

International Symposium for Next Generation Infrastructure
October 1-4, 2013, Wollongong, Australia

Transport Infrastructure Renewal in the Context of an Ageing Society in European Cities in the 21st Century

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Abstract: This article explains how renewal of infrastructure of actual city transport network can provide access of older people to a variety of city areas, including the areas of housing and basic services, in order to prevent the exclusion of older people in society. The author of this article^b presents, on the base of selected European cities, new and innovative solutions regarding improvement of accessibility to various city areas, including strategic approach to transport policy and renewal of urban spatial planning, in response to the needs of an aging population. Urban development requires proper transportation services, and in turn extension of infrastructure of transport network ensures the availability and increases the attractiveness of the most of city areas for different social groups, including older people, who need special arrangements in this regard. Such feedback makes a mechanism for the development and transformation of urban structures, understood as the renewal of public areas in response to current trends and tendencies in European cities.

Key words; Ageing society; Transport infrastructure; Urban renewal; European cities.

I. Introduction

The process of ageing of society has an impact on a number of issues of strategic approach for the future of the city. According to the Charter of Athens¹, mobility is the key to reducing social exclusion in European cities. In spite of reduction of time of the trip, not all residents feel it equally, due to the limited access to public transport. There is a high proportion of older people using daily public transport, but there are also older people who do not use this service at all - that makes them feel socially excluded. They need solutions that will positively contribute to active ageing, and thus increase their mobility in the city.

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^b This paper is a part of research performed in the doctoral thesis entitled: "Aging of 21st century European societies in concepts of urban renewal" realized in the years 2009-2013 in the Department Urban and Spatial Planning, the Faculty of Architecture of the Silesian University of Technology in Gliwice, Poland, under the supervision of prof. Zbigniew J. Kamiński, PhD, Eng. Arch. The project has been financed from the resources of the National Center of Science granted by virtue of the decision number DEC-2011/01/N/HS4/02638.

<http://dx.doi.org/10.14453/isngi2013.proc.28>

Transport infrastructure renewal, according to the OECD¹ sees solutions in systems of integration services, reduced spatial distances, contributing to a more compact urban structure in the development of future cities, thus supporting economic growth and urban renewal. There are many links for the transport infrastructure in the sustainable development, among them the most important seem to be two aspects. On the one hand, urban streets, should not only allow the smooth movement of vehicles, but also presence of public spaces, social, with a small architecture, frontages, bike paths, etc., providing accessible and safe access to various locations in the city. On the other hand, the grid of streets in dense urban multifunctional structure can be part of supporting and stimulating older people to activity based on social networking in local venues and local services. The appropriate density of development and the street grid reduces the need to transport and makes the use of infrastructure more efficient.

Transport infrastructure renewal in European cities generally includes activities related to the removal of physical barriers and possible separation of pedestrians from traffic. However, there is a need for broader changes in this area, because the older generation may have special needs in terms of structure and function of the urban environment. The importance of the availability of local amenities increases with age. For example, older people make everyday shopping on foot, so the connection with the services should be located within walking distance of their home, that results in the need for a well-designed network of sidewalks and paths. The ageing of the population also contributes to the increase in demand for services and articles aimed at a specific age group, reduces the amount of time spent on a job and makes a rapid change in social structures². More and more people, due to the increased mobility³, use the services of the neighboring towns, that is associated with an increase in competition between the cities and the necessity to develop easy links to other urban centers and the related dense network of public transportation.

II. Case studies

The subjective selection of case studies includes representative European cities, where the author was involved in the process of renewal of infrastructure of the city transport network. These studies present examples of the strategic and structural approach in selected European cities, such as: Barcelona (Spain), Malmö (Sweden), Sangerhausen (Germany), which are the cities that provide urban renewal policy in the context of demographical changes.

A. Barcelona (Spain)

Barcelona is one of the European cities which carry on urban policy aimed at the renewal of the city in the context of an ageing of the population. The city participated in a global project “Age Friendly Cities”, which aim to change the way of thinking about the city in the context of adapting it to the needs of people of all ages. As an participant in project “Age Friendly Cities” Barcelona conducted a study on daily life and experiences of older people in the city^{4,5} and today is considered to be one of the cities in which they live the most comfortably and where one can easily move around. The changes that were introduced in the city in order to adapt it to the needs of the residents had been planned for the motto: “do not - for cars, do - for pedestrians”.

