GIS improves accessibility in pedestrian, bicycle, public transport and car networks (Sweden)

In order to improve urban accessibility a GIS (Geographical Information Systems) method, was designed to calculate accessibility on foot, by bicycle, by bus and by car over an entire area of a city for the standard setting user groups (children, elderly and the disabled) in Swedish transport policy. The project has been financed by Vägverket The Swedish National Road Administration.

Background & Objectives

In order to improve urban accessibility methods must be designed, which can describe the present distribution of accessibility. Such a method must also consider different means of transportation, the user s age, sex, physical abilities, as accessibility differs due to these variables. That is why a GIS (Geographical Information Systems) method was designed.

Implementation

The GIS method was applied in several different ways. In order to improve accessibility of for pedestrians and cyclists, foot- and cycleway network data was collected through field inventory. This network is characterized by 24 different quality parameters which are considered to be of importance for the safety, security and convenience of the user groups studied.

Further, in Sweden population statistics on real estate coordinates are available for research and planning purposes as long as the results are not presented in a way that individual households are possible to identify. So, in order to calculate public transportation accessibility, a GIS-model has been built, which connects bus stops to the foot- and cycleway network.

The fastest travel time between real estate coordinates (where people live) can then be calculated considering time for walking, waiting, traveling and changing between different lines. The GIS-model for car use considers one-way streets, forbidden turns and average speed. Like the other models it can calculate travel time between real estate coordinates of free choice.

Further, the method was used to:

- develop a good standard for children s safe walking,

Conclusions

These methods of GIS data bases have been built for the municipalities of Helsingborg, Umeå, Luleå, Trelleborg, Falun, Alingsås, Nynäshamn, Säffle and Ösmo.

The different GIS programme applications developed have been joined into one user-friendly tool, ArcTVISS, free to use. The method has proved to be a useful tool to calculate urban accessibility in a detailed way not known before.

More information

Using GIS to calculate accessibility in real foot, bicycle, public transport and car networks (Sweden) Paper presented by Mr. Mats Reneland at ECOMM 2006 (city of Groningen, the Netherlands).

Author

Mats Reneland

Contact

Mats Reneland

- analyse accessibility of vision impaired's access to the town centre by public transport,
- analyse mobility impaired's access to food stores by wheelchair,
- analyse access to major work places by car, public transport and bicycle.