

Updated Crash Costs for Highway Safety Analysis

The *Crash Costs for Highway Safety Analysis*¹ was published in 2018, releasing national comprehensive crash costs for each KABCO² crash-unit severity level in 2016 dollars. The comprehensive crash costs are a combination of economic costs (e.g., vehicle damage, lost wages) and quality-adjusted life years (QALY) costs. The crash costs have been updated to incorporate changes in safety performance and economics. The crash costs in 2024 dollars (rounded to the nearest hundred dollars) are summarized in Table 1.

Table 1. New KABCO Crash Costs, 2024 Dollars. [Source: FHWA]

KABCO Severity Category	Economic Crash Unit Costs, 2024 Dollars	QALY Crash Unit Costs, 2024 Dollars	Comprehensive Unit Costs, 2024 Dollars
K	\$2,238,500	\$13,749,500	\$15,988,000
A	\$272,700	\$1,432,400	\$1,705,100
B	\$80,800	\$303,200	\$384,000
C	\$53,000	\$151,600	\$204,600
O	\$18,100	\$0	\$18,100

Applications of Crash Costs

Crash costs are integral to several aspects of highway safety analysis. First, they are used to quantify the economic and societal impact of crashes which have already occurred, both for summarizing safety performance at a site and for communicating with stakeholders about safety challenges. Second, they are used to monetize the benefits of potential crash reductions for a proposed alternative and subsequently applied for benefit-cost analysis. Third, they are used to evaluate the safety performance of a completed project, performing benefit-cost analysis by comparing the cost of crashes prevented to the cost of the project.

Update Process

Comprehensive KABCO-level crash costs are derived using injury costs from the Maximum Abbreviated Injury Scale (MAIS), crash-level injury data, and person-level injury data. *Crash Costs for Highway Safety Analysis* describes a five-step process for determining these costs. The following sections describe the methodology used to generate the new crash costs.

¹ Harmon, T., Bahar, G., & Gross, F. (2018, January). Crash costs for highway safety analysis. Federal Highway Administration, FHWA-SA-17-071. Washington, D.C. <https://highways.dot.gov/safety/data-analysis-tools/rsdp/rsdp-tools/crash-costs-highway-safety-analysis-0>.

² K = Fatal Injury; A = Suspected Serious Injury; B = Suspected Minor Injury; C = Possible Injury; O = Property Damage Only



Step 1 – Translate Person-Injury Unit Costs from MAIS to KABCO

The first step calls for translating MAIS person-injury unit costs to KABCO person-injury unit costs using the most recent [MAIS person-injury unit costs](#) and [MAIS-to-KABCO translation values](#).

MAIS Category	Economic Costs	QALY Costs	Comprehensive Cost
MAIS0	\$4,789	\$-	\$4,789
MAIS1	\$23,974	\$41,112	\$65,086
MAIS2	\$75,961	\$402,341	\$478,302
MAIS3	\$288,385	\$1,763,881	\$2,052,266
MAIS4	\$675,727	2,938,008	\$3,613,735
MAIS5	\$979,328	\$5,068,923	\$6,048,251
Fatal	\$1,606,644	\$9,651,851	\$11,258,495
Vehicle	\$7,913	\$-	\$7,913

KABCO Person Injury	Economic Costs	QALY Costs	Comprehensive Cost
K	\$1,606,644	\$9,651,851	\$11,258,495
A	\$172,179	\$917,345	\$1,089,524
B	\$44,490	\$180,107	\$224,597
C	\$25,933	\$85,348	\$111,281
O	\$6,269	\$3,927	\$10,196

Step 2 – Calculate Injury-to-Crash and Vehicle-to-Crash Ratios

To convert the person-injury unit costs to crash-unit costs, crash-level, vehicle-level, and person-level data from the National Highway Traffic Safety Administration's (NHTSA) Crash Report Sampling System (CRSS) for the years 2019 through 2023 were used to calculate the number of KABCO person-injuries per crash by maximum injury severity category. For instance, for the 5,934 fatal crashes in the dataset, there were 6,493 fatal (K) injuries, 1,593 suspected serious (A) injuries, 1,506 suspected minor (B) injuries, 1,111 possible (C) injuries, and 3,838 uninjured persons (O). Thus, the average fatal crash includes 1.09 fatalities, 0.27 A injuries, 0.25 B injuries, 0.19 C injuries, and 0.65 non-injured persons. Additionally, these calculations found that the average property damage only (PDO) crash included 1.86 vehicles per crash.

Step 3 – Convert Person-Injury Unit and Vehicle Unit Costs to KABCO Crash Unit Costs

With the person-injury unit costs and the average injuries and vehicles per crash, the next step is to calculate the average cost of each crash by severity. Since the MAIS costs were in 2019 dollars, these KABCO crash unit costs also reflect 2019 dollars.

Step 4 – Update KABCO Crash Unit Costs to 2024

The KABCO crash unit costs were then converted to 2024 dollars. This requires growing the economic costs using Consumer Price Index (CPI) and growing the QALY costs using Median Usual Weekly Earnings (MUWE). Per the Bureau of Labor Statistics (BLS), the average non-seasonally adjusted monthly CPI was \$256 in 2019 and \$314 in 2024, resulting in a growth ratio of 1.227 for economic costs. Additionally, BLS reported the average quarterly MUWE was \$917 in 2019 and \$1160 in 2024, resulting in a growth ratio of 1.265 for QALY costs. Using these growth ratios, the 2024 crash costs are summarized in Table 1.

Step 5 – Adjust National Costs to State Costs

States can use Per Capita Income (PCI) to convert the national costs to State-specific crash costs. The Bureau of Economic Analysis (BEA) data was used to derive national and State-level PCI for 2024; comparing the State PCI to national PCI gives the ratio needed to convert the crash costs.

Relevant Resources

For more information about the development and application of crash costs, see FHWA's [Crash Costs for Highway Safety Analysis](#). FHWA's [Highway Safety Benefit-Cost Analysis Guide](#) and [Tool](#) have additional information about the application of crash cost in benefit-cost analysis. If you are interested in following a similar process for your agency, you can use the updated [Crash Costs for Highway Safety Analysis Companion Spreadsheet Tool](#).



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