Strategy approach

In Barcelona, the main objectives of transport policy in the context of older people were:

- creating pedestrian-friendly areas by eliminating cars from the pedestrians zones in the city, in which they are the main problem increasing the risk of accidents and reducing level of security,
- the introduction of new public transport to facilitate access to specific functions in the city, in the end, a relief for public transport for the elderly in the form of special cards “Rosa Target” and new forms of so-called bus El Barri del Bus, the bus to the nearest neighborhood residential areas and Nocturn bus, or buses in the night. Buses from the neighborhood support a large number of stops in the city, and their distribution is dense, which is significant to facilitate and enable the mobility of the elderly and disabled⁶,
- expansion of the existing system of bicycle paths, aimed at promoting a healthy lifestyle and a more ecological means of transport (to encourage older people to be active).

Structural approach

Urban renewal of transportation activities in Barcelona (in this article) applies to urban structure Nou Barris district, located in the north of Barcelona, which is characterized by a topographically diverse terrain. The potential of the area has increased in 1992, when in connection with the Olympic Games in Barcelona a ring road was built, that connected the district with the rest of the city and shortened distance between the districts of Barcelona.

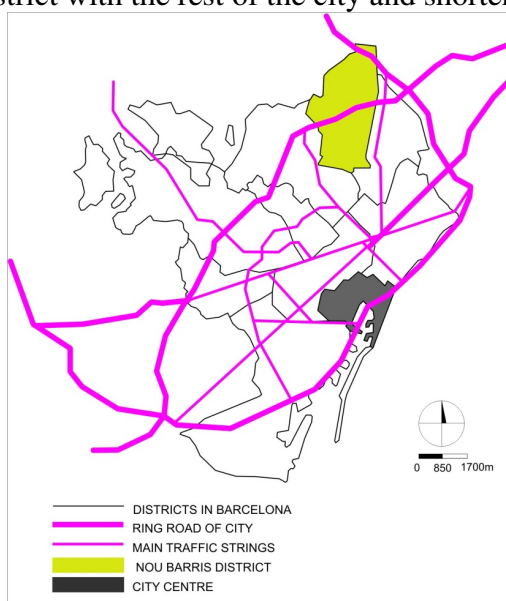


Figure 1. Main arterial roads and the neighbourhood's connections with the city centre. Source: author on the basis of www.mapy.google.pl

The demographic situation in the district made an extra boost to its renewal, because 30% of the population in Nou Barris district are elderly people. Significant differences in elevation of land in the district represented spatial barriers that in the context of older people contribute to their exclusion from urban and social life. There was no friendly public spaces which are places for meeting and recreation for the elderly, because most of them were crossed by major transport routes. Location of bus stops of public transport prevented access to basic services, there was also lacking space for recreation close to home⁷. Due to the topography of the land in Nou Barris

district, a big problem for residents, especially the elderly, was the availability of the bus, metro and core services. There were lacking pedestrian zones, and transport services were not well distributed, due to differentiation of terrain. Public buildings were located too far away from residential areas, beyond the reach of the elderly. Older people were forced to use other than public means of transport (taxis), or stay at home. The main aim of renewal of communication areas was to connect the district to the city center and the integration of the two settlements Verdum and Prosperitati with walking pass by the Via Julia. On the Via Julia meeting place for the elderly, along with direct access to the metro and bus stops was located. In addition, in the structure of the district a system of three passageways was designed, forming links between housing estates, such as:

- pedestrian walkway with local services,
- city squares forming a meeting place for the elderly, connected by walkway crossing the district and allowing the opening for the new areas),
- pedestrian connection with the revitalized pedestrian settlement (inhabited mainly by senior citizens) and the rest of the city (introduction of new public buildings, administrative and subway stations).

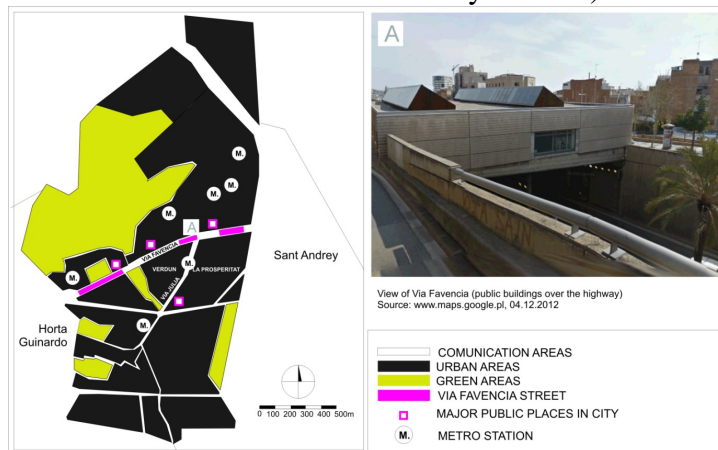


Figure 2. Connections of public spaces between the housing estates of Nou Barris neighbourhood.
Source: author.

