. And the time to reach it at constant speed is $32/15.28 = 2.1$ s, which is too long (the light turns in 1.8 s). The driver is caught between a rock and a hard place.