Safety Benefits Framework
5.4 million
unimpaired

Single
Vehicle

V2V + V2I
81%
(4.5 million)

*Frequency of Target Crashes for IntelliDrive Safety Systems, DOT HS 811 381, 2010
Safety Benefit Estimation Framework

- Test Technology
- Changes in Driver Behavior
- Crashes Avoided
- Harm Reduction (Unavoidable Crashes)
- Unintended Consequences
- Fatality & Injury Reduction
Basic Equations

\[
\text{Crashes Prevented} = \text{Crashes without V2V} - \text{Crashes with V2V}
\]

\[
\text{Crash Harm Reduction} = \text{Harm without V2V} - \text{Harm with V2V}
\]
Basic Equations

\[
\text{Crashes Prevented} = \frac{\text{Crashes without}}{\text{Crashes with}} \times 1 - \frac{\text{Crashes with}}{\text{Crashes without}}
\]

Effectiveness = 1 - \frac{\text{Crashes with}}{\text{Crashes without}}

National crash databases
Estimating Crashes: Conflicts
Estimating Crashes: Conflicts