B. Malmö (Sweden)

City of Malmö is located in the Öresund region in Sweden and it is the third largest city in the country with a population of about 300,000 inhabitants. A large part of them are the people of other nationalities, reflecting the multi-cultural character of the city. People over 65 years of age account for about 16% of the general population and young people (under 45 years old) account for about 62%, hence the city of Malmö is classified as a young from demographic point of view. However, it is an example which is worth a more detailed presentation, due to its policy of renewal, taking into account the urban aspect of the aging population.

Strategy approach

Key investment was the construction of the Öresund bridge, that has increased the city's importance in the region, and even in Europe and created the potential for the development of the

city, new investments, new jobs, new residential areas, which contributed to the attractiveness of the area. Malmö residents, including the elderly, due to this connection may use the services offered by Copenhagen, which is a large metropolis, offering a wider range of important service and cultural and educational chances for the elderly. The municipal authorities in order to facilitate the mobility of older people in Malmö have introduced a system of coordination of transport, which aims to maintain a high standard of service and optimizing the performance of vehicles. Significantly reduced number of parking spaces resulted in a creation of public space free of cars. Some streets were closed to vehicular traffic with pedestrian traffic entering only. The city has also a well-developed network of bike paths providing fast, eco-friendly and economical way to get around the city center of urban canyons. The activities included the construction of urban bike paths along the main roads in the city center⁹. Such a policy successfully reduced traffic in central city areas and designated new areas of public life. According to the communication strategy regarding cycling in the city, an increase in bicycle transport can play a key role in creating sustainable development of Malmö.

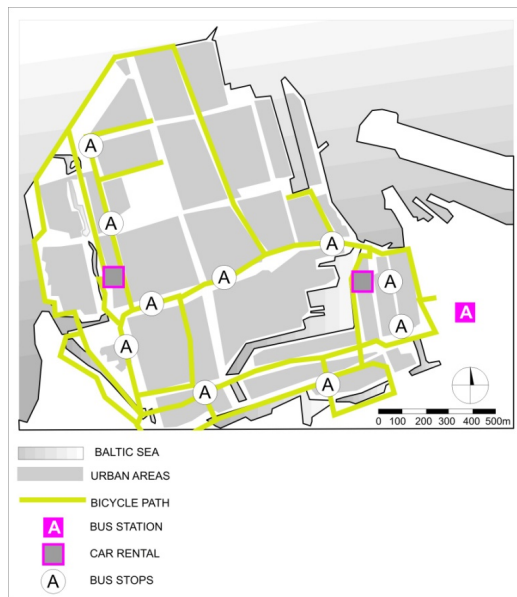


Figure 3. Areas served by public and bike transport in Västra hamnen neighbourhood in Malmö. Source: author on the basis of Folett N., & Filed S., (2011), *Europe's vibrant New Low Car(bon) Communities*, ITDP, Malmö⁸.

Structural approach

The transport system is designed to promote eco-friendly transport in Malmö. This is accomplished by bus, by bike or by foot. Bo01^c area has been designed to minimize the need to move the car. The main mean of transport within the estate are specially rented bicycles and electric-powered vehicles. A dense network of cycle paths provides access to any part of the district in the city. Moreover in the city a convenient for residents, developed bus system was organized. Bus stops in the district of Västra Hamnen are located in close proximity to residential

^c **Bo01 area** (also known as the "City of Tomorrow") was a housing expo in the southern Swedish city of Malmö. It was created in 2001 as part of the European Housing Expo and is notable for its sustainable character.

areas, along major traffic routes in the district, at approximately 400 meters. In the Bo01 district one can rent a car driven by electricity, in order to promote healthy living environment (without the noise and pollution), that promotes a high quality of life for all residents. Parking spaces for cars have been placed outside the team, and in several underground car parks, which reduces the danger of accidents on the streets, in which frequently participants are the pedestrians.

C. Sangerhausen (Germany)

Sangerhausen is a city located in the southern part of the region Saxony-Anhalt in central Germany. It is one of the oldest cities in this region, with a population of about 30,000. It has a long tradition of heavy industry, especially mining. In connection with the liquidation of mines there was a big wave of emigration due to lack of workplaces, resulting in a large number of vacancies. This was associated with a decrease in population in the city, which has contributed to the process of shrinking and ageing of the population. Demographic projections predict that the situation will get worse, which can cause adverse effects on the development of the city. Currently, elderly people above 65 years of age account for about 26% of the population¹⁰.

