Vehicle turn trajectories from a naturalistic driving database were modeled using Bezier curves. A-pillar geometry from 56 vehicles was analyzed to develop representative and extreme cases of A-pillar obscuration. A new methodology was developed for quantifying plan-view obscuration in intersections during left turns. The driver-side A-pillar results in a region of high obscuration immediately to the left of the entrance to the intersection-departure lane. The analysis showed that A-pillars that are closer to the forward line of sight result in high-obscuration regions that are closer to the vehicle travel path. Pedestrians in these regions would be at risk of remaining undetected by a driver. Turn trajectories within the range observed also affected the distribution of obscuration, with shallower turns producing less severe obscuration.