For a military platoon moving across a terrain, it is extremely important to learn beforehand possible bottlenecks or ambush points. These regions could be narrow passes or constrictions through which a large number of routes pass through. Vector-based Mobility Modeling suite of tools developed for ArcMap using Python and multiprocessing, highlight such regions on the terrain by applying multi-criteria evaluation and Monte Carlo simulation.

The tools run a large number of least-cost path simulations between source and destination points. For each iteration, the tools apply a noise value to the underlying cost surface to account for errors and uncertainty. At the end of each run, the edges of the vector model that make up the route are accounted in the database.

When the simulations are completed, the edges can be symbolized on their traversal count to highlight regions that could become bottlenecks or ambush points.