In this study, the usage of the level of service (LOS) concept, which was developed specifically for pedestrian satisfaction and safety, was critically analyzed. The focuses of this investigation were the Fruin and Highway Capacity Manual (HCM) LOS values, which were evaluated and compared in terms of their anthropometric dimensions. In this paper, new LOS values are proposed on the basis of the critical evaluation of the HCM and Fruin LOS values revealing the inconsistencies between the LOS values and the analysis. The importance of emptiness area in calculating human comfort and satisfaction in terms of the anthropometric dimensions and LOS value is also discussed. A software program called Laborer Image Analysis Software (LIAS) was developed to evaluate and compare the impacts of different body dimensions on the LOS values and on the space requirements for pedestrians. LIAS is presented as a facilitation tool for calculating more concise and effective emptiness areas and LOS values. The comfort area concept is also presented and discussed. This discussion is used to reveal the contrasts and inconsistencies in the existing usage of the LOS concept and to highlight the importance of the emptiness area approach. The paper presents a different perspective and discussion on the existing utilization of LOS levels, particularly for pedestrians in different structures. The research contributes to the LOS analysis discussion in terms of the anthropometric scale according to changing user profiles and develops facilitator(s) for analyzing and applying amendments to pedestrian needs, which can be used in transportation buildings.