

Preface

6th International Conference on Pedestrian and Evacuation Dynamics

Editorial

Why Is Pedestrian Research Important?

People have been walking for millions of years. Humans walked out of Africa on their journey to settle the whole world. Yet, in spite of how long and how far we have walked, there is still a great deal we do not know about walking. And, more importantly, in spite of our advanced transport technologies, the demand for walking is growing since it provides the foundation for sustainable and practical transport solutions. In summary, as the following challenges show, pedestrian research is more important than ever.

First, the density of human settlement is increasing. The world population is approximately seven billion and by 2050 it will be over nine billion. Today, over 50 % of people live in cities; by 2050 it will be over 70 %. Many of these cities will be megacities with settlement densities hard for us to imagine today. Even in places with stagnant population growth, such as Europe, forecasts show that the number of people living in major cities will increase as a result of better economic opportunities and efforts to protect rural landscapes. These population increases pose a major challenge for urban infrastructure and transport systems everywhere. Not only must more people be served, but crowded transport systems pose additional risks during technical breakdowns or emergency situations. Managing these risks is becoming more complex and important to society. In short, our cities will have more pedestrians, so we need to better understand their behaviour and needs.

Second, the number of older and disabled persons is rapidly increasing. We need to design fully accessible infrastructure and transport systems to meet the needs of older and disabled people, but also recognize that they move more slowly than younger people. So we also need to reduce distances, simplify paths and reduce detours. Understanding the physical requirements of walking will be fundamental to achieving these important goals.

In addition to becoming more crowded, new social media are enabling people to quickly organize spontaneous gatherings. Whether for a celebration or a revolution, social media can bring together thousands of people in hours. Once the process has

started, there is little time to evaluate a location's physical safety conditions or to establish necessary pedestrian control systems. New pedestrian assessment methods and applications are needed to help quickly evaluate and plan for these types of events.

Third, increasing land use intensity encourages the construction of underground infrastructure, especially for transport. Many cities will build or extend underground metro systems. Many existing and new railway lines will be placed underground to serve as a backbone for regional transport networks. For example, in Zurich a new underground railway line is being built between the main station and the northern part of the city. But underground transport will not be confined to cities; long distance rail lines – especially high speed lines – will include many tunnels and underground structures to both maximize speed and reduce environmental impacts. Examples include Switzerland's 35-km Loetschberg railway tunnel (operating since 2007) and 57-km Gotthard tunnel (opening in 2016). Designing underground transport systems and facilities that can efficiently and safely accommodate large numbers of people in regular operations and, especially in emergency conditions, requires a very detailed understanding of pedestrian behaviour and needs. Government authorities have very stringent requirements that must be fulfilled in order to obtain approval for these types of projects.

Fourth, walking is a fundamental element of public transport and therefore must be carefully considered as operators seek ways of reducing costs and improving productivity. One example: today it costs Zurich's public transport operator 1 million CHF annually to operate a tram and 0.5 million CHF to operate a bus! The faster the service, the fewer the vehicles needed to run the same schedule. So, a powerful means for reducing costs is accelerating service – only fast public transport can be efficient. A good way of achieving this is to reduce dwell times at stops, but doing this successfully requires careful analysis of pedestrian movements.

Similarly, a growing number of railways are adopting the principle of cyclic timetables ("Integrierter Taktfahrplan"). Achieving the required node-to-node running times needed to meet these timetables can mean spending many millions of CHF on infrastructure improvements per minute of travel time saved. The alternative, reducing station dwell times through better design of pedestrian transfer facilities, can be much less expensive and make service more attractive to passengers.

But even in a continuously changing world, there are constants: The Swiss distance measure "Schweizerstunde" ("Swiss hour") used in the nineteenth century was equal to $4.8 \text{ km} = 1.33 \text{ m/s}$ or exactly the average of today's pedestrian speed!

Answering these challenges requires new knowledge, new methods and new tools. We must understand pedestrian behaviour under different conditions as well as be able to predict and simulate these behaviours in advance. We must develop accurate simulation for use in designing pedestrian facilities, helping us avoid dangerous situations, plan adequately for emergencies, and, last but not least, to make walking more attractive and enjoyable in general. The PED 2012 conference was an excellent opportunity to showcase research focused on these important topics.

At PED 2012, over 170 people enjoyed 70 presentations and keynotes as well as 70 poster presentations. The conference included presentations on new mathematical models and improvements to existing models. Many presentations described new insights on pedestrian behaviour in normal situations and emergency cases. Exciting new fields of research based on new technologies such as sensors and advanced means of observation were opened. In short, PED 2012 highlighted the transportation research community's commitment to meeting the challenges inherent in creating the pedestrian society of the future and has served as a starting point for innovative new research ideas, building a strong foundation for future research and the next conference.

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