Algorithm

1. Determine the quickest possible time that the vehicle can reach the pedestrian
   1.1. If the vehicle is currently at it's maximum speed
      1.1.1. t = d / r
   1.2. If the vehicle can reach its max speed before reaching the pedestrian determine the time it takes to reach the max speed and add it to the time travelled at max speed
      1.2.1. t = (vf - vi) / a
      1.2.2. xf = xi - (r * t + a * t^2 / 2)
      1.2.3. t = d/r
   1.3. If the vehicle cannot reach its max speed determine the velocity it would be at when it reaches the pedestrian and determine the time this will take using average velocity
      1.3.1. vf = sqrt(vi^2 + 2 * a * d);
      1.3.2. t = 2 * d / (vi + vf)
2. Determine if a collision is possible
   2.1. If the pedestrian started moving in the next frame would it be possible to reach the collision zone[1] before the vehicle
      2.1.1. xf = r * t + xi
   2.2. If the pedestrian has already passed the collision zone a collision is impossible
   2.3. If the vehicle has passed the pedestrian a collision is impossible
3. If the vehicle is not braking and a collision is possible, apply the maximum comfortable deceleration[2]
4. If the vehicle is already braking determine if in two frames it will be able to stop before the pedestrian
   4.1. vf = vi + a*t
   4.2. xf = xi - (r * t + a * t^2 / 2)
   4.3. vf^2 = vi^2 + 2 * a * d
5. If the vehicle will not be able to stop before the pedestrian two frames from now, stop the vehicle now.
   5.1. Apply maximum deceleration[3]
6. If at any point a collision with the pedestrian becomes impossible release the brake and accelerate[4] to the steady state speed[5]

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[1] Collision Zone is -1.75 to 1.75 on the y axis, 1m on both sides of the x axis due to vehicle length, .5m due to error, and .25 due to the pedestrians radius.

[2] -.25 * 9.81 m/s^2

[3] -.85 * 9.81 m/s^2

[4] .25 * 9.81 m/s^2

[5] 13.9 m/s