Strategy approach

The local transport plan¹¹ for the district Mansfeld Südharz, in which Sangerhausen is located, has included a chapter on the impact of demographic changes on mobility. The document noted that, due to an aging population and an increase in the number of single person households, people are increasingly changing their place of residence in old age and are characterized by higher activity in the elderly, resulting in expected in the future increase in the number of elderly travelers, less likely using public transport, and often other forms of transportation. In addition, growth in single person households will increase the demand on the system of services delivered to homes, particularly during working hours, which is the opposite of the current trend, when the most traffic is generated after those hours. It is expected that as a result of demographic changes, the public transport will lose in importance. Now in the district of Mansfeld Südharz declining trends related to the intensity of use of public transport are observed.

Structural approach

Sangerhausen city is well connected in terms of access to neighboring towns. The main means of transportation include: the train, the communication bus service in the city and outside its borders, and a well-developed network of roads and highways. Transportation in the city is serviced by city buses, plying on three lines. Supra-local transport is provided by the railway as well as an additional buses to neighboring cities such as Halle, Nordhausen, Magdeburg and Erfurt. This allows older adults can benefit from service offers of the neighboring municipalities.

III. Conclusion

The above presented case studies made it possible to draw conclusions regarding the methods of renewal of the city transport network.

In Barcelona transport infrastructure renewal has been carried out on the basis of following interventions:

- point interventions (multi-generation housing estates, nursing homes for the elderly),
- linear interventions (promenades for pedestrians, means of reaching one's destination),

- system interventions (relationship between functional-spatial structures, with particular emphasis on the effective distribution of services in the area, with the ability to reach them by foot).

Those interventions have contributed to the synergies between the different functional-spatial structures, so that the entire structure of the district was integrated not only with the nearest surroundings, but also from the city center, which offers older people a wide range of commercial services, culture, entertainment, etc. In turn Malmö implements the concept of a compact and green city, growing within the urban structure. Older people have access to different services by reducing traffic in pedestrian zones and creating a compact structure of communication areas, providing access to basic functions by foot, or in close proximity to bus stops of public transport and also by mixed utilization of areas with different functions.

In case of Sangerhausen the transport system in whole city scale is underdeveloped. This is due to short distances between particular areas in the city, which can be covered by foot. The frequency of plying of public transport is less than in other big cities. The number of lines of public transport is small, and their routes cover all areas of the city. This type of transportation is addressed to people who want to get to distant areas of the city, without paying excessive attention to the time of trip and the frequency of plying.

References

- ¹OECD, *Ageing, housing and urban development*, Paris: OECD, 2003.
- ²Giddens, A., *Europa w epoce globalnej*. Warszawa, Wydawnictwo Naukowe PWN, 2009.
- ³Fiedler, M., Schuster, A., and Link, J., *AENEAS programme. Study Tour Catalogue*, 2010, URL: http://www.aeneas-project.eu/docs/AENEAS_StudyTourCatalogue.pdf
- ⁴WHO, *Checklist of Essential Features of Age-friendly Cities*, 2007, URL: http://www.who.int/ageing/publications/Age_friendly_cities_checklist.pdf
- ⁵WHO, *Global Age Friendly Cities: A guide*. Geneva, WHO Press, 2007, URL: http://www.who.int/ageing/publications/Global_age_friendly_cities_Guide_English.pdf
- ⁶ACT Consultants, *Good policies and practices to tackle urban challenges*. Paris, European Commission, 2011, URL: http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/citiesoftomorrow/citiesoftomorrow_case.pdf
- ⁷Garcia, A. S., and Garcia-Villalba, O. C., "Housing in the first periphery of Barcelona: Towards the finding of criteria for urban renewal." *Proceedings of the 23rd European Network for Housing Research (ENHR) Conference*, European Network for Housing Research, Toulouse, France, 2011, pp. 1-22.
- ⁸Folett N., and Filed S., *Europe's vibrant New Low Car(bon) Communities*, ITDP, Malmö, 2011.
- ⁹*Cykelprogram för Malmö stad 2012-2019*, 2012 URL: <http://www.malmo.se/download/18.3744cbfb13a77097d8748de/Cykelprogram+f%C3%B6r+Malm%C3%B6+stad+2012-2019+2012-10-30.pdf> [
- ¹⁰IBA Saxony-Anhalt, *Sangerhausen. Rating for liveable urban district*, 2010, URL: http://www1.europa.sachsen-anhalt.de/vademecum/Archiv_verbindlicher_Dokumente/I+P/Veranstaltungen/IBASTadtumbau2010_broschuere_sangerhausen_EN.pdf

- ¹¹Landkreis Mansfeld Sudharz Kassel, 2. *Fortschreibung des Nahverkehrsplans*, 2009, URL:
[http://www.mansfeldsuedharz.de/
media/pdf/2._fortschreibung_des_nahverkehrsplans_endfassung.pdf](http://www.mansfeldsuedharz.de/media/pdf/2._fortschreibung_des_nahverkehrsplans_endfassung.pdf)