Mobility Pass for Residential Real Estate – An Online Tool for the Calculation of Mobility Costs and the Awareness on Housing Decisions

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“Mobility Pass for Residential Real Estate” is an online tool which investigates the relationship between the selection of the location of residence and the mobility behaviour, showing the effects of mobility time, mobility costs, CO₂ emissions and possible accident risks on different selected locations.
In Austria, about 10% of the population changes their home every year, in 2009 that was about 875,000 people. Nearly 80% (680,000 people) residence changes occur within one or between neighbouring municipalities in Austria.*.

A household in Austria spends EUR 5,240 on average in 2010 on mobility. **

Compared to year 2005, Austrian households spend EUR 330 more in mobility.**

The choice of location for a residence or a business is usually an important, long-term decision requiring a high level of investment of capital.

- The costs of real estate and the energy efficiency are key factors for the decision to buy a house or apartment.
- The estimation of the mid-and long-term location indicated mobility costs is quite difficult.
- The tolerance towards the time consumption of commuting and of mobility is high.
- Aspects like sustainability and accident risk are becoming more important.

Quellen: *Statistik Austria, **VCÖ, 2010
Main Features
• Calculation of the annual real estate costs
• Calculation of the mobility costs and its side effects

assignment of the location of
• residential site
• working site
• regularly weekly leisure activity sites

selection of different means of transport
• car
• public transport
• foot
• Bicycle

selection of different sequence of leisure events
• Before work, After work, …

visualization of the locations on the map
Determination of the parameters
• mobility costs
• travel time
• CO2 emission
• monetary accidental risk
• real estate costs

Comparison between the annual real estate costs and mobility costs

Visualization of the calculated routing trips on a map

Possibility to calculate different variants and compare them against

Decision support on residential location
Calculation of the daily business trips

Lifestyle types:

Based on the lifestyle matrix developed out of the micro census evaluation made by Statistic Austria, 7 different lifestyle types could be identified for Austria in relation to the residential location (urban, semi-urban, peripheral, urban cities with special transport structure). 28 lifestyle groups have been established and a certain mobility behaviour can be classified.
Open Street Map Data

• Integration of an open and extensible data source
• the individual vehicle transport should be calculated by the street data of Open Street Map (OSM)
• Open Street Map has the goal to collect all kind of data on a map and the main advantage of the data is the open source license and the community is updating the map continuously
CORINE Landcover

• With the help of CORINE Landcover 2006 data set, there is an attempt to have a delineation of inner-city and non-urban roads

• The delineation from the city streets, the main class of “built-up area” and its subclasses are used
AnachB API

• The interface is used for the calculation of the route trips of foot, bicycle and public transport and has a multimodal graph.

• The underlying routing graph of this interface is more detailed than commercial ones and includes live traffic information (Floating Car Data, Traffic Messages ...).
- passenger car routing network
  - weighted graph
  - Time assigned as weights
- dijkstra algorithm
  - optimal route (fastest path)
- travel time matrix
  - grouped by street categories
Architecture

3-tier architecture

Web Browser / Client
- Reverse Geocoder & Geocoder API

Technologies:
- Client-side: JQuery/AJAX/ Javascript
- Server-side: PHP
- Database: PostgreSQL
- Data source: OpenStreetMap CLC 06

Logic Tier

Presentation Tier

Database Tier

Web Server (Apache)

External routing API

Database (PostgreSQL)

pgRouting

PostGIS

HTTP

AJAX

PGSQL

REAL CORP 2012 – Remixing the city
Mobility Pass for Residential Real Estate
The navigation bar provides the user the ability to calculate and change the input values of the different variants. This also allows a comparison between two variants. User Interface is split into different parts.
The result of these tools creates a summary of the annual mobility costs, and accident costs and CO₂ emission and travel times for the entire household.

Division in tabular form for each person in the household and their modes of transportation.
Comparison of two variants by entering different parameters

The annual mobility costs can be compared with costs of real estate
Potential Users

• The **target groups** for this online tool will be on the one hand the **individual household (buyer/tenant)**, and on the other hand the **real estate business** (real estate agents/real estate education/project developers).

• As a result of the online tool, the **real estate business can offer a better service to their customers** – after the first steps of the online tool, taylor-made version can be developed in which real estate agents can update important facts and real estate data themselves.

• A future perspective is the use by public administration for modification of the rules of subsidized housing
END CUSTOMER / REAL ESTATE SEARCHER:
Transparent / comprehensible estimation and the comparison of mobility costs, time costs, CO$_2$ emission and accident risk of different locations

Perspective for companies =>

a help for making location decisions

REAL ESTATE INDUSTRY/ AGENCIES/ BROKERS
Awareness for „approaches to planning“ in real estate industries allows better consulting and services

Perspective: „location-aware housing subvention“ instead of commuter subsidies
It would be indicated if the same status were given to the Mobility Pass as it was for the “Energy Pass” because of the EU Directive, which is compulsory since 2009 and shows on scale from A to G how energy efficient a building or a flat is.

A future possibility to enlarge the offer within the “Mobility Pass for Residential Real Estate” is the integration of Open Government Data (OGD) for other European countries beside Austria.

**Involvement of banks** for further development of the tool and a “business model”

**Foreseeing and comparing the mobility costs**, mobility time, CO2 emissions and accident risks of different selected locations over enables citizens (and companies) to make their own choices when choosing housing (or business) locations.

**Planners and local administrations** can use “Mobility Pass for Residential Real Estate” to have an effective tool when thinking about where to further develop cities (compact vs. dispersed way) or where to allocate housing subsidies.
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Thank you for your attention!