# ERGONOMICS FOR AGING: ACCESSIBILITY AND URBAN MOBILITY IN BRAZIL

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## 1. Context

Throughout the mankind history, never populations had life expectancies so high. The public health policies and preventive medicine as well as the advances in scientific research have a significant contribution for this scenery. Souza (2005) tells that the morphological alterations related to human physiology requires a change in the environment, in the spaces of human relationship, the domestic or professional devices. So, with the forecast of the United Nations (BRASIL, 2015), two billion older people in 2050, occurs a need to new specific solutions, for indoor environments and urban spaces, proposed by the architecture and design with significant economic and cultural influences in today's society context. The Brazilian Institute of Geography and Statistics (IBGE, 2005) provided, for 2025, an elderly population of 30 million individuals, in Brazil. In 2009, the IBGE (2010a) identified a population of 20,590,559 people aged from 60 years, equivalent to approximately 11% of the total population of 191,796,000 people, on the same date. From this latest census, it was also demonstrated changes in life expectancy rate at birth. The average life expectancy in Brazil today is 73.1 years and 69.4 years for men and 77 years for women. In the metropolitan regions like São Paulo and Rio de Janeiro the highest proportions of elderly, is 33.21% and 26.65%, respectively, in the total population. In some situations that allow the quality of life and therefore longevity, the elderly population tends to live more independently, despite his physical limitations with advancing age.

## 2. Method

The project Elderly Porto Alegre: a transdisciplinary evaluation, held in 2006 (IGG-PUCRS, 2007), with a population of about 400 elderly, made possible through its results prove the commented characteristics over text of this article. The results showed that the growth of the elderly population is a significant factor in the typological and demographic changes that a significant portion of users of the urban environment. Today, shares in inclusion policies, particularly with regard to accessibility in the management of Brazilian cities, already constitute own legislation and sectorial master plans oriented to the subject named accessibility and urban mobility. Porto Alegre has in effect the Complementary Law

N°. 678, August 2011, wich establishes the Sectorial Master Plan of Accessibility - PDAC (PORTO ALEGRE, 2011), The legislative instrument was written from specific search for theme, called Diagnosis of Conditions Accessibility of Porto Alegre (FAUPUCRS, 2008). The zoning of urban accessibility is included in the text of Municipal Law. The aging characteristics mentioned in the text have also been proved during the research for the diagnosis and supported the preparation of the final text of the law.

## 3. Impact of Urban Scene in Physiology, Cognition and Perception of the Elderly.

In this third millennium, the urban environment sets up a scenario even more different for all human groups and of a very special kind for today's seniors. That significant change in the functioning of the city and urban space finds today the elderly people having logic of use from the Second Industrial Revolution scenario (1900-1950). During the old industrial society has been given time to learn new emerging technologies. For other side, in the knowledge society the movements of insertion-removal of a system or equipment in the urban environment are very quick. the timing for learning and safe use of utilities have changed. It can be highlighted some of disturbances in the elderly population with direct impact on the perception and use of the urban environment described, resulting from changes that led to the definition of the twenty-first century: a) difficulties in motor coordination, handling and issuing single tickets and tickets for urban mobility; b) reducing the time "learning" some software for information on schedules and urban routes; c) changes of manual skills with limited use in gestual screens of information; d) implications for the long-term memory (KAPFERER, 1991) with difficulties in attention, perception, understanding and memorizing information and urban signing; e) changes in the application of the senses (sight, touch and hearing): readability and interpretation of signals; f) difficulties in perception and cognition environments, spaces and messages transmitted with a restricted meaning to the current cultural context.

## 4. Final Considerations

The city planning, with new inputs from the accessibility concepts and urban mobility in the urban environment, should consider the physiological characteristics of the elderly population. Among the solutions to design, we can highlight the types of information and sound signal, considering the auditory acuity levels of this population can be highlighted. The reduction of visual acuity levels requires the need for control of lighting levels for reading, with implications for the quality of information and urban signing systems. Some situations like location and distances between bus terminals and the level difference between the track and ride, are problems to the biomechanics reduction of this human group. The intellectual capacity in the perception of movement, noise, vibration are others variables in these situations too. The limitation of physical mobility, decreased sense of touch, with quality loss in use of general devices handling ability are recognized as characteristics known in the aging people. Thus, it can highlight the necessity of insert

these requirements in the design of stations, issuing tickets systems in bus terminals, information screens and computer programs for public applications. A multidisciplinary study as mentioned above, was developed by the Geriatrics and Gerontology Institute (IGG / PUC-RS) in 2007. The subject was deepening the level of scientific and technological knowledge about the elderly and allowed a review of accessibility solutions and urban mobility in Brazil, through understanding and consideration of the characteristics of considerably growing population in the country. Thus, knowledge of this audience may lead to changes in the urban environment by adapting existing reality, in order to obtain accessibility urban situations, of special way for the aging people, a very important human group in this century.

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