1.1.3 Societal Risk Criteria

Based on a review of the literature and an understanding of the risk analysis framework, it is apparent that stationary facility SR criteria are not appropriate for evaluating the transportation or shipping risk of hazardous materials along a route. For the risk of a stationary facility, all consequences (e.g., toxic release, fires, and explosions) are limited to the region surrounding the facility, which may have a characteristic dimension on the order of 1 km with a fixed surrounding population. If the same consequences are applied to a tanker truck or rail car transportation route, then the geographic region where those consequences may be manifest can be much larger and the surrounding population may vary. Additionally, for stationary facilities there may be green space (i.e., no permanent population) around the site and/or a considerable amount of property under their control; however, concerning transport applications, this standoff distance is greatly reduced or may not exist.

The aggregate societal risk for a transportation route is directly proportional to the length of the route. For example, a 10 km route would have 10 times the risk of a stationary facility all else being equal; a 100 km route would have 100 times the risk, and so on. The total aggregate SR for a shipping route is presented on an FN graph without using quantitative risk criteria due to this aggregate risk versus distance relationship. Using a quantitative risk criterion that is based on a stationary facility will inherently limit the risk tolerability of routes to those that are similar in dimensions to a stationary facility. To address this limitation, the international regulations and guidance documents employ a scaled approach to compare the highest risk sections of a transportation route to stationary facility quantitative risk criteria by applying SR criteria on a per unit length of route (i.e., per route kilometer) basis.[11]

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[11] For example, see Section 3.3.5 "Calculation and presentation of results" in the Dutch Purple Book, which states, "According to current regulations the Societal Risk has to be calculated and presented per kilometre of transport route. For shunting yards this does not of course apply." *Guideline for Quantitative Risk Assessment, Part Two: Transport* (Dutch Purple Book), Publication Series on Dangerous Substances, Ministerie van Verkeer en Waterstaat (2005)