

## Risk Analysis with Control Measures of a Daily Commute by Car:

A person drives 50 miles each way to work in a densely populated area. The speed limits on the roads taken are 60 mph and only stop signs are used at on-ramps for major highways.

Worst possible outcome: death from a car accident for one or more people

Probability: Given the density of the population in this scenario, the speed at which drivers are going, and the use of stop signs instead of traffic lights, the probability is moderate.

Hierarchy of controls application (from most useful to least)

**Choice 1:** Elimination – this is where we eliminate the risk all together. Elimination in this case would be work from home or moving closer to the place of business to permit walking to work. While it is possible for the employee to rent an apartment closer to work or stay in a hotel, this may not be a reasonable action to take with respect to the employee's personal needs, family, and finances.

**Choice 2:** Substitution – this would be substituting the car for a bus or train. The risk of not being seen, rolling over, driving while tired, or going too fast is largely mitigated, particularly with the train option.

**Choice 3:** Engineering control – this already exists in this scenario, the engineering control that we all know about is the air bag. The air bag self-deploys, cannot be forgotten or rendered useless without effort and conscious work to that effect. Another type of engineering control that might be useful is some of the more recent studies that some car manufacturers are using such as car-to-car sensors to automatically stop or avoid collisions or controls that force a vehicle to stay at or below the speed limit. Additional engineering controls, for example, are road maintenance, lane dividers, rumble strips, anti-lock brakes, and automatically locking doors.

**Choice 4:** Administrative Controls – these also already exist in this scenario. There are legal ramifications for going through a stop sign. We legally need to have passed a driving test and have a current license. Some people are required to wear corrective lenses. Administrative controls are rules that are meant to be followed but can sometimes be forgotten, poorly enforced, or otherwise not complied with.

**Choice 5:** Personal Protective Equipment (PPE) – this is an item that the individual uses as a last-line of defense. This is often considered the last choice as a control as it has the most issues. PPE is often customized to the activity, user, or industry. PPE requires training by the user regarding how to select it, maintain it, wear it, and care for it. It tends to be costly, easily forgotten, or used improperly. In this example, the seatbelt is PPE. If there were a child in the car, the car seat would be PPE. PPE is often utilized in conjunction with administrative controls (it is illegal to drive a car without wearing a seatbelt).

Unlike the current COVID-19 pandemic concerns, the above example involved a single individual in a vehicle we know everything about and a potential outcome we can anticipate.