This paper presents a new approach to improve lidar data evaluation on the basis of using a priori knowledge. In addition to the common I- and L-shapes, the directional IS-shape, the C-shape for pedestrians and the E-shape for bicycles are introduced. Considering the expected object shape and predicted position enables effective interpretation even of poor measurement values. Therefore a classification routine is utilized to distinguish between three classes (cars, bicycles, pedestrians). The tracking operation with Kalman filters is based on class specific dynamic models. The fusion of radar objects with the used a priori knowledge improves the quality of the lidar evaluation. Experiments with real measurement data showed good results even with a single layer lidar scanner.