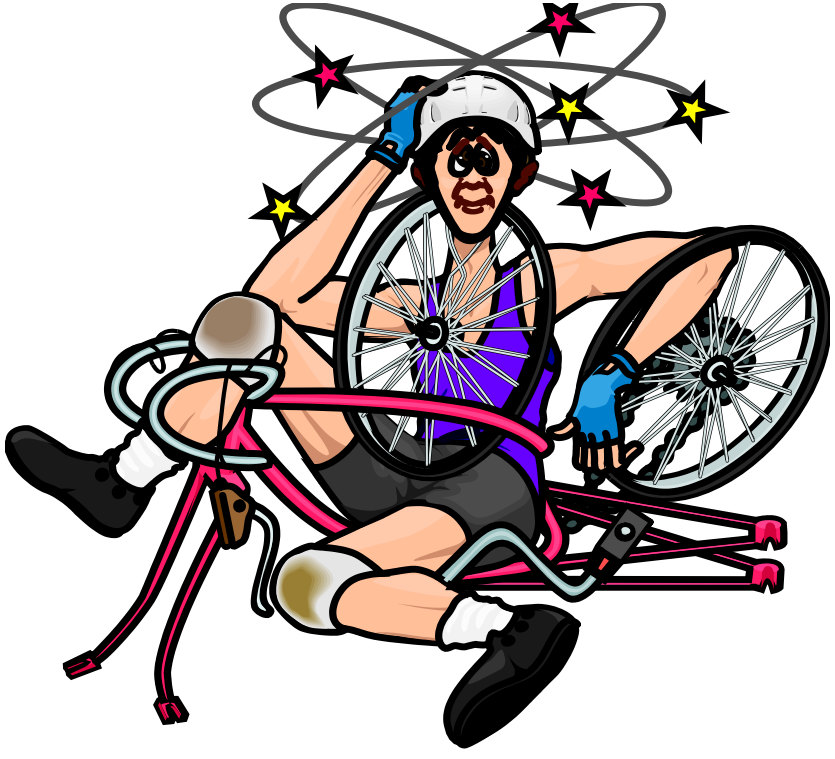
Chapter 14

Severity



Revised: February 4, 2013

Injury Types (person level)

K	(fatal)	deaths that occur within twelve months of the crash
A	(disabling)	injuries serious enough to prevent normal activity for at least one day such as massive loss of blood, broken bones, etc.
B	(evident)	non-K or A injuries that are evident at the scene such as bruises, swelling, limping, etc.
C	(possible)	no visible injury but there are complaints of pain or momentary unconsciousness
O	(none)	no injury
U	(unknown)	unknown if any injury occurred

Crash Level Severity

The crash level severity is the worst severity sustained by any individual in the crash.

Example 1: A crash involved two motor vehicle and all occupants sustained a “C” level injury. The crash severity is “C”.

Example 2: A crash involved two cars where the driver of Unit 1 was killed but everyone else sustained either a “B” or “C” level injury. The crash severity is “K”.

Example 3: A bus with 35 passengers was rear-ended by a car with one occupant. No one on the bus was injured, but the driver of the car sustained a “B” level injury. The crash severity is “B”.

Equivalent Property Damage Only

- A property damage only crash (PDO) means that there were no injuries or fatalities

- The equivalent property damage only (EPDO) is a way of comparing severity types among each other

- A non-injury crash (O) or an unknown injury crash (U) are equivalent to 1.0 PDO crashes (i.e. EPDO = 1.0)

- An evident injury crash (B) and a possible injury crash (C) are equivalent to 8.4 PDO crashes (i.e. EPDO = 8.4)

- A fatal crash (K) and a disabling injury crash (A) are equivalent to 76.8 PDO crashes (i.e. EPDO = 76.8)

Severity Index

The crash severity is equal to the most serious injury sustained by any individual involved in the crash (i.e. a crash that involved one disabling injury and two evident injuries would have a crash severity of ‘A’).

The severity index (SI) of a crash is equal to the total equivalent property damage only (EPDO) divided by the number of crashes.

A severity index of 8.4 is the threshold for locations that have more serious crashes (i.e. a location with an SI = 9.6 would tend to have more severe injuries than other locations).

Severity index formula:

$$\frac{(76.8 * (K + A \text{ crashes})) + (8.4 * (B + C \text{ crashes})) + (1.0 * (O + U \text{ crashes}))}{\text{total crashes}}$$

Severity Index (Cont.)

Exception 1

Approximately 99% of all pedestrians involved in crashes sustain some type of injury. Therefore, the normal severity index (SI) for pedestrian crashes is approximately 13.4

Exception 2

Approximately 92% of all bicyclists involved in crashes sustain some type of injury. Therefore, the normal severity index (SI) for bicycle crashes is approximately 11.3

Severity Index Example

The location being analyzed had one disabling injury crash, three evident injury crashes, three possible injury crashes, and thirteen non-injury crashes. The severity index would be calculated as follows:

(0 K crashes + 1 A crash) * 76.8	=	1 * 76.8	=	76.8
(3 B crashes + 3 C crashes) * 8.4	=	6 * 8.4	=	50.4
(13 O crashes + 0 U crashes) * 1	=	13 * 1.0	=	13.0
		Total EPDO	=	140.2

Total crashes = 1 + 3 + 3 + 13 = 20

$$\text{Severity Index} = \frac{\text{Total EPDO}}{\text{Total Crashes}} = \frac{140.2}{20} = 7.01$$

Therefore, this location would tend to have less severe crashes.

Severity Index Exercise

The location being analyzed had two K crashes, two B crashes, one C crash, and five O crashes. The severity index would be calculated as follows:

Severity Index Exercise

The location being analyzed had two K crashes, two B crashes, one C crash, and five O crashes. The severity index would be calculated as follows:

(2 K crashes + 0 A crashes) * 76.8	**=**	**2 * 76.8**	**=**	**153.6**
(2 B crashes + 1 C crashes) * 8.4	**=**	**3 * 8.4**	**=**	**25.2**
(5 O crashes + 0 U crashes) * 1.0	**=**	**5 * 1.0**	**=**	**5.0**
		Total EPDO	**=**	**183.8**

Total crashes = 2 + 2 + 1 + 5 = 10

$$\textbf{Severity Index} = \frac{\textbf{Total EPDO}}{\textbf{Total Crashes}} = \frac{183.8}{10} = 18.38$$

Therefore, this location would tend to have more severe crashes.