Technical Notes on GDF, GEOGRAPHIC DATA FILES Information support for the visually impaired Project R&D MD

1 WHY ACTUALLY CREATE AN INFORMATION SYSTEM FOR THE NICHE USER GROUP OF THE VISUALLY IMPAIRED?

- Equal opportunity; all (consequently also handicapped people) have the same right to information
- It is an adverse civilization factor that has an increasing tendency

2 BACKGROUND

For the safe movement of blind and weak-eyed people it is important sufficient and unambiguous information is obtained, mainly in a haptic way (white cane, stepping, etc.), while acoustic information is often supplementary. It is important that the amount of information is optimal (minimized), and its sequencing comprehensible. The principle of safe movement for the visually impaired consists of a sufficient number of easily and unambiguously identifiable orientation points and their sequence (creating guiding lines). Examples of these points are identifiable as home corners, retaining walls, parts of fences, and, sometimes, regular flowerbeds. However, many other points do not need to fulfil this function. In the event of snow these points are covered - grass kerbs, haptic elements and surface changes on walkway (natural and special pavement). Complementary to the function of haptic obtained information is acoustic information. This information serves for identification and routing. Blind people are able to move very well in a known environment with the help of the other senses and a blind cane. But in the case of an unknown environment he or she needs assistance from the surroundings. Information which one generally considers trivial becomes absolutely vital for blind people.

3 SYSTEM DESIGN

A system should respect the needs and recommendations of the end user group. The frequency of data providing in familiar environment may be one time per fifteen to thirty minutes. Orientation in an emergency situation has to be with an immediate response with a frequency of one time per minute. For navigation wide walkways are recommended without having to walk across a square, and the system has to integrate information about public transport (nearest bus stop etc.).

A significant set of functions that influence the system design is possible to define according to a few levels:

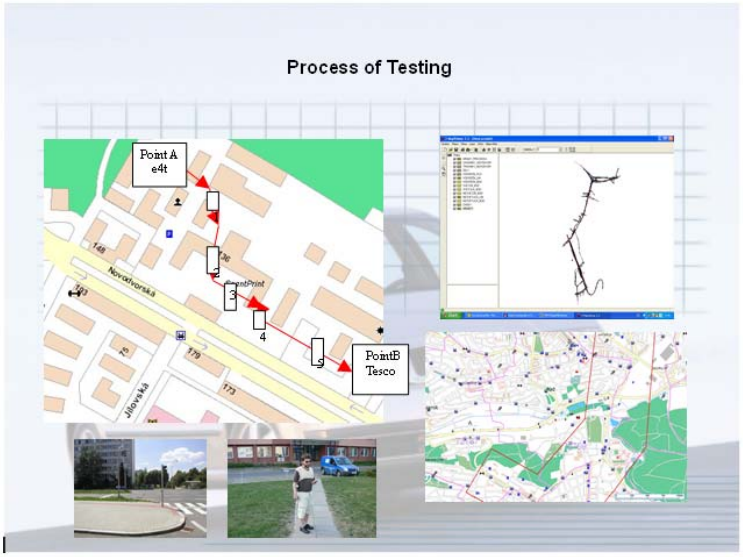
- Frequented zebra crossing without acoustic signalisation, passing tracks and roads. Blind people would rather use a longer, safer way with sound signalisation than take the risk of crossing roadway at unknown places.
- Navigation of extensive areas, loss of orientation points in front of railway stations, as well as supermarkets, walking in a straight direction are difficult for the visually impaired, blind people deviate from the direct way without recognising this situation.

- Unexpected and dangerous obstacles, badly parked cars on sidewalks (threats from unforeseen entrances to the roadway), awkward advertising columns, unsecured excavations etc.

4 TESTING AND RESULTS

For the purposes of testing a local part of Prague – Prague Lhotka was proposed. At the testing visually impaired people have participated, together with developers of the system. The system is based on the platform MDA (iPAQ 6500, QTEK 9110) with a voice output and an external GPS receiver. The testing simulated situations on how to get from place A to place B using public transport.

On the following slide the process of testing is demonstrated.



At the present time the final report is formulated from the research project and discusses the potential integration of the system among other systems supporting the visually impaired.

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