This thesis aims to explore gender and mode choice differences in commuting behaviours in terms of distance, duration, velocity and trip frequency, and to assess the validity of four distance measuring methods in relation to a newly developed criterion method. In the studies we used adult active commuters from Greater Stockholm, Sweden, recruited both by advertisements and commuters recruited on the streets. The participants responded to a questionnaire and drew their commuting route on a map. In the studies we found that commuting routes drawn on a map and measured with a curvimeter could function as a criterion method for active commuting distance measurements. We also found that four assessed distance measurement methods – straight-line distance, GIS, GPS and self-report – differed significantly from the criterion method. Therefore, we recommend the use of correction factors to compensate for the systematic over- and underestimations. We found three distinctly different modality groups in both men and women with different behaviours in commuting distance, duration and trip frequency. These groups were commuters who exclusively walk or bicycle the whole way to work, and dual mode commuters who switch between walking and cycling. These mode groups accrued different amounts of activity time for commuting. Through active commuting exclusively, the median pedestrian and dual mode commuters met or were close to the recommended physical activity level of 150 minutes per week during most months of the year. The single mode cyclists met the recommendations only during the summer half of the year. These finding can be used to enhance the surveillance of physical activity levels from the transport domain and to tailor active commuting promotion campaigns.