Enhancement to Homeland Security Grant Program Terrorism Risk Methodology:
Component Base Variable

FEMA proposes to change the calculation of relative risk in the Terrorism Risk Methodology (TRM) by introducing a base variable (BV) for each of the three components of Risk: Threat (T), Vulnerability (V) and Consequence (C). The BV intends to capture universal and unquantifiable elements faced by every jurisdiction. These variables would act as any other variable in the TRM, but their set value for each entity would ensure that they act as a baseline for each component value. The change would also remove the need for constraining raw component values; the constraining operation acts to limit the impact of T, V and C on final risk scores by limiting the range by which final values can vary among the jurisdictions. (See Current Constraints paper for details.) The BV would achieve a similar effect, but in a different, simpler, more transparent calculation of relative risk.

Background of Base Variable

The central idea behind the BV is that T, V and C will have a single variable which is not captured by the component’s other elements. It is designed to capture the unknown, unrepresented and unquantifiable universal elements that would be deemed as present for all jurisdictions. For example, it will help account for secondary economic effects or to an attack’s effects on personal and group behaviors—impacts that could be significant and may be the primary goals of terrorists. The BV will behave in the same way as all the other variables from which the component value is constructed.

The main difference from the other variables will be that the BV value is the same for all jurisdictions, and thus all jurisdictions will always receive a full score of one. Consequently, it will establish a “base value” for each component equal to the weight given to this variable. Each jurisdiction considered will receive at least this base value for the component under consideration.

This approach is different from Fiscal Year (FY) 2022 constraints in that the lowest possible value is explicit in the construction of each component from its variables. In FY 2022, constraints were established by a post-processing step which takes raw values and transforms them to a final result. The new calculation using BV eliminates the complex procedure used to arrive at constraint ranges and underscores the independent dimension of risk represented by each component.

Incorporation of Base Variable with T, V, C

The T variables all carry internal base values set through the DHS Office of Intelligence and Analysis, which scores threat levels assuming all jurisdictions have some threat of terrorism: Counterterrorism Threat Variable, Transnational Organized Crime Threat Variable, and Cyber Threat Variable. Consequently, FEMA will set the overall Threat BV at 0 and let the scores of individual threat variable levels set the base value.

Within Vulnerability, with the proposed introduction of new variables for Community Resilience and Economic Concentration, many of important features of vulnerability to terrorism are accounted for in the model. Similarly for Consequence, the elements of Population, Population Density, Economy, Infrastructure, and Military Mission cover large portions of the consequence from terrorism. As a result of the coverage of the V and C elements, FEMA proposes adding a BV with 10% weight for each V and C to account for the unrepresented elements.

Setting both components at an equal weight shows the inherent unknown in both components, and that at this time there is no information or data FEMA can point to in order to weight one above the other.

Benefits to Adding Base Variable

The use of a BV creates a simple approach, with uniform representation of each component. This is because instead of using constraints, the T, V and C components are pure collections of important variables, added together with corresponding weights. The calculation—a one-step process in computing each component—contributes to clarity and simplicity.

Limitations to Adding Base Variable

This still will be a shift from a well-established calculation methodology, and there will be large initial risk score changes across most jurisdictions due to this change in calculation.