

Abstract

In a Swedish vehicle speed survey, data are collected for a stratified three-stage sample of road sites. The parameters of interest include total vehicle mileage, total travel time, and, above all, their ratio average speed. In this report, the expectations and variances of the employed estimators are derived, taking both the sampling design and models for errors due to frame imperfections and missing data into account. The influence of each error on the bias and variance of the estimators can not in general be isolated. Under some simplifying assumptions, however, the nonsampling errors do not bias the estimators. In addition, a component of the total variance purely due to sampling, as well as a component purely due to frame errors, can be sorted out.

Key words: Survey, vehicle speeds, missing data, frame errors, total error.